

## EXECUTIVE SUMMARY OF THE BASIC ASSESSMENT REPORT:

### Introduction

Gasfit, an agent of Afrox, is planning to install a bulk LPG storage and filling facility at the existing gas storage depot, which is situated on Erf 5875 and 5876, Samuel Walters Road, Worcester, Western Cape. Gasfit purchased the new storage site and began trading in filled cylinders at the site mid-2019. Currently Gasfit transports filled cylinders from Afrox Epping branch (Cape Town) on a daily basis to Worcester. The daily transporting of LPG is already a health and safety risk to the Gasfit staff, as well as to members of the public, due to the risks associated with road transportation.

Market projections indicate an increase in LPG demand in the near future (due to increased loadshedding by Eskom, convenience of using gas), trading in cylinders filled in Cape Town and transported to site daily will add unnecessary inefficiencies, operating costs and increase safety risks due to the increased volume of cylinders that need to be managed to meet the market demand. The proposed application is to enable cylinder filling on site by installing a 70m<sup>3</sup> LPG bulk storage tank and cylinder filling equipment rather than to transport filled cylinders from Cape Town.

### Site description

The Gasfit depot is located within the urban edge of Worcester, adjacent to Samuel Walters Street, which is located within the Industrial Zone of Worcester. The site is surrounded by industrial type activities, with the Hex River approximately 400m east of the site. Please refer to the figure below and **Appendix A**, which shows the location of the site.

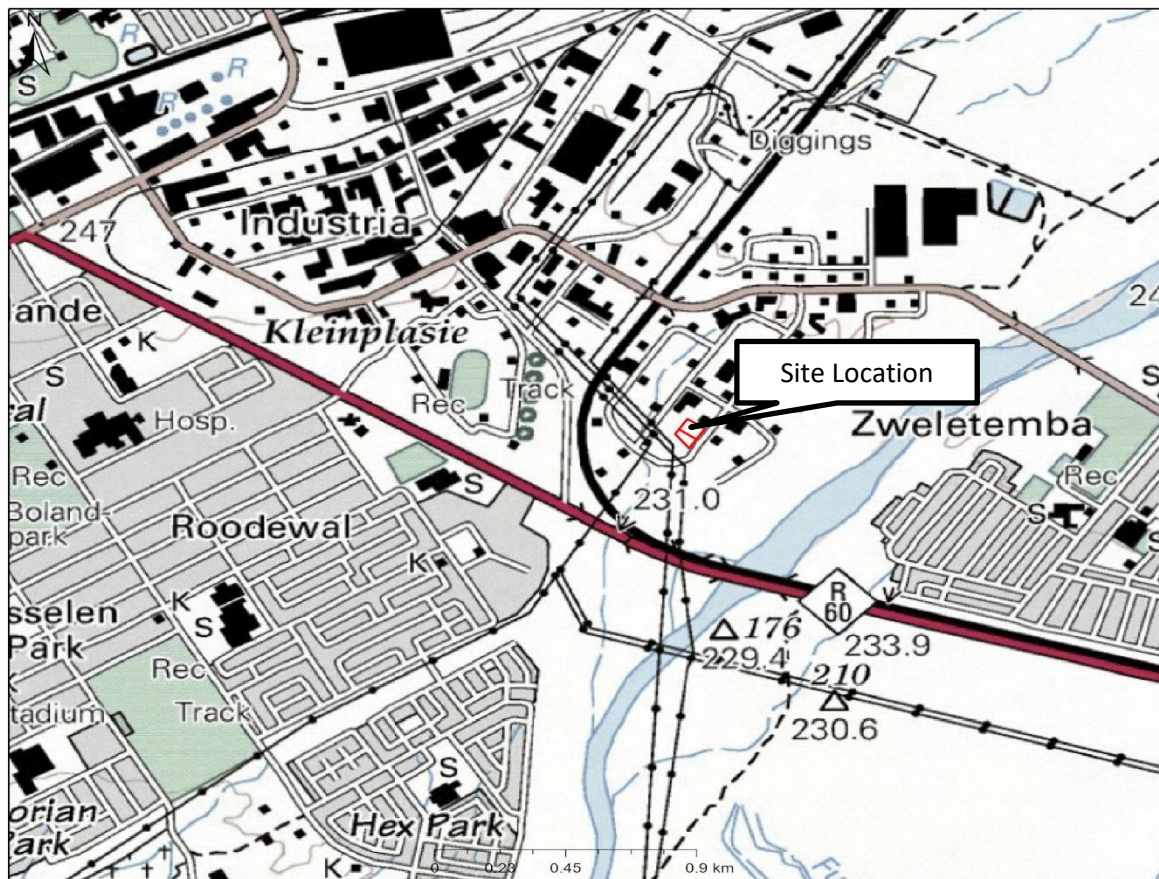


Figure 1: Locality Map of the proposed development site (Source: Cape Farm Mapper, 2020).

## Summary of Proposed Development

Please refer to the Site Layout Plan in **Appendix B**, and Figure 2 below. In summary, the following is proposed:

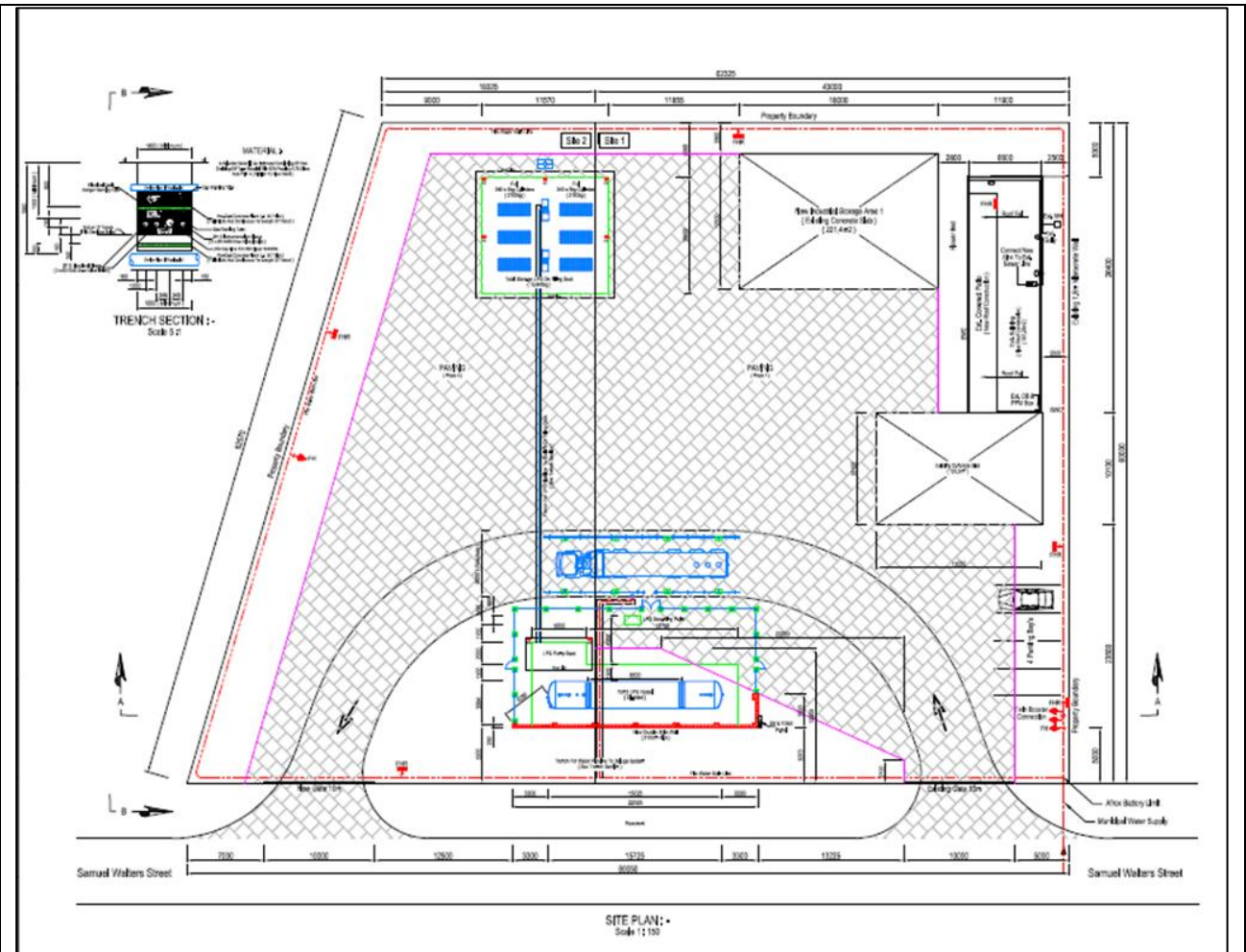
- a. 70m<sup>3</sup> insulated LPG vessel
- b. Cylinder filling pump:      Corken F522  
   Max 300l/min  
   Motor 5.5kW
- c. New road decant point for LPG tanker off-loading
- d. Four off Profill Bizerba cylinder filling scales
- e. Fire detection and suppression system (FDandS) consisting of following:
  - Air/nitrogen supply from cylinders
  - FDandS panel
  - FDandS manifold
  - 8mm SCAD tubing
  - Deluge system at road decant point

The development footprint of the proposed Gasfit gas depot is approximately 882m<sup>2</sup>.

As shown in the site plan below, bulk LPG will to be brought to the site via 20-ton (40 m<sup>3</sup>) road tankers. The LPG will then be decanted into the new on-site bulk storage vessel from the road tanker, while the road tanker is parked under the deluge (sprinkler) system at the road decant point. There will be an overfill protection indicator to stop road tanker decanting to prevent overfilling of the vessel. Empty gas cylinders will be brought to the facility on trucks, where they will be off-loaded for refilling on site. Filling of cylinders from the proposed on-site LPG vessel will be carried out on the cylinder-filling scales, which will be programmed to determine residual return gas in the cylinders and calculate the exact amount of gas required for each cylinder.

The site will be adequately serviced with stormwater management infrastructure; a connection to the municipal sewerage system; and with municipal water and electricity supply to the small office block proposed.

Entrance to the site is proposed from the existing site entrance gate situated on Samuel Walters Street, which runs along the eastern boundary of Erf 5875 and 5876.



**Figure 2: Site Layout Plan (full A3 Site Plan included in Appendix B of this report)**

### Legislative Context

The proposed expansion of the existing diesel gas depot triggers the following activity, which is listed in terms of 2014 EIA Regulations, as amended, published under the National Environmental Management Act, Act No. 107 of 1998 (NEMA), and therefore requires an application for Environmental Authorisation:

Activity No(s):	Provide the relevant <b>Basic Assessment Activity(ies)</b> as set out in <b>Listing Notice 1</b>	Describe the portion of the proposed development to which the applicable listed activity relates.
Activity 67	Phased activities for all activities- i. listed in this Notice, which commenced on or after the effective date of this Notice; or ii. similarly listed in any of the previous NEMA notices, which commenced on or	The proposed development does not entail the increase of gas storage capacity by more than 80m <sup>3</sup> but the total combined capacity on site will exceed the 80m <sup>3</sup>

	<p>after the effective date of such previous NEMA Notices;  where any phase of the activity may be below a threshold but where a combination of the phases, including expansions or extensions, will exceed a specified threshold;</p>	<p>threshold with the addition of one 70m<sup>3</sup> LPG storage tank.  As such, Activity 67 is triggered and not Activity 51.</p>
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### Planning Context

Erf 5875 and 5876 are currently zoned for industrial use in the Breede Valley Spatial Development Framework Revision 2019-2020 (please see **Appendix C**) and is situated in the Worcester industrial area. It is therefore concluded that no rezoning is required, and the proposed expansion is in line with the intended use of the site for industrial purposes.

### Major Hazard Installation Risk Assessment

An independent assessment of the Major Hazard Installation (MHI) risks was conducted at the Gasfit storage Depot in Worcester by Nature and Business Alliance Africa (Pty) Ltd (please see **Appendix G1**). In summary, the main findings of the MHI Risk Assessment are listed below.

- The Occupational Health and Safety Act (Act 85 of 1993) defines a major hazard installation as "an installation-
  - where more than the prescribed quantity of any substance is or may be kept, whether permanently or temporarily; or
  - where any substance is produced, used, handled or stored in such a form and quantity that it has the potential to cause a major incident".
- It was concluded in the MHI Risk Assessment that the Afrox facility and the LPG road tanker are classified as a major hazard installation.
- The hazardous events identified by the MHI Risk Assessment that could occur at the facility could be:

(a) An uncontrolled leak of LPG from the bulk storage tank.

(b) An uncontrolled leak of LPG from the delivery road tanker.

(c) An uncontrolled release of LPG from a cylinder at the filling platform

(d) An uncontrolled release of propane from a cylinder.

(e) An uncontrolled release of acetylene from a cylinder.

(f) An uncontrolled release of ammonia from a cylinder.

(g) An uncontrolled release of Sulphur dioxide from a cylinder.

- As a result of the hazardous events, the identified potential major incidents were:

- Vapour cloud explosion

- Jet fire

- Toxic cloud

- BLEVE on bulk storage tank

- BLEVE on cylinder

- Toxic cloud

- The most critical effect that a major incident at the facility could have is a sulphur dioxide toxic cloud or the release of LPG scenario.

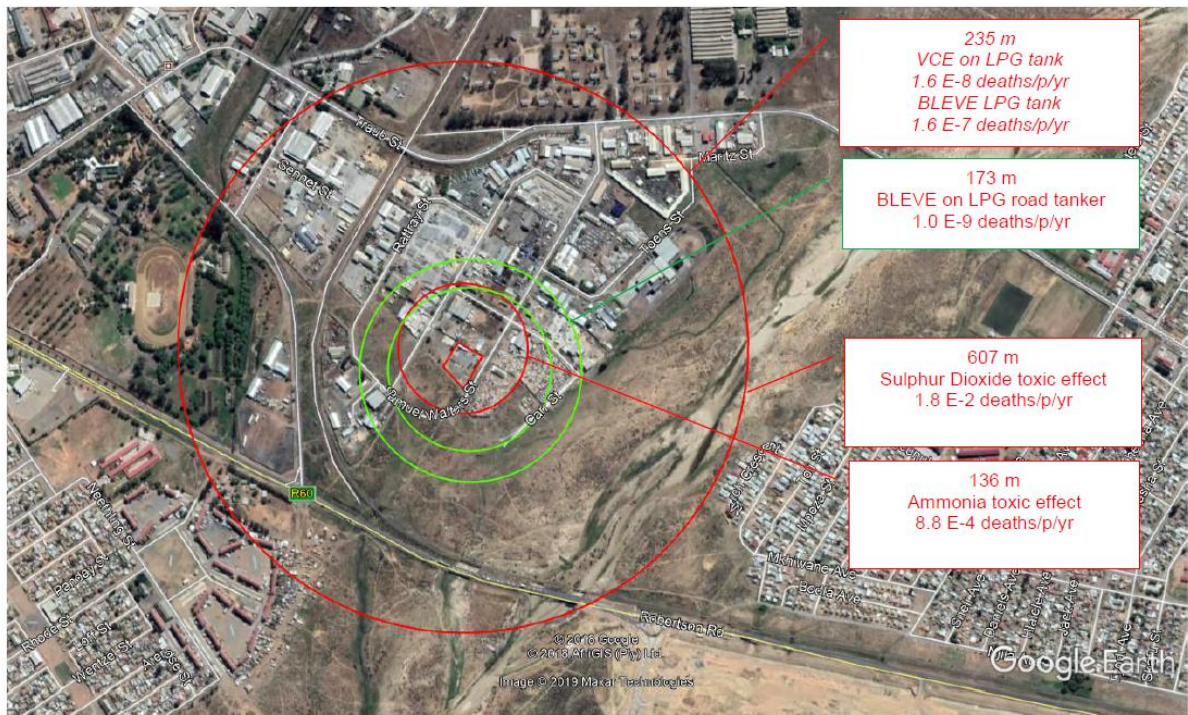
- The risk profile of the facility is within the tolerable norm for public risk ( $1.00E-4$ ) as well as the norm for tolerable worker risk ( $1.00E-3$ ) as recommended by the UK Health and Safety Executive (HSE).
- Various mitigation measures have been recommended to be implemented to reduce the risk. They have all been included in the EMPR.

The MHI Risk Assessment concluded the following:

- Residences are located 610 meters from the site and the occupants will be exposed to a toxic sulphur dioxide gas cloud under low wind speed conditions, in case of a full release of one cylinder.
- The level of risk posed by the facility to various populations immediately outside the site, closest residences, vulnerable developments is highest for sulphur dioxide and LPG.
- The risks associated with the hazardous facilities on site can be tolerable provided the recommended mitigation measures (ALARP) are implemented.
- The facility is classified as a major hazard installation, because a major incident at the site will impact on members of the public outside the boundaries of the site.
- The LPG road tankers on site are classified as major hazard installations because a major incident at the road tanker will impact on members of the public outside the boundary of the site.

It was confirmed during discussions with the author of the MHI Risk Assessment, Dr Niemand, that even if the adjacent erf is developed in the future, the health and safety risk is expected to be a low risk because risk is a measure of the likelihood of an event and the consequence of an event. With the proposed mitigation measures implemented, the likelihood of an event occurring is exponentially low, resulting in the level of risk expected to be low. Dr. Niemand advised during the discussions and in the MHI Risk Assessment that amongst other mitigation measures listed in the MHI Assessment, key mitigation measures to reduce risk of impact to humans on the adjacent (currently vacant) site would be the following:

- A safe separation distance of 236 meters from a BLEVE on the LPG storage tank should be taken into consideration when planning for potential future development.



**Figure 3: Major Hazard Installation Risks associated with the proposed development (source: MHI, 2020).**

### Public Participation

A key component of the Basic Assessment process is public participation. Public participation allows identified Interested and Affected Parties (I&AP's) to assist in identifying issues or concerns around the activity which may need further investigation or assessment.

The Draft Basic Assessment Report will be available for a 30 days public and Authority consultation phase. The following means of notification of the availability of the Draft BAR will be provided:

- A newspaper advertisement will be published in the local newspaper.
- A Site Notice will be placed at the entrance to the existing site.
- A notification poster will be placed at the local café adjacent to the site.
- Additional arrangements will be made with the Adjacent Landowners and Occupiers to ensure they receive a notification letter (See PPP Plan **Appendix F1**).
- An executive summary will be uploaded to SEC website as a data saving alternative.
- Electronic copies of the Draft BAR Report and EMP will be couriered to Key Commenting Authorities
- A Notification email will be sent to all the I &APs to inform them about the availability of the Draft BAR.
- The Draft BAR will be uploaded to SEC website.
- A reminder notification email will be sent to remind potential I&AP's and Key Authorities to comment.

### Alternative Investigations

The NEMA EIA Regulations, 2014, as amended, require that an Applicant identify and investigate alternative "means of meeting the general purposes and requirements of the activity" for which authorisation is being applied for.

#### Site Alternatives:

No site alternatives have been investigated as the proposed site for the expansion is an existing gas depot with sufficient resources and space available for the proposed installation of a 70m<sup>3</sup> LPG bulk storage tank and associated infrastructure. The site is already zoned for industrial use. It is therefore not reasonable to identify or assess site alternatives as this is an expansion activity not a new activity.

#### Activity/Technology Alternative:

No activity or Technology alternative exists, LPG can only be stored in carbon steel pressure vessels. The only alternative would be to install two smaller LPG vessels, it would however increase installation costs and increase the maintenance requirements. The installation of two smaller vessels will pose no advantage to Afrox than rather installing one large LPG vessel.

#### No-Go Alternative:

The No-Go option will mean that Afrox will need to continue with their current daily operations of transporting various gases from their Epping (Cape Town) branch to Worcester, which poses a much greater health and safety risk than the installation of the bulk storage tank. Afrox actual gas volumes, and predicted gas volumes show that during 2020 volume growth is expected to be ±750 tonnes, a 46% increase from 2019, with a possible 54% demand increase for 2021. The gas demand has led to Afrox transporting gas on a daily basis from their Epping Branch (Cape Town), this alternative is unfeasible, and increases the risk of staff or the public getting hurt due to an accident.

The preferred alternative, to install a bulk LPG storage tank is therefore needed and desired as it will reduce the safety risks and will increase Afrox/Gasfit profits. No-Go alternative would result in the existing facility being unable to provide for the projected future gas demand in the area and therefore the expansion is needed to meet the demand.

### **Identification and Assessment of Impacts**

The proposed upgrade entails the construction and operation of one 70m<sup>3</sup> LPG bulk storage tank, storage of 9 to 48kg gas vessels and associated infrastructure. The potentially significant impacts identified as being associated with the depot are as follows:

#### Construction phase:

- **Soil and Groundwater Contamination and Pollution:** Fuel, oil, lubricants and other pollutants may leak from vehicles/ machinery and contaminate the soil. Pollution and soil contamination could also occur from chemical toilets, cement mixing directly on the soil and stormwater runoff may flow over the site camp area and carry contaminants off-site.
- **Fire, Health and Safety Risk:** Exposure through breathing in vapors, swallowing hazardous substances or skin contact may have possible health effects. There is a minor risk of a gas cylinder release, as other gas cylinders will be stored on site during the construction phase.
- **Dust and Noise Impacts:** As a result of the construction phase of this development noise and dust impacts are expected to occur in the area due to an increase in construction vehicles

and road tankers for the duration of the construction phase while materials are being transported to the site and excavations are being made.

- **Traffic, Safety and Access Impacts:** As a result of the construction phase of this development traffic impacts are expected to occur in the area due to an increase in construction vehicle and truck traffic in the area for the duration of the construction phase while materials are being transported to the site. Road safety impacts and road condition impacts could also occur.
- **Visual Impacts:** The construction phase is associated with temporary disturbance as a result of construction (trench excavations, vehicles, machinery, fencing and signage) that may have a negative visual impact on the public.
- **Socio-economic – Creation of employment opportunities:** Temporary employment opportunities will be provided during the construction phase to those residing in the geographical area.

#### Operational phase:

- **Soil and Groundwater Contamination and Pollution:** During the operational phase of the proposed development soil and groundwater contamination could result due to delivery and collection vehicles. In addition, if stormwater is not managed correctly there is the potential for the unmanaged stormwater runoff to impact negatively on the environment, potentially causing pollution and contamination.
- **Traffic and Safety Impacts:** Traffic impacts are expected to occur for the duration of the operational phase of the activity as a result of the additional vehicles making use of the gas depot. This could lead to safety impact or damage to road infrastructure.
- **Fire, Health and Safety Impact:** Exposure through breathing in vapors or skin contact may have possible health effects. The hazardous events identified by the MHI Risk Assessment that could occur at the facility could be an uncontrolled leak of gas at the depot from a bulk storage tank or an uncontrolled leak of gas from the delivery road tanker. As a result of the hazardous events, the identified potential major incidents could be the release of LPG gas or a Sulphur dioxide gas cloud due to the full release of a gas cylinder.
- **Air Quality Impact:** Gas vapour emissions may cause an odour nuisance or health impacts to adjacent residents, staff on site or to users of the gas depot.
- **Socio Economic Benefit:** Creation of new permanent job opportunities.
- **Socio Economic Benefit:** Supply of gas to the surrounding towns and communities, and additional income opportunity for Afrox and Gasfit as they can meet the demand and job creation.

The EAP has assessed the impacts associated with the gas depot to be as follows, after mitigation:



**Table 1: Construction and operational phase impacts associated with the proposed development.**

<b>CONSTRUCTION PHASE IMPACTS and BENEFITS</b>	
<b>IMPACT</b>	<b>IMPACT SIGNIFICANCE AFTER MITIGATION</b>
Soil and Groundwater Contamination and Pollution	Low (-)
Visual Impact	Low (-)
Dust and Noise Impact	Low (-)
Fire, Health and Safety Risk	Low - Medium (-)
Traffic, Safety and Access	Low (-)
Socio-economic benefit – creation of 20 temporary employment opportunities	Low – Medium (+)
<b>OPERATION PHASE IMPACTS</b>	
<b>IMPACT</b>	<b>IMPACT SIGNIFICANCE AFTER MITIGATION</b>
Soil and Groundwater Contamination and Pollution	Low - Medium (-)
Fire, Health and Safety Risk	Low - Medium (-)
Air Quality: Gas Vapour Emissions	Low (-)
Traffic and Safety	Low (-)
Socio-economic benefit – creation of permanent employment opportunities	Low – Medium (+)
Socio-economic benefit – gas supply to community and surrounding towns and income opportunity for Afrox and Gasfit	Medium (+)

The Basic Assessment has determined that none of these associated impacts have been found to be of an unacceptable level; all of these impacts can either be avoided or minimised to an acceptable level of risk, provided that the mitigation measures recommended in the EMP are followed.

### **Conclusions and Recommendations by the EAP**

The most significant impact of the development proposal is the potential health and safety risk. The MHI Risk Assessment found that a major incident such as the release of LPG or sulphur dioxide will impact the surrounding community outside of the site boundaries. However, if the mitigation measures recommended by the Major Hazard Installation Risk Specialist is implemented, the likelihood of an event occurring is exponentially low, resulting in the level of risk to be low. It is also recommended that future developments on the vacant properties adjacent to the site must have a safe separation distance of 236 meters, in case a BLEVE on the LPG storage tank.

In terms of benefits, the depot upgrade will provide job opportunities to the community during the construction/installation and operational phases, an income stream for the applicant as well as additional provision of gas supply services needed in the area by the community.

Given the low-medium significance of the impacts assessed and because of the fact that the likelihood of an incident occurring is very low, the socio-economic benefit of this project should be realised and the EAP recommends that this site should be developed with the proposed development.

The implementation of the design, construction and operational phase measures contained in the EMPr in **Appendix H**, will maximize the benefits and avoid/ minimize any environmental risks associated with the upgrade. It is in this case of particular importance to manage the health and safety risk associated with the exposure to hazardous gasses and gas vapours.

There is thus adequate motivation for the Gasfit gas depot upgrade to proceed under the following recommended conditions of approval:

- The mitigation measures listed in the EMPR must be strictly implemented.
- A fire wall of 3,6 meters will be constructed on the eastern boundary, adjacent to the LPG storage tank.
- The tanks must be installed according to the following SANS:
  - All relevant electrical works must be compliant with SANS 10108
  - All LPG storage and filling installations must comply with SANS 10087-7
  - All relevant building works must comply with SANS 10400
  - SANS 10087-3 (2008) (English): The handling, storage, distribution and maintenance of liquefied petroleum gas in domestic, commercial, and industrial installations Part 3: Liquefied petroleum gas installations involving storage vessels of individual water capacity exceeding 500 L

The following plans and procedures must be produced prior to construction taking place (as per design phase requirements listed in the EMPR):

- Stormwater Management Plan.
- Spill Contingency Plan.
- Fire Plan.
- Update Emergency Response Plan.
- Update Preventative Maintenance Plans.
- The installation of the Aboveground Storage Tank and associated pipework must comply with the National Building Regulations and Standards Act No. 103 of 1977.
- The installation must comply with local authority bylaws and all procedures and equipment used must be in accordance with the Occupational Health and Safety Act (No. 85 of 1993).
- Upon completion of the UST installation, an engineer is to inspect and verify that the tanks and the associated infrastructure have been installed as per the design criteria described in the final BAR and to all required SABS / SANS standards and applicable legislation.

The implementation of the design, construction and operational phase measures contained in the EMPr in **Appendix H**, will maximize the benefits and minimize any environmental risks associated with the proposal. Adherence to the EMPr should be made a condition of authorization. There is thus adequate motivation for the gas depot expansion to proceed.