



Draft Environmental Impact Report

Construction of 2 500m² processing facility to remove contaminants from waxy oil at FFS

Govan Mbeki Municipality
EIA Number 17/2/3/8 GS - 05
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Applicant:	FFS Refiners
Contact:	Alison Haycock
Phone:	031 459 5300
Fax:	031 459 5326
Email:	alison@ffs.co.za

Prepared By:



www.ksems.co.za

Kerry Seppings Environmental Management Specialists cc

Phone: 031 769 1578 Fax: 086 535 5281 Cell: 082 823 1844 E- Mail: kerry.seppings@elkomsa.net

P. O. Box 396, 3603

Company Registration no: 1999/049452/23

Members: K.A. Stanton (Director)

The information in this report is based on information supplied by the client, FFS Refiners. All information is given in good faith, however, no physical testing or chemical analyses were performed by Kerry Seppings Environmental Management Specialists cc during the course of this assessment.

Although every effort was made to request and obtain all pertinent information for this assessment Kerry Seppings Environmental Management Specialists cc cannot be held accountable or accept responsibility for any discrepancies in this information or for the disclosure or review of information which has not been presented to the consultant. All reports presented to the consultant for review have been referenced.

As per Regulation 31 (2) (a) of the NEMA EIA regulations herewith (ii) the expertise of the EAP to carry out an Environmental Impact Assessment;

Expertise to Conduct Scoping and EIAs

Kerry Seppings Environmental Management Specialists cc (KSEMS) has been based in KZN since 1998. The consultancy is responsible for numerous Environmental Impact Assessments per annum and all consultants managing our EIAs have a minimum of a Master of Science degree in the Environmental Sciences. In early 2008 the business was converted to a closed corporation (cc). In the new organisation each project is reviewed by at least 3 qualified staff. The increased staff component has allowed for specialised staffing in the following areas; linear EIAs, large developments, ecological expertise, coastal and estuarine ecology, ECO provision, petrol stations, roads development and industrial development. There is also a legal expertise to complement all work done by KSEMS cc.

Integrity and Independence:

Our independence in assessing environmental impacts is paramount to the EIA process. We support sustainable development and believe that as independent consultants our role is to represent the interest of the environment first and foremost and ensure an effective and efficiently conducted environmental assessment process.

Environmental Legal Knowledge:

Kerry Seppings has extensive environmental legal knowledge regarding not only the EIA process and requirements but also with regards to all other legislation at a national, provincial and local level and how these affect environmental management issues. KSEMS has compiled a number of environmental legal registers for several industries in the chemical, paint and manufacturing sector as well as for companies involved in green field developments. Kerry has also carried out several environmental legal audits and as such is conversant with a wide range of legislation relating to various aspects of industry and development.

Specialist Training:

Kerry Seppings has been extensively involved in implementing ISO 14001 Environmental management systems for a number of industries and has good industrial knowledge as well as sound ecological experience when it comes to green field development. Kerry is an ecologist by training and has experience in terrestrial and estuarine environments having obtained her honours degree working on the St Lucia estuary. She was awarded her Master of Science (cum laude) for work done on a thesis on Environmental Management and Open Space Planning. Her continued involvement in the EIA process has resulted in her being an experienced facilitator of the public participation process and is often contracted to resolve environmental related conflict. Kerry has also been certified as an Environmental Assessment Practitioner by the EAPSA and is a GCX certified Carbon Footprint Analyst (Level 1). Kerry is also registered as a Professional Natural Scientist by the South African Council for National Scientific Professions.

Major Clients and Projects:

KSEMS cc is involved with the full range of environmental assessments from a client developing a site for a single resident to some of the Nation's biggest corporations, government departments and parastatal organisations.

Key Areas of Focus Include:

Ecological system planning, hydroelectric power plant and dam construction, retail and residential developments, road and bridge development, transmission and power line installation, gas pipelines and metering stations, filling stations development, multi-use complex development, EIA and ECO work, 24G applications, carbon footprint calculations and analyses, development of rural roads, water use licensing and waste licenses and management of diverse specialist teams on major projects.

As per Regulation 31 (2) (a) of the NEMA EIA regulations herewith details of – (i) the EAP who compiled the report;

AUTHORS

This Report was prepared by *Kerry Seppings Environmental Management Specialists cc*

Kerry Seppings BSc (Hons) MSc EAPSA certified (Pr Natural Scientist)

Lead Environmental Consultant and Director

Certifications: Certified by the Environmental Assessment Practitioners of South Africa (EAPSA)
 Certified Professional Natural Scientist (400167/12)
 Certified GCX Carbon Footprint Analyst (Level 1)

Tertiary Education: University of Natal, Durban
 BSc (Hons) - Estuarine Ecology (Major), Urban Biogeography (Ecology) (Major) *MSc awarded cum laude*
 Environmental Management and Open Space Planning Thesis “*Developing an Open Space System for the Queensburgh Municipal Area*”

Work Experience: 1993 - 1994 Queensburgh Municipality - Unofficial Environmental Advisor for duration of MSc
 1994 - 1995 IDEAS- Partner in Environmental Consultancy
 1995 - 1998 Environment Branch, North and South Central Local Council- Professional Environmental Officer
 1999 - present; Director Kerry Seppings Environmental Management Specialists cc.

Stephanie Williams BSc (Hons) MPhil Marine and Environmental Law

Lead Environmental Scientist

Tertiary Education: University of Cape Town, Cape Town
 BSc (Hons) - Botany (Major), Zoology and Ecology.
 MPhil Marine and Environmental Law

Work Experience: 2012 Environmental Control Officer for the Transnet multi-purpose pipeline.
 2012 – 2013; Environmental Consultant for Kerry Seppings Environmental Management Specialists cc.
 2013 – present; Lead Environmental Scientist for Kerry Seppings Environmental Management Specialists cc.

Detailed CVs and proof of certifications and degrees are available on request.

EXECUTIVE SUMMARY

FFS Refiners (Pty) Ltd are in the business of refining hydrocarbon liquids for use in the industrial heating fuel market. The FFS Evander plant located at 3 Brunel Road, currently processes tar derived fuels into industrial heating fuels. The site also produces creosote for wooden pole treatment. FFS propose to construct a new 2 500m² facility to process a residue termed “waxy oil”. The site was designed for a future expansion of this nature in mind as the site has approval for 15 000m³ storage tank capacity. FFS intends to use 2 x 1200m³ storage tanks already erected under the original environmental authorisation as raw material/initial storage tanks in the waxy oil process and construct 6 x 250m³ (process/intermediate tanks) and 7 x 60m³ process tanks under this EIA application.

The process involves the filtration of iron catalyst fines and carbon particulates from the waxy oil to produce a low sulphur oil used as an industrial heating fuel for sale to the industrial heating fuel market. The full process is described in section 3.0 of the EIR.

The waxy oil will be received by FFS in road tankers from SASOL Synfuels located in Secunda, Mpumalanga. The proposed processing facility will consist of two raw material tanks, six process tanks and seven static plant tanks with a total new additional storage capacity of 1 920m³. Other equipment includes centrifugal separators, static separators, a distillation unit, a filtration unit, heat exchangers, a magnetic separator, chillers, cooling towers, scrubbers and oil fired heaters.

An application for environmental authorisation was submitted to the Mpumalanga Department of Economic Development, Environment and Tourism (DEDET) on the 22nd January 2009. Notification of interested and affected parties (I & APs) commenced on the 17th February 2009 and the relevant adverts placed as required by the 2010 EIA regulations in terms of Chapter 5 of the National Environmental Management Act, 1998 as amended. The second draft Scoping Report was submitted to I & APs for review and comment on 13th October 2010. The Final Scoping Report was submitted to the DEDET along with all comments received on 24 November 2010. The DEDET approved the Scoping Report on 19th May 2011. The project was put on hold and the application timeframe lapsed however DEDET have granted exemption from re-doing the Scoping Report (Appendix 9.6). The Draft EIR was therefore compiled and submitted to I & APs for comment on the 05 September 2013. Once all comments have been received, the Final EIR will be submitted to the DEDET for environmental authorisation.

Using independent specialist input, the contribution that the additional waxy oil processing facility may have on ambient air quality, MHI risk potential (on and offsite) and the hazardous nature of various products and materials utilised during the waxy oil process were assessed to identify all environmental and social impacts. Recommendations and mitigation measures have been included and a final Environmental Impact Statement prepared with recommended conditions for environmental authorisation. Based solely on the specialist information provided, the EAP is satisfied that the ambient air concentrations will not be significantly affected and that the increase in offsite risks posed by the future Evander operations is very low. The increase in onsite risks can be sufficiently mitigated against combined with hazardous waste management.

The attached Environmental Management Programme (EMPr) should be adhered to during all phases of development: pre-construction, construction and operational. Specialist input provided during the Environmental Impact Assessment has been incorporated in the EMPr to ensure that potential impacts of the proposed development are minimized, mitigated against or prevented.

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ACRONYMS

AEL	Atmospheric Emission License
ADMS	Atmospheric Dispersion Modelling System
AQIA	Air Quality Impact Assessment
AQMP	Air Quality Management Programme
BID	Background Information Document
BLEVE	Boiling Liquid Expanding Vapour Explosion
C ₆ H ₆	Benzene
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DEDET	Mpumalanga Department of Economic Development, Environment and Tourism
DWA	Department of Water Affairs
DWAF	Department of Water Affairs and Forestry
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMPr	Environmental Management Programme Report
EPA	Environmental Protection Agency
FFS	FFS Refiners (Pty) Ltd
GIS	Geographical Information Systems
HECEMA	Highveld East Conservation Environment Management Association
HPCMS	High Pressure Customer Metering Station
HFO	Heavy Fuel Oil
I & AP	Interested and Affected Party
KSEMS	Kerry Seppings Environmental Management Specialists cc
LDAR	Leak Detection and Repair Programme
NAAQS	National Ambient Air Quality Standards
NACA	National Association for Clean Air
NEMA	National Environmental Management Act 107 of 1998
NEMAQA	National Environmental Management Air Quality Act
NO ₂	Nitrogen Dioxide
MHI	Major Hazard Installation
MRG	Methane Rich Gas
OHS	Occupational Health and Safety
PCA	Post Construction Audit
PM ₁₀	Particulate Matter
SAHRA	South African Heritage Resources Agency
SANS	South African National Standards
SAWS	South African Weather Services
SEF	Smelter Enrichment Fuel
SO ₂	Sulphur Dioxide
USEPA	United States Environmental Protection Agency
VOC's	Volatile Organic Compounds
WESSA	Wildlife and Environment Society of South Africa

1.0 Introduction

1.1 Brief Description of the Proposed Activity [Regulation 31 (2b)]

FFS Refiners (Pty) Ltd (hereafter referred to as FFS) propose to construct a processing facility at their existing Plant on 3 Brunel Road, Evander (Figure 1, Appendix 1). The Evander plant currently processes coal tar derived fuels into industrial heating fuels for a wide variety of applications. The site currently also produces wood preservative for wooden pole treatment.

Kerry Seppings Environmental Management Specialists cc (KSEMS) were appointed by FFS to conduct the Environmental Impact Assessment (EIA) for the proposed waxy oil processing facility. Please refer to Table 7, which lists the relevant listed activities that triggered Environmental Authorisation (EA).

The new proposed waxy oil processing plant will occupy a total area of 2 500m² within the boundaries of the existing plant (Figure 1). The facility will process a heavy distillate residue termed “waxy oil”.

Waxy oil is the resultant remaining residue after a valuable petroleum distillate fraction is removed for further processing into petrol, diesel and other petroleum products.

The waxy oil received at the proposed new facility will be further processed to produce a Heavy Fuel Oil which is suitable for use as an industrial heating fuel for sale to the industrial heating fuel market and an iron enriched fuel for the smelter fuel market. A full break down of the production process is outline in section 3.0 of the Environmental Impact Report (EIR) but briefly, the facility is used to filter iron catalyst fines and carbon particulates from the waxy oil to produce a low sulphur oil. The major market for the final product is the Gauteng area where power stations are numerous.

The proposed processing facility will consist of six new processing/intermediate 250m³ tanks and seven 60m³ tanks for static plant with a total capacity of 1920m³. Other equipment that will be installed includes:

- 4 Centrifugal Separators
- Static Separators
- Distillation Plant
- Filtration Plant
- Various Heat Exchangers
- Magnetic Separation Plant
- 2 Chillers
- 2 Cooling Towers
- 2 Scrubbers
- 2 Oil Fired Heaters.

FFS will be also be utilizing their existing raw material/initial storage tanks (2 x 1 200m³), which were erected under the original EA (ref no: 17.2.25.16H45). The total combined capacity for the full waxy oil process will therefore be 4320m³.

An alternative layout and tank designs have been considered by the applicant and are discussed in section 3.4 of the EIR as well as the no-go option. The environmental, social and economic impacts are discussed throughout the EIR and a summary of the potential impacts provided in Table 11 under section 6.0 of the EIR.

Figure 1: Google Earth image illustrating the location of the existing FFS plant in Evander with the proposed position of the new waxy oil processing plant outlined in red (source: Google Earth & FFS Refiners Pty Ltd)



1.2 Description of the property on which the activity is to be undertaken and the location of the activity on the property [Regulation 31 (2c)]

The existing FFS Evander plant occupies stands 1941 through 1943 on 3 Brunel Road. Geographically the site is situated at 26°29'12" South and 29°06'02" East. It is located \pm 18 km north-east of Secunda. North of the site is the Kinross Gold slimes dam and the town of Evander (1km) (Figure 1). The site proposed for the waxy oil processing facility is zoned and used for industrial purposes. It is located within an industrial area in the Evander Industrial Park surrounded by light to medium industries.

The proposed new waxy oil processing facility will occupy approximately 2 500m² of floor area within the existing FFS tar processing facility opposite the transport workshop. Please refer to Appendix 2 for a detailed site plan of the existing Evander plant which includes the location of the proposed new waxy oil facility outlined in red. A photograph showing the location of the proposed new facility within the Evander site is provided in Figure 2 below.

Figure 2: Existing FFS Evander tar processing facility (red outline) and location of the proposed activity (in yellow).

1.3 Description of the Need and Desirability [Regulation 31 (2) (f)]

Sasol Synfuels of Secunda, Mpumalanga, generate a process residue called waxy oil which remains after the valuable petroleum distillate fraction is removed for further processing into petrol, diesel and other petroleum chemicals. This heavy distillate residue is suitable for re-refining into a Heavy Furnace Oil (HFO). FFS Refiners are proposing to design and build a process to remove the catalyst fines from this product at their existing Plant located in the Evander Industrial complex (Figure 2 above). The new processing facility envisaged will require new technology to significantly improve on the quality of the product produced.

1.4 Purpose and Structure of this Report

The EIA process is a planning tool that assists with the assessment of social and environmental impacts through independent specialist input and public participation. The role of the Environmental Assessment Practitioner (EAP) is to provide independent specialist input, manage the public participation and consolidate all relevant information culminating in the EIR and Environmental Management Programme [Regulation 32 (2) (o)].

The purpose of the EIR is to assess environmental impact and illustrate significance according to the extent, intensity and duration, taking into account specialist input and interested and affected party (I&AP) comment. All of this is done with the intent of making recommendations to reduce or avoid the negative impacts of the proposal. Ultimately a statement on whether or not the project should go ahead is made. Another important function of the EIR is the inclusion of the Environmental Management Programme (EMPr). The EMPr is a document where the findings of the EIR have been translated into measurable actions that must occur during construction and operation in order to mitigate identified environmental impacts. The EMPr is intended as a standalone, public document that becomes legally binding should the EIA be approved. The EMPr is included as Appendix 3.

This EIR has been structured according to the requirements of the NEMA EIA regulations. Section 1.5 provides an overview of the scoping process indicating key issues raised and investigated and summarising the process itself. Through each of the following sections leading up to the table of assessment of impacts, impacts that have been

identified throughout each section have been highlighted in italics to ensure that all impacts have been identified for assessment. Where specific issues for assessment have been newly identified as a result of the specialist report review or due to further investigation, these have been added to the impacts identified in scoping and are shown in the table in section 6.0 in **purple**.

In section 3.0 the development proposal including associated aspects such as management of stormwater, sewage, water and electricity supply as well as traffic impacts are described and discussed. Once again potential environmental risks identified in each section are listed for review and assessment in section 6.0. Section 4.0 describes the environment of the site in terms of physical, biological, social, economic and cultural characteristics. Throughout this section, potential environmental risks are identified for further assessment and rating under section 6.0.

Public participation carried out during scoping is included in section 5.0 and comments raised are discussed throughout the report in the relevant sections. In section 5.4, the reader is directed to the comments and responses tables which are provided in Appendix 9.8. Section 6.0 commences with the identification and assessment of issues and impacts, identifying the underlying principles used to determine the importance of certain impacts identified and how these are rated once the mitigation measures have been taken into account. The EMP, which is intended to function as a standalone document identifying key construction impacts and controls for mitigating these is included in Appendix 3.

Finally the report concludes by identifying assumptions gaps and uncertainties in terms of information used in the assessment (section 8.0), ending with an Environmental Impact Statement intended to summarise significant impacts (section 9.0) with the conclusion and opinion on authorisation provided in section 10.0.

1.5 Summary of Scoping Process

The draft Scoping Report was distributed to I & APs on the 23rd June 2010. After amendments were made to the draft, it was resubmitted to I & APs on the 13th October 2010. Comments on the Draft Scoping Report have been included in Appendix 9.8 on Public Participation. The DEDET accepted the final Scoping Report on 19th May 2011. An Air Quality Impact Assessment was required to assess the potential contribution that the proposed waxy oil facility may have to ambient air quality. In the interim, the application timeframe lapse in terms of section 67 of the EIA regulations. Since no changes were made to the scope of work originally applied for, the DEDET granted exemption in terms of section 50 of the EIA regulations from resubmitting a scoping report (section 29 of the EIA regulations). Proof of the exemption is provided in Appendix 9.6.

During the Scoping Report, the following issue were raised by an I & APs and required further discussion in the EIR:

- The Major Hazardous Installation (MHI) circles must be indicated on a map as part of the MHI Assessment Report.

A preliminary Major Hazardous Installation Risk Assessment was carried out by Ishecon to determine whether the inclusion of the proposed waxy oil processing plant would have a major impact on the sites risk profile. The report is addressed in section 4.0 of the EIR and includes MHI circles.

Below is a summary of the EIA process followed to date:

EIA PROCESS

The current application is undergoing Scoping and EIA and as such the following steps have or will be followed:

An application form was submitted to the Provincial Environmental Authority (DEDET) on the 21/01/2009.

The application was advertised in a local and regional newspapers (The Beeld and The Ridge Times) on the 25/02/2009 and 27/02/2009 and notices were placed around the site on the 18/02/2009. Notices were handed out to neighbours within 100m of the boundary of the site on the 18/02/2009. A public meeting was not held.

The Scoping Report and plan of study for EIA has been produced detailing impacts to be investigated. This was made accessible to all registered I & APs and to the authorities for comment and review on the 23/06/2010. A second draft scoping report was submitted to I & APs on the 13/10/2010 for review.

I&AP
Input

I & APs were requested to provide comment within 40 days with the comment period closing on 22/11/2010. All comments received were included in the final Scoping Report which was submitted to DEDET for approval on 17/01/2011.

DEDET accepted the final Scoping Report on 19/05/2011.

Current
status

KSEMS proceed with the draft EIR which will has been submitted to all I & APs and authorities for review on the 05 September 2013. This report will assess the impacts identified during scoping phase and investigates mitigation measures.

I&AP
Input

Once the 40 day comment period ends on the 18 October 2013, all comments received will be considered and responded to with the final EIR being submitted to the DEDET for environmental authorisation or rejection.

DEDET have 60 days after acknowledging receipt of the report to accept the EIR and a further 45 days to provide environmental authorisation or reject the proposal.

2.0 Legislation and Guidelines Considered in Developing this Environmental Impact Report

The following sub-sections contain a list of relevant legislation, guidelines and regulations that were consulted during the EIA process.

2.1 Legal Requirements and Legislation

This section aims to provide an overview of the key legal requirements that apply to the proposed waxy oil processing facility. Legislation will be addressed in terms of its relevance to environmental protection and conservation, water use and protection, health and safety, waste management, noise management, as well as the activities requiring an impact assessment under the NEMA regulations. Govan Mbeki Municipality by-laws have not been included under the relevant sections as the by-laws are still in their draft form for public comment.

2.2 Environmental Protection and Conservation

Environmental legislation provides for the effective protection and controlled use of the environment and its services. Although development is seen as key to economic growth, it has the potential to negatively impact the environment through altering biological functions and affecting fauna and flora. Table 1 provides a list of applicable legislation in terms of environmental protection and conservation.

Table 9: List of Legislation Key to Environmental Protection and Conservation

Legislation	Description
National Environmental Management Act, 1998	This Act places an onus on all levels of government to ensure that risk to the environment is identified and where it cannot be avoided, is minimised and mitigated against. Should there be any impact on the environment during or after construction, FFS refiners (Pty) Ltd as the responsible parties, have a responsibility to take measures to address these impacts and undertake the necessary clean up and mitigation measures.

	There are no natural areas on the site however due to the hazardous nature of the chemicals involved in the waxy oil processing; FFS have a duty of care to ensure that the ambient air quality is not compromised. Mitigation measures are required to be implemented to ensure that the air and surrounding communities are not compromised.
National Heritage Resources Act, 1999	<p>The act provides protection of and management of conservation worthy places, areas and objects by heritage authorities, by means of registration and the implementation of certain protections.</p> <p>SAHRA have confirmed in the scoping phase that the proposed project is located within an existing industrial landscape and as such, the likelihood of archaeological resources within the proposed project area is minimal.</p>
Environment Conservation Act, 1989	The act empowers government authorities to prohibit any action which, in their opinion, may cause serious damage to the environment, or to instruct responsible parties to take any steps that they deem fit to remedy or rectify the situation. The Act also provides for declaration of conservation areas and protected natural environments.
National Environmental Management: Biodiversity Act, 2004	<p>The Act lists critically endangered, vulnerable and protected species.</p> <p>It is not expected that the proposal will have an impact on fauna and flora as no endangered or protected species were noted at the site.</p>
Relevant International Environmental Conventions	
Kyoto Protocol to the United Nations Framework Convention on Climate Change	Requires developed country signatories to implement and/or further elaborate policies and measures in order to achieve quantified emission limitation and reduction commitments in order to promote sustainable development.
Paris Convention for the Protection of the World Cultural and Natural Heritage	Imposes an obligation on State Parties to ensure that effective and active measures are taken for the protection, conservation and presentation of the cultural and natural heritage situated on its territory.

2.3 Water Use and Protection

According to the Department of Water Affairs (DWA), water in South Africa is viewed as a national asset. In global terms, South Africa's water resources are scarce and extremely limited. Poor spatial distribution of rainfall means that the natural availability of water across the country is also highly uneven. However, provided South Africa's water resources are judiciously managed and wisely allocated and used, sufficient water of appropriate quality will be available to sustain a strong economy, high social standards and healthy aquatic ecosystems for many generations. Legislation such as the National Water Act of 1998, provide regulations to govern the use, management and protection of water. Table 2 provides a list of legislation that applies to the proposed processing facility in terms of water use and protection.

Table 10: List of Legislation Key to Water Use and Protection

Legislation	Description
National Water Act, 1998	Aims to ensure that water resources are protected, used, developed, conserved, managed and controlled in a sustainable manner, for the benefit of everyone in South Africa. Section 19 includes various requirements to prevent and control water pollution. Water use is defined broadly and includes taking and

	storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities, altering a water course and removing water from underground. Unless the water use is for basic human needs, is an existing lawful use or is permitted under general authorisation, it must be licensed.
National Water Resources Strategy 2004	Describes how the water resources of South Africa will be protected, used, developed, conserved, managed and controlled in accordance with the requirements of the National Water Policy and the National Water Act, 1998.

2.4 Health and Safety

The existing FFS plant in Evander is classified as a major hazard installation (MHI), meaning that incidental explosive risks have the potential to adversely affect the health and safety of employees and the public. For this reason, major hazardous installations are governed by the Occupational Health and Safety Act 1993 and the Major Hazardous Installations Regulations 1998 and 2001. Table 3 provides a list of legislations that are applicable to the proposal in terms of health and safety.

Table 11: Health, Safety and Major Hazardous Installations Regulations

Legislation	Description
Major Hazardous Installations Regulations (GNR 96 of 1998 and GNR 692 of 2001)*	Prior to the erection and commencement of operation of any hazardous installation the developer is required to submit an application accompanied by a risk assessment to the local authority concerned. The MHI Risk Assessment is summarised in section 3.2.1 of the EIR and is provided in Appendix 4.
Occupational Health and Safety Act, 1993	Main objective is to provide for the health and safety of persons at work, including aspects which are hazardous to health and safety. In terms of major hazardous installation, the regulations shall apply to employers, self-employed persons and users, who have on their premises, either permanently or temporarily, a major hazard installation or a quantity of a substance which may pose a risk that could affect the health and safety of employees and the public.
Hazardous Chemical Substance Regulations, 1995	These regulations stipulate requirements for storage and handling of hazardous chemical substances and provide guidelines for training of staff.
Environmental Regulations for Workplaces, 1987	These regulations specify optimal working conditions for staff including thermal conditions, illumination requirements, requirements for ventilation; noise levels etc. and also specify requirements for housekeeping.
General Administrative Regulations, 2003	These regulations stipulate the administration of the various OHS regulations including designation of health and safety committees, reporting and recording of incidents and occupational diseases.
Construction Regulations, 2003	These Regulations apply to any persons involved in construction work and are therefore applicable to the construction phase. The regulations provide guidelines for safe operation during construction.

* The Major Hazard Installation Regulations (MHI Regulations) were first promulgated in Government Gazette No. 18608 as Government Notice No. R. 96 of 16 January 1998. At the request of the industry the Regulations were reviewed and promulgated a second time in Government Gazette No. 22506 as Government Notice No. R. 692 of 30 July 2001. The first Regulation was repealed in Government Gazette No. 22580 as Government Notice No. 767 of 24 August 2001.

2.5 Noise Management

There is a potential for the generation of noise during construction and operation of the proposed processing facility. Table 4 lists the regulations which apply to the current project in terms of noise management.

Table 12: Legislation Applicable To Noise Management

Legislation	Description
Environment Conservation Act, 1989	<p>The Act outlines general prohibitions for noise control. It also specifies noise management during construction. Specifically section 3(i) states that no person shall use any power tool or power equipment for construction, earth drilling or demolition works, or allow it to be used in a residential area during the following periods of time:</p> <ul style="list-style-type: none"> i) Before 06:00 and after 18:00 from Monday to Saturday; and ii) at any time on any Sunday, Good Friday, Ascension Day, Day of the Covenant and Christmas Day, or any other day as may be determined by a local authority; <p>The provisions of the regulations may not apply if any person may by means of a written application, in which the reasons are given in full, apply to the local authority concerned for exemption from any provision of these Regulations.</p>
Occupational Health & Safety Act 1993 & Noise induced Hearing Loss Regulations, 2003	These regulations specify safe working conditions in environments where noise exceeds safe levels and gives guidelines for assessment of noise, training measures, provisions of information to staff etc.
National Standards (SANS10103:2003)	Specifies the maximum ambient noise level acceptable in various land use type zones
National Environmental Management: Air Quality Act, 2003 section 34 on the control of noise.	<p>This section of the Act states that the Minister may prescribe essential national standards -</p> <ul style="list-style-type: none"> a) for the control of noise, either in general or by specified machinery or activities or in specified places or areas; or b) for determining - <ul style="list-style-type: none"> i. a definition of noise; and ii. the maximum levels of noise. <p>This section of the act further states that the provincial and local spheres of government are bound by may prescribed national standards when controlling noise levels.</p>

2.6 Air Quality Management

The proposed waxy oil processing facility has the potential to release vapours, as well as potentially result in fire or explosion. In the event of such a situation, air quality will be negatively impacted. The potential impact on air quality is governed by the National Environmental Management Air Quality Act of 2004 (NEMAQA). Table 5 lists the legislation and describes the relevant legislation and SANS codes applicable to air quality management.

Table 13: Air Quality Management Legislation

Legislation	Description
National Environmental Management Air Quality Act, 2004	<p>Aim is to reform the law regulating air quality in order to protect and enhance the quality of air in South Africa.</p> <p>Section 35 on offensive odours states that the occupier of any premises must take all reasonable steps to prevent the emission of any offensive odour caused by any activity on such premises. Furthermore, the Minister / MEC may prescribe measures for the control of offensive odours emanating from specified activities (i.e. the processing of waxy oil).</p>
GNR 1210 dated 13 March 2009 (GG 32816) National Ambient Air Quality Standards	The legislated standards for common pollutants are prescribed. The common pollutants are sulphur dioxide, nitrogen dioxide, particulate matter, ozone, benzene, lead

	and carbon monoxide.
GNR No 248 dated 31 March 2010 (GG 33064) “List of activities which result in atmospheric emissions”.	Lists the activities which have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage.

2.7 Waste Management

During construction and operation, the production of wastes, either liquid, solid or and/or hazardous, will require that they be adequately disposed of. To regulate waste disposal and management several legislations and regulations have been formulated. Table 6 provides a list of these as well as a short description.

Table 14: Legislation for waste management which applies to the current project

Legislation	Description
Environment Conservation Act, 1989	Section 31A provides that the Minister of Environmental Affairs or the Administrator, local authority or government institution concerned may take specified action if any person performs any activity or fails to perform any activity as a result of which the environment is or may be seriously damaged. Section 20(6) of the Act states that, subject to the provisions of any other law, no person shall discard waste or dispose of it in any manner, except at a disposal site for which a permit has been issued, and in a manner or by means of a facility or method and subject to such conditions as the Minister may prescribe. All waste generated during both the construction and operational phase of the development must be disposed of appropriately and is outlined in the EMPr.
National Environmental Management, 1998	Outlines principles that serve as the general framework within which environmental management and implementation plans must be formulated: “4 (iv) that waste is avoided, or where it cannot be altogether avoided, minimised and reused or recycled where possible and otherwise disposed of in a responsible manner.”
National Environmental Management: Waste Act, 2008	To reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development; to provide for institutional arrangements and planning matters; to provide for national norms and standards for regulating the management of waste by all spheres of government; to provide for specific waste management measures; to provide for the licensing and control of waste management activities, the remediation of contaminated land; the national waste information system and to provide compliance and enforcement measures.

2.8 Environmental Impact Assessment

NEMA (107 of 1998 as amended) requires that the potential impact on the environment, socio-economic conditions and cultural heritage of activities that require authorisation or permission by law, and which may significantly affect the environment must be considered, investigated and assessed prior to implementation. The application for the FFS Waxy Oil project was submitted in 2009. At the time of submission of the application form, the proposed activity required that a Scoping and EIA process be followed in terms of the 2006 EIA Regulations. The following activities listed in the table below were relevant at the time:

Table 15: List of activities requiring Environmental Impact Assessment in terms of the 2006 EIA Regulations Identified for the proposed waxy oil processing facility

Government Notice No.	Activity No(s)	Description
GNR 387	1(c)	The construction of facilities or infrastructure, including associated structures or infrastructure, for: c. the above ground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of 1000 cubic metres or more at any one location or site including the storage of one or more dangerous goods, in a tank farm;
GNR 387	1(e)	The construction of facilities or infrastructure, including associated structures or infrastructure, for: e. any process or activity which requires a permit or license in terms of legislation governing the generation or release of emissions, pollution or effluent or waste and which is not identified in GN R 386 of 2006

The 1st version of the Scoping Report listed the above mentioned activities and the 2nd version submitted to I &APs listed the activities as per Table 8 below. The Scoping Report was accepted by DEDET in May 2011. Since submitting the Scoping Report, the 2006 EIA Regulations were repealed in August 2010. During this time the EIR was still being compiled. As per regulation 76(1), an application that was submitted in terms of the 2006 EIA Regulations and which is pending when the 2010 EIA came into effect must be dispensed with in terms of the previous regulations as if they had not been repealed. As per regulation 76 (2 & 3), if an activity is no longer listed you can ignore it, but if a new activity is triggered, as long as all the impacts of the newly listed activity have been considered and assessed in line with the requirements of the new regulations, then authorisation can be granted for these new activities even if they were not originally applied for.

As such Table 8 identifies all the activities in terms of the new 2010 EIA regulations that now apply to this pending application.

Table 16: List of activities requiring Environmental Impact Assessment in terms of the 2010 EIA Regulations Identified for the proposed waxy oil processing facility

Government Notice No.	Activity No(s)	Description
Government Notice No. 545 of 18 th June 2010	3	The construction of facilities or infrastructure for the storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres. <i>FFS Refiners are constructing a processing facility which will consist of six tanks and seven static plant tanks with a total combined capacity of 4 320m³. Two 1200m³ tanks are already erected as part of the original EA.</i>
Government Notice No. 545 of 18 th June 2010	4	The construction of facilities or infrastructure for the refining, extraction or processing of gas, oil or petroleum products with an installed capacity of 50m ³ or more, excluding facilities for the refining, extraction or processing of gas from landfills <i>The applicant is constructing a facility to process oil with a total combined capacity of 4 320m³.</i>
Government Notice No. 545 of 18 th June 2010	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.

		<i>In terms of the National Environmental Management: Air Quality Act, the proposed activity will trigger a Category 2 (subcategory 2.2 and subcategory 2.3) listed activity. FFS have submitted their application for an Atmospheric Emission License and await authorisation.</i>
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2.9 Mitigation of Environmental Impacts

Section 28 of NEMA (107 of 1998 as amended) places a duty of care on every person who causes, has caused or may cause pollution or degradation of the environment to take responsible measures to prevent, minimise and rectify such pollution or degradation. Such measures may include the investigation, assessment and evaluation of the impact on the environment; informing and educating employees about the environmental risk of their work and the manner in which the task must be performed to avoid causing significant pollution or degradation of the environment; modifying or controlling any activity causing the pollution or degradations; containing or preventing the movement of pollutants or the cause of degradation; eliminating any source of the pollution or degradation; or remedying the effects of the pollution or degradation.

In terms of Section 19 of the National Water Act of 1998, the owner of land, person in control of land or person who occupies or uses any land in which any activity or processes performed or undertaken which causes or may cause pollution a water source, must take all reasonable measures to prevent such pollution from occurring, continuing or recurring. Such measures may include modifying or controlling the act or process causing the pollution; complying with any prescribed waste standards or management practice; containing or preventing the movement of pollutant; eliminating any source of the pollution; remedying the effect of the pollution; and remedying the effect of any disturbance to the bed and banks of a water course.

2.10 Permit Requirements

Table 9 summarises the permits and authorisations that will be required for the processing facility. Only those permits pertaining to the environmental impact assessment of the current project are included in this section.

Table 9: Permit and Authorisation Requirements for the Current Project.

Permit/Authorisation	Description
General Environmental Authorisation	Authorisation required under regulations GNR 545 of the 18 th June 2010 in terms of the National Environmental Management Act, 1998. In the current project, authorisation will be issued by the provincial Department of Economic Development, Environmental and Tourism.
Waste license	<p>In terms of section 19 (1) of the National Environmental Management Waste Act, 2008:</p> <p>Category A 3 (2) “The storage including the temporary storage of hazardous waste at a facility that has the capacity to store in excess of 35m² of hazardous waste at any one time, excluding the storage of hazardous waste in lagoons” and</p> <p>Category B (7) “The treatment of effluent, wastewater or sewage with an annual throughput capacity of 15000m³ or more.”</p> <p>A waste license application has been submitted to the National Department of Environmental Affairs. A meeting is due to be set in September to discuss the license.</p>
Air Emission License	<p>In terms of section 21 (1) National Environmental Management: Air Quality Act, 2004:</p> <p>Section 11 Category 2: Petroleum Industry, the production of gaseous and liquid fuels as well as petrochemicals from crude oil, coal, gas or biomass. Subcategory 2.2: “Storage and Handling of Petroleum Products” and Subcategory 2.3: “Industrial Fuel Oil Recyclers”</p> <p>The applicants have submitted the application for an AEL and are currently awaiting the license from the Gert Sibande District Municipality.</p>

3.0 Proposed Activity [Regulation 31 (2) (b)]

Section 3 provides a detailed description of the waxy oil production process which includes a description of the raw waxy oil product and the equipment required to remove contaminants from the product. The different effluents and emissions that will result from the waxy oil process are outlined in subsection 3.1. Health and safety impacts are discussed under subsection 3.2. Potential environmental risks have been identified and are included in italics below the various subsections. These impacts have been summarised in Table 11 in section 6.0 of the EIR. A comparison of all proposed alternatives is also provided in this section (subsection 3.3). The alternative comparison includes the effect that the identified alternatives may have on the environment and surrounding communities.

The applicant is proposing to construct a separate facility in their existing Evander plant for processing a heavy distillate residue termed “waxy oil”. Waxy oil is a residue remaining after the valuable petroleum distillate fraction is removed for further processing into petrol, diesel and other petroleum chemicals. It is characterised as a long chain paraffinic hydrocarbon that can be further processed to produce a heavy fuel oil suitable for use as an industrial heating fuel. Waxy oil is a desirable fuel oil component due to its low sulphur content (<0,5%). This material can be described as **a low hazard flammable hydrocarbon** (Class III B SANS 10089:2003) with an iron catalyst and carbon particulate components. Under ambient conditions, waxy oil has a similar consistency to that of shoe polish. The oily component of the product is a paraffinic oil and the wax component constitutes around 8 – 12%.

The waxy oil product to be processed by FFS has the following characteristics:

Solids content	1 – 1.5% v/v
Ash content	0,5 – 1,0% w/w
Wax content	8 -12% w/w
Carbon content	>80% w/w
Gross Energy Value	43 – 44 MJ/kg
Viscosity @ 100°C	<20 cSt
Flash Point (close cup)	>100°C
Pour Point	30 – 40°C
Initial Boiling Point	>240°C
Sulphur content	<0,2% w/w

The aim of the proposed processing facility is to remove particulates and other components of varying sizes from the waxy oil to produce a low sulphur oil that will be used for sale to the industrial heating fuel market.

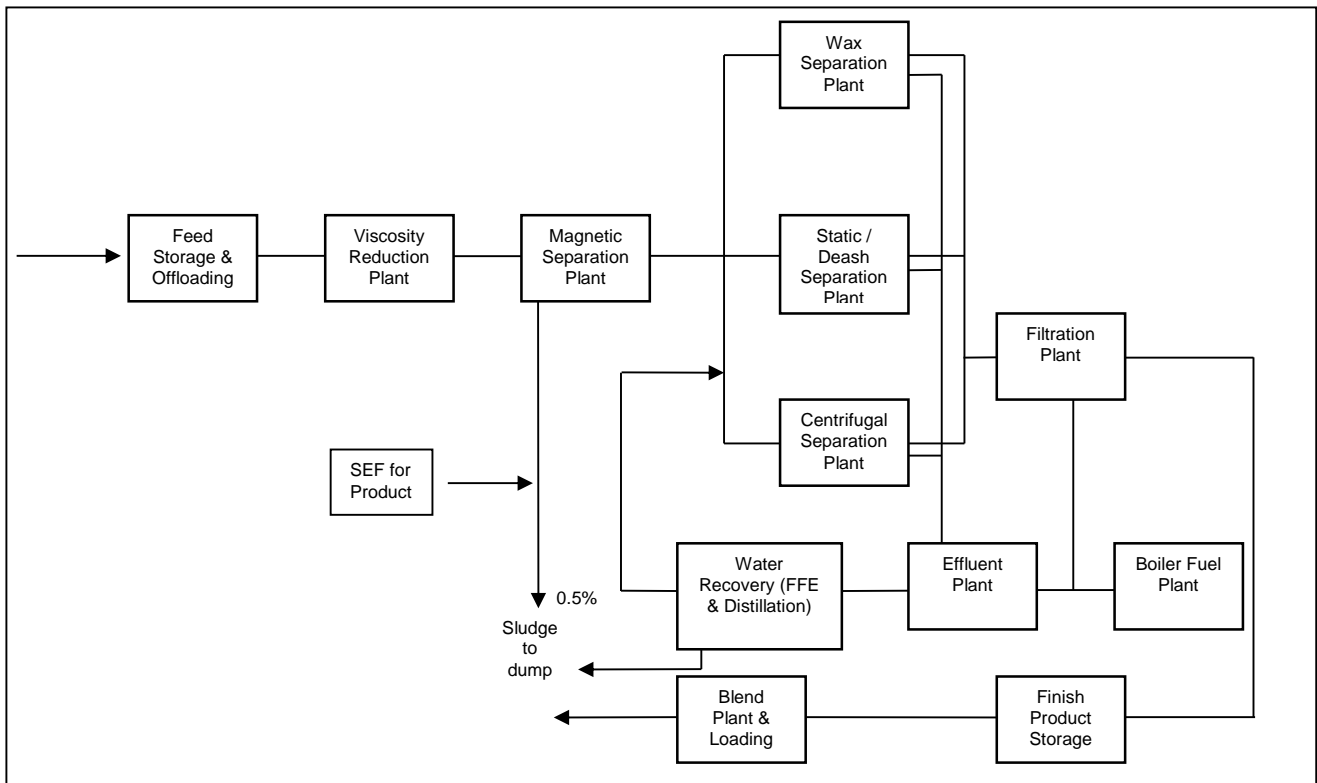
The production process is described in point form below and is also illustrated in Figure 3.

- The waxy oil product will be received in road tanker loads, which vary in capacity from 26-34 tons. These will be received on site via a weighbridge to determine the mass of product received and then pumped into raw product tanks.
- The viscosity of the waxy oil is reduced by using a fired oil heater. The product will be heated to around 340°C under pressure. Further “trimming” of the viscosity is done with additives.
- Once the viscosity is reduced, the large particles within the material are separated using a static separator. This process is assisted by the temporary reduction of viscosity by means of heat (120°C), reduction of pH and surface tension through the addition of nitric acid.
- Should iron components be excessive, the use of magnetic separators on the hot stream exiting the heat soak plant will be used to reduce loading.
- From the static separator, material containing a high content of solids is fed into the de-ashing vessel where wash water is used to facilitate the removal of the ash in a liquid phase.
- The water is then removed and recovered using an FFE and distillation.
- Further removal of solids may be required using centrifugal separation. Any carbon particulate is then removed by filtration. However excessive waxes in the process stream may blind filter media requiring the chilling of the stream which will result in the separation and removal of waxes prior to filtration. This stream of wash would be retreated in the de-ashing plant and re-constituted with the oil after the filtration stage.
- Nitric acid can also be added to the waxy oil process to react with inorganic elements in the de-ashing process.
- This process of filtration produces the least amount of waste and the lowest loss of oil. The filter cake can be oil free and is suitable for use as a heating source in a coal fired steam boiler.
- After filtration, the processed low sulphur oil stream is stored in blend tank. It will then be blended into an industrial heating fuel with various other fuel oils before final storage.

- The product will be pumped to a final storage tank where it will be kept at a temperature of 60°C - 70°C ready for loading into road tankers for delivery to customers (refer to Appendix 2 for the proposed waxy oil processing facility layout).
- The concentrated iron catalyst stream will be suitable for a product, smelter enrichment fuel (SEF) for use in smelter furnaces as energy value while the iron will be reclaimed into the raw steel produced in the smelter and not emitted as an airborne pollutant.

Identified environmental risks: possible spill of raw product when waxy oil is transferred from the road tankers to the storage tanks and vice versa, risk of spills/leakages from other hazardous materials used in the production process (oils, sludge, waste water etc), potential contamination of stormwater as a result of spillages/leaks from tanks, improper disposal of oily sludge, release of fugitive emissions during filling, loading and offloading operations, increased risk posed on surrounding industries (fire, explosion etc), risk of fire and/or explosion on the site, effluent discharged not meeting municipal standards, potential increase in noise, occupational health impact associated with workers handling the waxy oil, potential failure of bund integrity leading to spillage of material and possible environmental risk associated with the generation, storage and disposal of wastes associated with the production process.

Figure 3: Illustration of the waxy oil production process to be followed (source: FFS Refiners Pty (Ltd))



The site currently has approval for 15 000m³ storage tank capacity granted on 20th March 2006 by DEDET for the existing tar processing plant at Evander. Two of the 1 200m³ tanks (raw materials) erected under the original EA will be used. The following additional storage tanks will be erected, compliant to the SANS code 10089, for the proposed waxy oil production process on site.

Process tanks: 6 x 250 m³
Static plant: 7 x 60 m³

New additional storage capacity of 1 920m³

The following new equipment is required:

- Four Centrifugal Separators
- Static separators
- Distillation unit
- Filtration unit
- Various Heat exchangers
- Magnetic separation plant
- Two chillers
- Two cooling towers
- Two scrubbers
- Two oil fired heaters

The proposed waxy oil processing facility will occupy a total floor area of **2 500m²** (including tanks).

All tanks of the new storage facility will be designed according to BS EN 14015:2004 for the design of petroleum industry vertical welded steel tanks. The pertinent design features are:

- Low pressure tanks of less than 20 kPa internal pressure and maximum 6 kPa external pressure with weak roof-to-shell seam weld,
- Fixed roof design,
- The tanks will be of welded steel construction,
- Manways fitted for de-sludging,
- Loading lines extended from the top to the bottom of the tank with anti-siphon hole to remove splash loading vapour generation,
- Tank top access will be by individual cat-ladders for access to the top manway and instruments.

The tank foundations will be according to the engineer's instructions and will conform to the BS EN 14015:2004 code of practice. The pertinent features as they affect safety and pollution controls are:

- The tank shell will be supported on a reinforced concrete ring beam.
- The inside of the ring beam will be filled with suitable stable and well compacted material.
- A sealing layer of bentonite or equivalent of 50 – 75mm will be laid below the level of the leak detection pipes.
- A series of leak detection pipes of 50mm diameter are to be cast into the ring beam 100mm below the top level of the ring beam which is above ground level. This allows any tank leakage to show itself by dripping out of the leak detection pipes onto the hard surfacing of the floor bund.
- A layer of permeable crusher run is to be laid above the bentonite seal layer.
- A capping layer of bitumen pre-mix is to be laid with a slope from the centre to the tank shell.
- The flooring from the ring beam is to fall at a 1:100 slope away for 15m or to the bund wall. This is to ensure that any spillage will drain away from the tank and reduce the fire hazard.

All instrumentation and electrical equipment on the tanks and within the bunded area to be intrinsically safe
All pump motors to be E x N fire proof rated for Zone 2 areas in a separate bund.

The following is the expected quantity of waxy oil to be received on site:

- | | | |
|--------------------------|-----------------|------------------|
| • Initially: | 1000 tons/month | 12 000 tons/year |
| • Within 12 – 24 months: | 2500 tons/month | 30 000 tons/year |
| • Finally: | 5000 tons/month | 60 000 tons/year |

3.1 Effluents and Emissions

The waxy oil process is expected to produce the following effluents and emissions:

3.1.1 Sludge

The inorganic concentrate that will be produced by the centrifuge discharge, static separation and filter discharge as well as magnetic separation plant will be collected in skips. The concentrate will then be sold as a smelter enrichment fuel while some may be transported to an appropriate landfill site for disposal when the market is flat. It is expected that the process will produce approximately 30 tons of sludge per month at the beginning of the process. This amount will increase to approximately 75 tons per month and finally to 150 tons per month. This means that the process will initially utilise 5 skips per month, this will eventually increase to 21 skips per month.

3.1.2 VOC Emission

The waxy oil product has a high flash point and no low boiling point components. The product will be processed at temperatures of up to 95°C. It is anticipated that this may result in the release of some VOC's, however the potential release of VOCs can be mitigated against. Mitigation measures will include storage tank vapour space balancing, pressurisation of tanks and vapour vent condensers. There will however be a small insignificant fugitive emission potential from the filters on discharge.

3.1.3 Rainwater

The equipment required for the process will be located within a bunded and hard-surfaced area which will also be roofed to prevent the rainwater becoming contaminated with oil. Any oily water effluent that may inadvertently occur will be treated in the existing effluent water system.

3.1.4 Spillages

There is a potential that a spillage may occur and as such all areas will be bunded and hard-surfaced. The sumps will recover any spilt product which will be pumped back to the raw material tank.

Identified environmental risks: *incorrect storage of sludge in skips resulting in sludge coming into direct contact with the ground, skips containing sludge not collected regularly resulting in a large amount of sludge accumulating on the site, incorrect disposal of the sludge, release of VOC's decreasing air quality in the area potentially affecting the neighbouring communities and the incorrect disposal of contaminated rainwater or spills from the bunded area.*

3.2 Health and Safety

A Major Hazardous Installation (MHI) Risk Assessment of the existing Evander facility was conducted in 2007 and concluded that the site was classified as a small MHI (under the equivalent UK regulations this facility would not be considered an MHI¹). It is therefore important to determine whether the inclusion of the proposed waxy oil processing plant would have a major impact on the sites risk profile.

A “major hazard installation” is defined in the Occupational Health and Safety Act 85 of 1993 as an installation-
“(a) where more than the prescribed quantity of any substance is or may be kept, whether permanent or temporarily; or

(b) where any substance is produced, processed, used, handled or stored in such a form and quantity that it has the potential to cause a major incident”

The following hazardous materials are either used/produced/handled on site:

- Waxy oil
- Recovered heating oil (Heavy Fuel Oil)
- Nitric acid
- Thermal oils

The above is representative only of the largest or most hazardous materials. It is important to note that not all materials on site have the potential to affect person outside the site (expanded on in section 3.2.1 below). The hazardous materials have been classified according to SANS 10228:2003. Waxy Oil, HFO and thermal oil have been classified as Class 3 (flammable liquids) and nitric acid has been classified as Class 6 (toxic vapours released from spill or mixing) and Class 8 (corrosive substances). The Material Safety Data Sheets for Waxy Oil, HFO and nitric acid have been included in Appendix 5.

ISHECON was therefore commissioned to identify and analyse potential risks associated with the new waxy oil production process. The report is included in Appendix 4 of the EIR and is summarised below.

3.2.1 Summary of Specialist MHI Risk Assessment [Regulation 31 (2)(j)]

As stated above, an MHI Risk Assessment has been carried out for the site in 2007 and this MHI Risk Assessment conducted by ISHECON in July 2010 must be considered as an addendum to this existing site MHI risk assessment report until such time that a combined updated MHI report is issued. The MHI Risk Assessment identified potential hazards on the site, reviewed the incident and accident history for incidents relating to the production, transport and storage of oils and nitric acid and identified potential major hazardous events. The cause, consequence, severity and likelihood of the hazardous events were then analysed. The MHI was defined according to thresholds and the effects of potential incidents on adjacent installations considered. Finally, the risk levels and risk acceptability was determined.

The following hazards were considered by the specialist:

Fire	Pool fire	Refers to fires involving an entire bunded area and can be particularly intense and may lead to damage to other tanks in the bund. The potentially fatal effects of only the worst case pool fire scenario can extend beyond the site boundary (page 28 of the MHI Risk Assessment in Appendix 4 of the EIR).
	Jet fire	Any leaks on high pressure, high temperature equipment may result in a jet fire which refers to high intensity fires. These fires often have an effect directly on near-by equipment leading to domino failures. Most of the equipment on the plant operates under vacuum conditions and therefore jet fires are highly unlikely and in addition should be limited

¹ Ishecon MHI Risk Assessment 2010

		to the plant area and will have no offsite effects .
	Flash fire	There are not likely to be major flash fires associated with failures of the stock tanks as the liquids are stored at low temperatures. The areas of concern for flash fires are the high temperature processing units. As per the risk assessment, the effects of most flash fires on the processing or storage units are unlikely to have catastrophic effects on persons outside the site . There could be significant effects on employees from major and minor flash fires. Although flash fires are not significant MHI events, were these release lead to explosions, the effects are significant .
Explosions	Internal	Confined explosion where the event occurs within a vessel. This results in the bursting of the vessel and tends not to be destructive as other types of explosions; however, there are some large vessels on site where the potential effects can extend slightly beyond the boundary .
	Confined within a building	This type of explosion requires the accumulation of flammable vapours within a building or structure prior to ignition and could potentially occur where the ventilation system is inadequate allowing flammable vapours to accumulate in the building. The effects of such explosions are often limited to within 10-15m of the building / structure .
	Unconfined	If a large amount of flammable vapour is formed in the air due to a rupture of a high pressure high temperature vessel containing hydrocarbons, the gas can ignite as a flash fire or explode with great force. The likelihood of explosions was found to be relatively small although the consequences are severe .
	Boiling Liquid Expanding Vapour Explosion (BLEVE)	This is one of the more significant types of event associated with liquefied hydrocarbons. This occurs when an external fire impinges on a vessel weakening the metal and heating up the contents of the tank. This type of event is most likely to occur in the reboiler on the distillation plant. The MHI threshold for a BLEVE of the reboiler extends 20m from the unit and not beyond the site boundary .
Toxic gases	Acute exposure	Nitric acid is the only potential material on the site that can release large quantities of toxic fumes. The photograph provided on page 33 of the MHI Risk Assessment (Appendix 4) shows that the effect will not go beyond the site boundary.

As the hazards being assessed will usually originate from loss of containment, the specialist identified the following main causes of hazardous incidents:

- Failure of equipment
- Failure of systems
- Inadequate purging during shut down and start-up operations

A full list of all potential incidents considered in the study that could affect persons outside the site and therefore employees on site, is included in Appendix B of the MHI Risk Assessment (Appendix 4). Preventative and protective measures are to be incorporated in the design of the installations to minimise the potential for the above mentioned incidents to occur. These measures are listed below and have been included in the EMPr.

Quality Assurance

- There will be safe operating procedures of most of the activities on site
- Operators will be trained and retrained where necessary to perform their allotted functions
- Tanks designed to comply with SANS10089.
- There will be a permit to work system in operation on the site.

Protective Features

- All bulk storage tanks and all processing areas are fully bunded to contain 110% of the largest tank.
- Curbed nitric acid offloading area.
- There is an on-site emergency plan.
- There is fire water, foam spraying systems, trained fire fighting personnel on site.

The MHI report found that the **most likely failure events** on the site are small leaks on heat exchangers, **once in 500 years**. However, these are unlikely to be MHI events with major off site impacts.

The large ruptures on heat exchangers may have **impacts offsite, once in 2000 years** whilst a **major catastrophic event** such as the rupture of a large stock tank overtopping or comprising the bund walls are likely to occur **less than once in 500 000 years**. It is anticipated the most release will not ignite; therefore the associated risk is reduced.

The most unlikely MHI type event relate to those involving the catastrophic rupture of the bulk road tankers during loading and off-loading. Section 5.6 of the MHI Risk Assessment provides a number of maps, photos and graphs illustrating the expected extent of the various potential accidents.

The consequences of flammable hazardous events will be radiation and explosive effects with the major consequence of an explosion being the shock wave effect. For the FFS Evander plant, it is unlikely that missiles, produced from an explosion, will affect the public directly due to the large distance they will have to travel. These are therefore not considered a major hazard. Using key fire radiation levels (see table 5.3.3.2 of MHI Risk Assessment), it was calculated that any person in the 37.5kW/m² radiation circle for a minute is likely to be burned, while there is a 50% chance of those people between 12.5 and 37.5kW/m² radiation circles being fatally burned within a minute. Outside the 12.5kW/m² radiation level, there are less than 1% fatalities.

There are no other MHI's in the immediate vicinity of the site and therefore no significant domino effects are expected. Potentially highly destructive levels of radiation and explosion over-pressure could however result from accidents on the distillation plant or the FFE plant etc. These could extend over the plant control room, administration and workshop buildings. This may pose high risks and an update of the site occupied building study should be conducted as part of the MHI update to evaluate the risks against international guidelines. In the interim FFS should harden the structures in the form of shatter-proof film on the windows of the admin building and workshop as well as ensuring escape routes out of these buildings away from the plant towards the south. In addition to the above there is a risk of large failures on one plant leading to secondary failures on adjacent plants.

The following aspects in terms of individual risks need to be highlighted as per section 5.10.1 of the MHI Risk Assessment:

- The increase in offsite risks is very low;
- The proposed facility does not present any major concerns over and above those from the current site from an MHI perspective;
- The risks are not low enough to be considered totally acceptable and all reasonable risk reduction measures need to be incorporated into the design so that the risks may be considered tolerable;
- The onsite risks have increased, however the increase is not unacceptably high. This increase is due to the new processing plant facilities;

In terms of societal risks, the MHI found that the risks associated with the MHI type events could be considered acceptably low. According to the MHI, it is estimated that should the industrial area around the site be fully occupied with low occupancy industrial operations, up to 150 people could die in the very worst case fire and explosion scenarios.

It is expected that the extent of only the worst case potential accident scenarios for the proposed waxy oil facilities may have impacts beyond the site boundary. As such, the events of the operation of the Waxy Oil facility should be considered as a Major Hazard Installation. It should however be noted that the more likely events will not have a major impact beyond the site boundary. There is not expected to be any impact on the residential areas in Evander.

The specialist concluded that under the worst case conditions, offsite impacts can occur and as such the proposed waxy oil facility is therefore classified as an MHI addition to the existing MHI facility. The following recommendations were therefore prescribed by the specialist:

- Notification must be done as per the requirement of the MHI regulations;
- A copy of this report must be attached as an addendum to the existing MHI and must be made available on site at all times;
- Although there could be offsite impacts, the likelihood of occurrence of such accidents is low with the result that the increase in offsite risks posed by the future Evander operations is very low. As such, the proposed waxy oil facility does not present any major concerns over and above those of the existing site;
- All reasonable risk reduction measures should be incorporated into the design of the facility so that the risks are tolerable;
- The proposed facility will increase the onsite risks and as such the following recommendations must therefore be considered for the admin building and workshops located within 50m of the new processing plant:

- Emergency exits from the buildings exiting towards the north, south or west / east;
- Hardening of structures to ensure blast resistant windows on all sides; and
- In terms of assembly points, it should be noted that with toxic fumes from nitric acid the best protection is afforded by a policy of shelter-in-place indoors.
- The on-site emergency plans may need to be reviewed to take the new facilities and hazards into account;
- Land use planning restrictions as per the existing MHI remains unchanged; and the full site MHI risk assessment and occupied building study should be updated prior to commissioning of the new facilities.
- Appendix E in the MHI Risk Assessment provides a checklist that can be used to review the organisational measures in place on the site.
- Any catastrophic spill that breaches the bunding/massive fire fighting operation may lead to direct oil contamination of the stream approximately 300m north-west of the site. Fire water management therefore requires particular attention in the FFS emergency plans.

Identified environmental risk for assessment: *potential contamination of the stream if catastrophic spill occurs, pool fire damaging bund or tank integrity resulting in a possible leakage, unlikely impact of a potential flash fire occurring in the high temperature processing units effecting employees on site, potential for an internal explosion to occur within the large vessels on site, inadequate ventilation could result in a confined explosion, small possibility of a ruptured high pressure high temperature vessel containing hydrocarbons could result in an unconfined explosion, the potential for a BLEVE in the reboiler on the distillation plant effecting workers on the site and possible release of toxic fumes from acute exposure to nitric acid which could impact the workers on the site. Possible equipment failure resulting in an uncontrolled rise in pipe/vessel pressure increasing the potential for a fire/explosion, hot work tools used during maintenance/ warming up procedures increasing the risk of a source of ignition. Potential leak/rupture in waxy oil loading/off-loading hose and/or pipe transferring the waxy oil to new 1 200m³ feed tank resulting in spillage of hydrocarbon, potential puncture/rupture in the waxy oil feed tank resulting in an explosion or internal fire open roof, pipe rupture/leak during the iron removal process, potential leaks, punctures or ruptures in the pipes/ tanks used during the distillation process in the FFE and/or blending tanks, potential internal explosion in the fired heater in the distillation plant, rupture or puncture of nitric acid road tanker resulting in possible MHI event depending on quantity of nitric acid spilt, rupture/leak of nitric acid offloading hose and/or transfer piping and potential catastrophic rupture or puncture in nitric acid bulk storage tank/s.*

3.3 Bulk Services

The existing FFS site in Evander was designed and built with an expansion of this nature in mind and thus allowance has already been made for all utility requirements.

3.3.1 Stormwater

The proposed waxy oil facility will connect to the existing stormwater system on site. All stormwater falling within the banded area will drain into a sump and be transferred to the effluent plant for treatment before release into the municipal system under permit.

Identified environmental risk for assessment: *potential contamination of stormwater and incorrect disposal of contaminated rainwater collecting in banded areas.*

3.3.2 Water Provision

Water for the proposed waxy oil facility and for fire control, water will be obtained from the municipal system. A water storage tank of adequate capacity will be provided. Hydrants will also be provided to allow fire services to provide additional foam and fire fighting capabilities. Wastewater from routine maintenance and washing of the tank farm area will drain into a sump and be sent to the effluent treatment plant at FFS. The following utilities will be required for the processing facility and are available on site:

- Steam (10 Bar [Bar gauge]): 300 – 900 kg/hr 135 – 400 tons/month
- Potable water: 80 – 120 kl/month

Identified environmental risk for assessment: *potential increased pressure on municipal services (i.e. water supply).*

3.3.3 Sewage

There is not expected to be any changes to the volume of domestic sewage with the installation of the new waxy oil facility however domestic sewage will be directed to the municipal sewerage system. Any other waste water produced from waxy oil processing facility will be transferred to the effluent plant for treatment before release to the municipal system.

Identified environmental risk for assessment: *None.*

3.3.4 Electricity Supply

The existing facility is supplied with electricity. It is anticipated that the existing electricity supply will be sufficient for the proposed waxy oil facility which is expected to require approximately 50 – 75 kW/month of electricity to operate.

Identified environmental risk for assessment: *Potential for increased pressure on existing electric services.*

3.3.5 Traffic

It is not anticipated that traffic during operation will increase significantly as there will only be a small increase in the number of additional tankers to and from the FFS Evander site daily. It is recommended that flagsman be provided to control traffic during construction. Tankers waiting to enter the site must ensure that they are not obstructing the flow of traffic.

Identified environmental risk for assessment: *Negligible increase in traffic around the site.*

3.3.6 Solid Waste

The majority of the solid waste resulting from the proposed waxy oil processing facility is likely to be hazardous in nature and should therefore be disposed of accordingly at a registered hazardous landfill site. For example, the Holfontein H;H Landfill site is located on Portion 24 of Farm Holfontein, Springs (approximately 70km from the Evander Plant). Waste and sludge skips are to be clearly labelled to ensure workers on site are aware of the various waste streams. It is unlikely that there will be a significant increase in general solid waste during operation.

Identified environmental risk for assessment: *incorrect disposal of hazardous waste.*

3.4 Description of Identified Potential Alternatives to the proposed activity, including Advantages and Disadvantages that the proposed activity or alternatives may have on the Environment and the Community that may be affected by the Activity [Regulation 31 (2) (d)]

The Western Cape Department of Environmental Affairs and Development Planning (DEA & DP) guideline² on alternatives has been used as a guide to the identification of feasible alternatives to the proposed activity. The NEMA EIA Regulations define alternatives as a “*different means of meeting the general purpose and requirements of the activity*”.

Alternatives to the proposed activity were identified according to the following criteria:

- i. Is the alternative feasible and reasonable?
- ii. Does the alternative suit the general purpose of the proposed activity?
- iii. Does the alternative align with the need and desirability considerations of the proposed activity?
- iv. Is the alternative designed to prevent and minimise negative impacts and to maximise benefits?
- v. Does the alternative compromise the integrity of the proposal?
- vi. Does the alternative comply with policy and legal requirements?

Based on the above, the following alternatives were considered for further investigation in the Scoping Report:

There are no alternatives sites considered as this is the only available space within the existing Evander plant. It is also not feasible to locate the proposed new facility outside of the existing facility boundaries as the cost of another facility would be prohibitive due to the duplication of certain infrastructure involved in the waxy oil production process (e.g. fire system, weighbridge, roads etc.).

An alternative layout was also considered which involved the installation of two small tanks for the product and two smaller storage tanks for the raw material (combined storage capacity of 2 400m³). The spacing between the tanks would however not be in line with the SANS 10089-1:2008 code of practised and the impacts would remain the same. Underground tanks were also considered however extensive excavation and construction would be required compared to the above ground alternative. The layout as proposed in Appendix 2 therefore remains the preferred layout alternative.

Different tank designs were also reviewed by the applicant however the proposed preferred tank design was considered the best available technology for the design of fuel tanks and meet the relevant SANS and BS codes.

² Source: DEA&DP (2009). *Guideline on Alternatives, NEMA EIA Regulations Guideline and Information Document Series*. Western Cape Department of Environmental Affairs & Development Planning (DEA&DP).

Only the current preferred alternative as outlined above and the no go option are assessed in the table below. The no go option means that FFS Refiners will not construct the waxy oil processing facility and has been included in the assessment as a baseline study. The potential impacts of the no go alternative are used to compare the impact of the preferred alternative to.

Alternative 1 (preferred option): Construction of a 2 500m² waxy oil processing facility opposite the laboratory on the existing facility as indicated in the site layout (Appendix 2).

Alternative 2 (no go option): FFS will not construct the waxy oil processing facility.

Table 10 summarises the main advantages and disadvantage of each alternative.

Table 10: Advantages and Disadvantages of the Proposed Alternative for the Waxy Oil Processing Facility.

	Alternative 1	No-go option
Advantages	<ul style="list-style-type: none"> - Employment opportunities (approximately 12 new positions) - Recycles a non-renewable resource which would otherwise be disposed of as hazardous waste. - Prevents the disposal of a large volumes of waxy oil. - Will replace this amount of high sulphur Heavy Furnace Oil in the industrial fuel market and will reduce the emission of sulphur dioxide from client installations by between 900 – 1800 tons per annum. - Potential to increase the economic activity in the area in the form of services, spares, housing etc. 	<ul style="list-style-type: none"> - No additional construction activities on the site. - No additional release of emissions (including VOC's) from the site. - No additional hazardous waste (i.e. sludge) produced/accumulating on the FFS site.
Disadvantages	<ul style="list-style-type: none"> - Short-term peaks in air pollution concentrations could result from spilled product and fugitive emissions from general operations. - Slight increase in air benzene concentrations on site. - Minor increase in the Evander plants MHI status. 	<ul style="list-style-type: none"> - FFS would miss an economic opportunity to diversify its ability to process low sulphur fuels which are in high demand due to stringent air emission standards set by the DEA.

4.0 Description of environment and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity [Regulation 31 (2) (d)]

The National Environmental Management Act (107 of 1998 as amended) states that the “environment” is made up of:

- (i) The land, water and atmosphere of the earth;
- (ii) Micro-organisms, plant, and animal life;
- (iii) Any part or combination of (i) and (ii) and the inter-relationships among and between them; and
- (iv) The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

This section aims to describe the various aspects of the environment that may be affected by the proposed development. The physical and biological characteristics of the proposed site are considered and the Air Quality Impact Assessment (AQIA) specialist report summarised to identify potential impacts that the proposed development could have on the environment as well as recommending mitigation measures to minimize or alleviate these impacts. Social, economic and cultural features within and surrounding the site has all been assessed to reach a holistic description of the environment that the proposed waxy oil processing facility will be located in.

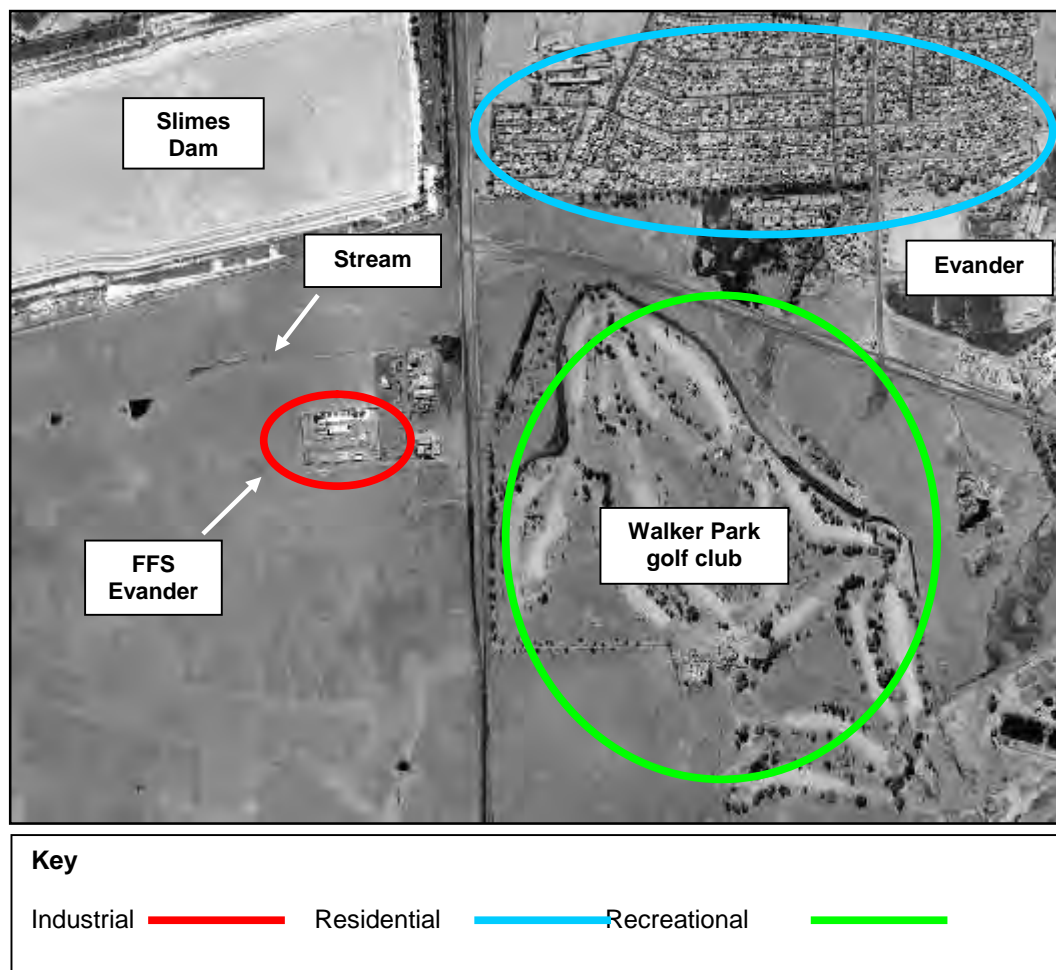
4.1 Surrounding Land Use

It is important to note that the Evander Plant has already been classified as a small Major Hazardous Installation (see section 3.2.1 for the summary of the ISHECON MHI Risk Assessment results). Since the waxy oil processing

plant will contribute to the MHI status of the existing plant, it is important to take into consideration the surrounding land uses to ensure that they are not impacted on by the proposed activity.

The proposed site is located within an existing industrial area surrounded by light to medium industries. Other factories and facilities in the immediate area include Joran's Tanker cleaning services to the north-east and a concrete and sand supply yard to the south. Land to the north and west of the site are vacant. The main road from Evander to Standerton (R546) is approximately 250m east of the FFS Evander plant. The Evander Golf Course is a further 100m east of the R546 and the residential area of Evander is located approximately 750m to the north-east of the proposed site (Figure 4). There is a small stream to the north of the site however it is approximately 300m away and it is therefore unlikely to be impacted on in any way by the construction and operation of the proposed facility.

Figure 4: Aerial Photograph of FFS Evander site (circled in red) showing surrounding land uses (source: S3 Technologies-Geographic Information Systems & Large Format Printing specialists, 2008).



4.2 Physical

The topography of the proposed site is relatively level with a slight westerly slope (gradient decreases by 5m across the site from east to west). Evander is situated in the Watervaal Catchment Area and water from this catchment area ultimately flows into the Vaal River. There is a small stream situated to the north-west of the site which drains into a dam to the west of the site. Previous groundwater monitoring for the existing FFS tar processing facility indicates that the probability that groundwater contaminants will be readily dispersed within the groundwater system is unlikely³. A Geotechnical Report was prepared for the Evander site by WSP Environmental (Appendix 7) and is summarised below.

³ WSP Environmental (2009). Groundwater Monitoring Report for FFS Evander.

The identified significant environmental risk for assessment in terms of the physical aspect of the environment is the contamination of soil and groundwater in the event of a spill and/or the release of untreated effluent. A geotechnical report was submitted in February 2009 which investigated the nature and condition of the underlying geology and soil to ensure that the proposed piece of land where the new facility is being constructed is stable. The findings of the geotechnical report are summarised below. Currently, FFS conducts groundwater monitoring biannually for the existing tar processing facility. FFS will, in conjunction with its groundwater specialists, determine the groundwater monitoring requirements with the addition of the proposed waxy oil plant.

Identified environmental risk for assessment: *Impact on soil and groundwater in the event of a spill / leakage of storage tanks and/or various pipes.*

4.2.1 Summary of Specialist Geotechnical Investigation [Regulation 31 (2)(j)]

The report outlines the nature and thickness of the soils on the FFS Evander site, the foundation conditions for the proposed hydrocarbon storage tank facility and the nature of materials on site for the construction of surface beds, paved layers and drainage.

The site is relatively flat with an approximate fall of 1:100 to the north-west. It is partially covered by dumped earth from the grading and construction of the adjacent developed land. The site was originally farmland and is situated on the edge of an extensive mining property.

The geotechnical investigation consisted of field work with the excavation of pits taking place and soil profiling and sampling (Appendix A of the geotechnical report included as Appendix 7 of the EIR). Laboratory testing was then carried out on the samples taken (Appendix B of the geotechnical report included as Appendix 7 of the EIR).

The following conclusions were drawn from the findings:

- The site consists of colluvial, residual sandy clays and silts overlying highly weathered dolerite.
- Slow groundwater seepage was encountered at a depth of 2.2m in one trial hole.
- The upper clayey soils have poor compaction characteristics and a high swell. These materials are a very poor subgrade for roads and pavements and are considered unsuitable for load-bearing fill. Importation of granular fill is recommended for highly trafficked areas and for layer works below concrete slabs and bunds.
- The soils within the uppermost 0.75m are highly variable in stiffness and are considered to be mildly expansive. Bearing capacity for shallow foundations is estimated to be only 100 kPa. For foundations at depths of approximately 1m the bearing capacity is estimated to be 300 kPa. For contact pressures in excess of 300 kPa we recommend founding directly on good quality, un-fractured, hard rock dolerite at depths of approximately 2.0m to 2.5m below existing ground level.
- Foundations should be inspected and approved by a competent person to ensure removal of soft clayey material has been achieved prior to casting foundations.

Identified environmental risk for assessment: *None.*

4.3 Biological

The waxy oil processing facility will be located within a fully operational industrial site which does not offer any biological or environmental services.

Identified environmental risk for assessment: *None.*

4.4 Air Quality

In November 2007 the Minister of Environmental Affairs and Tourism officially declared the eastern part of Gauteng and the western part of Mpumalanga as a priority area referred to as the "Highveld Priority Area" in terms of section 18(1) of the National Environmental Management: Air Quality Act, 2004. The area that has formally declared as the Highveld Priority Area includes the Govan Mbeki municipal area which includes the town of Evander. The control of emissions and odours at the FFS site is therefore crucial as specific air quality management action is required for the entire Highveld Priority Area (Government Notice No. 30518).

Currently FFS undertakes ambient monitoring on a biannual basis for the Evander site and this will incorporate the waxy oil plant. Pollutants measured biannually from point sources and dispersed emissions are the Benzene, Toluene, Ethylbenzene and Xylene (Volatile Organic Compounds), as well as the inorganic oxides of nitrogen and sulphur dioxide. These may change with the National Air Quality Act point source emission limits and requirements.

The waxy oil product has a high flash point and no low boiling point components and will be processed at temperatures of up to 95°C. This may result in some Volatile Organic Compounds (VOC's) being present. There will also be a small fugitive emission potential from the filters on discharge. WSP Environmental (Pty) Ltd was

therefore commissioned to determine the impact of ambient air quality of any increases in atmospheric emissions associated with the proposed waxy oil plant. The Air Quality Impact Assessment (AQIA) is included in Appendix 8 and is summarised below.

Identified environmental risk for assessment: *potential release of vapours and odours, release of fugitive emissions and a reduction in air quality in the Evander area.*

4.4.1 Summary of Specialist Air Quality Impact Assessment [Regulation 31 (2)(j)]

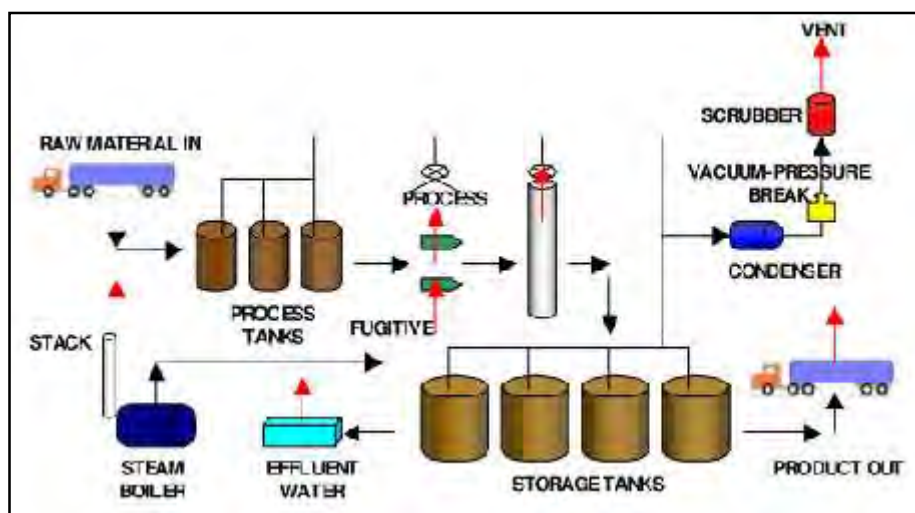
WSP Environmental (Pty) Ltd was appointed to update the existing emissions inventory and undertake a revised Air Quality Impact Assessment (AQIA) for the FFS Refiners (Pty) Ltd Evander branch (29 May 2013). FFS is located immediately south-west of Evander's residential zone whose primary sources of air quality concern are vehicular emissions, dust from decommissioned mining operations and potential odours from a nearby sewage works. SASOL Secunda, 8km south-east of the site is the only industrial polluter in the region with significant stack emissions of Sulphur Dioxide (SO₂), Nitrogen Dioxide (NO₂) and particulates.

Since accurate modelling of pollution dispersion requires knowledge of the local climate and weather, the macro-scale climate of South Africa and the micro-scale climate of Evander are described in section 2.2 of AQIA. This includes a description of the local temperature, rainfall, wind direction and speed. Due to the wind conditions, it was envisaged that air pollution emissions from FFS Evander plant will predominantly be dispersed in south-easterly, west-south-westerly and south-south-easterly directions.

FFS propose to construct a separate facility for processing a heavy distillate residue termed “waxy oil”. This requires the removal of iron catalyst fines and carbon particulates from the waxy oil to produce a low sulphur oil for the industrial heating fuel market. It is proposed that all emissions from the waxy oil plant and associated tanks will be linked to a common scrubber. Furthermore, two small oil fired heaters, ducted to a common stack, are to be installed. Emissions from these two additional stacks, as well as fugitive emissions from the waxy oil process, will potentially increase the impact of the FFS Evander plant on local air quality.

The production process was broken down into stages and each stage analysed in terms of potential atmospheric emissions (illustrated by red arrows in the figure 5 below). A map showing the location of the various emission sources across the site is attached in Appendix A (section 10.2) of the Air Quality Impact Assessment.

Figure 5: Simplified diagram of the production process at the FFS Evander facility for the proposed waxy oil facility (source: WSP Air Quality Impact Assessment, May 2013).



1. Delivery of Raw Product – displacement of vapour space into the atmosphere.
The Evander plant however has installed a tank balancing system which greatly reduces the potential for vapour emissions.
2. Solids Removal – takes place in the decanter shed and results in fugitive emissions that are ducted to the vapour scrubber.

3. **Water Removal** – Water is heated to boiling point where water is flashed off at the top of a closed column. The vapour is then condensed through a water-cooled condenser and the light ends separated from the water in a static separator. On the separator column, there is a vent installed which is an emission source linked to the vapour scrubber system.

4. **Blending Processes** – no potential atmospheric emissions

5. **Storage** – All tanks connected via vapour balancing ducts to the scrubber stacks therefore all breathing and working losses are not vented to the atmosphere but rather to an abatement technology. The storage tanks are also pressure controlled ensuring that a vent discharge will only occur at pressures exceeding 2.0kPag. Air will also not be drawn into the tanks unless the vacuum drops below -0.6kPag.

6. **Vapour Ducts** – all emissions mentioned above are ducted to a wet scrubber. Most condensable hydrocarbons are recovered by means of static separation for use in the process.

7. **Product Loading** – Top loading system could result in the emission of vapours to the air. Operating a closed tank system results in safety issues for workers due to the potential for the tanks to explode.

8. **Boiler** – There is a coal fired boiler used to generate steam for the boiler. A standby oil fired boiler is also installed. Emissions from the oil fired boiler are much lower than the coal fired boiler and therefore WSP conservatively assumed that the coal fired boiler operate at all times.

9. **Effluent Water Treatment** – Rainwater and any effluent water are contained and gravity-drained to an effluent water treatment plant. The water flows through a static separator to recover all free hydrocarbons. This is an enclosed system running at ambient temperature that results in marginal emissions from a small vent (not considered in the report as the values will be insignificant and could not be estimates confidently).

The legal framework regulating air quality in South Africa is provided in section 4 of the AQIA. The FFS Evander site fall under the following Listed Activity as published by DEA Government Notice No. 248, 31 March 2010, GG No. 33064 "List of Activities which result in Atmospheric Emission which have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological or cultural heritage":

- Category 2 (Petroleum Industry), subcategory 2.2: Storage and Handling of Petroleum Products
FFS have submitted an application for an Atmospheric Emission License (AEL) and await authorisation.

The methodology used for the assessment is detailed in section 5 of the report but is summarised below. An emissions inventory for the FFS Evander plant's production process was initially compiled in 2005 and updated by FFS in 2013 (included emissions from the storage tanks, boiler, vapour recovery stacks, emissions from idling trucks and possible product spills). An additional heater and scrubber stacks for the proposed waxy oil plant are considered in this assessment. Atmospheric Dispersion Modelling System (ADMS) was used as the modelling software with GIS input (site and receiving environment) and Meteorological data and statistics being used for the dispersion modelling. Gridded and discrete receptor points were used for model validation tests. Gridded receptor points are defined X and Y coordinates off a regular Cartesian grid. A summary of the locations of the discrete receptors relative to the FFS Evander site is provided below:

Receptor	Direction from Nearest Boundary	Distance from Nearest Boundary (m)
Fire Water Tank	North-west	0
Tank Farm	North-east	0
Workshop	South-east	0
Main Gate	South-west	0
School	North-east	1000
Walker Park Golf Course	South-east	1000

Tank Emissions

Volatile Organic Compound (VOC) emissions from storage tank vents that are not linked to the scrubber stack were quantified using the United States Environmental Protection Agency's (USEPA) TANKS model. One year of meteorological data (2011) from the onsite weather station was consolidated for use in the model. Cloud cover data was obtained from the South Africa Weather Services (SAWS) station in Bethal. The product stored in the tanks has similar chemical properties to coal tar fuel (highest flash point of all fuels currently handled by the plant and a lowest vapour pressure of all the fuels). The TANKS model calculates the working loss and breathing loss for total VOCs.

Boiler Stack and Vapour Scrubber Emissions

Isokinetic stack monitoring is undertaken on an annual basis at the boiler and vapour scrubber stacks. The efficiency of the scrubber was tested on two occasions in 2012. Results from these stack monitoring campaigns have been used for the Atmospheric Dispersion Modelling System (ADMS). ADMS was used to calculate suspended particulate matter with an aerodynamic diameter of 10 microns or less (PM₁₀), SO₂, NO₂ and benzene (C₆H₆) concentrations onsite and in the site's vicinity. The various pollutant emissions rates were thus calculated for the boiler stack and vapour scrubber.

Truck Exhaust Emissions

Emissions from idling trucks from three onsite areas were calculated from emission factors presented in the USEPA Emissions Fact Sheet for Idling Vehicle Emissions (EPA, 1998).

Spill Emissions

There is the potential for the spillage of coal tar product within bunded areas. Emission rates were calculated for a 3m x 3m area of spilled product and the temperature of the spilled product is at 90°C. It was conservatively assumed that spills occurred in four out of 6 bunds.

Waxy Oil Plant – Vapour Scrubber

The six process tanks and seven static plant tanks are linked via vapour balancing lines to two wet scrubbers. These two scrubbers are ducted to a common stack resulting in a single point source of emissions. Total VOC emissions from the tanks was calculated using the US EPA's TANKS model.

Waxy Oil Plant – Heater Stack

Two oil fired heaters are to be located on the site for the generation of steam. Water is sourced from the municipality with a consumption rate of 80-120 kl/month. The heater stacks are to be ducted to a common stack and the emissions for each heater estimated using emission factors from the Australian National Pollutant Inventory Emission Estimation Technique Manual for Petroleum and USEPA AP42 factors.

Results for the dispersion modelling are provided in section 6 of the AQIA but are summarised below for Particulate Matter (PM₁₀), Nitrogen Dioxide (NO₂), Sulphur Dioxide (SO₂) and Benzene (C₆H₆). Maps illustrating the annual average contributions to ambient air concentrations and the worst case scenario (P100 24 hour) are provided for each of the pollutants in Appendix B of the AQIA.

Particulate Matter (PM₁₀)

The plume extends in north-easterly (towards Evander), south-easterly (towards the Golf Club) and south-westerly directions away from the plant. The highest proposed contributions (maximum = 0.759 µg/m³) are predicted to occur to the east of the plant. All modelled contributions (current and proposed) are fully compliant with the annual PM₁₀ NAAQS of 50 µg/m³. Current annual average concentrations at each receptor point will not increase significantly with the marginal increase in PM₁₀ emissions from the proposed heater stack. In the worst case scenario, all modelled contributions remain fully compliant with the 24 hour NAAQS of 120 µg/m³ for PM₁₀ with a proposed peak value of 12.61 µg/m³. There is a slight increase in worst-case daily PM₁₀ concentrations at each receptor point due to the marginal increase in PM₁₀ emissions from the proposed heater stack.

Nitrogen Dioxide (NO₂)

The plume extends in north-easterly (towards Evander), south-easterly (Golf Club) and south-westerly directions away from the plant. The maximum predicted NO₂ contribution of 4.91 µg/m³ is less than the annual NAAQS of 40 µg/m³. Annual average NO₂ concentrations are expected to increase marginally with addition of emissions from the waxy oil plant, with the greatest increases experienced closer to the site. The maximum hourly contribution from the Evander site is 46.80 µg/m³, and is fully compliant with the hourly NAAQS of 200 µg/m³. Concentrations are expected to increase marginally at each receptor location.

Sulphur Dioxide (SO₂)

The plume extends in north-easterly (towards Evander), south-easterly (Golf Club) and south-westerly directions away from the plant. The maximum SO₂ contribution from the existing plant including the additional, heater stack is approximately 1.61 µg/m³ and is less than the annual NAAQS of 50 µg/m³. Concentrations are expected to increase marginally at each receptor location. The modelled P100 (worst case) hourly SO₂ concentrations were plotted and shown in Section 11.6 in Appendix B of the AQIA. The maximum modelled contribution including the proposed heater stack at the waxy oil plant (42.60 µg/m³) to ambient concentrations onsite is compliant with the hourly NAAQS for SO₂ of 350 µg/m³. Contributions to ambient concentrations at receptor points are well below the respective NAAQS with the highest concentrations onsite at the Tank Farm (proposed modelled concentration value of 40.06 µg/m³). It is expected that SO₂ concentrations will increase at each receptor location. There is a

slight decrease in the P100 hour SO₂ concentrations at the school and is likely to be an artefact of the plume interpolation process.

Benzene (C₆H₆)

The plume extends in north-easterly (towards Evander), south-easterly and south-westerly directions away from the plant. The maximum annual benzene concentration with the additional vapour scrubber at the waxy oil plant results in approximately 0.86 µg/m³ generated from FFS is less than the annual NAAQS of 10 µg/m³ presented in the NAAQS. Due to the high efficiency of the scrubber to be installed on the vapour duct, there are no increases in benzene emissions predicted at the receptor locations.

As the distance away from the FFS Evander site increases, air pollution concentrations decrease as the effect of dilution takes place. Annual average air pollutant plumes extend in north-easterly, south-easterly and south-westerly (towards Evander residential areas) directions due to prevailing wind directions. None of the NAAQS are exceeded. Worst case modelled contributions for SO₂, NO₂ and PM₁₀ do not exceed the corresponding NAAQS. The predicted increase in emissions from the additional waxy oil plant remains marginal due to the high efficiency of the abatement technology fitted onto each heater and vapour recovery stack. Although background concentrations are not included in this assessment, it is not expected that background concentrations are high and would alter this conclusion due to the lack of proximate pollutant sources. Limitations and uncertainties are outlined in section 8 of the AQIA.

The specialist concludes that pollution concentrations are expected to only increase marginally therefore no significant concerns are expected to arise with respect to the impact of the proposed waxy oil plant on ambient air quality and local environmental health. Short-term peaks in air pollution concentrations could result from spilled product and fugitive emissions from the general operation. Benzene concentrations measured onsite however, were higher than those measured at the off-site locations indicating that the operations undertake at FFS Evander does result in the generation of benzene.

An Air Quality Management Program (AQMP) is recommended to comprise of the following:

- Frequent (bi-annual) stack monitoring be undertaken at the current plant stacks as well as the proposed heater and vapour scrubber stack at the waxy oil plant to test their efficiency,
- A leak detection and repair program (LDAR) approved by the licensing authority in line with requirements of the NEMAQA,
- Frequent inspection and repair of processing units to reduce hydrocarbons venting to the atmosphere,
- Possible linking of Tanks E37 - E40 via vapour balancing lines to the common vapour scrubber stack,
- Minimisation of truck idling during loading/offloading of product,
- Continuous inspection of tanks rims and seals,
- Reduction in fugitive dust emissions from vehicular traffic by sealing or paving roadways,
- Improvements in response time to spilled product within bunded areas,
- Real-time analysis of air pollution concentrations prevailing at the site to determine periods of elevated concentrations emanating the plant. This dataset would also serve as background ambient air quality that will enhance the representivity of air pollution modelling results and
- The on-site meteorological station should be upgraded to ensure hourly sequential data is collected for the following parameters: wind speed, wind direction, temperature relative humidity, and precipitation.

Identified environmental risk for assessment: *Nominal displacement of vapour space into the atmosphere during delivery of raw product, emissions from top loading system during product loading, emissions from truck idling, coal fired boiler releasing emissions into the atmosphere, potential emission of volatile organic compounds from the various storage tanks, potential short-term peaks in air pollution concentrations resulting from spilled product/fugitive emissions from general operation and an increase in benzene concentrations on site.*

4.5 Social

The site is located in an industrial area and all surrounding land uses are industrial. The closest residential area is the town of Evander which is located 1.5km north east of the site (see Figure 4). The Walker Park Golf Club is located approximately 1km east of the site. Positively, the project is expected to require approximately 12 additional staff, comprising the following:

- | | |
|---|---|
| • Process controllers (2 per shift x 4 shifts): | 8 |
| • Assistants (1 per day shift) | 1 |
| • Drivers: | 2 |
| • Maintenance personnel (artisan): | 1 |

Identified environmental risk for assessment: *Potential safety issues for workers on site related to the MHI status of the proposal and potential health impacts from the release of emissions to workers on site. Positive impact with employment opportunities.*

4.6 Economic

The construction of the proposed project will provide employment for construction companies during the construction period. The proposal will create 12 jobs during operation of the proposed project as described above.

Identified environmental risk for assessment: *None*

4.7 Cultural

The South African Heritage Resources Agency (SAHRA) was notified of the application who have confirmed that since the development is in an existing industrial landscape, the likelihood of architectural resources within the proposed project area are minimal (see Comments and Response table, Appendix 9.8).

Identified environmental risk for assessment: *None.*

4.8 Specialist studies [Regulation 31 (2) (q)]

The following specialist studies were conducted and have been summarised in the sections above.

1. Preliminary Major Hazardous Installation Risk Assessment for FFS Refiners – Evander New Waxy Oil Facility (ISHECON, July 2010)
2. FFS Evander Storage Tanks Geotechnical Report (WSP Environmental, February 2009)
3. Air Quality Impact Assessment – Proposed Waxy Oil Plant (WSP Environmental, May 2013)

As per Regulation 31 (2) (q), copies of the reports have been provided in full in Appendices 4, 6 and 7 respectively.

5.0 Public Participation Process [Regulation 31 (2) (e) and [Regulation 54, 55, 56]

(e) details of the public participation process conducted in terms of subregulation (1), including – (i) steps undertaken in accordance with the plan of study;

As per the plan of study, Interested and Affected Parties (I &APs) were given the opportunity to provide comment on the draft Scoping Report and draft EIR.

5.1 Timeline for Public Participation

Activity	Date
Submission of Application to DEDET	22 January 2009
Notification of application to Authorities and Community groups	17 February 2009
Notification of neighbours within 100m of the site boundary	18 February 2009
Placement of site notices	18 February 2009
Placement of adverts in the BEELD (regional paper) and The Ridge Times (community paper)	25 February and 27 February 2009
Distribution of BID	03 and 4 March 2009
Public meeting	n/a
Notification of release of 1 st draft scoping report	23 June 2010
Scoping report placed at the Walker Park Golf Club and submitted to authorities	23 June 2010
40 day comment period ended	02 August 2010
Notification of release of 2 nd draft scoping report	13 October 2010
Scoping report placed at the Walker Park Golf Club and submitted to authorities	13 & 14 October 2010
40 day comment period ended	22 November 2010
Acceptance of scoping report	19 May 2011
Exemption Request	21 February 2013
Exemption Approved	19 June 2013
Notification of release of Draft EIR	05 September 2013
EIR placed at Walker Park Golf Club and submitted to authorities	09 September 2013
40 day comment period ends	18 October 2013
Submission of Final EIR to DEA	-

Acknowledgement of receipt (2 weeks)	-
Assessment of EIR (60 days)	-
Compilation of EA (45 days)	-

5.2 Notification

54. (2) *The person conducting a public participation process must take into account any guidelines applicable to public participation and must give notice to all potential interested and affected parties of the application which is subjected to public participation by –*

- (a) fixing a notice board at a place conspicuous to the public at the boundary or on the fence of -*
 - (i) the site where the activity to which the application relates is or is to be undertaken; and*
 - (ii) any alternative site mentioned in the application;*

(4) A notice board referred to in subregulation (2) must –

- (a) be of a size at least 60cm by 42cm; and*
- (b) display the required information in lettering and in a format as may be determined by the competent authority.*

Four site notices (60cm by 42cm in English and Afrikaans) were placed around the site on Brunel, York, Essex and Bradford Roads on 18th February 2010. Proof of notice placement is provided in Appendix 9.1.

54. (2)(b) *giving written notice to –*

- (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;*
- (ii) occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;*
- (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site;*
- (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represents the community in the area;*
- (v) the municipality which has jurisdiction in the area; and*
- (vi) any organ of state having jurisdiction in respect of any aspect of the activity;*

Neighbours adjacent to and within 100m of the property boundaries were notified by hand delivered notice (Appendix 9.1). Where possible, people were requested to sign a register indicating that they had received the notice. Where people were unavailable to accept delivery, the address was noted and the notices were placed in the post box.

The following authorities and interest groups were notified on the 17th February 2010 (proof provided in Appendix 9.1): Mpumalanga Department of Agriculture Rural Development and Land Administration, Govan Mbeki Municipality (Environmental Dept, Technical & Engineering Services), DWAF, WESSA, SAHRA, Harmony, Ward councilor, Evander Rate Payers Association, Sasol Synfuels, Sasol Mining, Roodebank Farmers Union, Randwater, Highveld East Environmental Monitoring Association (HECEMA) and National Association for Clean Air (NACA).

Background Information Documents were sent to Mpumalanga Department of Agriculture Rural Development and Land Administration, Govan Mbeki Municipality (Environmental Dept, Technical & Engineering Services), DWAF, WESSA, SAHRA, Harmony, the ward councilor, Evander Rate Payers Association, Sasol Synfuels, Sasol Mining, Roodebank Farmers Union, and Randwater, Highveld East Environmental Monitoring Association (HECEMA) and the National Association for Clean Air (NACA) and all registered I & APs on the 03rd and 4th March 2009 (Appendix 9.3).

54. (2)(c) *placing an advertisement in –*

- (i) one local newspaper; or*
- (ii) any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations; and*
- (d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or local municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in subregulation (c)(ii).*

An advert was placed in the Ridge Times on the 27th February 2009 and the Beeld on the 25th February 2009 in the classified section as a public notice (Appendix 9.4).

54. (3) *A notice, notice board or advertisement referred to in subregulation (2) must –*

(a) give details of the application which is subjected to public participation; and
 (b) state –
 (i) that the application has been or is to be submitted to the competent authority in terms of these Regulations, as the case may be;
 (ii) whether basic assessment or scoping procedures are being applied to the application, in the case of an application for environmental authorisation;
 (iii) the nature and location of the activity to which the application relates;
 (iv) where further information on the application or activity can be obtained; and
 (v) the manner in which and the person to whom representations in respect of the application may be made.

All notices, signboards and advertisements (Appendices 9.1 and 9.4) stated that the application in question is subject to scoping and EIA and that it had been submitted to DEDET. Each notice also stated the nature and location of the activity along with a brief description. The contact details for the company (phone, fax and e-mail) were provided where further information could be obtained.

54. (7) When complying with this regulation, the person conducting the public participation process must ensure that
 (a) information containing all relevant facts in respect of the application is made available to potential interested and affected parties; and
 (b) participation by potential interested and affected parties is facilitated in such a manner that all potential interested and affected parties are provided with a reasonable opportunity to comment on the application.

56. (2) Before the EAP managing an application for environmental authorisation submits a report compiled in terms of these Regulations to the competent authority, the EAP must give registered interested and affected parties access to, and an opportunity to comment on the report in writing.

56. (3) Reports referred to in subregulation (2) include –
 (c) scoping reports;
 (d) scoping reports amended and resubmitted in terms of regulation 30 (3);
 (e) specialist reports and reports on specialised processes compiled in terms of regulation 32;
 (f) environmental impact assessment reports submitted in terms of regulation 31; and
 (g) draft environmental management plans compiled in terms of regulation 33.

All parties who registered for the process by contacting KSEMS were provided with copies of the BID on the 03rd and 04th March 2009 (Appendix 9.3). A public meeting date was set for 18th March 2009, however due to technical details regarding the project proposal, I&APs were notified on 10th March 2009 that the project was placed on hold temporarily and that they will be notified of the new meeting date. On 08th July 2009 I&APs were re-notified that the project had resumed and that the new meeting was scheduled for 22nd July 2009. Registered I & APs were given details of the time and venue on the 08 July 2009 (Appendix 9.1). Due to a lack of interest in attending, the meeting was not held and all registered I&APs were notified of the meeting cancellation on 13th July 2009 (Appendix 9.1). The 1st draft Scoping Report has been prepared and I & APs were notified of its availability at the Walker Park Golf Club on the 23rd June 2010 (Appendix 9.5). After amendments were made to the 1st draft Scoping Report, the 2nd draft Scoping Report was released for comment on 13th October 2010 (Appendix 9.5). Hard copies of the 2nd draft scoping report were couriered or hand delivered to the following bodies (Appendix 9.5):

Name	Authority / Group / Company
Mike Knowles	Govan Mbeki Municipality
Keet Marius	DWAF
James Harris	Ward Councillor

I & APs were instructed that they have 40 days to comment on the draft scoping with comment period ending on the 22nd November 2011. A final Scoping Report including all comment received has been submitted to DEDET and DEA (Air Quality Department).

Acknowledgement of receipt of the Scoping Report was received from DEDET on the 17th January 2011. The report was accepted on the 19th May 2011. Due to a delay in the compilation of the specialist reports, the submission of the EIR was delayed. The DEDET exempt the EAP and applicant from resubmitting another Scoping Report since the scope of work has not changed and I & APs were notified of the exemption (Appendix 9.6).

The draft EIR was prepared and I & APs were notified of its availability at the Walker Park Golf Club on the 05 September 2013 (Appendix 9.7). Hard copies of the draft EIR were couriered or hand delivered to the following bodies as requested:

Name	Authority / Group / Company
Surgeon Marebane	DEDET
Joyce Lekoane	DWA
Dan Hlanyane	Gert Sibande District (Air Quality Official)

The various other authorities and I & APs listed in the I&AP register in Appendix 9.2 receive email copies of the report as requested by the I&APs. The I & APs were instructed that they had 40 days to comment on the draft EIR with comment period ending on the 18 October 2013. A final EIR including all comment received by the 18 October 2013 will be submitted to the DEDET by courier.

5.3 Register of Interested and Affected Parties [Regulation 31 (2) (e) (ii); 55 and 56]

55. (1) An EAP managing an application must open and maintain a register which contains the names and addresses of –
 (a) all persons who, as a consequence of the public participation process conducted in respect of that application in terms of regulation 54, have submitted written comments or attended meetings with the applicant or EAP;
 (b) all persons who, after completion of the public participation process referred to in paragraph (a), have requested the applicant or the EAP managing the application, in writing, for their names to be placed on the register; and
 (c) all organs of state which have jurisdiction in respect of the activity to which the application relates.
 (2) An applicant or EAP managing an application must give access to the register to any person who submits a request for access to the register in writing.

Regulation 31 (2) (e) ii- a list of persons, organisations and organs of state that were registered as interested and affected parties;

A register of all persons that were specifically identified for notification over and above neighbours within 100m is included in Appendix 9.2. A register of all I & APs who registered for the project as well as organs of state with jurisdiction in respect of the activity was maintained and is provided in Appendix 9.2.

5.4 Registered Interested and Affected Parties Entitled to Comment on Submissions (Regulation 56 & 57) Comments of Interested and Affected Parties to be Recorded in Reports Submitted to Competent Authority (Regulation 56) and Regulation 31

56. (1) A registered interested and affected party is entitled to comment, in writing, on all written submissions made to the competent authority by the applicant or the EAP managing an application, and to bring to the attention of the competent authority any issues which that party believes may be of significance to the consideration of the application, provided that –
 (a) comments are submitted within –
 (i) the timeframes that have been approved or set by the competent authority; or
 (ii) any extension of a timeframe agreed to by the applicant or EAP;
 (b) a copy of comments submitted directly to the competent authority is served on the applicant or EAP
 (c) the interested and affected party discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.

57. (1) The EAP managing an application for environmental authorisation must ensure that the comments of interested and affected parties are recorded in reports.

*Regulation 31 (2) (e) (iii) a summary of comments received from, and a summary of issues raised by registered interested and affected parties, the date of receipt of these comments and the response of the EAP to those comments; and
 (iv) copies of any representations, objections and comments received from registered interested and affected parties;*

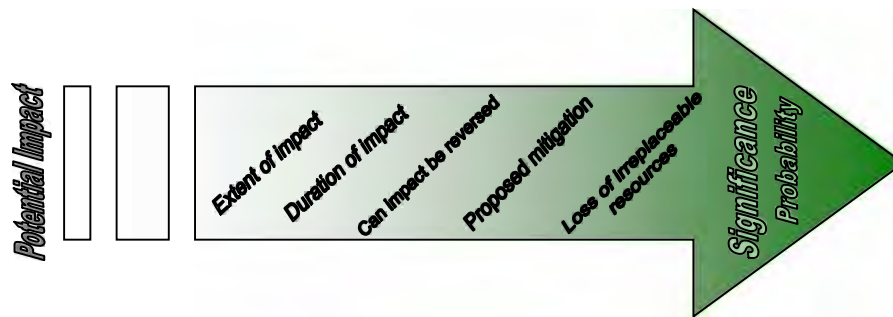
Comments received on the draft scoping report have been included in a comments and response table and in full in Appendix 9.8.

6.0 Environmental Issues and Investigation of Potential Impacts

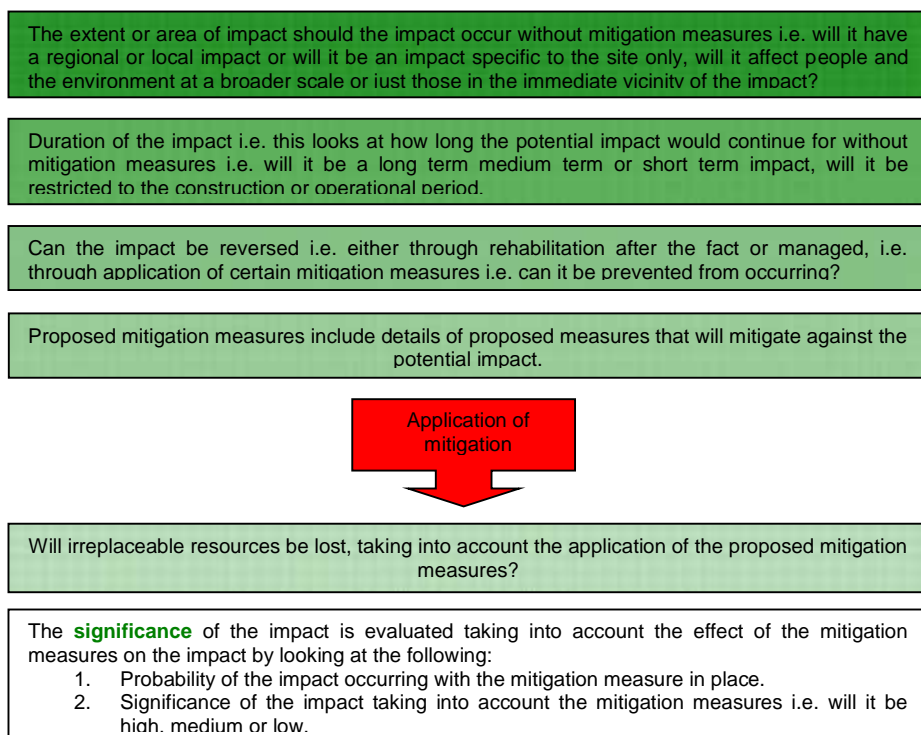
6.1 Methodology Used In Determining Significance of Potential Environmental Impacts [Regulation 32 (h)]

In terms of how impacts have already been assessed, aerial photos and the 1 in 50 000 map for the area have been reviewed. Site visits have been conducted during which information on the surrounding environment as well as photographs of the affected areas has been gathered. The professional judgment of the EAP based on

previous EIA experience in the industrial and ecological fields has been used. The potential impacts associated with the proposed development have been identified and rated in terms of their significance in a table, looking at the following:



As demonstrated above the significance of an impact is established using a progressive process whereby a potential impact is investigated using a number of parameters. **Potential impact** describes the potential environmental impact that might be associated with a specific aspect of the project i.e. without taking into account mitigation measures, extent of impact duration, or intensity of the impact. All of these factors have to be considered before the significance and probability of an impact can be established.



In addition, the following DEA (formerly known as DEAT) guideline has been used to assess impacts and Alternatives *“DEAT (2006) Guideline 5: Assessment of Alternatives and Impacts in support of the Environmental Impact Assessment Regulations, 2006. Integrated Environmental Management Guideline Series, Department of Environmental Affairs and Tourism (DEAT), Pretoria”*.

6.2 Description Of Environmental Issues Identified, Assessment Of The Significance Of Each Issue And An Indication Of The Extent To Which The Issue Could Be Addressed By The Adoption Of Mitigation Measures [Regulation 31 (2) (h, k)]

The following impacts were identified for further investigation during scoping and all potential impacts have been listed, been where these can be mitigated against. Additional potential impacts identified through the impact

assessment phase and review of the specialist reports have been added and are shown in purple in the table below.

Table 11 provides an assessment of each identified potential impact, including:

- (i) the nature of the impact;
- (ii) the extent of the impact (i.e. spatial area that may be affected by the impact);
- (iii) duration of the impact (long-term / short-term, construction / operation);
- (iv) the probability of the impact occurring before and after mitigation, i.e. the likelihood of impact occurring with or without any mitigation measures in place = low/medium/high);
- (v) the degree to which the impact can be reversed;
- (vi) the degree to which the impact may cause irreplaceable loss of resources; and
- (vii) the degree to which the impact can be mitigated, i.e. the **mitigatory potential** which has been classified as follows:
 - Low (little or no mitigation measure exists to mitigate negative impacts),
 - Medium (mitigation measures exists however some negative effects cannot be fully mitigated)
 - High (can be fully mitigated);

The assessment into potential impacts also considered the type of impact i.e. is the impact direct or indirect; whereby the definition is as follows:

Direct Impact: Impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity, e.g. noise generated by blasting operations on the site of the activity). These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.

Indirect Impact: Induced changes that may occur as a result of the activity. These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.

The significance of each impact after mitigation has also been evaluated according to the following criteria:

- (i) Will the impact result in an alteration to the environment?
- (ii) Does the level of public concern (including both norms and values) influence the impact?
- (iii) Is there scientific and professional evidence against/for the impact?
- (iv) Will there be environmental loss or degradation?
- (v) Will the environmental impact result directly or indirectly in social change?
- (vi) What is the likelihood and acceptability of the residual risk?

Based on the above criteria, **significance of the impact after mitigation** has been classified as follows:

- low (little or no residual negative impact occurs after mitigation; probability of impact occurring after mitigation is low)
- medium (residual impact is acceptable to society but has an undesirable effect – impact can be further reduced through rehabilitation / abatement measures; impact will occur to a lesser extent after mitigation)
- high (impact cannot be mitigated and will result in alteration of environment impact will definitely occur even after mitigation; potential investigation into offsets or alternative designs/proposals)
- very high (impact results in loss of irreplaceable resources even after mitigation i.e. protected areas, world heritage sites, etc.)

Table 11: Assessment of identified potentially significant impacts for the construction and operation of the proposed waxy oil facility [Regulation 31 (2) (k, l)i-vii]

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented /reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
SOIL										
Erosion of stockpiled material (stone, sand and gravel) on the FFS site during construction activity.	Direct	Local	Construction phase (short-term)	Yes – can be managed.	No	Low	High	Material must be stockpiled in such a way that it cannot fall or cause injury or damage to properties or the natural environment. Stockpiles must not exceed 2m in height and must be covered if exposed to heavy wind or rain. Alternatively, low walls or berms must be constructed around the stockpiles. An Environmental Management Programme (EMPr) has been designed to manage construction activities and is attached under Appendix 3.	Low	Low
Risk of contamination to soil and stormwater during concrete mixing.	Direct	Local	Construction phase (short-term)	Yes – can be prevented.	No	Medium	High	Cement mixing will need to take place on a hard surface or cement mixing trays will need to be used. Cement mixing will not be permitted to occur where run off can enter stormwater drains. Construction will be monitored by an ECO who will ensure compliance with the construction EMPr.	Low	Low
Risk of spills from construction equipment (oil, fuels, etc) contaminating soil and stormwater.	Direct	Local	Construction phase (short-term)	Yes – can be prevented.	No	Medium	High	Any construction equipment that could leak oil must be placed on a drip tray or hard surfaced area. Construction vehicles must have a drip tray and any oil leaks must be attended to over a drip tray. All equipment must be in good working order to reduce the likelihood of oil leaks occurring. Any re-fuelling of equipment must occur on a hardened surface, within a designated re-fuelling area where any spills can be contained. Construction will be	Low	Low

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented /reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								monitored by an ECO who will ensure compliance with the construction EMP.		
Risk of spills and leakage during storage of construction hazardous materials (cement, oils, paints etc.) contaminating soil.	Direct	Local	Construction phase (short-term)	Yes – can be prevented	No	Medium	High	Implementation of measures as stipulated in the EMP can prevent the impact from occurring. FFS Procedure 3 (spills) to be complied with. Hazardous materials used during construction should be stored in the existing store with all Material Safety Data Sheets (MSDS) at hand. Spill kits must be readily available.	Low	Low
Potential for improper storage and disposal of waste materials generated during construction resulting in leachate contaminating the soil.	Direct	Local	Construction phase (short-term)	Yes – can be prevented	No	Medium	High	Waste must be stored in the bins within the waste management area and must not be allowed to blow around the site or be placed in piles adjacent to the skips/bins/ Separate waste bins for each waste stream generated must be provided by the contractor. The waste containers must be appropriate to the waste type contained therein and where necessary should be lined and covered. Waste must not be allowed to accumulate on site but should be disposed of regularly by a reputable contractor. Hazardous waste such as oils, contaminated rags etc. must be disposed of at a hazardous class landfill. It is not expected that there will be any generation of scrap metal as the metal sheets for the tank are brought to the site ready rolled and measured to size. Any rubble must not be buried on site.	Low	Low
NOISE										
Noise generated	Direct	Local	Construction	Yes – can be	No	Low	Medium	Construction will be managed	Low	Low

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented /reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
by construction workers, machinery and construction vehicles disturbing surrounding businesses.			phase (short-term)	managed				through implementation of the construction EMPr (Appendix 3). Construction will be during normal plant working hours and only if required, over weekends. The existing tank farm is however located in an industrial area so it is unlikely that the proposed new tank will create a noise nuisance for neighbours. Excessive noise must be controlled on site. All construction workers must be aware of the proximity of the neighbouring industries and all precautions must be taken to ensure that noise generation is kept to a minimum. If excessive noise is expected during certain stages of the construction, all neighbours must be notified of the events timeously.		
Potential increase in noise generation on site (electrical pumps in the processing facility).	Direct	Local	Operational phase (long-term)	Yes – can be managed	No	Low	Low	The proposed pumps for the tanks are unlikely to generate excessive levels of noise. The Noise is not expected to exceed 85dBA. If excessive noise is expected during certain stages of the construction, all neighbours must be notified of the events timeously however the existing tank farm is located in an industrial area so it is unlikely that the proposed new tank will create a noise nuisance for neighbours.	Low	Low
RESOURCE USE										
Sourcing of raw materials i.e. gravel, stone, sand, cement and water from unsustainable	Indirect	Potential for regional impact	Construction phase (short-term)	Yes – can be prevented	Yes	Low	High	All materials must be obtained from a registered and sustainable source and all delivery notes and slips must be made available to the ECO e.g. mined material such as stone must only be obtained	Low	Low

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented /reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
sources resulting in illegal sand winning and mining operations causing significant environmental damage.								from permitted quarries. Municipal water must be used for dust suppression on site if necessary.		
WASTE										
Littering on and around the site and windblown wastes can have an impact on the aesthetics of the surrounding area.	Direct	Local	Construction phase (short-term)	Yes – can be managed	No	Low	Medium	Littering will not be permitted on the site. Waste containers with lids must be provided on site during construction. These must be cleaned on a regular basis to prevent overflow. The EMPr has been designed to manage waste during construction and is attached under Appendix 3.	Low	Low
Environmental contamination risk associated with generation, storage and disposal of various waste streams.	Direct	Local with the potential of a regional impact.	Construction and Operational phase (long-term)	Yes – can be managed.	No	Medium	High	<p>Separate skips/bins are to be clearly labelled as “general waste” and “hazardous waste”. The skip/bin is to be contained to prevent rain ingress and preferably located on a hard surface to prevent any spills or leachate from coming into direct contact with the soil/groundwater.</p> <p>During construction safe disposal slips for hazardous waste are to be retained on the site in the environmental file for ECO audit purposes.</p> <p>All waste should not be stored on site for periods longer than three months⁴.</p>	Low	Low
Skips containing	Direct	Local	Operational	Yes – can be	No	Low	High	As above, hazardous waste	Low	Low

⁴ Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste, DWAF 1998

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented /reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
oily sludge not collected regularly resulting in large amounts of hazardous sludge accumulating on site.			phase (long-term)	prevented.				should not be stored on site for longer than three months. The applicant is therefore to ensure that a regular waste collection schedule is agreed on with the relevant waste collection service being used. The schedule is to be tightly followed to ensure that the skips are regularly collected from the site and disposed of accordingly. The Holfontein Landfill H:H site accepts hazardous waste of this nature.		
Incorrect disposal of contaminated rainwater or spills from the bunded areas.	Direct	Local	Operational phase (long-term)	Yes – can be prevented.	No	Medium	High	FFS Refiners have an existing effluent treatment plant on the site which will be used to treat rainwater mixed with any spills that have accumulated in the bunded areas. Alternatively, contaminated rainwater from the bunded areas is to be disposed of as hazardous waste at a registered landfill site. Safe disposal slips should be retained on site for auditing purposes.	Low	Medium
Incorrect storage and disposal of iron oxides and contaminants that are removed from the waxy oil.	Direct	Local	Operational phase (long-term)	Yes – can be prevented.	No	Medium	High	The applicant has stated that the iron oxides and other components are to be stored on site in waste skips until they are disposed of at a registered landfill site. Skips containing waste should be covered to prevent rain ingress, labelled clearly and should not be kept on site for longer than three months.	Low	Low
AIR QUALITY										
The use of the product, Heavy Furnace Oil, in industrial heating market.	Indirect	Regional	Long-term	No	No	High	n/a	Although liquid fuels have various advantages over using electricity or solid fuels, there is sulphur dioxide and nitrous oxides produced during combustion.	High	Medium

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented /reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								When sulphur dioxide combines with moisture, this produces sulphuric acid (impact on health and the environment). There is no mitigation measure for this impact as it is an offsite impact that the applicant cannot be held fully responsible for.		
Emissions generated from construction vehicles.	Direct	Local	Construction phase (short-term)	Yes – can be managed	No	Low	Low	Emissions generated from construction vehicles will be minimal and is not expected to significantly affect surrounding communities or air quality. This impact is only relevant during the construction and/or decommissioning phase.	Low	Low
Increase in dust levels during construction.	Direct	Local	Construction phase (short-term)	Yes – can be managed	No	Low	High	There is not expected to be a large amount of dust generated during the construction of the proposed waxy oil facility however dust levels should be visually monitored on site by the contractor. Should dust levels become a problem, the ground should be dampened with municipal water. Dust control is included in the EMPr and will be monitored by the ECO during the site audits.	Low	Low
Release of VOCs and fugitive emissions during filling/ loading/ offloading operations impacting on ambient air quality (AQIA, May 2013).	Direct	Local with the potential of a regional impact	Operational phase (long-term)	Yes – can be managed	No	High	Medium	Trucks offloading or receiving product should not be permitted to idle unnecessarily on the site for long periods of time. All vehicles are to be maintained regularly to ensure efficiency and roadworthiness.	Low	Low
Potential release of odours from the	Direct	Local	Operational phase (long-term)	Yes – can be managed.	No	Medium	Medium	Odours should be monitored on site however neighbouring	Medium	Low

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented /reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
processing facility (i.e. when the decanters are de-sludged).			term)					communities are not expected to be affected by the odours. Ambient air monitoring to be undertaken six monthly. Scrubber/s will be placed on relevant component/s in the deashing process to reduce emissions. De-sludging should be carried out regularly to prevent the build-up of large amounts of sludge which is likely to result in odours.		
Nominal displacement of vapour space into the atmosphere during delivery of raw product (AQIA, May 2013).	Direct	Local	Operational phase (long-term)	Yes – can be prevented.	No	Low	High	This usually results in a working loss of vapours from tanks that are vented to the atmosphere. The specialist has confirmed that the Evander plant has installed a tank vapour balancing system that greatly reduces the potential for vapour emissions.	Low	Low
Emissions from coal fired boiler releasing emissions into the atmosphere (AQIA, May 2013).	Direct	Local	Operational phase (long-term)	Yes – can be managed.	No	High	Medium	The air quality specialist recommends that frequent (bi-annual) stack monitoring be undertaken at the proposed heater and vapour scrubber stack at the waxy oil plant to test their efficiency (included in EMPr and as a recommended condition of the environmental authorisation; section 10.0 of the EIR). Ambient air monitoring is to be undertaken on a 6 monthly basis which is part of the AQMP. The oil fired boiler cannot support the entire steam needed for the operation of the plant.	Medium	Low
An increase in benzene concentrations on site (AQIA, May 2013).	Direct	Local	Operational phase (long-term)	Yes – can be managed	No	Low	Low	The air quality specialist has stated that the benzene concentrations from the additional waxy oil plant ambient concentrations fall well within the	Low	Low

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented /reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								respective NAAQS. The AQMP must however include frequent inspection and repair of processing units to reduce hydrocarbons from venting into the atmosphere. There is also to be continuous inspection of tanks rims and seals. As above, ambient air monitoring is to be undertaken on a 6 monthly basis which is part of the AQMP.		
HAZARDOUS MATERIALS										
Incorrect storage of raw material resulting in soil or groundwater contamination.	Direct	Local	Operation phase (long-term)	Yes – can be prevented.	No	Medium	High	Tanks storing the raw material must be sealed to prevent rain ingress and be within a bunded area to contain 110% of the largest tank. ISHECON have also stated that the tanks are to be designed to comply with SANS 10089.	Low	Low
Potential hydrocarbon spills/ leakages during construction and operation of the waxy oil facility polluting surface and/or groundwater.	Direct	Local	Construction phase (short-term) and operational phase (long-term)	Yes – can be managed	No	Medium	High	<p>The contractor and construction staff must be made aware of the potential groundwater and stormwater impacts. During construction, cement mixing must only occur on a hard surface. Any equipment that could leak oil must be placed on a drip tray. This has been included in the EMPr which will be monitored by the ECO.</p> <p>ISHECON has stated that the tanks are to be designed to comply with SANS 10089. All bulk storage tanks and all processing areas are fully bunded to contain 110% of the largest tank. There is to be a curbed nitric acid offloading area and an onsite emergency plan (MHI Risk Assessment, July 2010).</p>	Low	Medium

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented /reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
Possible spill of raw product when waxy oil is transferred from the road tankers to the storage tanks and visa versa during offloading. This could contaminate soil/water as well as increasing the risk of fire/explosion events.	Direct	Local	Operational phase (long-term)	Yes – can be prevented and managed.	No	Medium	High	Offloading of the waxy oil and loading of the product onto road tankers should not be carried out where there is the potential for a spill/leak to come into direct contact with the soil (i.e. in a bunded area or soil protected by a drip tray). The loading hoses are to be tested and inspected regularly for leaks. Measures to ensure a quick response time to spilled product within bunded areas to be implemented.	Low	Low
Risk of spills/leakages from other hazardous materials used in the production process (oils, sludge, waste water etc) polluting the surrounding environment.	Direct	Local	Operational phase (long-term)	Yes – can be prevented and managed.	No	Medium	High	An organisational measures checklist has been provided by ISHECON in Appendix E of the MHI Risk Assessment (July 2010, Appendix 4 of EIR). These measures aim to reduce the potential major risks associated with the site and include various relief valve testing and inspections of the storage tanks. Measures to ensure a quick response time to spilled product within bunded areas to be implemented. Any hazardous spills that occur are required to be cleaned up appropriately and the waste disposed of at a registered landfill site. FFS adheres to a strict spillage procedure which is improved and upgraded on an on-going basis. FFS has stated that the entire process will be located within a bunded and hard-surfaced area. Sumps will recover any spilt product which will be pumped back to the raw material tank.	Low	Low

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented /reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								<p>Various tank features that have been included into the design for pollution control are:</p> <ul style="list-style-type: none"> - the bentonite sealing layer laid below the level of the leak detection pipes. - the series of leak detection pipes cast into the ring beam 100mm below the top level of the ring beam which is above ground level (allows any tank leakage to show itself by dripping out of the leak detection pipes onto the hard surfacing of the floor bund). - the capping layer of bitumen pre-mix laid with a slope from the centre to the tank shell. - the flooring from the ring beam to fall at a 1:100 slope away for 15m or to the bund wall (ensures any spillage will drain away from the tank and reduce any fire hazard). 		
Improper disposal of oily sludges (byproduct of the waxy oil process).	Indirect	Local with the potential of a regional impact.	Operational phase (long-term).	Yes – can be prevented.	No	Medium	High	Oily sludges will be collected in road skips for transportation to the appropriately classified landfill site (e.g. Holfontein H;H Landfill). Oily sludges should not be stored on the site for longer than three months. FFS expect approximately 30 tons per month initially, increasing to 75 tons and finally 150 tons a month once fully operational. This equates to 5, 12 and 21 skips per month respectively. A reputable, experienced company is to be used to transport the oily sludge to the landfill to ensure that there are no spillages on route.	Low	Low
Failure	or Direct	Local	Operational	Yes – can be	No	Medium	High	ISHECON have stated that the	Low	Low

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented /reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
deterioration of equipment and/or bund integrity leading to spillage of material (MHI, July 2010).			phase (long-term)	prevented.				best assurance against failure is correct design, specification, fabrication and construction procedure. Tanks will be designed to comply with SANS10089 and all bulk storage tanks and processing areas are to be fully banded to contain 110% of the largest tank. These design requirements should be followed by thorough inspections throughout the life of the equipment.		
Incorrect storage of sludge resulting in oily sludge coming into direct contact with the ground.	Direct	Local	Operational phase (long-term)	Yes – can be prevented.	No	High	High	The byproduct is to be stored in a designated waste management area which is to be located on an impermeable surface and banded to prevent any potential seepage from coming into direct contact with the ground. The proposed waste management area will be located adjacent to Tank 12 (see Appendix 4 for layout).	Low	Low
Spills during road transport of the waxy oil and final product to and from FFS.	Direct	Local	Operational phase (long-term)	Yes – can be prevented.	No	High	High	A reputable, experienced company is to be used to transport the raw and final products to and from the site to ensure that there are no spillages on route. Existing FFS Evander procedures to handle the loading/ offloading of raw materials and products (Procedures 1 and 2E), handling, storage and use of hazardous substances (Procedure 20E) and waste management (Procedure 18E) must all be revised to include the new processing facility.	Low	Low
Potential contamination of the “spruit” (stream) if a catastrophic spill	Direct	Local with the potential to impact regional.	Operational phase (long-term)	Yes – can be prevented.	Yes	Low	High	Unlikely as the stream is located over 250m away from the proposed location of the new waxy oil processing facility. All bulk storage tanks and processing	Low	Low

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented /reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
occurs and there is a massive firefighting operation).								areas will however be bunded to contain 110% of the largest storage tank. Fire water management requires particular attention in the updated FFS on-site emergency plans dealing with major fire emergencies.		
Potential leak/rupture in waxy oil loading/off-loading hose and/or pipe transferring the waxy oil to new 1 200m3 feed tank resulting in spillage of hydrocarbon (MHI, July 2010).	Direct	Local.	Operational phase (short-term impact duration)	Yes – can be prevented and/or managed.	No	Medium	High	ISHECON have confirmed that a hose rupture will not have a major impact beyond the site boundary. Personnel loading/ off-loading the waxy oil are to be trained on the FFS procedures for handling the loading/ offloading of raw materials and products (Procedures 1 and 2E), which is to be updated to include the new process. Loading and off-loading should take place within a contained area so if a leak or spill was to occur, it would be within the bunded area.	Medium	Low
Potential leaks, punctures or ruptures in the pipes/ tanks used during the distillation process in the FFE and/or blending tanks resulting in a hydrocarbon spill, (MHI, July 2010).	Direct	Local	Operational phase (short-term impact duration)	Yes – can be prevented.	No	Medium	High	As above, ISHECON have confirmed that tank failure into the bunded areas will not have a major impact beyond the site boundary. Tanks will be designed to comply with SANS10089 and all bulk storage tanks and processing areas are to be fully bunded to contain 110% of the largest tank. These design requirements should be followed by thorough inspections throughout the life of the equipment.	Medium	Low
Rupture/leak of nitric acid offloading hose and/or transfer piping and/or nitric acid bulk storage tank	Direct	Local	Operational phase (short-term impact duration)	Yes – can be prevented.	No	Medium	High	The specialist recommends that the nitric acid offloading area be curbed. A nitric acid spill should be incorporated into the onsite emergency plan (an Emergency Procedures checklist has been included in Appendix E of the MHI	Medium	Low

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented /reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
resulting in a safety concern (MHI, July 2010).								Assessment as a guide to improving the onsite emergency plan for an MHI). All tanks will be designed to comply with SANS10089 and all bulk storage tanks and processing areas are to be fully bunded to contain 110% of the largest tank. Thorough inspections throughout the life of the equipment should be undertaken. ISHECON has stated that the offloading points should be fitted with different couplings to reduce the risk of a mixing incident which could result in an explosion or the generation of heat/ NO _x fumes.		
Incorrect storage of nitric acid at the site leading to an explosion/ spill or the release of NO _x fumes.	Indirect	Local	Operational phase (short-term impact duration).	Yes – can be prevented.	No	Medium	High	<p>Nitric acid should be safely stored away from bases and organic compounds such as turpentine, cleaning detergents⁵ or metallic powders. It should also not be stored near any assembly points as nitric acid give off fumes if not handled and stored correctly. Excess quantities of nitric acid should not be stored on the site. The storage area should be clearly labelled with signage indicating the flammable nature of the acid.</p> <p>The Material Safety Data Sheet (MSDS) for Heavy Fuel Oil (Appendix 5) states that Heavy Fuel Oil should avoid strong oxidisers and is incompatible with nitric acid. Nitric acid should therefore not be stored directly</p>	Low	Low

⁵ ISHECON MHI Assessment, July 2010.

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented /reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								adjacent to any Heavy Fuel Oil. The MSDS for nitric acid (Appendix 5) includes a list of materials that the chemical reacts with. Nitric acid must not be stored or exposed to these listed materials (includes wood, paper, cloth and most metals).		
SERVICES										
Increase in traffic disruptions on surrounding access roads during the construction period.	Direct	Local	Construction phase (short-term)	Yes – can be managed	No	Low	Medium	There is only expected to be a negligible increase in traffic on the surrounding road networks however flagmen must be provided where necessary if it is anticipated that construction vehicles or machinery may affect traffic along the access roads. Traffic has been included in the EMPr (Appendix 3).	Low	Low
Effluent discharged not meeting municipal standards.	Direct	Local with the potential of a regional impact	Operational phase (long-term)	Yes – can be managed	No	Medium	High	All stormwater falling within the bunded area will drain into a sump and be transferred to the existing effluent plant for treatment before release into the municipal system. There is currently a permit for discharging the treated effluent.	Low	Low
Potential increased pressure on municipal services (i.e. water supply and electricity).	Direct	Local	Operational phase (long-term)	Yes – can be managed.	No	Low	Low	The existing FFS site in Evander was designed and built with an expansion of this nature in mind and thus allowance has already been made for all utility requirements. There is not expected to be any changes to the volume of domestic sewage with the installation of the new waxy oil facility. It is anticipated that the existing electricity supply will be sufficient for the proposed waxy oil facility which is expected to require approximately 50 – 75 kW/month	Low	Low

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented /reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								of electricity to operate.		
Leak on high pressure high temperature equipment may result in a jet fire impinging directly on near-by equipment leading to domino failures (MHI, July 2010).	Direct	Local	Operation phase (short-term)	Yes – can be prevented.	No	Low	High	<p>Unlikely as “most of the equipment on the plant operates under vacuum conditions and therefore jet fires are highly unlikely” (MHI, July 2010). Preventative and Protective measures to be incorporated into the design of the installations to minimize Major Hazard Incidents are outlined on page 21 of the MHI report (and summarized in section 3.2.1 of the EIR). These include employee training, tank design, bunds, curbed offloading areas, emergency plans and firefighting on the site.</p> <p>There is an existing fire protection system in place that will be extended to cover the new facility. The applicant is to consult with the fire department once the fire system has been extended (included in section 10 of the EIR as a recommended condition for authorisation). The on-site emergency plans are required to be reviewed to take into the new facilities and associated hazards.</p> <p>Tank inspection to be undertaken as per Procedure 45 (Appendix 6). This is a recommendation of the AQMP. These inspections will aid in reducing the likelihood of a jet fire from occurring by detecting any minor leaks as soon as they occur.</p>	Low	Medium
SOCIAL										
Potential for job	Direct	Local	Operational	No mitigation measure required. The new facility will provide 12 new employment opportunities (see section 4.5 of the EIR for a						

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented /reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
creation during the construction period.			phase (long-term)	breakdown of the expected employment opportunities).						
Potential unearthing of artifacts of cultural or heritage significance	Direct	Local	Construction phase (short-term)	Yes – can be managed	No	Low	Medium	It is not anticipated that there will be any artefacts of heritage / cultural significance as this is an existing industrial site. Should any graves or artefacts be identified, construction must immediately stop and SAHRA must be notified.	Low	Low
HEALTH AND SAFETY										
Potential risks posed to surrounding industries in terms of fire, explosion, etc.).	Direct	Local with the potential to impact regional.	Operational phase (long-term)	Yes – can be prevented.	No	Low	High	<p>The MHI Risk Assessment (Appendix 4) concluded that there will only be offsite impacts under worst case scenario such as a catastrophic failure of the new bulk oil tanks, the nitric facilities and high temperature processing equipment. The increase in offsite risk posed by the proposed waxy oil facility was therefore rated as "very low" by the specialist.</p> <p>There are a number of quality assurance measures (tank design parameters and safe operating procedures) and protective features (bunds and emergency plans) that are to be incorporated into the design of the installations to minimize the potential for major hazard incidents (full list on page 21 of the MHI Risk Assessment, July 2010 attached in Appendix 4).</p>	Low	Medium
Occupational health impact associated with the handling of waxy oil. The handling of the oils may cause	Direct	Local	Operational phase (long-term)	Yes – can be prevented.	No	Medium	High	This may occur during handling and maintenance of equipment. All employees who handle the proposed waxy oil and process chemicals on site will be required to wear the appropriate Personal Protective Equipment (PPE). The	Low	Low

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented /reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
occupational diseases through inhalation of vapours, skin contact or ingestion.								<p>relevant PPE is outlined in the Material Safety Data Sheet (MSDS) for Waxy Oil (Appendix 5).</p> <p>The MSDS for Waxy Oil must be made available on site and employees working with the waxy oil are to be educated and aware of the details of the MSDS.</p> <p>Training on the use and storage of hazardous substances is currently undertaken on an annual basis and forms part of the environmental management system requirements of the FFS site. All employees will continue to be given annual health & safety training. They will also be required to have annual medicals for early detection of occupational diseases. Current ambient air sampling is undertaken on a 6 monthly basis, thus is to include the waxy oil plant.</p>		
<p>There are a number of potential equipment or system failure events, identified by ISHECON that could result in a fire or explosion occurring on the site. The various impacts include:</p> <p>- Pool fire from a vessel or pipe</p>	Direct	Local with the increase in offsite risks being very low (one in 2000 years).	Operational phase (long-term)	Yes – impact can be prevented.	No	Medium	High	<p>From an MHI perspective, the new processing facility does not present any major concerns over and above those currently onsite (page 5 of the MHI report in Appendix 4 of the EIR). ISHECON recommended that the site occupied building study should be conducted as part of the MHI update to evaluate the risks against international guidelines such as the “Guidance for the location and design of occupied buildings on chemical manufacturing sites”.</p>	Low	Medium

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented /reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
<p>rupture or leak damaging bund/tank integrity,</p> <ul style="list-style-type: none"> - Flash fire occurring in the high temperature processing units effecting employees on the site, - Potential for an internal explosion to occur within the large vessels on site, - Inadequate ventilation resulting in a confined explosion, - Small possibility of a ruptured high pressure high temperature vessel containing hydrocarbons could result in an unconfined explosion, - Potential for a BLEVE in the reboiler on the distillation plant effecting workers on the site, - Possible release of fumes from acute exposure to nitric acid fumes. which could 								<p>In the interim, the admin building and workshops within 50m of the new processing plant have:</p> <ol style="list-style-type: none"> blast resistant windows on all sides and emergency exists exiting south, west or east. <p>Assembly points to consider the “shelter-in-place indoors” policy to avoid any nitric acid fumes.</p> <p>Preventative and Protective measures to be incorporated into the design of the installations to minimize Major Hazard Incidents are outlined on page 21 of the MHI report (and summarized in section 3.2.1 of the EIR). These include employee training, tank design, bunds, curbed offloading areas, emergency plans and firefighting on the site.</p> <p>There is an existing fire protection system in place that will be extended to cover the new facility. The applicant is to consult with the fire department once the fire system has been extended (included in section 10 of the EIR as a recommended condition for authorisation). The on-site emergency plans are required to be reviewed to take into the new facilities and associated hazards.</p> <p>Tanks to be inspected as per existing Procedure 45. These inspections will aid in reducing the likelihood of a confined explosion</p>		

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented /reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
<p>impact the workers on the site.</p> <ul style="list-style-type: none"> - Possible equipment failure resulting in an uncontrolled rise in pipe/vessel pressure increasing the potential for a fire/explosion - Potential puncture/rupture in the waxy oil feed tank resulting in an explosion or internal fire open roof. - Potential internal explosion in the fired heater in the distillation plant, rupture or puncture of nitric acid fumes. <p>road tanker resulting in possible MHI event depending on quantity of nitric acid fumes. spilt.</p> <ul style="list-style-type: none"> - inadequate purging during shut down and start-up operations resulting in the ingress of foreign 								<p>from occurring by detecting any minor leaks as soon as they occur.</p> <p>The FFS site is currently operating an ISO 14001 based environmental management system with the proposed project being part of a designated environmental management plan to ensure full compliance with all legal requirements and to ensure appropriate monitoring and assessment takes place. The applicant has stated that existing procedures to handle the loading/offloading of raw materials and products (Procedures 1 and 2 E); handling, storage and use of hazardous substances (Procedure 20E); waste management (18E); emergency procedures (6E; 11E and 64E); sampling and analysis (32E); underground and above ground tank testing (Procedure 45); environmental reporting (58E) will all be revised to include the new project. This has been included as a recommended environmental authorization condition in section 10 of the EIR.</p>		

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented /reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
oxidizing material. A full list of all possible equipment and system failure possibilities is included in Appendix B of the MHI Report (Appendix 4 of the EIR). All these potential impacts have a similar result (i.e. fire and/or explosion) and therefore the same mitigation measure applies.										
Hot work tools used during maintenance/ warming up procedures increasing the risk of a source of ignition (MHI, July 2010).	Indirect	Local	Operational phase (long-term).	Yes – can be prevented.	No	Medium	High	Where possible, hot work tools should be avoided during maintenance or warm up procedures. All employees working in this area must be made aware of the risk that hot tools could have as a source of ignition. After any maintenance has been carried out at the new facility, it is recommended that a designated safety person inspect the facility to ensure that no hot work tools have been left behind.	Low	Low
Potential safety issues for workers on site related to the MHI status of the proposal (MHI Risk Assessment, July 2010)	Direct	Local	Operational phase (long-term).	Yes – can be prevented and managed.	No	Medium	High	Since the onsite risk will increase with the proposed facilities, ISHECON recommends that the admin building and the workshops located within 50m of the proposed new processing plant have blast resistant windows on all sides, emergency exits from the buildings be towards the south or	Low	Medium

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented /reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								west or east (i.e. not only north) and assembly points be located indoors (best shelter from nitric acid toxic fumes). Workers on site are to be aware of the FFS EMS procedures, specifically emergency procedures (reference: 6E; 11E and 64E).		

From the assessment of impacts identified in the table above, the majority of mitigation measures involve preventative action in the form of quality assurance and protective features for the equipment and employees working at the proposed facility. After reviewing the table of impacts there are three key impact areas which are discussed in more detail below:

Waste Management

Due to the hazardous nature of the materials involved with the process on the site, it is of importance that the materials are stored, transported and disposed of appropriately to avoid any soil and/or groundwater contamination. This is also necessary from a health and safety perspective. MSDS are required to be available on the site and storage recommendations adhered to (MSDS included in Appendix 5 of the EIR). Storage and disposal of oily sludge is of particular importance and should not be stored on site for extended periods of time due to its hazardous nature and the odours that will be released over time. An appropriately licensed landfill site must be used for the disposal of hazardous waste and safe disposal certificates kept on the site. Section 3E and 3H in the EMPr (Appendix 3) specifically deals with waste management and hazardous materials storage.

Taking into consideration the relevant MSDS' and EMPr conditions, it is unlikely that the hazardous materials will significantly impact on the surrounding environment. Precautionary measures have also been included in the design of the proposed facility (i.e. sufficiently bunded tank storage area and curbed loading areas directing spills into a sump).

Air Quality

While it is noted that all predicted concentrations of PM₁₀, SO₂, NO₂ and benzene fall well within the respective NAAQS, bi-annual stack monitoring, leak detection and ambient air monitoring is to continue and must include monitoring of the new processing plant (see environmental condition recommendations in section 10.0 of the EIR).

Once issued, any conditions prescribed in the Air Emissions License for the site are to be adhered to. The impact of the proposed waxy oil plant on ambient air quality and local environmental health should therefore be negligible (section 9.0 of the AQIA, May 2013).

MHI Risk

Please note that while the EIR includes potential safety impacts associated with the proposed processing facility, the EAP is not qualified to fully prescribe specific recommendations and draw conclusions regarding safety on site.

The risk specialist has indicated that the offsite risks are very low and only the onsite risks will increase. It will therefore be important for FFS Refiners to educate and train the relevant employees on the dangers, precautions and emergency responses for various incidents. FFS have stated that training on the use and storage of hazardous substances is included in the site environmental management system requirements. This training is to include the four new hazardous materials (Waxy oil, Heavy Fuel Oil, Nitric acid and Thermal oils). New employees working at the proposed processing facility are to be inducted before commencing work. Induction training is to include the correct storage, handling and transportation of the hazardous materials ensuring that there is no soil or groundwater contamination. Training has been outlined in section 3I of the attached EMPr.

The FFS Environmental Management Procedures (specifically the Emergency Procedures) are to be revised to include the new processing plant (see environmental condition recommendations in section 10.0 of the EIR). Preventive and protective measures outlined on page 21 of the ISHECON MHI report will sufficiently reduce the risks of an explosion/fire from occurring on the site with the most likely failure events occurring once in 500 years and major catastrophic events occurring less than once in 500 000 years.

6.3 Draft Environmental Management Programme [Regulation 31 (2) (p) and 33]

A draft Environmental Management Programme (EMPr) in accordance with regulation 33 has been compiled and is included in Appendix 3.

6.4 Determination and Assessment of Cumulative impacts [Regulation 32 (2) (l) (i)]

The NEMA EIA regulations define cumulative impact as follows:

“The impact of an activity that in itself may not be significant but may become significant when added to the

The DEA guideline on the assessment of alternatives and impacts identifies two types of cumulative impacts:

- (1) Additive cumulative impact, i.e. where the identified potential impact adds to the impact which is caused by other similar impacts; or
- (2) Interactive cumulative impact, i.e. where a cumulative impact is caused by different impacts that combine to form a new kind of impact. Interactive impacts can be further classified:
 - (a) Counterveiling: the net adverse cumulative impact is less than the sum of the individual impacts; or
 - (b) Synergistic: the net adverse cumulative impact is greater than the sum of the individual impacts.

Table 12 provides an assessment of potential cumulative impacts that may arise from the development proposal:

Table 12: Assessment of potential cumulative impacts for the construction and operation of the proposed waxy oil facility

Nature of Impact (potential)	Extent of Impact	Duration of Impact	Type of cumulative impact	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
Since the Evander site falls within the Highveld Priority Area, an identified pollution hotspot, the release of vapours and fugitive emissions from the storage tanks may contribute to the existing air quality of the surrounding area and contribute to poor regional air quality.	Potential regional impact due to the Highveld Priority Area	Operational phase (long-term)	Additive	High	<p>The AQIA (Appendix 8) demonstrated that the cumulative air quality impact emanating from the site when the waxy oil plant is added to the existing facility, is expected to increase marginally however no significant concerns are expected to arise with respect to the impact of the proposed waxy oil plant on ambient air quality and local environmental health.</p> <p>The ambient concentrations of PM₁₀, SO₂, NO₂, and benzene concentrations fall well within the respective NAAQS.</p> <p>All emissions will however be minimised as follows:</p> <ul style="list-style-type: none"> - All tanks will have hermetically sealed roofs. - All tank vents will have air-cooled condensers fitted to condense and return all vapour back in to the tanks. - All tanks will have vacuum-pressure breaks fitted to reduce the amount of vapour formation in the tanks. - Tanks storing Class I products will direct all vapour through a wet scrubber to remove the hydrocarbons down to the required level. <p>The storage tanks on the site are also to be design according to SANS 10089 to reduce the likelihood of leaks (MHI risk assessment, July 2010). The air quality specialist recommends that the AQMP include a LDAR approved by a licensing authority in line with requirements of the NEM: AQA. These measures will contribute to reducing short term peaks in the air pollution concentrations.</p> <p>Biannual ambient air monitoring on the FFS Evander site must be extended to include the proposed tank storage facility. Pollutants measured biannually from point sources and dispersed emissions are the BTEX volatile organic compounds, the inorganic oxides of nitrogen and sulphur dioxide.</p>	Low	Low

Nature of Impact (potential)	Extent of Impact	Duration of Impact	Type of cumulative impact	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
The presence of an additional processing facility within the existing operations increasing the risk profile of the site and the area, adding to the existing industrial risk of the area.	Local	Operational phase (long-term)	Additive	High	The existing FFS tar processing facility is a registered MHI. ISHECON concluded that the new processing facility does not present any major concerns above those of the current site. If preventative and protective measures, outlined on page 21 of the MHI (Appendix 4) and summarized in section 3.2.1 of the EIR, are incorporated into the design of the installations the likelihood of a Major Hazardous Incidents from occurring will be greatly minimized.	Low	Medium
Increase in hazardous material to the Holfontein H:H Landfill site or other appropriately classified landfill site.	Local	Operation phase (long-term)	Additive	Low	<p>In-organic sludge (ash and metals) will be transported via road skips to an appropriately classified hazardous landfill. FFS Refiners expected approximately 30 tons per month initially, increase to 75 tons per month and finally to 150 tons per month. This will equate to 5, 12 and 21 skips per months respectively.</p> <p>FFS are required to contact the relevant landfill that will be used to ensure that there is enough capacity to handle the increase in hazardous skips over time. Proof of communication should be retained on the site for audit purposes.</p> <p>It is important to keep in mind that the proposed waxy oil facility will process a non-renewable resource which would otherwise be disposed of as hazardous waste.</p>	Low	Low

The specialist studies have confirmed that all cumulative impacts identified in Table 12 above either have a negligible impact and/or can be sufficiently mitigated. WSP have stated that there will be an insignificant increase in ambient air quality in the Highveld Priority Area when the proposed waxy oil plant is added to the existing facility (AQIA, May 2013). The proposed new facility also does not present any major concerns above those of the current site from an MHI perspective (MHI Risk Assessment, July 2010). The offsite risks posed by the proposed additional operations is very low and the onsite risks are within the 'tolerable provided ALARP' range. Recommendations made by the risk specialist (summarised in section 3.2.1. of the EIR) to reduce the onsite risks have been included in the EMPr (Appendix 3).

Once the applicant has notified the relevant hazardous landfill site regarding the quantities of waste expected to be delivered to the landfill, the increase in hazardous material received by the landfill can be sufficiently managed and safely disposed of.

7.0 Comparative assessment of all alternatives identified during the Environmental Impact Assessment process [Regulation 31 (2) (i)] and the rating of the identified potential alternatives including advantages & disadvantages that the proposed activity may have on the environment and community that may be affected by the activity [Regulation 31 (2) (g)].

The various environmental, social and economic advantages and disadvantages for the proposed waxy oil processing facility as well as the no go alternative have been tabulated below. This is a comparative assessment which includes the advantages and disadvantages of the two alternatives during the operational phase of the proposed facility.

Table 13: Comparative Assessment between the No Go alternative and the Operation of the Proposed Waxy Oil Processing Facility.

	No Go	Alternative: Construction of the waxy oil processing facility.
ENVIRONMENTAL impacts / opportunities	<ul style="list-style-type: none"> The proposed site will remain as a mowed grass field with no additional environmental impact or opportunities. Waxy Oil currently produced at the Sasol Synfuels synthetic fuel process in Secunda will be sold as a high ash burning fuel resulting in added particulate matter dispersion into the atmosphere at various sites around South Africa. 	<ul style="list-style-type: none"> Short-term peak in air pollution concentrations resulting from a spilled product and fugitive emissions from general operation. Marginal increase in air pollution concentrations however no local environmental health concerns. Reduction in non-renewable resource which would otherwise be disposed of as a hazardous waste.
ECONOMIC feasibility	No change in the economic status of the Evander site.	Expanding the current FFS Evander site's facilities and selling the processed waxy oil as Heavy Furnace Oil will increase the economic productivity of the site. This alternative is therefore more economically feasible compared to the no go alternative.
SOCIAL implications	No additional direct and/or indirect social implications.	<ul style="list-style-type: none"> No significant increase in offsite risk posed by the additional processing facility from a MHI perspective. No significant air quality concerns expected on ambient air quality.
Policy or legal requirements	<ul style="list-style-type: none"> Waste Management License pending Atmospheric Emissions License pending 	<ul style="list-style-type: none"> Waste Management License pending Atmospheric Emissions License pending Update of FFS EMS procedures and environmental management plan.
Positive impacts	No additional positive impacts.	<ul style="list-style-type: none"> Reduction in non-renewable resource which would otherwise increase many users particulate matter when burnt as a high ash burning fuel. Additional employment opportunities.

In terms of rating, the alternative was reviewed by a matrix system using the following criteria:

- Which alternative is more suitable from an environmental services / biological perspective at least in terms of the site itself?

- b) Which alternative is more feasible from the perspective of the environmental services / biological perspective from a regional perspective?
- c) Which alternative is more suitable from the perspective of the surrounding communities / businesses in terms of services or benefits they may receive?
- d) Which alternative is more suitable from the perspective of the surrounding communities / businesses in terms of impacts i.e. traffic, that may affect them?
- e) Which alternative is more economically feasible and also more viable for the developer?

Table 14: Rating of Alternatives

Key: 0 = not viable (or may cause impact); 1 = less viable (or impact can be mitigated); 2 = most viable (or no impact caused);

	No Go	Alternative
Environmental Services / Biological – on site	2	1
Environmental Services / Biological – regional	2	2
Surrounding Communities / Businesses – services / benefits / positive impacts	2	2
Economic Feasibility & Viability for the developer	1	2

Since there are no other biological services present on the piece of proposed site, air quality was considered when rating the impact of the proposed waxy oil processing plant on the onsite environmental services. Short-term peaks in air pollution could result from spilt product but the impact will not decrease the rating significantly to reduce the proposed development as “unviable”. The air quality specialist has stated that the ambient air concentrations fall within the respective NAAQS and therefore the impact of the proposed facility in terms of the regional environment services has the same rating as the no go option.

According to ISHECON as well as the AQIA, there will be no significant impact during the operation of the waxy oil processing facility on surrounding communities. Offsite risks are not increased with the operation of the proposed new facility. The alternative is more economically profitable for FFS Refiners when compared to the no go alternative where this section of the Plant will be left undeveloped.

8.0 Assumptions, Uncertainties and Gaps in Knowledge [Regulation 31 (2) (m)]

The EAP is satisfied that sufficient information has been made available to allow for assessment of this proposal. The opinion of the EAP has been based on the specialist studies listed in section 4.8 of the EIR. Limitations and uncertainties of the AQIA are listed under section 8 of the report (Appendix 8).

9.0 Environmental Impact Statement with Summary of Key Findings and Comparative Assessment of The Positive and Negative Implications of The Proposed Activity and Identified Alternatives; [Regulation 31 (2) (o) i-ii]

It is important to keep in mind that the FFS Evander site was constructed with an expansion of this nature in mind. The site currently has approval for 15 000m³ storage tank capacity. The proposed site within the existing plant is currently a maintained grass lawn offering very little environmental services. The Air Quality Impact Assessment (May 2013) has concluded that there will only be a marginal increase in ambient air concentrations of PM₁₀, SO₂, NO₂ and benzene which will not impact air quality or local environmental health. The onsite risks identified in the MHI Risk Assessment, can be mitigated according to recommendations in the assessment (Appendix 4).

The EAP is satisfied that once the recommended mitigation measures and monitoring procedures have been put in place and/or updated, the impact that the proposed processing facility will have on the environment and surrounding communities will be negligible.

10.0 Reasoned Opinion on Authorization and Conditions for Authorization [Regulation 31 (2) (n)]

When deciding whether the activity should or should not be authorised, the EAP has evaluated and considered all identified impacts as listed in Table 11 as well as the cumulative impacts listed in Table 12. Where impacts cannot be avoided, the significance of these impacts was measured. The EAP has included specialist recommendations and prescribed mitigation measures into the EMP_r (Appendix 3). Provided that the applicants and contractors adhere to the specifically designed EMP_r, the EAP is of the opinion that environmental authorisation should be **granted** for the construction and operation of the proposed waxy oil processing facility as illustrated in Appendix 2.

Taking into account the above mentioned factors, a number of conditions for Environmental Authorisation can be prescribed. These conditions include:

1. The applicant must ensure that mitigation measures and controls specified in the EMPr are adhered to during all phases of the development (pre-construction, construction and operational). All phases must be monitored by an independent ECO who should ensure compliance with the EMPr.
1. Environmental audits during the construction phase should be conducted on a monthly basis or at an agreed upon interval depending upon rate of construction by an independent ECO in addition to post-construction audit (PCA).
2. Existing infrastructure (i.e. electricity lines, water pipelines) must be identified prior to construction.
3. The contractor and all staff must attend an environmental awareness training course, presented by the independent ECO prior to construction commencing. The environmental awareness training course should cover the following key aspects: (a) basic awareness and understanding of key environmental features of the work site (b) understanding the importance of, and reasons why, the environment must be protected, (c) ways to minimize environmental impacts, and (d) requirements of the Environmental Authorisation and EMPr.
4. Adequate toilet facilities must be provided for all staff members as standard construction practice.
5. When sourcing building materials such as sand and stone, company details and proof of registration must be available on site for auditing purposes. This should prove that the company is obtaining materials from a permitted site.
6. Littering must not be permitted on the site and general housekeeping must be enforced.
7. Waste must be stored in the designated waste management area and must not be allowed to blow around the site or be placed in piles adjacent to the skips / bins and must be disposed of at an appropriate land fill site.
8. If there is any hazardous waste, it must be stored on a hard surface within a bunded area and must not be allowed to enter the surrounding environment.
9. All excess material and rubble, not being used on the site, must go to an approved, designated landfill and a safe disposal certificate must be obtained.
10. Normal construction hours must be adhered to and weekend work minimised where possible.
11. As recommended in the Air Quality Impact Assessment (WSP; May 2013), an Air Quality Management Plan is to be developed for the site/ the existing AQMP is to be revised to include the proposed waxy oil facility.
12. bi-annual stack monitoring, leak detection and ambient air monitoring is to continue and must include monitoring of the new processing plant.
13. As recommended in the MHI Risk Assessment (ISHECON; July 2010), the full site occupied building study should be conducted as part of the MHI update, preferably at least prior to commissioning of the new facilities.
14. Preventative and Protective measures as outlined on page 21 of the MHI Risk Assessment (ISHECON; July 2010) are to be incorporated into the design of the installations to minimize Major Hazard Incidents.
15. The existing fire protection system and on-site emergency plans are required to be extended and reviewed to cover the new facilities and associated hazards. The updated emergency plan should take into account
 - (a) In terms of assembly points, it should be noted that with possible emissions the best protection is afforded by a policy of shelter-in-place indoors.
 - (b) The on-site assembly points, may need to be reviewed to take the new facilities into account.
16. The existing FFS procedures to handle the loading/ offloading of raw materials and products (Procedures 1 and 2 E); handling, storage and use of hazardous substances (Procedure 20E); waste management (18E); emergency procedures (6E; 11E and 64E); sampling and analysis (32E); environmental reporting (58E) and tank testing (Procedure 45) must be revised to include the new facility.
17. As recommended in the MHI Risk Assessment (ISHECON; July 2010), FFS are to confirm with the relevant local emergency services that the authorities off-site emergency plan is updated for the new installation.
18. As recommended in the MHI Risk Assessment (ISHECON; July 2010), FFS are required to record and report to the relevant national, provincial and local authorities major incidents, incidents which brought the emergency plan into action as well as near-misses. The records must be available on the site for inspection.
19. As recommended in the Geotechnical Investigation (WSP; February 2009), prior to construction, foundations should be inspected and approved by a competent person to ensure the foundation is found.
20. FFS Refiners are to secure their Waste Management License as soon as possible and comply with any prescribed conditions therein.

11.0 References

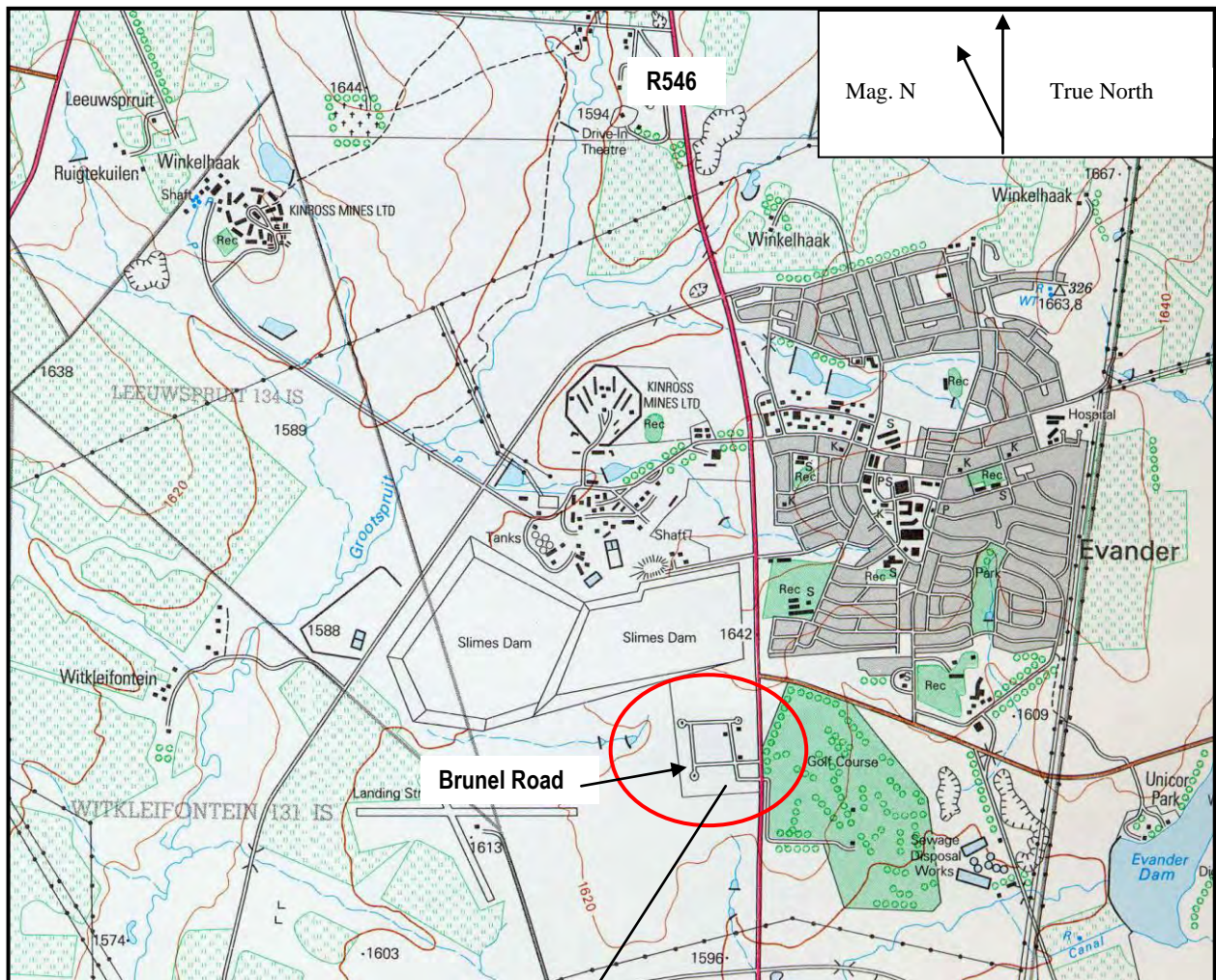
DEA&DP 'Guideline on Alternatives, NEMA EIA Regulations Guideline and Information Document Series. Western Cape Department of Environmental Affairs & Development Planning' (2011).

Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste: Department of Water Affairs and Forestry; 2nd Edition (1998)

Appendix 1: Locality map

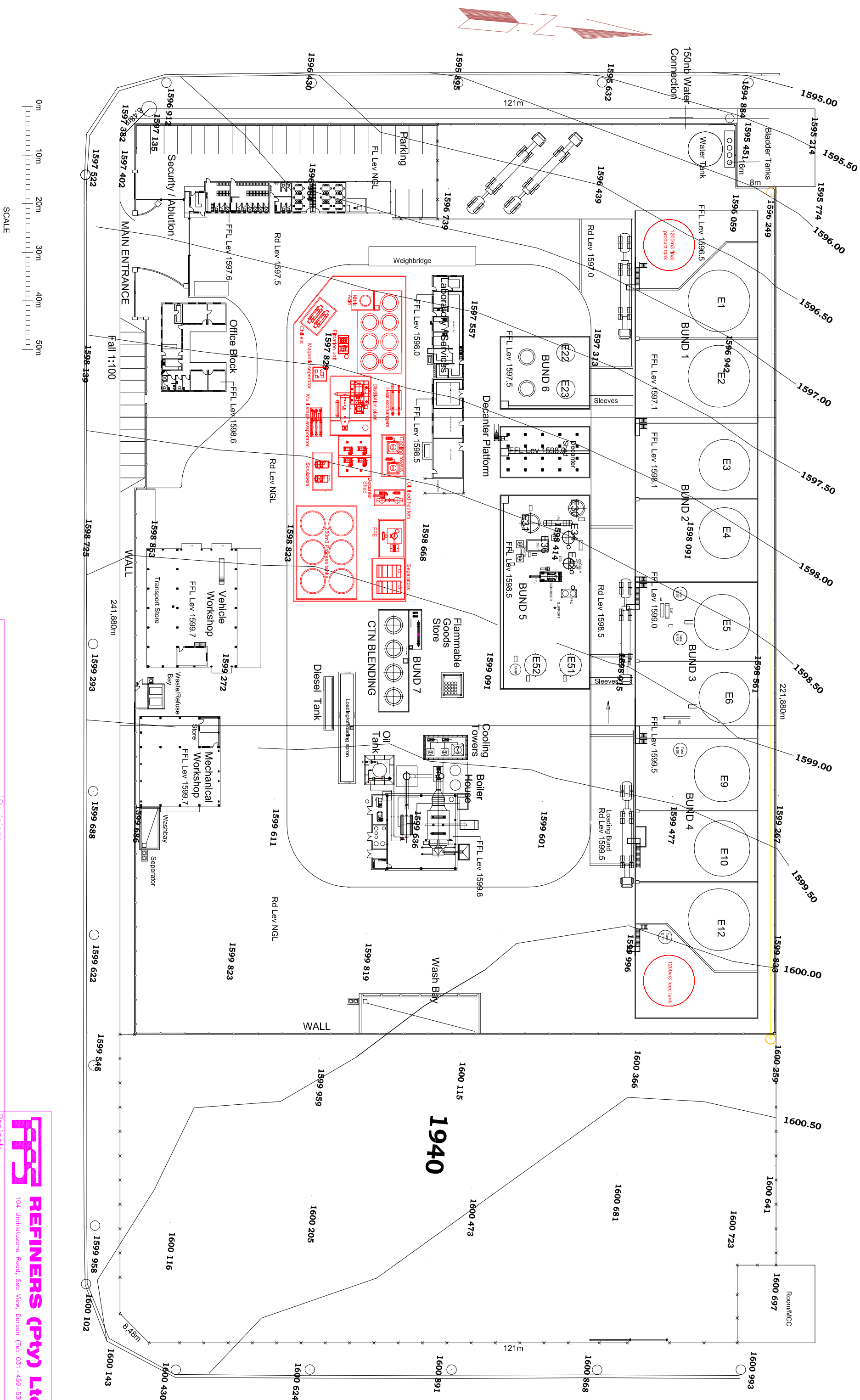
Appendix 1 – Locality Map

1:50 000 Topographic Map illustrating the location of FFS Refiners (Pty) Ltd (circled in red) located in Evander.



Aerial photograph of the current FFS Industrial Complex with the location of the proposed new tanks shown with a red cross. GPS co-ordinates for the centre of the site are 26°29'10.40"S 29°05'51.33"E.

Appendix 2: Site map of existing Evander Plant including the location of the proposed new facility



THE REFINERS (Pty) Ltd
104 Umhlatuzana Road, See View, Durban (Tel: 031-459-5300)

EVANDER TAR PLANT

Description:

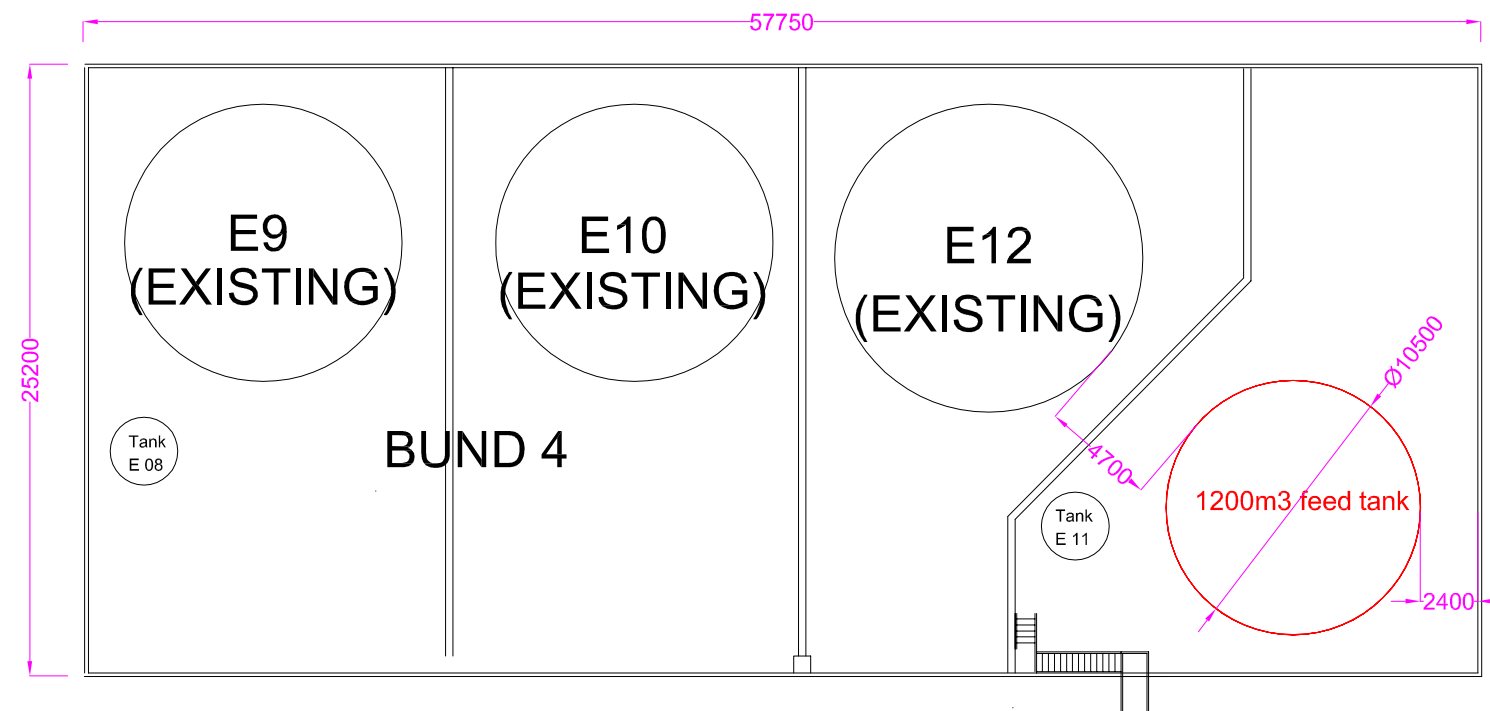
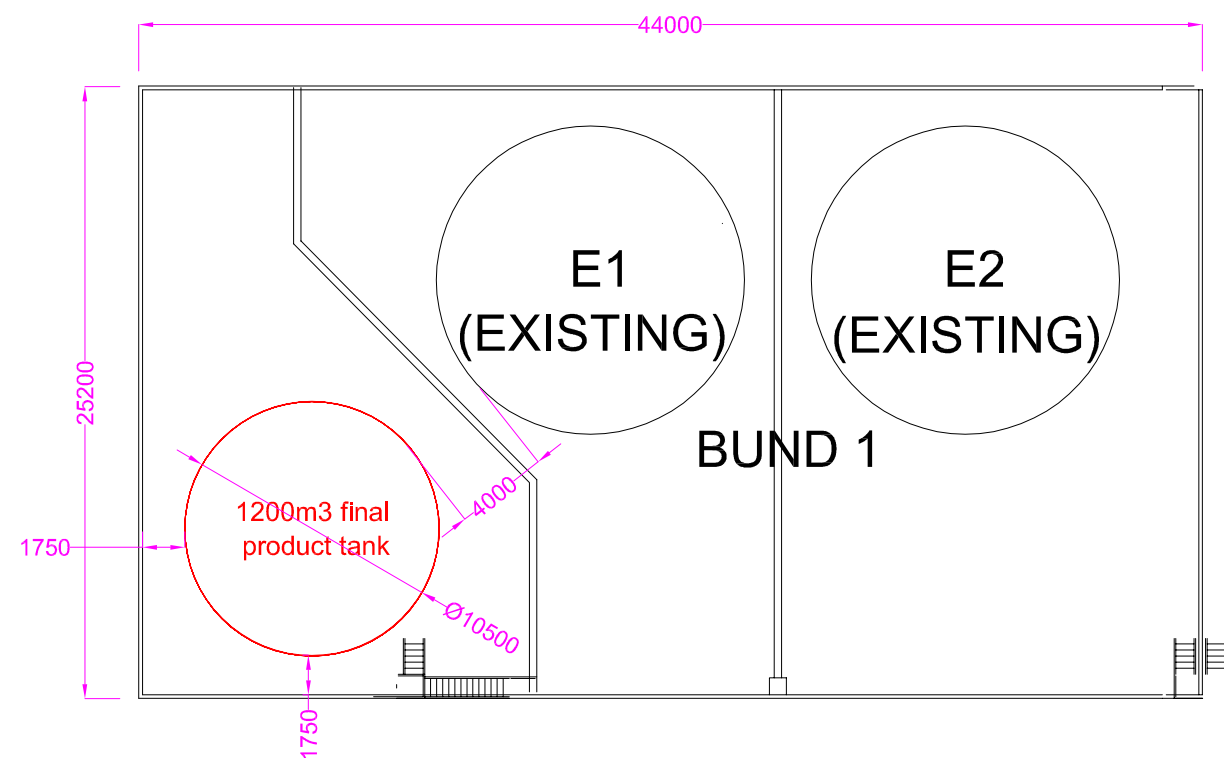
SUBMISSION SITE PLAN WAXY OIL FACILITY

Date:	08/04/10	By:	GW	Scale:	NTS
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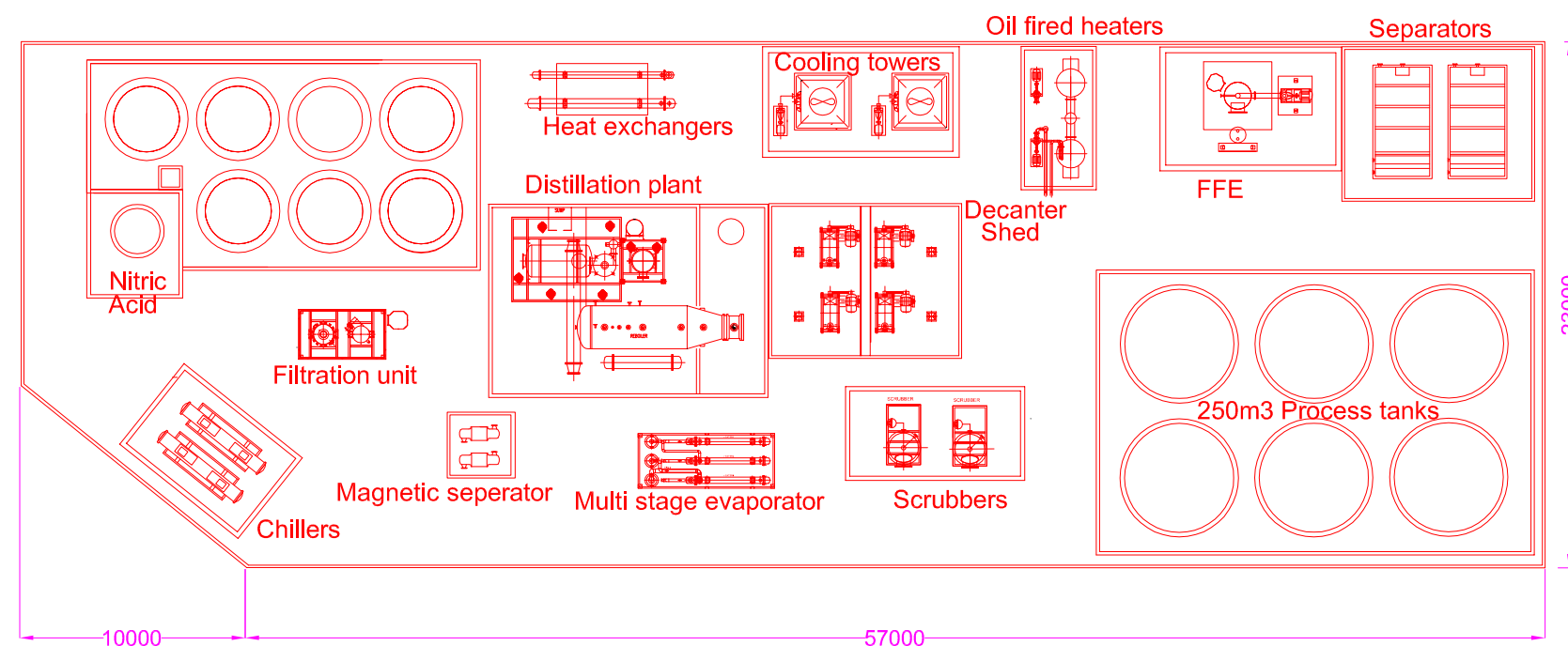
Drawing Number: 4189

SHEET 5

Revision: 00



FOR ACTUAL LOCATION OF TANKS & PLANT, REFER TO SITE LAYOUT



FFS REFINERS (Pty) Ltd 104 Umhlaluzana Road, Sea View, Durban (Tel: 031-459-5300)		
Project: EVANDER TAR PLANT		
Description: SUBMISSION SITE PLAN WAXY OIL FACILITY DETAILED EQUIPMENT		
Date: 08/04/10	By: GW	Scale: NTS
Drawing Number: 4189	SHEET 6	Revision: 00

This drawing is the property of FFS Refiners (Pty) Ltd and may not be copied, reproduced or passed on to any third party without the written permission of FFS Refiners (Pty) Ltd

Revisions:

Appendix 3: Environmental Management Programme

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

FOR THE CONSTRUCTION & OPERATION OF A 2 500m² PROCESSING FACILITY TO REMOVE CONTAMINANTS FROM WAXY OIL AT FFS REFINERS EVANDER SITE



Location for the proposed new processing facility with the existing FFS plant, Evander.

September 2013
(EIA no. 17/2/3/8 GS - 05)

KERRY SEPPINGS
ENVIRONMENTAL



MANAGEMENT
SPECIALISTS

www.ksems.co.za

Kerry Seppings Environmental Management Specialists cc

Phone: 031 769 1578 Fax: 086 535 5281 Cell: 082 823 1844 E- Mail: kerry.seppings@telkomsa.net

P.O. Box 396; Gillett's; 3603

Company Registration no: 1999/049452/23

Members: K.A. Stanton (Director)

AUTHORS

This Report was prepared by *Kerry Seppings Environmental Management Specialists cc*

Kerry Seppings BSc (Hons) MSc EAPSA certified (Pr Natural Scientist)

Lead Environmental Consultant and Director

Certifications:	Certified by the Environmental Assessment Practitioners of South Africa (EAPSA)
Tertiary Education:	University of Natal, Durban BSc (Hons) - Estuarine Ecology (Major), Urban Biogeography (Ecology) (Major) <i>MSc awarded cum laude</i> Environmental Management and Open Space Planning Thesis “ <i>Developing an Open Space System for the Queensburgh Municipal Area</i> ”
Work Experience:	1993-1994 Queensburgh Municipality - Unofficial Environmental Advisor for duration of MSc 1994-1995 IDEAS- Partner in Environmental Consultancy 1995-1998 Environment Branch, North and South Central Local Council- Professional Environmental Officer 1999- present; Director Kerry Seppings Environmental Management Specialists cc.

Stephanie Williams BSc (Hons) MPhil Marine and Environmental Law

Lead Environmental Scientist

Tertiary Education:	University of Cape Town, Cape Town BSc (Hons) - Botany (Major), Zoology and Ecology. MPhil Marine and Environmental Law
Work Experience:	2012 Environmental Control Officer on the Transnet multi-purpose pipeline. 2012 - 2013 Environmental Consultant for Kerry Seppings Environmental Management Specialists cc 2013 – present; Lead Environmental Scientist for Kerry Seppings Environmental Management Specialists cc

Detailed Curriculum Vitae's and proof of certifications and degrees are available on request.

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Acronyms

AQIA	Air Quality Impact Assessment
AQMP	Air Quality Management Programme
DEDET	Department of Economic Development Environment and Tourism
DWA	Department of Water Affairs
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMPr	Environmental Management Programme
FFS	FFS Refiners (Pty) Ltd
HFO	Heavy Fuel Oil
I & AP	Interested and Affected Party
IEM	Integrated Environmental Management
KSEMS	Kerry Seppings Environmental Management Specialists cc
LDAR	Leak Detection and Repair Programme
NAAQS	National Ambient Air Quality Standards
MSDS	Material Safety Data Sheet
NEMA	National Environmental Management Act 107 of 1998, as amended
NO ₂	Nitrogen Dioxide
NWA	National Water Act
PCA	Post Construction Audit
PM ₁₀	Particulate Matter
PPE	Personal Protection Equipment
SAHRA	South African Heritage Resources Agency
SANS	South African National Standards
SO ₂	Sulphur Dioxide
SHE	Safety, Health and Environment

1.0 INTRODUCTION

1.1 BACKGROUND

FFS Refiners (Pty) Ltd (hereafter referred to as FFS) propose to construct an additional processing facility at their existing plant on 3 Brunel Road, Evander. The Evander plant currently processes coal tar derived fuels into industrial heating fuels for a wide variety of applications. The site also produces creosote for wooden pole treatment. The new proposed waxy oil processing plant will occupy a total floor area of 2 500m² within the boundaries of the existing plant (Figure 1). The facility will process a heavy distillate residue termed “waxy oil” which will be received by FFS in road tankers from SASOL Synfuels located in Secunda, Mpumalanga.

Kerry Seppings Environmental Management Specialists cc (KSEMS) were appointed by FFS to conduct the Environmental Impact Assessment (EIA) for the construction and operation of the proposed waxy oil processing facility. The following listed activities were triggered in terms of the National Environmental Management Act 107 of 1998 as amended (NEMA), Government Notice No. 545 of 18th June 2010:

- (3) The construction of facilities or infrastructure for the storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic meters,*
- (4): The construction of facilities or infrastructure for the refining, extraction or processing of gas, oil or petroleum products with an installed capacity of 50m³ or more, excluding facilities for the refining, extraction or processing of gas from landfills,*
- (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.*

1.2 OBJECTIVES OF THE EMPr

The objective of the Environmental Management Programme (EMPr) is to provide measures to mitigate and manage pre-construction, construction, operation and decommissioning activities in order to minimize potential negative impacts on the surrounding environment. This is achieved by;

- Assigning environmental impact mitigation responsibilities to key personnel;
- Developing specific action plans designed to ensure mitigation;
- Managing and auditing the specified action plans; and
- Managing stakeholder involvement.

Integrated Environmental Management Principles (IEM) have been used as a foundation for the development of this EMPr and must be strictly applied during its implementation.

The EMPr serves as a standalone document to be disseminated to and used by the contractor/s and other stakeholders involved in the construction phase of the proposed development. It typically forms the basis for monitoring compliance with the Environmental Authorisation (EA) during the construction and operational phase.

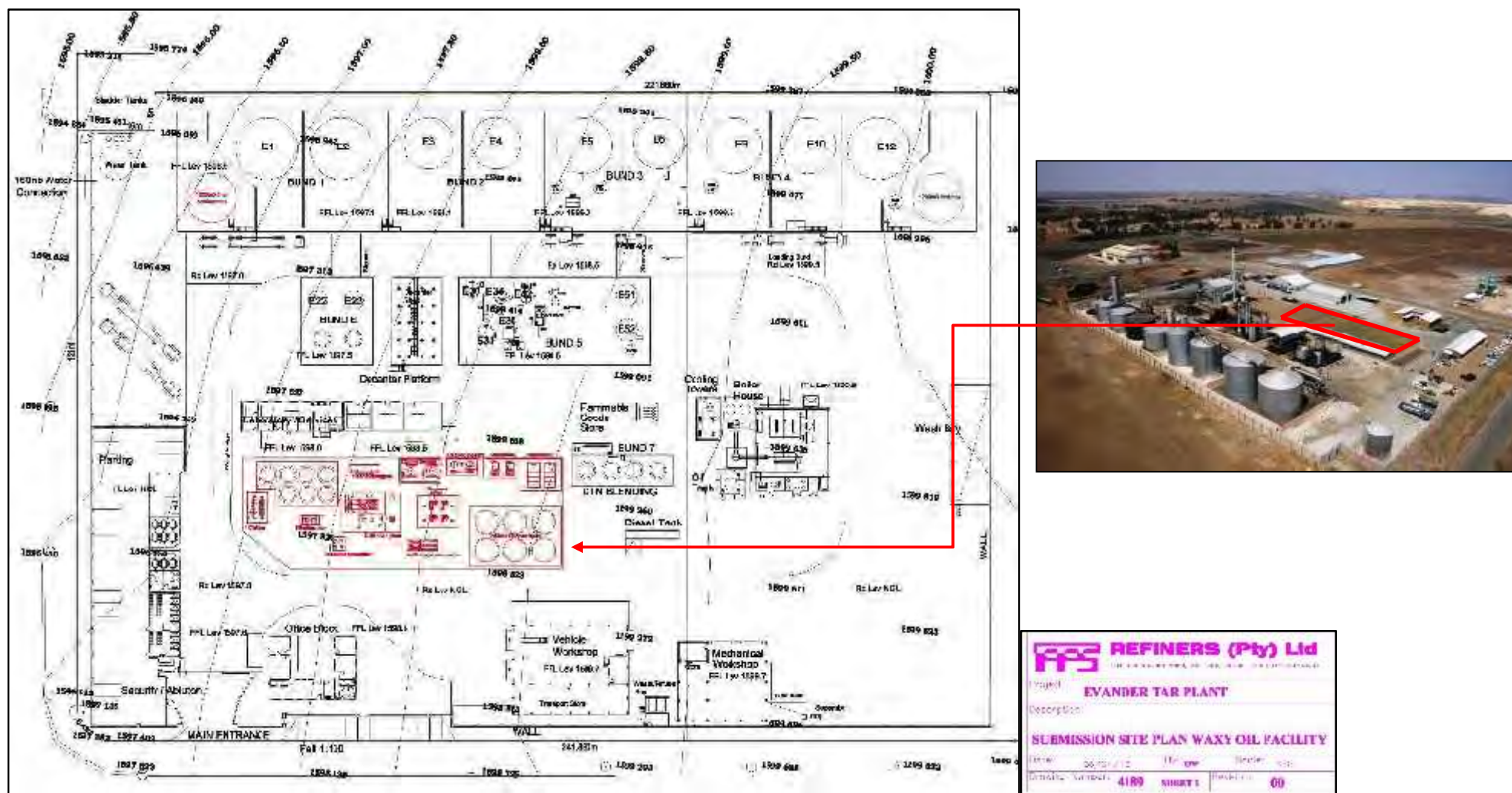


Figure 1: Existing site layout including the location of the proposed waxy oil plant in red and the additional final product and feed tanks.

1.3 ASSIGNED RESPONSIBILITY

In order for the EMPr to be effectively implemented the following inputs will be required;

Applicant – FFS is responsible for the following:

- Ensuring that the engineer and contractors comply with the approved EMPr.
- Ensuring compliance with the provisions for duty of care and remediation of damage in accordance with section 28 of NEMA and its obligations regarding the control of emergency incidents in terms of Section 30 of NEMA.
- Notifying the Department of Economic Development Environment and Tourism (DEDET) of any incident as defined in subsection 30(1) (a) of NEMA.

Project Manager – Engineer is responsible for the following:

- Appointing the appropriately qualified contractor to co-ordinate, supervise and expedite different action plans.
- Ensuring adherence to the DEDET conditions of authorisation and any other laws and standards relevant to the construction of the facility.
- Ensuring all elements of the work undertaken are properly and competently directed, guided and executed at appointed stages of the project.
- Ensuring the adherence to statutory safety, health and environment (SHE) standards and ensuring the construction activities comply with the EMPr.
- Monitoring the site on a daily basis to ensure compliance.
- Overall responsibility and accountability for the site during the construction phase.
- Avoiding and/or mitigating adverse impacts on the environment by the appropriate design and construction.
- Ensuring transparency in their operation and environmental management of the site.
- Managing the contractors compliance and ensure documentation management.
- Ensuring that the contractor has a copy of the EMPr and all agreed Method Statements.

Contractors are responsible for the following:

- Managing and operating their activities with due care and diligence.
- Complying with all elements of the EMPr.
- Ensuring that stakeholder interest is reported to the Environmental Control Officer (ECO).
- Maintaining relevant documentation for review by the ECO.

ECO is responsible for the following:

- Determining the conformance of the site with the EMPr criteria and compliance with the conditions of the EMPr.
- Identification of possible areas of improvement during construction.
- Undertaking ongoing monitoring of the construction site through regular site visits and recording key findings. This includes photographic monitoring of the construction site.
- Advising the Project Manager and the contractors on environmental matters during the construction phase of the development.
- Monitoring implementation of the EMPr by the contractor.
- Advising the project manager on actions or issues impacting on the environment and provide appropriate recommendations to address and rectify these matters.

- Monitor compliance with the EA.

Names and telephone number of contact persons

The following list of contacts must be completed and printed to be made clearly visible on the site.

Name	Designation	Organisation	Contact number
Alison Haycock	Applicant	FFS Refiners (Pty) Ltd	031 459 5300
	Environmental Control Officer		
Kerry Stanton	Independent Environmental Practitioner	Kerry Seppings Environmental Specialists cc	031 769 1578
Stephanie Williams	Independent Environmental Consultant	Kerry Seppings Environmental Specialists cc	031 769 1578/ 079 520 1583
Sturgeon Marebane	DEDET Official	Department of Economic Development Environment and Tourism	017 819 1155
	Site Engineer		
	(other relevant construction staff)		
Ignatius Mathebula	Council Official Responsible for Project	Govan Mbeki Municipality	017 620 6200
	Evander Fire Department		017 620-6308
R.J. Lekoane (Joyce)	DWA Official	DWA	012 392 1381
	Police	Evander Police Station	017 632-2322
	Emergency Spill Response	Wasteman Specialised Industrial Cleaning (Secunda)	017 632 4837/ 017 632 4838 ldebeer@wasteman.co.za
	Solid Waste		
Britz Reinders	Hazardous Waste	Hofontein H:H Landfill site	013 661 9000
	Water / electricity/ sewerage		080 060-0002 / After Hours - Emergency: 017 620-6038

1.4 COMPLIANCE

A copy of the EMPr must be available on site at all times. Compliance with all elements of the EMPr must be reviewed on a daily basis by the site engineer and all responsible parties must sign the acceptance letter in Appendix 1. In addition it must be noted that section 28 of NEMA places a duty of care on “every person who has caused or may cause significant pollution or degradation to the environment” in that the offending parties will be held financially accountable for any pollution or environmental damage. An independent ECO must be appointed to monitor compliance with the EMPr. Once site camp inception and construction commences it is recommended that the ECO visit the site on a monthly basis or at relevant intervals depending on progress made with construction of the plant.

1.5 MONITORING

The key to a successful EMPr is appropriate monitoring and review to ensure effective functioning of the EMPr and to identify and implement corrective measures in a timely manner. Monitoring for non-compliance must be done on a daily basis (using appendices 2-10) by the contractors under the guidance of the project manager / engineer. As described above, monthly audit reports should be compiled by the ECO throughout construction. A post-construction audit is to be carried out once construction is complete, before the operation of the waxy oil plant commences. Paramount to the reporting of non-conformance and incidents is that appropriate corrective and preventative action plans are developed and adhered to. Photographic records of all incidents and non-conformances must be retained.

1.6 APPLICABLE LEGISLATION

The following environmental legislation must be adhered to;

- Constitution of South Africa Act No. 108 of 1996
- National Environmental Management Act No 107 of 1998 as amended
- Environment Conservation Act No 73 of 1989
- National Water Act No 36 of 1998
- National Water Resources Strategy 2004
- Hazardous Substances Act No 15 of 1973
- Hazardous Chemical Substance regulations 1995
- Environmental Regulations for Workplaces 1987
- General Administrative Regulations 2003
- Construction Regulations 2003
- National Standards (SANS10103:2003)
- Occupational Health & Safety Act 1993
- National Environmental Management: Waste Act No 59 of 2008
- Occupational Health and Safety Act No 85 of 1993
- National Environmental Management: Air Quality Act No 39 of 2004
- Noise induced Hearing Loss Regulations, 2003

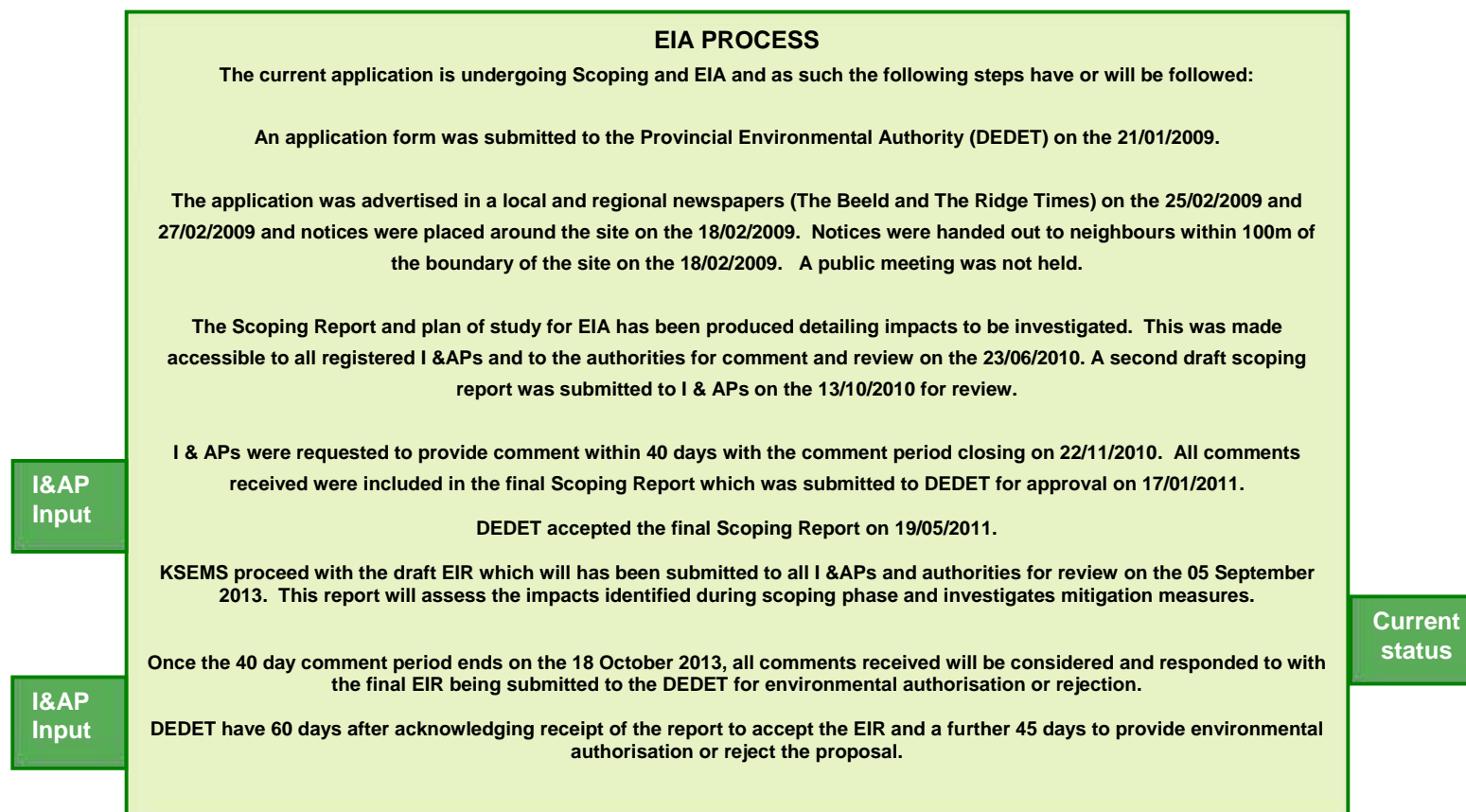
1.7 SUMMARY OF THE ENVIRONMENTAL PROCESS FOLLOWED

The EIA process is a planning tool that assists with the assessment of social and environmental impacts through independent specialist input and public participation. The role of the Environmental Assessment Practitioner (EAP) is to provide independent specialist input, manage the public participation and consolidate all relevant information culminating in the Environmental Impact Report (EIR) and EMPr [Regulation 32 (2) (o)].

The purpose of the EIR is to assess environmental impact and illustrate significance according to the extent, intensity and duration, taking into account specialist input and interested and affected parties (I&APs) comment. All of this is done with the intent of making recommendations to reduce or avoid the negative impacts that may result from the proposed activity. Ultimately a statement on whether or not the project should go ahead was made. The EMPr is a document where the findings of the EIR have been translated into measurable actions that must occur

during construction and operation in order to mitigate identified environmental impacts. The EMP is intended as a standalone, public document that becomes legally binding should the EIA be approved.

The full EIA process that was followed to date is outlined below:



1.8 LAYOUT OF THE EMP

This EMP is site and impact specific. Sections 1 and 2 are introductory sections whilst section 3 forms the bulk of the report. Section 3 has been designed so that each element is investigated for the different phases of development i.e.: site inception, construction, post construction, operation and decommissioning. Where possible a photographic illustration has been included to assist with implementation of the EMP. The layout of this EMP allows for the users to quickly and efficiently locate and use relevant sections. For example if a spill occurs, the Contractor can immediately refer to Section E which outlines the procedure in the event of a spill/incident.

2.0 PROPOSAL

The new waxy oil processing facility will consist of six new processing/intermediate 250m³ tanks and seven 60m³ tanks for static plant with a total capacity of 1920m³. FFS will also be utilizing their existing raw material/initial storage tanks (2 x 1 200m³), which were erected under the original EA (ref no: 17.2.25.16H45). The total combined capacity for the full waxy oil process will therefore be 4320m³. Other equipment that will be installed includes:

- 4 Centrifugal Separators
- Static Separators
- Distillation Plant
- Filtration Plant
- Various Heat Exchangers
- Magnetic Separation Plant
- 2 Chillers
- 2 Cooling Towers
- 2 Scrubbers
- 2 Oil Fired Heaters.

The waxy oil will be received by road tanker at the proposed new facility and will be further processed to produce a Heavy Fuel Oil (HFO) which is suitable for use as an industrial heating fuel for sale to the industrial heating fuel market. A full break down of the production process is outline in section 3.0 of the EIR but briefly, the facility is used to filter iron catalyst fines and carbon particulates from the waxy oil to produce a low sulphur oil.

2.1 SITE DESCRIPTION

The proposed new facility will be constructed within the existing FFS Evander Plant (Figure 1). There is no significant vegetation or fauna on the site.

Directions to the site: From Evander town head west on Elias Motswaledi Street towards Stellenbosch Road. Turn left onto the R546. After 1.4km turn right onto York Road and keep right to stay on York Road. Take the 1st left onto Brunel Road and the FFS Evander site will be on the right.

Co-ordinates for the center of the site: 26 29'10.82"S 29 05'50.07"E.

Gradient: The topography of the proposed site is relatively level with a slight westerly slope (gradient decreases by 5m across the site from east to west).

Surrounding Land use: The proposed site is located within an existing industrial area surrounded by light to medium industries. Other factories and facilities in the immediate area include Joran's Tanker cleaning services to the north-east and a concrete and sand supply yard to the south. Land to the north and west of the site are vacant. The main road from Evander to Standerton (R546) is approximately 250m east of the FFS Evander plant. The Evander Golf Course is a further 100m east of the R546 and the residential area of Evander is located approximately 750m to the north-east of the proposed site (Figure 4). There is a small stream to the north of the site however it is approximately 300m away and it is therefore unlikely to be impacted on in any way by the construction and operation of the proposed facility.

Existing Infrastructure and Services: The existing FFS site in Evander was designed and built with an expansion of this nature in mind and thus allowance has already been made for all utility requirements. The proposed waxy oil facility will connect to the existing stormwater system on site. Water for the proposed waxy oil facility and for fire control, water will be obtained from the municipal system. Wastewater from routine maintenance and washing of the tank farm area will drain into a sump and be sent to the effluent treatment plant at FFS. Domestic sewage will be directed to the municipal sewerage system. Any other waste water produced from waxy oil processing facility will be transferred to the existing effluent plant for treatment before release to the municipal system. The existing facility is supplied with electricity.

2.2 SUMMARY OF IMPACTS

The following specialist studies were carried out:

- Preliminary Major Hazardous Installation Risk Assessment for FFS Refiners – Evander New Waxy Oil Facility (ISHECON, July 2010)
- FFS Evander Storage Tanks Geotechnical Report (WSP Environmental, February 2009)
- Air Quality Impact Assessment – Proposed Waxy Oil Plant (WSP Environmental, May 2013)

All specialist studies have been fully summarized in sections 3 and 4 of the EIR and identified impacts included in the impacts table below. Recommendations prescribed by the variety of specialists have been incorporated into the main body of the EMPr in section 3. From the assessment of impacts identified, the majority of mitigation measures involve preventative action in the form of quality assurance and protective features for the equipment and employees working at the proposed facility. After reviewing the table of impacts there are three key impact areas which are discussed in more detail below:

Waste Management

Due to the hazardous nature of the materials involved with the process on the site, it is of importance that the materials are stored, transported and disposed of appropriately to avoid any soil and/or groundwater contamination. This is also necessary from a health and safety perspective. Material Safety Data Sheets (MSDS) are required to be available on the site and storage recommendations adhered to (relevant MSDS included in Appendix 5 of the EIR). Storage and disposal of oily sludge is of particular importance and should not be stored on site for extended periods of time due to its hazardous nature and the odours that will be released over time. An appropriately licensed landfill site is to be used for disposal of hazardous waste. Section 3G and 3E in the EMPr specifically deals with waste management and hazardous materials storage.

Taking into consideration the relevant MSDS' and EMPr conditions, it is unlikely that the hazardous materials will significantly impact on the surrounding environment. Precautionary measures have also been included in the design of the proposed facility (i.e. sufficiently bunded tank storage area and curbed loading areas directing spills into a sump).

Air Quality

While it is noted that all predicted concentrations of PM10, SO₂, NO₂ and benzene fall well within the respective NAAQS, bi-annual stack monitoring, leak detection and ambient air monitoring is to continue and must include monitoring of the new processing plant (see environmental condition recommendations in section 10.0 of the EIR).

Once issued, any conditions prescribed in the Air Emissions License for the site are to be adhered to. The impact of the proposed waxy oil plant on ambient air quality and local environmental health should therefore be negligible (section 9.0 of the AQIA, May 2013).

MHI Risk

Please note that while the EIR includes potential safety impacts associated with the proposed processing facility, the EAP is not qualified to fully prescribe specific recommendations and draw conclusions regarding safety on site.

The risk specialist has indicated that the offsite risks are very low and only the onsite risks will increase. It will therefore be important for FFS Refiners to educate and train the relevant employees on the dangers, precautions and emergency responses for various incidents. FFS have stated that training on the use and storage of hazardous substances is included in the site environmental management system requirements. This training is to include the four new hazardous materials (Waxy oil, Heavy Fuel Oil, Nitric Acid and Thermal oils). New employees working at the proposed processing facility are to be inducted before commencing work. Induction training is to include the correct storage, handling and transportation of the hazardous materials ensuring that there is no soil or groundwater contamination. Training has been outlined in section 3H of the attached EMPr.

The FFS Environmental Management Procedures (specifically the Emergency Procedures) are to be revised to include the new processing plant. Preventive and protective measures outlined on page 21 of the ISHECON MHI report will sufficiently reduce the risks of an explosion/fire from occurring on the site with the most likely failure events occurring once in 500 years and major catastrophic events occurring less than once in 500 000 years.

2.3 IMPACTS TABLE

Compliance against the EMPr must be audited on a monthly basis or at relevant intervals depending on progress made with construction of the plant by an independent ECO. The person identified in the table below for monitoring the specific impacts, must ensure this is done on a regular basis. An EMPr checklist (Appendix 3) and an EMPr audit form (Appendix 4) must be utilised on site to monitor compliance. A complaints register (Appendix 4) and a non-conformance record (Appendix 5) must be utilised to record any complaints and non-conformances which will assist in monitoring compliance.

Time Frames

Phase 1 – Site camp establishment (i.e. erection of temporary waste disposal facilities, training programme for construction workers, creation of temporary stormwater facilities etc.)

Phase 2 – Construction activities

Phase 3 – Post Construction (i.e. removal of waste disposal facilities, removal of site camp, etc.)

Phase 4 – Rehabilitation (removal of alien vegetation around site etc.)

Phase 5 – Operational phase

CONSTRUCTION PHASE			
Nature of impact (potential)	Mitigation measure	Timeframe for mitigation measure to be undertaken	Person responsible for monitoring
Erosion of stockpiled material (stone, sand and gravel) on the FFS site during construction activity.	Material must be stock piled in such a way that it cannot fall or cause injury or damage to properties or the natural environment. Stockpiles must not exceed 2m in height and must be covered if exposed to heavy wind or rain. Alternatively, low walls or berms must be constructed around the stockpiles.	Phase 1 - 2	Contractor ECO
Risk of contamination to soil and stormwater during concrete mixing.	Cement mixing will need to take place on a hard surface or cement mixing trays will need to be used. Cement mixing will not be permitted to occur where run off can enter stormwater drains. Construction will be monitored by an ECO who will ensure compliance with the construction EMP.	Phase 1 - 2	Contractor ECO
Risk of spills from construction equipment (oil, fuels, etc) contaminating soil and stormwater.	Any construction equipment that could leak oil must be placed on a drip tray or hard surfaced area. Construction vehicles must have a drip tray and any oil leaks must be attended to over a drip tray. All equipment must be in good working order to reduce the likelihood of oil leaks occurring. Any re-fuelling of equipment must occur on a hardened surface, within a designated re-fuelling area where any spills can be contained. Construction will be monitored by an ECO who will ensure compliance with the construction EMP.	Phase 1 - 2	Contractor ECO
Risk of spills and leakage during storage of construction hazardous materials (cement, oils, paints etc.) contaminating soil.	Implementation of measures as stipulated in the EMP can prevent the impact from occurring. FFS Procedure 3 (spills) to be complied with. Hazardous materials used during construction should be stored in the existing store with all Material Safety Data Sheets (MSDS) at hand. Spill kits must be readily available.	Phase 1 - 2	Contractor ECO
Potential for improper storage and disposal of waste materials generated during construction resulting in leachate contaminating the soil.	Waste must be stored in the bins within the waste management area and must not be allowed to blow around the site or be placed in piles adjacent to the skips/bins/ Separate waste bins for each waste stream generated must be provided by the contractor. The waste containers must be appropriate to the waste type contained therein and where necessary should be lined and covered. Waste must not be allowed to accumulate on site but should be disposed of	Phase 1 - 2	Contractor ECO

CONSTRUCTION PHASE			
Nature of impact (potential)	Mitigation measure	Timeframe for mitigation measure to be undertaken	Person responsible for monitoring
	<p>regularly by a reputable contractor. Hazardous waste such as oils, contaminated rags etc. must be disposed of at a hazardous class landfill.</p> <p>It is not expected that there will be any generation of scrap metal as the metal sheets for the tank are brought to the site ready rolled and measured to size. Any rubble must not be buried on site.</p>		
Noise generated by construction workers, machinery and construction vehicles disturbing surrounding businesses.	<p>Construction will be during normal factory working hours and on weekends if required. The existing tank farm is however located in an industrial area so it is unlikely that the proposed new tank will create a noise nuisance for neighbours.</p> <p>Excessive noise must be controlled on site. All construction workers must be aware of the proximity of the neighbouring industries and all precautions must be taken to ensure that noise generation is kept to a minimum. If excessive noise is expected during certain stages of the construction, all neighbours must be notified of the events timeously.</p>	Phase 1 - 2	Contractor ECO
Sourcing of raw materials i.e. gravel, stone, sand, cement and water from unsustainable sources resulting in illegal sand winning and mining operations causing significant environmental damage.	All materials must be obtained from a registered and sustainable source and all delivery notes and slips must be made available to the ECO e.g. mined material such as stone must only be obtained from permitted quarries. Municipal water must be used for dust suppression on site if necessary.	Phase 1 - 2	Contractor Designated Representative (i.e. Resident Engineer) ECO
Littering on and around the site and windblown wastes can have an impact on the aesthetics of the surrounding area.	Littering will not be permitted on the site. Waste containers with lids must be provided on site during construction. These must be cleaned on a regular basis to prevent them overflowing. The EMPr has been designed to manage waste during construction.	Phase 1 - 2	Contractor ECO
Environmental contamination risk associated with generation, storage and disposal of various waste streams.	Separate skips/bins are to be clearly labelled as "general waste" and "hazardous waste". The skip/bin is to be contained to prevent rain ingress and preferably located on a hard surface to prevent any spills or leachate from coming into direct contact with the soil/groundwater.	Phase 1, 2 and 5	Applicant Contractor ECO

CONSTRUCTION PHASE			
Nature of impact (potential)	Mitigation measure	Timeframe for mitigation measure to be undertaken	Person responsible for monitoring
	During construction safe disposal slips for hazardous waste are to be retained on the site in the environmental file for ECO audit purposes (hazardous and general waste slips). All waste should not be stored on site for periods longer than three months.		
Emissions generated from construction vehicles.	Emissions generated from construction vehicles will be minimal and is not expected to significantly affect surrounding communities or air quality. This impact is only relevant during the construction and/or decommissioning phase.	Phase 1 - 2	Contractor Designated Representative (i.e. Resident Engineer) ECO
Increase in dust levels during construction.	There is not expected to be a large amount of dust generated during the construction of the proposed waxy oil facility however dust levels should be visually monitored on site by the contractor. Should dust levels become a problem, the ground should be dampened with municipal water. Dust control is included in the EMP and will be monitored by the ECO during the site audits.	Phase 1 - 2	Contractor ECO
Potential hydrocarbon spills/ leakages during construction and operation of the waxy oil facility polluting surface and/or groundwater.	The contractor and construction staff must be made aware of the potential groundwater and stormwater impacts. During construction, cement mixing must only occur on a hard surface. Any equipment that could leak oil must be placed on a drip tray. ISHECON has stated that the tanks are to be designed to comply with SANS 10089. All bulk storage tanks and all processing areas are fully bunded to contain 110% of the largest tank. There is to be a curbed nitric acid offloading area and an onsite emergency plan (MHI Risk Assessment, July 2010).	Phase 2 and 5	Applicant Contractor Designated Representative (i.e. Resident Engineer) ECO
Increase in traffic disruptions on surrounding access roads during the construction period.	There is only expected to be a negligible increase in traffic on the surrounding road networks however flagmen must be provided where necessary if it is anticipated that construction vehicles or machinery may affect traffic along the access roads.	Phase 2	Contractor ECO
Potential unearthing of artifacts of cultural or heritage significance	It is not anticipated that there will be any artefacts of heritage / cultural significance as this is an existing industrial site. Should any graves or artefacts be identified, construction must immediately stop and SAHRA must be notified.	Phase 2	Contractor ECO

OPERATIONAL PHASE			
Nature of impact (potential)	Mitigation measure	Time frame for mitigation measure to be undertaken	Person Responsible
Potential increase in noise generation on site (electrical pumps in the processing facility).	The proposed pumps for the tanks are unlikely to generate excessive levels of noise. The Noise is not expected to exceed 85dBA. If excessive noise is expected during certain stages of the construction, all neighbours must be notified of the events timeously however the existing tank farm is located in an industrial area so it is unlikely that the proposed new tank will create a noise nuisance for neighbours.	Phase 5	Applicant Designated Representative (i.e. Resident Engineer) EO
Environmental contamination risk associated with generation, storage and disposal of various waste streams.	Separate skips/bins are to be clearly labelled as “general waste” and “hazardous waste”. The skip/bin is to be contained to prevent rain ingress and preferably located on a hard surface to prevent any spills or leachate from coming into direct contact with the soil/groundwater. During construction safe disposal slips are to be retained on the site in the environmental file for ECO audit purposes (hazardous and general waste slips). All waste should not be stored on site for periods longer than three months.	Phase 1 - 5	Applicant Contractor EO
Skips containing oily sludge not collected regularly resulting in large amounts of hazardous sludge accumulating on site.	As above, hazardous waste should not be stored on site for longer than three months. The applicant is therefore to ensure that a regular waste collection schedule is agreed on with the relevant waste collection service being used. The schedule is to be tightly followed to ensure that the skips are regularly collected from the site and disposed of accordingly.	Phase 5	Applicant Contractor EO
Potential release of odours from the processing facility (i.e. when the decanters are de-sludged).	Ambient air monitoring to be undertaken six monthly. Scrubber/s will be placed on relevant component/s in the deashing process to reduce emissions. De-sludging should be carried out regularly to prevent the build-up of large amounts of sludge which is likely to result in odours.	Phase 5	Contractor EO
Release of VOCs and fugitive emissions during filling/ loading/ offloading operations impacting on ambient air quality (AQIA, May 2013).	Trucks offloading or receiving product should not be permitted to idle unnecessarily on the site for long periods of time. Fugitive dust emissions from vehicular traffic can also be reduced by sealing or paving roadways.	Phase 2 and 5	Applicant Contractor EO
Emissions from coal fired boiler releasing emissions into the atmosphere (AQIA, May 2013).	The air quality specialist recommends that frequent (bi-annual) stack monitoring be undertaken at the proposed heater and vapour scrubber stack at the waxy oil plant to test their efficiency. Ambient air monitoring is to be undertaken on a 6 monthly basis which is part of the AQMP. The oil fired boiler cannot support the entire steam needed for the operation of the plant.	Phase 5	Applicant Contractor EO

OPERATIONAL PHASE			
Nature of impact (potential)	Mitigation measure	Time frame for mitigation measure to be undertaken	Person Responsible
Release of VOCs and fugitive emissions during filling/ loading/ offloading operations impacting on ambient air quality (AQIA, May 2013).	Trucks offloading or receiving product should not be permitted to idle unnecessarily on the site for long periods of time. Fugitive dust emissions from vehicular traffic can also be reduced by sealing or paving roadways.	Phase 5	Applicant EO
Nominal displacement of vapour space into the atmosphere during delivery of raw product (AQIA, May 2013).	This usually results in a working loss of vapours from tanks that are vented to the atmosphere. The specialist has confirmed that the Evander plant has installed a tank vapour balancing system that greatly reduces the potential for vapour emissions.	Phase 5	Applicant Contractor EO
An increase in benzene concentrations on site (AQIA, May 2013).	The air quality specialist has stated that the benzene concentrations from the additional waxy oil plant ambient concentrations fall well within the respective NAAQS. The AQMP must however include frequent inspection and repair of processing units to reduce hydrocarbons from venting into the atmosphere. There is also to be continuous inspection of tanks rims and seals. As above, ambient air monitoring is to be undertaken on a 6 monthly basis which is part of the AQMP.	Phase 5	Applicant EO
Incorrect disposal of contaminated rainwater or spills from the bunded areas.	FFS Refiners have an existing effluent treatment plant on the site which will be used to treat rainwater and any contaminated water from spills in the bunded areas. Alternatively, contaminated rainwater from the bunded areas is to be disposed of as hazardous waste at a registered landfill site. Safe disposal slips should be retained on site for auditing purposes.	Phase 5	Applicant Contractor EO
Incorrect storage and disposal of iron oxides and contaminants that are removed from the waxy oil.	The applicant has stated that the iron oxides and other contaminants are to be stored on site in waste skips until they are disposed of at a licensed landfill site. Skips containing contaminants should be covered to prevent rain ingress, labeled clearly and should not be kept on site for longer than three months.	Phase 5	Applicant Contractor EO
The use of the product, Heavy Furnace Oil, in industrial heating market.	Although liquid fuels have various advantages over using electricity or solid fuels, there are sulphur dioxide and nitrous oxides produced during combustion. When sulphur dioxide combines with moisture, this produces sulphuric acid (impact on health and the environment). There is no mitigation measure for this impact as it is an offsite impact that the applicant cannot be held fully responsible for.	Phase 5	Applicant

OPERATIONAL PHASE			
Nature of impact (potential)	Mitigation measure	Time frame for mitigation measure to be undertaken	Person Responsible
Incorrect storage of Heavy Fuel Oil resulting in soil or groundwater contamination.	Tanks storing the HFO must be sealed to prevent rain ingress and be within a bunded area to contain 110% of the largest tank. ISHECON have also stated that the tanks are to be designed to comply with SANS 10089.	Phase 5	Applicant Contractor EO
Potential hydrocarbon spills/leakages during construction and operation of the waxy oil facility polluting surface and/or groundwater.	<p>The contractor and construction staff must be made aware of the potential groundwater and stormwater impacts. During construction, cement mixing must only occur on a hard surface. Any equipment that could leak oil must be placed on a drip tray.</p> <p>ISHECON has stated that the tanks are to be designed to comply with SANS 10089. All bulk storage tanks and all processing areas are fully bunded to contain 110% of the largest tank. There is to be a curbed nitric acid offloading area and an onsite emergency plan (MHI Risk Assessment, July 2010).</p>	Phase 1, 2 and 5	Contractor EO
Possible spill of raw product when waxy oil is transferred from the road tankers to the storage tanks and visa versa during offloading. This could contaminate soil/water as well as increasing the risk of fire/explosion events.	Offloading of the waxy oil and loading of the product onto road tankers should not be carried out where there is the potential for a spill/leak to come into direct contact with the soil (i.e. in a bunded area or soil protected by a drip tray). The loading hoses are to be tested and inspected regularly for leaks. The AQMP is to include improvements in response time to spilled product within bunded areas.	Phase 5	Applicant Contractor EO
Risk of spills/leakages from other hazardous materials used in the production process (oils, sludge, waste water etc) polluting the surrounding environment.	<p>An organisational measures checklist has been provided by ISHECON in Appendix E of the MHI Risk Assessment (July 2010, Appendix 4 of EIR). These measures aim to reduce the potential major risks associated with the site and include various relief valve testing and inspections of the storage tanks. The recommended AQMP is to include improvements in response time to spilled product within bunded areas. Any hazardous spills that occur are required to be cleaned up appropriately and the waste disposed of at a registered landfill site. FFS adheres to a strict spillage procedure which is improved and upgraded on an on-going basis. FFS has stated that the entire process will be located within a bunded and hard-surfaced area which will be roofed to prevent rain ingress and capture all spills. Sumps will recover any spilt product which will be pumped back to the raw material tank.</p> <p>Various tank features that have been included into the design for pollution control are:</p>	Phase 5	Applicant Contractor EO

OPERATIONAL PHASE			
Nature of impact (potential)	Mitigation measure	Time frame for mitigation measure to be undertaken	Person Responsible
	<ul style="list-style-type: none"> - the bentonite sealing layer laid below the level of the leak detection pipes. - the series of leak detection pipes cast into the ring beam 100mm below the top level of the ring beam which is above ground level (allows any tank leakage to show itself by dripping out of the leak detection pipes onto the hard surfacing of the floor bund). - the capping layer of bitumen pre-mix laid with a slope from the centre to the tank shell. - the flooring from the ring beam to fall at a 1:100 slope away for 15m or to the bund wall (ensures any spillage will drain away from the tank and reduce any fire hazard). 		
Improper disposal of oily sludges (byproduct of the waxy oil process).	Oily sludges will be collected in road skips for transportation to the appropriately classified landfill site (e.g. Holfontein H ₂ H Landfill). Oily sludges should not be stored on the site for longer than three months. FFS expect approximately 30 tons per month initially, increasing to 75 tons and finally 150 tons a month once fully operational. This equates to 5, 12 and 21 skips per month respectively. A reputable, experienced company is to be used to transport the oily sludge to the landfill to ensure that there are no spillages on route.	Phase 5	Applicant Contractor EO
Failure or deterioration of equipment and/or bund integrity leading to spillage of material (MHI, July 2010).	ISHECON have stated that the best assurance against failure is correct design, specification, fabrication and construction procedure. Tanks will be designed to comply with SANS10089 and all bulk storage tanks and processing areas are to be fully banded to contain 110% of the largest tank. These design requirements should be followed by thorough inspections throughout the life of the equipment.	Phase 5	Applicant
Incorrect storage of sludge resulting in oily sludge coming into direct contact with the ground.	The byproduct is to be stored in a designated waste management area which is to be located on an impermeable surface and banded to prevent any potential seepage from coming into direct contact with the ground. The proposed waste management area will be located adjacent to Tank 12 (see Appendix 4 for layout).	Phase 5	Applicant Contractor EO
Spills during road transport of the waxy oil and final product to and from FFS.	A reputable, experienced company is to be used to transport the raw and final products to and from the site to ensure that there are no spillages on route. Existing FFS Evander procedures to handle the loading/ offloading of raw materials and products (Procedures 1 and 2E), handling, storage and use of hazardous substances (Procedure 20E) and waste management (Procedure 18E) must all be revised to include the new processing facility.	Phase 5	Contractor
Potential contamination of the "spruit" (stream) if a catastrophic spill occurs and	Unlikely as the stream is located over 250m away from the proposed location of the new waxy oil processing facility. All bulk storage tanks and processing areas will however be banded to contain 110% of the largest storage tank. Fire water management requires particular attention in the updated FFS on-site emergency plans dealing with major fire emergencies.	Phase 5	Applicant EO

OPERATIONAL PHASE			
Nature of impact (potential)	Mitigation measure	Time frame for mitigation measure to be undertaken	Person Responsible
there is a massive firefighting operation).			
Potential leak/rupture in waxy oil loading/off-loading hose and/or pipe transferring the waxy oil to new 1 200m ³ feed tank resulting in spillage of hydrocarbon (MHI, July 2010).	ISHECON have confirmed that a hose rupture will not have a major impact beyond the site boundary. Personnel loading/ off-loading the waxy oil is to be trained on the FFS procedures for handling the loading/ offloading of raw materials and products (Procedures 1 and 2E), which is to be updated to include the new process. Loading and off-loading should take place within a contained area so if a leak or spill was to occur, it would be within the bunded area.	Phase 5	Applicant Contractor EO
Potential leaks, punctures or ruptures in the pipes/ tanks used during the distillation process in the FFE and/or blending tanks resulting in a hydrocarbon spill, (MHI, July 2010).	As above, ISHECON have confirmed that tank failure into the bunded areas will not have a major impact beyond the site boundary. Tanks will be designed to comply with SANS10089 and all bulk storage tanks and processing areas are to be fully bunded to contain 110% of the largest tank. These design requirements should be followed by thorough inspections throughout the life of the equipment.	Phase 5	Applicant Designated Representative (i.e. Resident Engineer) EO
Rupture/leak of nitric acid offloading hose and/or transfer piping and/or nitric acid bulk storage tank resulting in a safety concern (MHI, July 2010).	The specialist recommends that the nitric acid offloading area be curbed. A nitric acid spill should be incorporated into the onsite emergency plan (an Emergency Procedures checklist has been included in Appendix E of the MHI Assessment as a guide to improving the onsite emergency plan for an MHI). All tanks will be designed to comply with SANS10089 and all bulk storage tanks and processing areas are to be fully bunded to contain 110% of the largest tank. Thorough inspections throughout the life of the equipment should be undertaken. ISHECON has stated that the offloading points should be fitted with different couplings to reduce the risk of a mixing incident which could result in an explosion or the generation of heat/ NO _x fumes.	Phase 5	Applicant Designated Representative (i.e. Resident Engineer) EO

OPERATIONAL PHASE			
Nature of impact (potential)	Mitigation measure	Time frame for mitigation measure to be undertaken	Person Responsible
Incorrect storage nitric acid at the site leading to an explosion/spill or the release of NO _x fumes.	<p>Being a strong oxidizing agent, nitric acid should be safely stored away from bases and organic compounds such as turpentine, cleaning detergents or metallic powders. It should also not be stored near any assembly points as nitric acid gives off toxic fumes. Excess quantities of nitric acid should not be stored on the site. The storage area should be clearly labeled with signage indicating the flammable nature of the acid.</p> <p>The Material Safety Data Sheet (MSDS) for Heavy Fuel Oil states that Heavy Fuel Oil should avoid strong oxidisers and is incompatible with nitric acid. Nitric acid should therefore not be stored directly adjacent to any Heavy Fuel Oil.</p> <p>The MSDS for nitric acid includes a list of materials that the chemical reacts with nitric acid must not be stored or exposed to these listed materials (includes wood, paper, cloth and most metals).</p>	Phase 5	Applicant Contractor EO
Effluent discharged not meeting municipal standards.	All stormwater falling within the bunded area will drain into a sump and be transferred to the existing effluent plant for treatment before release into the municipal system. There is currently a permit for discharging the treated effluent.	Phase 2 – 5	Applicant Designated Representative (i.e. Resident Engineer) EO
Potential increased pressure on municipal services (i.e. water supply and electricity).	The existing FFS site in Evander was designed and built with an expansion of this nature in mind and thus allowance has already been made for all utility requirements. There is not expected to be any changes to the volume of domestic sewage with the installation of the new waxy oil facility. It is anticipated that the existing electricity supply will be sufficient for the proposed waxy oil facility which is expected to require approximately 50 – 75 kW/month of electricity to operate.	Phase 2 – 5	Applicant EO
Leak on high pressure high temperature equipment may result in a jet fire impinging directly on near-by equipment leading to domino failures (MHI, July 2010).	Unlikely as “most of the equipment on the plant operates under vacuum conditions and therefore jet fires are highly unlikely” (MHI, July 2010). Preventative and Protective measures to be incorporated into the design of the installations to minimize Major Hazard Incidents are outlined on page 21 of the MHI report (and summarized in section 3.2.1 of the EIR). These include employee training, tank design, bunds, curbed offloading areas, emergency plans and firefighting on the site.	Phase 5	Applicant Designated Representative (i.e. Resident Engineer)

OPERATIONAL PHASE			
Nature of impact (potential)	Mitigation measure	Time frame for mitigation measure to be undertaken	Person Responsible
	<p>There is an existing fire protection system in place that will be extended to cover the new facility. The applicant is to consult with the fire department once the fire system has been extended (included in section 10 of the EIR as a recommended condition for authorisation). The on-site emergency plans are required to be reviewed to take into the new facilities and associated hazards.</p> <p>Tank inspection to be undertaken as per Procedure 45 . These inspections will aid in reducing the likelihood of a jet fire from occurring by detecting any minor leaks as soon as they occur.</p>		
Potential for job creation during the construction period.	No mitigation measure required. The new facility will provide 12 new employment opportunities.		
Potential risks posed to surrounding industries in terms of fire, explosion, etc.).	<p>The MHI Risk Assessment concluded that there will only be offsite impacts under worst case scenario such as a catastrophic failure of the new bulk oil tanks, the nitric facilities and high temperature processing equipment. The increase in offsite risk posed by the proposed waxy oil facility was therefore rated as “very low” by the specialist.</p> <p>There are a number of quality assurance measures (tank design parameters and safe operating procedures) and protective features (bunds and emergency plans) that are to be incorporated into the design of the installations to minimize the potential for major hazard incidents (full list on page 21 of the MHI Risk Assessment, July 2010).</p>	Phase 5	Applicant
Occupational health impact associated with the handling of waxy oil. The handling of the oils may cause occupational diseases through inhalation of vapours, skin contact or ingestion.	<p>This may occur during handling and maintenance of equipment. All employees who handle the proposed waxy oil and process chemicals on site will be required to wear the appropriate Personal Protective Equipment (PPE). The relevant PPE is outlined in the Material Safety Data Sheet (MSDS) for Waxy Oil.</p> <p>The MSDS for Waxy Oil must be made available on site and employees working with the waxy oil are to be educated and aware of the details of the MSDS.</p> <p>Training on the use and storage of hazardous substances is currently undertaken on an annual basis and forms part of the environmental management system requirements of the FFS site. All employees will continue to be given annual health & safety training. They will</p>	Phase 5	Applicant EO

OPERATIONAL PHASE			
Nature of impact (potential)	Mitigation measure	Time frame for mitigation measure to be undertaken	Person Responsible
	also be required to have annual medicals for early detection of occupational diseases. Current ambient air sampling is undertaken on a 6 monthly basis, this is to include the waxy oil plant.		
<p>There are a number of potential equipment or system failure events, identified by ISHECON that could result in a fire or explosion occurring on the site. The various impacts include:</p> <ul style="list-style-type: none"> - Pool fire from a vessel or pipe rupture or leak damaging bund/tank integrity, - Flash fire occurring in the high temperature processing units effecting employees on the site, - Potential for an internal explosion to occur within the large vessels on site, - Inadequate ventilation resulting in a confined explosion, - Small possibility of a ruptured high pressure high temperature vessel containing hydrocarbons could result in an unconfined explosion, - Potential for a BLEVE in the reboiler on the distillation plant effecting workers on the site, - Possible release of toxic fumes from acute exposure to 	<p>From an MHI perspective, the new processing facility does not present any major concerns over and above those currently onsite. ISHECON recommended that the site occupied building study should be conducted as part of the MHI update to evaluate the risks against international guidelines such as the "Guidance for the location and design of occupied buildings on chemical manufacturing sites".</p> <p>In the interim, the admin building and workshops within 50m of the new processing plant have:</p> <ol style="list-style-type: none"> blast resistant windows on all sides and emergency exits exiting south, west or east. <p>Assembly points to consider the "shelter-in-place indoors" policy to avoid any toxic nitric acid fumes.</p> <p>Preventative and Protective measures to be incorporated into the design of the installations to minimize Major Hazard Incidents are outlined on page 21 of the MHI report (and summarized in section 3.2.1 of the EIR). These include employee training, tank design, bunds, curbed offloading areas, emergency plans and firefighting on the site.</p> <p>There is an existing fire protection system in place that will be extended to cover the new facility. The applicant is to consult with the fire department once the fire system has been extended. The on-site emergency plans are required to be reviewed to take into the new facilities and associated hazards.</p> <p>Tanks are to be inspected as per Procedure 45. These inspections will aid in reducing the likelihood of a confined explosion from occurring by detecting any minor leaks as soon as they occur.</p> <p>The FFS site is currently operating an ISO 14001 based environmental management system with the proposed project being part of a designated environmental management plan to ensure full compliance with all legal requirements and to ensure appropriate monitoring and</p>	Phase 5	Applicant Designated Representative (i.e. Resident Engineer) EO

OPERATIONAL PHASE			
Nature of impact (potential)	Mitigation measure	Time frame for mitigation measure to be undertaken	Person Responsible
<p>nitric acid which could impact the workers on the site.</p> <ul style="list-style-type: none"> - Possible equipment failure resulting in an uncontrolled rise in pipe/vessel pressure increasing the potential for a fire/explosion - Potential puncture/rupture in the waxy oil feed tank resulting in an explosion or internal fire open roof. - Potential internal explosion in the fired heater in the distillation plant, rupture or puncture of nitric acid road tanker resulting in possible MHI event depending on quantity of nitric acid spilt. - inadequate purging during shut down and start-up operations resulting in the ingress of foreign oxidizing material. <p>A full list of all possible equipment and system failure possibilities is included in Appendix B of the MHI Report. All these potential impacts have a similar result (i.e. fire and/or explosion) and therefore the</p>	<p>assessment takes place. The applicant has stated that existing procedures to handle the loading/ offloading of raw materials and products (Procedures 1 and 2 E); handling, storage and use of hazardous substances (Procedure 20E); waste management (18E); emergency procedures (6E; 11E and 64E); sampling and analysis (32E); underground and above ground tank testing (Procedure 45); environmental reporting (58E) will all be revised to include the new project.</p>		

OPERATIONAL PHASE			
Nature of impact (potential)	Mitigation measure	Time frame for mitigation measure to be undertaken	Person Responsible
same mitigation measure applies.			
Hot work tools used during maintenance/ warming up procedures increasing the risk of a source of ignition (MHI, July 2010).	Where possible, hot work tools should be avoided during maintenance or warm up procedures. All employees working in this area must be made aware of the risk that hot tools could have as a source of ignition. After any maintenance has been carried out at the new facility, it is recommended that designated safety person inspect the facility to ensure that no hot work tools have been left behind.	Phase 5	Applicant Contractor
Potential safety issues for workers on site related to the MHI status of the proposal (MHI Risk Assessment, July 2010)	Since the onsite risk will increase with the proposed facilities, ISHECON recommends that the admin building and the workshops located within 50m of the proposed new processing plant have blast resistant windows on all sides, emergency exits from the buildings be towards the south or west or east (i.e. not only north) and assembly points be located indoors (best shelter from nitric acid toxic fumes). Workers on site are to be aware of the FFS EMS procedures, specifically emergency procedures (reference: 6E; 11E and 64E).	Phase 5	Applicant
Since the Evander site falls within the Highveld Priority Area, an identified pollution hotspot, the release of vapours and fugitive emissions from the storage tanks may contribute to the existing air quality of the surrounding area and contribute to poor regional air quality.	<p>The AQIA demonstrated that the cumulative air quality impact emanating from the site when the waxy oil plant is added to the existing facility, is expected to increase marginally however no significant concerns are expected to arise with respect to the impact of the proposed waxy oil plant on ambient air quality and local environmental health.</p> <p>The ambient concentrations of PM₁₀, SO₂, NO₂, and benzene concentrations fall well within the respective NAAQS.</p> <p>All emissions will however be minimised as follows:</p> <ul style="list-style-type: none"> - All tanks will have hermetically sealed roofs. - All tank vents will have air-cooled condensers fitted to condense and return all vapour back in to the tanks. - All tanks will have vacuum-pressure breaks fitted to reduce the amount of vapour formation in the tanks. - Tanks storing Class I products will direct all vapour through a wet scrubber to remove the hydrocarbons down to the required level. 	Phase 5	Applicant Designated Representative (i.e. Resident Engineer) EO

OPERATIONAL PHASE			
Nature of impact (potential)	Mitigation measure	Time frame for mitigation measure to be undertaken	Person Responsible
	<p>The storage tanks on the site are also to be design according to SANS 10089 to reduce the likelihood of leaks (MHI risk assessment, July 2010). The air quality specialist recommends that the AQMP include a LDAR approved by a licensing authority in line with requirements of the NEM: AQA. These measures will contribute to reducing short term peaks in the air pollution concentrations.</p> <p>Biannual ambient air monitoring on the FFS Evander site must be extended to include the proposed tank storage facility. Pollutants measured biannually from point sources and dispersed emissions are the BTEX (volatile organic compounds), the inorganic oxides of nitrogen and sulphur dioxide.</p>		
The presence of an additional processing facility within the existing operations increasing the risk profile of the site and the area, adding to the existing industrial risk of the area.	The existing FFS tar processing facility is a registered MHI. ISHECON concluded that the new processing facility does not present any major concerns above those of the current site. If preventative and protective measures, outlined on page 21 of the MHI and summarized in section 3.2.1 of the EIR, are incorporated into the design of the installations the likelihood of a Major Hazardous Incidents from occurring will be greatly minimized.	Phase 5	Applicant
Increase in hazardous material to the Holfontein H:H Landfill site or other appropriately classified landfill site.	<p>In-organic sludge (ash and metals) will be transported via road skips to an appropriately classified hazardous landfill. FFS Refiners expected approximately 30 tons per month initially, increase to 75 tons per month and finally to 150 tons per month. This will equate to 5, 12 and 21 skips per months respectively.</p> <p>FFS are required to contact the relevant landfill that will be used to ensure that there is enough capacity to handle the increase in hazardous skips over time. Proof of communication should be retained on the site for audit purposes.</p> <p>It is important to keep in mind that the proposed waxy oil facility will process a non-renewable resource which would otherwise be disposed of as hazardous waste.</p>	Phase 5	Contractor

2.4 PROCEDURES FOR ENVIRONMENTALLY RELATED EMERGENCIES AND REMEDIATION

The purpose of this section is to anticipate a potential impact resulting in an environmental crisis which may occur due to unforeseen circumstances. Such events cannot be predicted and as such a procedure has been prepared. This procedure must be followed in the event of such an incident to prevent degradation to the surrounding environment and to contribute to the safety of the workers and I & APs.

2.5 POTENTIAL ENVIRONMENTAL INCIDENTS / EMERGENCIES

NEMA defines an 'incident' as an unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed. The following hazards have the potential to occur within the proposed site:

- Hazardous chemical spillage
- Leakage of fuel or oil from equipment
- Potential contamination of a water resource

2.5.1 RESPONSE TO ENVIRONMENTAL EMERGENCIES

The emergency response plan (Appendix 6) must be used to update the onsite emergency response plans. A record of all incidents must be recorded as defined in NEMA and NWA (Appendix 7). Incidents should be reported and recorded the relevant authority as soon as reasonably practicable after knowledge of the incident.

An emergency incident report (Appendix 8) must be completed in terms of section 30(5) of the National Environmental Management Act (Act No. 107 of 1998 as amended).

"The responsible person or, where the incident occurred in the course of that person's employment, his or her employer, must, within 14 days of the incident, report to the Director General, provincial head of department and municipality such information as is available to enable an initial evaluation of the incident, including:

- (a) the nature of the incident;*
- (b) the substances involved and an estimation of the quantity released and their possible acute effect on persons and the environment and data needed to assess these effects;*
- (c) initial measures taken to minimize impacts;*
- (d) causes of the incident, whether direct or indirect, including equipment, technology, system, or management failure; and*
- (e) measures taken and to be taken to avoid a recurrence of such incident."*

2.5.2 ENVIRONMENTAL AWARENESS PLAN

In accordance with NEMA EIA (2010) regulations, an environmental awareness plan is required. As part of the environmental awareness plan 'Toolbox Talks' posters have been developed and can be used for training purposes.

- **Objectives of the plan**

The objective of the environmental awareness plan is to inform employees and contractors of any environmental risks which may result from their work and the manner in which the identified possible risks must be dealt with in order to prevent degradation of the environment.

- **Content of the plan**

The environmental awareness plan should include:

1. The definition of environment (people + air + soil + water +business);
2. Reasons for conserving and protecting the environment;
3. How the following activities can impact the environment: - Not using assigned ablutions, hazardous materials, uncleared spills, mixing of cement or paint on soil or grass surfaces, waste management i.e. use of waste receptacles and waste separation for recycling, vehicle washing polluting soil & ground water; litter;
4. What to do to prevent the above impacting the environment i.e. assign impermeable mixing areas, no vehicle washing on site, use of waste receptacles and separation of waste to allow for recycling, how to respond in an emergency and deal with a spill; and
5. Consideration of neighbours.

The environmental awareness plan that should be presented to employees is attached in Appendix 9. A training record of all staff that has undergone environmental training must be kept on record (Appendix 10).

ENVIRONMENTAL MANAGEMENT PROGRAMME

3.0 GENERAL ADMINISTRATION

- An ECO must be appointed prior to construction in order to monitor compliance of the EMPr and conducting monthly inspections or at relevant intervals depending on progress made with construction of the plant and audit reports during construction.
- A copy of the Emergency Response Plan must remain on site as must a copy of the EMPr. This should be provided by the contractor and accessible on the site.
- The contractor, engineer and ECO must obtain a copy of the EMPr prior to coming on site. An initial site meeting must be held with all responsible parties to discuss the EMPr and ensure that all elements are understood.
- It must also be agreed that no ad hoc changes will be made to the EMPr and that any requested changes must be submitted in writing to the ECO who will obtain clearance for the changes from either the DEDET compliance officer auditing the site and / or the environmental consultant or an authority body, depending on the changes requested and depending on the status of the project.
- An environmental file must be kept on site. The environmental file should contain, amongst other things, a register of all environmental training, an incident record, a complaints register, safe disposal slips (waste and sewage) and any records proving the source of materials.
- The following details must be made available on the site:
 - *Emergency contact numbers: Name, contact details*
 - *Environmental Control Officer: Name, contact details*
- All staff to be trained on their environmental responsibilities, which can be conducted at the same time as the required health, & safety training before commencing work. All new staff to be trained before they start work on site.
- Training should include: (1) the definition of environment (people + air + soil + water +business); (2) reasons for conserving and protecting the environment; (3) how the certain activities can impact the environment (e.g. not using assigned ablutions, hazardous materials, uncleaned spills, mixing of cement or paint on soil or grass surfaces, waste management, vehicle washing polluting soil & ground water; litter); (4) What to do to prevent the above impacting the environment (i.e. assign impermeable mixing areas, no vehicle washing on site, use of waste receptacles and separation of waste to allow for recycling, how to respond in an emergency and deal with a spill) and (5) Consideration of neighbouring residents
- Adequate spill kits and/or containers for spilled and contaminated material to be on standby on site.
- Adjoining neighbours must be advised of the work and hours of work at least one week prior to commencement. The hours of operations must be limited to weekdays between 7am – 5pm.
- A meeting must be held between the Engineer, the Contractor and the ECO once construction is complete to approve all remediation activities and ensure that the site has been restored to a condition.
- A Post Construction Audit (PCA) is to be carried out by the ECO to ensure that any construction impacts have been rectified and that the correct environmental measures are in place before operation begins (e.g. waste management and storage areas).

A. SITE CAMP ESTABLISHMENT



Figure 2: An example of the fence that should be placed around the construction camp (source: <http://www.norfoss.com/construction-site-fencing/construction-site-fence.html>).



Figure 3: An example of a bunded area that should be used to contain the hazardous store area within the construction camp (source: www.oasis-environment.co.uk).

Site Inception

- The construction camp shall be located within the existing FFS Evander site and agreed with by the ECO and the Contractor.
- The size of the construction camp must be minimized.
- The construction camp must be well demarcated with adequate signage and fencing (e.g. Figure 2).
- A materials storage area must be identified and designated.
- Bins and / or skips must be provided within the construction camp.
- The waste management area is to be designated and demarcated within the construction camp.
- Storage of waste must be within a hard surfaced, bunded area located under cover and there must be a regular schedule for removal of waste.
- Appropriate and adequate spill kits must be available at the site camp.
- An area for fuel storage must be identified and must be secured within the construction camp. No excessive amounts of fuel should be stored on site.
- The hazardous store area must be designated within the construction camp (Figure 3). The store must be clearly demarcated and sign boarded and must have fire extinguishers in close proximity. An inventory of goods stored must be maintained and updated regularly.
- Stockpiles created during site establishment are to be maintained as flat as possible. Stockpiles to be covered for wind screening to prevent soil loss.

Construction

- The designated waste management area must be utilized at all times.
- Litter collection bins must be provided and emptied at frequently.
- Any drip trays must be cleaned out daily and material collected disposed of as hazardous waste.
- Any alien vegetation re-growth must be controlled throughout the entire site during the construction period.
- All areas that have been stripped of vegetation, must be dampened periodically to avoid excessive dust.

Post construction

- All building materials and waste must be removed from the site at the end of construction.
- Clearance from the ECO must be obtained to ensure the all of the requirements of the EMPr have been complied with (i.e. conduct a Post-Construction Audit).
- Bins and / or skips must be removed from the construction site.
- Waybills must be produced showing the removal of waste / spoil / rubble to a registered waste site.
- Alien vegetation growing in disturbed areas must be removed.

B. STORMWATER



Figure 4: An example of an existing stormwater system within an industrial complex (source: www.soundearthinc.com).

Site Inception

- There must be limited storage of materials such as sand and cement on the site as this could contaminate stormwater runoff during construction.

Construction

- Flow of stormwater within the existing system must not be impeded during construction.
- Contamination of stormwater must be avoided at all times.
- The drainage system must be regularly checked to ensure an unobstructed water flow
- The washing and / servicing of construction vehicles must be undertaken at the designated workshop to prevent stormwater or ground water contamination.
- Any incidents involving stormwater must be reported to the ECO for the purposes of maintaining the site's incident records.

Operation

- All chemicals / hazardous waste that have the potential to contaminate stormwater must be stored within the designated bunded waste management area to prevent stormwater contamination.

C. SOURCING MATERIAL



Figure 5: The photograph shows materials being collected from a permitted source.

Site Inception

- Contractors must prepare a source statement indicating the sources of all materials (including topsoil, sands, natural gravels, crushed stone, asphalt, clay liners etc.). The source statement must be readily available in the environmental file for review by the ECO.
- Where possible, a signed document from the supplier of natural materials must be obtained confirming that the materials have been obtained in a sustainable manner and in compliance with relevant legislation.
- Where materials are borrowed (mined), proof of authorisation to utilise these materials from the landowner/mineral rights owner and the Department of Minerals and Energy must be available on request.

Construction

- Make certain transportation of materials is such that no spillage occurs on route to the site.
- Ensure that all materials are sourced from those sites set out in the source statement and that any changes to sources of materials are updated on the source statement.
- Source documents for all raw materials must be available on site.
- All materials must be obtained from a registered and sustainable source and all delivery notes and slips must be made available to the ECO e.g. mined material such as stone must only be obtained from permitted quarries.

Post construction

- Ensure that all materials (including topsoil, sands, indigenous gravels, crushed stone etc.) are removed from the construction site.

D. RESOURCE USE AND CONSERVATION



Figure 6: Photograph of tanks that may be used at the site camp for collection of wastewater (source: www.pureeffect.com/images/holding.htm).

Site Inception

- Water used on site must be from a tanker or an approved municipal source.
- No contaminated runoff or gray water may be discharged from the site camp.
- Foundations are to be inspected and approved by a competent person to ensure removal of soft clayey material has been achieved prior to casting foundations (Geotechnical Investigation, WSP; February 2009).
- Existing services on the site must be identified prior to construction.

Construction

- Volumes of water from the municipal source must be recorded and monitored.
- Should the site use in excess of 50 000 L per day DWA must be contacted as a permit will be required.
- Concrete mixing directly on the ground must not be allowed and must take place on bunded, impermeable surfaces to the satisfaction of the ECO e.g. impermeable mixing trays.
- Adequate wastewater collection facilities must be provided during construction (Figure 6).
- There must be no washing or maintenance of vehicles on site unless in a designated wash bay/ workshop

Post construction

- All excess concrete shall be removed from site on completion of works and disposed of. Washing of the excess into the ground is not allowed.
- All excess aggregate shall also be removed.
- Alien plant eradication to take place across the site.

Operational

- Any waste water produced from waxy oil processing facility transferred to the effluent plant for treatment before release to the municipal system.
- An Air Quality Management Program developed as recommended in the WSP Air Quality Impact Assessment (WSP; May 2013).

E INCIDENTS/ SPILLS



Figure 7: An example of a spillage on site that will need to be cleaned up using the prescribed methods.

Site Inception

- A method statement must be completed by the Contractor and submitted to the ECO showing procedures for dealing with possible emergencies that can occur, such as fire and accidental leaks and spillages.
- The Contractor must be in possession of an emergency spill kit that is complete and available at all times on site. The ECO will be aware of the location of the emergency spill kit and have access to it.
- The ECO must be aware of the spillage procedure with regard to spillages of hazardous or potentially hazardous substances.

Construction

- Should any spills (as indicated in Figure 7) of hazardous materials occur on the site or in the storage area, the spill is to be cleaned up immediately. Materials that absorb fuel & oil, such as absorbent or earth must be placed over the spill. This contaminated material must be uplifted and disposed of at a recognized disposal site. Safe disposal slips are to be retained.
- The Contractors and ECO must be aware of the location of the emergency spill kit and have access to it.
- Any drip trays must be cleaned out daily and material collected disposed of as hazardous waste.
- An incident record must be completed for all spills that do occur. Minor incidents will include small spills of less than 5l that do not enter the stormwater drains, housekeeping issues and general small non compliances with the requirements of the EMPr. The list of incidents to be included in the reporting to the authorities. Major incidents are those that as per section 2.5 of this EMPr must be reported to the authorities, which include all incidents involving contamination of the stormwater or other reportable incidents as defined in 2.5.
 - **Minor incidents:** small spills less than 3 l that do not enter stormwater, minor non-compliance with EMPr that does not cause major environmental impact i.e. housekeeping issues etc.
Action: Supervisor and staff on site to records and address and notify ECO. ECO to advise on remediation measures and to follow up on actions taken to address incident.
Records: On site incident register.
 - **Major incidents:** Large spills or any spills that enter stormwater, contamination of soil fires, explosions. Please see definition of a reportable incident provided below.
Action: Report immediately to ECO, action to be taken to prevent further damage and incident to be reported to authorities. ECO to advise on remediation measures and to follow up on actions taken to address incident.
Records: On site incident register and report to authorities as listed below.
- In the event of a spillage that cannot be contained and which poses a serious threat to the local environment, the following Departments must be informed of the incident in accordance with Section 30 of the National Environmental Management Act, Act 107 of 1998, within forty-eight (48) hours.
 - The Local Authority;
 - Department of Water Affairs;

	<ul style="list-style-type: none"> • DEDET • The Local Fire Department; and • Any other affected departments.
	Post construction <ul style="list-style-type: none"> ▪ No evidence of spills must be evident after construction. ▪ Safe disposal certificates must be submitted to the ECO. ▪ Spill register must be submitted to the ECO.

F. STOCKPILES / SPOIL SITES



Figure 8: An example of soil that has been stockpiled in a designated stockpile area on flat ground near to minimize runoff and impact on the surrounding environment.

Site Inception

- Stockpiles must be positioned and sloped to ensure that material does not blow around the site and/or interfere with the current operations at the FFS site (Figure 8).
- The designated storage area should preferably be located within the FFS Evander plant boundary.

Construction

- Building and other materials including non-hazardous materials and chemicals must be kept in a separate designated lay down area.
- Materials must be stacked in a way that they cannot fall or cause injury or damage to property or the natural environment.
- Stockpiles must not exceed 2m in height.
- Any topsoil must be stockpiled separately to the sub-soils.
- Stockpiles must be covered if exposed to heavy wind and rain or alternatively, low walls or berms must be constructed around the stockpiles.
- Alien vegetation must not be permitted to grow on the stockpiles.
- Materials from stockpiles to be used as soon as practically possible/spread and spoiled in designated areas.
- General building/other materials include non-hazardous materials and chemicals must be kept in a designated spoil site area.
- No building rubble, spoil materials or waste materials may be dumped on any adjoining sites.

Post construction

- All residual stockpiles must be removed to spoil or spread on site as directed by the ECO.
- All leftover building materials must be removed from the site.
- No foreign material generated / deposited during construction may remain on site.
- No building rubble, spoil materials or waste materials may be dumped on any adjoining sites.

G. WASTE MANAGEMENT

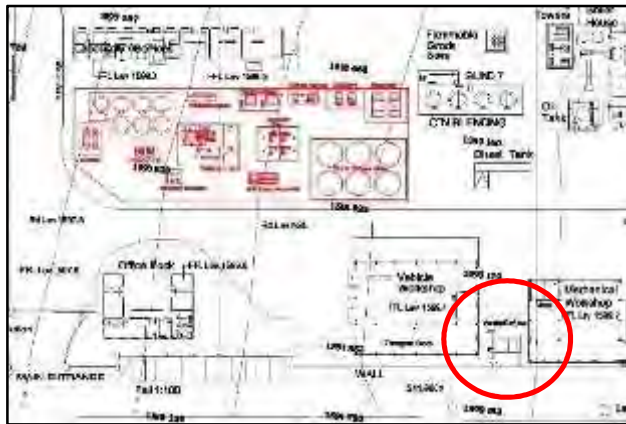


Figure 9: The existing waste management area is circled in red between the vehicle and mechanical workshop (source: FFS Refiners)



Figure 10: Example of 220ltr metal drum used to store contaminated soil.

Site Inception

- The existing hazardous waste area which is located on an impermeable surface to prevent leachate from coming into direct contact with the soil must be used (Figure 9).
- The excavation of rubbish pits on site is not allowed.
- Burning of rubbish on site is not allowed.

Construction

- The designated waste area must be utilized at all times.
- Waste must be disposed at the appropriate landfill site by an approved contractor.
- Safe disposal certificates for hazardous waste must be obtained and kept on site within the site office.
- Littering is prohibited and the site must be cleaned daily.
- A separate drum must be available for storage of contaminated soil (Figure 10).
- Waste must not be allowed to accumulate on site but should be disposed of regularly by a reputable contractor.

Post construction

- No litter must be left on site.
- The contractor is to check that the stormwater channels and the drainage pipes are free from building rubble, spoil materials and waste materials.
- All bins and other waste storage are removed from site.
- Safe disposal certificates must be submitted to the ECO.

H. HAZARDOUS STORAGE AND DISPOSAL



Figure 11: An example of hazardous material which has not been properly stored and is leaking on to bare soil. Hazardous material must always be kept separate from other storage areas and must be bunded.

Site Inception

- Material Safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and hazardous substances to be used on site. Where possible and available, MSDSs must additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases or escapes.
- Ensure all staff are trained on proper hazardous waste disposal.
- Hazardous storage and refueling areas are to be bunded and hardsurfaced to protect groundwater quality.
- Storage areas containing hazardous substances/materials must be clearly signed.
- The hazardous materials storage area must be fully secured to prevent people from accessing it.

Construction

- Hazardous materials to be stored separately in the designated hazardous storage area (Figure 11).
- Appropriate signage must be fixed for all hazardous materials or materials requiring special management.
- Any fuel storage areas must be bunded with a sump capable of containing at least 110% of the largest fuel storage container. The sump is to be linked to the effluent plant. Hazardous material must not be stored on bare soil.
- A separate drum must be available for storage of contaminated soil (Figure 9).
- Transport of hazardous materials around the site must be limited, and materials must be transported in sealed bags/containers.
- Mixing/decanting of all chemicals and hazardous substances (including cement mixing) must take place either on a tray or on an impermeable surface. Waste from these must then be disposed of at a suitable waste site.
- Cement mixing is not permitted where run off can enter any stormwater drains.
- Decanting of any chemical must be done within the confines of a suitably sized drip tray.
- Decanting from large containers (e.g. 210L drums) must be done using a hand pump.
- Any drip trays are to be cleaned out daily and material collected disposed of as hazardous waste.
- Spill kits are required to be checked regularly and maintained.

Post construction

- Hazardous materials that require disposal (cement, paints, solvents, old fuel / oil etc) must be disposed of to a registered hazardous landfill site. These materials may be removed by an appropriate hazardous waste contractor. Proof of appropriate disposal must be available to the ECO for scrutiny and kept on record.
- FFS are required to contact the relevant landfill that will be used to ensure that there is enough capacity to handle the increase in hazardous skips over time. Proof of communication should be retained on the site for audit purposes.

Operation

- MSDSs shall be readily available on site for all chemicals and hazardous substances to be used on site. This includes the MSDSs for nitric acid, Waxy Oil and Heavy Fuel Oil.
- Workers are to be educated and aware of the potential hazardous and protective measures that are required to handle the material.

	<ul style="list-style-type: none">▪ Excess quantities of nitric acid should not be stored on the site and the storage area is to be clearly labelled with signage indicating the flammable nature of the acid.▪ Nitric acid should not be stored directly adjacent to any Heavy Fuel Oil.▪ Nitric acid must not be stored or exposed to the materials listed in the MSDS for nitric acid. This includes wood, paper, cloth and most metals.
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I. TRAINING



Figure 12: An example of workers training on site. All workers must have a basic level of environmental awareness (source: www.bwint.org)

Site Inception

- The Contractor shall be responsible for informing all employees about the need to prevent any harmful effects on natural environment during the construction phase as a result of their activities.
- The ECO must ensure that the engineer has sufficient understanding of environmental issues to pass this information on to the construction staff.
- The need for a “clean site” policy must be explained to construction workers.
- The ECO has, ensured that all site staff are informed of the details of the EMPr document as well as the conditions of the Environmental Authorisation issued by the DEDET.
- Prior to the commencement of construction, all workers need to know what possible archaeological or historical objects of value may look like, and to notify the site manager if one is found.
- An EMPr awareness toolbox talk must be conducted (Appendix 9). The toolbox talk must outline the conditions and responsibilities of the EMPr to all staff workers. An attendance register must be kept and stored within the SHE file.

Construction

- Regular toolbox sessions (Figure 12) must be held to ensure that staff are reminded about environmental and safety issues and procedures. Proof of the toolbox talks are to be retained on site.
- The Environmental Awareness talk is to include:
 - (1) the definition of environment (people + air + soil + water +business);
 - (2) reasons for conserving and protecting the environment;
 - (3) how the certain activities can impact the environment (e.g. not using assigned ablutions, hazardous materials, uncleaned spills, mixing of cement or paint on soil or grass surfaces, waste management, vehicle washing polluting soil & ground water; litter);
 - (4) What to do to prevent the above impacting the environment (i.e. assign impermeable mixing areas, no vehicle washing on site, use of waste receptacles and separation of waste to allow for recycling, how to respond in an emergency and deal with a spill);
 - (5) Consideration of neighbouring residents
- SAHRA should be contacted if any heritage objects are identified during earthmoving activities and the following procedure is to be followed:
 - (1) stop construction
 - (2) report finding to local police station
 - (3) report to SAHRA to investigate

Post Construction:

- The new development is to be incorporated into the existing environmental management system with a designated environmental management plan/actions to ensure full compliance with all legal requirements and to ensure appropriate monitoring and assessment takes place.

	<ul style="list-style-type: none"> Existing procedures to handle the loading/ offloading of raw materials and products (Procedures 1 and 2 E); handling, storage and use of hazardous substances (Procedure 20E); waste management (18E); emergency procedures (6E; 11E and 64E); sampling and analysis (32E); environmental reporting (58E) are to be revised to include the new waxy oil processing facility. <p>Operation</p> <ul style="list-style-type: none"> MSDSs shall be readily available on site for all chemicals and hazardous substances to be used on site. This includes the MSDSs for nitric acid, Waxy Oil and Heavy Fuel Oil. Workers are to be educated and aware of the potential hazardous and protective measures that are required to handle the material.
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J. CONDUCT



Figure 13: Occupational health and safety PPE (<http://www.alpinesafety.co.uk/acatalog/Intermediate.jpg>).

Site Inception

- Workers must be briefed by the person in charge of managing construction / management activities on the do's and don'ts on the property, when workers arrive at the property. This must be repeated in regular toolbox talks.
- All workers are to undergo the FFS SHE induction training before commencing work on site (please confirm).
- No alcohol, drugs, snares, slingshots or animals may be brought onto the property.
- Toilets must be available on site for use by construction staff at all times.
- All construction staff must be provided with relevant PPE (Hardhat, ear protection, protective clothing, eye protection, dust masks, safety footwear; Figure 13).
- The contractor must ensure that the necessary equipment is in place to control dust generated during construction.

Construction

- No fires may be made on the property.
- Firefighting equipment to be maintained on site.
- Workers that are under the influence of alcohol or drugs may not work on the site.
- Construction activities must comply with designated working hours and surrounding residents must be informed prior to noisy activities.
- Excessive noise must be prevented.
- Trespassing on private / commercial properties adjoining the site is forbidden.
- The necessary PPE must be worn.
- Staff handling hazardous substances/materials must be aware of their potential impacts and follow appropriate safety measures.
- A complaints register must be maintained on site at all times and be made accessible to the surrounding community (or any affected person(s)) to record complaints regarding odours, emissions, noise and/or excessive levels of dust. Any complaints should be investigated.
- Speeding must be prohibited.
- Construction vehicles must be regularly maintained to ensure that excessive emissions are controlled.

Post construction

- Any damage caused by misconduct must be remedied and rehabilitated.

K EMERGENCY PROCEDURES & PREVENTION



Figure 14: Emergency response procedures (source: www.safety.engineering.ualberta.ca)

Site Inception

- All construction staff must be made aware of emergency phone numbers to use in the case of an emergency.
- All staff must be trained on how to react in the case of an emergency.
- Tanks are to be designed to comply with SANS 10089 as recommended by ISHECON (MHI Risk Assessment, July 2010).

Construction

- Keep clearly marked booms and/or absorbent material on site to contain spills if they occur.
- If a spill occurs, stop the source, contain it, clean up in accordance with MSDSs and notify relevant authorities as described in section 3E of the EMP.
- The following protective features are to be incorporated into the design and construction of the new processing plant as recommended by ISHECON (MHI Risk Assessment, July 2010):
 - All bulk storage tanks and all processing areas are fully bunded to contain 110% of the largest tank,
 - Curbed nitric acid offloading area,
 - There is an on-site emergency plan and
 - There is to be fire water, foam spraying systems and trained firefighting personnel on site.

Post construction

- Firefighting equipment must be readily available.
- Emergency phone numbers and responsible persons must be available.
- An emergency procedure to follow/activate must be drawn up and all employees must be made aware of this.
- The site occupied building study should be updated as part of the MHI update to evaluate the risk of radiation and explosion over-pressure from accidents on the distillation plant / FFE plant etc. against international guidelines (ISHECON, MHI Risk Assessment; July 2010).
- A copy of the ISHECON MHI Risk Assessment (July 2010, Appendix 4 of the EIR) must be attached as an addendum to the existing MHI and must be made available on site at all times;
- The following should apply to the admin building and workshops located within 50m of the new processing plant:
 - Emergency exits from the buildings exiting towards the north, south or west / east;
 - Hardening of structures to ensure blast resistant windows on all sides; and
 - In terms of assembly points, it should be noted that with toxic fumes from nitric acid the best protection is afforded by a policy of shelter-in-place indoors.

Operation

- Safe operating procedures are to be developed for the new processing plant with operators to be trained to perform their allotted function effectively and safely (ISHECON, MHI Risk Assessment; July 2010).
- A "permit to work" system is to be available during operation (ISHECON, MHI Risk Assessment; July 2010).

	<ul style="list-style-type: none"> The on-site Emergency Plans are to be updated to include the new waxy oil processing facility (ISHECON MHI Risk Assessment; July 2010).
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L TRAFFIC, ACCESS, EQUIPMENT AND VEHICLES ON SITE



Figure 15: Access to the FFS Evander site off existing roads (source: Google Earth).

Site Inception

- Access routes to the construction site must follow existing access roads (Figure 15).
- Construction signage indicating speed limits must be erected on the road verge.
- Machinery and vehicles will be well maintained and no maintenance work can be carried out on site to ensure that no contamination of soil or stormwater occurs through oil spills etc.
- Excessively noisy machinery will be removed from site.

Construction

- Vehicles travelling along the access roads must adhere to speed limits ensure the safety of the surrounding businesses.
- Workers must be trained regarding noise on site and construction hours will be kept to working hours (07h00 to 17h00).
- Work should not continue on weekends or after hours or public holidays.
- Machinery and vehicles must be maintained in good working order to maximize efficiency and minimise pollution.
- No vehicle or machinery washing must occur on site, only at designated locations at the workshop area.

Post construction

- All temporary signage must be removed on completion of construction.
- All existing access roads to and from the construction site must be cleared.

M. DECOMMISSIONING

- A detailed decommissioning plan must be submitted to DEDET for approval at least 30 days prior to the decommissioning of the proposed development. The plan must address the following:
 - Air quality
 - Soil erosion
 - Waste management
 - Waste water management
 - Stormwater management
 - Worker conduct
 - Dust
 - Landscaping, re-vegetation, stabilization and rehabilitation
 - Land remediation
 - Complaints register
- Prior to decommissioning the applicants must notify the relevant authorities, e.g. Fire Department, Department of Transport, Local Municipality etc. as well as surrounding interested and affected parties.
- Surrounding properties and residents should be notified prior to decommissioning activities.
- Decommissioning must take place only during working hours.
- All solid waste and rubble must be disposed of at an approved landfill site.
- Rehabilitation measures must be put into place.
- All structures, foundations, concrete and tarred areas must be demolished. Rubble must be removed by an approved contractor and taken to a licensed landfill site. Waste recycling must be encouraged.

Appendix 1: Letter of acceptance of EMPr

RE: Construction of the 2500m² Processing Facility to Remove Contaminants from Waxy Oil at FFS

To whom it may concern

This is to state that the undersigned have received a copy of the Environmental Management Programme (EMPr) developed for this site by *Kerry Seppings Environmental Management Specialists cc (KSEMS)* dated August 2013. The undersigned do hereby agree to abide by the strictures of the Environmental Management Programme (EMPr). Any contravention of the EMPr will be recorded and corrective action will be carried out.

Any changes to the EMPr must be approved by the *Environmental Control Officer (ECO)*, the consultant *Kerry Seppings Environmental Management Specialists cc (KSEMS)* and the relevant authority. Such changes are to be made in writing and a record must be maintained.

As Agreed on this day _____ of _____ (Month) _____ (Year)

Environmental Control Officer (ECO)

Name _____

Signed _____

Contractor

Name _____

Company _____

Signed _____

Engineer

Name _____

Company _____

Signed _____

Appendix 2: EMPr checklist

ENVIRONMENTAL MANAGEMENT PLAN CHECK LIST				
Contractor				
Telephone Number				
Project				
	Issue	Page number	No of pages	Signature
1	Cover Sheet Identifying Persons and Contacts			
2	Project Description			
3	Construction Site Layout Plan			
4	Action Plan Responsibilities			
5	EMPr Audit Form			
6	Non Conformance Register			
7	Incidents Record			
8	Letter of Acceptance of EMPr			
9	Complaints			
10	Appendix 6:			
11	Appendix 7:			
12	Appendix 8:			
13	Training Record			
Contractors Representative Completing this Form				
Name		Signature		
Date		Revision Number		

Appendix 3: EMPr audit form

EMPr AUDIT FORM		
This report must be completed each time an audit is done, even during daily inspections. ECO monthly audits are to be submitted to DEDET official. Please note that this audit form is an example and a more detailed audit form will be required detailing issues as per the EMPr.		
Date:	Persons Carrying Out Audit:	Signature/s:
Issue	Y/N	Corrective Action Required
1. Are all sediment and pollution control structures in place, cleaned and operating? If no provide details.		
2. Have there been any (verbal or written) complaints from nearby resident, local council or authority in relation to the site activities such as noise, dust, traffic, dirt on roads or stormwater pollution? If yes, detail the complaints and response to the complaints?		
3. Have there been any incidents on the site such as spills of chemicals or fuel? If yes, describe what has happened and what was done to clean up the spill.		
4. Are there any areas of the EMPr that have not been complied with? If so detail (the auditor to check all requirements of the EMPr carefully to ensure that all requirements are met)		
5. Have any further strategies been employed to reduce waste going to landfill?		
6. Other comments: list any other environmentally related issues.		

Appendix 4: Complaints register

This a register for recording all complaints received from neighbours i.e. Complaints about noise, odours, dust etc.

[illegible]

Appendix 5: Non conformance record

This is record of non-compliances with the EMPr i.e. any action taken that is in violation of the EMPr must be recorded e.g. mixing concrete directly on soil, site staff using neighbouring properties as toilet facilities, dumping of material over fence etc.

Date of non conformance	Details of non conformance	Party / ies responsible	Corrective action taken	Date action completed

Appendix 6: Emergency Plan

The updated FFS Emergency Response Plan is to be included in this Appendix.

DEFINITION OF AN “INCIDENT”

As defined by NEMA, section 30 “Control of emergency incidents”.

(1) In this section—

- (a) “incident” means an unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed;
- (b) “responsible person” includes any person who—
 - (i) is responsible for the incident;
 - (ii) owns any hazardous substance involved in the incident; or
 - (iii) was in control of any hazardous substance involved in the incident at the time of the incident;
- (c) “relevant authority” means—
 - (i) a municipality with jurisdiction over the area in which an incident occurs;
 - (ii) a provincial head of department or any other provincial official designated for that purpose by the MEC in a province in which an incident occurs;
 - (iii) the Director General;
 - (iv) any other Director General of a national department.

As defined by the National Water Act section 20 “Control of emergency incidents”

- (1) In this section “incident” includes any incident or accident in which a substance -
- (a) pollutes or has the potential to pollute a water resource; or
 - (b) has, or is likely to have, a detrimental effect on a water resource.

DEFINITION OF AN INCIDENT ON SITE

Spills, contamination of soil and or stormwater, fires, explosions.

CONTENTS OF EMERGENCY RESPONSE REPORT TO AUTHORITIES

As taken from NEMA, section 30: “Control of Emergency Incidents”

- (3) The responsible person or, where the incident occurred in the course of that person’s employment, his or her employer must forthwith after knowledge of the incident, report through the most effective means reasonably available—
- (a) the nature of the incident;
 - (b) any risks posed by the incident to public health, safety and property;
 - (c) the toxicity of substances or byproducts released by the incident; and
 - (d) any steps that must be taken in order to avoid or minimise the effects of the incident on public health and the environment to—
 - (i) the Director General;
 - (ii) the South African Police Services and the relevant fire prevention service;

- (iii) the relevant provincial head of department or municipality; and
 - (iv) all persons whose health may be affected by the incident.
 - (4) The responsible person or, where the incident occurred in the course of that person's employment, his or her employer, must, as soon as reasonably practicable after knowledge of the incident—
 - (a) take all reasonable measures to contain and minimise the effects of the incident, including its effects on the environment and any risks posed by the incident to the health, safety and property of persons;
 - (b) undertake cleanup procedures;
 - (c) remedy the effects of the incident;
 - (d) assess the immediate and long term effects of the incident on the environment and public health.
 - (5) The responsible person or, where the incident occurred in the course of that person's employment, his or her employer, must, within 14 days of the incident, report to the Director General, provincial head of department and municipality such information as is available to enable an initial evaluation of the incident, including—
 - (a) the nature of the incident;
 - (b) the substances involved and an estimation of the quantity released and their possible acute effect on persons and the environment and data needed to assess these effects;
 - (c) initial measures taken to minimise impacts;
 - (d) causes of the incident, whether direct or indirect, including equipment, technology, system, or management failure; and
 - (e) measures taken and to be taken to avoid a recurrence of such incident.
 - (6) A relevant authority may direct the responsible person to undertake specific measures within a specific time to fulfil his or her obligations under subsections (4) and (5): Provided that the relevant authority must, when considering any such measure or time period, have regard to the following:
 - (a) the principles set out in section 2;
 - (b) the severity of any impact on the environment as a result of the incident and the costs of the measures being considered;
 - (c) any measures already taken or proposed by the person on whom measures are to be imposed, if applicable;
 - (d) the desirability of the State fulfilling its role as custodian holding the environment in public trust for the people;
 - (e) any other relevant factors.
 - (7) A verbal directive must be confirmed in writing at the earliest opportunity, which must be within seven days.
 - (8) Must—
 - (a) the responsible person fail to comply, or inadequately comply with a directive under subsection (6);
 - (b) there be uncertainty as to who the responsible person is; or
 - (c) there be an immediate risk of serious danger to the public or potentially serious detriment to the environment,a relevant authority may take the measures it considers necessary to—
 - (i) contain and minimise the effects of the incident;
 - (ii) undertake cleanup procedures; and
 - (iii) remedy the effects of the incident.

As taken from the National Water Act section 20 "Control of emergency incidents"

- (2) In this section, "responsible person" includes any person who -
 - (a) is responsible for the incident;

- (b) owns the substance involved in the incident; or*
 - (c) was in control of the substance involved in the incident at the time of the incident.*
- (3) The responsible person, any other person involved in the incident or any other person with knowledge of the incident must, as soon as reasonably practicable after obtaining knowledge of the incident, report to -*
 - (a) the Department;*
 - (b) the South African Police Service or the relevant fire department; or*
 - (c) the relevant catchment management agency.*
- (4) A responsible person must -*
 - (a) take all reasonable measures to contain and minimise the effects of the incident;*
 - (b) undertake clean-up procedures;*
 - (c) remedy the effects of the incident; and*
 - (d) take such measures as the catchment management agency may either verbally or in writing direct within the time specified by such institution.*

SPILL RESPONSE

RESPONSIBLE PERSONS

The spill is reported to the Foreman who must report to his superior who must report to the ECO.

All employees must be made aware of the procedure in case of a spill.

The ECO must report to relevant authorities if contamination occurs and if spill falls within the definition of a spill

PROCEDURE

1. Identify nature and size of spill e.g. oil 20L
2. Protect exposed stormwater drains, prevent entry of substance to stormwater drains and drainage line.
3. For a small spill (less than a litre), locate spill kit, contain spill according to the training from the spill kit suppliers
4. For large spill (unable to deal with onsite), contact external spill control contractors
5. Determine appropriate method for disposal of material base on information provided in MSDS
6. Determine if any contamination has occurred i.e. entry to stormwater, , soil contamination
7. If contamination has occurred, consult with authorities on need for ongoing monitoring and or rehabilitation requirements. Determine medium and long term effects. Stormwater incidents must be reported to waste water
8. If no contamination has occurred, determine if spill falls under definition of an “incident” and if so, report to relevant authorities.
9. Record in Incidents register
 - Nature of incident
 - Cause of incident
 - Contamination if any
 - Measures taken to control spill and handle contamination
 - If spill falls under definition of an incident
 - Mitigation measures taken to prevent re-occurrence
10. Record in non-compliance register and incident (if defined as incident)

11. The ECO shall review all spill reports
12. Adjustments will be made, if necessary, to the operational and emergency procedures to prevent future occurrences

FIRE

RESPONSIBLE PERSONS

The spill is reported to the Foreman who must report to his superior who must report to the ECO.

All employees must be made aware of the procedure in case of a spill.

The ECO must report to relevant authorities if contamination occurs and if spill falls within the definition of a spill

PROCEDURE


1. Identify source and nature of fire
2. In case of small fire extinguish with material appropriate to the nature of the fire. Consult MSDS.
3. Immediately contact the ECO. In case of a large fire contact Fire Department
4. Record in incident register: Nature of incident
 - Cause of incident
 - Clean up measures
 - Mitigation measures taken
5. Record in non-compliance register and record as incident if applicable.
6. The ECO shall review all fire reports
7. Adjustments will be made, if necessary, to the operational and emergency procedures.

Appendix 7: Incident record

This is record of incidents as defined in NEMA and the NWA. Incidents must be recorded and reported to the applicable authorities.

Date of incident	Details of incident	Party / ies responsible	Corrective action taken	Date action completed

Appendix 8: Example of an emergency incident report form (Source: DEA website)

	Document Type:	Emergency Incident Report	
	Title for the Incident:		
	Date of the incident:		
Reference:	[A reference that may be used in future correspondence]	Initial Submission Date:	[Date of initial submission of the report to the Department: Environmental Affairs and Tourism]
Revision No.:	example	Compiled by:	[Full name and contact details of the person submitting the report]

This form provides a template for the emergency incident report required in terms of section 30(5) of the National Environmental Management Act (Act No. 107 of 1998) (hereinafter “NEMA”) in which the responsible person or, where the incident occurred in the course of that person’s employment, his or her employer, must, within 14 days of the incident, report to the Director General, provincial head of department and municipality such information as is available to enable an initial evaluation of the incident, including: (a) the nature of the incident; (b) the substances involved and an estimation of the quantity released and their possible acute effect on persons and the environment and data needed to assess these effects; (c) initial measures taken to minimise impacts; (d) causes of the incident, whether direct or indirect, including equipment, technology, system, or management failure; and (e) measures taken and to be taken to avoid a recurrence of such incident.

In terms of section 30(1)(a) of NEMA, an “incident” means an unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed.

In line with section 24 of the Constitution of the Republic of South Africa (Act No. 108 of 1996), “serious” is taken to be a measure of the impact of an incident where such an incident has had, could have had, is having, or will have a negative impact on human health or well-being.

1. RESPONSIBLE PERSON

In terms of section 30(1)(b) of NEMA, the “responsible person” includes any person who: (i) is responsible for the incident; (ii) owns any hazardous substance involved in the incident; or (iii) was in control of any hazardous substance involved in the incident at the time of the incident

Name:	[Full name of person, company, etc.]	Designation:	[designation of responsible person (n/a for companies, etc.)]
Postal Address:	[Full postal address including postal code]	Physical Address:	[Full physical address]
Telephone (B/H)	[Business hours contact telephone number and area code]	Telephone (A/H)	[After hours contact telephone number and area code]
Fax:		Email:	
Nature of Business:	[Brief summary of the nature of the business]		

2. Emergency Incident Summary Information

Mark the appropriate boxes

2.1 Fire:	<input type="checkbox"/>	2.2 Spill:	<input type="checkbox"/>	2.3 Explosion:	<input type="checkbox"/>	2.4 Gaseous Emission:	<input type="checkbox"/>
2.5 Injuries	<input type="checkbox"/>	2.6 Reportable injuries:	<input type="checkbox"/>	2.7 Hospitalisation:	<input type="checkbox"/>	2.8 Fatalities:	<input type="checkbox"/>
2.9 Open water impacts:	<input type="checkbox"/>	2.10 Ground water impacts:	<input type="checkbox"/>	2.11 Atmospheric impacts:	<input type="checkbox"/>	2.12 Soil impacts:	<input type="checkbox"/>
2.13 Own emergency response involved	<input type="checkbox"/>	2.14 Fire prevention services involved	<input type="checkbox"/>	2.15 Government hazardous materials emergency response involved	<input type="checkbox"/>	2.16 More than 1 governmental emergency response service involved	<input type="checkbox"/>
2.17 Emission of non-toxic substances at low concentrations	<input type="checkbox"/>	2.18 Emission of non-toxic substances at high concentrations	<input type="checkbox"/>	2.19 Emission of toxic substances at low concentrations	<input type="checkbox"/>	2.20 Emission of toxic substances at high concentrations	<input type="checkbox"/>
2.21 No evacuation required	<input type="checkbox"/>	2.22 Immediate area evacuated	<input type="checkbox"/>	2.23 Immediate surrounds evacuated	<input type="checkbox"/>	2.24 Evacuation of the general public	<input type="checkbox"/>
2.25 Others	<input type="checkbox"/>						<input type="checkbox"/>

3. Initial Emergency Incident Report

In terms of section 30(3) of NEMA, the responsible person or, where the incident occurred in the course of that person's employment, his or her employer must forthwith after knowledge of the incident, report through the most effective means reasonably available: (a) the nature of the incident; (b) any risks posed by the incident to public health, safety and property; (c) the toxicity of substances or byproducts released by the incident; and (d) any steps that must be taken in order to avoid or minimise the effects of the incident on public health and the environment to: (i) the Director General; (ii) the South African Police Services and the relevant fire prevention service; (iii) the relevant provincial head of department or municipality; and (iv) all persons whose health may be affected by the incident.

Description	Date:	Time:	Medium:	Contact Details:
Relevant fire prevention services: (in case of fire)	[submission date]	[submission time]	[Fax, phone, SMS, letter, etc.)	[who was the report made to?]
Local:				
Provincial: (Those deal with Environmental issues)				
Director General: (DEA)				
Any other Director General of National Department eg DWA				

4. Incident Details

In terms of NEMA section 30(5)(a) and (d), the responsible person must report on the nature of the incident as well as the causes of the incident, whether direct or indirect, including equipment, technology, system, or management failure

Location of the incident	[Provide physical address of the location where the incident happened including the GPS co-ordinates]		
Incident start date and time:	[The exact time that the unexpected event started]	Incident duration:	[the duration of the unexpected event]
Duration of exposure:	[The duration of conditions that had a direct impact anyone's health or well-being]		
Incident description			
<u>Background of the incident:</u> <u>Operation:</u> <u>Incident type:</u> <u>Root Cause of the incident:</u> <u>Contributing factors to the incident:</u> <u>Conclusion:</u>			

4. Incident Details			
In terms of NEMA section 30(5)(a) and (d), the responsible person must report on the nature of the incident as well as the causes of the incident, whether direct or indirect, including equipment, technology, system, or management failure			
Wind speed and direction	[The wind speed and direction at the point of the incident at the time of the incident]	Ambient air temperature	[ambient air temperature at the time of the incident]
Weather conditions	[Sunny, light rain, mist, heavy rain, etc.]	Other relevant meteorological conditions	[Temperature inversion, floods, etc]

5. POLLUTANTS RELEASED DURING INCIDENT					
In terms of NEMA section 30(5)(b), the responsible person must report on the substances involved and an estimation of the quantity.					
List all the pollutants directly released during the incident (i.e. exclude those pollutants that resulted from mitigation measures, e.g. flaring, treatment, dilution etc.)					
Substance or mixture of substances	Reference Number	Phase	Total Quantity emitted	Unit	Nature of emission
[The name recognised by any national or internationally recognised chemical referencing system]	[Reference to any national or internationally recognised chemical referencing system]	[solid, semi-solid, liquid or gas]	[the total measured or estimated quantity released into the environment]	[the unit of measure in respect to the quantity]	[emitted from truck, underground pipe, stack, etc.]

6. SECONDARY POLLUTANTS RESULTING FROM INCIDENT					
In terms of NEMA section 30(5)(b), the responsible person must report on the substances involved and an estimation of the quantity released.					
List all the pollutants that resulted from mitigation measures, e.g. flaring, treatment, dilution etc.					
Substance or mixture of substances	Reference Number	Phase	Total Quantity emitted	Unit	Nature of emission
[The name recognised by any national or internationally recognised chemical referencing system]	[Reference to any national or internationally recognised chemical referencing system]	[solid, semi-solid, liquid or gas]	[the total measured or estimated quantity released into the environment]	[the unit of measure in respect to the quantity]	[emitted from truck, underground pipe, stack, etc.]

7. POLLUTANT CONCENTRATIONS

In terms of NEIMA section 30(5)(b), the responsible person must report on the substances involved and an estimation of the quantity released.

List all the pollutants detailed above.

Substance or mixture of substances	Reference Number	Estimated pollutant concentration			
		10m	100m	500m	>2000m
[The name recognised by any national or internationally recognised chemical referencing system]	[Reference to any national or internationally recognised chemical referencing system]	[estimate the concentration of the pollutant in water, soil and/or air within a 10m radius of the epicentre of the incident] [provide the units used in a case of estimating concentrations eg ppm]	[estimate the concentration of the pollutant in water, soil and/or air within a 100m radius of the epicentre of the incident] [provide the units used in a case of estimating concentrations eg ppm]	[estimate the concentration of the pollutant in water, soil and/or air within a 500m radius of the epicentre of the incident] [provide the units used in a case of estimating concentrations eg ppm]	[estimate the concentration of the pollutant in water, soil and/or air within a >2000m radius of the epicentre of the incident][provide the units used in a case of estimating concentrations eg ppm]

8. INCIDENT IMPACT

In terms of NEIMA section 30(5)(b), the responsible person must report on possible acute effect on persons and the environment and data needed to assess these effects;

Minor injuries	[Describe the number and types of any minor injuries that resulted from the incident or efforts to manage the incident or the impacts thereof]
Reportable injuries	[Describe the number and types of any injuries requiring statutory reporting that resulted from the incident or efforts to manage the incident or the impacts thereof]
Hospitalisation	[Describe the number and types of any injuries that required professional medical care that resulted from the incident or efforts to manage the incident or the impacts thereof]
Fatalities	[Describe the number and cause of any fatalities that resulted from the incident or efforts to manage the incident or the impacts thereof]
Biological impacts	[Describe any impacts on biological life, other than human life, e.g. fish kills, plant mortality, etc.]
Impact area	[Describe the area possibly affected by the incident or the impacts thereof including: (i) size of the area; (ii) socio-economic context; (iii) population density; (iv) sensitive environments (if any), etc.]
Data	Attach relevant impact reports, medical reports, death certificates, post mortem reports, environmental monitoring data, etc. as Annexes C1, C2,... to this report

9. EXISTING PREVENTION PROCEDURES AND/OR SYSTEMS	
Foresight	[Briefly describe whether the incident could have, or had, been foreseen, e.g. was it included in any environmental impact assessment, risk assessment, health and safety plan, etc.]
Procedures and/or systems	Attach any relevant safety, health and environmental plans (including any statutory planning requirements) that detail what actions must be taken in the event of the incident that is the subject of this report
Procedure and/or systems failures	[Describe any failures or shortfalls in procedures and/or systems that may have contributed to the incident]
Technical measures	[Describe any technical measures, equipment, 'fail-safe' devices, etc. that are in place to prevent the occurrence of the incident]
Technical failure	[Describe any failures of technical measures, equipment, 'fail-safe' devices, etc. that are in place to prevent the occurrence of the incident]

10. INITIAL INCIDENT MANAGEMENT	
In terms of NEMA section 30(5)(c), the responsible person must report on initial measures taken to minimise impacts.	
Evacuation	[Describe any evacuation activities including information on the number of people evacuated and whether these people were staff or otherwise]
Technical measures	[Describe all technical measures taken to address the incident]
Mitigation measures	[Describe all measures taken to minimise the impact]
Emergency Services	[Describe any governmental emergency services involvement]

11. CLEANUP AND/OR DECONTAMINATION			
In terms of NEMA section 30(5)(c), the responsible person must report on initial measures taken to minimise impacts.			
Cleanup and/or decontamination		[Provide a detailed description of all cleanup and/or decontamination activities and the environmental quality and impacts resulting from these activities as well as contact details for any contracted service providers in an annex.]	
Permissions and Instructions			
Provide details of any permissions and/or instructions received from any organ of state during initial incident management, cleanup and/or decontamination			
Type	Statute	Issued By	Name and contact details
[Describe the nature or type of permission or instruction]	[Provide a reference to the legal mandate for the permission or instruction]	[Provide contact details for the permitting or instructing authority]	[provide a summary of the activities carried out in terms of the permission or instruction]

12. MITIGATION MEASURES

In terms of NEIMA section 30(5)(e), the responsible person must report on measures taken and to be taken to avoid a recurrence of such incident.

Measure	Objective	Cost	Timing
[Briefly describe each of the measures taken, and to be taken, to avoid a recurrence of such incident]	[Briefly describe the objective of the measure, i.e. the desired outcome of the measure]	[Estimate the cost of the measure in terms of capital costs and/or recurrent costs]	[Provide information on the timing for the full implementation of the measure]

13. AUTHORISATIONS

Provide detail on all authorisations (including permits, licenses, certificates, etc.) in respect of the activity to which the incident relates.

Type	Statute	Issued By	Issue & Expiry Date
[Describe the nature or type of authorisation, e.g. Registration Certificate]	[Provide the reference for the authorisation, e.g. section X of the National Environmental Management Act (Act No. 107 of 1989)]	[Provide contact details for the issuing authority]	[provide the date of issue and expiry]

14. History

Provide details on any and every similar incident involving the responsible person in the last 24 months. Similar incidents include those that: (i) involved similar circumstances; (ii) involved similar emissions; (iii) involved similar personal; and/or (iv) involved similar impacts.

Incident title	Report reference	Date of incident	Summary of event
[Provide the title used in the relevant emergency incident report]	[Provide the reference in respect of the relevant emergency incident report]	[Date of incident]	[Provide a summary of the event]

Signed by, or as a mandated signatory for, the responsible person:		Date:	
--	--	-------	--

APPENDIX 1				
List of affected people as results of the incident				
NAME	ADDRESS	PHONE	FAULT	REMARKS
APPENDIX 2				
Layout map of the area likely to be affected or affected as a result of the incident				

Disclaimer

Any other information not covered in the reporting template must be included.

NOTE: In terms of section 30 (11) of NEMA as amended, it is an offence not to report an incident and liable on conviction to a fine not exceeding R 1 million or imprisonment for a period not exceeding 1 year, or to both such a fine and such imprisonment.

Appendix 9: Environmental Awareness Plan / Toolbox Talks

Environmental Awareness Plan

Important Definitions

- **Environment** (NEMA, 1998) - means the surroundings within which humans exist and that are made up of -
 - the land, water and atmosphere of the earth;
 - microorganisms, plant and animal life;
 - any part or combination of (i) and (ii) and the interrelationships among and between them;
 - and
 - the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing
- **Pollution** (NEMA, 1998) - means any change in the environment caused by -
 - substances;
 - radioactive or other waves; or
 - noise, odours, dust or heat,
 - emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or wellbeing or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future
- **Environmental Management Programme** – refers to a document that used to investigate, assess and evaluate the impacts that the mine is likely to have on the environment during the operation and decommission phases.

Site Environmental Rules

1. No urinating or defecating on site. Toilet facilities provided at the site and are to be used at all times.
2. Do not waste water
3. No littering
4. No washing of construction vehicles
5. Be aware of fire when using hot tools on site
6. No smoking on the site unless in a designated area
7. Do not use spill kits for disposal of general waste
8. Display Material Safety Data Sheets for storage containers on site and handle hazardous materials accordingly

Dispensing and disposal of hydrocarbons/mineral oils

DISCUSSION:

What is a Hydrocarbon (mineral oil)?

Diesel/hydraulic oil etc. are hydrocarbons and therefore classified as hazardous substances. A hazardous substance is any material that poses an unreasonable risk to people, property and the environment. The environment is our surroundings, soil, air and water.

What is the risk?

- Regular dispensing and offloading of diesel increases the risk of a spillage occurring.
- Changing hydraulic lines/ greasing parts / basic maintenance of vehicles
- Leaks from vehicles and equipment

Hydrocarbons are toxic if swallowed by humans or animals. The presence of hydrocarbons in water can also prevent aquatic organisms from breathing and may result in aquatic kills depending on the extent of the spill. Hydrocarbons should therefore be prevented from contaminating ground or surface water.

Note:

Only 1 litre of oil can contaminate a soccer field of water. It is therefore essential to prevent spillages as far as possible and to ensure that if they do occur that they are properly cleaned up and that the resulting material is disposed of correctly.

What is a spillage?

All situations involving the spilling of a hydrocarbon on to the floor or ground or water.

How do we manage this?

1 Correct Storage:

- Refer to issues around the bunded area.
- Should be contained in waterproof and leak proof containers. Any containers or points that are leaking to be addressed immediately.
- Should be stored in a dedicated area on site.

2 Correct Dispensing:

- Should check lines for leaks before starting with dispensing.
- Place drip tray so as to catch any drips. How would you empty the drip tray?
- Ensure all residual diesel/oil is drained from pipe before disconnecting.

3 Maintenance of vehicles and equipment

- Check equipment and vehicles for leaks daily. Report leaks to supervisor immediately. Contain slow drips using a drip tray.
- Do not use excessive grease when greasing vehicle or equipment parts.

4 Correct Spillage Handling and Disposal:

- Clean all spillages immediately. This means treat and remove spillage.
- Dispose in hazardous waste drum or skip.
- Report spillage to supervisor.

DATE:	TIME:	LOCATION:
TOPIC:	Dispensing, storage and disposal of hydrocarbons/ mineral oils	
ISSUE:	Spillage	



Use, handling and storage of hazardous chemicals

4.

DISCUSSION:

What is a Hazardous Chemical?

These are substances that may be dangerous to humans and or the environment if not handled, stored and disposed of correctly. The definition of a hazardous chemical is based on the amount, concentration or inherent properties of the waste.

e.g. Consumption of Alcohol,

Amount – the effect of 1 glass versus 5 litres. It is the same with a chemical. One drop may not be harmful but continuous dripping over a period of a week could be very harmful

Concentration – Beer as opposed to wine, there is alcohol in both but there is more alcohol in the wine than in the beer. It is the same with some chemicals

Inherent properties – Methylated spirits versus Beer, one bottle of methylated spirits could kill you but one beer won't because of the type of alcohol in the beer versus that in methylated spirits. It is the same with some chemicals

What is the risk?

There is a risk of spillage of chemicals under the following circumstance:

- During decanting of chemicals such as paint and curing compound etc, some of the chemicals may be spilt on the ground; and/or
- While applying paint or grease you need something to put the tin, paint brush or roller into.
- Temporary storage of chemicals at point of use

What are the correct use, handling and storage of hazardous chemicals?

- Hazardous chemicals should be stored in a roofed, bunded area that is kept locked. Entry of rain water into the bunded area must be prevented.
- All chemicals or chemical contaminated items should be stored within the bunded area. NOT on the wall of the bunded area or outside the bunded area on a concrete slab.
- Empty chemical containers and drums should be stored in the bunded area until removed or smaller containers thrown in the hazardous waste skip e.g. paint tins, paint brushes or rollers.
- Decanting of chemicals should be done within a bunded area as far as possible. A funnel should be used when discharging liquids into a container with a small opening. Spillage of chemicals should always be avoided.
- All chemical containers should be labelled. No food related containers are to be used for the storage of chemicals e.g. cool drink bottles.
- Temporary storage of chemicals at point of use. Chemicals should always be returned to chemical store at the end of the shift.
- Drip trays may be used for the placing of paint brushes and rollers while applying curing compound or shutter oil.
- All these chemicals must have an MSDS (material safety data sheet). This information is required to ensure that all chemicals are stored, handled and disposed of in the best possible way to ensure the safety of staff and the environment.

Correct maintenance of bunded area

Any cracks in the walls or floors and holes in the roof are to be repaired as soon as possible. Bunded area is to be kept free of spillages. Any spillages are to be cleaned up and disposed of as hazardous waste.

DATE:	TIME:	LOCATION:
TOPIC:	Use, handling and storage of hazardous chemicals	
ISSUE:	Incorrect storage of chemicals	
	Spillage of chemicals	



Waste segregation and separation

5.

DISCUSSION:

What is waste separation?

This is the separation of hazardous and general waste

Some examples of hazardous wastes generated on site:

Used oils (hydrocarbons), contaminated spill absorbent or sand, paints, batteries (acid), fluorescent tubes (mercury), concrete.

Some examples of general waste generated on site:

Cool drink bottles, chip packets, plastic, leftover food, paper etc.

Correct handling, storage and disposal

- General waste must be disposed of in the green wheelie bins or marked skips provided
- Hazardous waste to be thrown in marked skips provided or 210L marked drums provided in certain areas
- The two must not be mixed!
- If hazardous waste is found in general waste, all must be disposed of as hazardous waste.

Why?

- The two waste types are disposed of at different waste dumps. The general waste dump is built only to deal with general waste. Hazardous waste accidentally disposed of here, could pollute the water and harm the people in the area.
- Disposal of general waste at a hazardous waste site results in an unnecessary cost to the company, as it is a lot more expensive to dispose of hazardous waste than general waste.

What is an incident?

- Mixed waste in any of the skips or bins.

DATE:	TIME:	LOCATION:
TOPIC:	Waste segregation	
ISSUE:	Mixing of wastes	
	Incorrect disposal of mixed wastes	



Air Quality Issues

7.

DISCUSSION:

The problem:

In 2007 the Minister of Environmental Affairs declared the western part of Mpumalanga as an air pollution hot spot. The area has been formally declared as the **Highveld Priority Area** and includes the Govan Mbeki municipal area which includes the town of Evander. The control of emissions and odours at the FFS site is therefore crucial.

Industry, such as the FFS site, is the biggest contributor to air pollution in this area and therefore emissions are to be strictly controlled and monitored utilising an Air Quality Management Plan.

Management:

Certain types of emissions (e.g. sulphur dioxide and nitrogen dioxide) have to be in line with specific air quality standards in the area. These have been developed by the government to reduce the amount of air pollution in this Evander area.

For the new processing facility that is being constructed on the FFS site, an Air Quality Specialist has assessed the expected emissions and concluded that the additional emissions will not contribute significantly to the current air problem. The tanks have been designed to stop air and other fumes from leaking out and FFS are required to maintain the tanks to make sure that no new leaks form over time.

What you can do:

Report any odours/smells on the site

Cover any open drums containing hazardous materials (e.g. fuel or nitric acid etc.)

Immediately report and smoke/fires


DATE:	TIME:	LOCATION:
TOPIC:	Air Quality	
ISSUE:	Highveld Priority Area	
	Air Quality Management Plan	



Appendix 10: Training Record
This is record of training carried out on site.

Date of Training	Name of Attendee	Signature	Details of Training course	Training provided by (name)

Appendix 4: MHI Risk Assessment (ISHECON; July 2010)

REPORT:	PRELIMINARY MAJOR HAZARD INSTALLATION RISK ASSESSMENT FFS REFINERS - EVANDER NEW WAXY OIL FACILITY
ASSIGNMENT NO:	J1109M
PREPARED BY:	Debra Mitchell Pr.Eng Telephone: 082 428 8844 e-mail : ishecon.dcm@global.co.za
CLIENT:	<i>Name:</i> Alison Haycock <i>Address:</i> FFS Refiners (Pty) Limited P O Box 25102 Sea View, 4072 <i>Telephone:</i> 031 459 5300 <i>e-mail :</i> Alison@ffs.co.za
DATED:	14 July 2010 
REVISION:	1 Previous site MHI RA Ref No J793M Aug 2007



INTEGRATED SAFETY, HEALTH AND ENVIRONMENTAL CONSULTANTS
to the chemical and process industries

ISHECON cc, H3 Pinelands Site, Ardeer Road, Modderfontein, Box 320 Modderfontein 1645
Tel: (011) 997.7945 Fax: (011) 608-2000 Cell: (082) 428-8844
Email: ishecon.dcm@global.co.za
CK 99/29022/23 VAT 4800182422

REPORT ADMINISTRATIVE RECORD

CONTRIBUTORS

NAME / TITLE	COMPANY
Alison Haycock	FFS Seaview – Environmental Manager
Neil Yelland	FFS Seaview – Project Engineer

DISTRIBUTION

NAME / TITLE	COMPANY	COPY
Debra Mitchell	ISHECON	Original
Alison Haycock	FFS	1

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APPENDIX B – Full list of incidents considered in the analysis

APPENDIX C – Frequency data used in this study

APPENDIX D – MSDS for Waxy Oil, Heavy Oil, Nitric acid

APPENDIX E – Emergency Procedures for the Installation and Evaluation Checklists

APPENDIX F – AIA Certificate

1. INTRODUCTION

FFS Refiners (Pty) Ltd have a coal tar refining facility at a site in the industrial area of Evander. A Major Hazard Installation Risk Assessment of the existing facility conducted in 2007 concluded that the site was a Major Hazard Installation. It as however, noted that the facility was a small MHI and under the equivalent United Kingdom regulations it would not be considered a Major Hazard Site. An Occupied Buildings study was also conducted fro the site to confirm on-site risks and the adequacy of protective measure in place.

FFS now propose to expand the existing facility by locating a waxy oil processing plant on site. The facility will receive waste waxy oil from Sasol and process it to produce usable heavy fuel oils. This preliminary MHI study was undertaken to determine whether the expansion would have major impacts on the site risk profile. This report summarise the results of the preliminary study as must be considered as an addendum to the existing site MHI RA Report until such time as a combined updated MHI Report is issued.

Although this assessment is based on the best available information and expertise, ISHECON can not be held liable for any incident which may occur on this installation and associated equipment which directly or indirectly relate to the work in this report.

2. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions have been reached and recommendations have been made

1. There can, under worst case conditions, be offsite impacts from catastrophic failure of the new bulk oil tanks, the nitric acid facilities and the high temperature processing equipment.
2. Therefore the waxy oil facility is an MHI addition to an existing MHI site.
3. Notifications for changes to the existing site should be undertaken as per the requirements of the MHI regulations (i.e. before commencing construction).
4. A copy of this preliminary risk assessment must be an addendum to the existing site MHI. They must both be available on the site at all times for inspection by the relevant authorities. This assessment can be made available to interested or affected persons who may wish to scrutinize the document.
5. Despite the fact that there could be offsite impacts the likelihood of occurrence of such accidents is low with the result that **the increase in offsite risks posed by the future Evander operations is very low.**
6. Therefore **from an MHI perspective this new facility does not present any major concerns** over and above those of the current site.
7. Never the less risks are not so low as to be considered totally acceptable and all reasonable risk reduction measures should be incorporated in the design so that the risks might be considered tolerable.
8. It should be noted that **on site risks will increase** with the proposed new facilities. The increase is not unacceptably high, but is in the 'tolerable provided ALARP' range. The increase is largely due to the new high temperature processing plant facilities as opposed to additional bulk storage.
9. As a result of increased on site risks it would be recommended that until such time as the occupied buildings study is updated, the following be considered for the admin building and the workshops located within 50m of the new processing plant :
 - a. Hardening of structures to ensure blast resistant windows on all sides,
 - b. Emergency exits from the buildings exiting towards the south or west/east, i.e. not only emergency exits towards the north.

- c. In terms of assembly points, it should be noted that with toxic fumes from nitric acid the best protection is afforded by a policy of shelter-in-place indoors.
- 10. The on-site emergency plans, e.g. assembly points, may need to be reviewed to take the new facilities and new hazards into account.
- 11. Land use planning restrictions suggested in the existing site MHI will be unchanged.
- 12. The full site MHI risk assessment and occupied building study should be updated, preferably at least prior to commissioning of the new facilities.

3. ASSESSMENT METHODOLOGY

The assessment methodology was the same as for the existing site.

There will be no prescribed quantity (as per Schedule A in the General Machinery Regulations under the OHS Act [Ref. 1]) of any substance is kept on site in one fixed vessel.

Apart from environmental considerations, combustible materials with flash points above 55 deg C are not included in the list of potential COMAH materials in the United Kingdom. There will be less than 4500 tons of various oils on the new site all of which have flash points above 55 deg C. Therefore in the UK the new facilities would most likely NOT be considered a COMAH site.

4 DESCRIPTIONS

4.1 DESCRIPTIONS OF ORGANISATION, LOCATION, SITE AND SURROUNDING HUMAN ACTIVITIES

FFS Refiners (Pty) Ltd is part of the Fuel Firing Services group. The main focus of the company is the recovery of used or waste hydrocarbons for reuse and they have a few facilities around the country, e.g. Durban, Evander etc.

The Evander FFS facility is located in the industrial area of Evander to the south west of the town. The physical address is:

Erf 2510 Evander Industrial Park Evander
--

The following surrounds the site. Refer to the existing site MHI RA Report for maps and photos etc.:

- Other factories and facilities in the industrial area for 0.25 km to the north, east and south (Joran's Tanker cleaning services to the north east, Rickie B Transport, TR projects, JL Distributors to the east and a concrete and sand supply yard to the south, land to the west and north is vacant at present)
- The main road R546 from Evander to Standerton to the east (250m)
- The Evander Golf Course a further 100m east of the R546
- Residential areas of Evander over 750m to the north east

FIGURE 4.1.1 – Map of Evander showing the Location of the Existing FFS Site



FIGURE 4.1.2 – Site Layout Showing the Proposed new Facilities in Red



4.2 METEOROLOGICAL, GEOGRAPHICAL, ECOLOGICAL AND TOPOGRAPHICAL CONSIDERATIONS

Refer to previous MHI RA. Conditions unchanged.

4.3 INSTALLATION PROCESS DESCRIPTION

Refer to the Project Proposal – Oil Re-Refining Plant FFS February 2010 for details used in this study and reproduced below.

MATERIAL RECEIVING

The product will be received in 26 – 34 ton road tanker loads. These will be received on site via a weighbridge to determine the mass of product received and then pumped into a raw product tank. Samples will be taken in order to determine the degree and characteristics of the contaminants. This will determine the processing steps required to meet market demand.

PROCESSING

The process will remove the ash or non-combustible contaminants, these being iron and iron carbide, as well as carbon particulate from the waxy oil. The processing steps are viscosity reduction, particulate removal, ash reduction, drying and blending.

The first step is the reduction of the viscosity of the waxy oil which facilitates processing, especially separation, and is also required to meet the market specification suitable for industrial heating fuels. The raising of the temperature, using an oil fired heater, to around 340°C under pressure reduces the chain length without significant loss to incondensable gasses in the heat soak plant. Further “trimming” of the viscosity is done with additives.

Separation of the waxy oil and iron catalyst is a progressive process dependant on the characteristics of the contaminants and the specification of the final product required. The use of static separators and centrifuge separators depend on the specification quality of the final product and the processing cost.

Once the viscosity of the waxy oil is reduced, the material is fed into a static separator where large particles are separated. This process is assisted by the temporary reduction of viscosity by means of heat (120°C), the reduction in pH and surface tension through the addition of proprietary chemicals. Should iron contamination be excessive the use of magnetic separators on the hot stream exiting the heat soak plant will be used to reduce the loading.

From the static separator, material containing a high content of solids is fed into a de-ashing vessel, where wash water is used to facilitate the removal of the ash in a liquid phase – this is a very effective separation process. The water is then removed and recovered by means of a multistage evaporator. Centrifugal separation may be required to further remove solids before and after the de-ashing step. The carbon particulate, due to its low density, is best removed by means of filtration. However excessive waxes in the process stream may blind filter media requiring the chilling of the stream which will result in the separation and removal of waxes prior to filtration. This stream of wax would be retreated in the deashing plant and re-constituted with the oil after the filtration stage.

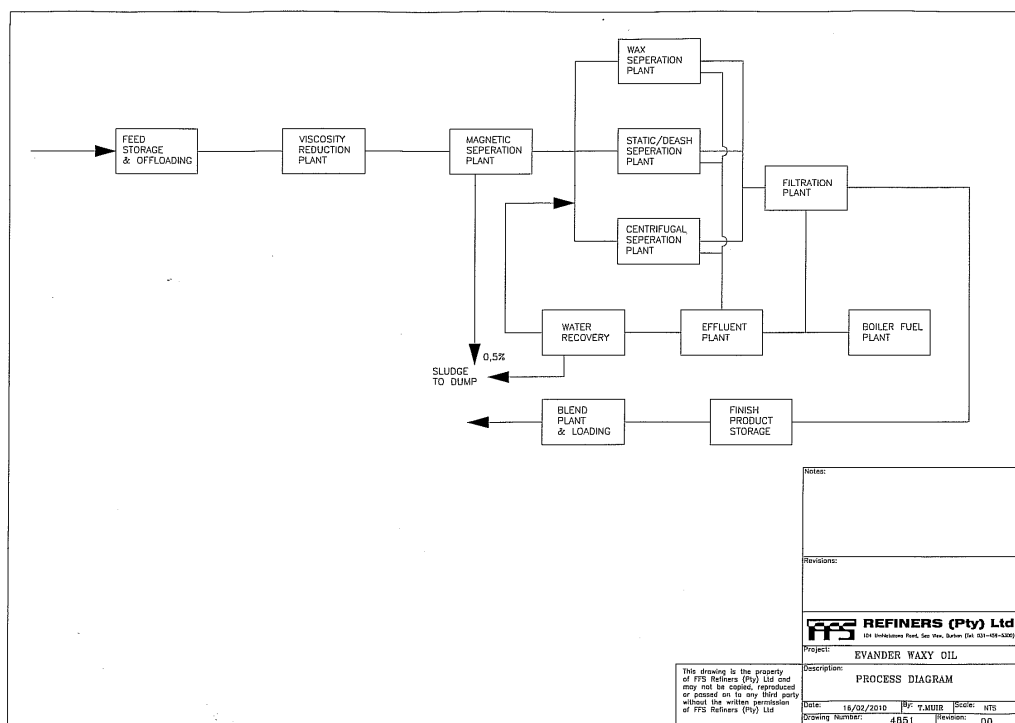
Filtration is effective down to micron size particulate and has the benefit of producing the least amount of waste and the lowest loss of oil. The filter cake can be made very “dry” or oil free and is suitable for use as a heating source in a coal-fired steam boiler.

After filtration the processed low sulphur oil stream is stored in a blend tank. This will then be blended into an industrial heating fuel with various other fuel oils before final storage.

FINAL PRODUCT

The product will be pumped to a final product storage tank where it will be kept at a temperature of 60 – 70°C ready for load-out to road tanker for delivery to customers. The plant will produce 60 000 tons/year.

The diagram below represents the process.



In addition to the above processes there will be a large distillation column with the ability to run at high process temperatures and low process pressure conditions, e.g. high reboiler temperatures with using thermal oil from a fired heater with a range of vacuum pressures. The unit has a large reboiler and is used to run varying batches of fuels.

Nitric acid can also be added to the waxy oil process to react with inorganic elements in the de-ashing process.

GENERAL

It should be noted that no piping and instrumentation diagrams, detailed process flow diagrams, equipment data sheets or other written indications of process conditions and parameters were available to the assessor at this stage of the project. Information was therefore based on data obtained from similar facilities operating at other FFS site. This information should be made available for the full MHI update.

5 RISK ASSESSMENT

5.1 IDENTIFICATION OF HAZARDS

5.1.1 HAZARDOUS MATERIALS ON THE SITES

The following compounds (or groups of compounds) are used / produced / handled on the site. Note that only the largest or most hazardous (from an MHI perspective) materials are mentioned individually in this table, the rest are grouped together.

Material	Annual Through-put t/a	Maximum Inventory t	Maximum Single Storage Unit t	Physical Form
Waxy oil	60 000	2 200	1 200	Liquid
Recovered heating oil HFO	60 000	2 200	1 200	Liquid
Nitric acid	200	10	10	Liquid
Thermal oils		5	1	Liquid

For the materials stored in the general stores and workshops on site (e.g. various brands of cleaning fluids, oils etc.), it is not practical (nor does it add significant value) to analyse each compound in detail with respect to its properties etc.

As discussed not all of the above materials have the potential to affect persons outside the premises. The above materials were categorised according to SANS 10228:2003 [Ref. 2] classes of dangerous substances, as below:

- CLASS 1 - Explosives (covered by explosives act and not considered in MHI regulations)
- CLASS 2 - Gases (only flammable or toxic gases could impact on the public)
- CLASS 3 - Flammable liquids (these could form large pool fires, or release flammable vapour clouds)
- CLASS 4 - Flammable solids (could contribute to warehouse fires etc.)
- CLASS 5 - Oxidising substances and peroxides (possible explosions)
- CLASS 6 - Toxic and infectious substances (only MHI if emit vapours that can effect persons outside the boundary, or liquids are extremely close to site boundary with no containment)
- CLASS 7 - Radioactive materials (excluded from MHI, covered by other regulations)
- CLASS 8 - Corrosives (generally not a major hazard unless very close to public at the boundary)
- CLASS 9 - Miscellaneous, materials that are combustible and can lead to escalation of fires or toxic products of combustion

TABLE of classification according to SANS 10228:2003

	Gases or liquefied gases	Flammable Liquids	Flammable Solids	Oxidising substances	Toxic Vapours released from spill or mixing	Corrosives	Combustible with noxious decomp products or other	Potential MHI Issue (i.e. accidental impact off-site)
	CLASS 2	CLASS 3	CLASS 4	CLASS 5	CLASS 6	CLASS 8	CLASS 9	
Waxy Oil		Yes						Possibly
Product Heating Oil HFO		Yes						Possibly
Nitric acid					Yes	Yes		Possibly
Thermal oils		Yes						Possibly

5.1.2 EXPLOSION, FLAMMABILITY AND REACTIVITY HAZARDS

Compound	Cn	Melting Point (deg C)	BP at 1 atm (deg C)	SG at 20deg C kg/m ³	Pour point (deg C)	Flash point (deg C)	Explosive limits in air (vol %)	Heat of combustion (kJ/kg)	Modelled as:
Waxy oil	Cn 20 – 40		240	0.9 - 1	30 -40	>100	1 – 5 Worst case	44 000	Decane 20%, Pentadecane 40%, Eicosane 30%, pentacosane 7%, triacontane 2% and Dotriacontane 1%
HFO	Cn 10 - 20		150	0.96 – 1.02		66	Yes	44 060	Decane 22%, Pentadecane 45% and Eicosane 33%
Thermal oil		-39	260	1 06		124	0.6 – 6.2	44 000	73% Diphenyloxide, 27% biphenyl

5.1.3 HEALTH HAZARDS ASSOCIATED WITH CHEMICALS

With respect to the detrimental health effects of chemicals on the public, it is really only the inhalation effects that are relevant. Skin contact and ingestion effects are only applicable to workers who are in immediate contact with the chemicals.

Compound	Hazardous Breakdown / Combustion Products	Inhalation Acute	Inhalation Chronic	Ingestion Contact Acute	Ingestion Contact Chronic
Oils	Carbon mon / di - oxide	Irritating to the respiratory tract	None	Irritating to the eyes	Mild skin discomfort
Nitric Acid	Nitrogen dioxide	DELAYED EFFECTS of cyanosis and pulmonary oedema can be lethal. Immediate pain may be significant but it is the delayed effects that are significant	Irritation, corrosion of the teeth and slowly development of pulmonary oedema.	Severe burns, blindness, epiglottal oedema and asphyxiation	Dermatitis, conjunctivitis, blindness

Compound	Odour Threshold (ppm)	Time Weighted Average OEL (ppm)	Short Term Exposure Level (ppm)	Immediately Dangerous to Life and Health (ppm)	LC 50 (30 mins)	ERPG 1 Value (ppm)	ERPG 2 Value (ppm)	ERPG 3 Value (ppm)	PROBIT k1	PROBIT k2	PROBIT n
Oils		5 mg/m3									
Nitrogen dioxide	3	3	5	50	235	3	15	50	-16.16	1	3.7

** TWA Threshold Limit Value – the time weighted average for a worker exposed 8 hours per day for a 40 hour week
 *** STEL short term exposure limit for a worker exposed to not more than the TWA but with a maximum of 4 excursions to this limit per day for a maximum duration of 15 minutes each with at least 60 minutes between exposures
 **** IDLH (Immediately Dangerous to Life and Health) a value that is believed on the basis of research to be immediately harmful to human health, i.e. irrecoverable damage to health within 30 minutes exposure
 ***** The ERPG (Emergency Response Planning Guidelines) values are established by the American Hygiene Association and are based on a 60 minute exposure. The three categories have the following implications in terms of effects on people:
 ERPG1 - minor irritation ERPG2 - no permanent harm ERPG3 - permanent harm possible but fatalities are unlikely
 d where ERPG values are not available they have been derived using a DOW chemical guideline where ERPG2 = STEL or 3 * TWA, ERPG3 = LC50/30 or 5 * ERPG2.
 ERPG1 = Odour threshold or ERPG2/10, if there are different values the lower more conservative value has been used
 ~~~ Probit is an estimation of chance of death from exposure to a concentration of toxic material ( c in ppm ) for a period of time ( t in mins) PROBIT = k1 + k2 \* ln ( c<sup>n</sup> t





The inhalation Threshold Limit Values (TLV's) are usually used to gauge the health effects, however, they are really only applicable to workers inside the factory. What is relevant for the public in terms of catastrophic major hazardous incidents, are the concentrations at which health effects become significant. Often the so called Immediately Dangerous to Life and Health limit (IDLH) or ERPG 3 values are used as preliminary estimates of unacceptable concentrations. However, these are only single values for fixed time periods. For short exposures it is necessary to use probit information. Probits are equations that relate the chance of fatal injury to both the concentration of exposure and the duration of the exposure (i.e. the so called "dose"). Probits can readily be converted into a probability of fatalities (i.e. lethality).

#### 5.1.4 HAZARDOUS MATERIALS INTERACTIONS

Most of the materials entering and leaving the site via road tankers are organic oils. Inadvertent mixing may lead to contamination but no process hazards.

The mistaken addition of nitric acid to organic materials or vice versa can lead to oxidation reactions and generation of heat and NO<sub>x</sub> fumes. However, no violent explosions are expected with <60% nitric acid. Offloading points will be fitted with different couplings to further reduce the risk of a mixing incident.

#### 5.1.5 HAZARDOUS MATERIALS BREAKDOWN PRODUCTS

There are no natural hazardous breakdown products of the materials as they are normally stored and used. However during a fire scenario there will be highly noxious smoke possibly containing carbon monoxide and dioxide, sulphur dioxide and NO<sub>x</sub> gases. These are however typical combustion products off almost any fire and present no specific major hazard threats.

#### 5.1.6 ENVIRONMENTAL HAZARDS

Assessment of environmental impacts is not included in this Major Hazard Installation risk assessment as it should be addressed in the EIA or EMP for the facility.

Note should be taken of the requirements of the new National Environmental Management Act (NEMA) which require various reports to be submitted in the event of any serious incidents on the installation. Safety, Health and Environmental management systems must be in place to facilitate the recording and reporting.

### 5.2 INCIDENT AND ACCIDENT HISTORY

The primary hazardous materials on site are oils and nitric acid. A study of the recorded history 1969 –1999 [Refs. 8 & 9] of incidents related to production, transport and storage of these materials indicates that there have been some significant incidents.

| Date | Place | Material  | Description                                                                  | Consequences |
|------|-------|-----------|------------------------------------------------------------------------------|--------------|
| -    | -     | Heavy oil | Numerous events where heavy oil was over heated in pump bearings, compressor | Few injuries |

| Date     | Place | Material    | Description                                                                                        | Consequences                |
|----------|-------|-------------|----------------------------------------------------------------------------------------------------|-----------------------------|
|          |       |             | bearings etc and ignited, or was released an ignited on hot surfaces such as steam lines.          |                             |
| Apr 2000 | USA   | Nitric acid | Spill                                                                                              | 17 injured<br>200 evacuated |
| Sep 1998 | UK    | Nitric acid | Spill mixed with cleaning fluid leading to explosion                                               | 2 injured                   |
| 1998     |       | Nitric acid | Offloaded into formic acid. Explosion and toxic vapours                                            |                             |
|          |       | Nitric acid | Canned pump exploded when acid reacted with copper motor wirings                                   | 1 injury                    |
|          |       | Nitrogen    | There are no recorded incidents of mass offsite fatalities associate with releases of inert gases. |                             |

Operating staff at the existing installation recall that there was an internal explosion in a heavy fuel/tar tank on the old Secunda installation as a result of unauthorized hot work. There have been a few small equipment related fires on the existing site but no major events. There have been spills but these have been cleared up without ignition occurring

### 5.3 IDENTIFICATION OF POTENTIAL MAJOR HAZARDOUS EVENTS

The possibilities of the following hazards were considered:

- fire
- explosions
- toxic gases
- external (jet, pool, flash)
- internal
- confined within a building
- unconfined
- BLEVE
- acute exposure

There are other hazards that are typically considered during a design risk assessment of a new chemical installation, such as pollution, violent release of energy, noise, aesthetics etc.

For the purposes of the assessment of major hazards, the focus of the legislation is on the instantaneous detrimental effects of hazardous chemicals. The hazards of noise (low level, not explosions ) are not immediate and therefore do not form part of the MHI hazards. In a similar vein, chronic exposure to chemicals is a long term hazard. It is not a Major Hazard Installation issue, and is rather covered under the Hazardous Substances Regulations. The hazards associated with the violent release of energy (kinetic or potential) were also not considered as they form part of the pressure vessel and general machinery regulations.

### 5.4 CAUSE ANALYSIS

#### 5.4.1 TYPICAL CAUSES OF HAZARDOUS INCIDENTS

As the hazards being assessed will usually originate from loss of containment i.e. gas released from piping, flammable materials released from vessels etc., the following main causes of the hazards were identified:

Failure of equipment:

1. Deterioration of the equipment integrity (physical impact damage, material of construction failure e.g. stress corrosion cracking). Although this is not fool proof, the best assurance against failure is correct design, specification, fabrication and construction procedure followed by thorough inspections throughout the life of the equipment.
2. Uncontrolled pressure rise in the pipes and vessels due to liquid blocked-in between two isolation valves, liquid exposed to fire, heat etc.
3. Failures of the preventative systems e.g. computer controls, control instruments and hardware trips.
4. Failure of the protective / mitigative hardware barrier systems e.g. bund walls,

Failure of systems:

1. Failure of the preventative systems through human or management system errors.
2. Failure of the protective / mitigative systems through human and procedural errors.

Another major hazard that is usually assessed is an internal fire / explosion. This requires the ingress of foreign oxidising materials ( e.g. air or strong acids ) into the system containing flammable materials and then some form of ignition of the mixture. This is generally caused by inadequate purging during shut down, and start up operations. The source of ignition is often hot work tools during maintenance, warming up procedures, static or high process temperatures.

#### **5.4.2 PREVENTATIVE AND PROTECTIVE MEASURES**

The following protective features are incorporated in the design of the installations to minimise Major Hazard Incidents.

#### **QUALITY ASSURANCE**

- There will be safe operating procedures of most of the activities on site
- Operators will be trained and retrained where necessary to perform their allotted functions.
- Tanks designed to comply with SANS10089.
- There will be a permit to work system in operation on the site.

#### **PROTECTIVE FEATURES**

- All bulk storage tanks and all processing areas are fully bunded to contain 110% of the largest tank.
- Curbed nitric acid offloading area.
- There is an on site emergency plan.
- There is fire water, foam spraying systems, trained fire fighting personnel on site.

#### **5.4.3 MHI TYPE INCIDENTS TO BE QUANTIFIED FOR MHI CLASSIFICATION OF THE SITE**

All the incidents considered in this study are listed in the table in **APPENDIX B**. Please note that this is not an exhaustive list of all incidents on the site that could impact on personnel. However, it represents most of the conceivable incidents that could affect persons outside the site and therefore also employees on site. From this list only the incidents that were assessed (on the basis of the estimated extent of the likely consequences) to be possible or probable major hazard incidents were further evaluated.

## 5.5 CONSEQUENCE ANALYSIS

### 5.5.1 MAGNITUDE OF SOURCE TERM

Information about two aspects of a loss of containment incident is required in order to determine the magnitude of a release; i.e. the rate at which the release occurs (or the size of the incident) and the duration of the release. In terms of the rate of release the following are generally applicable:

For vessels including cylinder, the following scenarios are usually considered;

- complete rupture,
- a large hole the size of the largest appurtenance (typically 100 mm),
- a small hole the size of a typical flange leak or valve stem leak (typically 10 mm).

For pipes:

- complete severance (full bore e.g. 50 mm),
- a small leak (the size of a typical flange leak, 10 mm).

These scenarios were used to evaluate the consequences using a modelling package called PHAST RISK (version 6.54). This package has built in fluid dynamics simulations and prior to simulating the consequences, accurately calculates the flows due to ruptures, leaks etc. based on pressures, temperatures, pipe diameters and material properties.

In terms of the duration of incidents where specific information is not available or calculable, the duration was estimated using the British Health and Safety Executive (HSE) standards [Ref. 5]:

|           |   |                                                                                                                                                                               |
|-----------|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 min     | - | for automatically detection and isolation, e.g. in the event of a pipe rupture and rapid de-pressurisation leading to a plant trip                                            |
| 5 mins    | - | for remotely operable isolation e.g. operator responds to panel alarm and can isolate either on the panel or at strategically located external isolation valves.              |
| 20 min    | - | operator is required to isolate manually directly at or very close to the source of the release e.g. required to don a BA set and move through vapour cloud to close a valve. |
| 5 seconds | - | for normal lifting and re-seating of relief valve                                                                                                                             |

The events considered in this study, fire and explosions, do not require an estimation of the duration of a release event as they can occur without any release actually occurring.

### 5.5.2 DISPERSION MODELLING

For evaluation of the consequences of vapour dispersion incidents, PHAST RISK version 6.54 was used. Any vapour released from a source will form a cloud that will eventually disperse completely into the atmosphere. Generally, ground level concentrations will decrease as one moves further away from the source. Dispersion of gas clouds is governed by the prevalent weather conditions including:

- Wind speed and direction ( essentially horizontal mixing )
- Stability of the atmosphere ( essentially vertical mixing )

The latter is essentially the extent to which wind turbulence, which is responsible for the dispersion, is suppressed or assisted. On cold windless nights, cold air is trapped close to the surface of the earth and any gas release will not be easily dispersed. On the contrary, on a hot summer's day there is generally a lot of turbulence in the air due to heating of the earth's surface and the air in contact with it. This aids dispersion of gases. These conditions had been labelled with the letters A to F. Using the wind weather information presented in **APPENDIX A** (also see description in Section 4) the following two broad weather categories were chosen due to their being the dominant conditions; F2 (stable and low wind speed 1 m/s typical night time) and D5 (unstable and moderate wind speed, typical day time). These represent both low and high wind speed conditions and well as day and night conditions. Generally the weather condition F with a low wind speed of <1.5 m/s results in the worst case toxic vapour concentrations. The American EPA recommends this scenario must be simulated when doing MHI type risk assessments [Ref. 15]. The UK HSE also uses weather categories similar to this when doing risk assessment verifications [Ref. 16].

The principal results from dispersion calculations are the concentrations at ground level at various distances down wind from the release source. In addition concentration isopleths in the vertical and horizontal planes can also be obtained. There are many dispersion combinations, due to the different probabilities of weather stability's and wind speeds. The wind direction was considered only for the eight major wind directions and the percentage of time that the wind is blowing in a particular direction was used to determine the final risk levels.

Following dispersion of the vapour the flammable or toxic concentrations can be determined at certain key distances from the installation. The radiation and explosion effects will also be determined at specific locations such as the closest neighbouring facilities, the site boundary, the on-site admin building etc.

### 5.5.3 EVENTS INVOLVING FLAMMABLE MATERIALS

The consequences of each of the flammable hazardous events are radiation burns, blast and shock wave damage and possible damage due to missiles. In general, every flammable release will have radiation and explosive effects. However, depending on the type of release either the radiation or the over-pressure (explosion) effects will dominate the severity of the consequences. For example the explosive effects of a jet fire are negligible in comparison with the radiation effects, and vice versa for a confined vapour cloud explosion.

The major consequence of an explosion is the shock wave effect. The shock wave shatters glass, damages equipment and can cause fatalities either directly through rupture of bodily organs or indirectly through structures collapsing onto people.

The following over pressures are usually considered in a risk assessment, and a pressure of 14 kPa is taken as the MHI fatality threshold for explosions.

**TABLE 5.5.3.1 – Levels of Damage at Key Explosion Overpressures**

| Over-pressure ( kPa ) | Injuries Fatalities / | Structural Damage                               | Other |
|-----------------------|-----------------------|-------------------------------------------------|-------|
| 100                   | 100 %                 | Typical blast wall design limit                 |       |
| 70                    | > 90 %                | Almost complete demolition of plant 100% damage |       |
| 35                    | Eardrum Rupture       | 80 % damage                                     |       |

| Over-pressure<br>( kPa ) | Injuries<br>Fatalities  | /  | Structural Damage         | Other                                  |
|--------------------------|-------------------------|----|---------------------------|----------------------------------------|
| 14                       | < 1%                    |    | 40% damage                | HSE development separation distance    |
| 7                        | Injuries,<br>fatalities | no | 5 % damage                |                                        |
| 4                        |                         |    | Minor structural damage   | HSE safe housing consultation distance |
| 0.7                      |                         |    |                           | Maximum missile distance               |
| 0.3                      | Loud noise              |    | Large glass windows break |                                        |

An explosion generally produces missiles as well as over-pressure wave. With respect to missiles it is unlikely that they will travel kilometres to affect the public directly, and moreover the large area of possible strikes means that the probability of a public fatality is so low that it is generally not worth considering as a major hazard.

The consequences of fires are damage to equipment and radiation burns to people. In terms of burns there are two aspects that are important, namely the intensity of the radiation and the duration of exposure. In quantifying the magnitude of a fire the information is presented in the form of radiation intensities for simplified specific exposure times. It is assumed that 1 minute is insufficient time to escape from the source of the threat. In this regard the following radiation guidelines have been used.

**TABLE 5.3.3.2 – Levels of Damage at Key Fire Radiation Levels**

| Radiation<br>Intensity<br>kW / m <sup>2</sup> | Exposure Limit<br>( time ) | Consequence                                                |
|-----------------------------------------------|----------------------------|------------------------------------------------------------|
| 75                                            | 5 secs                     | 100% lethal                                                |
| 37.5                                          | 1 min                      | 100 % lethal, will damage process equipment and structures |
| 15                                            | 1 min                      | 50 % lethal, permissible structure exposure level          |
| <b>12.5</b>                                   | <b>1 min</b>               | <b>&lt; 1 % lethal</b>                                     |
| 4                                             | 1 min                      | No fatalities expected                                     |
| 1.6                                           |                            | Pain Threshold, typical flare design limit                 |
| 1.2                                           | Unlimited                  | Equivalent to midday sun                                   |

This means that any person in the 37.5 kW/m<sup>2</sup> radiation circle for a minute is likely to be fatally burned, while there is a 50% chance of those persons between the 12.5 and 37.5 kW/m<sup>2</sup> radiation circles being fatally burned within a minute. Outside of the 12.5 kW/m<sup>2</sup> radiation level there are less than 1% fatalities. A level of 4 kW/m<sup>2</sup> is taken as the MHI fatality threshold for huge fires close to open public areas where shelter or escape is unlikely and a level of 12.5 kW/m<sup>2</sup> is taken as the threshold for small fires or where there are buildings and structures that provide some shielding between the public and the source of the fire.

The consequence modelling results for selected incidents are presented in the following section (note information on all incidents can be made available on request).

#### 5.5.4 TOXIC RELEASES

With information on the dispersion of the vapours, the extent of toxic effects can be determined. In order to evaluate the combined effects of exposure levels and the duration of the exposure PHAST makes use of so called probit equations. These logarithmic equations correlate the probability of fatalities to any concentration of the vapours combined with any time of exposure.

However, it is often useful to have a single number or single concentration of toxic vapours that can be used as a first approximation to the extent of dangerous exposure. For example there is the concentration which is deemed to be Immediately Dangerous to Life and Health (IDLH) and it is the concentration that can cause significant harm to almost all persons within 30 minutes of exposure.

Another single number that is often used is the Emergency Response Planning Guidelines that were developed by a consortium of chemical companies under the auspices of the American Industrial Hygiene Association. These guidelines indicate the maximum exposure concentrations that can be endured for 60 mins (i.e. a reasonable evacuation period) with certain levels of effects.

|        |   |                                                                   |
|--------|---|-------------------------------------------------------------------|
| ERPG 1 | - | only mild irritation will result                                  |
| ERPG 2 | - | no permanent damage                                               |
| ERPG 3 | - | no life threatening health effects<br>(Possible permanent damage) |

Often the ERPG3 and IDLH concentrations are often similar. Generally emergency services would consider evacuation of persons who could be exposed to ERPG 2, ERPG 3 or IDLH concentrations depending on their resources. Therefore, the local emergency services need to know the distance at which the gas concentration would drop below this concentration under both probable and well as worst case release scenarios.

#### 5.6 SEVERITY ANALYSIS

The maps, photos and graphs in the sections below present the expected extent of the various potential accidents.

The flammable events are shown as the radiation intensities or explosive overpressures which can be related to fatalities through the data in the tables in the previous section.

The toxic plumes are presented both as concentration contours and as lethality contours. Lethality is the probability of fatal effects if a person is exposed for the full duration of the event. A lethality of 1 = 100% chance of being fatality affected and 0 = no fatal effects likely.

##### 5.6.1 EXTERNAL FIRES

A cloud of flammable vapours when ignited can burn as a flash from the point of ignition on the edge of the cloud and back to the source of the vapours, which is usually a spill / pool of flammable liquid or a release / jet of flammable vapour/liquid.



#### 5.6.1.1 Flash Fires

The photos below show the effect circles for various types of flash fires that could occur on the site. Persons in the areas within the blue circles may be fatally affected as their clothing may catch alight etc. There are not likely to be major flash fires associated with failures of the stock tanks as the liquids are stored at low temperatures. The areas of concern for flash fires are the high temperature processing units.

Flash fire after catastrophic rupture of the distillation reboiler  
(note there may be fatalities within the area of the blue circle = MHI threshold within the site)



Flash Fire after rupture of a pipe conveying high temperature thermal oil on distillation unit  
(note there may be fatalities within the area of the blue circle = MHI threshold slightly beyond the site)



Flash Fire after outdoors rupture of FFE circulation Line  
(note there may be fatalities within the area of the blue circle = MHI threshold mostly within the site)



The above plots show that the effects of most flash fires on the processing or storage units on site are unlikely to have catastrophic effects on persons outside the site. There could be significant effects on employees from major and minor flash fires.

However, it should be noted that there is fine line between when a flash fire occurs and when an explosive deflagration occurs. Although the flash fires above are not significant MHI events, were the releases to lead to explosions (e.g. if dispersion is slightly more effective, if there is more confinement etc) the effects could be significant, see section 5.6.2 below.

#### 5.6.1.2 Pool Fires

Given that the materials on site are mostly below their boiling points, major pool fires are more likely than huge flash fires. Fires involving an entire bunded area can be particularly intense and may lead to damage to other tanks in the bund.

Radiation levels associated with a pool fire in the new 1.2 MI product tank with simultaneous bund failure  
(note fatalities possible within yellow circle = MHI threshold beyond the site)





Radiation levels associated with a pool fire inside the bunded area of the new 1.2MI feed tank  
(note fatalities possible within yellow circle = MHI threshold not significantly beyond site )



The above photos clearly show that the potentially fatal effects of only the worst case pool fire scenarios can extend beyond the site boundary.

#### 5.6.1.3 Jet Fires

Leaks on high pressure high temperature equipment may result in a jet fire. If there are catastrophic failures these are likely to rapidly depressurize the plant and the jet will not be sustained. However small leaks can be sustained for some time. Jet fires are high intensity fires and often impinge directly on near-by equipment leading to domino failures. Most of the equipment on the plant operates under vacuum conditions and therefore jet fires are highly unlikely. In addition they should be limited to the plant area and have no offsite effects.

#### 5.6.2 UNCONFINED EXPLOSIONS

If a large amount of flammable vapour is formed in the air, e.g. due rupture of a high pressure high temperature vessel containing hydrocarbons, the gas / aerosol could ignite as a flash fire (see section above) or explode with devastating force. If there is a delay between the release and ignition thereof, the flammable cloud may have migrated some distance down wind before the explosion occurs.

Given the number of hot surfaces on the FFS site the chance of finding an ignition source within a hundred meters or so is very likely. Flash fires are therefore the more likely events with most releases. It is therefore only the high pressure high temperature releases from processing equipment that are likely to be sufficiently dispersed to present major explosion hazards. As for jet fire the equipment operates under vacuum conditions and therefore the chance of large releases of flammable liquid/vapour mixtures is highly unlikely. It should also be noted that ignition with explosive force does not occur with every release, in fact ignition may only occur one in ten releases and explosion a further one in ten of these. The likelihood of explosions is therefore relatively small although as will be shown below the consequences are extremely severe.

Blast Over pressure circles from the delayed explosion of the vapours formed from the released contents of a catastrophically failed reboiler on the distillation plant

(note the bold circles photo show maximum effects in all directions – actually cloud is only the faint circle and it will only move in one direction at a time)

(The MHI threshold of 14 kPa is the green circle – not beyond site boundary)



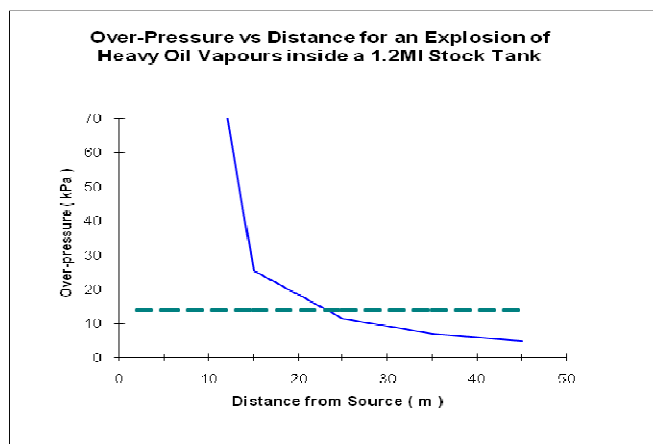
The above map shows that these catastrophic failure events are unlikely to extend significantly beyond the site boundaries.

### 5.6.3 CONFINED EXPLOSIONS

A confined explosion requires the accumulation of flammable vapours within a building or structure prior to ignition. These types of scenarios could occur where ventilation is inadequate and flammable vapours accumulate in the building. However, the effects of such explosions are generally limited to within 10 – 15m of the structure.

### 5.6.4 INTERNAL EXPLOSIONS

A special case of confined explosion is the internal explosion. Here the event happens within a vessel. Usually a large part of the energy of the explosion is used in bursting the vessel itself and these events tend not to be as destructive as the previously mentioned types of explosions. However, there are on site some very large vessels and the potential effects can extend slightly beyond the site boundary, e.g. the graph below shows the effects of an internal explosion in a 1.2 MI tank extending over 25m.



### 5.6.5 BOILING LIQUID EXPANDING VAPOUR EXPLOSION (BLEVE) OR FIR

One of the most significant types of event associated with liquefied hydrocarbons is a BLEVE or fireball. A BLEVE occurs when an external fire impinges on a vessel weakening the metal and heating up the contents of the tank.

Eventually after some time the metal fails catastrophically and the entire contents of boiling liquid is released in a huge fireball. Although there is an explosive element to these events it is the radiation from the fireball in the sky that tends to cause most damage. The fact that this type of event usually takes some time to develop can allow for evacuation of persons to a safe area. Below is an example of the reboiler on the distillation plant.

Radiation circles from the fire-balling of the reboiler on the distillation plant  
(Note the yellow line is the MHI threshold)



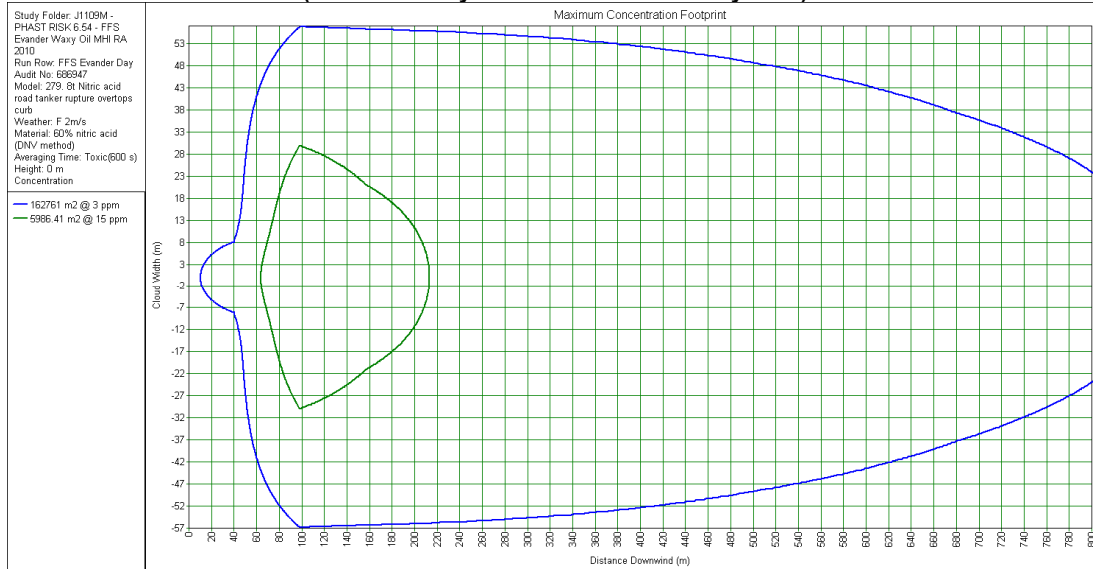
The MHI threshold for a BLEVE of the reboiler extends 20m from the unit, i.e. not beyond the site boundary.

#### 5.6.6 TOXIC RELEASES

The only material potentially releasing large quantise of toxic fume is nitric acid. Acid is generally delivered during the day and the plumes below show the effects under worst case weather conditions. It should be noted that the plumes are only shown for one wind direction but they apply equally in all other directions.



## 8 kl 60% nitric acid road tanker rupture– maximum ground level concentrations (worst case daytime conditions northerly wind)



## 8 kl 60% nitric acid road tanker rupture – outdoor lethality levels (worst case daytime conditions northerly wind) (Red is 100% lethal, Yellow 10%, and green 1 % = MHI threshold)





## **5.7 MHI CLASSIFICATION ACCORDING TO THRESHOLDS**

As can be seen from the discussion in the previous sections, it is expected that the extent of only the very worst case potential accident scenarios on the new FFS waxy oil facilities, e.g. catastrophic tank rupture and simultaneous bund failure, could have impacts beyond the site boundaries. As a result of these events the FFS waxy oil operation should be considered as a **Major Hazard Installation**. It should however be noted that due the protective features incorporated in the design, the more likely events, hose ruptures, tank failure into bunded area etc, will not have major impact beyond the site boundary. There are no events expected to impact on the residential areas of Evander.

## **5.8 EFFECTS ON ADJACENT INSTALLATIONS (DOMINO EFFECTS)**

At various levels of explosion over-pressure (70 kPa) and fire radiation levels (37.5 kW/m<sup>2</sup>) process equipment integrity can be expected to be adversely affected.

There are no other MHI's in the immediate vicinity of the site and therefore no significant domino effects are expected.

However it should be noted that potentially highly destructive levels of radiation and explosion over-pressure could result from accidents on the distillation plant, the FFE plant etc. These could extend over the plant control room, administration and workshop buildings. This may pose high risks and an update of the site occupied building study should be conducted as part of the MHI update to evaluate the risks against international guidelines such as the "Guidance for the location and design of occupied buildings on chemical manufacturing sites", by the Chemical Industries Association, November 2003, London [Ref 20]. In the interim FFS should harden the structures in the form of shatter-proof film on the windows of the admin building and workshop as well as ensuring escape routes out of these buildings away from the plant towards the south.

In addition to the above there is a risk of large failures on one plant leading to secondary failures on adjacent plants, e.g. impingement of jet fires directly on other equipment, explosion damage, missile damage, radiation damage.

## **5.9 LIKELIHOOD OF MAJOR HAZARDS**

To determine the likely frequency of occurrence of MHI type events generic failure data was used as well as any data available from the site. The standard failure data used for these types of failures was adjusted to account for the assessors evaluation of the effectiveness of the 'systemic organizational factors' in operation on site, i.e. the perceived level of maintenance and housekeeping and how effective is the actual implementation of any safety management system etc. The site was subjectively evaluated as being fairly very well maintained and organised and therefore generic failure data was not significantly penalized.

Some details are in **APPENDIX C**, while the table below summarises SOME of the frequencies for MHI type events. From the table it can be concluded that the mostly likely failure events on site are small leaks on heat exchangers, once in 500 years. However, these are unlikely to be MHI events with major off site impacts.

Events which might impact offsite are large ruptures on heat exchangers, especially the reboiler, one in 2 000 years. The potentially major catastrophic events such as a rupture of a large stock tank overtopping or compromising the bund walls are likely to occur far less than once in 500 000 years. Most releases will not ignite thereby reducing the risks. The most unlikely MHI type events are those involving catastrophic rupture of the bulk road tankers during off-loading / loading.

**Table of Frequencies of Failure Scenarios at the Plant**

| NO  | SECTION                          | EQUIPMENT                                                   | FAILURE                      | LOCATION                  | FREQUENCY<br>* F/Y |
|-----|----------------------------------|-------------------------------------------------------------|------------------------------|---------------------------|--------------------|
| 168 | Waxy oil raw materials delivery  | Waxy oil road tanker                                        | Catastrophic rupture         | Overtops curbed area      | 4.23E-08           |
| 173 |                                  | Pipe transferring waxy oil to new 1200m3 feed tank          | Rupture                      | Inside tank farm bund     | 3.00E-05           |
| 177 | <b>Processing to remove iron</b> | Waxy oil feed tank                                          | Catastrophic rupture         | Overtops bunded area      | 1.00E-06           |
| 186 |                                  | <b>High temperature heat exchanger</b>                      | <b>Catastrophic rupture</b>  | <b>Overshoots bund</b>    | <b>1.00E-04</b>    |
| 187 |                                  |                                                             | <b>Large liquid puncture</b> | <b>Inside bunded area</b> | <b>1.00E-04</b>    |
| 190 |                                  | Pipes of heated oil out of fired heater into heat exchanger | Rupture                      | Inside bunded area        | 6.00E-05           |
| 195 |                                  | Intermediate tank - additives                               | Catastrophic rupture         | Overtops bunded area      | 6.00E-06           |
| 198 |                                  | Static separator                                            | Catastrophic rupture         | Overtops bunded area      | 4.00E-05           |
| 206 | <b>Distillation in FFE</b>       | Intermediate tanks (2)                                      | Catastrophic rupture         | Overtops bunded area      | 3.00E-06           |
| 217 |                                  | <b>Feed/overheads recovery heater</b>                       | <b>Large vapour puncture</b> |                           | <b>1.00E-04</b>    |
| 223 |                                  | Pipe from feed heater to FFE Chamber                        | Rupture                      | Inside bunded area        | 6.00E-07           |
| 230 |                                  | FFE vapour overheads pipeline                               | Rupture                      | Inside bunded area        | 6.00E-07           |
| 239 | Blending                         | HFO intermediate and blending tanks                         | Catastrophic rupture         | Overtops bunded area      | 3.00E-06           |
| 244 | Final storage tank               | HFO Product tank                                            | Catastrophic rupture         | Overtops bunded area      | 1.00E-06           |
| 245 |                                  |                                                             | Large liquid puncture        | Within bunded area        | 1.00E-05           |
| 249 | HFO loading into road tankers    | Pipe transferring product to road tanker                    | Rupture                      | Inside tank farm bund     | 3.00E-05           |
| 255 |                                  | Product road tanker                                         | Catastrophic rupture         | Overtops curbed area      | 3.81E-08           |
| 265 | <b>Distillation plant</b>        | Distillation reboiler process (shell) side                  | Catastrophic rupture         | Overtops bunded area      | 1.00E-05           |
| 266 |                                  |                                                             | <b>Large liquid puncture</b> |                           | <b>1.00E-04</b>    |
| 267 |                                  |                                                             | <b>Small liquid puncture</b> |                           | <b>2.00E-03</b>    |
| 275 |                                  | <b>Distillation condenser</b>                               | <b>Catastrophic rupture</b>  | <b>Inside bunded area</b> | <b>1.00E-04</b>    |
| 279 | Nitric acid facilities           | Nitric acid road tanker                                     | Catastrophic rupture         | Overtops curbed area      | 5.48E-10           |
| 280 |                                  |                                                             | Large liquid puncture        | Within curbed area        | 5.48E-09           |
| 286 |                                  | Nitric acid bulk storage tank                               | Catastrophic rupture         | Overtop bund              | 1.00E-06           |

\* NOTE 1E-06 is one in a million or  $1 \times 10^{-6}$

## **5.10 RISK LEVELS**

### **5.10.1 INDIVIDUAL RISK**

For each of the incidents considered as possible major incidents, the overall risk was determined by combining the likelihood's and consequences etc. Together, these values indicate a risk level to which hypothetical individuals could be exposed as a result of the presence of the facility, i.e. the possibility of death per typical person per year. The individual risk determined in this study is a measure of the chance, in any one year, of a typical person at a specific distance from the installation being exposed to a lethal concentration of hazardous chemicals/radiation/overpressure from the installation. The units are typically of the order of one chance in a million of death per person per year, and are shown as exponents i.e.  $1 \times 10^{-6}$  d/p/y.

Considering the impact of the dominant winds the individual risks can be plotted on a map of the site. This has been done and is shown on **FIGURES 5.10.1 a&b** for the current and proposed future activities on the site. The figure is a map of the risk contours from toxic gas events as well as flammable events, i.e. all the areas where risks are lower than  $1 \times 10^{-7}$  d/p/y lie outside the  $1 \times 10^{-7}$  d/p/y risk contour. The maps easily allows one to see where certain risk levels e.g.  $1 \times 10^{-6}$  extend beyond the site boundary.

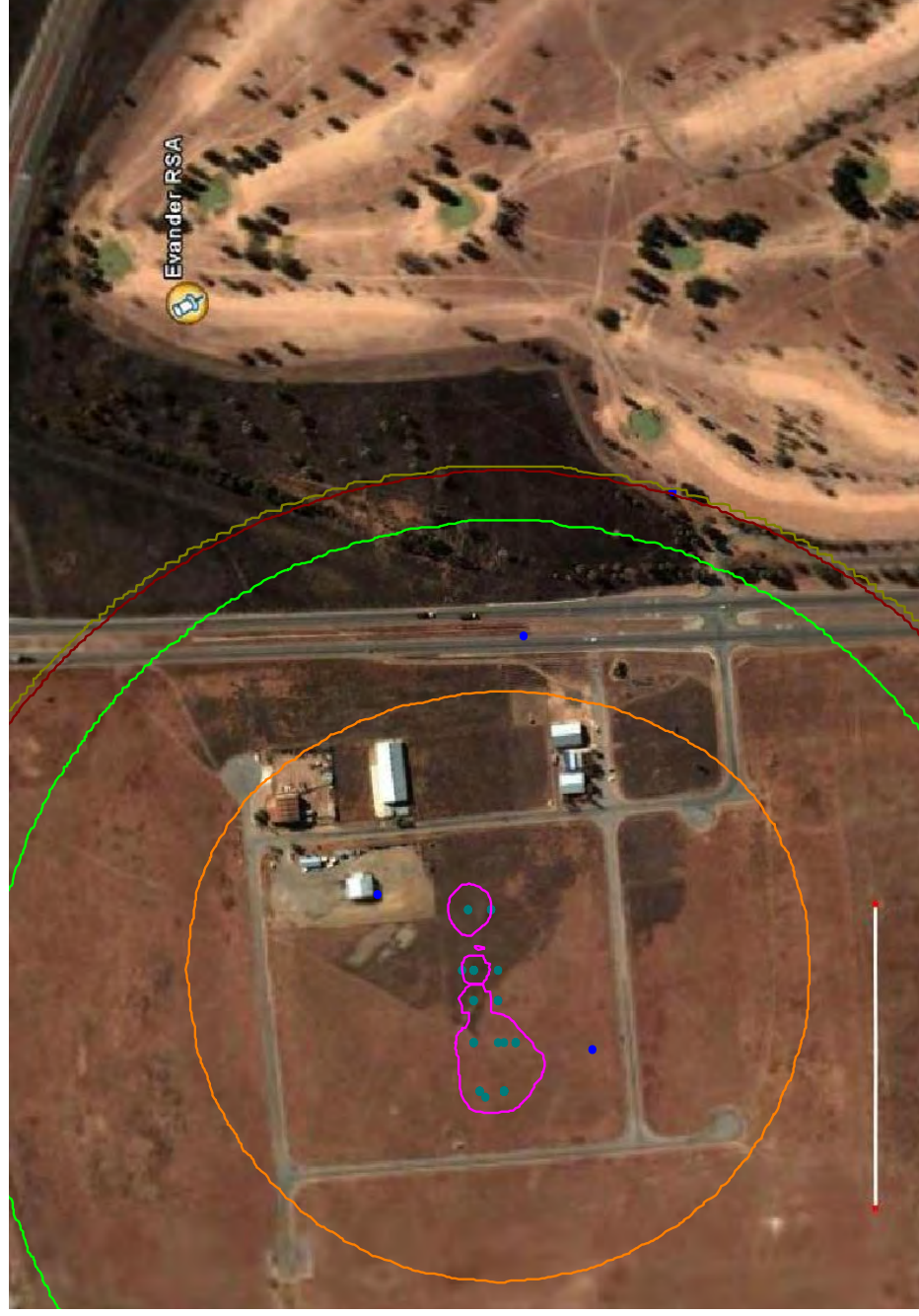
### **5.10.2 SOCIETAL RISK**

In all communities there is an aversion to large accidents that affect many people at once. For example in South Africa we appear to 'tolerate' a road accident fatality rate of about 30 persons per day. It is only the very large accidents where typically 10 or more persons are affected that may jog our awareness and make us consider that the road traffic accident situation is 'intolerable'. The same would apply to major hazard installations. Therefore in addition to considering the risks to a typical individual near an installation, it is important to consider the possible impact on the absolute numbers of persons potentially exposed. This gives an indication of how many persons could possibly be affected in any one accident.

The UK HSE's have recommended societal risk guidelines [Ref 15]. The criteria are that there should be no chance that more than 50 persons could be fatally affected by accidents on the site more often than once in 5000 years. The criteria are presented in the form of an F-N curve. This shows the number of persons potentially fatally affected by each and every one of the potential events on site and the frequency with which these levels of fatalities can be expected to occur. The F-N curve for the toxic and flammable events at the site is presented in **FIGURES 5.10.2 a& b** below.

**FIGURE 5.10.1a – Individual Risk Isoleths for the Existing Evander Installation**

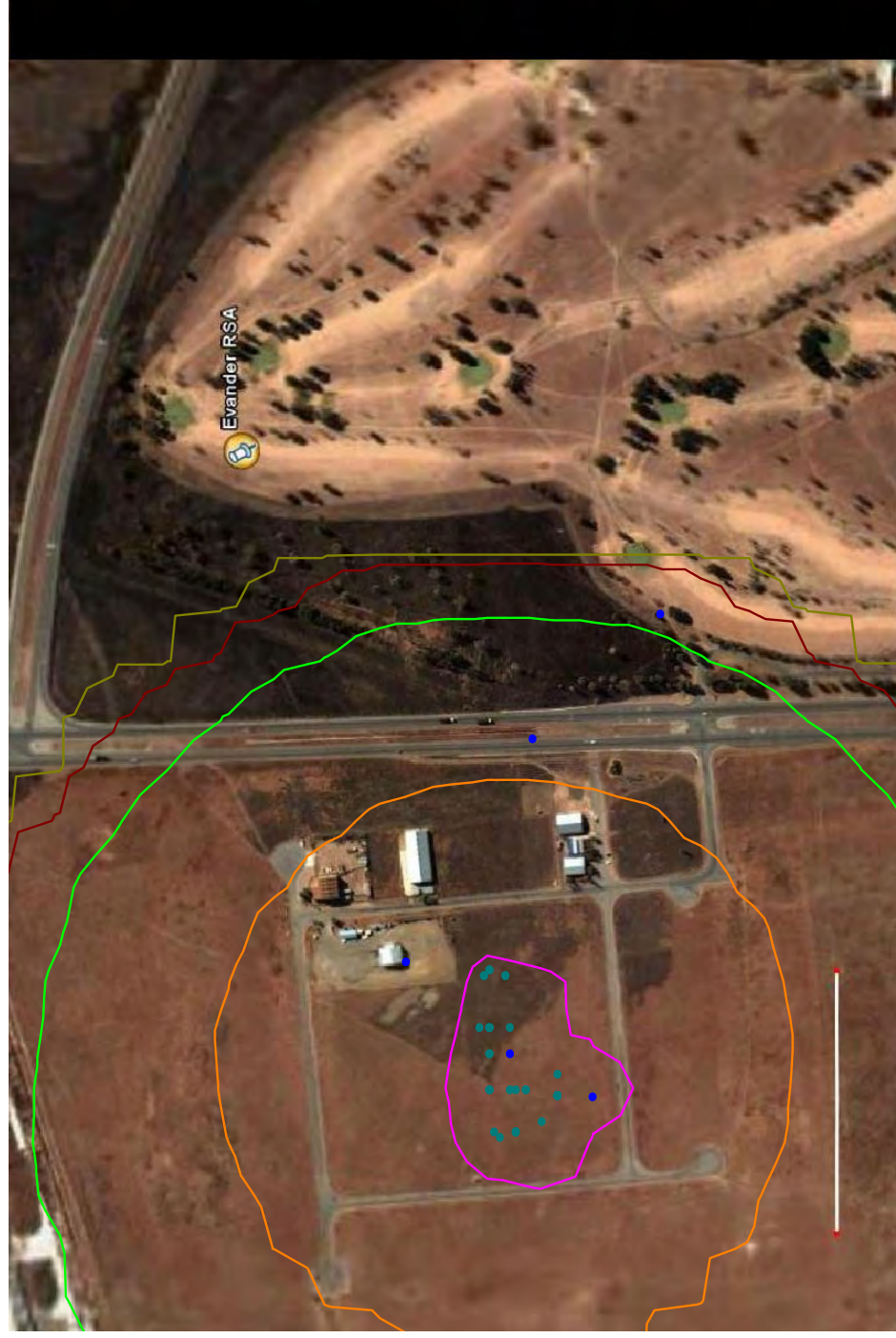
(Note the pink contour 1e-5d/p/y is within the site boundary. Ideally the crimson 1e-6 contour should not extend beyond the site boundary. The green line is the 1e-7 contour)



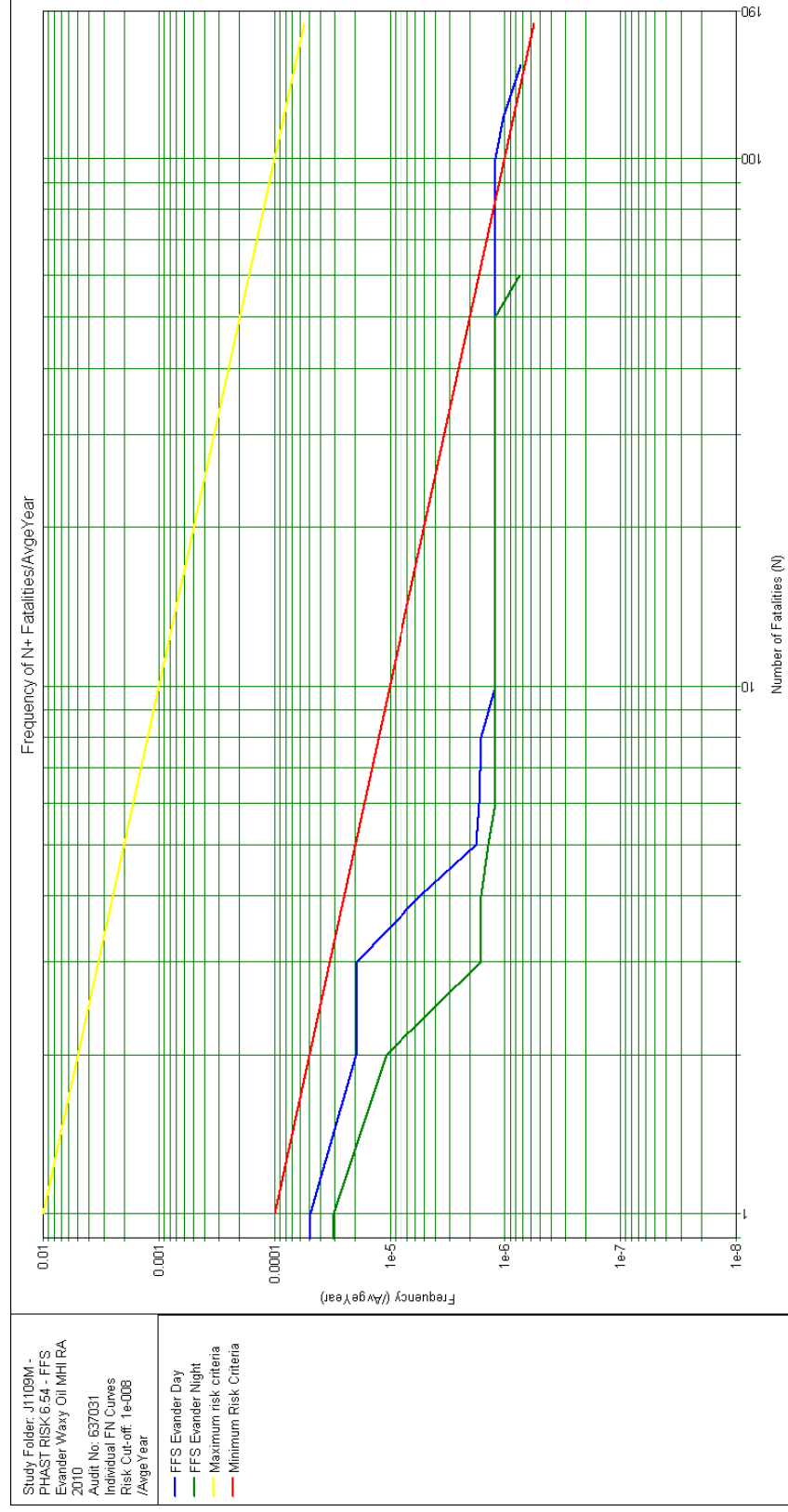


**FIGURE 5.10.1b – Individual Risk Isopleths for the Proposed Future FFS Evander Operations**

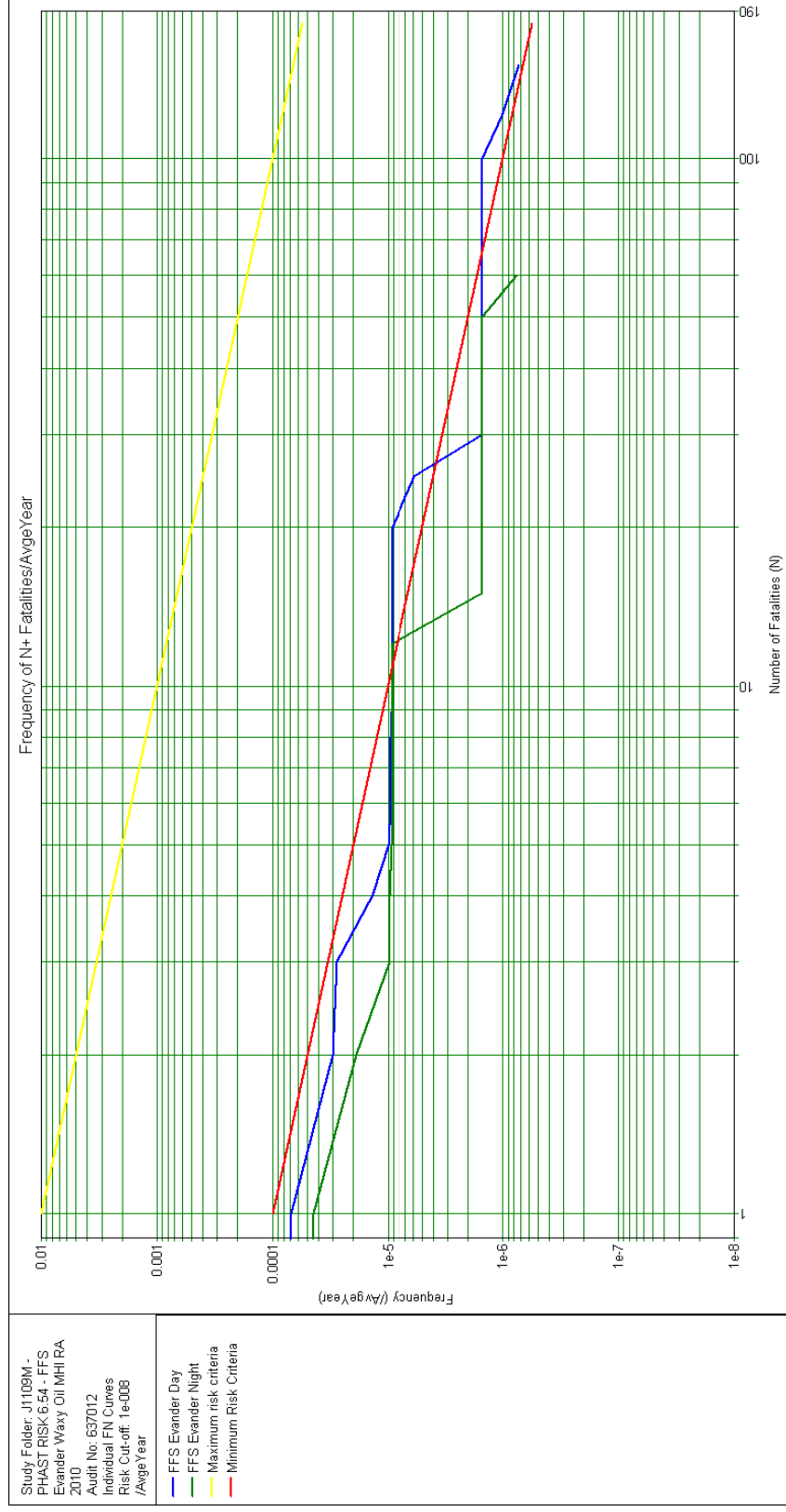
(Note the pink contour 1e-5d/p/y is still largely within the site boundary. Ideally the crimson 1e-6 contour should not extend beyond the site boundary. The green line is the 1e-7 contour)



**FIGURE 5.10.2a – Societal Risk F-N Curve for the Existing FFS Evander Site**  
(Note the blue and green lines for the installation risk must be below the yellow and should ideally be below the red risk criteria line)



**FIGURE 5.10.2b – Societal Risk F-N Curve for the Future FFS Evander Site**  
(Note the blue and green lines for the installation risk must be below the yellow and should ideally be below the red risk criteria line)



## 5.11 RISK ACCEPTABILITY

### 5.11.1 INDIVIDUAL RISK

With respect to acceptability of risk there are no agreed (or legislated) numerical criteria applicable in South Africa. In the absence thereof it is believed that the use of the United Kingdom's Health and Safety Executive's criteria will prove justifiable. These criteria are well developed, conservative and yet not stringent to the point of inhibiting industrial development.

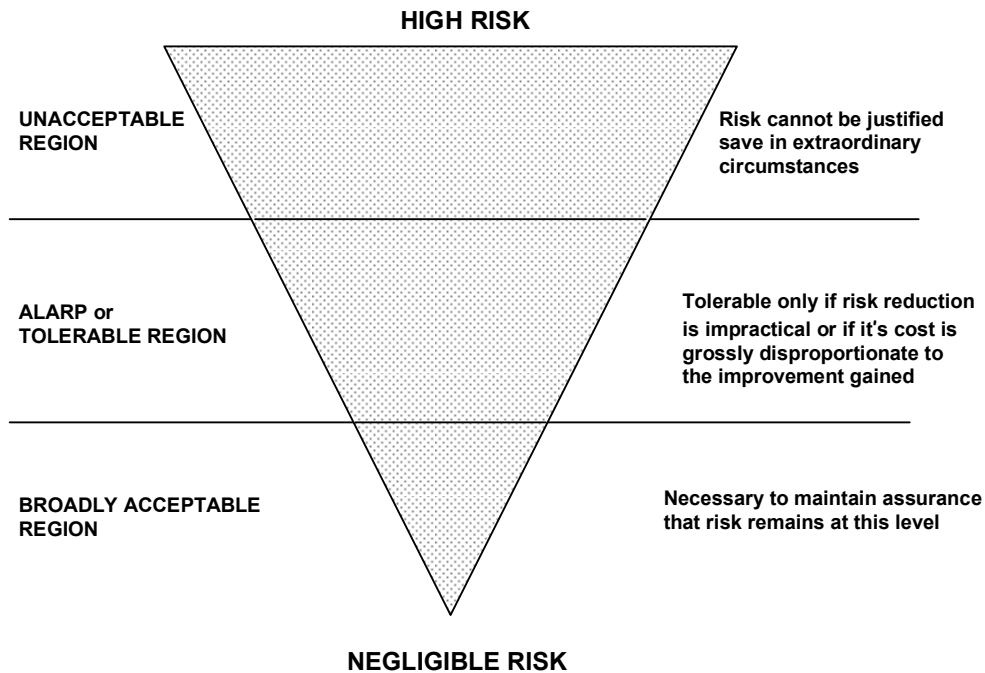
Risks that major hazard installations pose to persons are usually represented quantitatively as the chance in any one year of a typical person being fatally affected by an accident on the site. The acceptability of chemical risks is related to the other risks to which persons in society are exposed. Risks that are accepted voluntarily by persons are often quite high while risks that are not voluntarily accepted, e.g. the risk of so called acts of God, are quite low. The table below shows some risks that individuals tolerate.

| ACTIVITY / HAZARD                                                             | RISK *                   |
|-------------------------------------------------------------------------------|--------------------------|
| Becoming a homicide victim (RSA)                                              | 410 chances in a million |
| Becoming a traffic fatality (RSA)                                             | 220 in a million         |
| Becoming a traffic fatality (UK)                                              | 6 in a million           |
| Becoming a victim of some other accident<br>(e.g. drowning, electrocution UK) | 2.5 in a million         |
| Being struck by lightning (RSA)                                               | 1.5 in a million         |
| Being struck by lightning (UK)                                                | 0.05 in a million        |
| Being struck by a falling aircraft (world-wide)                               | 0.01 in a million        |

- approximate risk rounded-off data UK from "Reducing Risks, Protecting People", Traffic RSA AA 1997, Crime CIAC SAPS 2004/5

Once an approximation of the risk has been made it is possible to judge that risk according to agreed criteria and establish if it is acceptable or unacceptable to persons who maybe affected. In many cases there is no clear and easy distinction between what is acceptable and unacceptable. There is a zone between these two extremes where risks could be tolerated provided they are as low as reasonably practicable (ALARP). The installation whose risks fall into this category need to prove that they have done everything reasonably practicable to reduce risks. The ALARP principle is illustrated below:





The dividing lines between the zones, e.g. unacceptable and tolerable, can be set at different levels depending on the situation e.g. who is affected, whether they also receive benefits in addition to the risks etc.

In residential areas, a public risk level of  $10^{-6}$  chances of death per person per year (i.e.  $10^{-6}$  d/p/y = one in a million chances of death in one year) is accepted in the United Kingdom as being a broadly acceptably risk to which people could be exposed [Ref. 8]. This risk is more than 10 times higher than the risk of being struck by lightning in the UK and is therefore considered virtually negligible. In the UK, public risk levels in excess of  $10^{-4}$  d/p/y are considered to be unacceptable, and immediate attention should be given to reducing the risk. In the area between  $10^{-4}$  and  $10^{-6}$  risks are tolerable but not negligible and therefore some form of risk management program should be instituted with the aim of reducing risks within the constraints of what is practicable and reasonable. This range is referred to as the ALARP range, i.e. risks must be as low as reasonably practicable

In industrial areas the risk levels should be similarly low. However, it is possible that slightly higher risks could be tolerated than in residential areas provided everything reasonably practicable has been done to reduce the risks. This assumes that employees at neighbouring industrial sites are generally fit, healthy, able to be trained in emergency procedures etc. Within the broader manufacturing industry in the UK, the average employee serious injury rate is  $2.3 \times 10^{-5}$  d/p/y. The risks that a new installation poses to employees of adjacent industrial installations should not exceed the risk to which they would normally be exposed at work. The individual risk to employees of neighbouring installations should therefore be below  $1 \times 10^{-5}$  d/p/y. (Note ideally it should be below the  $1 \times 10^{-6}$  d/p/y as these persons are also members of the public).

### SUMMARY OF UK HSE INDIVIDUAL RISK CRITERIA

|                                               | INSTALLATION EMPLOYEES                                                                                    | TYPICAL PUBLIC PERSONS <sup>1</sup>                                                |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <b>UNACCEPTABLY HIGH INDIVIDUAL RISK</b>      | <b>1000</b><br>chances in a million (cpm) of being fatally affected in any one year or $1 \times 10^{-3}$ | <b>100</b><br>chances in a million (cpm) of being fatally affected in any one year |
| <b>BROADLY ACCEPTABLY LOW INDIVIDUAL RISK</b> | <b>10</b><br>chances in a million (cpm) of being fatally affected in any one year                         | <b>1</b><br>chance in a million (cpm) of being fatally affected in any one year    |

<sup>1</sup> – public persons are any persons outside the boundary of the site, e.g. employees of neighbouring installations, residents, passers-by etc

From FIGURE 5.10.1 a&b above the following aspects can be highlighted:

1. **The increase in offsite risks is very low**, i.e. the increase in risks at the existing neighbouring facilities is not noticeable.
2. Therefore **from an MHI perspective this new facility does not present any major concerns** over and above those of the current site.
3. Never the less risks are not so low and to be considered totally acceptable and all reasonable risk reduction measures should be incorporated in the design so that the risks might be considered tolerable.
4. It should be noted that **on site risks have increased**. The increase is not unacceptably high, but is in the 'tolerable provided ALARP' range. The increase is largely due to the new processing plant facilities as opposed to the storage tanks.
5. It would be recommended that the following be considered for the occupied admin building and the workshops located within 50m of the new processing plant :
  - a. Hardening of structures to ensure blast resistant windows on all sides,
  - b. Emergency exits from the buildings exiting towards the south or west/east, i.e. not only emergency exits towards the north.

#### 5.11.2 SOCIETAL RISK

Individual risk referred to above considers the risk to a typical individual but does not consider how many individuals could be affected. In general communities have an aversion to large events which lead to multiple fatalities. Therefore the frequency of events that lead to multiple fatalities should be suitable low. The F-N curve attempts to represent this concept graphically and to set some standards. The graph shows the frequency of accidents on the 'y-axis' and the maximum number of fatalities that could result from these accident on the 'x-axis'.

In the case of major hazard installations the more persons that are potentially exposed to the effects of accidents the greater will be the absolute number of persons that could be affected by any one event. In terms of fatalities there is no distinction between employees and the public, i.e. 100 deaths is serious whether it is employees or public persons. Major hazard installations that are located in remote uninhabited areas will pose lower societal risks that the same industries located near residential areas, despite the fact that both industries could pose identical individual risks.

In the UK a societal risk criterion of what is unacceptable for large scale events has been set as one incident in 5000 years that lead to 50 or more fatalities [Ref 14]. For each order of magnitude change in the number of fatalities, the frequency of the event occurring must also change in the opposite direction by an order of magnitude, (see the upper line on the **Figure 5.10.2**). The lower acceptable level is set two orders of magnitude below this.

**FIGURES 5.10.2 a&b** indicate that the societal risks associated with MHI type events could be considered acceptably low. It is estimated that, should the industrial area around the site be fully occupied with low occupancy industrial operations, up to 150 persons could perish in the very worst case fire and explosion scenarios.

#### **5.11.3 LAND USE PLANNING IN THE VICINITY OF MHI's**

There is a twofold responsibility placed on the local authorities when dealing with an MHI (See MHI regulation 9). Initially they should ensure that the existing MHI facility presents sufficiently low risks to existing neighbouring facilities and communities. Thereafter, they need to ensure that new developments within the area potentially affected by the MHI is of such a nature that persons are not unnecessarily exposed to high risks, for example they should act to prevent of erection of hospitals very close to major hazard installations.

The area around the FFS site is already zoned for industrial development however the following guideline restrictions could be considered should there be changes in future. Implementation of these restrictions would serve to ensure societal risks do not increase further.

- ideally no occupied buildings with 25m of the northern boundary fence opposite the bulk tanks
- no development of the housing within 450m of the site.
- no erection of new vulnerable facilities, schools, hospitals etc, within 500m of the installation.

Note that this is merely a suggestion and any decisions regarding land use planning are entirely the responsibility of the local authorities.

## **6 ENVIRONMENTAL ISSUES**

There are no specific environmental issues related to this major hazard installation. It is however noted that any catastrophic spill that breaches the bunding or any massive fire fighting operation may lead to direct oil contamination of the spruit to the west of the site. Fire water management requires particular attention in the FFS emergency plans.

## **7. EMERGENCY PLAN**

There is an on-site emergency plan dealing with major fire emergencies. This will need to be updated for the new facilities. The following should be considered:

- o In terms of assembly points, it should be noted that with toxic fumes the best protection is afforded by a policy of shelter-in-place indoors.
- o The on-site assembly points, may need to be reviewed to take the new facilities into account.

FFS should confirm with the relevant local emergency services that the authorities off-site emergency plan is updated for the new installation (see MHI Regulation 9).

In terms of MHI Regulation 7 there is a requirement for FFS to record and report to the relevant national, provincial and local authorities major incidents, incidents which brought the emergency plan into action as well as near-misses. The records must be available on the site for inspection. Note this is in addition to any NEMA report or Department of Labour accident reporting.

## **8. ORGANIZATIONAL MEASURES**

Also in APPENDIX E are checklists that can be used to review the Organizational Measures in place on the site, e.g. the control of modifications, testing of trips and alarms etc.

## 9. REFERENCES

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## **APPENDIX A**

### **WIND AND WEATHER DATA**

**WIND WEATHER DATA USED IN THIS RISK ASSESSMENT****1 GENERAL WEATHER INFORMATION**

|                          |   |            |
|--------------------------|---|------------|
| Altitude                 | - | 1500 m     |
| Atm Pressure             | - | 85 kPa Abs |
| Ave Min. Temp            | - | 8 °C       |
| Ave Max. Temp            | - | 22 °C      |
| Lowest Recorded Temp     | - | -9 °C      |
| Average All Year Round   | - | 15 °C      |
| Relative Humidity Winter | - | 34 %       |
| Relative Humidity Summer | - | 57 %       |
| Average Annual Rainfall  | - | 700 mm     |
| Season                   | - | summer     |

**2 WIND SPEEDS, DIRECTIONS AND THERMAL STABILITY'S**

There are a few sources of wind speed and direction data. None of the references above links the wind speeds, direction and temperature inversion conditions with each other. It was therefore necessary to separate the information into all the component parts and then recombine the information in a manner that was logically consistent.

There are three Pasquill stability conditions are normally applicable namely:

- Unstable: Sunny hot day (A, B, C).
- Neutral: Overcast day or night (D).
- Stable: Clear, cold night (E, F).

An analysis of the limited wind and weather information available for Witbank, Bethal and Standerton indicates that the following weather patterns and wind directions could be considered to prevail.

| Wind speed and Weather Category | % of Time | Temperature<br>(Deg C) | Relative<br>Humidity |
|---------------------------------|-----------|------------------------|----------------------|
| F2                              | 71        | 8                      | 0.34                 |
| D5                              | 29        | 22                     | 0.57                 |

Average wind directions

| Direction wind blows from | Percentage of time |
|---------------------------|--------------------|
| N                         | 15.2               |
| NE                        | 5.2                |
| E                         | 21.7               |
| SE                        | 11.4               |
| S                         | 6.7                |
| SW                        | 9.4                |
| W                         | 16                 |
| NW                        | 14.4               |

The data used in SAFETI was more detailed than the above in that the low wind speeds in each direction were included in F2 and the highs in D5. The data was then adjusted to account for the assumption that F2 prevails 100% of the night, D5 for 30% of the day and F2 for 20% of the day.

**APPENDIX B**  
**FULL LIST OF INCIDENTS CONSIDERED**

J1109M - FFS Evander - Waxy Oil Preliminary MHI RA 2010 - FINAL Addendum to Current Site Report.doc



| SECTION | EQUIPMENT                                             | FAILURE               | LOCATION              | PREVENTATIVE<br>& PROTECTIVE<br>SYSTEMS | MHI<br>EVENT | REASONS                                                                  |
|---------|-------------------------------------------------------|-----------------------|-----------------------|-----------------------------------------|--------------|--------------------------------------------------------------------------|
|         |                                                       |                       |                       |                                         |              |                                                                          |
|         |                                                       |                       |                       |                                         |              |                                                                          |
|         |                                                       |                       |                       |                                         |              |                                                                          |
| 193     |                                                       | Large liquid puncture |                       |                                         | No           | Small quantities involved                                                |
| 194     |                                                       | Internal explosion    |                       |                                         | No           |                                                                          |
| 195     | Intermediate tank - additives                         | Catastrophic rupture  | Overtops bunded area  |                                         | Possibly     | Lethalities limited to 28m, boundary >45m away                           |
| 196     |                                                       | Large liquid puncture | Within bunded area    |                                         | No           | Lethalities <10m                                                         |
| 197     |                                                       | Internal explosion    |                       |                                         | No           |                                                                          |
| 198     | Static separator                                      | Catastrophic rupture  | Overtops bunded area  |                                         | Possibly     | Lethalities limited to 28m, boundary >45m away                           |
| 199     |                                                       | Large liquid puncture | Within bunded area    |                                         | No           | Lethalities limited to 10m, boundary >45m away                           |
| 200     | Heater and coolers (3)                                | Catastrophic rupture  | Inside bunded area    |                                         | No           | Lethalities limited to 10m, boundary >45m away                           |
| 201     |                                                       | Large liquid puncture |                       |                                         | No           | Lethalities limited to 5m, boundaries >45m                               |
| 202     | Evap chamber and associated vessels (tanks / heaters) | Internal explosion    |                       |                                         | No           | Lethalities <10m, 45m from site boundary, assume 75kg 90%water 10%diesel |
| 203     | Evap vapour overheads pipeline                        | Rupture               |                       | Stop in 5 minutes                       | No           | Small quantities released                                                |
| 204     |                                                       | Leak                  |                       |                                         | No           | Lethalities limited to 5m, boundaries >45m                               |
| 205     | Evap overheads vessels (knock-out pot, condenser)     | Internal explosion    |                       |                                         | No           |                                                                          |
| 206     | Distillation in FFE                                   | Catastrophic rupture  | Overtops bunded area  |                                         | Possibly     | Lethalities limited to 28m, boundary >45m away                           |
| 207     | Intermediate tanks (2)                                | Large liquid puncture | Within bunded area    |                                         | No           | Lethalities <10m                                                         |
| 208     |                                                       | Internal explosion    |                       |                                         | No           | Lethalities limited to 28m, boundary >45m away                           |
| 209     | Pipes transferring and circulating to FFE             | Rupture               | Inside tank farm bund |                                         | No           | Small quantities released                                                |
| 210     |                                                       | Leak                  |                       |                                         | Unlikely     | Lethalities limited to 28m, boundary >45m away                           |
| 211     | FFE feed tank                                         | Catastrophic rupture  | Inside bunded area    |                                         | No           | Lethalities limited to 28m, boundary >45m away                           |
| 212     |                                                       | Large liquid puncture |                       |                                         | No           | Small quantities released                                                |
| 213     |                                                       | Small liquid puncture |                       |                                         | No           | Lethalities limited to 28m, boundary >45m away                           |
| 214     | Feed/overheads recovery heater                        | Catastrophic rupture  | Inside bunded area    |                                         | No           | Lethalities limited to 28m, boundary >45m away                           |
| 215     |                                                       | Large liquid puncture |                       |                                         | No           | Small quantities released                                                |
| 216     |                                                       | Small liquid puncture |                       |                                         | No           |                                                                          |
| 217     |                                                       | Large vapour puncture |                       |                                         | Possibly     | Over 5ML vol required before offsite impacts                             |
| 218     |                                                       | Internal explosion    |                       |                                         | No           | Lethalities limited to 28m, boundary >45m away                           |
| 219     | FFE feed heater HE20                                  | Catastrophic rupture  | Inside bunded area    |                                         | No           | Lethalities limited to 28m, boundary >45m away                           |

| SECTION | EQUIPMENT                                                 | FAILURE                 | LOCATION             | PREVENTATIVE<br>& PROTECTIVE<br>SYSTEMS | MHI<br>EVENT | REASONS                                        |
|---------|-----------------------------------------------------------|-------------------------|----------------------|-----------------------------------------|--------------|------------------------------------------------|
|         |                                                           |                         |                      |                                         |              |                                                |
|         |                                                           |                         |                      |                                         |              |                                                |
|         |                                                           |                         |                      |                                         |              |                                                |
| 220     |                                                           | Large liquid puncture   |                      |                                         | No           | Small quantities released                      |
| 221     |                                                           | Small liquid puncture   |                      |                                         | No           | Over 5ML vol required before offsite impacts   |
| 222     |                                                           | Internal explosion      |                      |                                         | No           |                                                |
| 223     | Pipe from feed heater to FFE Chamber                      | Rupture                 | Inside bunded area   |                                         | Possibly     | Small quantities released                      |
| 224     |                                                           | Leak                    |                      |                                         | No           | Too far from bund wall                         |
| 225     |                                                           | Rupture                 | Outside bunded area  |                                         | No           | Small quantities released                      |
| 226     |                                                           | Leak                    |                      |                                         | No           | Lethalities limited to 28m, boundary >45m away |
| 227     | FFE chamber E34                                           | Catastrophic rupture    | Inside bunded area   |                                         | No           | Lethalities limited to 28m, boundary >45m away |
| 228     |                                                           | Large liquid puncture   |                      |                                         | No           | Small quantities released                      |
| 229     |                                                           | Small liquid puncture   |                      |                                         | No           |                                                |
| 230     | FFE vapour overheads pipeline                             | Rupture                 | Inside bunded area   | Operator stop in 5 mins                 | Possibly     | Small quantities released                      |
| 231     |                                                           | Leak                    |                      |                                         | No           | Lethalities limited to 28m, boundary >45m away |
| 232     | FFE overhead knock-out pot and condenser HE22             | Catastrophic rupture    | Inside bunded area   |                                         | No           | Lethalities limited to 28m, boundary >45m away |
| 233     |                                                           | Large liquid puncture   |                      |                                         | No           | Small quantities released                      |
| 234     |                                                           | Small liquid puncture   |                      |                                         | No           | Over 5ML vol required before offsite impacts   |
| 235     |                                                           | Internal explosion      |                      |                                         | No           | Lethalities limited to 28m, boundary >45m away |
| 236     | E36 FFE Condensate separator and E44 vac stripper con sep | Catastrophic rupture    | Inside bunded area   |                                         | No           | Lethalities limited to 28m, boundary >45m away |
| 237     |                                                           | Large liquid puncture   |                      |                                         | No           | Small quantities released                      |
| 238     |                                                           | Small liquid puncture   |                      |                                         | No           |                                                |
| 239     | HFO intermediate and blending tanks                       | Catastrophic rupture    | Overtops bunded area |                                         | Possibly     | Lethalities limited to 28m, boundary >45m away |
| 240     |                                                           | Large liquid puncture   | Within bunded area   |                                         | No           | Small quantities released                      |
| 241     |                                                           | Small liquid puncture   |                      |                                         | No           | Lethalities limited to 10m, boundary >45m away |
| 242     |                                                           | Internal explosion      |                      |                                         | No           | Lethalities limited to 28m, boundary >45m away |
| 243     |                                                           | Internal fire open roof |                      |                                         | No           |                                                |
| 244     | Final storage tank                                        | Catastrophic rupture    | Overtops bunded area |                                         | Possibly     |                                                |
| 245     |                                                           | Large liquid puncture   | Within bunded area   |                                         | Possibly     | Small quantities released                      |

| SECTION                                       | EQUIPMENT                                              | FAILURE                 | LOCATION              | PREVENTATIVE<br>& PROTECTIVE<br>SYSTEMS | MHI<br>EVENT | REASONS                                                        |
|-----------------------------------------------|--------------------------------------------------------|-------------------------|-----------------------|-----------------------------------------|--------------|----------------------------------------------------------------|
|                                               |                                                        |                         |                       |                                         |              |                                                                |
|                                               |                                                        |                         |                       |                                         |              |                                                                |
|                                               |                                                        |                         |                       |                                         |              |                                                                |
| 246                                           |                                                        | Small liquid puncture   |                       |                                         | Unlikely     | Lethalities limited to 18m, boundary >20m away                 |
| 247                                           |                                                        | Internal explosion      |                       |                                         | Unlikely     | Lethalities limited to 18m, boundary >20m away                 |
| 248                                           |                                                        | Internal fire open roof |                       |                                         | Unlikely     |                                                                |
| HFO loading into<br>road tankers              | Pipe transferring product to road<br>tanker            | Rupture                 | Inside tank farm bund |                                         | Possibly     | Small quantities released                                      |
| 250                                           |                                                        | Leak                    |                       |                                         | Unlikely     | Lethalities limited to 18m, boundary >25m away                 |
| 251                                           |                                                        | Rupture                 | Outside bunded area   |                                         | Unlikely     | Small quantities released                                      |
| 252                                           |                                                        | Leak                    |                       |                                         | Unlikely     | Lethalities limited to 18m, boundary >35m away                 |
| 253                                           | Product loading hose                                   | Rupture                 | inside curbed area    |                                         | No           | Lethalities limited to 18m, boundary >35m away                 |
| 254                                           |                                                        | Leak                    |                       |                                         | No           |                                                                |
| 255                                           | Product road tanker                                    | Catastrophic rupture    | Overtops curbed area  |                                         | Possibly     | Lethalities limited to 18m, boundary >35m away                 |
| 256                                           |                                                        | Large liquid puncture   | Inside curbed area    |                                         | No           | Lethalities limited to 18m, boundary >35m away                 |
| 257                                           |                                                        | Small liquid puncture   |                       |                                         | No           | Lethalities limited to 5m, boundaries >50m                     |
| Disillation plant                             | Fired heater                                           | Internal explosion      |                       |                                         | No           | Lethalities < 40m, Assumes 6m3 oil at >300 deg C<br>and 30 kPa |
| 259                                           | Piped hot thermal oil to reboiler                      | Rupture                 | Inside bunded area    | Stop in 5 minutes                       | No           | Small quantities released                                      |
| 260                                           |                                                        | Leak                    |                       |                                         | No           | Lethalities limited to 30m, unit >50m from<br>boundary         |
|                                               | Pipes transferring oil from<br>storage to distillation | Rupture                 | Inside bunded area    | Stop in 5 minutes                       | No           | Small quantities released                                      |
| 261                                           |                                                        | Leak                    |                       |                                         | No           | Lethalities limited to 30m, unit >50m from<br>boundary         |
| 262                                           |                                                        | Rupture                 | Outside bunded area   | Stop in 5 minutes                       | No           | Small quantities released                                      |
| 263                                           |                                                        | Leak                    |                       |                                         | No           | Assumes 10m3 at >200 deg C and 2 bar                           |
| 264                                           |                                                        | Leak                    |                       |                                         | No           | Assumes 50mm hole                                              |
| Distillation reboiler process<br>(shell) side | Catastrophic rupture                                   |                         | Overtops bunded area  |                                         | Yes          | Assumes 10mm hole                                              |
| 266                                           |                                                        | Large liquid puncture   |                       | Stop in 5 minutes                       | Yes          | Assumes 10mm hole                                              |
| 267                                           |                                                        | Small liquid puncture   |                       |                                         | Yes          | Lethalities limited to 5m, boundaries >50m                     |
|                                               |                                                        | Internal explosion      |                       |                                         | No           | Assumes 2m3 (50% void) diesel at 100 deg C and<br>1 bar        |
| 268                                           |                                                        | Catastrophic rupture    | Overtops bunded area  |                                         | No           | Assumes 50mm hole                                              |
| 269                                           | Distillation column                                    | Large liquid puncture   | Inside bunded area    | Stop in 5 minutes                       | No           | Assumes 10mm hole                                              |
| 270                                           |                                                        |                         |                       |                                         | No           |                                                                |

|     | SECTION                | EQUIPMENT                               | FAILURE               | LOCATION             | PREVENTATIVE<br>& PROTECTIVE<br>SYSTEMS | MHI<br>EVENT | REASONS                                                                   |
|-----|------------------------|-----------------------------------------|-----------------------|----------------------|-----------------------------------------|--------------|---------------------------------------------------------------------------|
| 271 |                        |                                         | Small liquid puncture |                      |                                         | No           | Lethalities limited to 5m, boundaries >50m                                |
| 272 |                        |                                         | Internal explosion    |                      |                                         | No           | Assumes 0.1kg/s flow rate (30kg hexane)                                   |
| 273 |                        | Distillation vapour overheads pipeline  | Rupture               |                      | Stop in 5 minutes                       | No           | Small quantities released                                                 |
| 274 |                        |                                         | Leak                  |                      |                                         | No           | Lethalities up to 45m, boundary at 50m (1m3 kerosene @ 100 deg C 0.5 bar) |
| 275 |                        | Distillation condenser                  | Catastrophic rupture  | Inside bunded area   |                                         | Possible     | See note above borderline                                                 |
| 276 |                        |                                         | Large liquid puncture |                      | Stop in 5 minutes                       | No           | Small quantities                                                          |
| 277 |                        |                                         | Small liquid puncture |                      |                                         | No           | Lethalities < 10m                                                         |
| 278 |                        |                                         | Internal explosion    |                      |                                         | No           | Lethalities up to 90m, site boundary 50m                                  |
| 279 | Nitric acid facilities | Nitric acid road tanker                 | Catastrophic rupture  | Overtops curbed area |                                         | Yes          | Lethalities up to 85m, site boundary 50m                                  |
| 280 |                        |                                         | Large liquid puncture | Within curbed area   |                                         | Yes          | Lethalities up to 45m                                                     |
| 281 |                        |                                         | Small liquid puncture |                      | Stop leak in 30 minutes                 | No           | Lethalities up to 40m                                                     |
| 282 |                        | Nitric acid road tanker offloading hose | Rupture               | Within curbed area   |                                         | No           | Small quantities                                                          |
| 283 |                        |                                         | Leak                  |                      | Stop in 5 minutes                       | No           |                                                                           |
| 284 |                        | Nitric acid transfer piping             | Rupture               | Inside bunded area   | Stop in 5 minutes                       | No           | Small quantities                                                          |
| 285 |                        |                                         | Leak                  |                      | Stop in 5 minutes                       | No           | Lethalities < 50m, site boundary 45m                                      |
| 286 |                        | Nitric acid bulk storage tank           | Catastrophic rupture  | Overtops bunded area |                                         | Yes          |                                                                           |
| 287 |                        |                                         | Large liquid puncture | Inside bunded area   |                                         | No           | Small quantities                                                          |
| 288 |                        |                                         | Small liquid puncture |                      | Stop leak in 30 minutes                 | No           | Lethalities limited to 18m, boundary >35m away                            |
|     |                        |                                         |                       |                      |                                         |              |                                                                           |
|     |                        |                                         |                       |                      |                                         |              |                                                                           |

## **APPENDIX C**

### **FAILURE DATA**

## OPERATOR AND EQUIPMENT FAILURE DATA

### 1. Equipment Failure

Most of the failures leading to the above-identified potential major hazards are associated with loss of containment as a result of vessel or pipe rupture, or due to leaks. However, for the purpose of this assessment only ruptured pipes, and tanks were considered as representing the worst cases. Failure data used was that provided by the Dutch Committee for the Prevention of Disasters in their "Guidelines for Quantitative Risk Assessment" 1<sup>st</sup> Edition of 1999 (i.e. the Purple Book). Note that pipe failure depends on both pipe diameter and length. Examples of the frequency data used are presented below. Data from the TNO Purple book data.

*Full containment atmospheric tank (i.e. semi-explosion and missile penetration proof double containment tank)* - instantaneous release 1e-8

*Atmospheric tank with protective outer shell* - instantaneous release – 5e-7  
- small release to secondary container 1e-4

*Single walled atmospheric containment tank* - instantaneous rupture - 5 e-6  
- 10 minute release of entire inventory - 5 e-6  
- 10 mm hole - 1 e-4

*Pressure vessel* - instantaneous rupture – 5e-7  
- 10 min release of entire inventory – 5e-7  
- 10mm hole – 1e-5

*Process vessels and reactors* - instantaneous rupture – 5e-6  
- 10 min release of entire inventory – 5e-6  
- 10mm hole – 1e-4

*Pumps (canned)* - catastrophic failure 1e-5  
- leak 5e-5

*Pressure relief valve fails open* - 2e-5

*Gas Cylinders Cat rupture* - 1e-6

|                        |                                                 |                              |
|------------------------|-------------------------------------------------|------------------------------|
| <i>Heat Exchangers</i> | <i>Dangerous substance shell side</i>           | - int 5 e-5<br>- 10mm 1 e-3  |
|                        | <i>Dan sub inside shell des pressure lower</i>  | - inst 1 e-5<br>- 10mm 1 e-2 |
|                        | <i>Dan sub inside shell des pressure higher</i> | - inst 1 e-6                 |

*Storage of explosives* - mass detonation 1e-5

|              |                  |                                        |
|--------------|------------------|----------------------------------------|
| <i>Pipes</i> | Diameter < 75 mm | - rupture - 1e-6 /m<br>- leak 5e-6 / m |
|              | 75 < d < 150 mm  | - rupture 3e-7/m<br>- leak 2e-6/m      |
|              | d > 150 mm       | - rupture 1e-7 /m<br>- leak 5e-7 /m    |

*Road tanker (atm)* - inst rupture - 1e-5  
- large leak - 5e-7  
- hose rupture - 4 e-6/h  
- hose leak - 4e-5/h

- arm rupture -  $3e-8/h$
- arm leak -  $3e-7/h$

- Road tanker (press)*
- inst rupture -  $5e-7$
  - large leak -  $5e-7$
  - hose rupture -  $4e-6/h$
  - hose leak -  $4e-5/h$
  - arm rupture -  $3e-8/h$
  - arm leak -  $3e-7/h$

Failure data from ICI reliability manual:

*Centrifugal pump* - *failure to operate* -  $0.26 \text{ f/y}$

*Instrumentation:*

- Temperature switch* -  $F = 0.02 \text{ f/y}$  or  $Pf = 0.0033$  with check every 4 months
- Temperature control loop* -  $F = 0.2 \text{ f/y}$
- Flow switch* -  $F = 0.15 \text{ f/y}$  or  $Pf = 0.025$  with check every 4 months

## 2. Human Failure

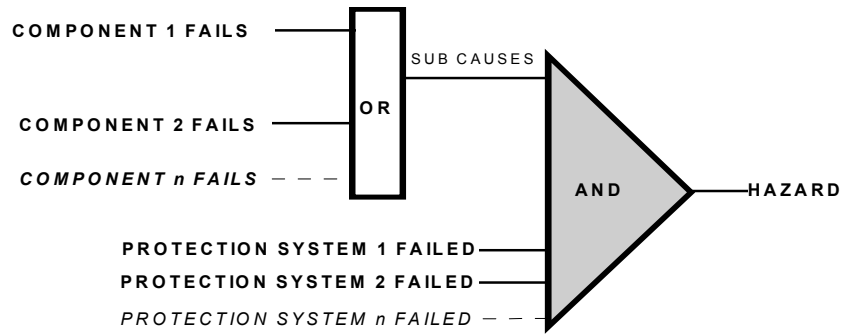
| Source  | Person     | Task Level                                     | Failure Rate<br>Prob of Error |
|---------|------------|------------------------------------------------|-------------------------------|
| ICI     | Operator   | Simplest                                       | $1 * 10^{-4}$                 |
|         |            | Routine                                        | $1 * 10^{-3}$                 |
|         |            | Must take care, e.g. a checklist is needed     | $1 * 10^{-2}$                 |
|         |            | Non routine                                    | $1 * 10^{-1}$                 |
|         |            | Checking another operator                      | $1 * 10^{-1}$                 |
|         |            | Fails to notice alarm and take action          | $2 * 10^{-1}$                 |
|         | Supervisor | Checking an operator                           | $1 * 10^{-2}$                 |
| Du Pont | Operator   | Simple                                         | $1 * 10^{-3}$                 |
|         |            | Checking another operator or shift change-over | $1 * 10^{-1}$                 |

## 3. System Failures

The standard of maintenance, the implementation of operating and emergency procedures and the general safety management systems in place on site can have a significant effect on the failure rates used. Pitblado (Ref. 19 pg 115) states that one can adjust generic data based on an assessment of the particular plant effectiveness at maintenance, safety systems etc. The basic standard of safety should be 1, i.e. neutral if good maintenance, operating and emergency procedures in place. Many plants fall below this standard; hence failure data must actually be increased up to a maximum of one order of magnitude. For those that are of world class standard and have much more than the basic safety systems in place the failure data can be reduced by up to one half an order of magnitude.

## 4. Simple Fault Trees

For most events in this study the simple failure rates above were not sufficient to estimate the final likelihood of a hazardous event. This is due to the layers of protection provided on the plant. Simple fault trees were compiled for most events. A fault tree is essentially a logic diagram, which represents the development of events from the root causes with failure data in terms of their frequency or probability of occurrence to the final 'top' event or hazard as illustrated below.



For these risk assessment very simple fault trees were compiled, For example the following were included:

- the generic equipment failure data (as listed above)
- the number of drums, tankers, lengths of pipeline etc,
- the amount of time that the equipment is onsite and in use (e.g. for road tankers)
- the ability of operator to respond or not or to cause failures (e.g. for stopping transfer if alarms provide warning),
- the likelihood of failure of any automated shut off valves, excess flow valves, ventilation, scrubbers or any ESD's etc
- the general perceived level of Safety Management on site (see systems failure above).



**APPENDIX D**

**MSDS's FOR:**

*Waxy oil (feed material)*  
*Heavy oil (product)*  
*Nitric Acid*



INTEGRATED SAFETY, HEALTH AND ENVIRONMENTAL CONSULTANTS

**APPENDIX E**  
**EMERGENCY PROCEDURES**  
**ORGANIZATION AND EMERGENCY PROCEDURE EVALUATION CHECKLISTS**

### Emergency Procedures Checklist

The following checklist can be used to guide improvements to the emergency plan for an MHI:

| No. | Aspect                                      | Essential emergency elements                                                                                                                                                                                                 | Review Evaluation |
|-----|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| 1.1 | Administration                              | The plan readily available on site for all persons to use when needed (i.e. it should not only be a document on the computer system, there should be summary copies at key locations)                                        |                   |
| 1.2 |                                             | The plan, or at least the parts readily available for use, should be simple and concise.                                                                                                                                     |                   |
| 1.3 |                                             | The plan should be part of a management system which include means to control the document, ensure revision and updating every 3 years, require witnessing, inclusion of the relevant authorities in reviewing the plan etc. |                   |
| 1.4 |                                             | All personnel, visitors, contractors etc should be trained in the relevant aspects of the emergency plan.                                                                                                                    |                   |
| 1.5 |                                             | Commitment to annual emergency drills                                                                                                                                                                                        |                   |
| 1.6 |                                             | The plan should indicate the need to inform the relevant authorities of every occurrence, which has brought the MHI aspects of the plan into action, of actual MHI incidents as well as of near misses.                      |                   |
| 1.7 |                                             | Commitment to communicate all necessary emergency planning information to potentially affected neighbours.                                                                                                                   |                   |
| 1.8 |                                             | Emergency plan signed by Chief executive Officer                                                                                                                                                                             |                   |
| 2.1 | Contents – roles and responsibilities       | The procedures should address all different groups of persons on site e.g. persons who discovers the emergency situation, visitors, staff, first response team, emergency coordinator etc.                                   |                   |
| 2.2 |                                             | All personnel should be able to easily determine which group of people they fit into. An organogram is particularly useful.                                                                                                  |                   |
| 2.3 |                                             | The actions of the person discovering the emergency situation need to be clearly spelled out.                                                                                                                                |                   |
| 2.4 |                                             | The person who has overall responsibility during an emergency clearly designated e.g. the emergency controller, his/her name and normal job title.                                                                           |                   |
| 2.5 |                                             | Contact names and numbers for key roll players should be clearly indicated.                                                                                                                                                  |                   |
| 3.1 | Contents – raising the alarm and evacuation | There should be a means of raising the alarm                                                                                                                                                                                 |                   |
| 3.2 |                                             | Clear indication who is responsible for raising the alarm (or the various levels of alarm if there is more than one) and the method of doing so.                                                                             |                   |

| No. | Aspect                          | Essential emergency elements                                                                                                                                                                                                                       | Review Evaluation                              |
|-----|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| 3.3 |                                 | The procedures must clearly describe what actions all personnel are to take in the event that the alarm is raised. If specific groups are to take different actions this must be clear.                                                            |                                                |
| 3.4 |                                 | Procedures for testing the alarm must be indicated.                                                                                                                                                                                                |                                                |
| 3.5 |                                 | The circumstances under which evacuations are undertaken must be clear.                                                                                                                                                                            |                                                |
| 3.6 |                                 | The details of muster/assembly points should be available in the procedures. A map showing the location should be included.                                                                                                                        |                                                |
| 3.7 |                                 | The responsibilities of the different persons at the muster points must be clearly defined.                                                                                                                                                        |                                                |
| 3.8 |                                 | Depending on the site and the nature of the risks, there may need to be an indication that the nature of the emergency may require changes in the location of assembly points or actions to be taken once there.                                   |                                                |
| 4.1 | Contents – type of emergencies  | The plan should cover the major risks assessed i.e. fire, explosion and toxic releases.                                                                                                                                                            |                                                |
| 4.2 |                                 | The plan must be easy to interpret, i.e. the sections dealing with fire, explosions and toxic gas events must be clearly identifiable on the first or second page and the written layout of the plan should be logical and systematic.             |                                                |
| 4.3 |                                 | Ideally the plan should differentiate between potential fire and explosion situations as well as the situation after an initial fire or explosion.                                                                                                 |                                                |
| 4.4 |                                 | The plan must indicate the location of emergency equipment such as BA sets, foam supplies etc.                                                                                                                                                     |                                                |
| 4.5 |                                 | Persons responsible for ensuring the maintenance of such equipment must be clear.                                                                                                                                                                  |                                                |
| 4.6 |                                 | The actions of First Response Teams or emergency controllers may need to be specified in more details, e.g. go to assembly point, don suitable PPE, approach the location of the emergency, isolate releases, activates fire fighting systems etc. |                                                |
| 4.7 |                                 | The location of the designated emergency control centre should be indicated.                                                                                                                                                                       |                                                |
| 4.8 |                                 | The facilities to be available at this location and the persons responsible for maintenance thereof must be indicated.                                                                                                                             |                                                |
| 5.1 | Contents – contact with outside | There must be an indication of who is responsible for notifying the external emergency services as well as which services must be contacted under what circumstances.                                                                              |                                                |
| 5.2 |                                 | There must be an indication of which external neighbouring facilities need to be notified and who is responsible for this.                                                                                                                         |                                                |
| 5.3 |                                 | Contact details for external services and neighbouring facilities must be in the procedures and readily availed to the responsible persons.                                                                                                        | Fire dept telephone number not only speed dial |

| No. | Aspect | Essential emergency elements                                                                                                                         | Review Evaluation |
|-----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| 5.4 |        | There must be a clear indication of what will be communicated to the emergency services as well as to neighbours as per a pre-agreed plan of action. |                   |
| 5.5 |        | The manner in which roles and responsibilities changes once external emergency services are on site needs to be clear.                               |                   |
| 5.6 |        | Access to the site / area during an emergency should be controlled and the means of achieving this must be described.                                |                   |
| 5.7 |        | If a specific offsite emergency plan exists then this should be referred to by name/number.                                                          |                   |

### Organisational Measures Checklist

Measures in the organisation to reduce the major risks can be evaluated as per the table below. This checklist can be used to guide improvement to the management systems on site.

| No. | Aspect                | Essential elements                                                                                                                                                                                      | Review Evaluation |
|-----|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| 1.1 | Management Leadership | Management has a clear understanding of the major hazards associated with the installation and the implications thereof and the means to prevent escalation of single failures into catastrophic events |                   |
| 1.2 |                       | Clear Management commitment to reducing potential major hazards                                                                                                                                         |                   |
| 1.3 |                       | Safety Management System (both occupational safety and process safety systems) implemented on site that includes a focus on Major Hazards (i.e. process safety aspects)                                 |                   |
| 1.4 |                       | Management system accredited (e.g. OHSAS 18000)                                                                                                                                                         |                   |
| 1.5 |                       | Major hazard process safety policies in place                                                                                                                                                           |                   |
| 1.6 |                       | Major hazard process safety performance measured and monitored and goals set for continual improvement                                                                                                  |                   |
| 1.7 |                       | Clear commitment to providing and maintaining adequate and competent resources to deal with major hazard process safety aspects                                                                         |                   |
| 1.8 |                       | Regular audits and management reviews                                                                                                                                                                   |                   |
| 1.9 |                       | Principles of inherent safety considered in the design                                                                                                                                                  |                   |
| 2.1 | Safety Documentation  | Facility has a complete and up to date set of process and design drawings as well as operating procedures                                                                                               |                   |
| 2.2 |                       | Facility has a complete set of MSDS's for all materials on site                                                                                                                                         |                   |
| 2.3 |                       | Pressure vessels registered                                                                                                                                                                             |                   |
| 2.4 |                       | Pressurised systems e.g. piping registered                                                                                                                                                              |                   |
| 2.5 |                       | Relief valve register                                                                                                                                                                                   |                   |
| 2.6 |                       | Critical machines e.g. pumps, compressors, fans on a register                                                                                                                                           |                   |

| No.  | Aspect                                | Essential elements                                                                                       | Review Evaluation |
|------|---------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------|
| 2.7  |                                       | Trips and interlocks logged on a register                                                                |                   |
| 2.8  |                                       | Permit to work clearance system                                                                          |                   |
| 2.9  |                                       | Specific procedures for control of contractors                                                           |                   |
| 2.10 |                                       | Specific lock-out and tagging procedures                                                                 |                   |
| 2.11 |                                       | Change / Modification control procedure                                                                  |                   |
| 2.12 |                                       | Management of change procedure includes specific instructions for review of major process safety hazards |                   |
| 2.13 |                                       | Flame and explosion proof electrical equipment register                                                  |                   |
| 3.1  | Integrity assurance                   | Scheduled inspection and testing of pressure vessels                                                     |                   |
| 3.2  |                                       | Schedule testing of pressure relief valves                                                               |                   |
| 3.3  |                                       | Scheduled inspection of atmospheric storage tanks                                                        |                   |
| 3.4  |                                       | Pressurised systems e.g. piping inspected                                                                |                   |
| 3.5  |                                       | Integrity of concrete and steel structures monitored                                                     |                   |
| 3.6  |                                       | Critical machines inspected                                                                              |                   |
| 3.7  |                                       | Loading hoses and arms inspected and tested                                                              |                   |
| 3.8  |                                       | Cathodic protection tested                                                                               |                   |
| 4.1  | Instrumented protection functionality | Trips interlocks and alarms tested regularly                                                             |                   |
| 4.2  |                                       | System in place to control trip and interlock defeats or overrides                                       |                   |
| 4.3  |                                       | Emergency shut down systems checked                                                                      |                   |
| 5.1  | Mechanical protective systems         | Relief valves tested                                                                                     |                   |
| 5.2  |                                       | Vacuum and pressure relief devices on tanks tested                                                       |                   |
| 5.3  |                                       | Non return valves checked and overhauled                                                                 |                   |
| 5.4  |                                       | Vents on tanks and vessels checked                                                                       |                   |
| 6.1  | Electrical protective systems         | Flame and explosion proof electrical equipment inspected and tested                                      |                   |

| No. | Aspect                         | Essential elements                                     | Review Evaluation |
|-----|--------------------------------|--------------------------------------------------------|-------------------|
| 6.2 |                                | Earthing on tanks and equipment checked for continuity |                   |
| 6.3 |                                | Emergency electric power generation regularly checked  |                   |
| 7.1 | Process protective system      | Inert gas blankets checked and maintained              |                   |
| 8.1 | Operator reliability           | Operational training carried out                       |                   |
| 8.2 |                                | Operator assessed competent                            |                   |
| 8.3 |                                | Refresher training carried out                         |                   |
| 8.4 |                                | Accident recall and review sessions instituted         |                   |
| 8.5 |                                | All equipment identified and labelled                  |                   |
| 8.6 |                                | Major hazard awareness training program                |                   |
| 9.1 | Fire protection and prevention | Fire water availability monitored e.g. pressure        |                   |
| 9.2 |                                | Foam inventory and quality monitored                   |                   |
| 9.3 |                                | Emergency diesel fire water pump regularly tested      |                   |
| 9.4 |                                | Fire detection and alarms checked and tested           |                   |
| 9.5 |                                | Bunding checked regularly                              |                   |



## **APPENDIX F**

### **EVALUATION OF THIS REPORT AGAINST THE REQUIREMENTS OF THE MHI REGULATIONS ISHECONCC AIA CERTIFICATE**

**Table Evaluating the Report against the Requirements of the MHI Regulations**

| Ref No | Section in OHS Act or MHI Regulations | Requirements Against the MHI Risk Assessment                                                                                                                                                              | Relevant Section in this MHI RA Report | Title of Section                                                                                    |
|--------|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-----------------------------------------------------------------------------------------------------|
| 1      | MHI Reg (5) (a)                       | Ensure that the MHI RA be carried out by an Approved Inspection Authority which is competent to express an opinion as to the risks associated with the major hazard installation<br>And at least include: | See AIA certificate on following page  |                                                                                                     |
|        | MHI Reg (5) (b)                       |                                                                                                                                                                                                           |                                        |                                                                                                     |
| 2      |                                       | (i) a general process description of the major hazard installation;                                                                                                                                       | Section 4                              | Process Description                                                                                 |
| 3      |                                       | (ii) a description of the major incidents associated with that type of installation and the consequences of such incidents, which shall include potential incidents;                                      | Sections 5.1 & 5.2                     | Incidents and Accidents                                                                             |
| 4      |                                       | (iii) an estimation of the probability of a major incident,                                                                                                                                               | Section 5.9<br>Appendix B              | Identification of Major Hazards<br>Frequency Analysis<br>Failure Data Used                          |
| 5      |                                       | (iv) a copy of the site emergency plan;                                                                                                                                                                   | Appendix F                             |                                                                                                     |
| 6      |                                       | (v) an estimation of the total result in the case of an explosion or fire,                                                                                                                                | Section 5.5 & 5.6                      | Flammable releases, fires and explosions                                                            |
| 7      |                                       | (vi) in the case of toxic release, an estimation of concentration effects of such release;                                                                                                                | Section 5.5 & 5.6                      | Toxic Releases                                                                                      |
| 8      |                                       | (vii) the potential effect of an incident on a major hazard installation or part thereof on an adjacent major hazard installation or part thereof;                                                        | Section 5.8                            | Domino effects                                                                                      |
| 9      |                                       | (viii) the potential effect of a major incident on any other installation, members of the public and residential areas;                                                                                   | Section 5.6, 5.10 & 5.11               | Consequence analysis for potential MHI events<br>Future land use planning in the vicinity of an MHI |
| 10     |                                       | (ix) meteorological tendencies;                                                                                                                                                                           | Section 4<br>Appendix A                | Topographical and meteorological considerations<br>Weather data                                     |

| Ref No | Section in OHS Act or MHI Regulations | Requirements Against the MHI Risk Assessment                                                                 | Relevant Section in this MHI RA Report | Title of Section                                                                                |
|--------|---------------------------------------|--------------------------------------------------------------------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------------------|
| 11     |                                       | (x) the suitability of existing emergency procedures for the risks identified,                               | Section 7<br>Appendix F<br>Appendix E  | Emergency Plan<br>Checklist for Evaluation of<br>Emergency Plan                                 |
| 12     |                                       | (xi) any requirements laid down in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989); and | Section 6                              | Environmental hazards                                                                           |
| 13     |                                       | (xii) any organisational measures that may be required.                                                      | Section 8<br>Appendix E                | Preventive and protective<br>measures<br>Checklist for Evaluation of<br>organizational measures |

**Republic of South Africa**



Department of Labour

***Certificate***

This is to certify that

**ISHECON CC**

has been approved as an  
**APPROVED INSPECTION AUTHORITY**  
**Category: Toxic; Flammable (Explosives or Fire)**

In terms of the Occupational Health and Safety  
Act, 1993, read with the Major Hazard  
Installation Regulations 5 (5)(a) regarding risk  
assessments

A handwritten signature in black ink, appearing to read 'M. J. J. J.', written over a horizontal line.

Chief Inspector

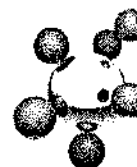
11 October 2005

Date

MHI 0001

Certificate Number

## **Appendix 5: Material Safety Data Sheets for Nitric Acid, Waxy Oil and Heavy Furnace Oil**



## Material Safety Data Sheet

### Waxy Oil 30

Version 1.00

Revision Date 08.11.2007

#### 1. Identification of the substance/preparation and of the company/undertaking

**Trade name** Waxy Oil 30

**Synonyms** Waxy Oil 30, WO 30

**Company** Sasol Oil  
P.O Box 4211  
Randburg  
2125  
South Africa

**Information (Product safety)** Telephone: +27 16 960 2696 Fax: +27 16 960 2711

**Emergency telephone**

|                                       |                     |
|---------------------------------------|---------------------|
| Europe, Israel, Africa, Americas      | +44 (0)208 762 8322 |
| Middle East, Arabic African countries | +961 3 487 287      |
| Asia Pacific                          | +65 633 44 177      |
| China                                 | +86 10 5100 3039    |
| South Africa                          | +27 (0)17 610 4444  |

#### 2. Hazards identification

##### Identification of the risks

R45 May cause cancer.

#### 3. Composition/information on ingredients

##### Preparation on the base:

Gas oils, hydrotreated; Gasoil - unspecified

Contents: 100.00 %W/W

CAS-No. 97862-78-7

Index-No. 649-238-00-2

EC-No. 308-128-1

Symbol(s) T

R-phrases(s) -R45

For the full text of the R phrases mentioned in this Section, see Section 16.

#### 4. First aid measures

**General advice** First aider needs to protect himself.

**Inhalation** Move to fresh air in case of accidental inhalation of vapours. If breathing is irregular or stopped, administer artificial



## Material Safety Data Sheet

### Waxy Oil 30

Version 1.00

Revision Date 08.11.2007

|                     |                                                                                                                                                                                                                                                                             |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Skin contact</b> | respiration. If symptoms persist, call a physician.<br>Wash off immediately with soap and plenty of water. If skin irritation persists, call a physician. For thermal burns, cool affected areas as quickly as possible by immersing in water. Consult a physician.         |
| <b>Eye contact</b>  | Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician immediately. If burns occur, treat as thermal burns.                                                                                                              |
| <b>Ingestion</b>    | If swallowed, seek medical advice immediately and show this container or label. Do NOT induce vomiting. Prevent vomiting if possible. If a person vomits when lying on his back, place him in the recovery position. Never give anything by mouth to an unconscious person. |

## 5. Fire-fighting measures

|                                                       |                                                                                                                                                                     |
|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Suitable extinguishing media</b>                   | Water spray, Foam, Dry powder, Carbon dioxide (CO2)                                                                                                                 |
| <b>Specific hazards during fire fighting</b>          | Do not allow run-off from fire fighting to enter drains or water courses.                                                                                           |
| <b>Special protective equipment for fire-fighters</b> | In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment.                                                                   |
| <b>Further information</b>                            | Cool containers / tanks with water spray. In the event of fire and/or explosion do not breathe fumes. Exposure to decomposition products may be a hazard to health. |

## 6. Accidental release measures

|                                  |                                                                                                                       |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Personal precautions</b>      | Keep people away from and upwind of spill/leak. Remove all sources of ignition. Do not breathe vapours or spray mist. |
| <b>Environmental precautions</b> | Prevent product from entering drains. Prevent further leakage or spillage if safe to do so.                           |
| <b>Methods for cleaning up</b>   | Soak up with inert absorbent material and dispose of as hazardous waste.                                              |
| <b>Additional advice</b>         | Never return spills in original containers for re-use.                                                                |

## 7. Handling and storage

### Handling

|                             |                                                                                                                                                                                       |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Safe handling advice</b> | Ensure adequate ventilation. Do not breathe vapours or spray mist. Barrier creams may help to protect the exposed areas of skin, they should however not be applied once exposure has |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



## Material Safety Data Sheet

### Waxy Oil 30

Version 1.00

Revision Date 08.11.2007

**Advice on protection against fire and explosion** occurred. Wear personal protective equipment.  
Keep away from open flames, hot surfaces and sources of ignition.

#### Storage

**Requirements for storage areas and containers** Keep containers tightly closed in a cool, well-ventilated place.

## 8. Exposure controls / personal protection

#### Components with workplace control parameters

##### NATIONAL OCCUPATIONAL EXPOSURE LIMITS

Contains no substances with occupational exposure limit values.

##### EUROPEAN OCCUPATIONAL EXPOSURE LIMITS

Contains no substances with occupational exposure limit values.

#### Engineering measures

Provide sufficient air exchange and/or exhaust in work rooms.

#### Personal protective equipment

**Respiratory protection** In case of insufficient ventilation, wear suitable respiratory equipment.

**Hand protection** Gloves suitable for permanent contact:  
Material: butyl-rubber  
Break through time: 4 h  
Material thickness: 0.5 mm  
unsuitable gloves  
Material: Polyvinylchloride, leather, nitrile rubber/nitrile latex, natural rubber/natural latex

**Eye protection** Safety glasses with side-shields

**Skin and body protection** Safety shoes, Lightweight protective clothing, Use protective skin cream before handling the product.

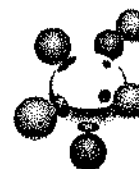
**Hygiene measures** Wash hands before breaks and immediately after handling the product.

**Protective measures** Wear suitable protective equipment.

## 9. Physical and chemical properties

**Form** Wax.





## Material Safety Data Sheet

### Waxy Oil 30

Version 1.00

Revision Date 08.11.2007

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|                                   |                                    |
|-----------------------------------|------------------------------------|
| <i>state of matter</i>            | <i>liquid; at 20 °C; 1,013 hPa</i> |
| <i>Colour</i>                     | <i>black</i>                       |
| <i>Odour</i>                      | <i>petroleum</i>                   |
| <i>Pour point</i>                 | <i>60 °C</i>                       |
| <i>Boiling point/boilingrange</i> | <i>&gt; 450 °C</i>                 |
| <i>Flash point</i>                | <i>&gt; 130 °C</i>                 |
| <i>Density</i>                    | <i>0.94 g/cm3; 20 °C</i>           |
| <i>Water solubility</i>           | <i>insoluble</i>                   |
| <i>Viscosity, kinematic</i>       | <i>30 mm2/s; 100 °C</i>            |

## 10. Stability and reactivity

---

|                                         |                                       |
|-----------------------------------------|---------------------------------------|
| <i>Materials to avoid</i>               | <i>Oxidizing agents</i>               |
| <i>Hazardous decomposition products</i> | <i>Carbon oxides<br/>Hydrocarbons</i> |

## 11. Toxicological information

---

|                            |                          |
|----------------------------|--------------------------|
| <i>Further information</i> | <i>no data available</i> |
|----------------------------|--------------------------|

## 12. Ecological information

### *Ecotoxicity effects*

---

|                       |                          |
|-----------------------|--------------------------|
| <i>General advice</i> | <i>no data available</i> |
|-----------------------|--------------------------|

## 13. Disposal considerations

---

|                               |                                                                                                            |
|-------------------------------|------------------------------------------------------------------------------------------------------------|
| <i>Product</i>                | <i>Dispose of in accordance with local regulations.</i>                                                    |
| <i>Contaminated packaging</i> | <i>Store containers and offer for recycling of material when in accordance with the local regulations.</i> |

## 14. Transport information

---

|             |                                                                                                   |
|-------------|---------------------------------------------------------------------------------------------------|
| <i>ADR</i>  | <i>UN-Number: 1202; Class: 3; Packaging group: III; F1;<br/>Description of the goods: GAS OIL</i> |
| <i>RID</i>  | <i>UN-Number: 1202; Class: 3; Packaging group: III; F1;<br/>Description of the goods: GAS OIL</i> |
| <i>ADNR</i> | <i>UN-Number: 1202; Class: 3; Packaging group: III; F1;<br/>Description of the goods: GAS OIL</i> |



## **Material Safety Data Sheet**

### **Waxy Oil 30**

**Version 1.00**

**Revision Date 08.11.2007**

*All reasonable efforts were exercised to compile this MSDS in accordance with ISO 11014 and ANSI Z400.1.1993. The MSDS provides information regarding the health, safety and environmental hazards, at the date of issue, to facilitate the safe receipt, use and handling of the product in the workplace. Since Sasol and its subsidiaries cannot anticipate or control all conditions under which the product may be handled, used and received in the workplace, it remains the obligation of each user, receiver or handler to, prior to usage, review this MSDS in the context within which the product will be received, handled or used in the workplace. The user, handler or receiver must ensure that the necessary mitigating measures are in place as regards health and safety. This does not substitute the need or requirement for any relevant risk assessments to be conducted. It further remains the responsibility of the receiver, handler or user to communicate such information to all relevant parties that may be involved in the receipt, use or handling of the product.*

*Although all reasonable efforts were exercised in the compilation of this MSDS, Sasol does not expressly warrant the accuracy or assume any liability for the incompleteness of the information contained herein or any advice given. The product is sold and risk passes in accordance with the specific terms and conditions of sale.*

*The MSDS was created by: Motlatsi(MS)*

*The MSDS was approved by: P.Gravett*



# Material Safety Data Sheet

|          |            |
|----------|------------|
| Page:    | 1 of 3     |
| Issued:  | 08 02 2001 |
| Revised: | 14 06 2008 |
| Rev No.: | 5          |
| Product: | HFO        |

## COMPANY DETAILS:

FFS Refiners (Pty) Ltd.  
104 Umhlathuzana Road  
Sea View, Durban 4094  
SOUTH AFRICA

Ph: 031 459 5300  
Fax: 031 459 5326  
Email: ffs@ffs.co.za

## 1) PRODUCT DETAILS:

Product name: Heavy Fuel Oil  
Chemical nature: Complex mixture of liquid hydrocarbons (C10 to C20).  
Synonyms: HFO, FO150, HFF  
UN/ SIN: 1268

## 2) COMPOSITION

Complex blend of liquid hydrocarbons (C10 to C20). Contains aromatic oils including polycyclic aromatic hydrocarbon (PAH) compounds. Sulphur content ranges to a maximum of 4.5% by volume.

| Dangerous Substances    | % (m/m) | Risk Phrase                    |
|-------------------------|---------|--------------------------------|
| Polycyclic Hydrocarbons | 5 - 40  | Probable carcinogenic, harmful |

## 3) HAZARDS IDENTIFICATION

Inflammable liquid (flashpoint approx 100°C); may be fatal if inhaled; harmful if swallowed or if absorbed through skin; contains probable carcinogen compounds. Severe skin irritant. Fuel oils are stored and handled hot; risk of thermal burns on skin contact.

## 4) FIRST AID MEASURES

|            | Symptom and Effect                                                                                                                                                                                        | First Aid                                                                                                                                                                      |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Skin       | Prolonged and repeated contact with skin may cause severe irritation; Toxic if absorbed through the skin; potentially carcinogenic; Burns.                                                                | Wash with soap and water until no odour remains. Cool burns immediately with cool water. Seek medical advice.                                                                  |
| Eyes       | Contact with eyes may cause redness, tearing, blurred vision and moderate irritation.                                                                                                                     | Flush eyes with clean water for 15 minutes. Seek medical advice if irritation persists.                                                                                        |
| Ingestion  | Harmful or fatal if swallowed. Ingestion of this product may cause central nervous system effects.                                                                                                        | If victim is alert, give large amounts of water to drink and seek medical advice. Small amounts can be washed from mouth until no taste remains. <b>DO NOT INDUCE VOMITING</b> |
| Inhalation | Excessive exposure may cause respiratory tract irritation. Repeated prolonged exposure to high concentrations may lead to central nervous system effects, headaches, dizziness and loss of co-ordination. | Immediately remove to fresh air. Give oxygen if required. Seek medical advice if required.                                                                                     |

## 5) FIRE FIGHTING MEASURES

**SMALL FIRES:** Use CO<sub>2</sub>, foam or dry chemical.

**LARGE FIRES:** Use CO<sub>2</sub>, fluoro protein foam or dry chemicals to extinguish the fire. Use water to cool fire-exposed containers/ structures and to protect personnel. Combustion may release toxic chemicals; utilise respirators; avoid low lying areas.



# Material Safety Data Sheet

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|----------|------------|
| Page:    | 2 of 3     |
| Issued:  | 08 02 2001 |
| Revised: | 14 06 2008 |
| Rev No.: | 5          |
| Product: | HFO        |

## 6) ACCIDENTAL RELEASE MEASURES

Full protective clothing, rubber gloves (PVC, Neoprene, Nitrile, or Viton), gumboots and respirator to be worn. Shut off leaks. Remove all sources of heat or flame. Control spill by use of booms, sand, sawdust or any other suitable available medium. Recover as much free product as possible using pumps or mechanical means. Absorb residue with sawdust, sand or other absorbent material. Avoid the product entering storm water drains or waterways.

## 7) HANDLING AND STORAGE

**Handling:** Full protective clothing should be worn when handling the product. A high standard of personal hygiene is essential. Application of protective hand creams may be beneficial.

**Handling temperature:** Avoid extreme temperatures

**Storage:** Store away from strong oxidisers. Incompatible with sulphuric acid, nitric acid, caustics, aliphatic amines and amides.

**Storage Conditions:** Storage conditions should comply with SANS Code 10131:2004 and SANS Code 10089:2003. Product should be stored in a well ventilated area. Sparks, flames and other sources of ignition near the product should be avoided. Do not eat, drink or smoke in storage area.

## 8) EXPOSURE CONTROLS/ PERSONAL PROTECTION

Occupational Exposure Limits: OHSA 0.2mg/m<sup>3</sup> TWA OEL-RL  
Controls: Store in accordance with SANS Code 10131:2004 or SANS Code 10089:2003  
Personal Protection: Ensure adequate tank ventilation  
If engineering controls and work practices are not effective in controlling this material, then wear suitable personal protection equipment including overalls, impervious gloves, respirators, safety goggles, safety boots or gumboots.

## 9) PHYSICAL AND CHEMICAL PROPERTIES

Black viscous liquid with characteristic hydrocarbon odour. Low solubility in water.  
Density @ 20°C, kg/l: 0.96 - 1.02  
Flashpoint @ 101, 325 kPa: 66°C  
Boiling Point: +150°C  
Viscosity (cSt): 120 @ 50°C

## 10) STABILITY AND REACTIVITY

Partially volatile at temperatures in excess of 70°C; avoid strong oxidisers. Incompatible with sulphuric acid, nitric acid, caustics, aliphatic amines and amides.

## 11) TOXICOLOGICAL INFORMATION

Some components of the product are suspected carcinogens. Potential harmful effects to liver, kidneys, heart, lungs and nervous system may result from chronic over exposure. Some of the components of the product have been associated with immunological, reproductive, fetotoxic and genotoxic effects.



# Material Safety Data Sheet

|          |            |
|----------|------------|
| Page:    | 3 of 3     |
| Issued:  | 08 02 2001 |
| Revised: | 14 06 2008 |
| Rev No.: | 5          |
| Product: | HFO        |

## 12) ECOLOGICAL INFORMATION

No ecological problems are expected if the product is handled and used with due care. When released to the environment, some evaporation and bio-degradation will occur. Some components of the product are soluble in water and may contaminate groundwater reserves. Some components of the product will persist in soil. Material is moderately toxic to aquatic organisms.

## 13) DISPOSAL CONSIDERATIONS

Do not flush to drain/ storm sewer. Product must be disposed of in an approved hazardous waste disposal site or an approved incinerator.

## 14) TRANSPORT INFORMATION

|                   |                    |
|-------------------|--------------------|
| SIN               | 1268               |
| ICS:              | Class 3: Group III |
| IMDG Code:        | Class 3            |
| Marine Pollutant: | Yes                |

## 15) REGULATORY INFORMATION

|                      |     |
|----------------------|-----|
| National Legislation | N/A |
|----------------------|-----|

## 16) OTHER INFORMATION

For more information please contact FFS Refiners' Customer Services Department on (031) 459 5300

THE INFORMATION CONTAINED HEREIN, WHILST APPROPRIATE, IS GENERAL IN NATURE.

The information contained herein is also an amalgamation of Good Laboratory Practice-accredited (GLP), in-house derived as well as from published and industry-published data. The data is presented in good faith and is to the best of FFS Refiners (Pty) Ltd's knowledge true and accurate. It is presented for information purposes only and without any warranty whatsoever. Due to the special nature of the product and its applications, FFS Refiners (Pty) Ltd does not accept any responsibility or liability whatsoever (including patent infringement) which may result from the use of this information. If in doubt please contact FFS Refiners (Pty) Ltd.

The information contained herein is not to be construed as any licence to operate under, or a recommendation to infringe any existing patents, nor should it be seen as taking preference over any Governmental or international safety codes or regulations.

# NITRIC ACID

NAC

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                          |              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------|
| Common Synonyms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  | Watery liquid                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Colorless to light brown | Choking odor |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  | Sinks and mixes with water. Harmful vapor is produced.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                          |              |
| AVOID CONTACT WITH LIQUID AND VAPOR. Keep people away. Wear chemical protective suit with self-contained breathing apparatus. Stop discharge if possible. Isolate and remove discharged material. Notify local health and pollution control agencies.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                          |              |
| Fire                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  | Not flammable. May cause fire on contact with combustibles. Flammable gas may be formed on contact with metals. Poisonous gases are produced when heated. Wear chemical protective suit with self-contained breathing apparatus. Cool exposed containers with water.                                                                                                                                                                                                                                                                                                          |                          |              |
| Exposure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  | CALL FOR MEDICAL AID.<br><br>VAPOR<br>Will burn eyes, nose and throat. If inhaled, will cause difficult breathing or loss of consciousness. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.<br><br>LIQUID<br>Will burn skin and eyes. Harmful if swallowed. Remove contaminated clothing and shoes. Flush affected areas with plenty of water. IF IN EYES, hold eyelids open and flush with plenty of water. IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk. DO NOT INDUCE VOMITING. |                          |              |
| Water Pollution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  | HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.                                                                                                                                                                                                                                                                                                                                                                                        |                          |              |
| 1. RESPONSE TO DISCHARGE<br>(See Response Methods Handbook)<br>Issue warning-corrosive<br>Restrict access<br>Evacuate area<br>Disperse and flush                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | 2. LABEL<br>2.1 Category: Oxidizer, Corrosive<br>2.2 Class: 5 & 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                          |              |
| 3. CHEMICAL DESIGNATIONS<br>3.1 CG Compatibility Class: Nitric acid<br>3.2 Formula: HNO <sub>3</sub> -H <sub>2</sub> O<br>3.3 120/UN Designation: 5.D/2031<br>3.4 DOT ID No.: 2031<br>3.5 CAS Registry No.: 7697-37-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  | 4. OBSERVABLE CHARACTERISTICS<br>4.1 Physical State (as shipped): Liquid<br>4.2 Color: Colorless<br>4.3 Odor: Acid; sweet to acid                                                                                                                                                                                                                                                                                                                                                                                                                                             |                          |              |
| 5. HEALTH HAZARDS<br>5.1 Personal Protective Equipment: Air mask; rubber acid suit, hood, boots and gloves; chemical goggles; safety shower and eye bath.<br>5.2 Symptoms Following Exposure: Vapors irritate eyes and respiratory tract; lung injury may not become apparent for several hours following exposure. Liquid may cause severe burns to eyes and skin.<br>5.3 Treatment of Exposure: INHALATION: remove to fresh air, administer artificial respiration if required. INGESTION: drink large volumes of water, do NOT induce vomiting. SKIN OR EYES: flush with water for at least 15 min.<br>5.4 Threshold Limit Value: 2 ppm<br>5.5 Short Term Inhalation Limit: 15 ppm for 5 min.<br>5.6 Toxicity by Ingestion: Grade 3; LD <sub>50</sub> = 50 to 500 mg/kg<br>5.7 Lethal Toxicity: None<br>5.8 Vapor (Gas) Irritant Characterization: 58-68%; Vapor is moderately irritating such that personnel will not usually tolerate moderate or high vapor concentrations. 95%: Vapors cause severe irritation of eyes and throat and can cause eye and lung injury. They cannot be tolerated even at low concentrations.<br>5.9 Liquid or Solid Irritant Characterization: Severe skin irritant. Causes second and third-degree burns on short contact and is very injurious to the eyes.<br>5.10 Odor Threshold: Data not available<br>5.11 ADLH Value: 100 ppm |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                          |              |
| 6. FIRE HAZARDS<br>6.1 Flash Point: Not flammable<br>6.2 Flammable Limits in Air: Not flammable<br>6.3 Fire Extinguishing Agents: Use water on adjacent fires.<br>6.4 Fire Extinguishing Agents Not to be Used: Not pertinent<br>6.5 Special Hazards of Combustion Products: May give off poisonous oxides of nitrogen and acid fumes when heated in fires.<br>6.6 Behavior in Fire: Decomposes and gives off poisonous oxides of nitrogen.<br>6.7 Ignition Temperature: Not flammable<br>6.8 Electrical Hazard: Not pertinent<br>6.9 Burning Rate: Not pertinent<br>6.10 Adiabatic Flame Temperature: Data not available<br><br>(Continued)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                          |              |
| 7. CHEMICAL REACTIVITY<br>7.1 Reactivity With Water: May heat up on mixing, but explosion or formation of steam unlikely.<br>7.2 Reactivity With Common Materials: Very corrosive to wood, paper, cloth and most metals. Toxic red oxides of nitrogen are formed.<br>7.3 Stability During Transport: When heated may give off toxic red oxides of nitrogen.<br>7.4 Neutralizing Agents for Acids and Caustics: Flush with water<br>7.5 Polymerization: Not pertinent<br>7.6 Inhibitor of Polymerization: Not pertinent<br>7.7 Molar Ratio (Reactant to Product): Data not available<br>7.8 Reactivity Group: 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                          |              |
| 8. WATER POLLUTION<br>8.1 Aquatic Toxicity:<br>72 ppm/96 hr/mosquito fish/TL <sub>50</sub> /fresh water<br>330-1000 ppm/48 hr/cookle/LC <sub>50</sub> /salt water<br>8.2 Waterfowl Toxicity: Data not available<br>8.3 Biological Oxygen Demand (BOD): None<br>8.4 Food Chain Concentration Potential: None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                          |              |
| 9. SHIPPING INFORMATION<br>9.1 Grades of Purity: Various grades: 52-98%<br>9.2 Storage Temperature: Ambient<br>9.3 Inert Atmosphere: No requirement<br>9.4 Venting: Open or pressure-vacuum                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                          |              |
| 10. HAZARD ASSESSMENT CODE<br>(See Hazard Assessment Handbook)<br>A-P                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                          |              |
| II. HAZARD CLASSIFICATIONS<br>11.1 Code of Federal Regulations: Oxidizer<br>11.2 NAS Hazard Rating for Bulk Water Transportation:<br>Category Rating<br>Fire ..... 0<br>Health ..... 3<br>Vapor Irritant ..... 3<br>Liquid or Solid Irritant ..... 4<br>Poisons ..... 3<br>Water Pollution<br>Human Toxicity ..... 3<br>Aquatic Toxicity ..... 3<br>Aesthetic Effect ..... 2<br>Reactivity<br>Other Chemicals ..... 4<br>Water ..... 0<br>Self Reaction ..... 0<br>11.3 NFPA Hazard Classification:<br>Category Classification<br>Health Hazard (Blue) ..... 3<br>Flammability (Red) ..... 0<br>Reactivity (Yellow) ..... 0<br>oxy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                          |              |
| 12. PHYSICAL AND CHEMICAL PROPERTIES<br>12.1 Physical State at 15°C and 1 atm: Liquid<br>12.2 Molecular Weight: Not pertinent<br>12.3 Boiling Point at 1 atm: 192.0°F = 88.9°C = 362.1°K<br>12.4 Freezing Point: -50°F = -45.6°C = 227.6°K<br>12.5 Critical Temperature: Not pertinent<br>12.6 Critical Pressure: Not pertinent<br>12.7 Specific Gravity: 1.48 at 20°C (liquid)<br>12.8 Liquid Surface Tension: Not pertinent<br>12.9 Liquid Water Interfacial Tension: Not pertinent<br>12.10 Vapor (Gas) Specific Gravity: Not pertinent<br>12.11 Ratio of Specific Heats of Vapor (Gas): (est.) 1.248<br>12.12 Latent Heat of Vaporization: 214 Btu/lb = 119 cal/g = 4.98 X 10 <sup>4</sup> J/kg<br>12.13 Heat of Combustion: Not pertinent<br>12.14 Heat of Decomposition: Not pertinent<br>12.15 Heat of Solution: -205 Btu/lb = -114 cal/g = -4.78 X 10 <sup>4</sup> J/kg<br>12.16 Heat of Polymerization: Not pertinent<br>12.25 Heat of Fusion: Data not available<br>12.26 Limiting Value: Data not available<br>12.27 Reid Vapor Pressure: 1.9 psia                                                                                                                                                                                                                                                                                                            |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                          |              |
| 6. FIRE HAZARDS (Continued)<br>6.11 Stoichiometric Air to Fuel Ratio: Data not available<br>6.12 Flame Temperature: Data not available                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                          |              |

## **Appendix 6: FFS Environemntal Management System Procedure 45**

|                                                           |                                      |          |                         |           |
|-----------------------------------------------------------|--------------------------------------|----------|-------------------------|-----------|
| FFS REFINERS (PTY) LTD<br>Environmental Management System | UNDERGRD & ABOVE<br>GRD TANK TESTING |          | Proc #                  | 45        |
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|                                                           | 10                                   | 18/07/12 | Approved by<br>D.Hunter | Signature |

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## **Procedure 45** **Underground and Above Ground Tank Testing**

### **Purpose**

To provide a means of determining the integrity of underground storage tanks and above ground storage tanks and eliminate leaking. Where possible a hydraulic pressure test should be undertaken. However, with tanks that are difficult to seal or isolate, an ullage test may be done.

| Element            | Characteristic                                 | Frequency of testing | Method                                                                                                                                     |
|--------------------|------------------------------------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Flame arrester     |                                                | every year           | Visual                                                                                                                                     |
| Underground Tanks  | Tanks over 5 years old                         | every year           | Hydraulic pressure test or ullage                                                                                                          |
| Above ground tanks | All tanks external inspection by FFS           | every month*         | Visual – see below under leak detection and response program.<br><br><b>Note:</b> New tanks to be tested using approved method before use. |
|                    | All tanks external inspection by AIA or Pr Eng | Every 5 years        | API Std 650                                                                                                                                |
|                    | All tanks internal by AIA or PrEng             | Every 10 years       |                                                                                                                                            |

\*If pick up problem, tank to be visually inspected more frequently than yearly. May need to do a proper tank test using approved method.

### **Tank integrity Assurance (Applicable to Evander only - as per MHI Assessment)**

- The integrity of the installation needs to be maintained through scheduled inspections and maintenance of plant, tank and equipment. Tank Inspections should occur as follows:
  - Routine visual inspection of the external of the tank
  - Formal visual inspection of the external of the tank
  - Ultrasonic shell thickness measurements – five years after commissioning, and then once corrosion rate is known continue at intervals which are the smaller of:

Remaining corrosion allowance  
2 x FFS corrosion rate

**OR**

15 years

- Internal inspection within 10 years to determine bottom plate corrosion followed by setting the interval such that the corrosion rate will not be less than 1,2mm at next inspection, but not greater



|                                                           |                                      |          |             |        |
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|                                                           | 10                                   | 18/07/12 | D.Hunter    |        |

than 20 years.

- Bunding also needs to be monitored in a similar way.

The physical integrity of the pipework circulating hot tar in the FFE also needs to be monitored and maintained

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### Hydraulic Pressure Testing

#### Preparation of the tank

- The tank must have a lid that can provide a completely air-tight seal.
- An accurate hydraulic pressure gauge must be installed in the tank.
- An air bleed and valve must be installed in the highest point of the tank.
- An attachment point for the hand pump must be installed in the tank.
- The tank must be empty and clean.

#### Hydraulic Testing

- Fill the tank with water up to the brim.
- Ensure that the lid is on and is providing a good seal.
- Connect the hand operated test pump securely to the tank via the attachment point.
- Pump water into the tank and bleed all the air out until there is water coming out of the air bleed. This is very important for a good test.
- Check to ensure that there is no leaking through the lid seal or pump attachment point. If there is leaking seal all leaks before continuing.
- Pump up to a pressure of 1 bar or half of the designed maximum pressure capacity of the tank.
- Stop pumping and check that the pressure holds for at least 5 minutes. During this time conduct leak tests around all seals and vents using soapy water in order to identify possible pressure leakage.

#### Possible Results

- If the tank holds pressure as above then there is no leak.
- If there is a big leak it won't be possible to get up to pressure.
- If there is a small leak the pressure will drop immediately you stop pumping. The approximate size of the leak can be determined by simulating the observed pressure drop by opening the air bleed valve and seeing how much water comes out.

#### Ullage Testing

- The tank must be isolated so that no water/product is moving into or out of the tank.
- If the tank is empty, fill the tank with water. If the tank contains oil, leave it as it is.
- Measure distance from tank lid to surface of liquid. Mark measuring point on lid rim.
- Close lid of tank. **Ensure that tank vents are open.**
- Measure distance from tank lid to surface of liquid daily, at the same time every day, and from the same point on the lid for three days. Note down ambient temperature when taking the measurement.

|                                                           |                                      |          |                          |           |
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### Possible Results

- If the tank level drops, it is possible that the integrity of the tank has been compromised. The tank should be emptied of oil and refilled with water. Repeat the test, ensuring complete isolation of the tank.
- If tank level rises, it is probable that the tank lid is leaking and allowing water to enter the tank, or the tank has been incorrectly isolated.

### Abandonment of Underground Storage Tanks

If any UST is found to be leaking, it must be taken out of service as soon as reasonably practical. If the leak is repaired, a full leak test must be conducted on the tank after the repair has been completed and before the tank may be put back into use. If the tank is still leaking it may not be used.

If the tank cannot be repaired it must be abandoned. Before any storage tank that is no longer required for use is removed, the following steps shall be carried out successively:

- all Flammable Liquid shall be removed from the tank and from connecting pipes;
- the suction, filler, vent and dipping hole pipes shall be disconnected;
- the tank shall be rendered thoroughly airtight after disconnecting all pipes by blanking off all flanges and screwing in metal gas plugs onto any sockets in the tank. All leakage holes shall be plugged with lead or hardwood plugs.

If tank is removed and soil around tank needs to be rehabilitated refer to EMS Procedure 40.

If the UST is not to be removed as described above, the tank must be filled with sand, liquid concrete or such other substance so as to prevent its future reuse.

If the tank is to be disposed of as scrap, it shall before disposal be retested for explosive vapours and, if necessary, rendered gas-free and a sufficient number of holes or openings shall be made in such tank so as to render it unfit for future use.

### Reporting

Following the completion of a leakage test, a **Tank Testing Report Form** must be completed and filed in the EMS Filing Cabinet.

If a leak has been detected a **non conformance report** must be initiated.



|                                                           |                                      |  |             |           |
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|                                                           | 18/07/12                             |  | D.Hunter    |           |

## **LEAK DETECTION AND REPAIR PROGRAMME FOR ABOVE GROUND TANKS**

### **EXTERNAL INSPECTIONS**

#### ***Routine In-Service external Inspections***

*The external condition of the tank shall be monitored by close visual inspection from the ground on a routine basis. This inspection may be done by FFS personnel. Personnel performing this inspection should be knowledgeable of the storage facility operations, the tank, and the characteristics of the product stored.*

*The interval of such inspections shall **not exceed one month**.*

*This routine in-service inspection shall include a visual inspection of the tank's exterior surfaces. Evidence of leaks; shell distortions; signs of settlement; corrosion; and condition of the foundation, paint coatings, insulation systems, and appurtenances should be documented for follow-up action by an authorized inspector/ registered engineer.*

*This inspection should be recorded on a register and signed off by the person(s) carrying out the inspection*

#### ***Formal External Inspection***

*All tanks shall be given a visual external inspection by a SANAS approved inspection authority or a professionally registered engineer experienced in storage tank design, operation & repair. This inspection must be conducted at least every 5 years API Std 650, Sec 6.3.2.1). Tanks may be in operation during this inspection.*

*Insulated tanks need to have insulation removed only to the extent necessary to determine the condition of the exterior wall of the tank or the roof.*

*This external inspection must also include ultrasonic thickness measurements of the tank shell & roof at sufficient intervals to detect any generalized corrosion.*

*API Std 653, Annex C contains an extensive checklist which should be used for external inspections.*

*These inspections must be accompanied by a formal report and entered into a register.*

### **INTERNAL INSPECTIONS**

*All tanks shall be subject to an internal inspection by a SANAS approved inspection authority or a professionally registered engineer experienced in storage tank design, operation & repair. This inspection must be conducted at least every 10 years (API 653, Sec. 6.4.2.1).*

*The tank is to be removed from service, safely isolated, cleaned and made gas free with a signed entry permit*

*Following an internal inspection, the inspector/engineer shall evaluate the suitability of service for the tank in accordance with API std 653, Section 4. The inspectors/engineers report must also include required repairs (if any). Note that a water fill test (hydrostatic test) is only required if extensive repairs are carried out (see below)*

*This inspection date and inspection party or person is to be recorded in the tank register.*

### **TANK MAINTENANCE & REPAIR**

*No hot or other hazardous work shall be started inside a tank or vessel in which a class I, a class II, or a class III petroleum product has been stored until such time as the tank or vessel has been inspected, a gas-free certificate has been issued and all pipelines have been isolated.*

*All mechanical repairs shall be carried out in accordance with API std 650 & API std 653.*

*All repair work must be authorized by a SANAS approved inspection authority or a professionally registered engineer experienced in storage tank design, operation & repair, before commencement of the work.*



|                                                           |                                      |             |           |        |
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|                                                           | 10                                   | 18/07/12    | D.Hunter  |        |

The authorized inspector or engineer will designate inspection hold points required during the repair or alteration sequence and minimum documentation to be submitted upon job completion.

During repairs, nondestructive testing as required by API Std 653 shall be carried out by a SANAS approved inspection authority.

Following repairs, water fill (hydrostatic) testing may be necessary. API Std 653 section 12.3 lists repair work that necessitates water fill testing as follows:

- a) Installing a shell penetration (nozzle or insert plate) larger than 300mm beneath the design liquid level. (Over plating does not constitute a shell penetration).
- b) Installing a bottom penetration (nozzle or insert plate) within 300mm of the shell (Over plating does not constitute a bottom penetration).
- c) Complete or partial (more than one-half of the weld thickness) removal and replacement of more than 300mm of vertical weld joining shell plates or radial weld joining the annular plate ring.
- d) Removing and replacing part of the weld attaching the shell to the bottom, or to the annular plate ring, in excess of 50% of the original weld size.
- e) Jacking a tank shell.

### **WATER FILL (HYDROSTATIC) TESTING**

This test is only a requirement for:

- Newly constructed tanks
- Relocated tanks
- Tanks that have undergone extensive repairs (See section 2)

### **METHOD**

The tank shall be filled with water to 50 mm above the weld connecting the roof plate or top angle to the shell. A lower level is permissible when restricted by overflows.

The tank shall be inspected frequently during the filling operation.

For pressurized (gas tight) tanks: After the tank is filled with water, the shell and the anchorage shall be visually inspected for tightness. Air pressure of

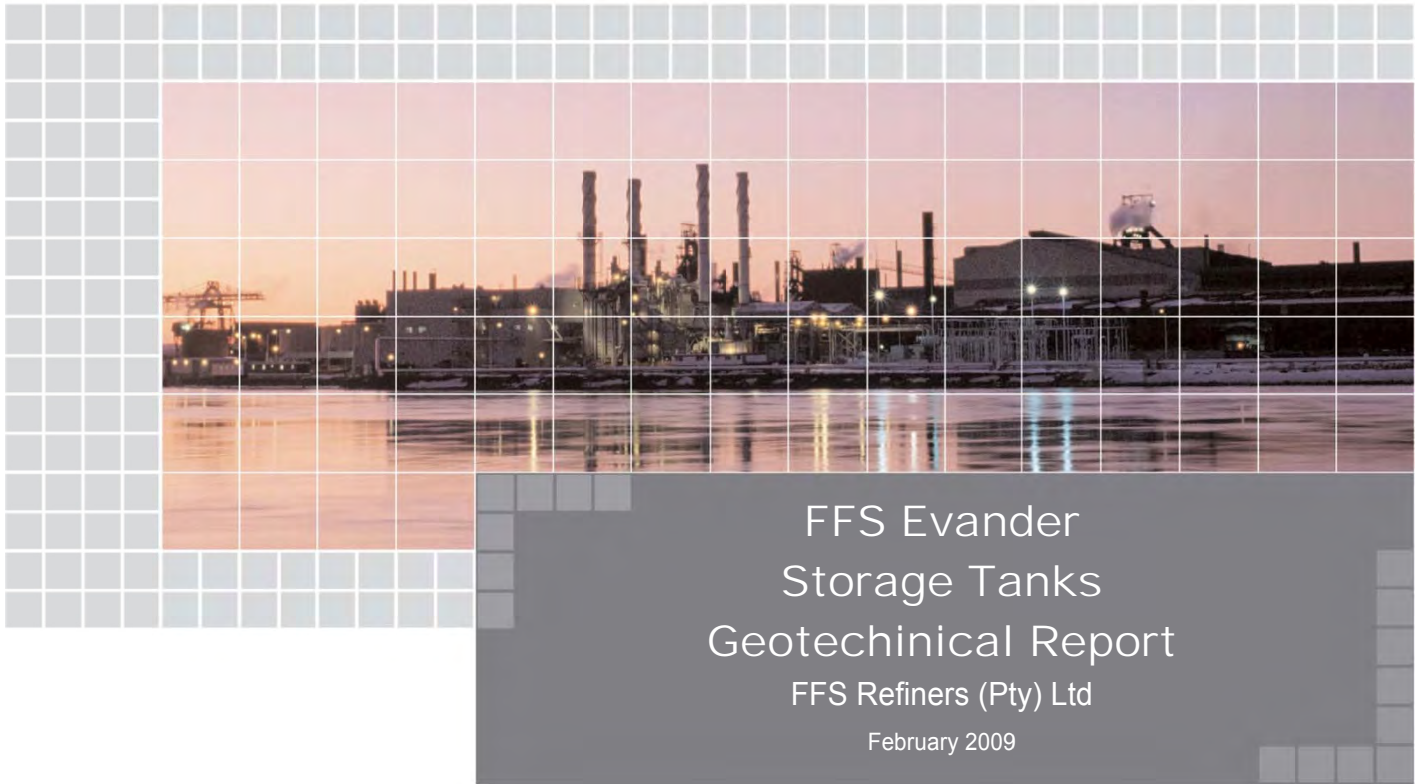
1.25 times the design pressure shall be applied to the inside of the tank roof. After 15 minutes, the air pressure shall be reduced to the design pressure, and the tank shall be checked for tightness. In addition, all seams above the water level shall be tested using a soap film or another material suitable for the detection of leaks. This test is applicable only for pressurized tanks. If the tank design pressure cannot be clearly identified or if the tank is vented to atmosphere, only a water fill test shall be carried out

Repairs of defects discovered after the tank has been filled with water for testing shall be made with the water level at least 0.3 m (1 ft) below any point being repaired or, if repairs have to be made on or near the tank bottom, with the tank empty.

### **RECORD KEEPING**

Inspection records form the basis of a scheduled inspection /maintenance program. FFS shall maintain a complete set of records consisting of tank testing report form, original construction records (if available), inspection history, and repair / alteration history.

## **Appendix 7: Geotechnical Report (WSP, February 2009)**

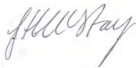

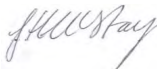


FFS Evander  
Storage Tanks  
Geotechnical Report  
FFS Refiners (Pty) Ltd  
February 2009



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# QM

| Issue/revision | Issue 1                                                                                              | Revision 1 | Revision 2 | Revision 3 |
|----------------|------------------------------------------------------------------------------------------------------|------------|------------|------------|
| Remarks        |                                                                                                      |            |            |            |
| Date           | 10 February 2009                                                                                     |            |            |            |
| Prepared by    | Dr J McStay                                                                                          |            |            |            |
| Signature      |                     |            |            |            |
| Checked by     | E Theeboom                                                                                           |            |            |            |
| Signature      | pp. G von Mayer<br> |            |            |            |
| Authorised by  | Dr J McStay                                                                                          |            |            |            |
| Signature      |                     |            |            |            |
| Project number | 81131CL                                                                                              |            |            |            |
| File reference |                                                                                                      |            |            |            |

WSP Environmental (Pty) Ltd  
3rd Floor  
35 Wale Street  
Cape Town  
8005

Tel: +27 (0)21 481 8700  
Fax: +27 (0)21 481 8799

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# 1 Introduction

## 1.1 TERMS OF REFERENCE

This report outlines the results of a geotechnical investigation on the site of a proposed hydrocarbon storage tank facility for FFS at their Evander depot.

The report describes the nature and thickness of the soils on site, the foundation conditions, and the nature of materials on site for the construction of surface beds, paved layers and drainage.

# 2 Site Description

The site is relatively flat with an approximate fall of 1:100 to the north west. The extent of the site is approximately 0.9ha. It is partly covered by dumped earth from the grading and construction of the adjacent developed land.

The site was originally farmland and is situated on the edge of extensive mining property.

# 3 Outline of the Investigation

## 3.1 FIELDWORK

The field investigation consisted of the following:

- Excavation of 5 trial holes to a maximum depth of 2.2m below existing ground level using a Digger Loader. The trial holes were excavated to the depth of practical refusal on hard rock.
- Soil profiling and sampling by an Engineering Geologist.
- The trial hole profiles are presented in Appendix A. The positions of the trial holes are shown on appended Site Investigation Plan.

## 3.2 FIELD AND LABORATORY TESTING

The following laboratory testing was undertaken:

- Particle Size Distribution and Atterberg Limits
- Compaction characteristics, including California Bearing Ratio and moisture-density relationship.

The laboratory test results are summarised in Table 1 and the full test results are given in Appendix B.

# 4 Geology and Soils

## 4.1 GEOLOGY AND SOILS

The site is underlain by Karoo-age dolerite intruded into shales, sandstones and coal measures of the Vryheid Formation of the Ecca Group.



The soils consist of a thin layer of gravelly silt topsoil underlain by black to brown coloured firm to stiff sandy clay and pale coloured residual sandy clayey silt and soft to medium hard weathered dolerite. Excavator refusal was experienced in the weathered rock in all trial pits. There is a minor amount of fill material in the form of clayey soil and dump rock exposed at surface this is probably related to site levelling and road construction during the initial phases of site development.

The soil profile is relatively consistent across the site and is typically as follows:

|          |                                                |
|----------|------------------------------------------------|
| 0.0-0.6m | Black, firm to stiff, sandy clay               |
| 0.6-1.1m | White to brown, dense, sandy clayey silt       |
| 1.1-2.2m | Brown, dense to very dense, weathered dolerite |

## 4.2 GROUNDWATER

Slow seepage of perched water was observed at the base of Trial Pit 2 at a depth of 2.2m.

# 5 Geotechnical Test Results

## 5.1 SOIL COMPACTION CHARACTERISTICS

The results of the particle size analysis and Atterberg Limits are summarised in Table 1 below.

**TABLE 1: LABORATORY TEST RESULTS – PARTICLE SIZE ANALYSIS AND ATTERBERG LIMITS**

| HORIZON          | TRIAL HOLE | DEPTH (m) | GRADING (%) |      |      |      | ATTERBERG LIMITS |    |      |
|------------------|------------|-----------|-------------|------|------|------|------------------|----|------|
|                  |            |           | Gravel      | Sand | Silt | Clay | LL               | PI | LS   |
| brown sandy clay | TP1 LS1    | 0.3       | 2           | 60   | 23   | 15   | 39               | 17 | 8    |
| brown sandy clay | TP2 LS1    | 0.3       | 2           | 41   | 26   | 30   | 47               | 23 | 10.5 |

The upper layers most likely to be encountered in layerworks for surface beds are plastic sandy clays.

The results of compaction testing on the materials are summarised in Table 2:

**TABLE 2: LABORATORY TEST RESULTS - COMPACTION CHARACTERISTICS**

| HORIZON          | TRIAL HOLE | Max Dry Density (kg/m <sup>3</sup> ) | OMC (%) | CBR at Mod AASHTO |     |     |     |      | MAX SWELL (%) |
|------------------|------------|--------------------------------------|---------|-------------------|-----|-----|-----|------|---------------|
|                  |            |                                      |         | 90%               | 93% | 95% | 98% | 100% |               |
| brown sandy clay | TP1 LS1    | 1755                                 | 14.6    | 4                 | 5   | 5   | 7   | 9    | 4.4           |
| brown sandy clay | TP2 LS1    | 1592                                 | 17.8    | 2                 | 3   | 3   | 3   | 3    | 9.9           |



The clayey soils have low shear strength on compaction with considerable swell. The in-situ CBR is unlikely to be better than 2 for these materials and thus they are considered unsuitable as load-bearing subgrade and should be stripped and spoiled.

## 6 Engineering Significance of the Site Conditions

### 6.1 EXCAVATION CONDITIONS

The trial holes were found to be excavatable with a lightweight digger loader to depths of between 1.1m and 2.2m below existing ground level. Refusal occurs in weathered dolerite and the depth of refusal is highly variable across the site.

### 6.2 CONSTRUCTION MATERIALS

The near-surface soils on site are clayey with poor compaction characteristics. The more silty and sandy residual dolerite soils at depths below 0.5m have better compaction characteristics and should classify as G9 materials according to TRH14 Classification for Road Construction. These soils (if free of organic material) can be considered for use as a subgrade layer in road and pavement construction or as general fill.

For areas under the floor slab or other pavements subjected to heavy traffic it will be necessary to import granular fill material. For general roads and pavement it is recommended to strip the clayey soils and compact the underlying silty subgrade to at least 95% Mod AASHTO.

### 6.3 FOUNDATION CONDITIONS

Foundation conditions for the proposed tanks are generally good with high bearing capacity developed within the stiff decomposed dolerite and weathered rock. The surface soils within the uppermost 0.75m are highly variable in stiffness and are considered to be mildly expansive. Bearing capacity for shallow foundations is estimated to be only 100 kPa. For foundations at depths of approximately 1m the bearing capacity is estimated to be 300 kPa. For contact pressures in excess of 300 kPa we recommend founding directly on good quality, un-fractured, hard rock dolerite at depths of approximately 2.0m to 2.5m below existing ground level.

## 7 Summary and Recommendations

- The site consists of colluvial and residual sandy clays and silts overlying highly weathered dolerite.
- Slow groundwater seepage was encountered at a depth of 2.2m in one trial hole.
- The upper clayey soils have poor compaction characteristics and a high swell. These materials are a very poor subgrade for roads and pavements and are considered unsuitable for load-bearing fill. Importation of granular fill is recommended for highly trafficked areas and for layerworks below concrete slabs and bunds.
- The soils within the uppermost 0.75m are highly variable in stiffness and are considered to be mildly expansive. Bearing capacity for shallow foundations is



---

estimated to be only 100 kPa. For foundations at depths of approximately 1m the bearing capacity is estimated to be 300 kPa. For contact pressures in excess of 300 kPa we recommend founding directly on good quality, un-fractured, hard rock dolerite at depths of approximately 2.0m to 2.5m below existing ground level.

- Foundations should be inspected and approved by a competent person to ensure removal of soft clayey material has been achieved prior to casting foundations.

**Dr Jon McStay**

Director (Engineering Geologist)

WSP Environmental Geoprojects

WSP Environmental (Pty) Ltd



## Appendix A Soil Profiles



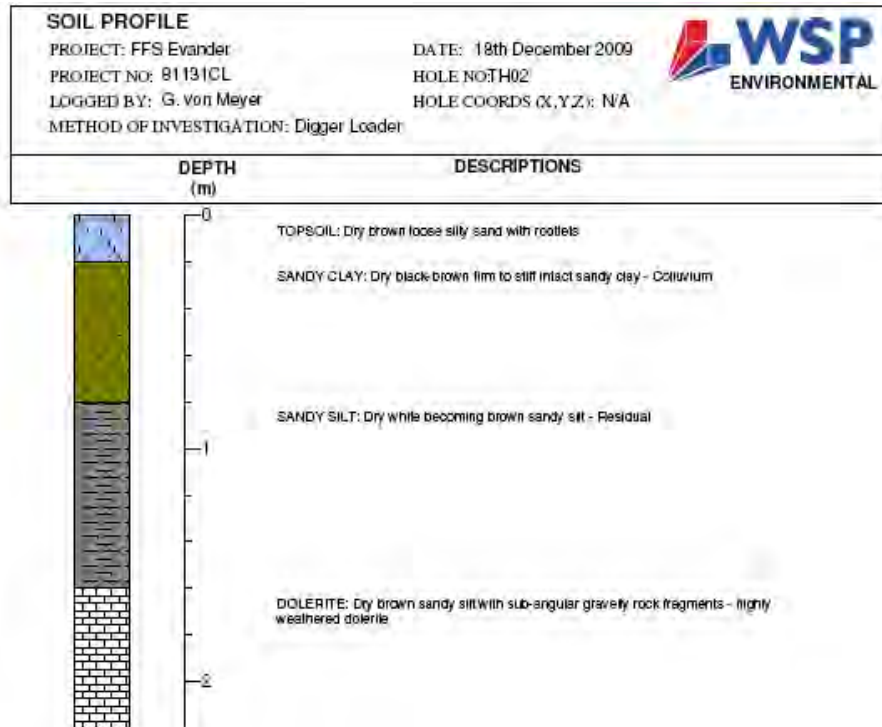
NOTE:

DISTURBED SAMPLE

UNDISTURBED SAMPLE

WATER TABLE

PERCHED WATER TABLE



NOTE: Refusal at 2.2m. Slow groundwater seepage at base of hole.

○ DISTURBED SAMPLE    □ UNDISTURBED SAMPLE    ✕ WATER TABLE    = PERCHED WATER TABLE



### SOIL PROFILE

PROJECT: FFS Evander

PROJECT NO: 81131CL

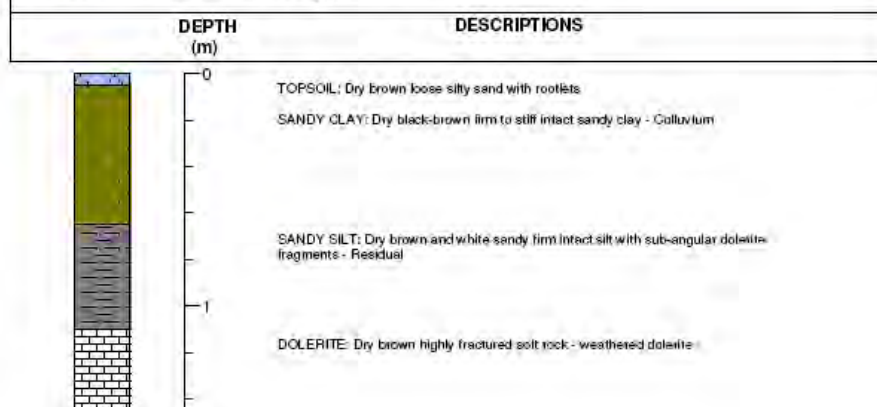
LOGGED BY: G. von Meyer

METHOD OF INVESTIGATION: Digger Loader

DATE: 18th December 2009

HOLE NO: TH03

HOLE COORDS (X,Y,Z): N/A



NOTE: Refusal at 1.45m

○ DISTURBED SAMPLE

□ UNDISTURBED SAMPLE

≡ WATER TABLE

≡ PERCHED WATER TABLE



# SOIL PROFILE

PROJECT: FFS Evander

DATE: 18th December 2009

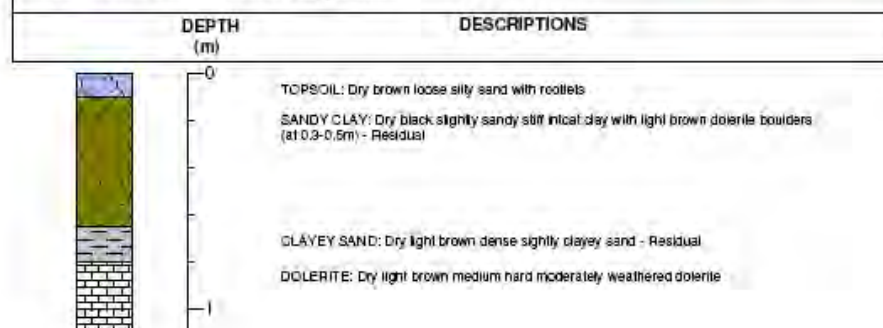
PROJECT NO: 81131CL

HOLE NO: H04

LOGGED BY: G. van Meyer

HOLE COORDS (X,Y,Z): N/A

METHOD OF INVESTIGATION: Digger Loader



NOTE: Refusal at 1.1m

☐ DISTURBED SAMPLE

☐ UNDISTURBED SAMPLE

☒ WATER TABLE

☐ PERCHED WATER TABLE





| SOIL PROFILE                           |                          |
|----------------------------------------|--------------------------|
| PROJECT: FFS Evander                   | DATE: 18th December 2009 |
| PROJECT NO: 81131CL                    | HOLE NO: H05             |
| LOGGED BY: G. von Meyer                | HOLE COORDS (X,Y,Z): N/A |
| METHOD OF INVESTIGATION: Digger Loader |                          |

| DEPTH<br>(m) | DESCRIPTIONS |
|--------------|--------------|
|--------------|--------------|



TOPSOIL: Dry brown loose silty sand with rootlets

SANDY CLAY: Dry black-brown firm to stiff intact sandy clay - Colluvium

SANDY SILT: Dry white firm intact sandy silt - Residual

SANDY CLAYEY SILT: Dry dark brown firm intact clayey and sandy silt - Residual

SANDY SILT: Slightly moist dark brown stiff to very stiff intact sandy silt - Residual

NOTE: Refusal at 1.8m

☐ DISTURBED SAMPLE    ☐ UNDISTURBED SAMPLE    ☒ WATER TABLE    ☐ PERCHED WATER TABLE



---

## Appendix B   Laboratory Test Results

36/38 Fourth Street, Booysens Reserve, Johannesburg 2091  
 P O Box 82223, Southdale 2135  
 Tel: +27 (0)11 835-3117 • Fax: +27 (0)11 835-2503  
 Email: jhb@civilab.co.za • Website: www.civilab.co.za

# Civilab

Civil Engineering Testing Laboratories

## California Bearing Ratio Results

|                                                                                                                                                                                                                                                                                   |  |                  |                         |                      |                     |                 |                      |     |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------|-------------------------|----------------------|---------------------|-----------------|----------------------|-----|------|
| Project:                                                                                                                                                                                                                                                                          |  | FFS EVANDER      |                         |                      |                     |                 |                      |     |      |
| Project No.:                                                                                                                                                                                                                                                                      |  | 1039/F25/01/2009 |                         | Date:                |                     | 4 Feb 2009      |                      |     |      |
| Field Reference:                                                                                                                                                                                                                                                                  |  | TP 1             |                         | Lab. Sample Ref:     |                     | M015            |                      |     |      |
| Depth (m):                                                                                                                                                                                                                                                                        |  | -                |                         | Remarks: Untreated   |                     |                 |                      |     |      |
| Description:                                                                                                                                                                                                                                                                      |  | -                |                         |                      |                     |                 |                      |     |      |
| <div>California Bearing Ratio (CBR)</div> <div><div>1000</div><div>200</div><div>100</div><div>50</div><div>20</div><div>10</div><div>5</div><div>2</div><div>1</div><div>0.5</div><div>0.2</div><div>0.1</div><div>0.05</div><div>0.02</div><div>0.01</div></div> <div>(m)</div> |  |                  | Mod AASHTO Data         |                      | CBR Compaction Data |                 |                      |     |      |
|                                                                                                                                                                                                                                                                                   |  |                  | Max Dry Density (kg/m³) | Optimum Moisture (%) | Dry Density (kg/m³) | Com-paction (%) | Moisture Content (%) |     |      |
|                                                                                                                                                                                                                                                                                   |  |                  | 1755                    | 14.6                 | 1769                | 100.8           | 14.5                 |     |      |
|                                                                                                                                                                                                                                                                                   |  |                  |                         |                      | 1686                | 96.1            |                      |     |      |
|                                                                                                                                                                                                                                                                                   |  |                  |                         |                      | 1585                | 90.3            |                      |     |      |
|                                                                                                                                                                                                                                                                                   |  |                  |                         |                      | 90%                 | 93%             | 95%                  | 98% | 100% |
|                                                                                                                                                                                                                                                                                   |  |                  |                         |                      | 3.9                 | 4.5             | 5.0                  | 6.9 | 9.2  |

The samples were tested in accordance with Method A8 of TMH1 of 1990.  
 The results reported relate only to the samples tested.  
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Email: jhb@civilab.co.za • Website: www.civilab.co.za

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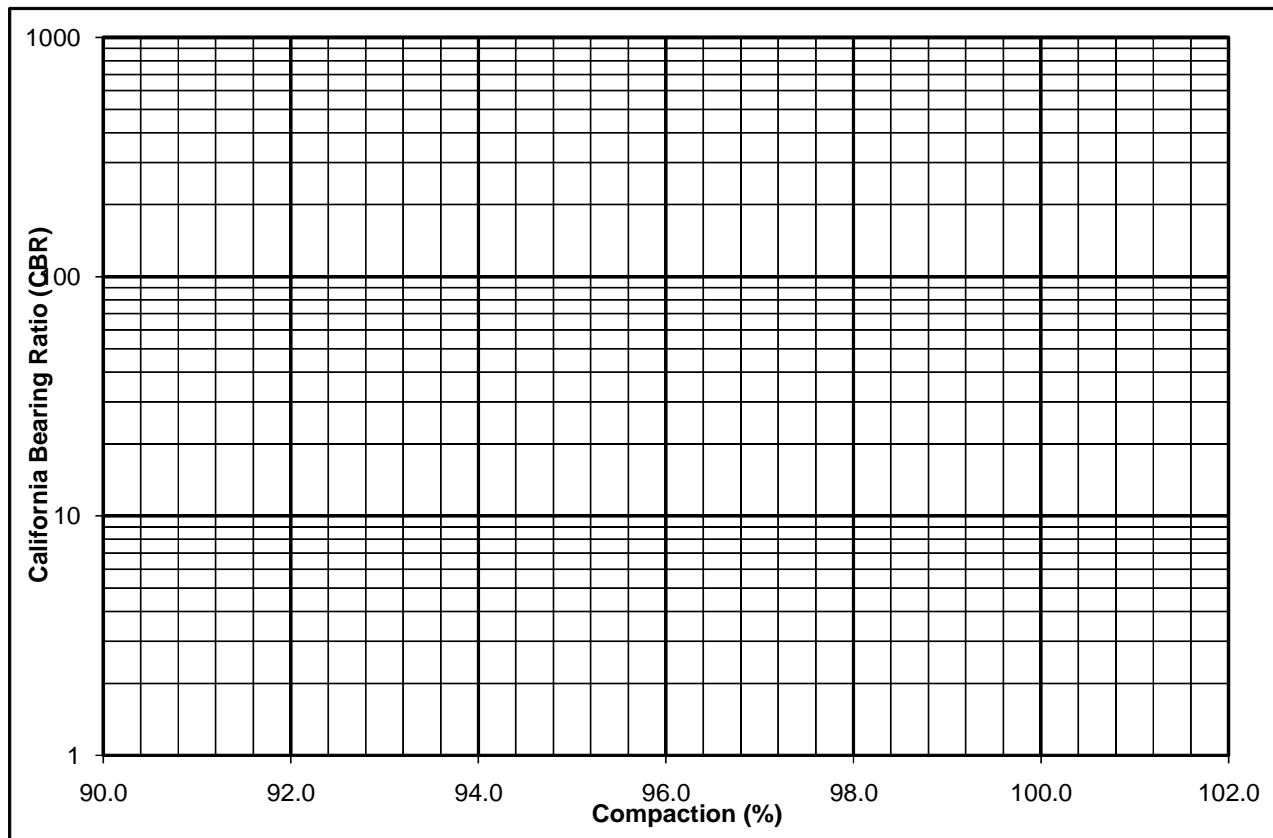
Civil Engineering Testing Laboratories

## California Bearing Ratio Results

|                  |                  |                  |            |
|------------------|------------------|------------------|------------|
| Project:         | FFS EVANDER      |                  |            |
| Project No.:     | 1039/F25/01/2009 | Date:            | 4 Feb 2009 |
| Field Reference: | TP 2             | Lab. Sample Ref: | M016       |
| Depth (m):       | -                | Remarks:         | Untreated  |
| Description:     | -                |                  |            |

| CBR at |      |      | Swell | Final<br>Moisture<br>Content | Mod AASHTO Data      |                     | CBR Compaction Data  |                 |                     |
|--------|------|------|-------|------------------------------|----------------------|---------------------|----------------------|-----------------|---------------------|
| 2.54   | 5.08 | 7.62 |       |                              | Max Dry<br>Density   | Optimum<br>Moisture | Dry<br>Density       | Com-<br>paction | Moisture<br>Content |
| (mm)   | (mm) | (mm) | (%)   | (%)                          | (kg/m <sup>3</sup> ) | (%)                 | (kg/m <sup>3</sup> ) | (%)             | (%)                 |
| 3      | 3    | 2    | 6.9   | 25.7                         | 1592                 | 17.8                | 1613                 | 101.3           | 17.7                |
| 3      | 3    | 2    | 9.9   | 32.5                         |                      |                     | 1516                 | 95.2            |                     |
| 3      | 2    | 2    | 8.7   | 35.4                         |                      |                     | 1446                 | 90.8            |                     |

| Interpolated Data | Compaction | 90% | 93% | 95% | 98% | 100% |
|-------------------|------------|-----|-----|-----|-----|------|
|                   | CBR        | 2.4 | 2.9 | 3.2 | 3.3 | 3.3  |



The samples were tested in accordance with Method A8 of TMH1 of 1990.  
The results reported relate only to the samples tested.  
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Email: jhb@civilab.co.za • Website: www.civilab.co.za

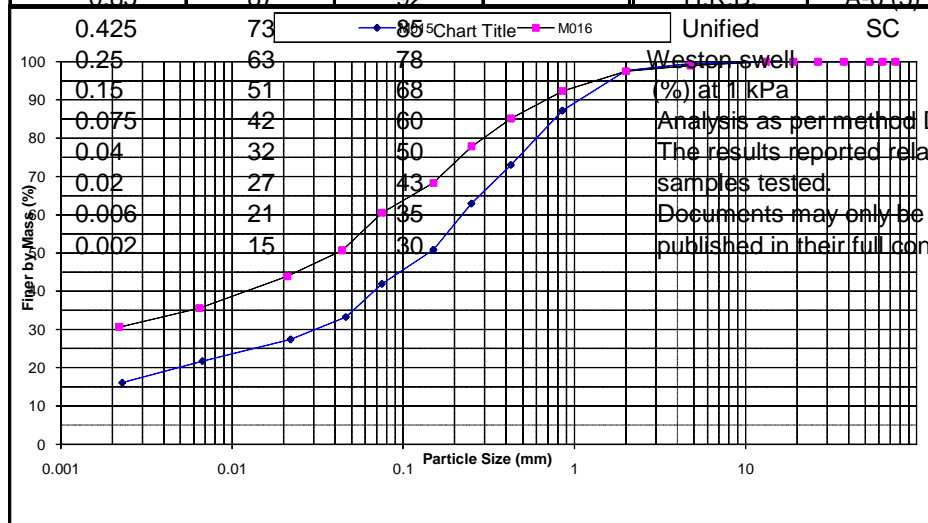
# Civilab

Civil Engineering Testing Laboratories

## Foundation Indicator Test Data

|             |                  |      |                 |
|-------------|------------------|------|-----------------|
| Project     | FFS EVANDER      |      |                 |
| Project No. | 1039/F25/01/2009 | Date | 30 January 2009 |

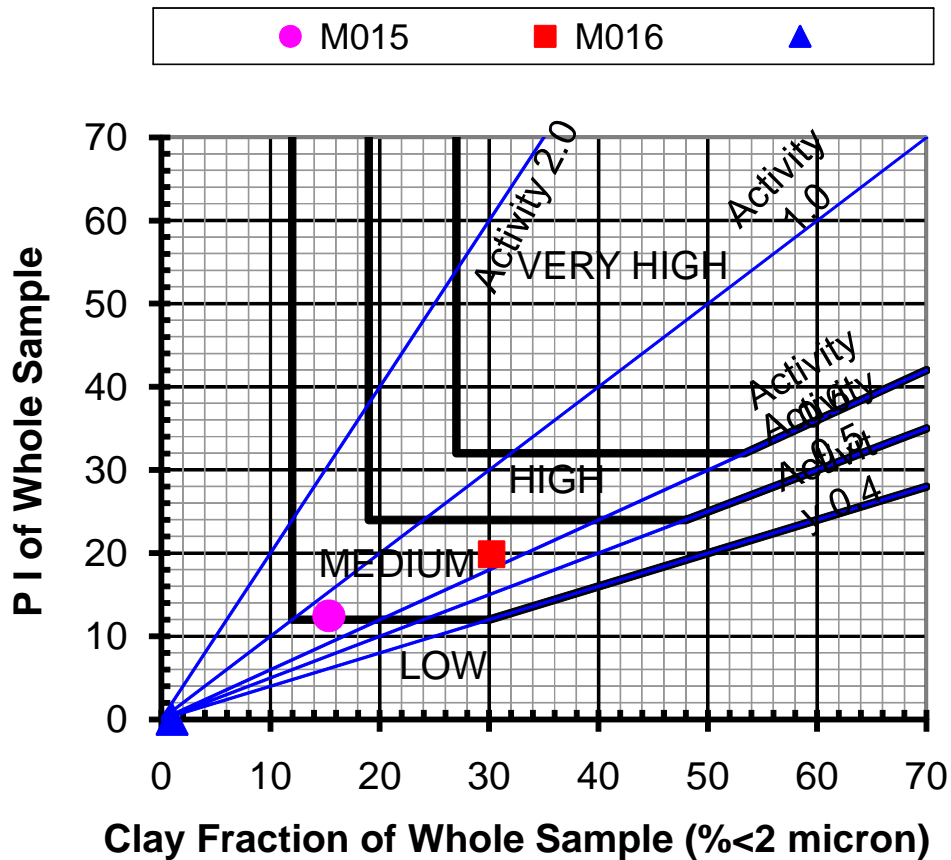
|                |          |           |           |                  |            |            |  |
|----------------|----------|-----------|-----------|------------------|------------|------------|--|
| Sample No.     | M015     | M016      |           | Sample No.       | M015       | M016       |  |
| Field Ref. No. | TP 1     | TP 2      |           | %Gravel          | 2          | 2          |  |
| Depth          | -        | -         |           | %Sand            | 60         | 41         |  |
| Sieve size     | %Passing | % Passing | % Passing | %Silt            | 23         | 26         |  |
| 75.00          | 100      | 100       |           | %Clay            | 15         | 30         |  |
| 63.00          | 100      | 100       |           | NMC %            | Not Tested | Not Tested |  |
| 53.00          | 100      | 100       |           | Liquid Limit     | 39         | 47         |  |
| 37.50          | 100      | 100       |           | Plasticity Index | 17         | 23         |  |
| 26.50          | 100      | 100       |           | Linear Shrink.   | 8.         | 10.5       |  |
| 19.00          | 100      | 100       |           | Overall P.I.     | 12         | 20         |  |
| 13.20          | 100      | 100       |           | Grading Modulus  | 0.87       | 0.57       |  |
| 4.75           | 100      | 99        |           | H.R.B.           | A-6 (3)    | A-7-6 (11) |  |
| 2.00           | 98       | 98        |           |                  |            |            |  |
| 0.85           | 87       | 92        |           |                  |            |            |  |



|      |      |        |        |      |        |        |        |        |        |
|------|------|--------|--------|------|--------|--------|--------|--------|--------|
| Clay | Fine | Medium | Coarse | Fine | Medium | Coarse | Fine   | Medium | Coarse |
|      | Silt |        |        | Sand |        |        | Gravel |        |        |

Remarks:

## Activity Diagram After D H van der Merwe



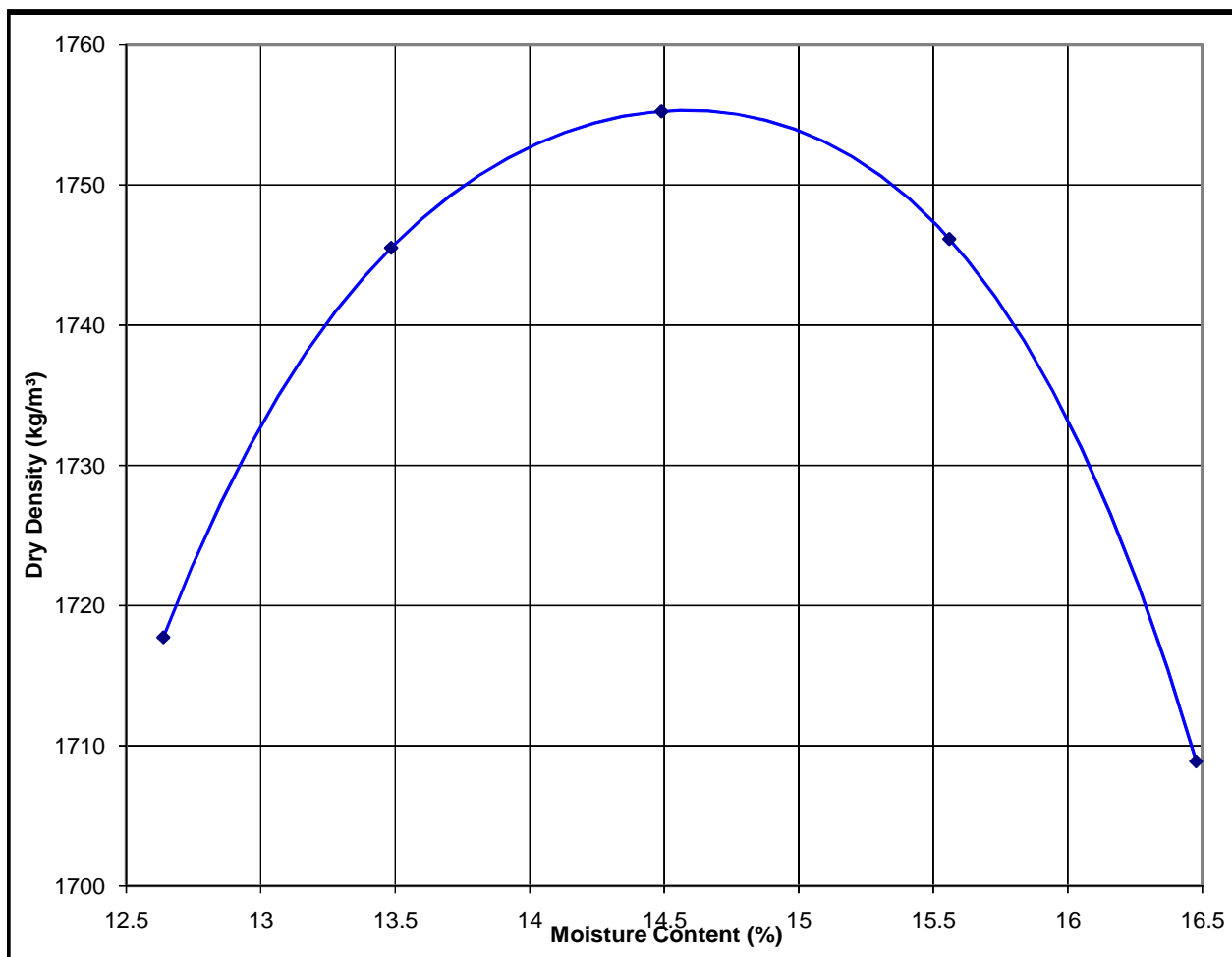
## Moisture Density Relationship

|                  |                  |                  |                 |
|------------------|------------------|------------------|-----------------|
| Project:         | FFS EVANDER      |                  |                 |
| Project No.:     | 1039/F25/01/2009 | Date:            | 26 January 2009 |
| Field Reference: | TP 1             | Laboratory Ref.: | M015            |
| Depth (m):       | -                | Remarks:         | Untreated       |
| Description:     | -                |                  |                 |

**Compactive Effort:** Mod. AASHTO

|                                   |      |      |      |      |      |  |  |  |  |
|-----------------------------------|------|------|------|------|------|--|--|--|--|
| Percent Water Content (%):        | 15.6 | 15.6 | 13.5 | 12.6 | 16.5 |  |  |  |  |
| Dry Density (kg/m <sup>3</sup> ): | 1775 | 1783 | 1783 | 1756 | 1746 |  |  |  |  |

|                             |                              |                                  |               |
|-----------------------------|------------------------------|----------------------------------|---------------|
| <b>Maximum Dry Density:</b> | <b>1755 kg/m<sup>3</sup></b> | <b>Optimum Moisture Content:</b> | <b>14.6 %</b> |
|-----------------------------|------------------------------|----------------------------------|---------------|



Analysis according to Method A7 of TMH1 of 1986.  
The results relate only to the samples tested.  
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Remarks:

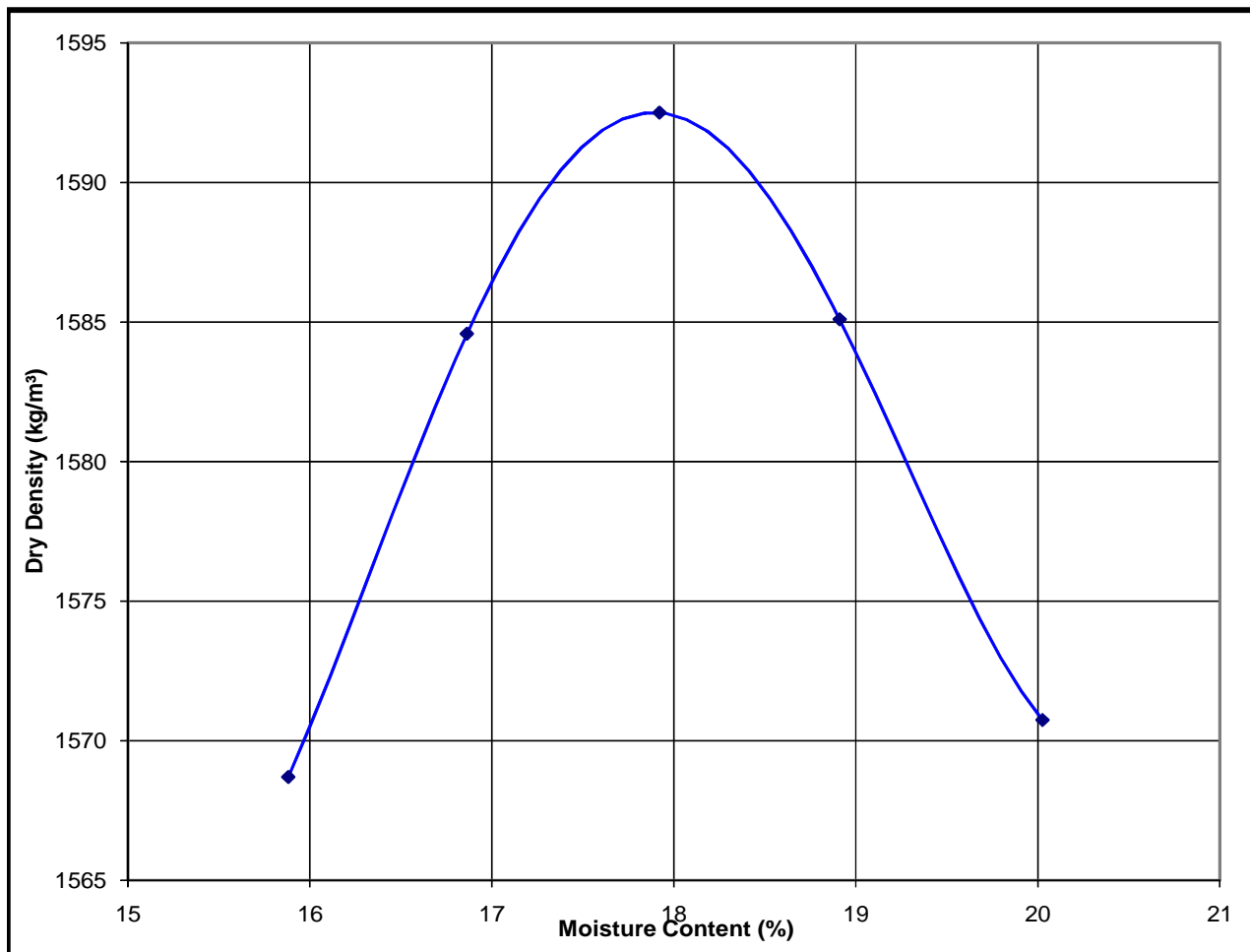
## Moisture Density Relationship

|                  |                  |                  |                 |
|------------------|------------------|------------------|-----------------|
| Project:         | FFS EVANDER      |                  |                 |
| Project No.:     | 1039/F25/01/2009 | Date:            | 27 January 2009 |
| Field Reference: | TP 2             | Laboratory Ref.: | M016            |
| Depth (m):       | -                | Remarks:         | Untreated       |
| Description:     | -                |                  |                 |

**Compactive Effort:** Mod. AASHTO

|                                   |      |      |      |      |      |  |  |  |  |
|-----------------------------------|------|------|------|------|------|--|--|--|--|
| Percent Water Content (%):        | 18.9 | 20.0 | 17.9 | 16.9 | 15.9 |  |  |  |  |
| Dry Density (kg/m <sup>3</sup> ): | 1585 | 1571 | 1593 | 1585 | 1569 |  |  |  |  |

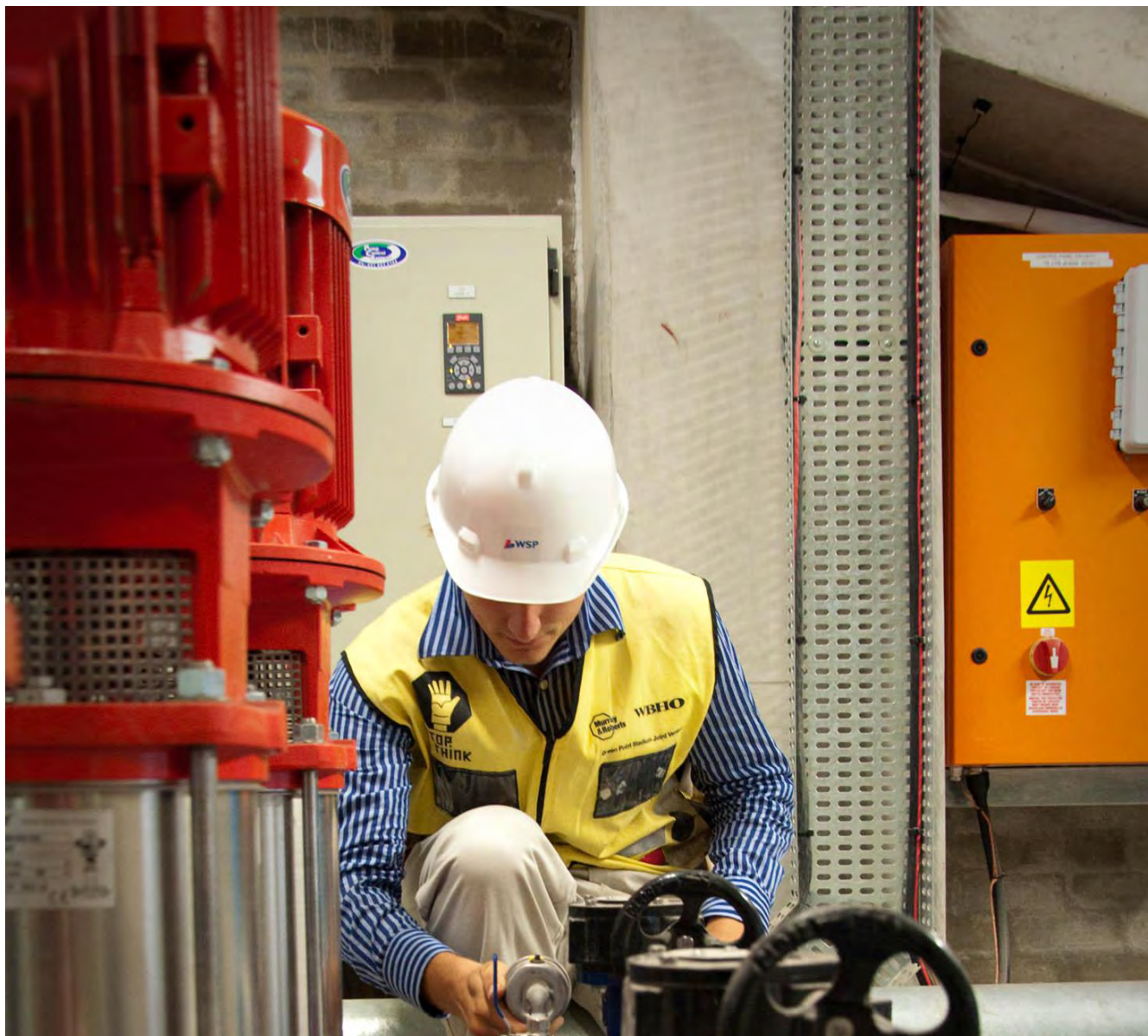
|                             |                              |                                  |               |
|-----------------------------|------------------------------|----------------------------------|---------------|
| <b>Maximum Dry Density:</b> | <b>1592 kg/m<sup>3</sup></b> | <b>Optimum Moisture Content:</b> | <b>17.8 %</b> |
|-----------------------------|------------------------------|----------------------------------|---------------|



Analysis according to Method A7 of TMH1 of 1986.  
The results relate only to the samples tested.  
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Remarks:



## **Appendix 8: Air Quality Impact Assessment (WSP, May 2013)**



UNITED  
BY OUR  
DIFFERENCE




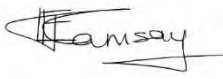

## FFS REFINERS (PTY) LTD - EVANDER SITE

Air Quality Impact Assessment - Proposed Waxy Oil Pant

2013/05/29

Final

# Quality Management

| Issue/revision | Issue 1                                                                           | Revision 1 | Revision 2 | Revision 3 |
|----------------|-----------------------------------------------------------------------------------|------------|------------|------------|
| Remarks        | Draft:1                                                                           |            |            |            |
| Date           | May 2013                                                                          |            |            |            |
| Prepared by    | H Tularam                                                                         |            |            |            |
| Signature      |  |            |            |            |
| Checked by     | L. Ramsay                                                                         |            |            |            |
| Signature      |  |            |            |            |
| Authorised by  | S. Doel                                                                           |            |            |            |
| Signature      |  |            |            |            |
| Project number | 36926                                                                             |            |            |            |
| Report number  | 1 of 1                                                                            |            |            |            |
| File reference | 36926 - AQIA for FFS Evander                                                      |            |            |            |

---

# FFS Refiners (PTY) Ltd - Evander Site

## Air Quality Impact Assessment - Proposed Waxy Oil Pant

2013/05/29

### Client

PO Box 1967  
Secunda  
2302  
Mpumalanga  
South Africa  
Phone +27 17 632 9100  
Fax +27 17 632 9119

### Consultant

Hasheel Tularam  
Block A, 1 on Langford  
Langford Road, Westville  
Durban  
3629  
South Africa  
Tel: +27 31 240 8860  
Fax: +27 31 240 8861

[www.wspenvironmental.co.za](http://www.wspenvironmental.co.za)

### Registered Address

WSP Environmental (Pty) Ltd  
1995/008790/07

WSP House, Bryanston Place, 199 Bryanston Drive,  
Bryanston, 2191, South Africa

### WSP Contacts

Hasheel Tularam  
[Hasheel.Tularam@wspgroup.co.za](mailto:Hasheel.Tularam@wspgroup.co.za)

Adam Sanderson  
[Adam.Sanderson@wspgroup.co.za](mailto:Adam.Sanderson@wspgroup.co.za)

# Executive Summary

FFS Refiners (Pty) Ltd processes liquid heating fuels and other oils. The Evander plant is located approximately one kilometre south-west of the sparsely populated town of Evander in a region of flat terrain. The processes undertaken at this plant required that FFS apply for an Atmospheric Emission License (AEL), which is pending authorisation.

The purpose of this air quality impact assessment (AQIA) is to determine the impact of ambient air quality of any increases in atmospheric emissions associated with the proposed waxy oil plant. A comprehensive AQIA recently was conducted detailing the current plant emissions. This current plant emissions inventory comprises emissions from the vapour scrubber, boiler stack, tank vents, idling trucks and four hypothetical spilled products. The latest (2012) stack monitoring results for the vapour scrubber and boiler stack were used in this assessment. Atmospheric emissions from tank vents not linked to the vapour scrubber system were estimated using the United States Environmental Protection Agency's (USEPA) TANKS model, while vehicular emissions were estimated using the USEPA AP42 emission factors. In this assessment, emissions from the proposed heater stacks and vapour scrubber stacks that are to be installed at the waxy oil plant were calculated using USEPA and Australian NPI emission estimation methodology.

Atmospheric Dispersion Modelling System (ADMS) v5 was used as the modelling platform for the study. One year of meteorological data (2011) from the onsite weather station was used for dispersion modelling. Cloud cover data was obtained from the South Africa Weather Services (SAWS) station in Bethal. Apart from the long-term (annual) emissions scenario, worst case (P100) scenarios were modelled to assess the impacts of the proposed waxy oil plant on ambient pollutant concentrations. Background air pollution and fugitive emissions were not considered in this study as no data were available.

Model outputs for each pollutant parameter confirmed low ambient concentrations, with plume dispersion in a north-easterly direction (towards Evander), south-easterly direction (towards the golf club) and a south-westerly direction away from receptors. This is primarily due to the prevailing winds. Ambient concentrations at discrete receptors were compared with national ambient air quality standards (NAAQS) under the National Environmental Management: Air Quality Act 39 of 2004 (NEMAQA) and local measurements taken during the latest air quality monitoring campaign.

Model results indicate that the waxy oil plant's *maximum* cumulative annual average contributions to ambient concentrations of key pollutant are tabulated below. The increase in ambient concentrations relative to the current scenario also is presented.

| Pollutant        | Averaging period | NAAQS<br>( $\mu\text{g}/\text{m}^3$ ) | Maximum<br>Concentration<br>( $\mu\text{g}/\text{m}^3$ ) | Increase in<br>Maximum<br>Concentration<br>( $\mu\text{g}/\text{m}^3$ ) |
|------------------|------------------|---------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------|
| PM <sub>10</sub> | Annual           | 50                                    | 0.76                                                     | 0.00                                                                    |
|                  | P100 24-hour     | 120                                   | 12.61                                                    | 0.01                                                                    |
| NO <sub>2</sub>  | Annual           | 50                                    | 3.69                                                     | 1.31                                                                    |
|                  | P100 1-hour      | 350                                   | 46.80                                                    | 0.50                                                                    |
| SO <sub>2</sub>  | Annual           | 40                                    | 1.61                                                     | 0.10                                                                    |
|                  | P100 1-hour      | 200                                   | 42.60                                                    | 3.60                                                                    |
| Benzene          | Annual           | 10                                    | 0.80                                                     | 0.00                                                                    |

Maximum concentrations are predicted to increase marginally from current ambient concentrations. The contributions of the plant to ambient concentrations remain well below all NAAQS, although a full assessment would require that ambient concentrations are considered. Despite the limited impact of the waxy oil plant, it is recommended that a Air Quality Management Program (AQMP) is developed and implemented to minimise the impact of atmospheric emissions from the plant on surrounding receptors..

---

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## List of Acronyms Abbreviations

|                               |                                                                      |
|-------------------------------|----------------------------------------------------------------------|
| ADMS                          | Atmospheric Dispersion Modelling System                              |
| AEL                           | Atmospheric Emission License                                         |
| APPA                          | Atmospheric Pollution Prevention Act 45 of 1965                      |
| AQIA                          | Air Quality Impact Assessment                                        |
| AQMP                          | Air Quality Management Plan                                          |
| BDL                           | Below detection limit                                                |
| C <sub>6</sub> H <sub>6</sub> | Benzene                                                              |
| CERC                          | Cambridge Environmental Research Consultants                         |
| CTF                           | Coal tar fuel                                                        |
| DAEA                          | Department of Agriculture and Environmental Affairs                  |
| DEAT                          | Department of Environmental Affairs and Tourism                      |
| EAP                           | Environmental Authorisation Processes                                |
| EIA                           | Environmental Impact Assessment                                      |
| EPA                           | Environmental Protection Agency                                      |
| GNR                           | Government National Regulation                                       |
| NAAQS                         | National Ambient Air Quality Standard                                |
| NEMA                          | National Environmental Management Act 107 of 1998                    |
| NEMAQA                        | National Environmental Management: Air Quality Act 39 of 2004        |
| NIOSH                         | National Institute for Occupational Safety and Health                |
| NO <sub>x</sub>               | nitrogen oxide(s)                                                    |
| NO <sub>2</sub>               | nitrogen dioxide                                                     |
| OHSA                          | Occupational Health and Safety Act                                   |
| PM                            | particulate matter                                                   |
| PM <sub>10</sub>              | particulate matter with an aerodynamic diameter less than 10 microns |
| RVP                           | Reid vapour pressure                                                 |
| SANS                          | South African National Standards                                     |
| SAWS                          | South African Weather Services                                       |
| SO <sub>2</sub>               | sulphur dioxide                                                      |
| U.S                           | United States                                                        |
| VOC                           | Volatile organic compounds                                           |
| WOP                           | Waxy oil plant                                                       |
| WSP                           | WSP Environmental                                                    |



---

# 1 Introduction

In 2007 the Minister of Environmental Affairs had declared the eastern part of Gauteng and the western part of Mpumalanga as an air pollution hotspot. The area has been formally declared as the 'Highveld Priority Area'. The town of Evander falls within this area. The FFS Refiners (Pty) Ltd Evander branch produces coal tar fuel (CTF) for various applications, as well as creosote for the wood treatment industry. The production process implemented at the plant results in the generation of air pollution emissions. FFS Evander has applied for an Atmospheric Emission License (AEL) in line with the requirements of the National Environmental Management Air Quality Act 39 of 2004 (NEMAQA).

WSP Environmental (Pty) Ltd (hereafter WSP) have conducted several passive air quality sampling surveys at the FFS Evander site and was recently appointed to update the existing emissions inventory and undertake a revised AQIA for the plant. All air emissions from the plants storage tanks, flash dryer vents, centrifuges etc are ducted to a common scrubber stack to recover the hydrocarbons for use in the production process. Air emissions from storage tank vents that are not linked to the scrubber stack were quantified using the United States Environmental Protection Agency's (USEPA) TANKS model, which applies AP-42 emission factors. Stack monitoring has been undertaken on an annual basis at the boiler stack and vapour scrubber and these results were used to update the emissions inventory for air pollution modelling purposes. The additional emissions from product spilt onsite also were assessed. Results from these assessments are detailed in an AQIA report compiled by WSP in May 2013.

FFS propose to construct a separate facility for processing a heavy distillate residue termed waxy oil. This requires the removal of iron catalyst fines and carbon particulates from the waxy oil to produce a low sulphur oil for the industrial heating fuel market. It is proposed that all emissions from the waxy oil plant (WOP) and associated tanks will be linked to a common scrubber. Furthermore, two small oil fired heaters, ducted to a common stack, are to be installed. Emissions from these two additional stacks, as well as fugitive emissions from the waxy oil process, will increase the impact of FFS on local air quality.

Atmospheric Dispersion Modelling System (ADMS) v5 was used as a modelling platform to calculate PM<sub>10</sub> (suspended particulate matter with an aerodynamic diameter of 10 microns or less), SO<sub>2</sub> (sulphur dioxide), NO<sub>2</sub> (nitrogen dioxide), and C<sub>6</sub>H<sub>6</sub> (benzene) concentrations onsite and in the site's vicinity. This study assesses the change (if any) in criteria air pollution concentrations relative to current site operations, and gauges compliance of expected ambient air pollutant concentrations with the South African National Ambient Air Quality Standards (NAAQS). One year of meteorological data (2011) from the onsite weather station was consolidated for use in the model. Cloud cover data was obtained from the South Africa Weather Services (SAWS) station in Bethal.

## 1.1 Requirements under the National Environmental Management Act 107 of 1998 (NEMA)

An environmental authorisation process must be undertaken to meet the requirements of South Africa's overarching environmental legislation, NEMA, as amended in June 2010. Section 32 of NEMA's environmental impact assessment (EIA) Regulations specifies the following with regards to the content of a specialist report:

- Details of the person who prepared the report, and the expertise of that person to carry out the specialist study;
- Declaration that the person is independent;
- Indication of the scope of and purpose for which the report was prepared;
- Description of the methodology adopted in preparing the report;
- Description of any assumptions made, any uncertainties or gaps in knowledge;
- Description of findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment;
- Recommendations in respect of any mitigation measures that should be considered by the applicant and the competent authority;

- Description of any consultation process that was undertaken during the course of carrying out the study;
- Summary and copies of any comments that were received during any consultation process;
- Any other information requested by the competent authority.

This report has been prepared in fulfilment of the above requirements.

### 1.1.1 Air Quality Consultant

Hasheel Tularam is a qualified environmental scientist with a Bachelor of Science (Honours) degree in Environmental Science obtained from the University of KwaZulu-Natal. He is currently furthering his studies by completing a Master's degree in Environmental Science at UKZN. With more than two years of solid air quality consulting experience at WSP and being actively involved in various air quality management services, his areas of expertise are in air pollution dispersion modelling, air quality impact assessments, compliance monitoring, compiling of atmospheric emission inventories and licences, strategic air quality management plans, providing specialist air quality support, as well as the application of remote sensing and geographic information systems. As a result of applying these skills to a diverse range of clients, Hasheel has developed a thorough understanding of both the theoretical and practical implementation of South African Environmental legislation, in particular that relating to the National Environmental Management: Air Quality Act 39 of 2004.

### 1.1.2 Declaration of Independence

I hereby declare that I am fully aware of my responsibilities in terms of the National Environmental Management Act 2006 EIA Regulations and that I have no financial or other interest in the undertaking of the proposed activity other than the imbursement of consultants fees.

Name: Hasheel Tularam

Company: WSP Environment and Energy

Signature: \_\_\_\_\_



## 2 Study Area

The FFS Evander plant is situated in Mpumalanga, South Africa and lies approximately 100 km east of Johannesburg. The small town of Evander, originally founded on gold mining, currently comprises light industries, a residential area, schools and a golf course.

*Section presented overleaf to improve formatting.*



Figure 1: Maps showing the location of FFS Evander in Mpumalanga South Africa.

## 2.1 Site Description and Present Air Quality

FFS is located immediately south-west of Evander's residential zone. The Walker Parker Golf Course sewage works and parks around the Evander dam are found immediately to the east of FFS. A small landing strip is located to the west of the site while old mines and mining camps are found to the north. The R546 is the primary transport route in the region. Evander is a small and sparsely developed town and the primary sources of air quality concern are vehicular emissions, dust from decommissioned mining operations, and potential odours from a nearby sewage works. SASOL Secunda is located approximately 8 km south-east of the site and is the only industrial polluter in the region with significant stack emissions of  $\text{SO}_2$ ,  $\text{NO}_2$  and particulates. A map showing the location of surrounding land use activities within a 5 km radius of FFS Evander is presented in Section 10.1 of Appendix A.

## 2.2 Dispersion Climate

Accurate modelling of pollution dispersion requires knowledge of the complex and individual nature of local climate and weather, particularly fluctuations in atmospheric stability and meso- and micro-scale wind systems (Tyson and Preston-Whyte, 1988). These influences are discussed further below.

### 2.2.1 Macro-scale Climate of South Africa

The general climate experienced along the east coast and adjacent interior of South Africa is controlled predominantly by subtropical high pressure with temporary disruptions by low pressure cells or fronts. This high pressure zone is located along  $30^\circ\text{S}$  latitude and is associated with strong divergence at the surface and convergence in the upper atmosphere. Figure 2 below shows the predominant macro-scale atmospheric circulations over the subcontinent. Easterly waves and lows tend to be summer phenomena, while the westerly wave and lows tend to be autumn to spring phenomena.

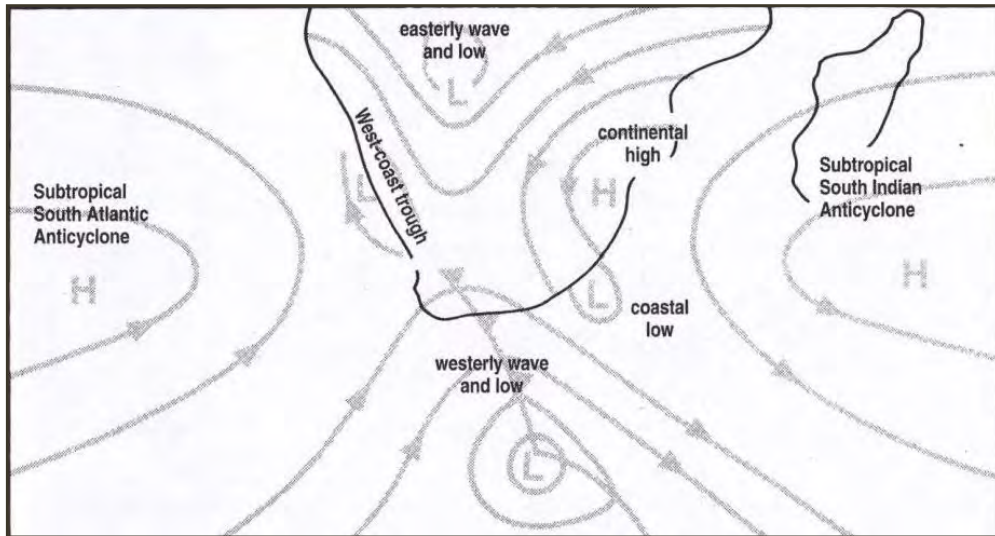


Figure 2: Map showing the location of major pressure cells across South Africa (Tyson and Preston-Whyte, 2004).

## 2.2.2 Micro-scale Climate of Evander

Local meteorological conditions affect how pollutants emitted into the air are directed, diluted and dispersed within the lower atmospheric boundary layer. As such, an accurate and representative meteorological dataset is essential for accurate air quality modelling. SAWS measures a range of meteorological parameters in Bethal (approximately 40 km east of Evander) and FFS own and operate their own Davis Vantage Pro<sup>TM</sup> weather station onsite. The 2011 data from the onsite station is presented below. For modelling purposes, the onsite data is supplemented with cloud cover data from Bethal.

### 2.2.2.1 Temperature and Rainfall

Figure 3 below presents average monthly temperatures and total monthly rainfall experienced at the FFS Evander site during 2011. These records show a clear seasonal variation. The highest hourly averaged temperature during 2011 was recorded in summer (33.4°C) and the lowest in winter (-4.2°C). Highest monthly rainfall of 243.8 mm was recorded in January 2011 with no rainfall recorded over July 2011. The Mpumalanga province typically receives high levels of rainfall during the summer months as warm, moist air is advected around the South Indian High over the warm Indian Ocean towards the east coast of South Africa. Rainfall is enhanced by afternoon convective thunderstorms. As the graph below reveals, highest rainfall in January coincides with highest monthly average temperatures. Rainfall removes dust and gases from the atmosphere via a process called wet precipitation or wet 'scavenging'. Thus if all else is the same, higher rainfall regions hypothetically would have lower pollutant concentrations.



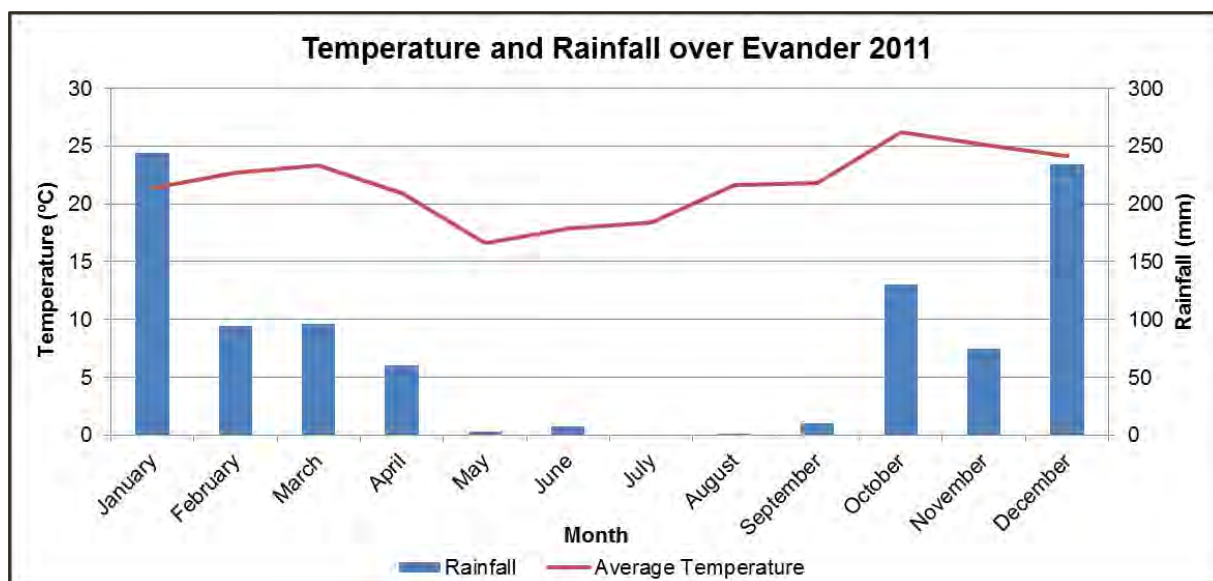


Figure 3: Graph showing the total monthly rainfall and average monthly temperature for 2011 over Evander.

#### 2.2.2.2 Wind Speed and Wind Direction

Winds affect the horizontal dispersion of air pollutants away from their source. An annual wind rose for Evander has been plotted to graphically illustrate wind speeds and directions (Figure 4). The angle of a wind rose element represents the wind direction (the direction from which the wind comes) while the radial distance from the centre represents the frequency of occurrence. Wind direction is divided into 22.5° intervals, with the values on each arc indicating directional frequency. The annual wind rose below shows winds prevailing from north-westerly, east-north-easterly, and north-north-westerly, directions. As such, it is envisaged that air pollution emissions from FFS Evander will predominantly be dispersed in south-easterly, west-south-westerly and south-south-easterly directions.

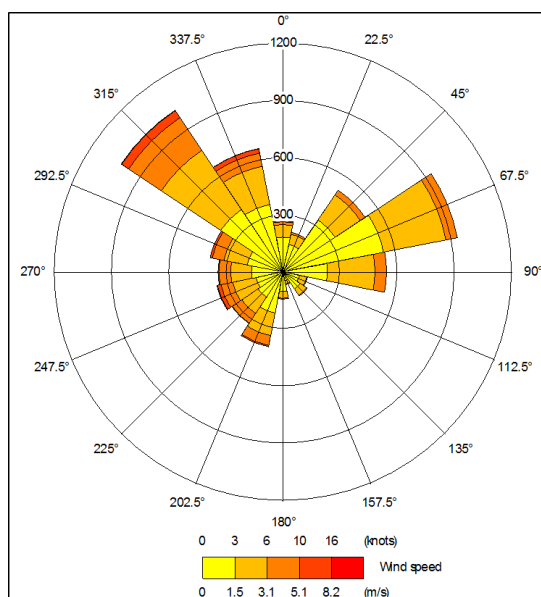


Figure 4: Annual wind rose showing prevailing wind speed and direction over Evander for the year 2011.

## 3 Production Process

### 3.1 Current Process

A simplified diagram of the production process at the FFS Evander facility is presented in Figure 5 below. Red arrows indicate points of atmospheric emissions. Discussion of various components of the production process follows.

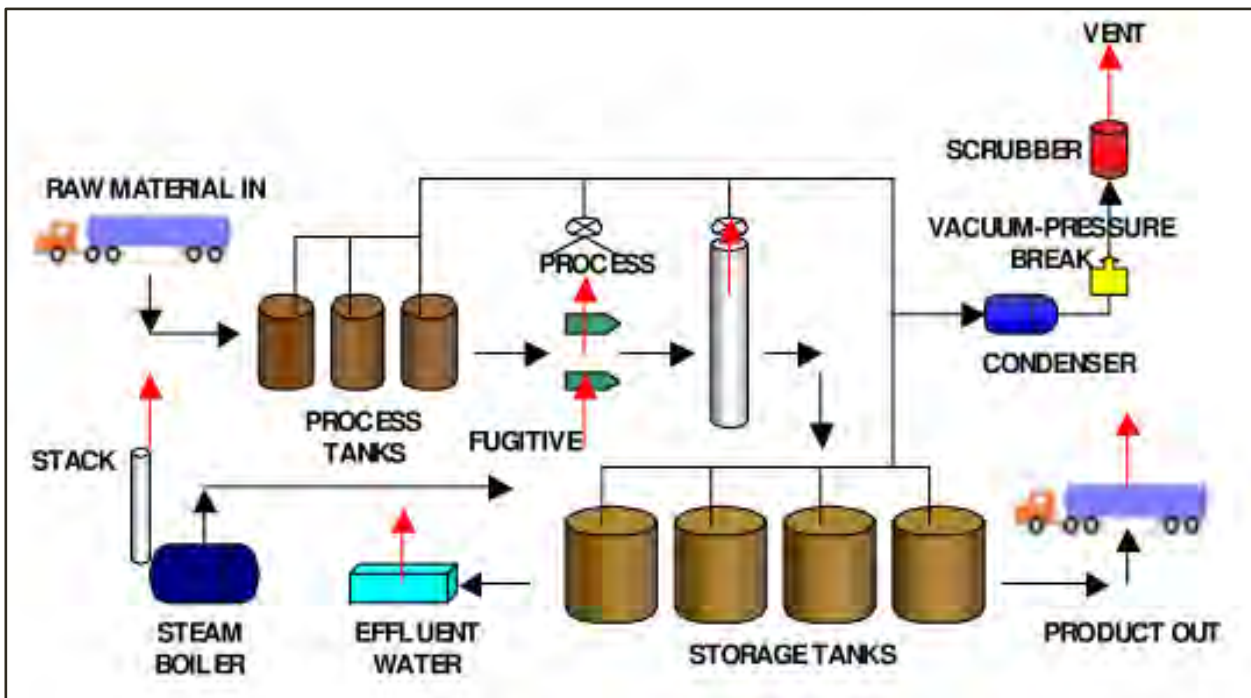


Figure 5: Flow chart showing the production process undertaken at FFS Evander (Hunter, 2005)

#### 3.1.1 Delivery of Raw Product

Raw product at a temperature of between 30°C and 60 °C is received by road tankers and unloaded into a series of receiving tanks. This process results in a displacement of vapour space in the receiving tanks, which usually results in a working loss of vapours from tanks that are vented to atmosphere. The Evander plant, however, has installed a tank vapour balancing system that greatly reduces the potential for vapour emissions.

#### 3.1.2 Solids Removal

The raw product received at the facility contains a proportion of solids. To remove this, the product is fed through a heat exchanger at 90°C and then a series of centrifuges at a pressure of 300-400 kPa at a controlled flow rate. The liquid product and solid wastes are then gravity drained into an enclosed surge tank, from which the liquid is pumped back into the processing tank while the solids are drained into waste skips. This solids removal process takes place in the decanter shed and results in fugitive emissions that are ducted to the vapour scrubber.

#### 3.1.3 Water Removal

Excess water in the product is removed by two processes, first in a thermal flash drier at ambient pressure and second in a thermal flash drier under vacuum conditions. The material is heated to a boiling point and water is flashed off at the top of a closed column. The vapour is then condensed through a water-cooled condenser and

the light ends are separated from the water in a static separator to be blended back into a wood preservative product to reduce viscosity. On the separator column there is a vent installed, which is an emission source linked to the vapour scrubber system.

### 3.1.4 Blending Processes

After solids and water have been removed, the final product is blended to ensure consistent viscosity and distillation fractions. At this point, approximately 10% of the final product is added to the product to generate a wood preservative. This addition is in accordance with product specifications outlined in the wood preservative SANS 1290. Further to this, a small quantity (<3%) of wax is added to the wood preservative to act as a water repellent and thickening agent.

### 3.1.5 Storage of Product

After processing, products are stored in final product tanks of various dimensions at a constant temperature of approximately 60 °C. All tanks are connected via vapour balancing ducts to the scrubber stack. As such all breathing and working losses are not vented to the atmosphere but rather to an abatement technology. Further, the tanks are pressure controlled, ensuring that a vent discharge will only occur at pressures in exceeding 2.0 kPag and conversely, air will not be drawn into the tanks unless the vacuum drops to below -0.6 kPag. There are seven oil products (Table 1) that can be stored in the tanks at any given time.

Table 1: Product details

| Name        | Description              | Class | Flash Point | Vapour Pressure |
|-------------|--------------------------|-------|-------------|-----------------|
| FO150       | Heavy fuel oil           | III   | >60 °C      | <14 kPa         |
| CGO         | Coker gas oil            | II    | >38 °C      | <14 kPa         |
| Naphtha     | Light mixed distillate   | II    | >38 °C      | <14 kPa         |
| MDO/LCO     | Middle distillates       | II    | >50 °C      | <14 kPa         |
| Paraffin    | Paraffin                 | II    | >38 °C      | <14 kPa         |
| Distillates | Light petroleum products | I     | <0 °C       | <14 kPa         |

### 3.1.6 Vapour Ducts

Emissions from the various processes mentioned above (i.e. centrifuges, waste skips, sludge conveyor, tank vents, flash dryer vents etc) are ducted to a wet scrubber. Here most condensable hydrocarbons are recovered by means of static separation for use in the process.

### 3.1.7 Product loading

Product is loaded into road tankers via top loading systems that can result in the emission of vapours to the air. The operation of a closed system would result in safety issues for the workers operating them due to tanks exploding.

### 3.1.8 Boiler

A coal fired boiler is used to generate steam for the production process. The coal used to fuel the boiler has a sulphur content of ~0.75% by mass and the average consumption is at 400 tonnes per month. There is a standby oil fired boiler installed that is rarely used (< than 5% of the time). Since emissions from the oil fired

boiler are expected to be lower than the coal fired boiler, WSP have conservatively assumed that the coal fired boiler operates at all times.

### 3.1.9 Effluent Water Treatment

All rainwater that collects within bund walls and any effluent water from the production process are contained and gravity-drained to an effluent water treatment plant. This water flows through a three-phase static separator to recover all free hydrocarbon material for return to the process. This is an enclosed system running at ambient temperature that results in marginal emissions from a small vent. These emissions have not been assessed in this study because their quantity is significantly smaller than other sources considered and available data does not allow for an estimate with reasonable confidence. The treated effluent water is discharged to the municipal sewer for further processing in the Municipality's water treatment plant.

## 3.2 Proposed Waxy Oil Plant

### 3.2.1 Characteristics of Waxy Oil

Waxy oil is the resultant remaining residue after a valuable petroleum distillate fraction is removed for further processing into petrol, diesel, and other petroleum products. Waxy oil can be further processed to produce heavy fuel oil which is suitable for use as an industrial heating fuel. The characteristics of the waxy oil to be processed at FFS are as follows:

Table 2: Characteristics of waxy oil (FFS Refiners, 2010).

| Component                      | Value          |
|--------------------------------|----------------|
| <b>Solids content</b>          | 1 – 1.5% v/v   |
| <b>Ash content</b>             | 0,5 – 1,0% w/w |
| <b>Wax content</b>             | 8 -12% w/w     |
| <b>Carbon content</b>          | >80% w/w       |
| <b>Gross Energy Value</b>      | 43 – 44 MJ/kg  |
| <b>Viscosity @ 100</b>         | <20 cSt        |
| <b>Flash Point (close cup)</b> | >100 °C        |
| <b>Pour Point</b>              | 30 – 40 °C     |
| <b>Initial Boiling Point</b>   | >240 °C        |
| <b>Sulphur content</b>         | <0,2% w/w      |

This proposed facility will remove particulates and contaminants of varying size fractions from waxy oil. Product will be received in road tankers and pumped into raw product storage tanks for processing. Thereafter the following processing stages will commence:

- With the use of oil fired heaters, the viscosity of the waxy oil will be reduced by heating it to temperatures of approximately 340°C under pressure. The viscosity will be further decreased with the use of additives.
- Large particles will be separated using a static separator. This process will be facilitated by temporarily reducing the viscosity by means of heat (120 °C) reduction of pH and surface tension through the addition of proprietary chemicals.
- From the static separator, material containing a high content of solids will be fed to the de-ashing vessel where wash water will assist in the removal of ash in a liquid phase.



- Excess water then will be removed and recovered using an free-flow electrophoresis (FFE and multistage evaporator);
- Any further solids will be removed by the centrifuge station and by filtration. Excessive waxes in the process stream may bind filter paper media requiring the chilling of the stream and separation and removal of waxes prior to filtration. This stream of wash will be treated in the deashing plant and re-constituted with the oil after the filtration stage.
- Upon filtration, the processed low sulphur oil stream will be stored in blending tanks to be blended into an industrial heating fuel with other fuel oils before final storage.
- The final product will be stored in tanks at temperatures between 60 °C and 70 °C ready for loading into road tankers.

The production process is outlined below.

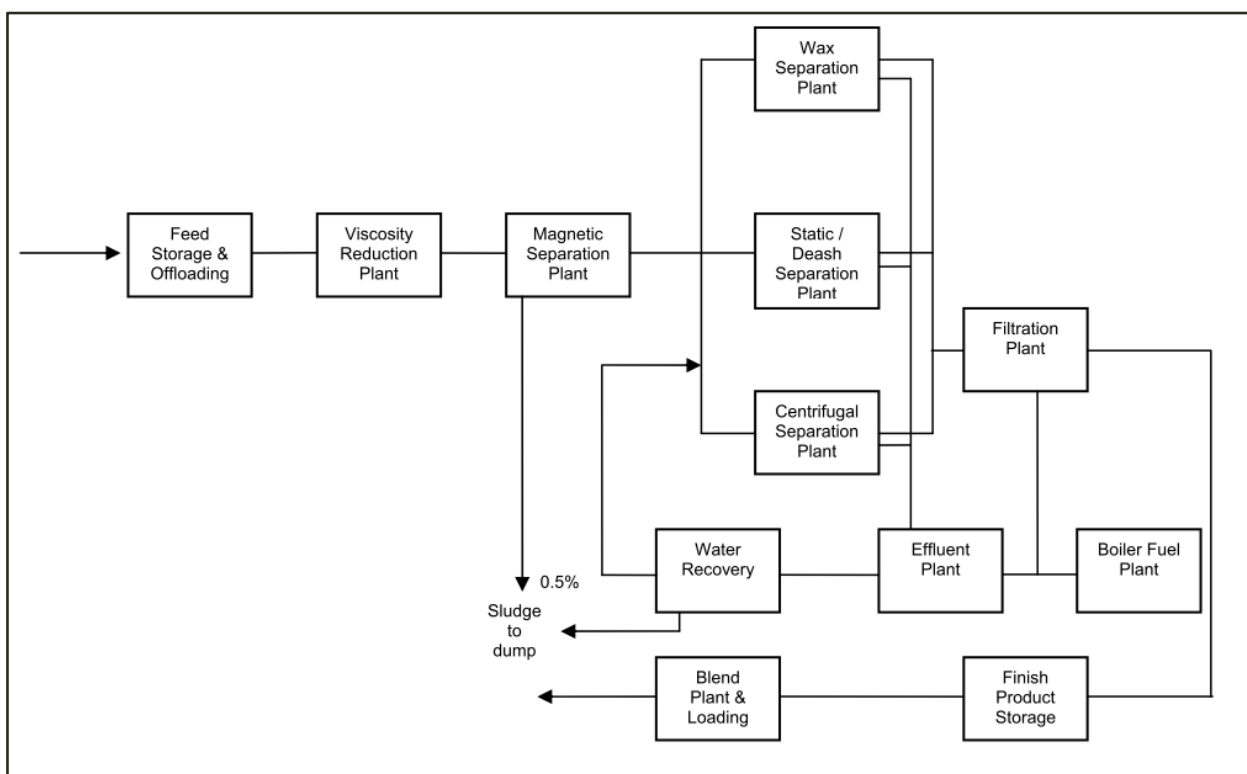


Figure 6: Process to be followed in the waxy oil plant (FFS Refiners, 2010)

## 4 Legal Framework

### 4.1 Overview of South Africa's Air Quality Legal Framework

The National Environmental Management: Air Quality Act 39 of 2004 (NEMAQA), which repeals the Air Pollution Prevention Act, Act 45 of 1965 (APPA), came into effect on 11 September 2005 with exclusions of certain sections such as the licensing of listed activities. Since mid-2010, a system of air emission licenses (AELs) for listed activities has come into force under Section 21 of NEMAQA, which supersedes the scheduled process permits under Schedule 2 of APPA. Key features of the current legislation include:

- Decentralization of air quality management responsibilities;
- The requirement that significant emission sources to be identified, quantified, and addressed;

- The setting of ambient air quality targets as goals for driving emission reductions;
- Recognition of source-based (command-and-control) measures in addition to alternative measures, including market incentives and disincentives, voluntary programmes, and education and awareness;
- Promotion of cost-optimized mitigation and management measures;
- Air quality management planning by authorities, and emission reduction and management planning by sources; and
- Access to information and public consultation.

NEMAQA introduces a system based on ambient air quality standards and corresponding emission limits to achieve them. Previous ambient air quality guidelines were viewed as inadequate to protect people's health and well-being. With the exception of sulphur dioxide (SO<sub>2</sub>), South Africa's limits for particulates (PM), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), and lead (Pb) were more lenient than internationally accepted health thresholds. Updated air quality limits for common pollutants were published by the South African Bureau of Standards (SABS) in 2005 and are gradually being adopted by national legislation which schedules a phased implementation between 2010 and 2015.

Linked to NEMAQA are two standards set by the South African National Standards (SANS), namely *SANS 69 (Framework for setting and implementing national ambient air quality standards)* which defines the basic principles of a strategy for ambient air quality management in South Africa, and *SANS 1929:2005* and provides limit values for common pollutants.

*SANS 69*, (Framework for setting and implementing national ambient air quality standards), makes provision for the establishment of air quality objectives for the protection of human health and the environment as a whole. Such air quality objectives include limit values, alert thresholds and target values.

*SANS 1929: 2005* it states that *SANS 69* makes provision for establishing air quality objectives for the protection of human health and the environment, and stipulates that limit values are initially set to protect human health. The setting of such limit values represents the first step in a process to manage air quality and initiate a process to ultimately achieve acceptable air quality nationally. The limit values presented in this standard are intended as information to be used in air quality management but are not enforceable until such time as time frames for achieving compliance have been determined. This process is underway and Government Notices are currently being issued. The limit values presented in the standard can therefore not be viewed in isolation, but should be seen as one part of an air quality management programme.

The final revisions of this standard include margins of tolerance, compliance time frames and permissible frequencies that limits may be exceeded, once the required assessments have been completed. *SANS 1929:2005 (Ambient Air Quality - Limits for Pollutants of Concern)* gives limit values for common air pollutants to ensure that the negative effects of such pollutants on human health are prevented or reduced.

## 4.2 Legal Standards / Guidelines Relevant To This Study

NEMAQA introduces a system based on ambient air quality standards and corresponding emission limits to achieve them. Two significant regulations stemming from NEMAQA have been promulgated in this regard, namely:

1. **GNR 248** on 31 March 2010 (Government Gazette 33064) National Environmental Management Air Quality Act, 2004 (Act No. 39 of 2004) List of Activities which result in Atmospheric Emissions which have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage.
2. **GNR 1210** on 24 December 2009 (Government Gazette 32816) National Environmental Management Air Quality Act, 2004 (Act No. 39 of 2004) National Ambient Air Quality Standards.

### 4.2.1 GNR 248

In terms of listed activities presented in GNR 248, the current operations undertaken at FFS Evander fall under the following Listed Activity:

- Category 2 (Petroleum Industry), Subcategory 2.2: Storage and Handling of Petroleum Products; and
- This subcategory has been extracted from Section 21 of the NEMAQ and is tabulated below:

Table 3: Subcategory 2.2: Storage and Handling of Petroleum Products

| Description                                                                                      |                 | Petroleum product storage tanks and product transfer facilities, except those used for liquefied petroleum gas. |                                                                        |
|--------------------------------------------------------------------------------------------------|-----------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| Applications                                                                                     |                 | All permanent immobile liquid storage tanks larger than 500 cubic meters cumulative tankage capacity at a site. |                                                                        |
| Substance or Mixture of Substances                                                               |                 | Plant Status                                                                                                    | mg/Nm <sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa |
| Common Name                                                                                      | Chemical Symbol |                                                                                                                 |                                                                        |
| Total volatile organic compounds from vapour recovery/ destruction units                         | N/A             | New                                                                                                             | 150                                                                    |
|                                                                                                  |                 | Existing                                                                                                        | 150                                                                    |
| Total volatile organic compounds from vapour recovery/ destruction units (Non thermal treatment) | N/A             | New                                                                                                             | 40                                                                     |
|                                                                                                  |                 | Existing                                                                                                        | 40                                                                     |

**Source:** DEA Government Notice No.248, 31 March 2010, Government Gazette No. 33064. "List of Activities which result in Atmospheric Emission which have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological or cultural heritage."

FFS have recently submitted their application for an Atmospheric Emission License (AEL) to the Department of Environmental Affairs and await authorisation.

#### 4.2.2 GNR 1210

Air Quality standards and guidelines are specified in the National Environmental Management: Air Quality Act (No. 39 of 2004) (NEMAQA), SANS 69 Framework for setting and implementing national ambient air quality standards as well as SANS 1929:2005 Ambient Air Quality - Limits for Common Pollutants. The priority pollutants as defined by the Act are sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), particulate matter (PM<sub>10</sub>), ozone (O<sub>3</sub>), benzene (C<sub>6</sub>H<sub>6</sub>), lead (Pb) and carbon monoxide (CO).

The legislated standards for ambient air quality related to FFS operations are presented in the tables below.

Table 4: Rollout of National Ambient Air Quality Standards (NAAQS) for SO<sub>2</sub>

| Sulphur Dioxide (SO <sub>2</sub> ) |                                    |                         |                 |
|------------------------------------|------------------------------------|-------------------------|-----------------|
| Avg. Period                        | Concentration (µg/m <sup>3</sup> ) | Frequency of Exceedence | Compliance Date |
| 10 min                             | 500                                | 526                     | Immediate       |
| Hourly                             | 350                                | 88                      | Immediate       |
| Daily                              | 125                                | 4                       | Immediate       |
| Annual                             | 50                                 | 0                       | Immediate       |

Table 5: Rollout of National Ambient Air Quality Standards (NAAQS) for NO<sub>2</sub>

| Nitrogen Dioxide (NO <sub>2</sub> ) |  |  |  |
|-------------------------------------|--|--|--|
|-------------------------------------|--|--|--|

| Avg. Period | Concentration ( $\mu\text{g}/\text{m}^3$ ) | Frequency of Exceedence | Compliance Date |
|-------------|--------------------------------------------|-------------------------|-----------------|
| Hourly      | 200                                        | 88                      | Immediate       |
| Annual      | 40                                         | 0                       | Immediate       |

Table 6: Rollout of National Ambient Air Quality Standards (NAAQS) for  $\text{PM}_{10}$

| Particulate Matter ( $\text{PM}_{10}$ ) |                                            |                         |                        |
|-----------------------------------------|--------------------------------------------|-------------------------|------------------------|
| Avg. Period                             | Concentration ( $\mu\text{g}/\text{m}^3$ ) | Frequency of Exceedence | Compliance Date        |
| Daily                                   | 120                                        | 4                       | Immediate – 31/12/2014 |
| Annual                                  | 50                                         | 0                       | Immediate – 31/12/2014 |

Table 7: Rollout of National Ambient Air Quality Standards (NAAQS) for Benzene

| Benzene ( $\text{C}_6\text{H}_6$ ) |                                            |                         |                        |
|------------------------------------|--------------------------------------------|-------------------------|------------------------|
| Avg. Period                        | Concentration ( $\mu\text{g}/\text{m}^3$ ) | Frequency of Exceedence | Compliance Date        |
| Daily                              | 10                                         | 0                       | Immediate – 31/12/2014 |
| Annual                             | 5                                          | 0                       | 1 January 2015         |

Whilst there does exist a  $\text{PM}_{2.5}$  NAAQS, elevated levels of particulate matter was not seen as a cause for concern and has not been assessed in this study.

## 5 Methodology

### 5.1 Pollutant Source Input: Emission Calculations and Inventory

Various methods exist to compile emissions inventories, with selection dependent on the availability of data, time, skills and funding. Common methods include continuous monitoring at source, data extrapolation from short-term source emissions testing, and the combination of published emission factors with known activity levels.

An emissions inventory for the FFS Evander plant's production process was compiled in 2005. This emissions inventory was updated by WSP in 2013 and includes emissions from the storage tanks, boiler and vapour recovery stack, as well as emissions from idling trucks and possible product spills. For the purpose of this assessment, an additional heater and scrubber stacks for the proposed waxy oil plant are considered. When discretion was required in calculating emissions from these sources, the most environmentally conservative option was chosen in line with international modelling best practice. Measurements and estimates were cross-checked with engineering specification where possible.

Results from the emissions calculations are summarised in the sections below while a map showing the location of each source is presented in Section 10.2 of Appendix A.

#### 5.1.1 Tank Emissions (Tanks E37 – E40)

The US EPA's TANKS 4.0.9 model was used to estimate total VOC emissions from tanks that are not linked to the plant's vapour scrubber system. The TANKS model requires the following parameters to estimate emissions from each tank's vent:

- Physical properties of each storage tank;
- Tank chemical contents;
- Throughput capacities of product stored and
- Meteorological data.

Meteorological data was obtained from the FFS Evander weather station onsite. Cloud cover data was sourced from the South African Weather Service (SAWS) station in Bethal .

Data on tank specifications and contents to populate the TANKS model were sourced from the client. The product stored in the tanks onsite has similar chemical properties to coal tar fuel (CTF). The chemical properties of CTF were calculated in the original AQIA for the plant and served as input to the TANKS model. CTF has a flash point of >90°C, the highest of all fuels currently handled in the plant and a vapour pressure of 14 kPa, the lowest of all fuel classes currently handled at the plant.

The TANKS model calculates the working loss and breathing loss (in grams per annum) for total VOCs. (TVOCs) From the measured concentrations in the tank headspace (INFOTOX, 2004), the long term scrubber emission of speciated VOCs were calculated. Benzene, the only VOC regulated by a NAAQS, was measured to comprise 2.77% of tank emissions and this values was used to speciate the TVOC emission rates calculated by the TANKS model. The gas exit velocity was calculated using USEPA equations incorporating wind speed and tank vent diameter. The tank vent specifications and conditions are presented in Table 8 while calculated vent emissions are presented in Table 9.

Table 8: Tank vents specifications and conditions.

| Tanks | Height (m) | Diameter (m) | Exit Temperature (°C) | Velocity (m/s) | Volume flux rate (m <sup>3</sup> s) |
|-------|------------|--------------|-----------------------|----------------|-------------------------------------|
| E37   | 15.60      | 0.10         | 16.86                 | 1.3            | 0.010                               |
| E38   | 15.60      | 0.10         | 16.86                 | 1.3            | 0.010                               |
| E39   | 15.60      | 0.10         | 16.86                 | 1.3            | 0.010                               |
| E40   | 15.60      | 0.10         | 16.86                 | 1.3            | 0.010                               |

Table 9: Tank vent emission rates used as input into the dispersion model.

| Tank | Pollutant  | Emission Rate |
|------|------------|---------------|
| E37  | Total VOCs | 5.18E-06      |
|      | Benzene    | 1.43E-07      |
| E38  | Total VOCs | 5.18E-06      |
|      | Benzene    | 1.43E-07      |
| E39  | Total VOCs | 5.18E-06      |
|      | Benzene    | 1.43E-07      |
| E40  | Total VOCs | 5.18E-06      |
|      | Benzene    | 1.43E-07      |

### 5.1.2 Boiler Stack and Vapour Scrubber Emissions

Isokinetic stack monitoring is undertaken on an annual basis at the boiler and vapour scrubber stacks by *Moderfontein Laboratory Services*. Stack monitoring was undertaken on two occasions at the boiler stack during 2012 to test the efficacy of the scrubber. Particulate matter, sulphur dioxide, carbon monoxide and

oxides of nitrogen samples were isokinetically drawn according to USEPA Methods. Emission measurements when the scrubber was switched off provide an environmentally conservative estimate of emissions. Stack testing at the vapour scrubber was undertaken on the 26<sup>th</sup> of March 2012 using appropriate National Institute for Occupational Safety and Health (NIOSH) methods to determine VOC concentrations. Results from these stack monitoring campaigns are tabulated below and have been used as input to ADMS. Table 10 below displays the stack specifications (at actual temperature and pressure) while Table 11 provides the emission rates calculated for each stack.

Table 10: Stack parameters and conditions.

| Stack           | Height (m) | Diameter (m) | Exit Temperature (°C) | Velocity (m/s) | Volume flux rate (m <sup>3</sup> s) |
|-----------------|------------|--------------|-----------------------|----------------|-------------------------------------|
| Boiler          | 33.60      | 1.25         | 182.00                | 4.60           | 5.69                                |
| Vapour Scrubber | 10.00      | 0.10         | 51.00                 | 15.10          | 0.12                                |

Table 11: Stack emission rates inputted to dispersion model.

| Stack           | Pollutant         | Emission Rate (g/s) |
|-----------------|-------------------|---------------------|
| Boiler          | PM <sub>10</sub>  | 0.49                |
|                 | PM <sub>2.5</sub> | 0.08                |
|                 | NO <sub>2</sub>   | 0.68                |
|                 | SO <sub>2</sub>   | 1.01                |
| Vapour Scrubber | Total VOCs        | 0.17                |
|                 | Benzene           | 0.03                |

### 5.1.3 Truck Exhaust Emissions

There are three onsite areas where trucks idle while offloading or receiving product to or from the storage tanks. Emissions from idling trucks were calculated from emission factors presented in the USEPA Emissions Fact Sheet for Idling Vehicle Emissions (EPA, 1998). The values utilised were for heavy duty diesel vehicles idling in an environment with an average ambient temperature of 23°C. The final truck exhaust parameters and calculated emission rates are presented in Tables 13 and 14 below.

Table 12: Truck exhaust specifications and conditions.

| Truck | Height (m) | Diameter (m) | Exit Temperature (°C) | Velocity (m/s) | Volume flux rate (m <sup>3</sup> s) |
|-------|------------|--------------|-----------------------|----------------|-------------------------------------|
| 1     | 0.50       | 0.10         | 349.85                | 3.17           | 2.50E-02                            |
| 2     | 0.50       | 0.10         | 349.85                | 3.17           | 2.50E-02                            |
| 3     | 0.50       | 0.10         | 349.85                | 3.17           | 2.50E-02                            |

Table 13: Truck exhaust emission rates inputted to dispersion model.

| Truck | Pollutant | Emission Rate |
|-------|-----------|---------------|
|-------|-----------|---------------|

|   |                  |          |
|---|------------------|----------|
| 1 | VOC              | 9.67E-04 |
|   | NO <sub>2</sub>  | 7.04E-03 |
|   | PM <sub>10</sub> | 3.33E-04 |
| 2 | VOC              | 9.67E-04 |
|   | NO <sub>2</sub>  | 7.04E-03 |
|   | PM <sub>10</sub> | 3.33E-04 |
| 3 | VOC              | 9.67E-04 |
|   | NO <sub>2</sub>  | 7.04E-03 |
|   | PM <sub>10</sub> | 3.33E-04 |

#### 5.1.4 Spill Emissions

During operation of the plant, there is the potential for spillage of coal tar product within bunded areas onsite. FFS strictly adheres to a spillage procedure, which is a continuous improvement system involving on-going documented training and has resulted in a decrease in the number of spills per a year. FFS undertook an in-house laboratory experiment to quantify air emissions from spilled product over time. Coal tar fuel (CTF) at a temperature of 90 °C was placed in an open beaker, in direct sunlight, at low humidity with a moderate breeze blowing and allowed to cool down to ambient temperature. Evaporation rates of the product were then calculated by measuring the percentage mass loss of the product over time as graphically presented below.

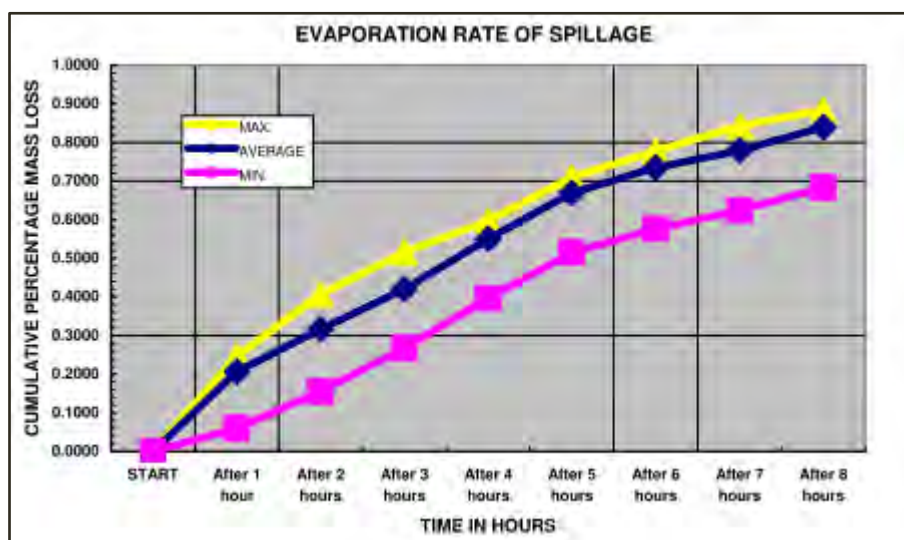


Figure 7: Graph showing the evaporation of spilled coal tar fuel over time.

By conservatively assuming the total mass of evaporated product comprises of the BTEX range, and using the maximum emission rate presented in Figure 7, a BTEX emission rate of 25 g/hr was calculated. It was assumed that the area of the spilled product is 3 m x 3 m and the temperature of the spilled product is at 90 °C. It was conservatively assumed that spills had occurred in four out of six bunds (bunds 1, 2, 3 and 4).

#### 5.1.5 Waxy Oil Plant - Vapour Scrubber

The six process tanks and seven static plant tanks are to be linked via vapour balancing lines to two wet scrubbers. These two scrubbers are to be ducted to a common stack thereby resulting in a single point source of emissions. To estimate the TVOC emissions from these tanks that will be ducted to the plant's vapour scrubber, the US EPA's TANKS 4.0.9 model was used. Data on tank specifications and contents to populate the TANKS model were sourced from the client. The methodology used to estimate emissions from these tanks



were identical to the methodology employed into estimate emissions from the current tanks outlined in section 5.1.1 above. The stack specifications and emissions are presented in the table below.

Table 14: Tank vents specifications and conditions.

| Height (m) | Diameter (m) | Exit Temperature (°C) | Velocity (m/s) | Volume flux rate (m <sup>3</sup> /s) | TVOC Emission Rate (g/s) | Benzene Emission Rate (g/s) |
|------------|--------------|-----------------------|----------------|--------------------------------------|--------------------------|-----------------------------|
| 10.00      | 0.50         | 40.00                 | 0.255          | 0.05                                 | 2.09e-4                  | 6.17e-6                     |

### 5.1.6 Waxy Oil Plant - Heater Stack

Two oil fired heaters are to be located on site for the generation of steam. Water for the boiler is to be sourced from the municipal supply as well as from recovered water from plant processes. The total monthly consumption of potable water is approximately 80-120 kl/month per month. The intention is to increase the use of recovered water for the heaters in future.

The two oil fired heaters are 2 MW each with an LO10 consumption rate of 120 litres/day per heater. The heater stacks are to be ducted to a common stack. The stack specifications and emissions are presented in Table 16 below.

The emissions from each heater were estimated using emission factors from the Australian National Pollutant Inventory (NPI)'s Emission Estimation Technique Manual for Petroleum and USEPA AP42 factors. Emission factors for boilers smaller than 30 MW and firing distillate oil were used to estimate the emissions for oxides of nitrogen (NO<sub>x</sub>), nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), particulate matter with an aerodynamic diameter of less than 10 microns (PM<sub>10</sub>), and total volatile organic compounds (TVOCs). Emission factors and the calculated emission rates are presented in Tables 16 to 18 below.

Table 15: NPI Emission Factors for Fuel Oil Combustion

| Oil Type and Firing Configuration                                                                                                                                                                | Emission Factors (kg/m <sup>3</sup> of oil fired) |      |                  |       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------|------------------|-------|
|                                                                                                                                                                                                  | NO <sub>2</sub> <sup>(a)</sup>                    | CO   | PM <sub>10</sub> | VOC   |
| <b>Boiler &lt;30 MW</b>                                                                                                                                                                          |                                                   |      |                  |       |
| <b>Distillate oil fired</b>                                                                                                                                                                      | 3.72                                              | 0.60 | 0.12             | 0.024 |
| Notes:                                                                                                                                                                                           |                                                   |      |                  |       |
| a) NO <sub>2</sub> emissions from industrial boilers (i.e. < 30 MW): kg NO <sub>2</sub> /m <sup>3</sup> oil fired = 2.47 + 12.53(N), where N is the weight percent (0.1) of nitrogen in the oil. |                                                   |      |                  |       |

Table 16: US-EPA Emission Factor for Sulphur Dioxide

| Oil Type and Firing Configuration                                                     | SO <sub>2</sub> Emission Factor (lb/10 <sup>3</sup> gal) |
|---------------------------------------------------------------------------------------|----------------------------------------------------------|
| <b>Boilers &lt;100 Million Btu/hr</b>                                                 |                                                          |
| <b>Distillate oil fired</b>                                                           | 147*S                                                    |
| Notes:                                                                                |                                                          |
| 1) To convert from lb/10 <sup>3</sup> gal to kg/10 <sup>3</sup> L, multiply by 0.120. |                                                          |
| 2) Sulphur content = 2.8 (% weight)                                                   |                                                          |

Table 17: Emission rates from each oil fired heater.



| Source           | NO <sub>2</sub> (g/s) | SO <sub>2</sub> (g/s) | CO (g/s) | PM <sub>10</sub> (g/s) | VOC (g/s) |
|------------------|-----------------------|-----------------------|----------|------------------------|-----------|
| Oil Fired Heater | 0.0052                | 0.0172                | 0.0008   | 0.0002                 | 3.333e-5  |

Table 18: Oil fired heater stack specifications and conditions.

| Height (m) | Diameter (m) | Exit Temperature (°C) | Velocity (m/s) | Volume flux rate (m <sup>3</sup> /s) |
|------------|--------------|-----------------------|----------------|--------------------------------------|
| 16.00      | 0.70         | 40.00                 | 0.50           | 0.192                                |

## 5.2 Dispersion Modelling

### 5.2.1 Modelling Software

Dispersion models calculate ambient concentrations as a function of source configurations, emission factors and local meteorology. There is an increasing reliance on model estimates in health impact assessments, risk assessments and emission control. There is a wide range of modelling software available on the market; common examples include AERMOD, ADMS, AIRQUIS and CALPUFF. Based on past experience, WSP has found that ADMS 5 handles area sources better than most other steady-state models and it does not require extensive (and often unavailable) meteorological datasets to produce accurate results. Comparative studies between ADMS and CALPUFF suggest that given limited local input data, the predictions are comparable, with ADMS being preferable in the absence of measured upper air data and over a small (< 10 km) domain. ADMS thus was selected as the modelling platform for this study.

Cambridge Environmental Research Consultants (CERC) developed ADMS to offer a practical dispersion model that simulates a wide range of buoyant and passive releases to the atmosphere, whether individually or in combination. It is recognised as a leading dispersion model in the UK, European Union (EU), Asia, Australasia, the Middle East and South Africa, drawing on the latest plume dispersion mathematics and based on a solid GIS platform (ArcGIS 10). The software is currently endorsed by the Climate Research Group (operating from the University of the Witwatersrand, University of KwaZulu-Natal and University of Cape Town). Output for criteria pollutants has been extensively validated against field data sets in the European Union and the American Standard Test Methods, whilst WSP and other consultants have proven its reliability against measured data in South African case studies. The model handles multiple point, line, area and volume sources to produce long- and short-term scenarios for comparison with measured values (in the case of an existing plant), guidelines, standards and objectives. The interface requires detailed geographic data, sequential meteorological data, efflux rates and emission parameters to produce optimal results.

The model output provided valuable data depicting ambient concentrations of pollutants surrounding the sources as required by this specialist study.

### 5.2.2 GIS Input: Site and Receiving Environment

For the purpose of this study, ArcGIS 10 was used as a mapping interface. ArcGIS includes a suite of integrated applications that provides several GIS tasks, from simple to advanced, including mapping, geographic analysis, data editing and compilation, data management, visualisation and geo-processing.

The *modelling domain* selected for this campaign is 6000 m x 6000 m, with FFS as the centre point; covering an approximate area of 3600 ha. Table 19 presents the modelling domain coordinates.

Table 19: Modelling domain coordinates

| Domain Point         | X Coordinate (m) | Y Coordinate (m) |
|----------------------|------------------|------------------|
| North-western vertex | 6761             | -2927639         |

|                      |       |          |
|----------------------|-------|----------|
| North-eastern vertex | 12761 | -2927639 |
| South-western vertex | 6761  | -2933693 |
| South-eastern vertex | 12761 | -2927639 |

### 5.2.3 Meteorological data and Statistics

The most important control on the dispersion of air pollution from its source is prevailing meteorological conditions in the boundary layer. FFS currently own a *Davis Vantage Pro™* weather station that records a range of meteorological parameters every hour. These include wind speed, wind direction, air temperature, air pressure, humidity, rainfall, sunrise and sunset times, and rainfall. FFS currently maintain and download data from this instrument on a regular basis. The full year of meteorological data collected over the course of 2011 was used in this study. Cloud cover was sourced from the nearest SAWS weather station located in Bethal, approximately 36 km east of Evander and is considered to be a reasonable surrogate for onsite measurements.

Wind speed, wind direction, air temperature, relative humidity, rainfall and cloud cover data were utilised for modelling purposes. Since there are 24 hours in a day and 365 days in year, a total of 8,760 hours of meteorological data were utilised. The limitation of a steady state model is its inability to model the dispersion of air pollution during calm conditions (no wind). The model log file indicated that 6492 (74%) of the available lines contained meteorological data usable in this study. This value is in line with the allowances of modelling best practice.

Table 20: Statistical summary of meteorological data used in the dispersion model.

| Met. Data   | Met. lines | Met. lines used | Met. lines calm | Met. lines with missing data |
|-------------|------------|-----------------|-----------------|------------------------------|
| <b>2011</b> | 8,760      | 6492 (74.1 %)   | 2068 (23.6 %)   | 200 (2.3 %)                  |

### 5.2.4 Receptors

ADMS provides the user with the choice of two types of receptors, namely gridded points and discrete points. For the purpose of this study, both gridded and discrete receptor points were selected in the modelling domain. Discrete receptors usually are sites selected for assessment because they are sensitive to emissions from the current and proposed facility. Examples of sensitive receptors include, but are not limited to, schools, shopping centres, hospitals, office blocks and residential areas. For this study, discrete receptors were selected at the six passive sampling locations, four on the site boundary and two offsite at a nearby school and the Walker Palk Golf Course. The passive sampling points were selected as receptors to allow for model validation tests. Their locations are presented by means of green points in subsequent output maps.

Table 21: Summary of discrete receptors and their approximate location relative to FFS Evander

| Receptor               | Direction from Nearest Boundary | Distance from Nearest Boundary (m) |
|------------------------|---------------------------------|------------------------------------|
| <b>Fire Water Tank</b> | North-west                      | 0                                  |
| <b>Tank Farm</b>       | North-east                      | 0                                  |
| <b>Workshop</b>        | South-east                      | 0                                  |
| <b>Main Gate</b>       | South-west                      | 0                                  |
| <b>School</b>          | North-east                      | 1000                               |

|                         |            |      |
|-------------------------|------------|------|
| Walker Park Golf Course | South-east | 1000 |
|-------------------------|------------|------|

For the gridded output, a regular Cartesian grid (modelling domain) is defined with start and finish X and Y coordinates, representing the maximum and minimum coordinates in each direction, together with the number of points along each X and Y axis. The model was set to predict concentrations at 10 000 points (maximum) within the modelling domain. These concentrations were interpolated in ArcGIS 10 for display as pollution plumes.

## 6 Results - Dispersion Modelling

This section presents the results from the ADMS model runs. These results show the spatial distribution of plumes generated from the existing plant as influenced by prevailing meteorology. A specific graphical framework has been adopted for the purpose of this study. The modelled plume concentrations emanating from FFS Evander have been overlain onto aerial imagery as a reference background (Appendix B). The 6 km x 6 km modelling domain is contained within the blue lines and sensitive receptors are plotted as yellow points on these maps. The model output maps show concentrations that would be experienced at 1.5 m above the ground, which represents average breathing height. The points of release (e.g. stack heights) are usually much higher above the ground than the breathing height and thus air pollution concentrations will be near zero immediately adjacent to the source before increasing to peak levels and then decreasing again as air pollution dilution takes place with increasing distance from source. The following statistical outputs were generated as output maps and receptor tables to meet the objectives of the study:

### ■ Long term (annual) average concentrations:

These values are calculated by averaging all hourly concentrations over the modelled period for each grid point and all specified receptor points within the modelling domain. Using the model calculated concentrations for each grid point within the model domain, long term output maps for each pollutant (PM<sub>10</sub>, NO<sub>2</sub>, SO<sub>2</sub>, C<sub>6</sub>H<sub>6</sub> and TVOCs) have been plotted and are presented in Appendix B.

### ■ 100<sup>th</sup> percentile concentration (P100):

This is the highest hourly (or 24 hour) average concentration over the modelled period at each grid point and each specified receptor point. It is thus a worst case hourly (or daily) concentration and is comparable with the respective pollutant NAAQS. Although the P100 results are graphically presented as concentration isopleths in the maps, in reality the worst case concentrations do not occur simultaneously across the model domain and hence the P100 images do not depict a worst case contaminant plume but rather a distribution of worst case concentrations. The following P100 results have been selected for further analysis as per their corresponding NAAQS:

- P100 24-hour PM<sub>10</sub>
- P100 1-hour NO<sub>2</sub>
- P100 1 hour SO<sub>2</sub>

## 6.1 Particulate Matter (PM<sub>10</sub>)

Section 11.1 in Appendix B shows the annual average PM<sub>10</sub> contributions from FFS to ambient concentrations within the study domain. The plume extends in north-easterly (towards Evander), south-easterly (towards the Golf Club) and south-westerly directions away from the plant. The highest proposed contributions (maximum = 0.759 µg/m<sup>3</sup>) are predicted to occur to the east of the plant. All modelled contributions (current and proposed) are fully compliant with the annual PM<sub>10</sub> NAAQS of 50 µg/m<sup>3</sup>. Current annual average concentrations at each receptor point will not increase significantly with the marginal increase in PM<sub>10</sub> emissions from the proposed heater stack. Background concentrations would need to be incorporated to assess ambient concentrations of PM<sub>10</sub>. The proposed annual average PM<sub>10</sub> contributions to existing ambient concentrations at the identified key receptor locations are presented in Table 22 below.

Table 22: Summary of annual PM<sub>10</sub> contributions to ambient concentrations at surrounding receptors.

| Receptor                       | NAAQS (µg/m <sup>3</sup> ) | Modelled Concentration (µg/m <sup>3</sup> ) |          | Increase (µg/m <sup>3</sup> ) |
|--------------------------------|----------------------------|---------------------------------------------|----------|-------------------------------|
|                                | Annual                     | Current                                     | Proposed |                               |
| <b>Fire Water Tank</b>         | 50                         | 0.37                                        | 0.37     | 0.00                          |
| <b>Tank Farm</b>               | 50                         | 0.50                                        | 0.50     | 0.00                          |
| <b>Workshop</b>                | 50                         | 0.12                                        | 0.10     | 0.00                          |
| <b>Main Gate</b>               | 50                         | 0.35                                        | 0.35     | 0.00                          |
| <b>School</b>                  | 50                         | 0.07                                        | 0.07     | 0.00                          |
| <b>Walker Park Golf Course</b> | 50                         | 0.13                                        | 0.13     | 0.00                          |

Section 11.2 in Appendix B shows the P100 (worst case) modelled 24-hour PM<sub>10</sub> contributions from FFS to ambient concentrations within the study domain. All modelled contributions (current and proposed) remain fully compliant with the 24-hour NAAQS of 120 µg/m<sup>3</sup> for PM<sub>10</sub> with a proposed peak value of 12.61 µg/m<sup>3</sup>. There is a slight increase in worst-case daily PM<sub>10</sub> concentrations at each receptor point due to the marginal increase in PM<sub>10</sub> emissions from the proposed heater stack. The proposed P100 24-hour contributions to ambient concentrations at the identified key receptor locations are presented in Table 23 below. Background concentrations have not been considered here as data was not available.

Table 23 below. Background concentrations have not been considered here as data was not available.

Table 23: Summary of P100 24-hour PM<sub>10</sub> contributions to ambient concentrations at surrounding receptors.

| Receptor                       | NAAQS (µg/m <sup>3</sup> ) | Modelled Concentration (µg/m <sup>3</sup> ) |          | Increase (µg/m <sup>3</sup> ) |
|--------------------------------|----------------------------|---------------------------------------------|----------|-------------------------------|
|                                | 24-Hour                    | Current                                     | Proposed |                               |
| <b>Fire Water Tank</b>         | 120                        | 9.00                                        | 9.03     | 0.03                          |
| <b>Tank Farm</b>               | 120                        | 11.00                                       | 11.01    | 0.01                          |
| <b>Workshop</b>                | 120                        | 6.44                                        | 6.48     | 0.04                          |
| <b>Main Gate</b>               | 120                        | 10.60                                       | 10.65    | 0.05                          |
| <b>School</b>                  | 120                        | 1.00                                        | 1.08     | 0.08                          |
| <b>Walker Park Golf Course</b> | 120                        | 0.66                                        | 0.71     | 0.05                          |

## 6.2 Nitrogen Dioxide (NO<sub>2</sub>)

Section 11.3 in Appendix B shows the annual average NO<sub>2</sub> contributions from FFS to ambient concentrations within the 6 km<sup>2</sup> study domain. The plume extends in north-easterly (towards Evander), south-easterly (golf course?) and south-westerly directions away from the plant. The maximum predicted NO<sub>2</sub> contribution of 4.91 µg/m<sup>3</sup> is less than the annual NAAQS of 40 µg/m<sup>3</sup>. Annual average NO<sub>2</sub> concentrations are expected to increase marginally with addition of emissions from the waxy oil plant, with the greatest increases experienced closer to the site. Background concentrations have not been considered here due to a lack of background data.

Table 24: Summary of annual average NO<sub>2</sub> contributions to ambient concentrations at receptors.

| Receptor                       | NAAQS (µg/m <sup>3</sup> ) | Modelled Concentration (µg/m <sup>3</sup> ) |          | Increase (µg/m <sup>3</sup> ) |
|--------------------------------|----------------------------|---------------------------------------------|----------|-------------------------------|
|                                | Annual                     | Current                                     | Proposed |                               |
| <b>Fire Water Tank</b>         | 40                         | 1.73                                        | 1.80     | 0.07                          |
| <b>Tank Farm</b>               | 40                         | 4.77                                        | 4.90     | 0.13                          |
| <b>Workshop</b>                | 40                         | 1.29                                        | 1.47     | 0.18                          |
| <b>Main Gate</b>               | 40                         | 1.26                                        | 1.40     | 0.14                          |
| <b>School</b>                  | 40                         | 0.13                                        | 0.13     | 0.00                          |
| <b>Walker Park Golf Course</b> | 40                         | 0.25                                        | 0.25     | 0.00                          |

A plot of modelled P100 (worst case) hourly contributions can be found in Section 11.4 in Appendix B. The maximum hourly contribution from the Evander site is 46.80 µg/m<sup>3</sup>, and is fully compliant with the hourly NAAQS of 200 µg/m<sup>3</sup>. Table 26 below shows the current, proposed and increase in contributions to ambient concentrations at each receptor location. Concentrations are expected to increase marginally at each receptor location. Once again, however, background concentrations have not been included in this assessment

Table 25: Summary of P100 1-hour NO<sub>2</sub> concentrations being projected onto surrounding receptors.

| Receptor                       | NAAQS (µg/m <sup>3</sup> ) | Modelled Concentration (µg/m <sup>3</sup> ) |          | Increase (µg/m <sup>3</sup> ) |
|--------------------------------|----------------------------|---------------------------------------------|----------|-------------------------------|
|                                | Hourly                     | Current                                     | Proposed |                               |
| <b>Fire Water Tank</b>         | 200                        | 31.46                                       | 31.46    | 0.00                          |
| <b>Tank Farm</b>               | 200                        | 46.03                                       | 46.75    | 0.72                          |
| <b>Workshop</b>                | 200                        | 20.06                                       | 20.64    | 0.58                          |
| <b>Main Gate</b>               | 200                        | 21.75                                       | 24.43    | 2.68                          |
| <b>School</b>                  | 200                        | 5.50                                        | 5.57     | 0.07                          |
| <b>Walker Park Golf Course</b> | 200                        | 5.19                                        | 5.26     | 0.07                          |

## 6.3 Sulphur Dioxide (SO<sub>2</sub>)

Section 11.5 in Appendix B shows the current, proposed and increases in annual average SO<sub>2</sub> contributions from FFS to ambient concentrations within the study domain. The plume extends in north-easterly (towards Evander), south-easterly (golf course?) and south-westerly directions away from the plant. The maximum SO<sub>2</sub> contribution from the existing plant including the additional, heater stack is approximately 1.61 µg/m<sup>3</sup> and is less than the annual NAAQS of 50 µg/m<sup>3</sup>. The table below shows the current, proposed and increase in contributions to ambient concentrations at each receptor location from the plants operation. Concentrations are expected to increase marginally at each receptor location. Background concentrations have not been considered here due to a lack of background data.

Table 26: Summary of annual SO<sub>2</sub> contributions to existing concentrations at surrounding receptors.

| Receptor                       | NAAQS (µg/m <sup>3</sup> ) | Modelled Concentration (µg/m <sup>3</sup> ) |          | Increase (µg/m <sup>3</sup> ) |
|--------------------------------|----------------------------|---------------------------------------------|----------|-------------------------------|
|                                | Annual                     | Current                                     | Proposed |                               |
| <b>Fire Water Tank</b>         | 50                         | 0.63                                        | 0.82     | 0.19                          |
| <b>Tank Farm</b>               | 50                         | 0.59                                        | 0.94     | 0.35                          |
| <b>Workshop</b>                | 50                         | 0.12                                        | 0.68     | 0.56                          |
| <b>Main Gate</b>               | 50                         | 0.64                                        | 1.07     | 0.43                          |
| <b>School</b>                  | 50                         | 0.14                                        | 0.15     | 0.01                          |
| <b>Walker Park Golf Course</b> | 50                         | 0.26                                        | 0.29     | 0.03                          |

The modelled P100 (worst case) hourly SO<sub>2</sub> concentrations have been plotted and shown in Section 11.6 in Appendix B. The maximum modelled contribution including the proposed heater stack at the waxy oil plant (42.60 µg/m<sup>3</sup>) to ambient concentrations onsite is compliant with the hourly NAAQS for SO<sub>2</sub> of 350 µg/m<sup>3</sup>. From Table 27 it is evident that contributions to ambient concentrations at receptor points are well below their respective NAAQS with the highest concentrations onsite at the Tank Farm. It is expected that SO<sub>2</sub> concentrations will increase at the each receptor location. There is a slight decrease in the P100 hour SO<sub>2</sub> concentrations at the school and is likely to be an artefact of the plume interpolation process.

Table 27: Summary of P100 hourly SO<sub>2</sub> contributions to existing concentrations at surrounding receptors.

| Receptor                       | NAAQS (µg/m <sup>3</sup> ) | Modelled Concentration (µg/m <sup>3</sup> ) |          | Increase (µg/m <sup>3</sup> ) |
|--------------------------------|----------------------------|---------------------------------------------|----------|-------------------------------|
|                                | Hourly                     | Current                                     | Proposed |                               |
| <b>Fire Water Tank</b>         | 350                        | 26.40                                       | 30.83    | 4.43                          |
| <b>Tank Farm</b>               | 350                        | 38.40                                       | 40.06    | 1.66                          |
| <b>Workshop</b>                | 350                        | 29.00                                       | 30.48    | 1.48                          |
| <b>Main Gate</b>               | 350                        | 31.80                                       | 39.51    | 7.71                          |
| <b>School</b>                  | 350                        | 8.29                                        | 8.17     | -0.12                         |
| <b>Walker Park Golf Course</b> | 350                        | 7.71                                        | 7.73     | 0.02                          |

## 6.4 Benzene (C<sub>6</sub>H<sub>6</sub>)

The annual average benzene contributions from the existing plant including the FFS waxy oil plant to ambient concentrations within the study domain are presented in Section 11.7 of Appendix B. The plume extends in north-easterly (towards Evander), south-easterly and south-westerly directions away from the plant.

The maximum annual benzene concentration with the additional vapour scrubber at the waxy oil plant results in approximately 0.86 µg/m<sup>3</sup> generated from FFS is less than the annual NAAQS of 10 µg/m<sup>3</sup> presented in the NAAQS. Due to the high efficiency of the scrubber to be installed on the vapour duct, there are no increases in benzene emissions predicted at the receptor locations. Background concentrations have not been considered in this assessment of ambient concentrations.

Table 28: Summary of annual benzene contributions to existing concentrations at surrounding receptors.

| Receptor                | NAAQS (µg/m <sup>3</sup> ) | Modelled Concentration (µg/m <sup>3</sup> ) |          | Increase (µg/m <sup>3</sup> ) |
|-------------------------|----------------------------|---------------------------------------------|----------|-------------------------------|
|                         | Annual                     | Current                                     | Proposed |                               |
| Fire Water Tank         | 10                         | 0.33                                        | 0.33     | <0.01                         |
| Tank Farm               | 10                         | 0.67                                        | 0.67     | <0.01                         |
| Workshop                | 10                         | 0.73                                        | 0.73     | <0.01                         |
| Main Gate               | 10                         | 0.37                                        | 0.37     | <0.01                         |
| School                  | 10                         | 0.01                                        | 0.01     | <0.01                         |
| Walker Park Golf Course | 10                         | 0.03                                        | 0.03     | <0.01                         |

## 7 Discussion

All modelled output concentrations are at a height of 1.5m above the ground *without* taking into account background concentrations as representative background data were not available for the region. As the distance away from FFS Evander site increases, air pollution concentrations decrease as the effect of dilution takes place. Annual average air pollutant plumes extend in north-easterly south-easterly and south-westerly directions due to prevailing wind directions. South-westerly winds transport the plume towards the Evander residential area while north-westerly winds transport air pollutants toward the Walker Palk Golf Course.

None of the NAAQS are exceeded for each criteria pollutant of concern within the modelling domain. Furthermore, worst case (P100) modelled contributions of SO<sub>2</sub>, NO<sub>2</sub> and PM<sub>10</sub> do not exceed their corresponding NAAQS. The predicted increase in emissions from the additional waxy oil plant remains marginal due to the high efficiency of the abatement technology fitted onto each heater and vapour recovery stack. Although background concentrations are not included in this assessment, it is not expected that background concentrations are high and would alter this conclusion due to the lack of proximate pollutant sources.

## 8 Limitations and Uncertainties

- The onsite weather station does not measure cloud cover. This meteorological parameter was obtained from Bethal (approximately 35 kilometres east of Evander). Although onsite cloud cover data is preferable, the Bethal data is considered a reasonable surrogate.
- No background ambient air quality data was used in this study as a complete, reliable dataset could not be obtained.
- Analysis of contour data indicated Evander is situated on flat terrain. As such a topographical model was not incorporated in the dispersion model.



- SASOL Secunda is located approximately 8 km south-east of Evander and emissions from this plant were not considered in this study.
- Emissions during the start-up of the coal fired boiler have not been modelled as these last for a short period of time (approximately 10 minutes). The scrubber system is in operation during start up conditions to minimise emissions during activation.
- We assumed that the coal fired boiler operates all year without interruption.
- As a worst case scenario, it was assumed that trucks idle the entire time that they are being filled.
- Exhaust height, diameter and exit temperature for the idling trucks was assumed as 0.5 m, 0.1 mm and 623 K respectively, based on generic characteristics of petroleum tankers.
- It was conservatively assumed that the temperature of the spilled product is constant at 90 °C and does not cool to ambient temperature.
- Fugitive emissions could not be estimated and were hence not considered in this study.

## 9 Conclusion and Recommendations

This AQIA demonstrates the cumulative air quality impacts that would emanate the FFS Evander plant when the waxy oil plant is to be added to the existing facility the using ADMS v5 and ArcGIS 10. The air pollution emissions inventory for the current operations undertaken at the facility comprised emissions from the vapour scrubber, boiler stack, tank vents, idling trucks and four spilled product within the bunded area. A comprehensive emissions inventory was developed using the latest stack monitoring results for the current vapour scrubber and boiler stack. Air emissions from tanks E37 to E40 were estimated using the USEPA TANKS model while vehicular emissions were estimated using USEPA AP42 emission factors. Emissions from the additional heater and vapour scrubber stacks for proposed waxy oil plant were calculated using USEPA and Australian NPI guidelines whilst, the fugitive emissions that may result in odour were not calculated.

A meteorological dataset was assembled using data from the onsite weather station and a SAWS weather station located in Bethal. No background emissions were considered in the study. Furthermore complex terrain was not accounted for as Evander lacks significant topographical irregularities that would affect plume dispersion.

Dispersion modelling results show pollutant plumes extending in north-easterly, south-easterly and south-westerly directions away from the plant due to prevailing wind directions in this region. Predicted contributions of PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>2</sub>, and benzene concentrations from the additional waxy oil plant to ambient concentrations fall well within the respective NAAQS. Pollution concentrations are expected to increase marginally therefore no significant concerns are expected to arise with respect to the impact of the proposed waxy oil plant on ambient air quality and local environmental health.

Short-term peaks in air pollution concentrations could result from spilled product and fugitive emissions from the general operation. A one week passive air quality monitoring campaign (April 2013) revealed all benzene concentrations measured at the fenceline and background receptors to be compliant with the annual NAAQS. Benzene concentrations measured onsite however, were higher than those measured at the off-site locations indicating that the operations undertake at FFS Evander does result in the generation of benzene.

The above notwithstanding, an Air Quality Management Program (AQMP) is recommended to comprise of the following:

- Frequent (bi-annual) stack monitoring be undertaken at the current plant stacks as well as the proposed heater and vapour scrubber stack at the waxy oil plant to test their efficiency;
- A leak detection and repair program (LDAR) approved by the licensing authority in line with requirements of the NEMAQA;
- Frequent inspection and repair of processing units to reduce hydrocarbons venting to the atmosphere;
- Possible linking of Tanks E37 - E40 via vapour balancing lines to the common vapour scrubber stack;
- Minimisation of truck idling during loading/offloading of product;



- Continuous inspection of tanks rims and seals;
- Reduction in fugitive dust emissions from vehicular traffic by sealing or paving roadways;
- Improvements in response time to spilled product within bunded areas;
- Real-time analysis of air pollution concentrations prevailing at the site to determine periods of elevated concentrations emanating the plant. This dataset would also serve as background ambient air quality that will enhance the representivity of air pollution modelling results;
- The on-site meteorological station should be upgraded to ensure hourly sequential data is collected for the following parameters: wind speed, wind direction, temperature relative humidity, and precipitation.

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# 10Appendix A

## 10.1 Surrounding Land Use Activities



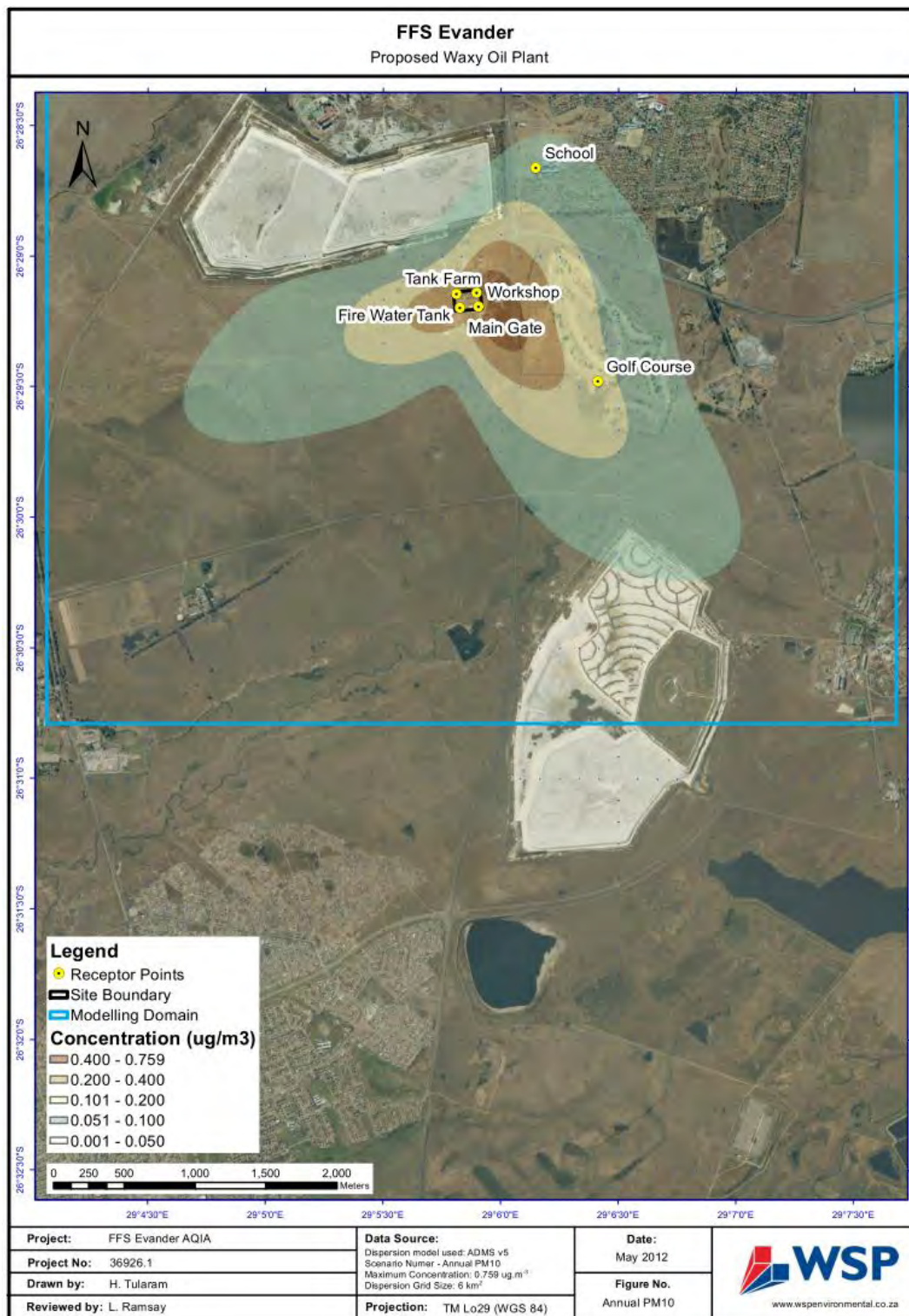


## 10.2 Map showing location of emissions sources



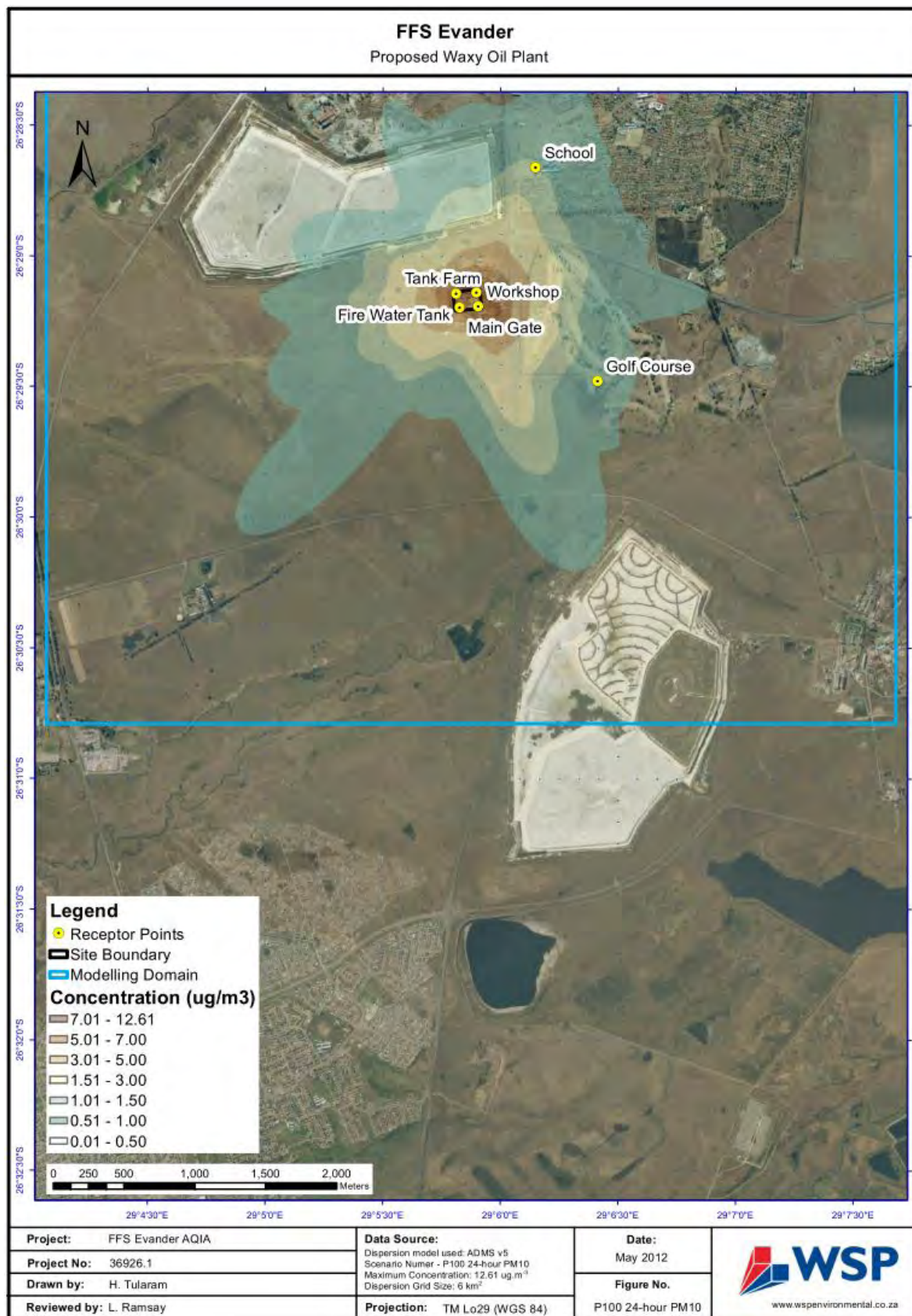
# 11Appendix B

## 11.1 Annual Average PM<sub>10</sub>

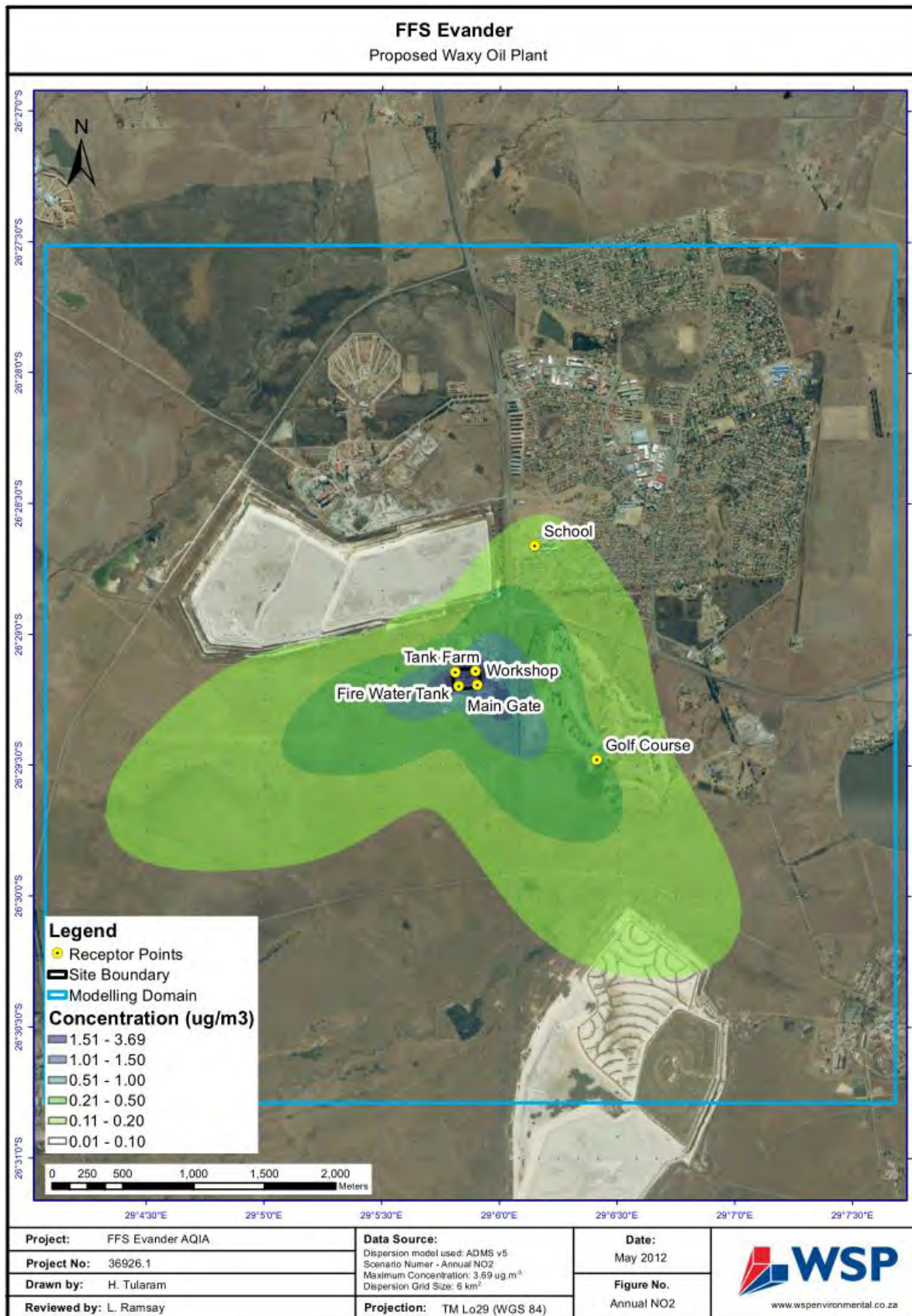




## 11.2 P100 24-hour PM<sub>10</sub>

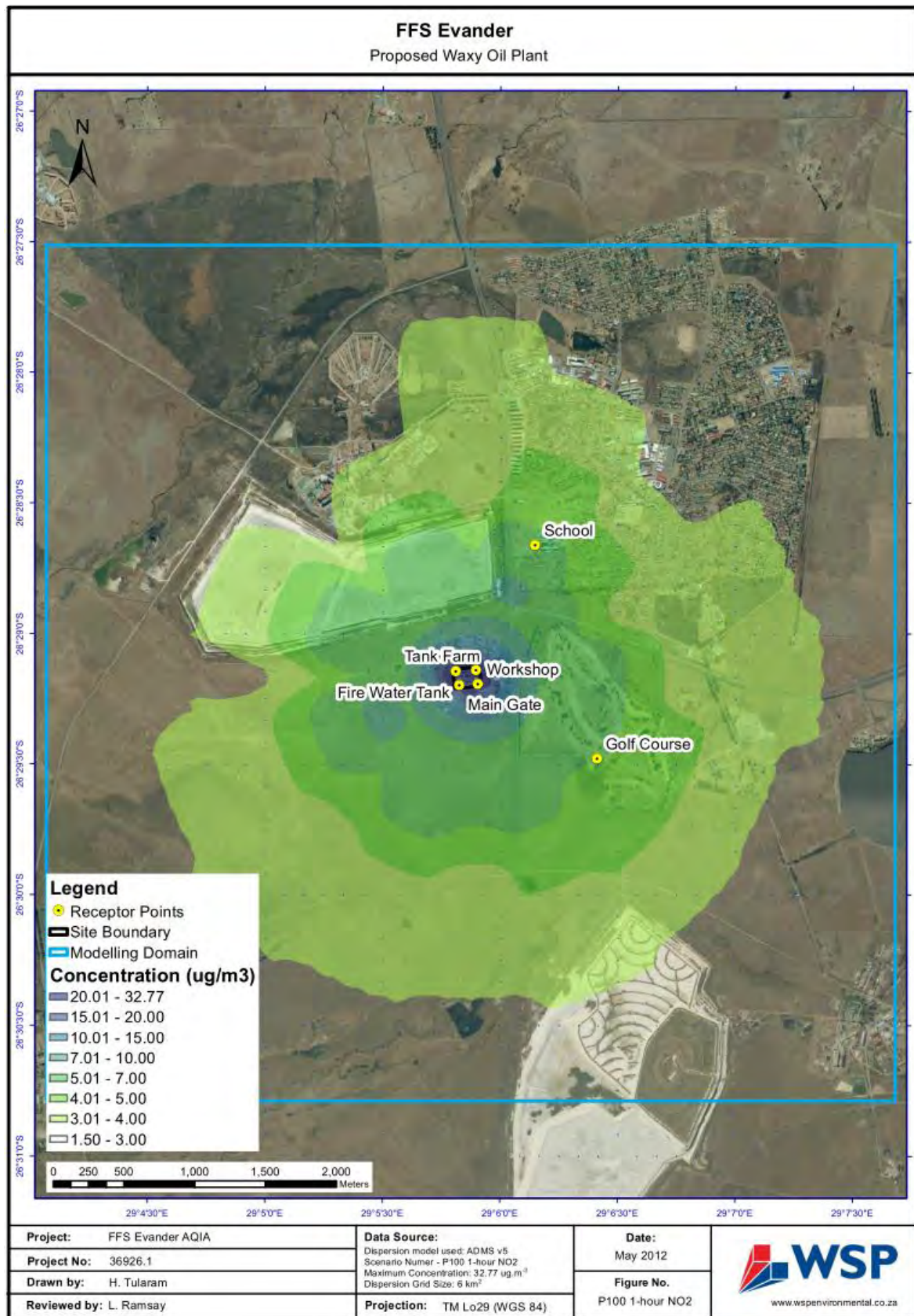


## 11.3 Annual NO<sub>2</sub>



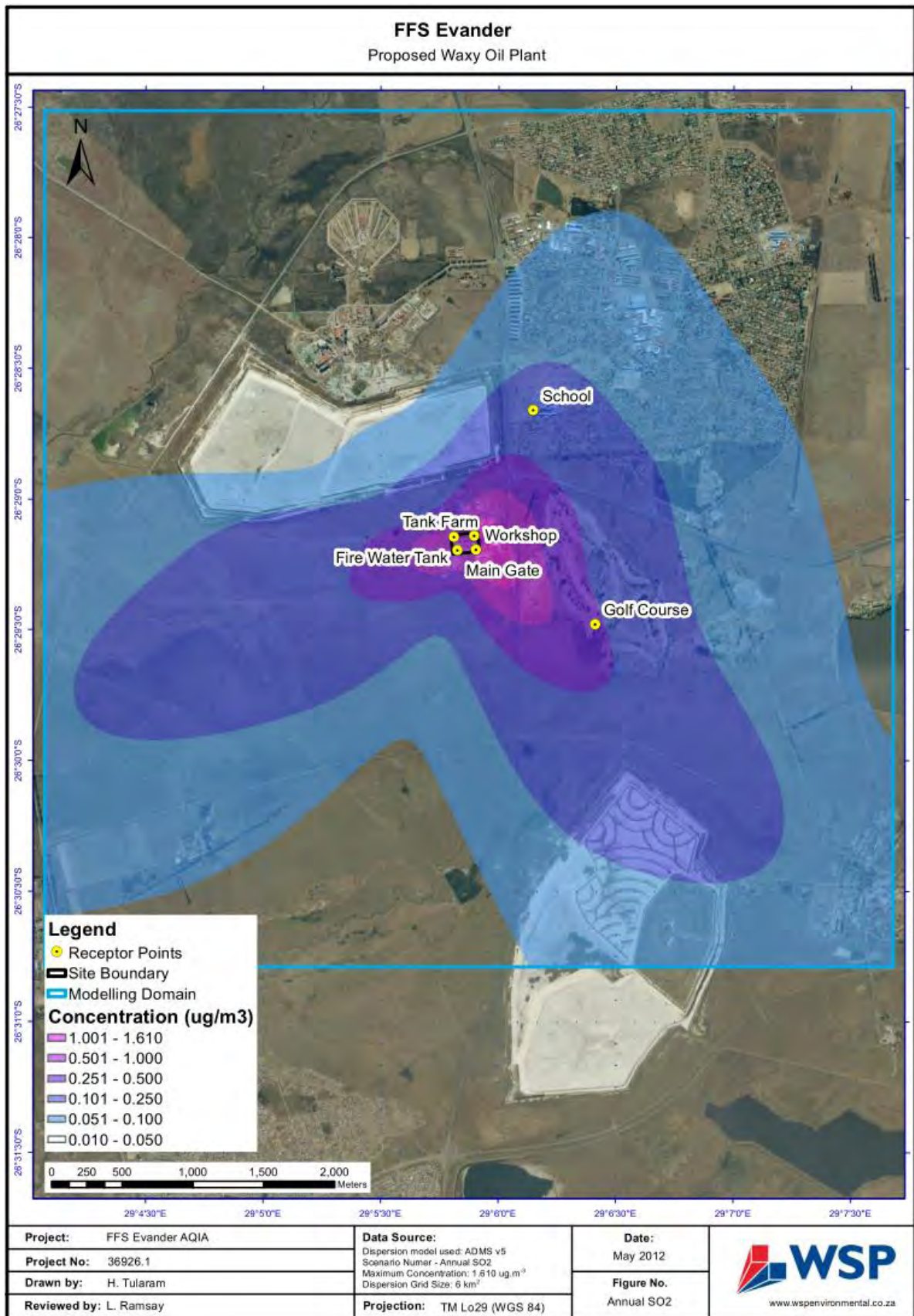


## 11.4 P100 1-Hour NO<sub>2</sub>

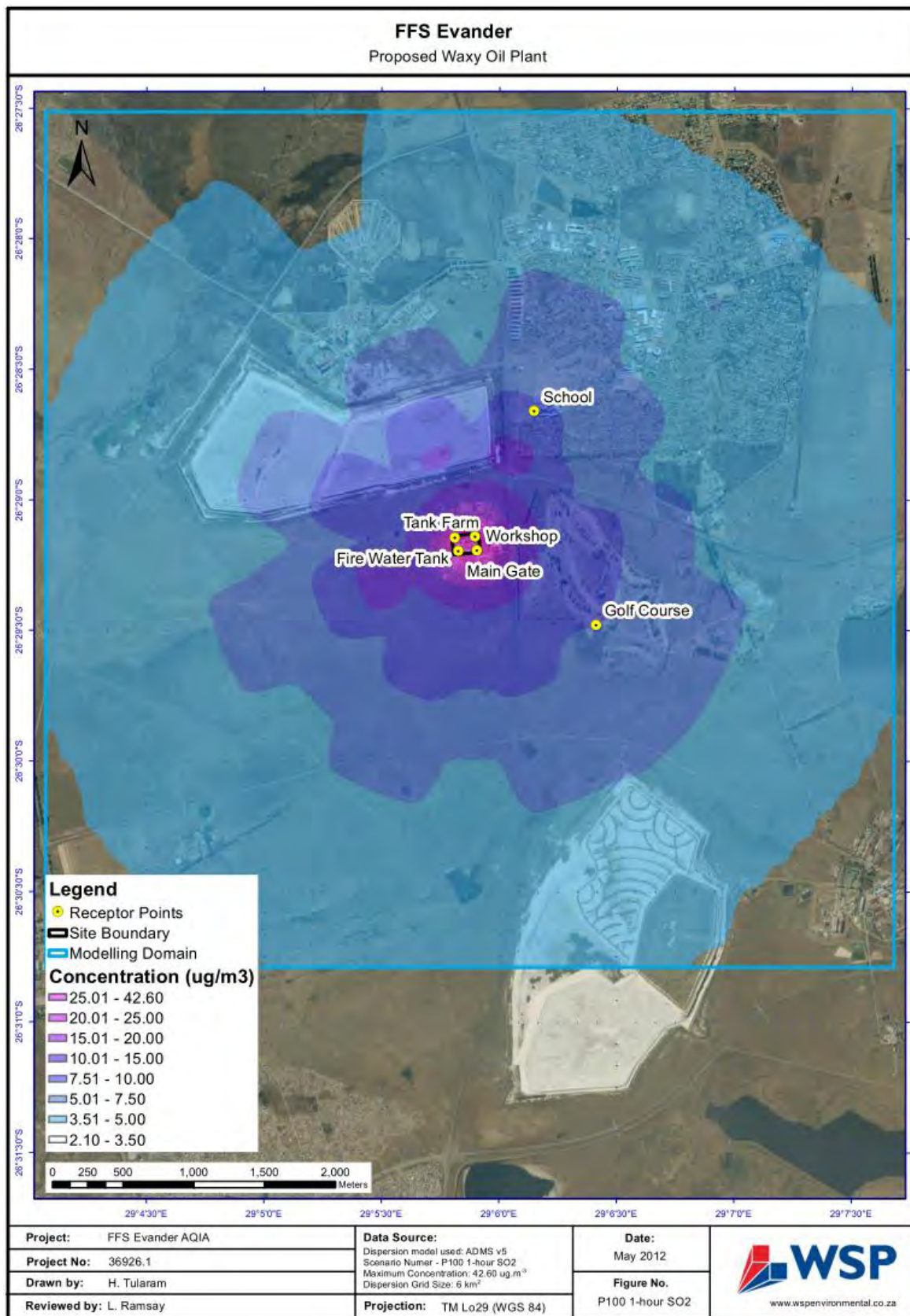




## 11.5 Annual SO<sub>2</sub>

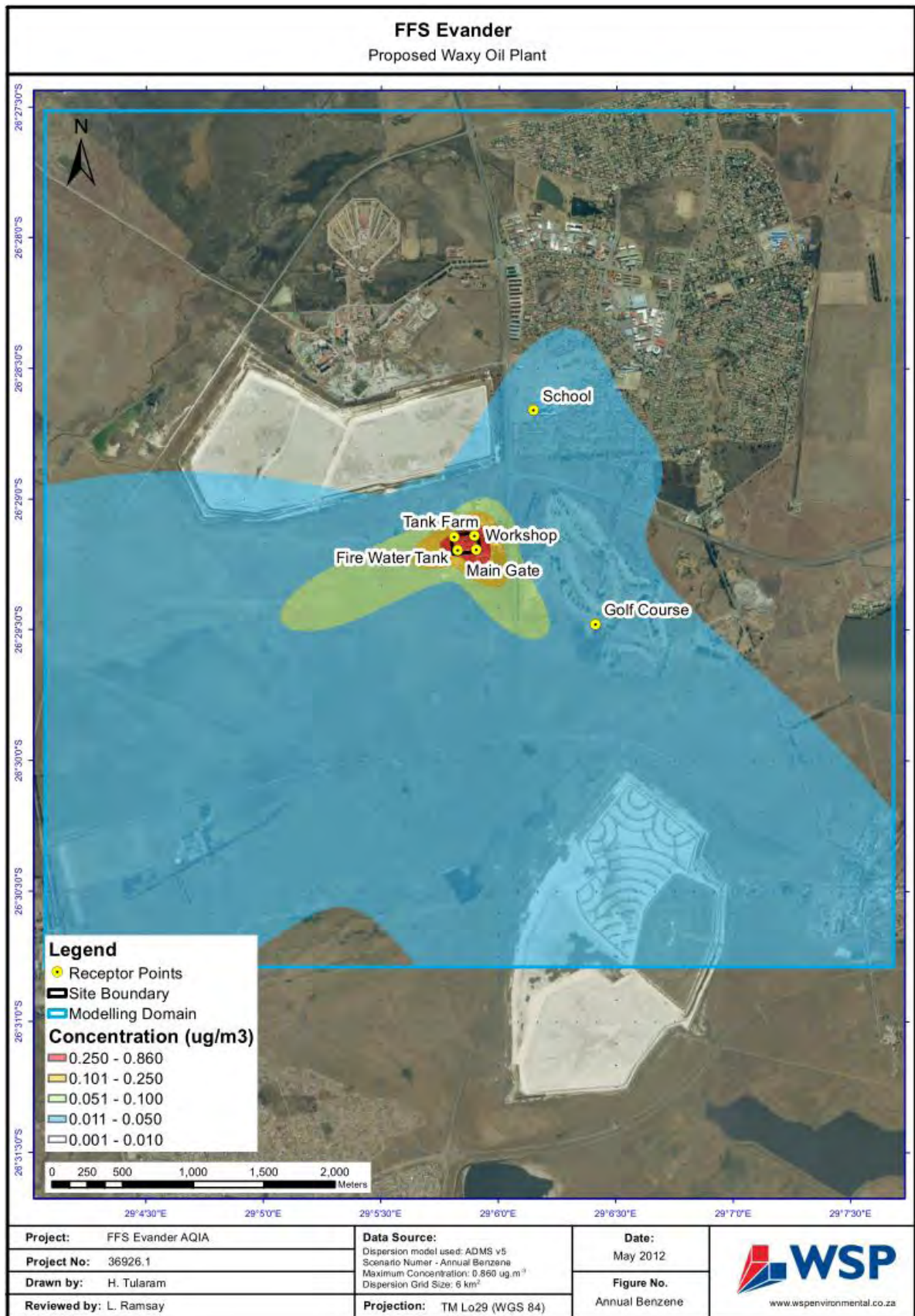


## 11.6 P100 1-hour SO<sub>2</sub>





## 11.7 Annual Benzene



**WSP Environmental (Pty) Ltd**

Block A, 1 on Langford  
Langford Road, Westville  
Durban  
3629

South Africa

Tel: +27 31 240 8860

Fax: +27 31 240 8861

[www.wspenvironmental.co.za](http://www.wspenvironmental.co.za)

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## **Appendix 9: Public Participation**

### **Appendix 9.1: Proof of Notification**

# NOTICE OF APPLICATION FOR ENVIRONMENTAL AUTHORIZATION

Notice is hereby given that an application for environmental authorization in terms of the EIA Regulations, 2006 (Regulations in terms of Chapter 5 of the National Environmental Management Act, 1998, as amended) has been lodged with the Mpumalanga Province Department of Agriculture and Land Administration

The proposed activity requires application subject to Scoping and EIA and all interested and affected parties are invited to register with the contact person below within 14 days of the issuing of this notice.

## Project details:

FFS Refiners Pty (Ltd) proposes to construct a 2500m<sup>2</sup> process facility at their existing plant located on 3 Brunel Road, Evander. The facility will be used to filter iron catalyst fines and carbon particulates from a product called Waxy Oil. The final processed product will be a low sulphur oil that can be used as a fuel source for the industrial heating market. An open day will be held on the 18<sup>th</sup> of March 2009. The time and venue will be confirmed with registered interested and affected parties. Representations with respect to this application may be made by phone, fax or e-mail to the contact person below.



## Further information regarding this project can be obtained from:



Kerry Seppings Environmental Management Specialists cc  
Contact: Leena Ackbar  
Phone: 031 765 6636  
Fax: 031 765 6632  
E-mail: [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

Date of this notice: 17<sup>th</sup> February 2009

# KENNISGEWING VAN AANSOEK VIR OMGEWINGSMAGTIGING

Hiermee word kennis gegee dat aansoek vir omgewingsmagtiging ingevolge Omgewingsimpakstudie regulasies, 2006 (Regulasies ingevolge hoofstuk 5 van die Wet op Nasionale Omgewingsbestuur, 1998, soos gewysig) ingedien is by die Mpumalanga Provinsie se Departement van Landbou en Grondadministrasie.

Die voorgestelde aktiwiteit vereis dat die aansoek onderhewig is aan 'n "Scoping" en Omgewingsimpakstudie. Alle geïnteresseerde en geïmpakteerde partye word genooi om, binne 14 dae vanaf die uitreiking van hierdie kennisgewing, by ondergenoemde kontak persoon te registreer.

## Projekinligting:

FFS Refiners (Edms) Bpk stel voor om 'n 2500m<sup>2</sup> behandelingsfasiliteit op hul perseel te bou, geleë te Brunelweg 3, Evander. Die fasiliteit sal gebruik word om fyn ysterkataliseermiddels en koolstofdeeltjies uit 'n produk genoem "Waxy Oil" te filter. Die finale produk wat vervaardig sal word is 'n olie met 'n lae swawelinhoud wat in die mark gebruik kan word as 'n



brandstofmiddel vir industriële verhitting. Op die 18<sup>de</sup> Maart 2009 sal 'n opedag gehou word. Die tyd en plek van vergadering sal bevestig word met alle geïnteresseerde en geïmpakteerde partye wat geregistreer het. Kommentaar met betrekking tot hierdie aansoek mag per telefoon, faks of e-pos by die kontak persoon ingedien word.

## Verdere inligting in verband met hierdie projek kan verkry word by:



Kerry Seppings Environmental Management Specialists BK  
Kontakpersoon: Leena Ackbar  
Tel: 031 765 6636  
Faks: 031 765 6632  
E-pos: [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)


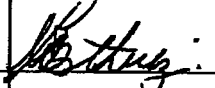




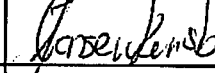

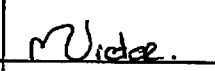


Datum van hierdie kennisgewing: 17<sup>de</sup> Februarie 2009

Att: Leena Hickbar.

Project Title FPS Waxy Process

Please include addresses for notification of neighbours. If someone is not at home, please place notice in gate and indicate that person was not available

Date of Distribution 18/2/09

| Company / Dept / Private | Contact name | Letter received - signed                                                             | Street Address  | Phone          | Fax            | e-mail                   |
|--------------------------|--------------|--------------------------------------------------------------------------------------|-----------------|----------------|----------------|--------------------------|
| Lynco                    | Lynco        |    | Brunell rd.     | (017) 132 4763 | (017) 132 4763 | Concrete @ lynco.co.za.  |
| IVS Scaffolding          | Wally        |    | Brundill) ESSEX | 017 632 4782   | 017 632 4784   | —                        |
| Cinforce                 | Beatrice     |    | Essex           | 017 632 4108   | 017 632 4016   | cinforce@telkomsa.net    |
| Onelex                   | Lydia        |    | ESSEX           | 017 632 4845   | 017 632 4713   | choled@telkomsa.net      |
| " Ahumini                | Terry        |    | —               | ✓              | —              | ✓                        |
| RTP                      | Barry        |    | york str        | 0825741481     | —              | —                        |
| Jorons                   | Charito      |   | york str        | 0176321695     | 0176321699     | —                        |
| Ricky B Toueking         | Tammy        |  | York Str.       | 017 632 1464   | 017 632 1433   | —                        |
| Energotec                | Melina       |  | York Str.       | 017-6323970    | 017-6323978    | energop@murib.co.za.     |
| WALKER PARK              | PAUL         |  | STD. ROAD.      | 0721528634     | 0866722167     | walkerparkgc@murib.co.za |
| Unique Welding           | Annemika     |  | York Road.      | 017 632 1123   | 017 632 2633   | monya@oribi.co.za        |



[illegible]

**Distribution of documents****Project Title****Notification of Application**

FFS Evander Waxy Oil

Orange - Must get copy

Pink - Must get copy of Report

Green - Get copy if registered

Blue - Newspapers, no copy

| Contact                                  | Name                       | Dept/ Business/ Private | Date sent  | Sent by fax, e-mail, hand delivered notice or post? |
|------------------------------------------|----------------------------|-------------------------|------------|-----------------------------------------------------|
| Client                                   |                            |                         |            |                                                     |
| Client                                   |                            |                         |            |                                                     |
| ARDLA                                    | Surgeon Marabane           |                         | 17/02/2009 | email                                               |
| Govan Mebki - Municipal Planning Contact | Mike Knowles               |                         | 17/02/2009 | email                                               |
| DWAF                                     | Marius Keet                |                         | 17/02/2009 | email                                               |
| KZN Wildlife                             |                            |                         |            |                                                     |
| AMAFA                                    |                            |                         |            |                                                     |
| WESSA                                    | Garth Barnes               |                         | 17/02/2009 | email                                               |
| Ward Councillor                          | James Harris               |                         | 17/02/2009 | email                                               |
| Rate Payers Assosiation                  | James Harris               |                         | 17/02/2009 | email                                               |
| SAHRA                                    | G. Tshivalavhala           |                         | 17/02/2009 | email                                               |
| NACA                                     | Bev Terry                  |                         | 17/02/2009 | email                                               |
|                                          | Albert Olivier             |                         | 17/02/2009 | email                                               |
| SASOL MINING                             | BLAAUW, EMILE (EVIRO DEPT) |                         | 17/02/2009 | email                                               |
| SASOL MINING                             | BOTHA,BERTIE (MANAGER)     |                         | 17/02/2009 | email                                               |
| SASOL SYNFUELS                           | CHRISTIE BRAND             |                         | 17/02/2009 | email                                               |
| RAND WATER                               | CHETTY,KAREN               |                         | 17/02/2009 | email                                               |

| Contact                         | Name                      | Dept/ Business/ Private | Date sent  | Sent by fax, e-mail, hand delivered notice or post? |
|---------------------------------|---------------------------|-------------------------|------------|-----------------------------------------------------|
| GOVAN MBEKI MUNICIPALITY TECHN  | DE WET, STEFAN            |                         | 17/02/2009 | email                                               |
| ROODEBANK FARMERS UNION         | JANKOWITZ, ATTIE          |                         | 17/02/2009 | email                                               |
| SASOL SYNFUELS (ENV DEPT)       | CHRISTI BRAND             |                         | 17/02/2009 | email                                               |
| DWAF                            | KEET, MARIUS KEET         |                         | 17/02/2009 | email                                               |
| KSE                             | MANNING, ANDREW           |                         | 17/02/2009 | email                                               |
| DWAF                            | MATSEBA, EPHRAIM          |                         | 17/02/2009 | email                                               |
| GOVAN MBEKI MUNICIPALITY        | MELATO, MICHELE           |                         | 17/02/2009 | email                                               |
| SASOL SYNFUELS (ENV DEPT)       | NEL, JOHAN                |                         | 17/02/2009 | email                                               |
| SASOL MINING (ENV DEPT)         | NUSSEL, GAIL              |                         | 17/02/2009 | email                                               |
| GOVAN MBEKI MUNICIPALITY(HEAD P | POLIVIER, ALBERT          |                         | 17/02/2009 | email                                               |
| GOVAN MBEKI FIRE STATION        | RHOBECK, FRANCOIS         |                         | 17/02/2009 | email                                               |
| MPUMALANGA DEPT OF AGRICULTUR   | SAMBO, ERIC               |                         | 17/02/2009 | email                                               |
| GOVAN MBEKI MUNICIPALITY        | VAN ECK, JOHAN (TECH ENG) |                         | 17/02/2009 | email                                               |
| AGRI ENVIRO LAB                 | VOSLOO, GIDEON            |                         | 17/02/2009 | email                                               |
| HARMONY                         | GIDEON MKHABELA           |                         | 17/02/2009 | email                                               |
| GOVAN MBEKI MUNICIPALITY        | ANNA                      |                         | 17/02/2009 | email                                               |
| DEPT AGRIC&LAND ADMIN           | ALLTUS LOTTER             |                         | 17/02/2009 | email                                               |
| WALKER PARK GOLF COURSE EVANG   | MARTHIE DAPIER            |                         | 17/02/2009 | email                                               |
| HIGHVELD EAST COMMUNITY         | ALEX PERSENT              |                         | 17/02/2009 | fax                                                 |
| HIGHVELD EAST COMMUNITY         | DANTYL FEESMAN            |                         | 17/02/2009 | fax                                                 |
| EMBALENHLE YOUTH ENVIRO CLUB    | SIBONGILE                 |                         | 17/02/2009 | fax                                                 |

## KSEMS

---

**From:** Brenda Erasmus [brenda.e@govanmbeki.gov.za]  
**Sent:** 27 February 2009 11:45 AM  
**To:** kerry.seppings@telkomsa.net  
**Cc:** Albert. O  
**Subject:** Notice of Application for Scoping and EIA

Evander Stand 2510

I hereby wish to register as an Interested and Affected party.

Albert Olivier  
Deputy Director  
Physical Development & Public Works

Govan Mbeki Municipality  
Private Bag X1017  
SECUNDA  
2302

E-Mail : [albert.o@govanmbeki.gov.za](mailto:albert.o@govanmbeki.gov.za)  
Tel Nr : 017 620 6007  
Cell Nr : 082 414 3771  
Fax Nr : 017 6313599



## KSEMS

---

**From:** KSEMS [kerry.seppings@telkomsa.net]  
**Sent:** 24 February 2009 11:57 AM  
**To:** 'gbarnes@wessanorth.co.za'  
**Subject:** FFS Waxy oil

Dear Garth,

The proposal is for a processing facility to remove contaminants from waxy oil via several filtration steps which includes centrifugation. Details will be provided in the BID.

Regards,

Leena

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; 1a Delamore Road; Hillcrest, 3610  
Phone 031 765 6636  
Fax 031 765 6632  
E-mail [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

---

**From:** Garth Barnes [mailto:gbarnes@wessanorth.co.za]  
**Sent:** 23 February 2009 05:22 PM  
**To:** 'KSEMS'  
**Cc:** 'Kim Webb'  
**Subject:** RE: FFS Waxy oil

Hi Leena,

Once again, i apologise for my tardiness. I look forward to the BID. Is this a chemical, water-related process or a chemical, air-related process?

Regards

**Garth Barnes**  
**Environmental Co-ordinator**  
**WESSA - Northern Region**



Tel: (011) 462 5663  
Fax: (011) 462 8364  
Cell: 082 296 1393  
Email: [gbarnes@wessanorth.co.za](mailto:gbarnes@wessanorth.co.za)

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2010/06/18

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---

**From:** KSEMS [mailto:kerry.seppings@telkomsa.net]  
**Sent:** Friday, February 20, 2009 2:20 PM  
**To:** gbarnes@wessanorth.co.za  
**Subject:** FFS Waxy oil

Hi Garth,

Sorry for the delay. I was out of the office yesterday. It is for the construction of a processing facility to remove contaminants from a product called waxy oil. A BID is being prepared, it will be sent to you shortly.

Regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; 1a Delamore Road; Hillcrest, 3610  
Phone 031 765 6636  
Fax 031 765 6632  
E-mail kerry.seppings@telkomsa.net

---

**From:** Garth Barnes [mailto:gbarnes@wessanorth.co.za]  
**Sent:** 19 February 2009 08:28 AM  
**To:** 'KSEMS'  
**Subject:** RE: ffs evander

Good morning Leena,

A quick question: what is this application for?

Regards

**Garth Barnes**  
**Environmental Co-ordinator**  
**WESSA - Northern Region**



Tel: (011) 462 5663  
Fax: (011) 462 8364  
Cell: 082 296 1393  
Email: gbarnes@wessanorth.co.za

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2010/06/18



## KSEMS

---

**From:** KSEMS [kerry.seppings@telkomsa.net]

**Sent:** 24 February 2009 11:57 AM

**To:** 'kwebb@wessanorth.co.za'

**Subject:** FFS Evander waxy oil - notice of EIA

**Tracking:** Recipient

Read

'kwebb@wessanorth.co.za' Read: 2009/02/24 01:36 PM

'Leena '

Dear Mam,

Kerry Seppings Environmental Management Specialists cc is conducting an environmental impact assessment for the proposed installation of a waxy oil processing facility at FFS Refiners (Pty) Ltd, Evander. Please see the attached notification.

Kind regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; 1a Delamore Road; Hillcrest, 3610  
Phone 031 765 6636  
Fax 031 765 6632  
E-mail [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)



## KSEMS

---

**From:** KSEMS [kerry.seppings@telkomsa.net]

**Sent:** 20 February 2009 02:20 PM

**To:** 'gbarnes@wessanorth.co.za'

**Subject:** FFS Waxy oil

**Tracking:** Recipient

**Read**

'gbarnes@wessanorth.co.za'

'Leena '

Read: 2009/02/20 02:24 PM

Hi Garth,

Sorry for the delay. I was out of the office yesterday. It is for the construction of a processing facility to remove contaminants from a product called waxy oil. A BID is being prepared, it will be sent to you shortly.

Regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc

Unit 9 Bristol House; 1a Delamore Road; Hillcrest, 3610

Phone 031 765 6636

Fax 031 765 6632

E-mail [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

---

**From:** Garth Barnes [mailto:gbarnes@wessanorth.co.za]

**Sent:** 19 February 2009 08:28 AM

**To:** 'KSEMS'

**Subject:** RE: ffs evander

Good morning Leena,

A quick question: what is this application for?

Regards

**Garth Barnes**  
**Environmental Co-ordinator**  
**WESSA - Northern Region**



Tel: (011) 462 5663

Fax: (011) 462 8364

Cell: 082 296 1393

Email: [gbarnes@wessanorth.co.za](mailto:gbarnes@wessanorth.co.za)

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2010/06/18

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---

**From:** KSEMS [mailto:kerry.seppings@telkomsa.net]  
**Sent:** Tuesday, February 17, 2009 4:37 PM  
**To:** gbarnes@wessanorth.co.za  
**Subject:** ffs evander

Dear Garth,

Our telephone conversation refers. I am trying to track down additional environmental/community groups that are predominant in Evander. Should you have knowledge of such groups, please forward me a list of contacts.

Kind regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; 1a Delamore Road; Hillcrest, 3610  
Phone 031 765 6636  
Fax 031 765 6632  
E-mail [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

\_\_\_\_\_ NOD32 3862 (20090217) Information \_\_\_\_\_

This message was checked by NOD32 antivirus system.  
<http://www.eset.com>

## KSEMS

---

**From:** KSEMS [kerry.seppings@telkomsa.net]  
**Sent:** 23 February 2009 03:40 PM  
**To:** 'tebogo@environ1.agric.za'  
**Subject:** FFS Evander waxy oil - notice of EIA

Dear Mam,

Kerry Seppings Environmental Management Specialists cc is conducting an environmental impact assessment for the proposed installation of a waxy oil processing facility at FFS Refiners (Pty) Ltd, Evander. Please see the attached notification.

Kind regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; 1a Delamore Road; Hillcrest, 3610  
Phone 031 765 6636  
Fax 031 765 6632  
E-mail [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)



## KSEMS

---

**From:** KSEMS [kerry.seppings@telkomsa.net]

**Sent:** 18 February 2009 12:51 PM

**To:** 'agmanning@lantic.net'

**Subject:** FFS Evander waxy oil - notice of EIA

**Tracking:** Recipient Read

'agmanning@lantic.net' Read: 2009/02/18 10:37 PM

'Leena '

Dear Sir,

Kerry Seppings Environmental Management Specialists cc is conducting an environmental impact assessment for the proposed installation of a waxy oil processing facility at FFS Refiners (Pty) Ltd, Evander. Please see the attached notification.

Kind regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; 1a Delamore Road; Hillcrest, 3610  
Phone 031 765 6636  
Fax 031 765 6632  
E-mail [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)



## KSEMS

---

**From:** KSEMS [kerry.seppings@telkomsa.net]  
**Sent:** 18 February 2009 12:51 PM  
**To:** 'agmanning@lantic.net'  
**Subject:** FFS Evander waxy oil - notice of EIA

Dear Sir,

Kerry Seppings Environmental Management Specialists cc is conducting an environmental impact assessment for the proposed installation of a waxy oil processing facility at FFS Refiners (Pty) Ltd, Evander. Please see the attached notification.

Kind regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; 1a Delamore Road; Hillcrest, 3610  
Phone 031 765 6636  
Fax 031 765 6632  
E-mail [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

## KSEMS

---

**From:** Karen Chetty [kchetty@randwater.co.za]  
**Sent:** 17 February 2009 03:42 PM  
**To:** KSEMS  
**Subject:** RE: FFS Evander waxy oil - notice of EIA

Good afternoon

Please can you add my details to the IAP's list?  
I'll be the responsible person from Rand Water.

Regards,

**Karen Chetty (Senior Water Quality Advisor - Vaal Dam)**

Snail Mail PO Box 1127 Johannesburg 2000 • By Road 522 Impala Road Glenvista 2058

Tel +27 (0)11 682-0735 • Fax +27 (0)86 693 2910 • Cell +27 (0)82 389-0374

Email kchetty@randwater.co.za • Web [www.reservoir.co.za](http://www.reservoir.co.za)

---

**From:** KSEMS [mailto:kerry.seppings@telkomsa.net]

**Sent:** 17 February 2009 12:06

**To:** SURGEON@environ1.agric.za; elzet.w@govanmbeki.gov.za; keetm@dwaf.gov.za;  
gbarnes@wessanorth.co.za; milnej@vodamail.co.za; gtshivhalavhala@mp.sahra.org.za;  
Emile.blauw@sasol.com; Bertie.botha@sasol.com; Christi.brand@sasol.com; Karen Chetty;  
jankowitz@secunda.co.za; matsebe@dwaf.gov.za; Melato.m@govanmbeki.gov.za; Johan.nel3@sasol.com;  
Gail.nussey@sasol.com; albert.o@govanmbeki.gov.za; lab@otk.co.za; gideon.makhabela@harmony.co.za;  
annah.m@govanmbeki.gov.za; mwbbmd@mweb.co.za

**Subject:** FFS Evander waxy oil - notice of EIA

Dear Sir/Madam,

Kerry Seppings Environmental Management Specialists cc is conducting an environmental impact assessment for the proposed installation of a waxy oil processing facility at FFS Refiners (Pty) Ltd, Evander. Please see the attached notification.

Kind regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc

Unit 9 Bristol House; 1a Delamore Road; Hillcrest, 3610

Phone 031 765 6636

Fax 031 765 6632

E-mail [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

---

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2010/06/18

Confirmation

17-FEB-2009 16:00 TUE

Fax Number : 031 7656632  
Name : KSEMS

Name/Number : 0176322394  
Page : 2  
Start Time : 17-FEB-2009 16:00 TUE  
Elapsed Time : 00' 32"  
Mode : STD ECM  
Status : [O.K]

Kerry Seppings  
**ENVIRONMENTAL**



**MANAGEMENT**  
SPECIALISTS

**FACSIMILE COVER PAGE**

|              |                                      |
|--------------|--------------------------------------|
| To:          | Alex Persent                         |
| Fax No.      | <del>017 632 3714</del> 017 632 2394 |
| Company:     | Highveld East Community              |
| Subject:     | FFS Waxy oil notice of EIA           |
| Sent:        | Tuesday, 17 February 2009            |
| No of Pages: | 2                                    |

Dear Sir,

Kerry Seppings Environmental Management Specialists cc is conducting an environmental impact assessment for the proposed installation of a waxy oil processing facility at FFS Refiners (Pty) Ltd, Evander. Please see the attached notification.

Kind regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc

Phone: 01 765 6636 Fax: 031 765 6632 Cell: 082 823 1844 E-Mail: [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

Unit 9 Bristol House, 1a Delamare Road, Hillcrest 3610

Company Registration no. 1999/049452/23

Members: K.A. Stanton (Director)

Confirmation

17-FEB-2009 15:50 TUE

Fax Number : 031 7656632  
Name : KSEMS

Name/Number : 0176322394  
Page : 2  
Start Time : 17-FEB-2009 15:49 TUE  
Elapsed Time : 00' 30"  
Mode : STD ECM  
Status : [ O.K ]

Kerry Seppings  
**ENVIRONMENTAL**



**MANAGEMENT**  
SPECIALISTS

**FACSIMILE COVER PAGE**

|              |                                      |
|--------------|--------------------------------------|
| To:          | Dyanty, Feesman                      |
| Fax No:      | <del>017 632 3714</del> 017 632 2394 |
| Company:     | Highveld East Community              |
| Subject:     | FFS Waxy oil notice of EIA           |
| Sent:        | Tuesday, 17 February 2009            |
| No of Pages: | 2                                    |

Dear Sir,

Kerry Seppings Environmental Management Specialists cc is conducting an environmental impact assessment for the proposed installation of a waxy oil processing facility at FFS Refiners (Pty) Ltd, Evander. Please see the attached notification.

Kind regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc

Phone 01 765 6636 Fax 031 765 6632 Cell 082 823 1844 E-Mail [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)  
Unit 9 Bristol House, 1a Delamare Road, Hillcrest 3610  
Company Registration no: 1999/049452/21  
Members: K.A. Stanton (Director)

Confirmation

17-FEB-2009 11:22 TUE

Fax Number : 031 7656632  
Name : KSEMS

Name/Number : 0176851388  
Page : 2  
Start Time : 17-FEB-2009 11:22 TUE  
Elapsed Time : 00' 30"  
Mode : STD ECM  
Status : [O.K]



| FACSIMILE COVER PAGE |                              |
|----------------------|------------------------------|
| To:                  | Sibongile                    |
| Fax No:              | 017 685 1388                 |
| Company:             | Embalenhle Youth Enviro Club |
| Subject:             | FFS Waxy oil notice of EIA   |
| Sent:                | Tuesday, 17 February 2009    |
| No of Pages:         | 2                            |

Dear Sir,

Kerry Seppings Environmental Management Specialists cc is conducting an environmental impact assessment for the proposed installation of a waxy oil processing facility at FFS Refiners (Pty) Ltd, Evander. Please see the attached notification.

Kind regards,

Leena Ackbar

## Stephanie

---

**From:** KSEMS <kerry.seppings@telkomsa.net>  
**Sent:** 20 August 2013 02:58 PM  
**To:** etsecunda@govanmbeki.gov.za; bev@naca.org.za; kchetty@randwater.co.za;  
albert.o@govanmbeki.gov.za; chelek@telkomsa.net; rosa@topfix.co.za;  
rhamid@energotech.co.za; stmarebane@mpg.gov.za; tmogakabe@mpg.gov.za  
**Subject:** FFS Waxy Oil (17/2/3/8 GS - 05)

Dear I&AP's

This email serves to confirm that you have been registered as an I&AP for the abovementioned project in Secunda. Kindly confirm your continued interest in the project by forwarding us your contact details.

Many Thanks  
Trisha Gounden  
Intern Consultant



Kerry Seppings Environmental Management Specialists cc  
4 Woodville Lane off Hawkstone Road, Summerveld, Assagay  
Postal P.O. Box 396; Gillitts; 3603  
Phone 031 7691578  
Fax 086 5355281  
Website [www.ksems.co.za](http://www.ksems.co.za)

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## Appendix 9.2: I & AP Register



| REGISTERED INTERESTED AND AFFECTED PARTIES - FFS WAXY OIL (EIA no. 17/2/3/8 GS - 05) |                    |                             |              |                                                                                                                                                      |                                                                                                                                       |
|--------------------------------------------------------------------------------------|--------------------|-----------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| CONTACT                                                                              | NAME               | PHONE                       | FAX          | E-MAIL                                                                                                                                               | ADDRESS                                                                                                                               |
| DEA Air Quality Dept                                                                 | Mr Vumile Senen    | 012 310 3567                |              | <a href="mailto:vsenene@environment.gov.za">vsenene@environment.gov.za</a>                                                                           | Private Bag X447, Pretoria, 0001                                                                                                      |
| DEDET Air Quality Official                                                           | Fikile Theledi     | 013 759 4000                | 0791895599   | <a href="mailto:mtheledi@mpg.gov.za">mtheledi@mpg.gov.za</a>                                                                                         | 44 Maris Street, Nelspruit                                                                                                            |
| Gert Sibande district Municipality (Air Quality Official)                            | Dan Hlanyane       | 017 801 7000                |              | <a href="mailto:dan.hlanyane@gsibande.gov.za">dan.hlanyane@gsibande.gov.za</a>                                                                       | c/o Joubert and Oosthuise Streets, Ermelo, 2350                                                                                       |
| DEDET                                                                                | Surgeon Marabane   | 017 819 1155                | 017 819 2828 | <a href="mailto:stmarebane@mpg.gov.za">stmarebane@mpg.gov.za</a>                                                                                     | 13 de Jager Street, Ermelo, 2351                                                                                                      |
| DEDET                                                                                | Tebogo Mogakabe    | 017 819 2828 /9             | 086 514 2007 | <a href="mailto:tmogakabe@mpg.gov.za">tmogakabe@mpg.gov.za</a>                                                                                       | 13 de Jager Street, Ermelo, 2351                                                                                                      |
| DEDET (Pollution & Waste Management, Gert Sibande District Services)                 | Mashudu Mposi      | 017 811 4830/082 590 7759   |              | <a href="mailto:MMposi@mpg.gov.za">MMposi@mpg.gov.za</a>                                                                                             |                                                                                                                                       |
| DEDET (air quality management, MP)                                                   | Mandla Mhlalela    |                             |              | <a href="mailto:MahlalelaMM@mpg.gov.za">MahlalelaMM@mpg.gov.za</a>                                                                                   |                                                                                                                                       |
| DEDET (Integrated waste management, MP)                                              | Gezephi Nyalunga   |                             |              | <a href="mailto:GHNyalunga@mpg.gov.za">GHNyalunga@mpg.gov.za</a>                                                                                     |                                                                                                                                       |
| Govan Mbeki Municipality (Dept Director Planning & Development)                      | Albert Olivier     | 017 620 6008 / 082 414 3771 |              | <a href="mailto:albert.o@govanmbeki.gov.za">albert.o@govanmbeki.gov.za</a>                                                                           |                                                                                                                                       |
| Govan Mbeki Municipality (Manager: Planning & Development)                           | Kamesh Rohan       | 017 620 6075 / 084 401 2137 |              | <a href="mailto:kamesh.r@govanmbeki.gov.za">kamesh.r@govanmbeki.gov.za</a>                                                                           |                                                                                                                                       |
| Govan Mbeki Municipality (Town Planning & Development)                               | Ignatius Mathebula | 017 620 6200                | 017 634 5373 | <a href="mailto:ignatius.m@govanmbeki.gov.za">ignatius.m@govanmbeki.gov.za</a>                                                                       |                                                                                                                                       |
| Govan Mbeki Municipality (Environmental Management)                                  | Nomsa Thabethe     | 017 620 6702                | 076 6412834  | <a href="mailto:nomsa.t@govanmbeki.gov.za">nomsa.t@govanmbeki.gov.za</a> ,<br><a href="mailto:nomsa.thabethe@gmail.com">nomsa.thabethe@gmail.com</a> | 101 Francis Baard Street, Waterbron Building, Pretoria Central, Pretori, 0001 (Private Bag X995, 18 Blackwood Street, Bryanston Ext 3 |
| DWA                                                                                  | Joyce Lekoane      | 012 392 1381                |              | <a href="mailto:lekoanej@dwa.gov.za">lekoanej@dwa.gov.za</a>                                                                                         |                                                                                                                                       |
| WESSA                                                                                | John Wetton        | 083 444 7649                | 086 603 7128 | <a href="mailto:jwetton@wessanorth.co.za">jwetton@wessanorth.co.za</a>                                                                               |                                                                                                                                       |
| Ward Councillor                                                                      | Mr Makola          | 082 957 3805                |              | <a href="mailto:makola1mt@vodamail.co.za">makola1mt@vodamail.co.za</a>                                                                               |                                                                                                                                       |
| Rate Payers Assosiation                                                              | Hein Badmos        | 082 554 6936                |              | <a href="mailto:hein@binvanetraining.co.za">hein@binvanetraining.co.za</a>                                                                           | PO Box 293, Evander, 2280                                                                                                             |
| SAHRA                                                                                | Jenna Lavin        | 012 462 4502                |              | <a href="mailto:ilavin@sahra.org.za">ilavin@sahra.org.za</a>                                                                                         | 111 Harrington Street, P.O.Box 4637, Cape Town, 8000                                                                                  |
| NACA                                                                                 | Bev Terry          | 071 683 9770                |              | <a href="mailto:bev@naca.org.za">bev@naca.org.za</a>                                                                                                 | 17 Riverview, Brackfontein Road, The Reeds, Centurion                                                                                 |
| Rand Water                                                                           | Victor Nkosi       | 011 682 0351                |              | <a href="mailto:vnkosi@randwater.co.za">vnkosi@randwater.co.za</a>                                                                                   |                                                                                                                                       |
| Rand Water                                                                           | Karen Chetty       | 011 682 0735 /              | 086 693 2910 | <a href="mailto:kchetty@randwater.co.za">kchetty@randwater.co.za</a>                                                                                 | 522 Mpala Road, Glenvista, 2058                                                                                                       |

|                              |                  |                                |              |                                                                      |                                                |
|------------------------------|------------------|--------------------------------|--------------|----------------------------------------------------------------------|------------------------------------------------|
| <b>Private</b>               | Lydia Oosthuizen | 017 632 4845                   | 017 632 4743 | <a href="mailto:chelek@telkomsa.net">chelek@telkomsa.net</a>         |                                                |
| <b>Topfix Scaffolding</b>    | Rosa Muller      | 086 523 7342                   |              | <a href="mailto:rosa@topfix.co.za">rosa@topfix.co.za</a>             |                                                |
| <b>Private</b>               | Rishad Hamid     | 017 632 3970 /<br>082 498 8833 | 017 632 3978 | <a href="mailto:rhamid@energotech.co.za">rhamid@energotech.co.za</a> | 3 Yorker Road, Industrial Park<br>Evander      |
| <b>Walker Park Golf Club</b> | Paul Van Heerden | 074 2591 788                   |              | <a href="mailto:walkerparkgc@mweb.co.za">walkerparkgc@mweb.co.za</a> | Standerton Road (PO Box 250,<br>Evander, 2280) |

### **Appendix 9.3: BID and Proof of Distribution**



## Background Information Document

The purpose of this document is to serve as a background information document intended to inform I & APs of the project as well as to provide information on the roles and responsibilities of registered I & APs. This document does not serve to provide detailed information on the potential impacts of the proposal which will be described in the basic assessment report.

|                                                       |                                                                                                                              |
|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <b>Project Title:</b>                                 | Construction of 2500m <sup>2</sup> process facility to remove contaminants from waxy oil at FFS Refiners (Pty) Ltd, Evander. |
| <b>Application Type:</b>                              | Basic Assessment                                                                                                             |
| <b>Competent Authority:</b>                           | Mpumalanga Department of Agriculture and Land Administration                                                                 |
| <b>Location of Activity:</b>                          | FFS Refiners (Pty) Ltd, 3 Brunel Road, Evander                                                                               |
| <b>Public Participation Commencement date:</b>        | 17 <sup>th</sup> February 2009                                                                                               |
| <b>Contact in Order to Register as an I &amp; AP:</b> | Leena Ackbar<br>Fax: 031 765 6632<br>Tel: 031 765 6636<br>kerry.seppings@telkomsa.net                                        |
| <b>Environmental Consultants for Project:</b>         | Leena Ackbar, Josette Oberholzer and Kerry Seppings                                                                          |
| <b>Applicant:</b>                                     | FFS Refiners (Pty) Ltd                                                                                                       |
| <b>Release Date:</b>                                  | First revision -2 <sup>nd</sup> March 2009<br>Second revision – To be announced                                              |

Figure 1. Aerial photo showing location of FFS Refiners (Pty) Ltd.

### The Proposal

FFS Refiners (Pty) Ltd are in the business of refining hydrocarbon liquids for use in the industrial heating fuel market. Sasol Synfuels of Secunda, Mpumalanga, generate a process residue called Waxy Oil. This heavy distillate product is suitable for re-refining into an industrial heating fuel.

FFS Refiners Pty (Ltd) proposes to process waxy oil at their existing tar processing facility in Evander. The process will involve filtering iron catalyst fines and carbon particulates from the waxy oil to produce a low sulphur oil that will be used as an industrial heating fuel source.



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Kerry Seppings Environmental Management Specialists cc

Phone: 031 765 6636 Fax: 031 765 6632 Cell: 082 823 1844 E- Mail: [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

Unit 9 Bristol House, 1a Delamore Road, Hillcrest 3610

Company Registration no: 1999/0494452/23

Members: K.A. Stanton (Director)

## Who are FFS Refiners (Pty) Ltd?

FFS is a processor and marketer of industrial liquid heating fuels and wood p reservatives. The c ompany was esta blished in the 1 970's with the key obj ectives of d eveloping firing system s cap able of handling unconventional fuels, p rocessing waste and other material s into marketable fuels, a nd en ergy systems. The comp any markets liquid heating fuels for a wide variety of use s in cluding, gla ssmaking, brick making, steam raising in boil ers, billet re -heating, ba king, i ncineration, laund ry, roa d-mix heating, lime kiln s, sand and stone drying. There are five p rocess plants situated th roughout South Africa, of which the Evander facility is one.



The Evander plant cu rrently p rocesses coal tar d erived fuels int o industrial heating fuels for a wide variety of application s. The site also produces creosote for wooden pole treatment. The existing Evander site is currently a major hazardous installation (MHI) which was designed to take account of p otential hazards identified. The site was also built i n accordance with SANS 10089 for bulk flammable storage.

All FFS branches operate under stringent environmental management systems and four of the m are ISO 14001 accredited; the Evander plant is going for certification in 2009.

## Background to the application

In January 2009 an application to conduct a scoping and EIA for the p roposed p rocessing of waxy oil was lodged with MDALA. Upon further review of the propo sed project in terms of the allowable activities at the existing FFS Evander plant, the environmental assessment practitioner is of the opinion that the proposal will only trigger a Basic Assessment and not a Scoping/EIA.

The existi ng FFS Evander tar p rocessing facilit y received enviro nmental auth orisation on 15<sup>th</sup> August 2008 (Reference: 17.2.25 16 H 45 ) for 15 000m<sup>3</sup> above-ground sto rage of da ngerous goods. The FFS Evander plant cu rrently stores only 9298m<sup>3</sup>; the waxy oil p roce ssing proposal will requi re an a dditional 346 0m<sup>3</sup> sto rage tan k capacity. Thi s means that 12 7 58m<sup>3</sup> of th e approved 15 000m<sup>3</sup> will be in use which is below the volume already authorised for the site.

As such, the activity *Government Notice R387 [1(c)] The construction of facilities or infrastructure, including associated structures or infrastructure, for c. the above ground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of 1000 cubic metres or more at any one location or site including the storage of one or more dangerous goods, in a tank farm; is not applicable and is hereby withdrawn.*

FFS Refiners have indi cated that existing equipment will be used for the processing of the waxy oil, and seven (7) new storage tanks will be erected.

With the promulgation of the Nation al Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), sludge generated from processing will be governed by the following activity:

### **CATEGORY A (Basic Assessment)**

#### **Storage of waste**

(2) *The storage including the temporary storage of hazardous waste at a facility that has the*

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Kerry Seppings Environmental Management Specialists cc

Phone: 031 765 6636 Fax: 031 765 6632 Cell: 082 823 1844 E- Mail: [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

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*capacity to store in excess of 35m<sup>3</sup> of hazardous waste at anyone time, excluding the storage of hazardous waste in lagoon.*

Thus, a basic assessment with a waste license is required for the proposal as use would be made of existing facilities and new tanks to be erected are already covered by the original ROD.

## **What is waxy oil?**

Waxy oil is a residue remaining after the valuable petroleum distillate fractions are removed for further processing into petrol, diesel and other petroleum chemicals. The reason for the waxy oil's removal is due to its high wax content and the small quantity of fine iron catalyst that is entrained after the Synthol Reactor process.

It is characterised as a long chain paraffinic hydrocarbon that can be further processed to produce a heavy fuel oil suitable for use as an industrial heating fuel. Waxy oil is a desirable fuel oil component due to its low sulphur content.

Under ambient conditions, waxy oil has a similar consistency to that of shoe polish. The oily component of the product is a paraffinic oil and the wax component constitutes around 30 – 40%.

The waxy oil to be processed by FFS is a by-product of the synthetic fuel processing at Sasol Synfuels in Secunda. It is a paraffinic oil with a wax content of 30-40% and is a low hazard combustible hydrocarbon with an iron catalyst and carbon particulate contamination.

The waxy oil product to be processed by FFS has the following characteristics:

|                         |                    |
|-------------------------|--------------------|
| Solids content          | 1 – 3% v/v         |
| Ash content             | 0,5 – 1,0% w/w     |
| Wax content             | 30 -40% w/w        |
| Carbon content          | >80% w/w           |
| Gross Energy Value      | 43 – 44 MJ/kg      |
| Viscosity @ 100°C       | <30 cSt            |
| Flash Point (close cup) | >100°C (Class III) |
| Pour Point              | 35 – 45°C          |
| Initial Boiling Point   | >240°C             |
| Sulphur content         | <0,2% w/w          |

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Phone: 031 765 6636 Fax: 031 765 6632 Cell: 082 823 1844 E- Mail: [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

Unit 9 Bristol House, 1a Delamore Road, Hillcrest 3610

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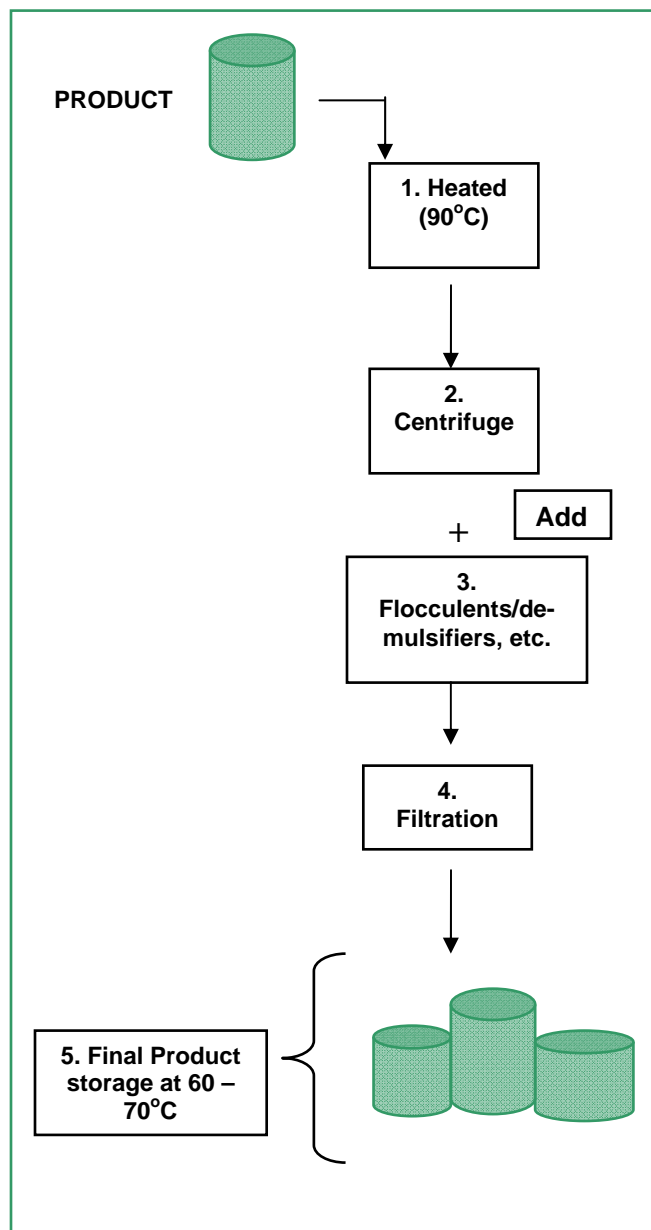
Members: K.A. Stanton (Director)

## Process Description

The aim of the proposed process is to remove particulates and contaminants of varying sizes from the waxy oil at each step.

The product will be received in 26 – 34 ton road tanker loads. These will be received on site via a weighbridge to determine the mass of product received and then pumped into raw product tanks. Thereafter the following processing steps will be followed:

1. The product will be heated to around 90°C by means of a steam heat exchanger to reduce its viscosity and make it pumpable.
2. The heated product is then centrifuged. The principle of a centrifuge is to separate substances by virtue of its density difference whereby heavier products will be spun to the outside. A small amount of water may be introduced to allow for a non-oil discharge containing the solids. For the proposal, this step serves to remove particulates of greater than 10µm. Sludge removed from this step, consisting of greater than 50% w/w in organics will be discharged into road skips for disposal at Holfontein H:H landfill site (safe disposal certificates will be obtained and kept on site). *[N.B. This step may or may not be required going forward depending on the particle loading and size distribution of the product when received.]*
3. Following centrifuging, the addition of flocculants/de-mulsifiers and/or precipitates may be used to improve separation e.g. MEA, sulphonic acid, nitric acid and other proprietary chemicals. The settled sludge will be drained to skip, stabilised with lime and disposed of to the appropriate landfill under certification.
4. The final processing step will be filtration wherein any remaining particulate down to 2µm size will be removed. The filter cake discharged with approximately 0,1% w/w, consisting of greater than 60% w/w inorganics, will be placed into road skips for disposal at Holfontein with the other sludges.
5. The end product will be pumped to a final product storage tank where it will be kept at a temperature of 60 – 70°C ready for load-out to road tanker for use as a blend stock or delivery to customers.



**Figure 2. Schematic of proposed filtration process**

## Equipment

FS have indicated that existing equipment will be used for the processing of the waxy oil, and seven (7) new storage tanks of the following capacities will be erected (compliant to the SANS code 10089):

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Phone: 031 765 6636 Fax: 031 765 6632 Cell: 082 823 1844 E- Mail: [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

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|                     |                                                    |
|---------------------|----------------------------------------------------|
| Raw material tank:  | 1 x 1200 m <sup>3</sup> and 1 x 250 m <sup>3</sup> |
| Process tanks: 60   | m <sup>3</sup> and 2 x 250 m <sup>3</sup>          |
| Final product tank: | 1 x 250 m <sup>3</sup> and 1 x 1200 m <sup>3</sup> |

*Giving a total capacity of 3460m<sup>3</sup>*

Other equipment includes: offloading pumps, heat exchangers (steam) and centrifuges (2-4), occupying a total of 2500m<sup>2</sup> (including tanks).

## Utilities

The existing FFS site in Evander was designed and built with an expansion of this nature in mind and thus allowance has already been made for all utility requirements. The following utilities will be required for the processing facility and are available on site:

- Steam (10 Barg [Bar gauge]): 300 – 900 kg/hr 135 – 400 tons/month
- Electricity: 50 – 75 kW
- Potable water: 80 – 120 kl/month

## Quantities

The following is the expected quantity of waxy oil to be received on site:

- |                          |                 |                  |
|--------------------------|-----------------|------------------|
| • Initially:             | 1000 tons/month | 12 000 tons/year |
| • Within 12 – 24 months: | 2500 tons/month | 30 000 tons/year |
| • Finally:               | 5000 tons/month | 60 000 tons/year |

## FFS Evander – Site Description



**Figure 3. Aerial view of the FFS Evander branch.**

The Evander branch is located in an area zoned as heavy industry. It is also situated close ( $\pm 1.8$  km) to Secunda which is home to SASOL, one of South Africa's biggest chemical and fuel production companies. North of the site is the Kinross Gold slime dam and the town of Evander (1000m).

The GPS coordinates of the site are: 26°29'12" South; 29°06'02" East. The proposed processing plant is located at their existing plant which processes coal-tar derived fuels.

The topography around the site is relatively level with a slight slope towards the south west. There are small non-perennial drainage courses located approximately 500m to the west and 700m south of the site.

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Kerry Seppings Environmental Management Specialists cc

Phone: 031 765 6636 Fax: 031 765 6632 Cell: 082 823 1844 E- Mail: [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

Unit 9 Bristol House, 1a Delamore Road, Hillcrest 3610

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Members: K.A. Stanton (Director)



## Potential Environmental Impacts

Some of the potential environmental impacts identified for further investigation are as follows:

1. Air Quality Impact - VOC emissions from tanks; fugitive emissions from accessory equipment.
2. Improper disposal of (oily) sludges generated during operation.
3. Contamination of storm- and groundwater as a result of spillage.
4. Risk posed to surrounding industries.
5. Risk of fire and/or explosion
6. Effluent not meeting municipal standards.
7. Spills during loading and offloading procedures and transport of the final product to customers.
8. Occupational health impact associated with the handling of waxy oil.



**Figure 4. Proposed location of the waxy oil processing facility outlined in yellow. The existing Evander process plant is outlined in red.**

## Mitigation measures

Some of the impacts identified above are already mitigated for and these measures are indicated in Table 1.

**Table 1: Mitigation Measures**

| Potential Impact                                                    | Mitigation measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Air quality impacts                                              | Whilst the product has a high flash point and no low boiling point components it will be processed at temperatures of up to 95 °C. This may result in some VOC's being present. Mitigation measures will include storage tank vapour space balancing, pressurisation of tanks and vapour vent condensers. There will be a small fugitive emission potential from the centrifuges and filters on discharge.                                                                                                                                                                                                      |
| 2. Improper disposal of (oily) sludges generated during operation.  | Oily sludges produced by the centrifuge discharge, static settling and filter discharge will be collected in road skips for transportation to an appropriately permitted landfill site. It is expected that this will amount to approximately 30 tons per month initially, increased to 75 tons per month and finally to 150 tons per month. This will equate to 5, 12 and 21 skips per month respectively.<br>In the long term it is anticipated that this material will be disposed of in a cement kiln (PPC) as there is sufficient residual energy value in the material to make this a viable proposition. |
| 3. Contamination of storm- and groundwater as a result of spillage. | The process which will be located within a bunded and hard-surfaced area will also be roofed to prevent the rainwater becoming contaminated with oil. Any                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

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Kerry Seppings Environmental Management Specialists cc

Phone: 031 765 6636 Fax: 031 765 6632 Cell: 082 823 1844 E- Mail: [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

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|                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                     | <p>oily water effluent that may inadvertently occur will be treated in the existing effluent water system. Sumps will recover any spilt product which will be pumped back to the raw material tank.</p> <p>Groundwater monitoring is conducted biannually and will serve to identify problem areas. However, there is a low potential for groundwater pollution from waxy oil processing as the mobility is non-existent and the leaching is insignificant. Existing boreholes should suffice for groundwater monitoring for the new processing facility.</p> |
| 4. Risks posed to surrounding industries (i.e. fire, explosion, etc.)                               | <p>A risk assessment will be conducted to determine the risks associated with the proposal. Potential impacts to the environment and surrounding industries will be assessed and mitigation measures will be investigated. As the existing site is already a Major Hazardous Installation (MHI), the risk assessment will determine how the new proposal will contribute to the current MHI status.</p> <p>There is an existing fire protection system in place that may need to be extended to cover this new plant.</p>                                     |
| 5. Spills during loading and offloading procedures and transport of the final product to customers. | <p>Loading and offloading procedures are already in the FFS EMS (environmental management system based on ISO 14001). Employees are also provided with annual training regarding these procedures as well as the safe handling of hazardous chemical substances, spill clean-up and emergencies. All FFS tankers are equipped with spill kits, and drivers undergo the necessary driver training and HCS (hazardous chemical substances) training.</p>                                                                                                        |
| 6. Risk of fire and/or explosion.                                                                   | <p>There is an existing fire protection system in place at the existing Evander plant, however this will be extended to cover the new waxy oil processing facility. A risk assessment will be conducted to further investigate this risk.</p>                                                                                                                                                                                                                                                                                                                 |
| 7. Effluent not meeting municipal standards.                                                        | <p>Effluent generated during processing will be treated through the existing effluent treatment system. Samples will be taken and municipal approval obtained before discharge under permit. Sumps will recover any spilt product which will be pumped back to the raw material tank.</p>                                                                                                                                                                                                                                                                     |
| 8. Increase in noise generation on site.                                                            | <p>It is not expected that noise levels during operation will exceed 85dbA, however this will be further investigated in the basic assessment report.</p>                                                                                                                                                                                                                                                                                                                                                                                                     |

|                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>9. Occupational health impact associated with the handling of waxy oil.</p> | <p>All employees who handle tar, creosote or the proposed waxy oil and process chemicals on site are required to wear the appropriate Personal Protective Equipment (PPE). This includes full overalls, gloves, safety boots and, where required, appropriate masks and goggles. There will thus be no change to PPE requirements with the new plant. Training on the use and storage of hazardous substances and PPE is undertaken on an annual basis and forms part of the environmental management system requirements.</p> <p>The handling of the oil may cause occupational diseases through inhalation of vapours, skin contact or ingestion. This may occur during handling and maintenance of equipment and all employees are given annual health &amp; safety training. They are also required to have annual medicals for early detection of occupational diseases.</p> |
|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Further impacts will be investigated in the basic assessment report.

## Environmental Impact Assessment

In order to determine the overall environmental feasibility of the proposal, an Environmental Impact Assessment is required (EIA) as per the National Environmental Management Act EIA regulations (Government Notice No. R 385 of 21st April 2006), promulgated as of the 3<sup>rd</sup> July 2006. An Environmental Impact Assessment (EIA) is an assessment carried out to determine the environmental impacts of a development project. It is a planning and management tool for sustainable development and aims to inform decision-makers about the potential environmental, physical, biological and socio-economic effects of the proposed project. This allows relevant authorities and decision-makers to provide a Record of Decision (ROD) either authorising or rejecting the proposal.

The relevant sections from the regulations under listing notice 386 (GNR 386, NEMA Waste Act) for the proposed waxy oil processing facility are:

### **CATEGORY A (Basic Assessment)**

#### **Storage of waste**

*(2) The storage including the temporary storage of hazardous waste at a facility that has the capacity to store in excess of 35m<sup>3</sup> of hazardous waste at any one time, excluding the storage of hazardous waste in laagoon.*

As per the listing activities, the proposal requires a Basic Assessment.

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Kerry Seppings Environmental Management Specialists cc

Phone: 031 765 6636 Fax: 031 765 6632 Cell: 082 823 1844 E- Mail: [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

Unit 9 Bristol House, 1a Delamore Road, Hillcrest 3610

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Members: K.A. Stanton (Director)

The figure below provides a summary of the EIA process, with steps that have been followed as well as those that are still to be carried out.

### **EIA PROCESS**

**The current application is undergoing a Basic Assessment and as such the following steps have or will be followed:**

An application form has been submitted to the Mpumalanga provincial authority, Department of Agriculture and Land Administration (MDALA) on the 21st of January 2009.

The application has been advertised in the Ridge Times (25/02/09) and the Beeld (27/02/09) in the classified section as a public notice. Four signboards (English and Afrikaans two each) were placed around the site. Written notification was given to all neighbours within 100m of the project on 18/02/09.

The following authorities and interest groups were notified on the 17/02/09: Mpumalanga Department of Agriculture and Land Administration, Govan Mbeki Municipality (Environmental Dept, Technical & Engineering Services), DWAF, WESSA, SAHRA, Harmony, the ward councilor, Evander Rate Payers Association, Sasol Synfuels, Sasol Mining, Roodebank Farmers Union, Randwater, Highveld East Environmental Monitoring Association (HECEMA) and the National Association for Clean Air (NACA).

A Basic Assessment report will include details on the environmental impacts investigated. This will be made accessible to all registered I & APs and to the authorities for comment and review.

I & APs and authorities will be requested to provide comment within 40 days. All comments received will be included in the final Basic Assessment report which will be submitted to MDALA for approval.

MDALA will either approve or reject the Basic Assessment report.

MDALA have two weeks to acknowledge receipt of the report and 30 days to assess, after which a Record of Decision approving or rejecting the proposal will be provided.

### **PUBLIC PARTICIPATION**

Public participation is an essential phase of the Basic Assessment process. It provides an opportunity for interested and affected parties (I&APs) to raise concerns, queries and suggestions regarding the proposal as well to gather information from the consultants about the proposal. The public participation phase requires that the proposal be advertised in a local and regional newspaper, and that neighbours within 100m of the site are given a written notification. Relevant authorities and interest groups are also required to be notified. The following is an account of the public participation for the proposal to date:

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Kerry Seppings Environmental Management Specialists cc

Phone: 031 765 6636 Fax: 031 765 6632 Cell: 082 823 1844 E- Mail: [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

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Members: K.A. Stanton (Director)

## About KSEMS

Kerry Seppings Environmental Management Specialists cc (KSEMS) is an established environmental consultancy which has been based in KwaZulu-Natal since 1998. KSEMS is the independent party and is responsible for assessing the impacts of the proposal. All people that may be interested or affected by this development can help KSEMS by providing us with questions, comments or feedback for this proposal. You can do this by registering as an Interested & Affected Party (I&AP) for this project with the contact person below.

### **Any Persons Interested In This Project Should Register As An Interested And Affected Party In Order To Receive Information And Comment On The Proposal**

You are invited to register with:

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc

Phone 031 765 6636

Fax 031 765 6632

e-mail [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

By registering for the process, your name will be included in the register of I & APs and you will be notified of meetings and availability of reports for comment. You will be able to offer comments or queries on any written submission or information provided which will be included in the reports that will be distributed to the authorities.

### **EXCERPT TAKEN FROM NEMA EIA REGULATIONS DESIGNATING RESPONSIBILITIES OF REGISTERED INTERESTED AND AFFECTED PARTIES**

#### ***Registered interested and affected parties entitled to comment on submissions***

**58.** (1) *A registered interested and affected party is entitled to comment, in writing, on all written submissions made to the competent authority by the applicant or the EAP managing an application, and to bring to the attention of the competent authority any issues which that party believes may be of significance to the consideration of the application, provided that –*

*(a) comments are submitted within –*

*(i) the timeframes that have been approved or set by the competent authority; or*

*(ii) any extension of a timeframe agreed to by the applicant or EAP;*

*(b) a copy of comments submitted directly to the competent authority is served on the applicant or EAP; and*

*(c) the interested and affected party discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.*

**This BID is available on request**

***The lead consultant on this project is Josette Oberholzer. She can be contacted directly on 031 765 6636.***

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Phone: 031 765 6636 Fax: 031 765 6632 Cell: 082 823 1844 E- Mail: [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

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Company Registration no: 1999/0494452/23

Members: K.A. Stanton (Director)

**Distribution of documents****Notification of BID**

Project Title

FFS Evander Waxy Oil

| Contact                                  | NAME              | Date sent  | Sent by fax, e-mail, hand delivered notice, post? |
|------------------------------------------|-------------------|------------|---------------------------------------------------|
| ARDLA                                    | Tebogo Mogakabe   | 04/03/2009 | email                                             |
| ARDLA                                    | Surgeon Marabane  | 04/03/2009 | email                                             |
| Govan Mbeki - Municipal Planning Contact | Mike Knowles      | 04/03/2009 | email                                             |
| Govan Mbeki - DEA                        | Neil Ross         | 04/03/2009 | email                                             |
| DWAF                                     | Takalani Thimisha | 04/03/2009 | email                                             |
| DWAF                                     | Marius Keet       | 04/03/2009 | email                                             |
| WESSA                                    | Kim Webb          | 04/03/2009 | email                                             |
| WESSA                                    | Garth Barnes      | 04/03/2009 | email                                             |
| Ward Councillor                          | James Harris      | 04/03/2009 | email                                             |
| Rate Payers Assosiation                  | James Harris      | 04/03/2009 | email                                             |
| SAHRA                                    | G. Tshivalavhala  | 04/03/2009 | email                                             |
| NACA                                     | Bev Terry         | 04/03/2009 | email                                             |
| Rand Water                               | Karen Chetty      | 04/03/2009 | email                                             |
| Govan Mbeki                              | Kamesh Rohan      | 04/03/2009 | email                                             |
| Govan Mbeki                              | Albert Olivier    | 04/03/2009 | email                                             |
| Private                                  | Lydia Oosthuizen  | 04/03/2009 | email                                             |
| Topfix Scaffolding                       | Rosa Muller       | 04/03/2009 | email                                             |



## KSEMS

---

**From:** KSEMS [kerry.seppings@telkomsa.net]

**Sent:** 10 March 2009 02:49 PM

**To:** 'kamesh.r@govanmbeki.gov.za'

**Subject:** FFS Waxy oil

**Tracking: Recipient**

**Read**

'kamesh.r@govanmbeki.gov.za' Read: 2009/03/11 07:36 AM

'Leena '

Read: 2009/03/10 02:55 PM

Dear I&AP,

Please see the attached background information document (BID) for the waxy oil processing facility EIA for FFS Refiners, Evander.

Kind regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; 1a Delamore Road; Hillcrest, 3610  
Phone 031 765 6636  
Fax 031 765 6632  
E-mail [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)



**KSEMS**


---

**From:** KSEMS [kerry.seppings@telkomsa.net]  
**Sent:** 04 March 2009 02:00 PM  
**To:** 'SURGEON@environ1.agric.za'; 'elzet.w@govanmbeki.gov.za'; 'keetm@dwaf.gov.za';  
'gtshivhalavhala@mp.sahra.org.za'; 'gbarnes@wessanorth.co.za'; 'milnej@vodamail.co.za';  
'bev@naca.org.za'; 'kchetty@randwater.co.za'; 'albert.o@govanmbeki.gov.za';  
'brenda.e@govanmbeki.gov.za'; 'ThimishaT@dwaf.gov.za'; 'tebogo@environ1.agric.za'  
**Subject:** FFS Waxy oil

| Tracking: Recipient               | Read                      |
|-----------------------------------|---------------------------|
| 'SURGEON@environ1.agric.za'       |                           |
| 'elzet.w@govanmbeki.gov.za'       | Read: 2009/03/04 02:42 PM |
| 'keetm@dwaf.gov.za'               |                           |
| 'gtshivhalavhala@mp.sahra.org.za' |                           |
| 'gbarnes@wessanorth.co.za'        | Read: 2009/03/04 03:20 PM |
| 'milnej@vodamail.co.za'           |                           |
| 'bev@naca.org.za'                 | Read: 2009/03/04 09:24 PM |
| 'kchetty@randwater.co.za'         |                           |
| 'albert.o@govanmbeki.gov.za'      | Read: 2009/03/04 02:52 PM |
| 'brenda.e@govanmbeki.gov.za'      | Read: 2009/03/09 02:12 PM |
| 'ThimishaT@dwaf.gov.za'           |                           |
| 'tebogo@environ1.agric.za'        |                           |

Dear I&AP,

Please see the attach background information document (BID) for the waxy oil processing facility EIA for FFS Refiners, Evander.

Kind regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; 1a Delamore Road; Hillcrest, 3610  
Phone 031 765 6636  
Fax 031 765 6632  
E-mail [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

**KSEMS**

---

**From:** KSEMS [kerry.seppings@telkomsa.net]  
**Sent:** 03 March 2009 08:11 AM  
**To:** 'SURGEON@environ1.agric.za'; 'elzet.w@govanmbeki.gov.za'; 'keetm@dwaf.gov.za'; 'gtshivhalavhala@mp.sahra.org.za'; 'gbarnes@wessanorth.co.za'; 'milnej@vodamail.co.za'; 'bev@naca.org.za'; 'kchetty@randwater.co.za'; 'albert.o@govanmbeki.gov.za'; 'brenda.e@govanmbeki.gov.za'; 'ThimishaT@dwaf.gov.za'; 'tebogo@environ1.agric.za'  
**Subject:** FFS Waxy oil

| <b>Tracking: Recipient</b>        | <b>Read</b>               |
|-----------------------------------|---------------------------|
| 'SURGEON@environ1.agric.za'       |                           |
| 'elzet.w@govanmbeki.gov.za'       | Read: 2009/03/03 09:06 AM |
| 'keetm@dwaf.gov.za'               |                           |
| 'gtshivhalavhala@mp.sahra.org.za' |                           |
| 'gbarnes@wessanorth.co.za'        | Read: 2009/03/03 08:31 AM |
| 'milnej@vodamail.co.za'           |                           |
| 'bev@naca.org.za'                 |                           |
| 'kchetty@randwater.co.za'         |                           |
| 'albert.o@govanmbeki.gov.za'      | Read: 2009/03/03 10:50 AM |
| 'brenda.e@govanmbeki.gov.za'      | Read: 2009/03/09 02:11 PM |
| 'ThimishaT@dwaf.gov.za'           |                           |
| 'tebogo@environ1.agric.za'        |                           |

Dear I&AP,

Please see the attach background information document (BID) for the waxy oil processing facility EIA for FFS Refiners, Evander.

Kind regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc  
 Unit 9 Bristol House; 1a Delamore Road; Hillcrest, 3610  
 Phone 031 765 6636  
 Fax 031 765 6632  
 E-mail [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

## Appendix 9.4: Advert

**ADVERTISED: RIDGE TIMES**  
**DATE: 27<sup>TH</sup> FEBRUARY 2009**

**Notice of Application for Scoping and EIA**  
Notice is hereby given that an application for environmental authorization in terms of the EIA Regulations, 2006 (Regulations in terms of Chapter 5 of the National Environmental Management Act, 1998, as amended) has been lodged with the Mpumalanga Province Department of Agriculture and Land Administration.

The proposed activity requires application subject to scoping and EIA and all interested and affected parties are invited to register with the contact person below within 14 days of the issuing of this notice.

FFS Refiners Pty (Ltd) proposes to construct a 2500m<sup>2</sup> process facility at their existing plant located on 3 Brunel Road, Evander. The facility will be used to filter iron catalyst fines and carbon particulates from a product called Waxy Oil. The final processed product will be a low sulphur oil that can be used as a fuel source for the industrial heating market. An open day will be held on the 18th of March 2009. The time and venue will be confirmed with registered interested and affected parties. Representations with respect to this application may be made by phone, fax or e-mail to the contact person below.

**ENVIRONMENTAL MANAGEMENT**

Kerry Seppings Environmental Management Specialists cc  
Contact: Leana Ackbar  
Phone: 031 765 6636  
Fax: 031 765 6632  
E-mail: kerry.seppings@telkomsa.net

**Mpumalanga-Beeld 5**

**Vrydag 27 Februarie 2009**

**Kennisgewing van aansoek vir omgewingsmagtiging**  
Hiermee word kennis gegee dat aansoek vir omgewingsmagtiging ingevolge Omgewingsimpakstudie-regulasies, 2006 (Regulasies ingevoegde hoofstuk 5 van die Wet op Nasionale Omgewingsbestuur, 1998) 600s gewysig. Ingedien is by die Mpumalanga Provinsiale Departement van Landbou en Grondadministrasie.

Die voorgestelde aktiwiteit veral dat die aansoek onderwerp is aan 'n "scoping" en omgewingsimpakstudie. Alle belangstellers en geïnteresseerde partye word versoek om, binne 14 dae vanaf die uitreiking van hierdie kennisgewing, by ondergenoemde kontakpersoon te registreer.

FFS Refiners (Edms) Bpk stel voor om 'n 2 500 m<sup>2</sup> behandelingsfasiliteit op hul perseel te bou, geleë te Brunelweg 3, Evander. Die fasiliteit sal gebruik word om tyn ysterkatalisatormiddels en koolstofdeeltjies uit 'n produk getoem "waxy oil" te filtreer. Die finale produk wat vervaardig sal word is 'n olie met 'n lae swaarteinhoud wat in 'n mark gebruik kan word as 'n brandstof vir industriële verhitting. Op die 18de Maart 2009 sal 'n oop dag gehou word. Die tyd en plek van vergadering sal bevestig word met alle belangstellers en geïnteresseerde partye wat geregistreer het. Kommentaar met betrekking tot hierdie aansoek mag per te telefoon, faks of e-pos by die kontakpersoon ingedien word.

**ENVIRONMENTAL MANAGEMENT**

Kerry Seppings Environmental Management Specialists Bpk  
Kontakpersoon: Leana Ackbar  
Tel: 031 765 6636  
Faks: 031 765 6632  
E-pos: kerry.seppings@telkomsa.net

## **Appendix 9.5: Proof of Distribution of Draft Scoping Report**

**Distribution of documents**
**Notification of Scoping**
**Project Title**
**FFS Waxy Oil**

| <b>Contact</b>                                  | <b>NAME</b>      | <b>Date sent</b> | <b>Sent by fax, email, hand delivered notice, post</b> | <b>Notification</b> |
|-------------------------------------------------|------------------|------------------|--------------------------------------------------------|---------------------|
| <b>Govan Mbeki - Municipal Planning Contact</b> | Mike Knowles     | 23/06/2010       | Courier 2 hard copies and a CD                         | email               |
| <b>Govan Mbeki - DEA</b>                        | Neil Ross        | 23/06/2010       | Email                                                  | email               |
| <b>DWAF</b>                                     | R.J. Lekoane     | 23/06/2010       | Courier                                                | email               |
| <b>WESSA</b>                                    | Kim Webb         | 23/06/2010       | Courier to Mr Barnes at WESSA                          | email               |
| <b>WESSA</b>                                    | Garth Barnes     | 23/06/2010       | Courier                                                | email               |
| <b>Ward Councillor</b>                          | James Harris     | 23/06/2010       | Post                                                   | email               |
| <b>Rate Payers Association</b>                  | James Harris     | 23/06/2010       | Post                                                   | email               |
| <b>SAHRA</b>                                    | Dumisani Sibayi  | 23/06/2010       | Courier                                                | email               |
| <b>NACA</b>                                     | Bev Terry        | 23/06/2010       | Courier                                                | email               |
| <b>Rand Water</b>                               | Karen Chetty     | 23/06/2010       | Courier                                                | email               |
| <b>Govan Mbeki</b>                              | Kamesh Rohan     | 23/06/2010       | Courier to Mr Knowles                                  | email               |
| <b>Govan Mbeki</b>                              | Albert Olivier   | 23/06/2010       | Courier to Mr Knowles                                  | email               |
| <b>Private</b>                                  | Lydia Oosthuizen | 23/06/2010       | Website                                                | email               |
| <b>Topfix Scaffolding</b>                       | Rosa Muller      | 23/06/2010       | Website                                                | email               |
| <b>Private</b>                                  | Andrew Manning   | 23/06/2010       | Courier to Mr White as per Mr Manning's request        | email               |
| <b>Private</b>                                  | Rishad Hamid     | 23/06/2010       | Post                                                   | email               |
| Walker Park Golf Club                           | Marthie Dampie   | 23/06/2010       | Courier                                                | telephone           |

**KSEMS**

**From:** KSEMS [kerry.seppings@telkomsa.net]  
**Sent:** 22 June 2010 03:13 PM  
**To:** 'etsecunda@govanmbeki.gov.za'  
**Subject:** Draft Scoping Report - FFS Waxy Oil (EIA no. 17/2/2/1/(e) GS - 03) Part 1

| <b>Tracking: Recipient</b>    | <b>Read</b>               |
|-------------------------------|---------------------------|
| 'etsecunda@govanmbeki.gov.za' | Read: 2010/06/22 03:27 PM |
| 'Manogrie'                    | Read: 2010/06/22 03:22 PM |
| 'Leena Ackbar'                | Read: 2010/06/22 03:48 PM |

Hi Mr Ross

As discussed, please find attached an electronic copy of the draft scoping report for the FFS Waxy Oil project. Due to the size of the file, the report and the appendices are attached in two different emails.

Regards

Manogrie Chetty  
 Lead Environmental Consultant (Housing)

Kerry Seppings Environmental Management Specialists cc  
 4 Woodville Lane off Hawkstone Road, Summerveld, Assagay  
 Postal P.O. Box 396; Gillitts; 3603  
 Phone 031 7691578  
 Fax 031 7691579  
 Website [www.ksems.co.za](http://www.ksems.co.za)

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2010/08/11

**KSEMS**


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**From:** KSEMS [kerry.seppings@telkomsa.net]  
**Sent:** 22 June 2010 03:13 PM  
**To:** 'etsecunda@govanmbeki.gov.za'  
**Subject:** Draft Scoping Report - FFS Waxy Oil (EIA no. 17/2/2/1/(e) GS - 03) Part 2

| <b>Tracking:</b> | <b>Recipient</b>              | <b>Read</b>               |
|------------------|-------------------------------|---------------------------|
|                  | 'etsecunda@govanmbeki.gov.za' | Read: 2010/06/22 04:02 PM |
|                  | 'Manogrie'                    | Read: 2010/06/22 03:23 PM |
|                  | 'Leena Ackbar'                | Read: 2010/06/22 03:48 PM |

Hi Mr Ross

Please find attached the appendices for the FFS Waxy Oil Draft Scoping Report.

Regards

Manogrie Chetty  
 Lead Environmental Consultant (Housing)

Kerry Seppings Environmental Management Specialists cc  
 4 Woodville Lane off Hawkstone Road, Summerveld, Assagay  
 Postal P.O. Box 396; Gillitts; 3603  
 Phone 031 7691578  
 Fax 031 7691579  
 Website [www.ksems.co.za](http://www.ksems.co.za)

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**KSEMS**

**From:** KSEMS [kerry.seppings@telkomsa.net]  
**Sent:** 23 June 2010 01:53 PM  
**To:** 'albert.o@govanmbeki.gov.za'  
**Subject:** FFS Waxy Oil - Draft Scoping Report (EIA Number 17/2/2/1/(e) GS - 03)

|                  |                              |                           |
|------------------|------------------------------|---------------------------|
| <b>Tracking:</b> | <b>Recipient</b>             | <b>Read</b>               |
|                  | 'albert.o@govanmbeki.gov.za' |                           |
|                  | 'Manogrie'                   | Read: 2010/06/23 03:17 PM |

Dear Mr Olivier

The Draft Scoping Report for the above mentioned project is available for comment. Copies of the Draft Scoping Report have been couriered to Mr Neil Ross and Mr Kamesh Rohan at the Govan Mbeki Municipality. A hard copy of the report has also been left at the Walker Park Golf Club for I&AP review; the report can also be electronically viewed on our website [www.ksems.co.za](http://www.ksems.co.za).

Please be advised that you have 40 days within which to comment. The comment period commences on 23 June 2010 and ends on 02 August 2010.

Should you have no comments, please confirm this in writing.

Regards,

Manogrie Chetty  
 Lead Environmental Consultant (Housing)

Kerry Seppings Environmental Management Specialists cc  
 4 Woodville Lane off Hawkstone Road, Summerveld, Assagay  
 Postal P.O. Box 396; Gillitts; 3603  
 Phone 031 7691578  
 Fax 031 7691579  
 Website [www.ksems.co.za](http://www.ksems.co.za)

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**KSEMS**

**From:** KSEMS [kerry.seppings@telkomsa.net]  
**Sent:** 23 June 2010 01:54 PM  
**To:** 'chelek@telkomsa.net'; 'rosa@topfix.co.za'  
**Subject:** FFS Waxy Oil - Draft Scoping Report (EIA Number 17/2/1/(e) GS - 03)

| <b>Tracking:</b> | <b>Recipient</b>      | <b>Read</b>               |
|------------------|-----------------------|---------------------------|
|                  | 'chelek@telkomsa.net' | Read: 2010/06/23 01:56 PM |
|                  | 'rosa@topfix.co.za'   | Read: 2010/06/23 03:46 PM |
|                  | 'Manogrie'            | Read: 2010/06/23 03:17 PM |

Dear Interested and Affected Party

Please be advised that the Draft Scoping Report for the above mentioned project can be viewed electronically on our website at [www.ksems.co.za](http://www.ksems.co.za).

Please be advised that you have 40 days within which to comment. The comment period commences on 23 June 2010 and ends on 02 August 2010.

It would be greatly appreciated if you could submit your comments within the given timeframe. Should you have no comments, please confirm this in writing.

Regards

Manogrie Chetty  
 Lead Environmental Consultant (Housing)

Kerry Seppings Environmental Management Specialists cc  
 4 Woodville Lane off Hawkstone Road, Summerveld, Assagay  
 Postal P.O. Box 396; Gillitts; 3603  
 Phone 031 7691578  
 Fax 031 7691579  
 Website [www.ksems.co.za](http://www.ksems.co.za)

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**KSEMS**

**From:** KSEMS [kerry.seppings@telkomsa.net]  
**Sent:** 23 June 2010 01:55 PM  
**To:** 'angy.b@govanmbeki.gov.za'; 'etsecunda@govanmbeki.gov.za'; 'kwebb@wessanorth.co.za'; 'gbarnes@wessanorth.co.za'; 'dsibayi@sahra.org.za'; 'lekoanej@dwaf.gov.za'; 'milnej@vodamail.co.za'; 'bev@naca.org.za'; 'kchetty@randwater.co.za'; 'kamesh.r@govanmbeki.gov.za'; 'agmanning@lantic.net'; 'rhamid@energotech.co.za'  
**Subject:** FFS Waxy Oil - Draft Scoping Report (EIA Number 17/2/2/1/(e) GS - 03)

| Tracking: | Recipient                     | Delivery                    | Read                      |
|-----------|-------------------------------|-----------------------------|---------------------------|
|           | 'angy.b@govanmbeki.gov.za'    |                             | Read: 2010/06/23 01:58 PM |
|           | 'etsecunda@govanmbeki.gov.za' |                             |                           |
|           | 'kwebb@wessanorth.co.za'      |                             | Read: 2010/06/23 01:56 PM |
|           | 'gbarnes@wessanorth.co.za'    |                             | Read: 2010/06/23 02:35 PM |
|           | 'dsibayi@sahra.org.za'        |                             |                           |
|           | 'lekoanej@dwaf.gov.za'        |                             |                           |
|           | 'milnej@vodamail.co.za'       |                             |                           |
|           | 'bev@naca.org.za'             |                             | Read: 2010/06/23 02:02 PM |
|           | 'kchetty@randwater.co.za'     |                             |                           |
|           | 'kamesh.r@govanmbeki.gov.za'  |                             |                           |
|           | 'agmanning@lantic.net'        |                             |                           |
|           | 'rhamid@energotech.co.za'     | Failed: 2010/06/23 01:55 PM |                           |
|           | 'Manogrie'                    |                             | Read: 2010/06/23 03:17 PM |
|           | Lekoane Joyce (GAU)           |                             | Read: 2010/06/24 07:47 AM |

Dear Interested and Affected Party

Please note that the Draft Scoping Report for the above-mentioned has been sent to you for comment.

A copy of this report can also be viewed and downloaded off our website [www.ksems.co.za](http://www.ksems.co.za).

Please be advised that you have 40 days within which to comment on this Draft Scoping Report. The comment period commenced on 23 June 2010 and ends on the 02 August 2010.

Please feel free to contact us should you require any additional information.

Regards

Manogrie Chetty  
Lead Environmental Consultant (Housing)

Kerry Seppings Environmental Management Specialists cc  
4 Woodville Lane off Hawkstone Road, Summerveld, Assagay  
Postal P.O. Box 396; Gillitts; 3603  
Phone 031 7691578  
Fax 031 7691579  
Website [www.ksems.co.za](http://www.ksems.co.za)

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2010/08/11

**KSEMS**

**From:** KSEMS [kerry.seppings@telkomsa.net]  
**Sent:** 29 July 2010 12:01 PM  
**To:** 'milnej@vodamail.co.za'  
**Cc:** 'Leena Ackbar'; 'Manogrie'  
**Subject:** FW: FFS Waxy Oil - Draft Scoping Report (EIA Number 17/2/2/1/(e) GS - 03)

|                  |                         |                           |
|------------------|-------------------------|---------------------------|
| <b>Tracking:</b> | <b>Recipient</b>        | <b>Read</b>               |
|                  | 'milnej@vodamail.co.za' |                           |
|                  | 'Leena Ackbar'          | Read: 2010/07/29 12:08 PM |
|                  | 'Manogrie'              | Read: 2010/07/29 12:20 PM |

Hi Mr Harris

Further to our conversation, I had contacted you telephonically on the 22/06/2010 and confirmed that a copy of the report will be sent to you via post to the following address:

P.O.Box 1842  
 Evander  
 2280

An email was sent to you on the 23/06/2010 notifying you of the release of the draft scoping report.

Please find attached an electronic copy of the report and please could you forward comments at your earliest convenience. Please note that the comment period ends on the 02/08/2010. However should the comments be sent through after this date, it will still be forwarded to the relevant authorities for review.

Please note that this email will be forwarded as two parts due to the size of the document.

Please confirm receipt of this document.

Regards

Manogrie Chetty  
 Lead Environmental Consultant (Housing)



Kerry Seppings Environmental Management Specialists cc  
 4 Woodville Lane off Hawkstone Road, Summerveld, Assagay  
 Postal P.O. Box 396; Gillitts; 3603  
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 Website [www.ksems.co.za](http://www.ksems.co.za)

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*Please think of the environment before printing out this email.*

2010/08/11

**From:** KSEMS [mailto:kerry.seppings@telkomsa.net]

**Sent:** 23 June 2010 01:55 PM

**To:** angy.b@govanmbeki.gov.za; etsecunda@govanmbeki.gov.za; kwebb@wessanorth.co.za; gbarnes@wessanorth.co.za; dsibayi@sahra.org.za; lekoanej@dwaf.gov.za; milnej@vodamail.co.za; bev@naca.org.za; kchetty@randwater.co.za; kamesh.r@govanmbeki.gov.za; agmanning@lantic.net; rhamid@energotech.co.za

**Subject:** FFS Waxy Oil - Draft Scoping Report (EIA Number 17/2/2/1/(e) GS - 03)

Dear Interested and Affected Party

Please note that the Draft Scoping Report for the above-mentioned has been sent to you for comment.

A copy of this report can also be viewed and downloaded off our website [www.ksems.co.za](http://www.ksems.co.za).

Please be advised that you have 40 days within which to comment on this Draft Scoping Report. The comment period commenced on 23 June 2010 and ends on the 02 August 2010.

Please feel free to contact us should you require any additional information.

Regards

Manogrie Chetty  
Lead Environmental Consultant (Housing)

Kerry Seppings Environmental Management Specialists cc  
4 Woodville Lane off Hawkstone Road, Summerveld, Assagay  
Postal P.O. Box 396; Gillitts; 3603  
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## KSEMS

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**From:** KSEMS [kerry.seppings@telkomsa.net]  
**Sent:** 29 July 2010 12:03 PM  
**To:** 'milnej@vodamail.co.za'  
**Subject:** FW: Draft Scoping Report - FFS Waxy Oil (EIA no. 17/2/2/1/(e) GS - 03) Part 2

Hi Mr Harris

Please find attached the appendices for the FFS Waxy Oil Draft Scoping Report.

Regards

Manogrie Chetty  
Lead Environmental Consultant (Housing)



Kerry Seppings Environmental Management Specialists cc  
4 Woodville Lane off Hawkstone Road, Summerveld, Assagay  
Postal P.O. Box 396; Gillitts; 3603  
Phone 031 7691578  
Fax 031 7691579  
Website [www.ksems.co.za](http://www.ksems.co.za)

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**KSEMS**

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**From:** KSEMS [kerry.seppings@telkomsa.net]  
**Sent:** 29 July 2010 12:02 PM  
**To:** 'dsibayi@sahra.org.za'  
**Cc:** 'Leena Ackbar'; 'Manogrie'  
**Subject:** FW: Draft Scoping Report - FFS Waxy Oil (EIA no. 17/2/2/1/(e) GS - 03) Part 1

|                  |                        |                           |
|------------------|------------------------|---------------------------|
| <b>Tracking:</b> | <b>Recipient</b>       | <b>Read</b>               |
|                  | 'dsibayi@sahra.org.za' |                           |
|                  | 'Leena Ackbar'         | Read: 2010/07/29 12:08 PM |
|                  | 'Manogrie'             | Read: 2010/07/29 12:09 PM |

Hi Mr Sibayi

This email is to confirm that as per our telephonic conversation, you received the email regarding the notification of the availability, forwarded on the 23/06/2010, of the FFS Waxy Oil draft scoping report.

I have just noticed that the website is down and the file is not accessible. I have therefore attached a copy of the report. I will forward a copy of the appendices in a separate email due to the size of the document.

Regards

Manogrie Chetty  
 Lead Environmental Consultant (Housing)

**ENVIRONMENTAL**  **MANAGEMENT**

Kerry Seppings Environmental Management Specialists cc  
 4 Woodville Lane off Hawkstone Road, Summerveld, Assagay  
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2010/08/11

## KSEMS

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**From:** KSEMS [kerry.seppings@telkomsa.net]  
**Sent:** 29 July 2010 12:03 PM  
**To:** 'dsibayi@sahra.org.za'  
**Subject:** FW: Draft Scoping Report - FFS Waxy Oil (EIA no. 17/2/2/1/(e) GS - 03) Part 2

Hi Mr Sibayi

Please find attached the appendices for the FFS Waxy Oil Draft Scoping Report.

Regards

Manogrie Chetty  
Lead Environmental Consultant (Housing)



Kerry Seppings Environmental Management Specialists cc  
4 Woodville Lane off Hawkstone Road, Summerveld, Assagay  
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**From:** KSEMS [kerry.seppings@telkomsa.net]  
**Sent:** 29 July 2010 12:29 PM  
**To:** 'rhamid@energotec.co.za'  
**Cc:** 'Leena Ackbar'; 'Manogrie'  
**Subject:** FFS Waxy Oil - Draft Scoping Report (EIA Number 17/2/2/1/(e) GS - 03)

| <b>Tracking:</b> | <b>Recipient</b>         | <b>Read</b>               |
|------------------|--------------------------|---------------------------|
|                  | 'rhamid@energotec.co.za' |                           |
|                  | 'Leena Ackbar'           | Read: 2010/07/29 12:29 PM |
|                  | 'Manogrie'               | Read: 2010/07/29 03:24 PM |

Hi Mr Hamid

Further to our telephonic conversation earlier today, you have received a copy of the draft scoping report. Please note that the comment period ends on the 02/08/2010. Please ensure that your comments reach us by the aforementioned date. Please note that should your comments reach us after this date, it will still be submitted to the relevant authority for review.

Should you have no comments, please confirm this in writing.

Regards

Manogrie Chetty  
 Lead Environmental Consultant (Housing)



Kerry Seppings Environmental Management Specialists cc  
 4 Woodville Lane off Hawkstone Road, Summerveld, Assagay  
 Postal P.O. Box 396; Gillitts; 3603  
 Phone 031 7691578  
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**KSEMS**

**From:** KSEMS [kerry.seppings@telkomsa.net]  
**Sent:** 29 July 2010 12:39 PM  
**To:** 'angy.b@govanmbeki.gov.za'; 'etsecunda@govanmbeki.gov.za'; 'kwebb@wessanorth.co.za'; 'gbarnes@wessanorth.co.za'; 'dsibayi@sahra.org.za'; 'lekoanej@dwaf.gov.za'; 'milnej@vodamail.co.za'; 'bev@naca.org.za'; 'kchetty@randwater.co.za'; 'kamesh.r@govanmbeki.gov.za'; 'agmanning@lantic.net'; 'rhamid@energotec.co.za'; 'chelek@telkomsa.net'; 'rosa@topfix.co.za'; 'albert.o@govanmbeki.gov.za'  
**Subject:** FW: FFS Waxy Oil - Draft Scoping Report (EIA Number 17/2/21/(e) GS - 03)

| <b>Tracking: Recipient</b>    | <b>Read</b>               |
|-------------------------------|---------------------------|
| 'angy.b@govanmbeki.gov.za'    | Read: 2010/07/29 01:06 PM |
| 'etsecunda@govanmbeki.gov.za' | Read: 2010/07/29 03:01 PM |
| 'kwebb@wessanorth.co.za'      |                           |
| 'gbarnes@wessanorth.co.za'    | Read: 2010/07/29 03:48 PM |
| 'dsibayi@sahra.org.za'        |                           |
| 'lekoanej@dwaf.gov.za'        |                           |
| 'milnej@vodamail.co.za'       |                           |
| 'bev@naca.org.za'             | Read: 2010/07/30 06:21 AM |
| 'kchetty@randwater.co.za'     | Read: 2010/07/29 03:14 PM |
| 'kamesh.r@govanmbeki.gov.za'  |                           |
| 'agmanning@lantic.net'        |                           |
| 'rhamid@energotec.co.za'      |                           |
| 'chelek@telkomsa.net'         | Read: 2010/07/29 12:52 PM |
| 'rosa@topfix.co.za'           | Read: 2010/07/29 02:27 PM |
| 'albert.o@govanmbeki.gov.za'  |                           |
| Lekoane Joyce (GAU)           | Read: 2010/07/30 07:53 AM |

Dear I & APs

Please note that the comment period for the waxy oil draft scoping report ends on the 02/08/2010. Please could you ensure that your comments reach us by the afore mentioned date. Should you not wish to comment, please could you provide this in writing.

Regards

Manogrie Chetty  
 Lead Environmental Consultant (Housing)

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Kerry Seppings Environmental Management Specialists cc  
 4 Woodville Lane off Hawkstone Road, Summerveld, Assagay  
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**KSEMS**

**From:** KSEMS [kerry.seppings@telkomsa.net]  
**Sent:** 29 July 2010 04:01 PM  
**To:** 'etsecunda@govanmbeki.gov.za'  
**Cc:** 'Manogrie'  
**Subject:** FW: FFS Waxy Oil - Draft Scoping Report (EIA Number 17/2/2/1/(e) GS - 03)

|                  |                               |                           |
|------------------|-------------------------------|---------------------------|
| <b>Tracking:</b> | <b>Recipient</b>              | <b>Read</b>               |
|                  | 'etsecunda@govanmbeki.gov.za' | Read: 2010/07/30 10:34 AM |
|                  | 'Manogrie'                    | Read: 2010/07/29 04:23 PM |

Hi Mr Ross

Thank you for your response.

Regards

Manogrie Chetty  
 Lead Environmental Consultant (Housing)



Kerry Seppings Environmental Management Specialists cc  
 4 Woodville Lane off Hawkstone Road, Summerveld, Assagay  
 Postal P.O. Box 396; Gillitts; 3603  
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<hr size=2 width="100%" align=center tabindex=-1>

**From:** Neil Ross [mailto:etsecunda@govanmbeki.gov.za]  
**Sent:** 29 July 2010 03:17 PM  
**To:** 'KSEMS'  
**Subject:** RE: FFS Waxy Oil - Draft Scoping Report (EIA Number 17/2/2/1/(e) GS - 03)

Good day Manogrie

I apologise for the delay in responding.

I have been through the Documentation and can find no issues that would affect this department. I see a copy of the closing date has been sent to Kamesh Rohan and I'm sure he will respond.

Thank you

Neil Ross

---

**From:** KSEMS [mailto:kerry.seppings@telkomsa.net]  
**Sent:** 29 July 2010 12:39 PM  
**To:** angy.b@govanmbeki.gov.za; etsecunda@govanmbeki.gov.za; kwebb@wessanorth.co.za;

2010/08/11

gbarnes@wessanorth.co.za; dsibayi@sahra.org.za; lekoanej@dwaf.gov.za; milnej@vodamail.co.za;  
bev@naca.org.za; kchetty@randwater.co.za; kamesh.r@govanmbeki.gov.za; agmanning@lantic.net;  
rhamid@energotec.co.za; chelek@telkomsa.net; rosa@topfix.co.za; albert.o@govanmbeki.gov.za  
**Subject:** FW: FFS Waxy Oil - Draft Scoping Report (EIA Number 17/2/2/1/(e) GS - 03)

Dear I & APs

Please note that the comment period for the waxy oil draft scoping report ends on the 02/08/2010. Please could you ensure that your comments reach us by the afore mentioned date. Should you not wish to comment, please could you provide this in writing.

Regards

Manogrie Chetty  
Lead Environmental Consultant (Housing)



Kerry Seppings Environmental Management Specialists cc  
4 Woodville Lane off Hawkstone Road, Summerveld, Assagay  
Postal P.O. Box 396; Gillitts; 3603  
Phone 031 7691578  
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**KSEMS**


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**From:** KSEMS [kerry.seppings@telkomsa.net]  
**Sent:** 11 August 2010 09:12 AM  
**To:** 'kamesh.r@govanmbeki.gov.za'  
**Cc:** 'Manogrie'  
**Subject:** FW: Draft Scoping Report - FFS Waxy Oil (EIA no. 17/2/2/1/(e) GS - 03) Part 1

Hi Mr Rohan

As discussed, please find attached a copy of the draft scoping report. Please note that the final scoping report will be submitted to ARDLA on the 12/08/2010. Any comments received on the draft scoping report thereafter will be forwarded directly to the municipality.

Please note that the report will be sent through in two parts due to the size of the document.

Regards

Manogrie Chetty  
 Lead Environmental Consultant (Housing)



Kerry Seppings Environmental Management Specialists cc  
 4 Woodville Lane off Hawkstone Road, Summerveld, Assagay  
 Postal P.O. Box 396; Gillitts; 3603  
 Phone 031 7691578  
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**From:** Manogrie [mailto:manogrie.ksems@telkomsa.net]  
**Sent:** 22 June 2010 02:27 PM  
**To:** 'KSEMS'  
**Cc:** 'Leena Ackbar'  
**Subject:** Draft Scoping Report - FFS Waxy Oil (EIA no. 17/2/2/1/(e) GS - 03) Part 1

[etsecunda@govanmbeki.gov.za](mailto:etsecunda@govanmbeki.gov.za)

Hi Mr Ross

As discussed, please find attached an electronic copy of the draft scoping report for the FFS Waxy Oil project. Due to the size of the file, the report and the appendices are attached in two different emails.

Regards

Manogrie Chetty  
 Lead Environmental Consultant (Housing)

2010/08/11

Kerry Seppings Environmental Management Specialists cc  
4 Woodville Lane off Hawkstone Road, Summerveld, Assagay  
Postal P.O. Box 396; Gillitts; 3603  
Phone 031 7691578  
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**From:** KSEMS [kerry.seppings@telkomsa.net]  
**Sent:** 11 August 2010 09:12 AM  
**To:** 'kamesh.r@govanmbeki.gov.za'  
**Cc:** 'Manogrie'  
**Subject:** FW: Draft Scoping Report - FFS Waxy Oil (EIA no. 17/2/2/1/(e) GS - 03) Part 2

Hi Mr Rohan

Please find attached the appendices for the FFS Waxy Oil Draft Scoping Report.

Regards

Manogrie Chetty  
Lead Environmental Consultant (Housing)



Kerry Seppings Environmental Management Specialists cc  
4 Woodville Lane off Hawkstone Road, Summerveld, Assagay  
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Phone 031 7691578  
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**Distribution of documents****Notification of Scoping -  
2nd Draft****Project Title****FFS Waxy Oil**

| <b>Contact</b>                                  | <b>NAME</b>      | <b>Date sent</b> | <b>Sent by fax, email, hand delivered notice, post</b> | <b>Notification</b> |
|-------------------------------------------------|------------------|------------------|--------------------------------------------------------|---------------------|
| <b>Govan Mbeki - Municipal Planning Contact</b> | Mike Knowles     | 12/10/2010       | Courier 2 hard copies and a CD                         | email               |
| <b>Govan Mbeki - DEA</b>                        | Neil Ross        | 12/10/2010       | Email                                                  | email               |
| <b>DWAF</b>                                     | R.J. Lekoane     | 12/10/2010       | Courier                                                | email               |
| <b>WESSA</b>                                    | Kim Webb         | 12/10/2010       | Courier to Mr Barnes at WESSA                          | email               |
| <b>WESSA</b>                                    | Garth Barnes     | 12/10/2010       | Courier                                                | email               |
| <b>Ward Councillor</b>                          | James Harris     | 12/10/2010       | Post                                                   | email               |
| <b>Rate Payers Association</b>                  | James Harris     | 12/10/2010       | Post                                                   | email               |
| <b>SAHRA</b>                                    | Dumisani Sibayi  | 12/10/2010       | Courier                                                | email               |
| <b>NACA</b>                                     | Bev Terry        | 12/10/2010       | Courier                                                | email               |
| <b>Rand Water</b>                               | Victor Nkosi     | 13/10/2010       | Courier                                                | email               |
| <b>Govan Mbeki</b>                              | Kamesh Rohan     | 12/10/2010       | Courier to Mr Knowles                                  | email               |
| <b>Govan Mbeki</b>                              | Albert Olivier   | 12/10/2010       | Courier to Mr Knowles                                  | email               |
| <b>Private</b>                                  | Lydia Oosthuizen | 12/10/2010       | Website                                                | email               |
| <b>Topfix Scaffolding</b>                       | Rosa Muller      | 12/10/2010       | Website                                                | email               |
| <b>Private</b>                                  | Andrew Manning   | 12/10/2010       | Courier                                                | email               |
| <b>Private</b>                                  | Rishad Hamid     | 12/10/2010       | Post                                                   | email               |
| Walker Park Golf Club                           | Marthie Dampie   | 12/10/2010       | Courier                                                | telephone           |

## KSEMS

---

**From:** KSEMS [kerry.seppings@telkomsa.net]  
**Sent:** 12 October 2010 02:14 PM  
**To:** 'rhamid@energotech.co.za'; 'rhamid@energotec.co.za'  
**Subject:** FFS Waxy Oil - Draft Scoping Report (EIA Number 17/2/2/1/(e) GS - 03)

Dear Interested and Affected Party

Following the distribution of the draft scoping report for the above-referenced project on 23 June 2010, amendments have been made to the content of the report that warrants re-distribution of the scoping report for I&AP comment. In light of this, you are hereby provided another 40 days to comment on the amendments to the scoping report prior to it being submitted to DEDET. Please find attached a letter highlighting the amendments to the scoping report.

A copy of this report can also be viewed and downloaded off our website [www.ksems.co.za](http://www.ksems.co.za).

Please be advised that you have 40 days within which to comment on this Draft Scoping Report. The comment period commenced on 13 October 2010 and ends on the 22 November 2010.

It would be greatly appreciated if you could submit your comments within the given timeframe. Should you have no comments, please confirm this in writing.

Regards

Manogrie Chetty  
Lead Environmental Consultant (Housing)



Kerry Seppings Environmental Management Specialists cc  
4 Woodville Lane off Hawkstone Road, Summerveld, Assagay  
Postal P.O. Box 396; Gillitts; 3603  
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**KSEMS**

**From:** KSEMS [kerry.seppings@telkomsa.net]  
**Sent:** 12 October 2010 02:11 PM  
**To:** 'angy.b@govanmbeki.gov.za'; 'etsecunda@govanmbeki.gov.za'; 'kwebb@wessanorth.co.za'; 'gbarnes@wessanorth.co.za'; 'dsibayi@sahra.org.za'; 'lekoanej@dwaf.gov.za'; 'milnej@vodamail.co.za'; 'bev@naca.org.za'; 'kchetty@randwater.co.za'; 'kamesh.r@govanmbeki.gov.za'; 'agmanning@lantic.net'; 'rhamid@energotech.co.za'  
**Cc:** 'Manogrie.ksems@telkomsa.net'; 'leena.ksems@telkomsa.net'  
**Subject:** FFS Waxy Oil - Draft Scoping Report (EIA Number 17/2/2/1/(e) GS - 03)

Dear Interested and Affected Party

Following the distribution of the draft scoping report for the above-referenced project on 23 June 2010, amendments have been made to the content of the report that warrants re-distribution of the scoping report for I&AP comment. In light of this, you are hereby provided another 40 days to comment on the amendments to the scoping report prior to it being submitted to DEDET. Please find attached a letter highlighting the amendments to the scoping report. A copy of the second draft scoping report has been sent to you for comment.

A copy of this report can also be viewed and downloaded off our website [www.ksems.co.za](http://www.ksems.co.za).

Please be advised that you have 40 days within which to comment on this Second Draft Scoping Report. The comment period commenced on 13 October 2010 and ends on the 22 November 2010.

Please feel free to contact us should you require any additional information.

Regards

Manogrie Chetty  
 Lead Environmental Consultant (Housing)



Kerry Seppings Environmental Management Specialists cc  
 4 Woodville Lane off Hawkstone Road, Summerveld, Assagay  
 Postal P.O. Box 396; Gillitts; 3603  
 Phone 031 7691578  
 Fax 031 7691579  
 Website [www.ksems.co.za](http://www.ksems.co.za)

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## KSEMS

---

**From:** KSEMS [kerry.seppings@telkomsa.net]  
**Sent:** 12 October 2010 02:12 PM  
**To:** 'albert.o@govanmbeki.gov.za'; 'chelek@telkomsa.net'; 'rosa@topfix.co.za'  
**Cc:** 'leena.ksems@telkomsa.net'; 'Manogrie.ksems@telkomsa.net'  
**Subject:** FFS Waxy Oil - Draft Scoping Report (EIA Number 17/2/2/1/(e) GS - 03)

Dear Interested and Affected Party

Following the distribution of the draft scoping report for the above-referenced project on 23 June 2010, amendments have been made to the content of the report that warrants re-distribution of the scoping report for I&AP comment. In light of this, you are hereby provided another 40 days to comment on the amendments to the scoping report prior to it being submitted to DEDET. Please find attached a letter highlighting the amendments to the scoping report.

A copy of this report can also be viewed and downloaded off our website [www.ksems.co.za](http://www.ksems.co.za).

Please be advised that you have 40 days within which to comment on this Draft Scoping Report. The comment period commenced on 13 October 2010 and ends on the 22 November 2010.

It would be greatly appreciated if you could submit your comments within the given timeframe. Should you have no comments, please confirm this in writing.

Regards

Manogrie Chetty  
Lead Environmental Consultant (Housing)



Kerry Seppings Environmental Management Specialists cc  
4 Woodville Lane off Hawkstone Road, Summerveld, Assagay  
Postal P.O. Box 396; Gillitts; 3603  
Phone 031 7691578  
Fax 031 7691579  
Website [www.ksems.co.za](http://www.ksems.co.za)

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## **Appendix 9.6: Scoping Report approval and Exemption letter**

Building No. 4  
No. 7 Government Boulevard  
Riverside Park Extension 2  
Nelspruit  
1200  
South Africa



Private Bag X 11215  
Nelspruit, 1200  
Tel: 013 766 4004  
Fax: 013 766 4614  
Int: +27 13 766 4004  
Int: +27 13 766 4614

## Department of Economic Development, Environment and Tourism

Uitiko Letekutfutukiswa  
Kwetennofo, Simondzwo neteku Vakasha

Umgango WezokuThuthukiswa  
KoMnotho, iBheduluko nezama Vakathiho

Departement van Ekonomiese  
Ontwikkeling, Omgewing en Toerisme

Enquiries: ST Marebane  
Tel: 017 811 48230  
E-mail: [stmarebane@mpg.gov.za](mailto:stmarebane@mpg.gov.za)

FFs Refiners (Pty) Ltd  
PO Box 25102  
Sea View  
4072

Attention: Mr Neil Yelland

Dear Sir

### THE PROPOSED CONSTRUCTION OF PROCESS FACILITY TO REMOVE CONTAMINATANTS FROM WAXY OIL AT FFS REFINERS, EVANDER, GOVAN MBEKI LOCAL MUNICIPALITY

1. The Department has evaluated the Scoping Report and Plan of study for Environmental Impact Assessment, which was submitted by you in respect of the abovementioned application. You may now proceed with the EIA process as required in terms of the Environmental Impact Assessment Regulations, 2010.
2. This department reserves the right to its initial comments and can request further comments based on new or additional information received.

Yours faithfully

*[Signature]*

Director: EIM

19/05/2011

Date

Cc: Leena Ackbar (Kerry Seppings Environmental Management Specialists cc)

Fax: (031) 459 5326 / 031 769 1579

*MB Leena  
Not member with the  
Consulting Company any more  
27.05.2011  
Please e-mail the letter to  
FFS Refiners*



# MPUMALANGA PROVINCIAL GOVERNMENT

Building No. 4  
No. 7 Government Boulevard  
Riverside Park Extension 2  
Nelspruit  
1200  
South Africa



Private Bag X 11215  
Nelspruit, 1200  
Tel: 013 766 4004  
Fax: 013 766 4614  
Int: +27 13 766 4004  
Int: +27 13 766 4614

## Department of Economic Development, Environment and Tourism

Litiko Letekutfutukiswa  
Kwelenzima, Simondzwe nelekuVakasha

Umgango WezokuThuthukiswa  
KoMnotho, iBhoduluko nezamaVakatjho

Departement van Ekonomiese  
Ontwikkeling, Omgewing en Toerisme

**Enquiries** : Bulelwa Shabalala  
**Telephone** : (017) 811 3944  
**Reference** : 17/2/3/8 GS-5

Alison Haycock  
FFS Refiners (Pty) Ltd  
P.O. Box 25102  
**Sea View**  
4072

**Fax** : (031) 459 5326  
**E-mail** : alisonh@ffs.co.za

Dear Sir/Madam

### **APPLICATION FOR EXEMPTION IN RESPECT OF THE PROPOSED CONSTRUCTION OF 2500M<sup>2</sup> PROCESSING FACILITY TO REMOVE CONTAMINANTS FROM WAXY OIL AT FFS ON ERF 1940, GOVAN MBEKI LOCAL MUNICIPALITY, MPUMALANGA PROVINCE.**

Your application for exemption refers.

1. Your application for exemption in terms of the provisions of section 50 of the Environmental Impact Assessment Regulations (EIA), 2010 is hereby granted.
2. **You are exempted from complying with the following:**
  - (a) Section 29 of the Environmental Impact Assessment Regulations (EIA), 2010.
3. **The background and reasons for the exemption**
  - (a) The Scoping Report was accepted by the Department during May 2011. The Application subsequently lapsed due to non-compliance with Section 67 of the EIA Regulations.
  - (b) The applicant submits that no changes are anticipated in the scope of work previously applied for.
  - (c) The specialist studies as were outlined in the plan of study for the Environmental Impact Assessment have now been completed and this information would not change even if a new scoping report has to be compiled.



4. **Conditions of the exemption**

You are instructed to notify Interested and Affected Parties of the exemption and obtain any new comments in line with applicable review timeframes.

5. You may proceed with the Environmental Impact Assessment process after compliance with (4) above.

Yours sincerely

**Mr SS Maluleka**

**Chief Director: Environmental Impact Management**

**Date:** 17.06.13

cc: Kerry Stanton

Kerry Seppings Environmental Specialists cc

[kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

## KSEMS

---

**From:** KSEMS <kerry.seppings@telkomsa.net>  
**Sent:** 04 September 2013 12:50 PM  
**To:** vsenene@environment.gov.za; 'mthaledi@mpg.gov.za'; dan.hlanyane@gsibande.gov.za; stmarebane@mpg.gov.za; tmogakabe@mpg.gov.za; 'mmposi@mpg.gov.za'; albert.o@govanmbeki.gov.za; 'kamesh.r@govanmbeki.gov.za'; 'ignatius.m@govanmbeki.gov.za'; 'nomsa.t@govanmbeki.gov.za'; 'nomsa.thabethe@gmail.com'; 'lekoanej@dwa.gov.za'  
**Subject:** FW: FFS Waxy Oil (17/2/3/8 GS-05) update  
**Attachments:** Exemption from SR.pdf

Good Morning I & APs

This email is to notify you of the release of the Draft Environmental Impact Report (EIR) for the above mentioned project. The EIR will be released for comment tomorrow for a period of 40 days.

The initial Scoping Report was accepted by the Department of Economic Development, Environment and Tourism (DEDET) in May 2011 however due to various delays with the required specialist studies, there has been a delay with the release of the EIR. Since the scope of the study has not changed, KSEMS has been exempt from re-writing the Scoping Report (please see attached exemption).

Kind Regards,

Stephanie Williams  
Lead Environmental Scientist



Kerry Seppings Environmental Management Specialists cc  
Postal P.O. Box 396; Gillitts; 3603  
Ph: 031 769 1578  
Fax: 086 535 5281  
Website [www.ksems.co.za](http://www.ksems.co.za)

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## KSEMS

---

**From:** KSEMS <kerry.seppings@telkomsa.net>  
**Sent:** 04 September 2013 12:56 PM  
**To:** 'jwetton@wessanorth.co.za'; 'makola1mt@vodamail.co.za'; 'hein@binyanetraining.co.za'; 'bev@naca.org.za'; 'vnkosi@randwater.co.za'; kchetty@randwater.co.za; 'chelek@telkomsa.net'; 'rosa@topfix.co.za'; rhamid@energotech.co.za; 'walkerparkgc@mweb.co.za'  
**Subject:** FFS Waxy Oil (17/2/3/8 GS-05) update  
**Attachments:** Exemption from SR.pdf

Good Morning I & APs

This email is to notify you of the release of the Draft Environmental Impact Report (EIR) for the above mentioned project. The EIR will be released for comment tomorrow for a period of 40 days.

The initial Scoping Report was accepted by the Department of Economic Development, Environment and Tourism (DEDET) in May 2011 however due to various delays with the required specialist studies, there has been a delay with the release of the EIR. Since the scope of the study has not changed, KSEMS has been exempt from re-writing the Scoping Report (please see attached exemption).

Kind Regards,

Stephanie Williams  
Lead Environmental Scientist



Kerry Seppings Environmental Management Specialists cc  
Postal P.O. Box 396; Gillitts; 3603  
Ph: 031 769 1578  
Fax: 086 535 5281  
Website [www.ksems.co.za](http://www.ksems.co.za)

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## **Appendix 9.7: Proof of Distribution of Draft and Final EIR**

To be included in the Final EIR

## Appendix 9.8: Comments and Response Table

## Comments and Responses Report

### Comments received on the Draft Scoping Report

| Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | From / Date                                                  | Response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>What is the status of the monitoring committee for the Hazardous facility? It is important for I &amp; AP's, to have confidence in FFS's capacity to apply the proposed Environmental Management Plans.</p> <p>It is important to show the company's ability/capacity and willingness to conform to the plans which they produce, which would be best done by showing existence compliance levels. Identifying impacts and providing mitigating measures is academic – compliance is what counts.</p> <p>I am sure that the pending Risk Assessment and EIA will provide adequate information for the Authorities to make a decision on the project.</p> <p>Lastly – Have the Govan Mbeki Municipality done anything about the Air Quality By Laws that are required for our district.</p> | <p>Andrew Manning<br/>(01/08/2010)</p>                       | <p>The last Environmental Liaison meeting was scheduled for 20/07/2010. However none of the invitees attended the meeting. These meetings are held every 6 months.</p> <p>The existing FFS Evander tar processing plant is operated according to an environmental management system based on ISO14001. As such FFS have adopted procedures to ensure the environmentally responsible operation and management of the plant. The same will apply to the proposed tank storage facility.</p> <p>With regards to compliance to their existing EMP, this lies outside the scope of the EIA. FFS have submitted that they conduct bi-annual permit condition audits (last done 12/05/10). This includes an audit of compliance to the EMP, EIR and ROD conditions set out for the existing operation. If non-compliances are noted, then these are logged as Incidents/Non-conformances on Isometrix (FFS's electronic environmental management system). Actions are then opened with target dates and responsible person/s allocated to ensure that they are resolved and closed timeously.</p> <p>Comment noted.</p> <p>The publication of the Air Quality Bylaws by the municipality is outside the scope of this EIA. However, the EAP has followed up with municipality. The by-law has still not been published. Once the by-law is completed, it will be published on the official Govan Mbeki municipal website.</p> |
| <p>Mr Ross has confirmed that he has no issues with the proposed project.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>Neil Ross - Govan Mbeki Municipality<br/>(29/07/2010)</p> | <p>Comment noted.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | From / Date                              | Response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The only input I have is the MHI circles that must be indicated. Not only the new circles but also the existing and you need to document the joint impact it might have on the plant and all surrounding properties.</p> <p>Kindly be advised that in terms of any industrial activity that has Major Hazardous Installations on site, various pollution lines are determined. In the case of FFS, there should be various circles of pollution included on all the various installations that are on site and that is proposed. This is similar to Sasol's MHI. The report must clearly indicate all the circles and it must also be contained in your report on what influences this will have on the site and the surrounding sites. What on site plan does exist, what is proposed and similarly for the off-site scenario. I trust this is much more clear to you now.</p> | <p>Kamesh<br/>Rohan<br/>(11/08/2010)</p> | <p>Comment noted. A MHI has been conducted and will be discussed further in the EIR. The MHI will include information on the risk circles for the proposed installation. The potential impact of the proposal on the site and surrounding sites will be discussed.</p> <p>The MHI does not indicate pollution extent, but rather the possible extent of risk involved with an incident. These are indicated in the report. The report does indicate the possible impacts associated with each type of incident considered.</p> <p>Page 9 of the MHI report depicts the site plan, and indicates in red the proposed waxy oil processing facility. FFS have an existing on site emergency plan which will be extended to include the proposed facility.</p> |

| Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | From / Date                                                                          | Response                                                                                                                                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Thank you for your indication that development is to take place in this area.</p> <p>In terms of the National Heritage Resources Act, no 25 of 1999, heritage resources, including archaeological or palaeontological sites over 100 years old, graves older than 60 years, structures older than 60 years are protected. They may not be disturbed without a permit from the relevant heritage resources authority. This means that before such sites are disturbed by development it is incumbent on the developer (or mine) to ensure that a Heritage Impact Assessment is done. This must include the archaeological component (Phase 1) and any other applicable heritage components. Appropriate (Phase 2) mitigation, which involves recording, sampling and dating sites that are to be destroyed, must be done required.</p> <p>In the application received by SAHRA it was noted that the proposed project will occur within an existing industrial landscape. The likelihood of archaeological resources within the proposed project area is minimal. A phase 1 Archaeological Impact Assessment is therefore not required in this instance. However, please note that:</p> <ul style="list-style-type: none"> <li>Where bedrock is to be affected, or where there are coastal, or marine or river terraces and in potentially fossiliferous superficial deposits, a Paleontological desktop study must be undertaken to assess whether or not the development will impact upon paleontological resources – or at least a letter of exemption from a Palaeontologist is needed to indicate that this is unnecessary. If the area is deemed sensitive, a full phase 1 paleontological impact assessment will be required and if necessary a phase 2 rescue operation might be necessary.</li> </ul> <p>Any other heritage resources that may be impacted such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves of victims of conflict, and cultural landscapes or viewpoints must also be assessed.</p> | <p>SAHRA<br/>(Letter dated 18/08/2010)<br/>(Letter received via post 02/09/2010)</p> | <p>Comment noted. Please note that the proposed development will occur within an existing industrial site. Should any graves or artefacts be identified, construction will immediately stop and SAHRA will be notified.</p> |

## KSEMS

---

**From:** Andrew Manning [agmanning@lantic.net]  
**Sent:** 14 July 2009 06:57 AM  
**To:** 'KSEMS'  
**Subject:** RE: FFS Waxy Oil - (17/2/2/1(e)GS-03)

Greetings Leena

I am sorry that there was a poor response to the meeting. I know how frustrating it is when you get no input from civil society. (People are far better at complaining than at actually doing something). Please just make sure that you still follow process, and do what is required in terms of P2. I will make an effort to send comment to you when I am back from leave. I look forward to receiving the documentation.

Regards

Andrew Manning.

Reverend Andrew Manning (Rector)  
Anglican Church of Southern Africa  
Diocese of the Highveld  
IGWA Archdeaconry  
Cluster Parish of Evander  
(St Peter's Evander, St Joseph's Secunda, St Luke's Kinross,  
St Bede's Bethal, St Thomas' Kriel and St Columba's Devon)  
017 634 5184  
082 370 4702  
rector@parishofevander.co.za  
The Rectory: 3 Pannevis Street Secunda  
P O Box 5726  
Secunda 2302

-----Original Message-----

**From:** KSEMS [mailto:kerry.seppings@telkomsa.net]  
**Sent:** 13 July 2009 02:04 PM  
**To:** SURGEON@environ1.agric.za; elzet.w@govanmbeki.gov.za; keetm@dwaf.gov.za; gtshivhalavhala@mp.sahra.org.za; gbarnes@wessanorth.co.za; milnej@vodamail.co.za; bev@naca.org.za; kchetty@randwater.co.za; albert.o@govanmbeki.gov.za; brenda.e@govanmbeki.gov.za; ThimishaT@dwaf.gov.za; tebogo@environ1.agric.za; kamesh.r@govanmbeki.gov.za; kwebb@wessanorth.co.za; agmanning@lantic.net; amvantienhoven@gmail.com; angy.b@govanmbeki.gov.za  
**Subject:** FFS Waxy Oil - (17/2/2/1(e)GS-03)

Dear I&AP,

Please note that the public meeting scheduled for the 22<sup>nd</sup> of July 2009 has been cancelled due to a lack of interest in attending. Please feel free to forward comments on the EIA for the proposed waxy oil processing facility at FFS Refiners, Evander.

All documentation regarding this EIA will be sent to you and you will be kept informed of the EIA process. You will be notified as soon as the scoping report is available for comment.

Kind regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; Access off Shongweni Road, Hillcrest  
Postal P.O. Box 396; Gillitts; 3603  
Phone 031 765 6636

## KSEMS

---

**From:** Kamesh Rohan [kamesh.r@govanmbeki.gov.za]  
**Sent:** 13 July 2009 02:15 PM  
**To:** 'KSEMS'  
**Cc:** 'Albert Olivier'; 'Ignatius Mandla Mathebula'; 'Sello Duma'  
**Subject:** RE: FFS Waxy Oil - (17/2/2/1(e)GS-03)

Your mail below refers.

Kindly be advised that it is imperative that a copy of the scoping report is made available to the Govan Mbeki Municipality for attention Mr. K Rohan. Our comments are reserved pending the delivery of the Scoping report and thus comments will be forwarded once we have studied the mentioned report.

I trust you find the above in-order. Thank you

Kamesh Rohan  
manager: physical development  
(017) 620 6075  
084 401 2137

---

**From:** KSEMS [mailto:kerry.seppings@telkomsa.net]  
**Sent:** 13 July 2009 02:04 PM  
**To:** SURGEON@environ1.agric.za; elzet.w@govanmbeki.gov.za; keetm@dwaf.gov.za; gtshivhalavhala@mp.sahra.org.za; gbarnes@wessanorth.co.za; milnej@vodamail.co.za; bev@naca.org.za; kchetty@randwater.co.za; albert.o@govanmbeki.gov.za; brenda.e@govanmbeki.gov.za; ThimishaT@dwaf.gov.za; tebogo@environ1.agric.za; kamesh.r@govanmbeki.gov.za; kwebb@wessanorth.co.za; agmanning@lantic.net; amvantienhoven@gmail.com; angy.b@govanmbeki.gov.za  
**Subject:** FFS Waxy Oil - (17/2/2/1(e)GS-03)

Dear I&AP,

Please note that the public meeting scheduled for the 22<sup>nd</sup> of July 2009 has been cancelled due to a lack of interest in attending. Please feel free to forward comments on the EIA for the proposed waxy oil processing facility at FFS Refiners, Evander.

All documentation regarding this EIA will be sent to you and you will be kept informed of the EIA process. You will be notified as soon as the scoping report is available for comment.

Kind regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; Access off Shongweni Road, Hillcrest  
Postal P.O. Box 396; Gillitts; 3603  
Phone 031 765 6636  
Fax 031 765 6632  
Website [www.ksems.co.za](http://www.ksems.co.za)

## KSEMS

---

**From:** Karen Chetty [kchetty@randwater.co.za]  
**Sent:** 13 July 2009 10:53 AM  
**To:** KSEMS  
**Subject:** RE: FFS Waxy Oil - (17/2/2/1(e)GS-03)

Good morning

I have another meeting for the 22<sup>nd</sup> of July. Please can you send me relevant information/reports once they are available.

Regards,

**Karen Chetty (Senior Water Quality Advisor - Vaal Dam)**  
**Snail Mail** PO Box 1127 Johannesburg 2000 · **By Road** 522 Impala Road Glenvista 2058  
**Tel** +27 (0)11 682-0735 · **Fax** +27 (0)86 693 2910 · **Cell** +27 (0)82 389-0374  
**Email** kchetty@randwater.co.za · **Web** [www.reservoir.co.za](http://www.reservoir.co.za)



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**From:** KSEMS [mailto:kerry.seppings@telkomsa.net]  
**Sent:** 08 July 2009 12:43  
**To:** SURGEON@environ1.agric.za; elzet.w@govanmbeki.gov.za; keetm@dwaf.gov.za; gtshivhalavhal@mp.sahra.org.za; gbarnes@wessanorth.co.za; milnej@vodamail.co.za; bev@naca.org.za; Karen Chetty; albert.o@govanmbeki.gov.za; brenda.e@govanmbeki.gov.za; ThimishaT@dwaf.gov.za; tebogo@environ1.agric.za; kamesh.r@govanmbeki.gov.za; kwebb@wessanorth.co.za; agmanning@lantic.net  
**Subject:** FFS Waxy Oil - (17/2/2/1(e)GS-03)

Dear I&AP,

You are registered for the EIA for the Proposed waxy oil processing facility at FFS Refiners in Evander (EIA number: 17/2/2/1(e)GS-03).

A public meeting was originally advertised for the 18<sup>th</sup> of March 2009 at the Walker Park Golf Club but the meeting was postponed due to technical issues. We have now re-scheduled the meeting; we have tentatively set the meeting for the 22<sup>nd</sup> of July 2009 between 11am and 1pm at the same venue. Please advise if the time is convenient for you. Should you wish to attend the meeting please confirm by no later than the 10<sup>th</sup> of July 2009; we would greatly appreciate an early confirmation as we are a Durban based consultancy and have to make logistical arrangements for the meeting.

Please note that should you not wish to attend the meeting, we would be happy to forward you further information and reports and keep you up to date about the EIA process.

Just as a refresher, I have re-attached the background information document for your perusal.

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; Access off Shongweni Road, Hillcrest  
Postal P.O. Box 396; Gillitts; 3603  
Phone 031 765 6636  
Fax 031 765 6632  
Website [www.ksems.co.za](http://www.ksems.co.za)

---

Disclaimer

2010/06/18



## KSEMS

---

**From:** anna mieke van tienhoven [amvantienhoven@gmail.com]  
**Sent:** 09 July 2009 11:27 AM  
**To:** Bev Terry; kerry.seppings@telkomsa.net  
**Subject:** Re: FW: FFS Waxy Oil - (17/2/2/1(e)GS-03)

Dear Leena

Bev Terry forwarded your email re the EIA. Unfortunately I will not be able to attend the meeting, but would appreciate being kept informed of developments.

Kind regards  
Mieke

---

>  
> From: KSEMS [mailto:kerry.seppings@telkomsa.net]  
> Sent: 08 July 2009 12:43 PM  
> To: SURGEON@environ1.agric.za; elzet.w@govanmbeki.gov.za;  
> keetm@dwaf.gov.za; gtshivhalavhal@mp.sahra.org.za;  
> gbarnes@wessanorth.co.za; milnej@vodamail.co.za; bev@naca.org.za;  
> kchetty@randwater.co.za; albert.o@govanmbeki.gov.za;  
> brenda.e@govanmbeki.gov.za; ThimishaT@dwaf.gov.za;  
> tebogo@environ1.agric.za; kamesh.r@govanmbeki.gov.za;  
> kwebb@wessanorth.co.za; agmanning@lantic.net  
> Subject: FFS Waxy Oil - (17/2/2/1(e)GS-03)  
>  
>  
>  
> Dear I&AP,  
>  
>  
>  
> You are registered for the EIA for the Proposed waxy oil processing  
> facility at FFS Refiners in Evander (EIA number: 17/2/2/1(e)GS-03).  
>  
>  
>  
> A public meeting was originally advertised for the 18th of March 2009  
> at the Walker Park Golf Club but the meeting was postponed due to technical issues.  
> We have now re-scheduled the meeting; we have tentatively set the  
> meeting for the 22nd of July 2009 between 11am and 1pm at the same  
> venue. Please advise if the time is convenient for you. Should you  
> wish to attend the meeting please confirm by no later than the 10th of  
> July 2009; we would greatly appreciate an early confirmation as we are  
> a Durban based consultancy and have to make logistical arrangements for the meeting.  
>  
>  
>  
> Please note that should you not wish to attend the meeting, we would  
> be happy to forward you further information and reports and keep you  
> up to date about the EIA process.  
>  
>  
>  
> Just as a refresher, I have re-attached the background information  
> document for your perusal.  
>  
>  
>  
> Leena Ackbar  
>  
>  
>  
>  
>

## KSEMS

---

**From:** Angelique Badenhorst [angy.b@govanmbeki.gov.za]  
**Sent:** 09 July 2009 10:18 AM  
**To:** 'KSEMS'  
**Subject:** RE: FFS Waxy Oil - (17/2/2/1(e)GS-03)

Morning Leena,

Mr MB Knowles will not be able to attend this meeting, he is on leave at the moment and he will only be in the office on the 27<sup>th</sup> July 2009. Any information prior to the meeting that will take place can be sent to this email, I will update him on the progress.

Thank You. Have a lovely day further.

*Regards*  
*Angelique Badenhorst*  
*Secretary : Director - Enviromental Affairs and Tourism*  
*Govan Mbeki Municipality*  
*Private Bag X1017*  
*Secunda*  
*2302*  
*Work : (017) 620 6209*  
*Mobile : (073) 199 2167*  
*Fax : (017) 634 5373*  
*Email : [angy.b@govanmbeki.gov.za](mailto:angy.b@govanmbeki.gov.za)*

---

**From:** KSEMS [mailto:kerry.seppings@telkomsa.net]  
**Sent:** 09 July 2009 08:43 AM  
**To:** [angy.b@govanmbeki.gov.za](mailto:angy.b@govanmbeki.gov.za)  
**Subject:** FFS Waxy Oil - (17/2/2/1(e)GS-03)

Dear I&AP,

You are registered for the EIA for the Proposed waxy oil processing facility at FFS Refiners in Evander (EIA number: 17/2/2/1(e)GS-03).

A public meeting was originally advertised for the 18<sup>th</sup> of March 2009 at the Walker Park Golf Club but the meeting was postponed due to technical issues. We have now re-scheduled the meeting; we have tentatively set the meeting for the 22<sup>nd</sup> of July 2009 between 11am and 1pm at the same venue. Please advise if the time is convenient for you. Should you wish to attend the meeting please confirm by no later than the 10<sup>th</sup> of July 2009; we would greatly appreciate an early confirmation as we are a Durban based consultancy and have to make logistical arrangements for the meeting.

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Just as a refresher, I have re-attached the background information document for your perusal.

Leena Ackbar

## KSEMS

---

**From:** Andrew Manning [agmanning@lantic.net]  
**Sent:** 08 July 2009 05:25 PM  
**To:** 'KSEMS'  
**Subject:** RE: FFS Waxy Oil - (17/2/2/1(e)GS-03)

Thank you very much. Unfortunately I will not be able to attend the meeting but would appreciate receiving all relevant documentation.

Andrew Manning

Reverend Andrew Manning (Rector)  
Anglican Church of Southern Africa  
Diocese of the Highveld  
IGWA Archdeaconry  
Cluster Parish of Evander  
(St Peter's Evander, St Joseph's Secunda, St Luke's Kinross,  
St Bede's Bethal, St Thomas' Kriel and St Columba's Devon)  
017 634 5184  
082 370 4702  
rector@parishofevander.co.za  
The Rectory: 3 Pannevis Street Secunda  
P O Box 5726  
Secunda 2302

-----Original Message-----

**From:** KSEMS [mailto:kerry.seppings@telkomsa.net]  
**Sent:** 08 July 2009 12:43 PM  
**To:** SURGEON@environ1.agric.za; elzet.w@govanmbeki.gov.za; keetm@dwaf.gov.za;  
gtshivhalavhal@mp.sahra.org.za; gbarnes@wessanorth.co.za; milnej@vodamail.co.za;  
bev@naca.org.za; kchetty@randwater.co.za; albert.o@govanmbeki.gov.za;  
brenda.e@govanmbeki.gov.za; ThimishaT@dwaf.gov.za; tebogo@environ1.agric.za;  
kamesh.r@govanmbeki.gov.za; kwebb@wessanorth.co.za; agmanning@lantic.net  
**Subject:** FFS Waxy Oil - (17/2/2/1(e)GS-03)

Dear I&AP,

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Please note that should you not wish to attend the meeting, we would be happy to forward you further information and reports and keep you up to date about the EIA process.

Just as a refresher, I have re-attached the background information document for your perusal.

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; Access off Shongweni Road, Hillcrest  
Postal P.O. Box 396; Gillitts; 3603  
Phone 031 765 6636

## KSEMS

---

**From:** Thimisha Takalani (PTA) [ThimishaT@dwaf.gov.za]  
**Sent:** 08 July 2009 02:39 PM  
**To:** Lekoane Joyce (GAU)  
**Cc:** KSEMS  
**Subject:** RE: FFS Waxy Oil - (17/2/2/1(e)GS-03)

Hi Joyce,

FYA.

Regards,

Takalani.

---

**From:** KSEMS [mailto:kerry.seppings@telkomsa.net]  
**Sent:** 08 July 2009 12:43 PM  
**To:** SURGEON@environ1.agric.za; elzet.w@govanmbeki.gov.za; Keet Marius (PTA); gtshivhalavhal@mp.sahra.org.za; gbarnes@wessanorth.co.za; milnej@vodamail.co.za; bev@naca.org.za; kchetty@randwater.co.za; albert.o@govanmbeki.gov.za; brenda.e@govanmbeki.gov.za; Thimisha Takalani (PTA); tebogo@environ1.agric.za; kamesh.r@govanmbeki.gov.za; kwebb@wessanorth.co.za; agmanning@lantic.net  
**Subject:** FFS Waxy Oil - (17/2/2/1(e)GS-03)

Dear I&AP,

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Please note that should you not wish to attend the meeting, we would be happy to forward you further information and reports and keep you up to date about the EIA process.

Just as a refresher, I have re-attached the background information document for your perusal.

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; Access off Shongweni Road, Hillcrest  
Postal P.O. Box 396; Gillitts; 3603  
Phone 031 765 6636  
Fax 031 765 6632  
Website [www.ksems.co.za](http://www.ksems.co.za)

### DISCLAIMER:

This message and any attachments are confidential and intended solely for the addressee. If you have received this message in error, please notify the system manager/sender. Any unauthorized use, alteration or dissemination is prohibited. The Department of Water Affairs and Forestry further accepts no liability whatsoever for any loss, whether it be direct, indirect or consequential, arising

## KSEMS

---

**From:** Albert Olivier [albert.o@govanmbeki.gov.za]  
**Sent:** 10 March 2009 04:06 PM  
**To:** 'KSEMS'  
**Subject:** RE: FFS Waxy oil

Thanks for the notification

### ***Albert Olivier***

Deputy Director Technical and Engineering Services  
Head: Physical Development and Public Works

Govan Mbeki Municipality  
Private Bag X1017  
Secunda  
2302  
Tel: 017-620 6007  
Cell: 082 414 3771  
Fax: 017-631 3599

---

**From:** KSEMS [mailto:kerry.seppings@telkomsa.net]  
**Sent:** 10 March 2009 02:49 PM  
**To:** SURGEON@environ1.agric.za; elzet.w@govanmbeki.gov.za; keetm@dwaf.gov.za;  
gtshivhalavhala@mp.sahra.org.za; gbarnes@wessanorth.co.za; milnej@vodamail.co.za; bev@naca.org.za;  
kchetty@randwater.co.za; albert.o@govanmbeki.gov.za; brenda.e@govanmbeki.gov.za;  
ThimishaT@dwaf.gov.za; tebogo@environ1.agric.za; kamesh.r@govanmbeki.gov.za  
**Subject:** FFS Waxy oil

Dear I&AP,

We regret that the open day scheduled for Wednesday the 18<sup>th</sup> of March 2009 has been temporarily postponed. A new meeting date will be confirmed.

We apologise for any inconvenience.

Kind regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; 1a Delamore Road; Hillcrest, 3610  
Phone 031 765 6636  
Fax 031 765 6632  
E-mail [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

## KSEMS

---

**From:** Kamesh Rohan [kamesh.r@govanmbeki.gov.za]  
**Sent:** 06 March 2009 07:31 AM  
**To:** 'KSEMS'  
**Subject:** RE: FFS Waxy Oil Confirmation of open day

Hi

Kindly accept this mail as my confirmation of attendance. The time is suitable. Thank you

Kamesh Rohan  
manager: physical development  
(017) 620 6075  
084 401 2137

---

**From:** KSEMS [mailto:kerry.seppings@telkomsa.net]  
**Sent:** 05 March 2009 04:02 PM  
**To:** SURGEON@environ1.agric.za; elzet.w@govanmbeki.gov.za; keetm@dwaf.gov.za;  
gtshivhalavhala@mp.sahra.org.za; gbarnes@wessanorth.co.za; milnej@vodamail.co.za; bev@naca.org.za;  
kchetty@randwater.co.za; albert.o@govanmbeki.gov.za; brenda.e@govanmbeki.gov.za;  
ThimishaT@dwaf.gov.za; tebogo@environ1.agric.za; kamesh.r@govanmbeki.gov.za; mwbmd@mweb.co.za  
**Subject:** FFS Waxy Oil Confirmation of open day

Dear I&AP,

Please confirm interest in attending the open day for the waxy oil processing facility at FFS Evander scheduled for the 18<sup>th</sup> of March 2009. The open day will be held at the Walker Park Golf Club from 4pm to 6pm. Please indicate if this time is convenient for you.

Confirmation must be sent by no later than Friday the 13<sup>th</sup> of March 2009.

Kind regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; 1a Delamore Road; Hillcrest, 3610  
Phone 031 765 6636  
Fax 031 765 6632  
E-mail [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

## KSEMS

---

**From:** Kamesh Rohan [kamesh.r@govanmbeki.gov.za]  
**Sent:** 06 March 2009 07:32 AM  
**To:** 'KSEMS'  
**Subject:** RE: FFS Waxy Oil I&AP

thank you

Kamesh Rohan  
manager: physical development  
(017) 620 6075  
084 401 2137

---

**From:** KSEMS [mailto:kerry.seppings@telkomsa.net]  
**Sent:** 05 March 2009 04:02 PM  
**To:** kamesh.r@govanmbeki.gov.za  
**Subject:** FFS Waxy Oil I&AP

Dear Kamesh,

Thank you for your interest. You have been registered as an I&AP. You will be kept informed about the EIA process for the waxy oil processing facility at FFS Refiners in Evander. Please feel free to contact me should you have any queries, concerns or information requests regarding the project. I will confirm the time for the open day with you soon.

Kind regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; 1a Delamore Road; Hillcrest, 3610  
Phone 031 765 6636  
Fax 031 765 6632  
E-mail [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

**From:** Kamesh Rohan [mailto:kamesh.r@govanmbeki.gov.za]  
**Sent:** 03 March 2009 03:59 PM  
**To:** kerry.seppings@telkomsa.net  
**Subject:** Registration as an Interested and Affected Party

Kindly acknowledge my registration as an Interested and Affected Party. Please forward me the proposed day and time for the open day event that is mentioned in your advert. Thank you

Kamesh Rohan  
manager: physical development  
(017) 620 6075  
084 401 2137

## KSEMS

---

**From:** Andrew Manning [agmanning@lantic.net]  
**Sent:** 05 March 2009 10:58 PM  
**To:** kerry.seppings@telkomsa.net  
**Cc:** 'James Harris'  
**Subject:** FFS Waxy Oil

Hi Kerry

I would like to attend the Open day for the FFS Waxy oil project.

My specific concern is the cumulative impact of the multiple developments on the plant, and the cumulative impact of this project when considered with all the fuel industry impacts in the region.

I have read the Bid and have a number of concerns that I wish to seek clarity on.

Yours Sincerely

Andrew Manning

Reverend Andrew Manning (Rector)  
Anglican Church of Southern Africa  
Diocese of the Highveld  
IGWA Archdeaconry  
Cluster Parish of Evander  
(St Peter's Evander, St Joseph's Secunda, St Luke's Kinross,  
St Bede's Bethal, St Thomas's Kriel and St Columba's Devon)  
017 634 5184  
082 370 4702  
agmanning@lantic.net  
The Rectory: 3 Pannevis Street Secunda  
P O Box 5726  
Secunda 2302



## KSEMS

---

**From:** Albert Olivier [albert.o@govanmbeki.gov.za]  
**Sent:** 05 March 2009 04:19 PM  
**To:** 'KSEMS'  
**Subject:** RE: FFS Waxy Oil Confirmation of open day  
**Importance:** High

Dear Leena,

Yes it will be attended by myself !

### **Albert Olivier**

Deputy Director Technical and Engineering Services  
Head: Physical Development and Public Works

Govan Mbeki Municipality  
Private Bag X1017  
Secunda  
2302  
Tel: 017-620 6007  
Cell: 082 414 3771  
Fax: 017-631 3599

---

**From:** KSEMS [mailto:kerry.seppings@telkomsa.net]  
**Sent:** 05 March 2009 04:02 PM  
**To:** SURGEON@environ1.agric.za; elzet.w@govanmbeki.gov.za; keetm@dwaf.gov.za; gtshivhalavhala@mp.sahra.org.za; gbarnes@wessanorth.co.za; milnej@vodamail.co.za; bev@naca.org.za; kchetty@randwater.co.za; albert.o@govanmbeki.gov.za; brenda.e@govanmbeki.gov.za; ThimishaT@dwaf.gov.za; tebogo@environ1.agric.za; kamesh.r@govanmbeki.gov.za; mwbmmd@mweb.co.za  
**Subject:** FFS Waxy Oil Confirmation of open day

Dear I&AP,

Please confirm interest in attending the open day for the waxy oil processing facility at FFS Evander scheduled for the 18<sup>th</sup> of March 2009. The open day will be held at the Walker Park Golf Club from 4pm to 6pm. Please indicate if this time is convenient for you.

Confirmation must be sent by no later than Friday the 13<sup>th</sup> of March 2009.

Kind regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; 1a Delamore Road; Hillcrest, 3610  
Phone 031 765 6636  
Fax 031 765 6632  
E-mail [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

## KSEMS

---

**From:** KSEMS [kerry.seppings@telkomsa.net]

**Sent:** 05 March 2009 04:02 PM

**To:** 'kamesh.r@govanmbeki.gov.za'

**Subject:** FFS Waxy Oil I&AP

**Tracking:** Recipient

**Read**

'kamesh.r@govanmbeki.gov.za'

'Leena '

'Iain '

Read: 2009/03/05 04:22 PM

Dear Kamesh,

Thank you for your interest. You have been registered as an I&AP. You will be kept informed about the EIA process for the waxy oil processing facility at FFS Refiners in Evander. Please feel free to contact me should you have any queries, concerns or information requests regarding the project. I will confirm the time for the open day with you soon.

Kind regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; 1a Delamore Road; Hillcrest, 3610  
Phone 031 765 6636  
Fax 031 765 6632  
E-mail [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

**From:** Kamesh Rohan [mailto:kamesh.r@govanmbeki.gov.za]

**Sent:** 03 March 2009 03:59 PM

**To:** kerry.seppings@telkomsa.net

**Subject:** Registration as an Interested and Affected Party

Kindly acknowledge my registration as an Interested and Affected Party. Please forward me the proposed day and time for the open day event that is mentioned in your advert. Thank you

Kamesh Rohan  
manager: physical development  
(017) 620 6075  
084 401 2137

## KSEMS

---

**From:** Albert Olivier [albert.o@govanmbeki.gov.za]  
**Sent:** 05 March 2009 02:41 PM  
**To:** 'KSEMS'  
**Cc:** 'Kamesh Rohan'; 'Nic van der Merwe'; alison@ffs.co.za; andre@ffs.co.za; neily@ffs.co.za; Mr A Lotter  
**Subject:** RE: FFS Waxy oil  
**Importance:** High

Dear Leena,

Thanks for the background info made available to GMM.

It is important to note that your EIA for FFS Refiners is based on an illegal development on the said property. The existing Evander plant currently processing tar derived fuels into heating fuels for a wide variety of applications, is an illegal activity operating ito the National Building Regulations and the Mpumalanga Town-Planning and Townships Ordinance, No 15 of 1986.

GMM is taking note of the EIA process and the construction of a 2500 sq meter process to remove contaminants from waxy oil at FFS Refiners(PTY) Ltd, Evander, is not supported by GMM.

Please note that DALA, DR G Bachelor, will be informed accordingly.

Regards

**Albert Olivier**

Deputy Director Technical and Engineering Services  
Head: Physical Development and Public Works

Govan Mbeki Municipality  
Private Bag X1017  
Secunda  
2302  
Tel: 017-620 6007  
Cell: 082 414 3771  
Fax: 017-631 3599

---

**From:** KSEMS [mailto:kerry.seppings@telkomsa.net]  
**Sent:** 04 March 2009 02:00 PM  
**To:** SURGEON@environ1.agric.za; elzet.w@govanmbeki.gov.za; keetm@dwaf.gov.za; gtshivhalavhala@mp.sahra.org.za; gbarnes@wessanorth.co.za; milnej@vodamail.co.za; bev@naca.org.za; kchetty@randwater.co.za; albert.o@govanmbeki.gov.za; brenda.e@govanmbeki.gov.za; ThimishaT@dwaf.gov.za; tebogo@environ1.agric.za  
**Subject:** FFS Waxy oil

Dear I&AP,

Please see the attach background information document (BID) for the waxy oil processing facility EIA for FFS Refiners, Evander.

Kind regards,

2010/06/18

## KSEMS

---

**From:** KSEMS [kerry.seppings@telkomsa.net]

**Sent:** 26 February 2009 04:43 PM

**To:** 'ThimishaT@dwaf.gov.za'

**Subject:** FFS Waxy oil Registered I&AP

**Tracking:** Recipient

**Read**

'ThimishaT@dwaf.gov.za'

'Leena '

Read: 2009/02/26 04:49 PM

Dear Thimisha,

Thank you for your interest. You have been registered as an I&AP. You will be kept informed about the EIA process for the waxy oil processing facility at FFS Refiners in Evander. Please feel free to contact me should you have any queries, concerns or information requests regarding the project.

Kind regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; 1a Delamore Road; Hillcrest, 3610  
Phone 031 765 6636  
Fax 031 765 6632  
E-mail [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

---

**From:** Thimisha Takalani (PTA) [mailto:ThimishaT@dwaf.gov.za]

**Sent:** 25 February 2009 01:34 PM

**To:** KSEMS

**Subject:** RE: FFS Refiners (Pty) Ltd

Hi,

For Evander FFS.

---

**From:** KSEMS [mailto:kerry.seppings@telkomsa.net]

**Sent:** 25 February 2009 12:06 PM

**To:** Thimisha Takalani (PTA)

**Subject:** FFS Refiners (Pty) Ltd

Dear Takalani,

Please can specify for which FFS project you are registering for.

Kind regards,

Leena Ackbar

2010/06/18

## KSEMS

---

**From:** Thimisha Takalani (PTA) [ThimishaT@dwaf.gov.za]  
**Sent:** 25 February 2009 01:34 PM  
**To:** KSEMS  
**Subject:** RE: FFS Refiners (Pty) Ltd

Hi,

For Evander FFS.

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**From:** KSEMS [mailto:kerry.seppings@telkomsa.net]  
**Sent:** 25 February 2009 12:06 PM  
**To:** Thimisha Takalani (PTA)  
**Subject:** FFS Refiners (Pty) Ltd

Dear Takalani,

Please can specify for which FFS project you are registering for.

Kind regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; 1a Delamore Road; Hillcrest, 3610  
Phone 031 765 6636  
Fax 031 765 6632  
E-mail [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

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**From:** Thimisha Takalani (PTA) [mailto:ThimishaT@dwaf.gov.za]  
**Sent:** 24 February 2009 12:33 PM  
**To:** [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)  
**Subject:** FFS Refiners (Pty) Ltd

Good day,

Please register me (DWAF) as interested party. I have attached my details below.

Kind regards,

Ms. Takalani Thimisha  
Dept: Water Affairs and Forestry  
P/Bag X995, Pretoria, 0001  
Cell: 082 800 6938  
Tel: 012 392 1413  
Fax: 012 392 1359  
Email: [thimishat@dwaf.gov.za](mailto:thimishat@dwaf.gov.za)

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## KSEMS

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**From:** Garth Barnes [gbarnes@wessanorth.co.za]  
**Sent:** 24 February 2009 07:13 PM  
**To:** 'KSEMS'  
**Subject:** RE: FFS Waxy oil

Thank you. I shall wait for the BID.

Regards

**Garth Barnes**  
**Environmental Co-ordinator**  
**WESSA - Northern Region**



Tel: (011) 462 5663  
Fax: (011) 462 8364  
Cell: 082 296 1393  
Email: gbarnes@wessanorth.co.za

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**From:** KSEMS [mailto:kerry.seppings@telkomsa.net]  
**Sent:** Tuesday, February 24, 2009 11:57 AM  
**To:** gbarnes@wessanorth.co.za  
**Subject:** FFS Waxy oil

Dear Garth,

The proposal is for a processing facility to remove contaminants from waxy oil via several filtration steps which includes centrifugation. Details will be provided in the BID.

Regards,

Leena

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; 1a Delamore Road; Hillcrest, 3610  
Phone 031 765 6636  
Fax 031 765 6632  
E-mail [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

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**From:** Garth Barnes [mailto:gbarnes@wessanorth.co.za]  
**Sent:** 19 February 2009 08:28 AM  
**To:** 'KSEMS'  
**Subject:** RE: ffs evander

Good morning Leena,

A quick question: what is this application for?

Regards

**Garth Barnes**  
**Environmental Co-ordinator**  
**WESSA - Northern Region**



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**From:** KSEMS [mailto:kerry.seppings@telkomsa.net]  
**Sent:** Tuesday, February 17, 2009 4:37 PM  
**To:** gbarnes@wessanorth.co.za  
**Subject:** ffs evander

Dear Garth,

Our telephone conversation refers. I am trying to track down additional environmental/community groups that are predominant in Evander. Should you have knowledge of such groups, please forward me a list of contacts.

Kind regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; 1a Delamore Road; Hillcrest, 3610  
Phone 031 765 6636  
Fax 031 765 6632  
E-mail [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

## KSEMS

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**From:** Thimisha Takalani (PTA) [ThimishaT@dwaf.gov.za]  
**Sent:** 24 February 2009 12:33 PM  
**To:** kerry.seppings@telkomsa.net  
**Subject:** FFS Refiners (Pty) Ltd

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Please register me (DWAF) as interested party. I have attached my details below.

Kind regards,

Ms. Takalani Thimisha  
Dept: Water Affairs and Forestry  
P/Bag X995, Pretoria, 0001  
Cell: 082 800 6938  
Tel: 012 392 1413  
Fax: 012 392 1359  
Email: thimishat@dwaf.gov.za

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E-mail [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

\_\_\_\_\_ NOD32 3862 (20090217) Information \_\_\_\_\_

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<http://www.eset.com>

\_\_\_\_\_ NOD32 3873 (20090220) Information \_\_\_\_\_

This message was checked by NOD32 antivirus system.  
<http://www.eset.com>

## KSEMS

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**From:** Garth Barnes [gbarnes@wessanorth.co.za]  
**Sent:** 23 February 2009 05:22 PM  
**To:** 'KSEMS'  
**Cc:** 'Kim Webb'  
**Subject:** RE: FFS Waxy oil

Hi Leena,

Once again, i apologise for my tardiness. I look forward to the BID. Is this a chemical, water-related process or a chemical, air-related process?

Regards

**Garth Barnes**  
**Environmental Co-ordinator**  
**WESSA - Northern Region**



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**From:** KSEMS [mailto:kerry.seppings@telkomsa.net]  
**Sent:** Friday, February 20, 2009 2:20 PM  
**To:** gbarnes@wessanorth.co.za  
**Subject:** FFS Waxy oil

Hi Garth,

Sorry for the delay. I was out of the office yesterday. It is for the construction of a processing facility to remove contaminants from a product called waxy oil. A BID is being prepared, it will be sent to you shortly.

Regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc

2010/06/18

## KSEMS

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**From:** Garth Barnes [gbarnes@wessanorth.co.za]  
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A quick question: what is this application for?

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**Subject:** ffs evander

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Kind regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; 1a Delamore Road; Hillcrest, 3610  
Phone 031 765 6636

2010/06/18

## KSEMS

---

**From:** Garth Barnes [gbarnes@wessanorth.co.za]  
**Sent:** 18 February 2009 08:13 AM  
**To:** 'KSEMS'  
**Subject:** RE: ffs evander

Morning Leena,

As said on the phone, I apologise if I wasn't being very helpful. However, I will pay closer attention to this request when I get a chance later today or tomorrow and then forward any relevant info.

Regards

**Garth Barnes**  
**Environmental Co-ordinator**  
**WESSA - Northern Region**



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**Subject:** ffs evander

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Kind regards,

Leena Ackbar

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Unit 9 Bristol House; 1a Delamore Road; Hillcrest, 3610

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## KSEMS

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**From:** Karen Chetty [kchetty@randwater.co.za]  
**Sent:** 17 February 2009 03:42 PM  
**To:** KSEMS  
**Subject:** RE: FFS Evander waxy oil - notice of EIA

**Good afternoon**

**Please can you add my details to the IAP's list?  
I'll be the responsible person from Rand Water.**

**Regards,**

**Karen Chetty (Senior Water Quality Advisor - Vaal Dam)**  
**Snail Mail** PO Box 1127 Johannesburg 2000 • **By Road** 522 Impala Road Glenvista 2058  
**Tel** +27 (0)11 682-0735 • **Fax** +27 (0)86 693 2910 • **Cell** +27 (0)82 389-0374  
**Email** kchetty@randwater.co.za • **Web** [www.reservoir.co.za](http://www.reservoir.co.za)

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**From:** KSEMS [mailto:kerry.seppings@telkomsa.net]  
**Sent:** 17 February 2009 12:06  
**To:** SURGEON@environ1.agric.za; elzet.w@govanmbeki.gov.za; keetm@dwaf.gov.za;  
gbarnes@wessanorth.co.za; milnej@vodamail.co.za; gtshivhalavhala@mp.sahra.org.za;  
Emile.blaauw@sasol.com; Bertie.botha@sasol.com; Christi.brand@sasol.com; Karen Chetty;  
jankowitz@secunda.co.za; matsebe@dwaf.gov.za; Melato.m@govanmbeki.gov.za; Johan.nel3@sasol.com;  
Gail.nussey@sasol.com; albert.o@govanmbeki.gov.za; lab@otk.co.za; gideon.makhabela@harmony.co.za;  
annah.m@govanmbeki.gov.za; mwbmd@mweb.co.za  
**Subject:** FFS Evander waxy oil - notice of EIA

Dear Sir/Madam,

Kerry Seppings Environmental Management Specialists cc is conducting an environmental impact assessment for the proposed installation of a waxy oil processing facility at FFS Refiners (Pty) Ltd, Evander. Please see the attached notification.

Kind regards,

Leena Ackbar

Kerry Seppings Environmental Management Specialists cc  
Unit 9 Bristol House; 1a Delamore Road; Hillcrest, 3610  
Phone 031 765 6636  
Fax 031 765 6632  
E-mail [kerry.seppings@telkomsa.net](mailto:kerry.seppings@telkomsa.net)

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