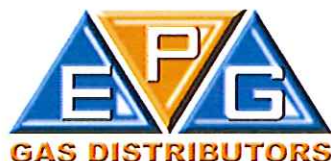


Appendix H

EMPr

- EMP
- Executive summary from MHI



**ENVIRONMENTAL MANAGEMENT PROGRAMME
REPORT**

FOR

**Proposed development and related operation of the
EPG Gas storage and handling facilities and
infrastructure for dangerous goods including liquefied
petroleum gas (LPG) and diesel on Erf 125 Klerksoord
X2, City of Tshwane, Gauteng Province**

MARCH 2018

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List of Definitions, Abbreviations and Acronyms

AST	Above-ground Storage Tank
BA	Basic Assessment
BAR	Basic Assessment Report
CBD	Central Business District
CFC	Chloro-Fluoro Carbons
CoT	City of Tshwane Metropolitan Municipality
DTI	Department of Trade and Industry
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMP	Environmental Management Programme
EO	Environmental Officer
GDARD	Gauteng Department of Agricultural & Rural Development
HDPE	High Density Poly-Ethylene
LPG	Liquefied Petroleum Gas
MHI	Major Hazard Installation
NEMA	National Environmental Management Act, 1998 (Act 107 of 1998) as amended
OHSA	Occupational Health and Safety Act, 1993 (Act 85 of 1993)
SANS	South African National Standards
SHEQ	Safety, Health, Environment and Quality
VOC's	Volatile Organic Compounds

1 INTRODUCTION

HydroScience cc, an independent Environmental Assessment Practitioner (EAP), has been appointed by EPG Gas, to undertake a Basic Assessment (BA) process and submit a Basic Assessment Report (BAR) to apply for environmental authorisation for the proposed development and related operation of the EPG Gas storage and handling facilities and infrastructure for dangerous goods including liquefied petroleum gas (LPG) [and diesel] on Erf 125 Klerksoord X2, City of Tshwane, Gauteng Province.

The BA process for this project has been designed to comply with the requirements of the Environmental Impact Assessment (EIA) Regulations of 4 December 2014 as amended on 7 April 2017 in terms of Section 24 of the National Environmental Management Act (NEMA), 1998 (Act 107 of 1998) as amended which is South Africa's national framework environmental legislation. Key principles embodied in the NEMA include:

- Sustainability – development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs;
- Mitigation hierarchy – avoidance of environmental impacts, or where this is not possible, minimising the impact and remediating the impact; and
- The duty of care towards the environment.

The assessment of impacts has been conducted in accordance with these principles.

Based on the findings of the BA, an Environmental Management Programme (EMP) has been developed that will be implemented to control and minimise possible adverse impacts during all phases of the proposed project. The EMP will therefore:

- Define the various measures to be taken into account during the life of the project in order to enhance positive and minimise/reduce adverse environmental impacts and meet the performance specifications;
- Define the actions required to implement these measures;
- Describe how this will be achieved; and
- Allocate responsibilities for implementation.

EMPs are important tools for ensuring that the management actions/measures arising from the EIA process are clearly defined and implemented through all phases of the project.

The purpose of the EMP (this document) is to ensure the following:

- That unnecessary or reasonably avoidable adverse impacts of the project are prevented;
- That impacts which cannot be prevented are managed to reduce their significance; and
- That the positive benefits of the project are enhanced where possible.

2 LEGAL COMPLIANCE

Compliance of this EMP with the NEMA as amended, as per requirements in GNR 982 of 4 December 2014 as amended on 7 April 2017 (GNR 326) in terms of the EIA Regulations, Appendix 4.

Requirement in GNR 982, Appendix 4	Section in report where contained:
a) details of: <ul style="list-style-type: none">i) EAP who prepared EMP; andii) expertise of the EAP, including a curriculum vitae	i) Paulette Jacobs from HydroScience ii) Refer to company profile and curriculum vitae in Appendix J

Requirement in GNR 982, Appendix 4	Section in report where contained:
b) Detailed description of aspects of activity covered by EMP as identified by project description.	Section 1 gives project description and Section 3 provides aspects of the project covered in terms of site layout.
c) Map at an appropriate scale, superimposing proposed activity, its associated structures, and infrastructure on environmental sensitivities of preferred site, indicating areas to be avoided.	Appendix A contains all maps and Figure 1 in this report shows the locality. Appendix C shows the activity, its associated structures, and infrastructure. The site is located within an industrial area. Areas to be avoided were indicated in the Ecology study (Appendix G).
d) Description of impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through EIA process for all phases of development: <ul style="list-style-type: none"> i. Planning & design ii. Pre-construction iii. Construction iv. Rehabilitation post construction and post closure v. Operational 	Section 6.2 Tables 2, 3, 4, 5 and 6 Section 7 Section 8 MHI (executive summary at the end of the EMP)
e) Description and identification of impact management objectives and outcomes required for aspects contemplated in d) above.	Section 8 Table 6 MHI
f) Description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph d) and e) will be achieved.	Section 8 Table 6 Section 12 Section 13.6.10
g) Method of monitoring implementation of impact management actions contemplated in f).	Section 9
h) Frequency of monitoring implementation of impact management actions contemplated in f).	Section 9
i) Indication of persons who will be responsible for implementation of impact management actions.	Section 10
j) Time periods within which impact management actions contemplated in f) must be implemented.	Section 8 Table 6 MHI
k) Mechanism for monitoring compliance with impact management actions contemplated in f).	Section 9

Requirement in GNR 982, Appendix 4	Section in report where contained:
l) Programme for reporting on compliance, taking into account requirements as prescribed by regulations.	Section 11 Section 13.6.10
m) Environmental awareness plan	Section 13
n) Any specific information that may be required by the competent authority.	None.

3 SITE CONTEXT

The project entails the proposed development and related operation of the EPG Gas storage and handling facilities and infrastructure for dangerous goods including liquefied petroleum gas (LPG) and diesel on Erf 125 Klerksoord X2, City of Tshwane, Gauteng Province. The total storage capacity will be 500m³ at this stage (potential future expansion will be applied for through another process) in 1 X 100m³ vessel and 1 X 400m³ vessel.

The proposed site is on Erf / Holding 125 Klerksoord Agricultural Holdings (Klerksoord X2), City of Tshwane Metropolitan Municipality (CoT), Gauteng Province. The property can be accessed via Ametis (Amethyst) Road, a two (2) way tarred road (east of the site). Ametis road is reached from the R566 turning north into Willem Cruywagen Avenue, then east into Granate Street and then south into Ametis road. Global Positioning System (GPS) coordinates are 25° 38' 02.8" South and 28° 07' 53.7" East. Surrounding properties include a variety of light industrial facilities such as Structural Precast Elements (SPE), scrapyard, Tsipe Engineering, Huntleigh (Arjo SA) etc. as well as a school. The property is situated:

- south of the Onderstepoort Nature Reserve with the Pyramid Koppies (500m);
- west of Bon Accord Dam (5km);
- north of Hestea Park and Winternest Agricultural Holdings; and
- east of Rosslyn Industrial.

The site layout includes the following (refer to drawing 201-02-EPG-Klerksoord):

- Entrance gate with security on Ametis Road;
- Offices and carport at weighbridge (existing);
- Weighbridge (existing upgraded);
- Concrete slab for off-loading;
- Emergency escape route; and
- 1 X 100m³ and 1 X 400m³ LPG storage vessels in north west corner.
- Currently, no diesel storage.

4 NEED AND DESIRABILITY

LPG as energy source is:

- More economical than many other energy sources
 - due to its very high thermal efficiency; and
 - low maintenance requirements as it avoids scaling and corrosion of parts which also extends the lifespan of infrastructure.
- Environmentally friendly as it is a cleaner energy source because:
 - It has minimal sulphur content.
 - It has the lowest black carbon emissions - low carbon alternative to conventional fossil fuels.

- It is clean burning and emits 33% less CO₂ (carbon dioxide) than coal and 15% less than heating oil – the lowest CO₂ emissions amongst all refined fuels.
- It has a low particle emission.
- It has low NOx emissions.

5 SPECIALIST STUDIES

The following specialist investigations were conducted:

- Ecology by African Litany which found geophytes which needs to be removed and replanted for protection.
- Heritage & cultural by Archaeos which found no site of cultural heritage significance.
- Geotechnical study due to clay content of soil.

A Major Hazard Installation (MHI) Risk Assessment was done by Nature and Business Alliance.

Pieter Wilken investigated the engineering services and storm water management.

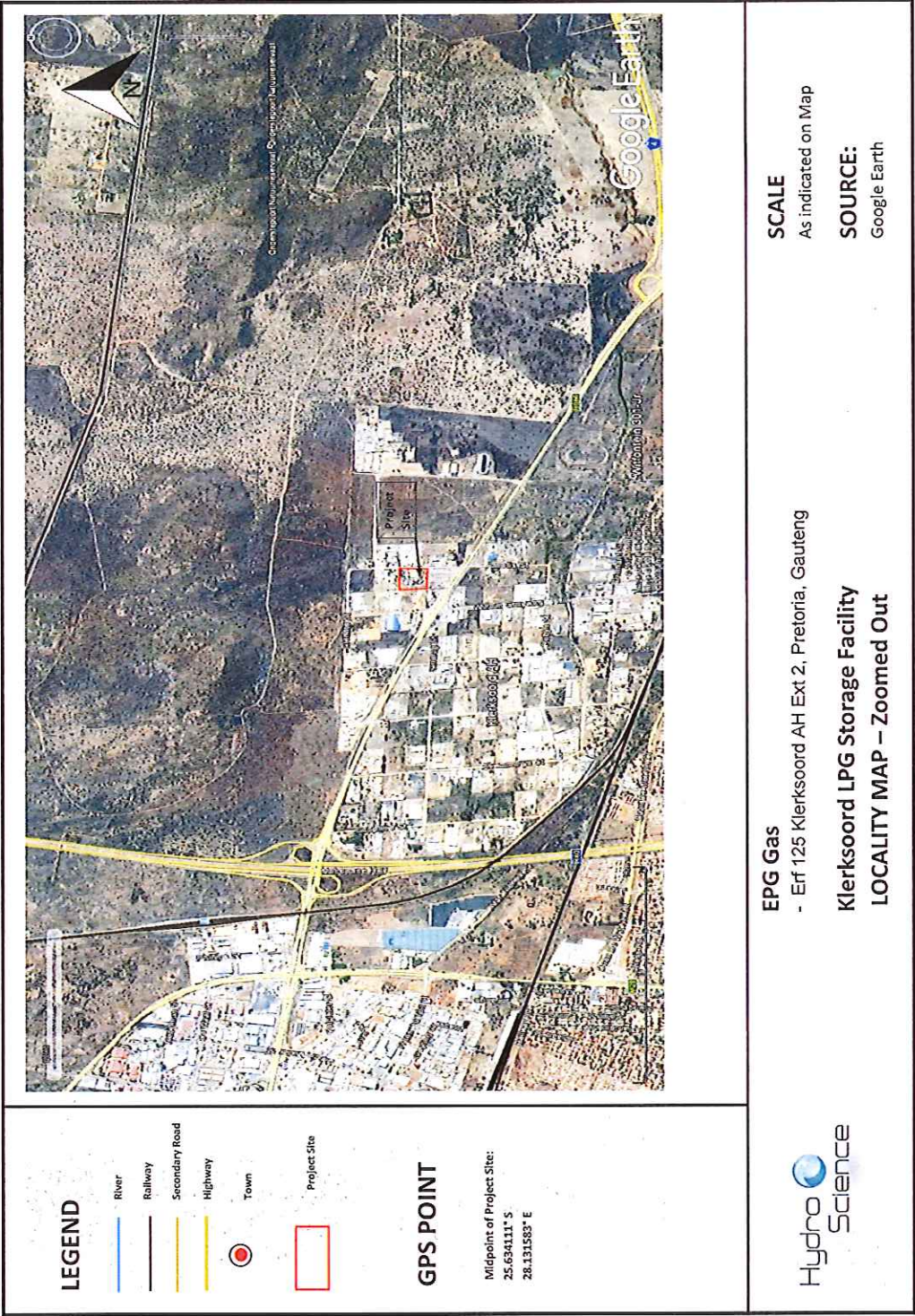


Figure 1: Regional locality map

6 ENVIRONMENTAL IMPACT ASSESSMENT

6.1 Methodology

The significance of the environmental impacts identified was assessed in terms of their:

- Duration;
- Extent;
- Probability; and
- Severity.

The above were used to determine the significance of an impact without any mitigation, as well as with mitigation.

Nature of an impact: An impact's nature can be positive (+) or negative (-).

Consequence: Considers duration, extent and severity

Consequence = duration + extent + severity

Table 1: Environmental risk and impact assessment criteria.

DURATION (D)		
Immediate	Immediate - less than 1 month	1
Construction	Short term	2
Life of project	Medium term - operational phase	3
Post closure	Long term - time of rehabilitation and for re-establishment of natural systems	4
Residual	A permanent impact (100 years or more)	5
EXTENT (E)		
Site specific	Site of the proposed development (Erf 125)	1
Local	Site and surrounding sites (Klerksoord and Akasia Industrial area)	2
Regional	City of Tshwane Metropolitan Municipality (CoT)	3
Provincial	Gauteng Province	4
National	Republic of South Africa	5
PROBABILITY (P)		
Rare	<5% probability of occurrence – may occur in exceptional circumstances	1
Unlikely	15% - 6% probability of occurrence – could occur at some time	2
Possible	45% - 16% chance of occurrence – might occur at some time	3
Likely	65% - 46% probability of occurrence – will probably occur in most circumstances (medium)	4
Almost Certain	90% - 66% probability of occurrence – is expected to occur – highly probable	5
Definite	100%- will occur	6
SEVERITY (S)		
Catastrophic (critical)	Total change in area of direct impact, relocation not an option, death, toxic release off-site with detrimental effects, irreversible loss, huge financial loss	6
Significant (High)	> 70% change in area of direct impact due to loss of significant	5

	aspect, extensive injuries, long term loss in capabilities, off-site release to high extent, major financial implications	
Serious	50 – 70% long term loss, extensive rehabilitation / restoration / treatment required, high financial impact, still restricted in extent	4
Moderate (medium)	20 – 49% change, medium term loss in capabilities, rehabilitation / restoration / treatment required, on-site release with outside assistance, medium financial impact	3
Minor	10 – 19% change, short term impact that can be absorbed, on-site release, immediate containment, low financial implications	2
Insignificant (low)	< 10 % change in the area of impact, no financial implications, localised impact, a small percentage of population	1

[Duration (D) + Extent (E) + Severity (S)] x Probability (P) = Impact Significance (IS)

IMPACT SIGNIFICANCE (IS)		
Impact Significance	IS score range	Description
Low (L)	<15	The impact is minor or insubstantial; it is of little importance to any stakeholder and can easily be rectified.
Moderate Low (ML)	16 - 45	The impact is limited in extent, even if the intensity is major; the probability will only be likely, the impact will not have a significant impact considered in relation to the bigger picture; no major material effect on decisions and will require only small scale management intervention bearing moderate costs.
Moderate high (MH)	46 - 70	The impact is significant to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.
High (H)	71 <	The impact could render development options controversial or the entire project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in project decision-making.

6.2 Impact Assessment Ratings

The impacts and associated significance ratings for each phase of the project were assessed (Tables 2, 3, 4 and 5 below). The no-go option would not meet the market demand for LPG as an alternative energy source and the property will not be utilised.

Table 2: Impact significance for the construction phase

Aspect and description ¹ⁿ		Impact rating (before mitigation)							Impact Rating (after mitigation)						
Aspect	Description	Nature of Impact (positive / Negative)	Spatial Scale/ Extent (5)	Duration (5)	Severity (6)	Consequence	Probability (6)	Significance (96)	Nature of Impact (positive / Negative)	Spatial Scale/ Extent (5)	Duration (5)	Severity (6)	Consequence	Probability (6)	Significance (96)
Topography and Aesthetics Geology & Soil	No impact: Small (± 2 ha) and relatively flat disturbed property surrounded by large structures on neighbouring properties (refer to photographs)														
	Damage to structures due to clayey nature of soils	N	1	5	4	10	6	60	N	1	5	4	10	2	20
Fauna & flora	Loss of vulnerable Marikana Thornveld vegetation type	N	1	5	3	9	6	54	N	1	5	2	8	3	24
	Loss of habitat for threatened and/or protected faunal species	N	1	5	3	9	6	54	N	1	5	2	8	1	8
	Establishment and spread of declared weeds and alien invader species	N	1	2	3	6	4	24	N	1	2	3	6	2	12
Land Use & Socio-economic	Industrial area and light industrial use	No impact: The site was previously used as a scrap yard. It is located in an industrial area (Klerksoord) and zoned for industrial use (Industrial 2)													
	Use of vacant property	Positive impact: The property is currently not used with derelict buildings, alien invasive infestation and illegal waste dumping													
	Socio-economic	Positive impact: The property is currently not used leading to a deterioration in the property, no jobs etc.													
Waste Management	Handling & Disposal of Construction Waste	N	1	2	2	5	4	20	N	1	2	2	5	2	10

Aspect and description		Impact rating (before mitigation)							Impact Rating (after mitigation)						
Aspect	Description	Nature of Impact (positive / Negative)	Spatial Scale/ Extent (5)	Duration (5)	Severity (6)	Consequence	Probability (6)	Significance (96)	Nature of Impact (positive / Negative)	Spatial Scale/ Extent (5)	Duration (5)	Severity (6)	Consequence	Probability (6)	Significance (96)
Air Quality	Emissions during construction	N	2	2	1	5	4	20	N	2	2	1	5	2	10
Surface (storm) Water and Groundwater	Pollution of water	N	1	2	1	4	4	16	N	1	2	1	4	2	8
Safety Requirements during Installation	Safety measures	N	1	2	4	7	4	21	N	1	2	4	7	2	14

Table 3: Impact significance for the operational phase

Aspect and description		Impact rating (before mitigation)							Impact Rating (after mitigation)						
Aspect	Description	Nature of Impact (positive / Negative	Spatial Scale/ Extent (5)	Duration (5)	Severity (6)	Consequence	Probability (6)	Significance (96)							
Socio-economic	Health and Safety – fire, explosion, toxic release	N	2	3	5	10	4	40						20	
	Sustainability & Job creation														
POSITIVE															
Fauna & flora	Reduction in extent of vegetation unit	N	1	5	3	9	5	45	N	1	5	2	8	2	16
Waste Management	Waste Generated	N	1	3	2	6	3	27	N	1	3	2	6	2	12
Surface (storm) water	Spillage of Hydrocarbons	N	1	3	2	6	2	18	N	1	3	2	6	2	12
Air Quality (linked to Health & Safety)	Gas leaks	N	2	3	4	9	4	36	N	2	3	4	9	2	18

Table 4: Impact significance for the decommissioning phase

Aspect and description		Impact rating (before mitigation)						Impact Rating (after mitigation)					
Aspect	Description	Nature of Impact (positive / Negative)	Spatial Scale/ Extent (5)	Duration (5)	Severity (6)	Consequence	Probability (6)	Significance (98)					
Waste Management	Demolition of Structures & Infrastructure	N	1	4	2	7	4	28	N	1	4	2	7
	Handling of Hazardous Material	N	1	4	2	7	4	28	N	1	4	2	7
Socio-economic	Job losses	N	1	4	3	8	5	40	N	1	4	2	7

It is unlikely that the facility will be decommissioned and closed. It is more likely that the facility may expand.

Aspect and description		Impact rating (before mitigation)						Significance (98)
Aspect	Description	Nature of Impact (positive / Negative	Spatial Scale/ Extent (5)	Duration (5)	Severity (6)	Consequence	Probability (6)	
Land use & socio-economic	Property not used; no jobs; no financial gain	N	1	4	5	10	4	40

7 POTENTIAL IMPACTS

Based on the identified impacts and associated significance ratings provided above, the following potential (negative and positive) impacts have been identified as being key to the three (3) phases of the preferred option for the proposed project:

7.1 Potentially negative Impacts

Construction phase (Short term)

- Ecology (located in vulnerable Marikana Thornveld vegetation type and geophytes present on site)
- Geology & soil (clayey soil)
- Waste management (demolition of buildings and clearance of site)
- Air quality (construction vehicle / equipment emissions)
- Surface (storm) water (runoff pollution due to construction)
- Safety (construction activities)

Operational phase (indefinitely)

- Health and safety (workers, neighbours & school)
- Ecology
- Waste management
- Air quality
- Surface (storm) water

Decommissioning phase

- Waste management: If the project should be decommissioned, it must be ensured that there is no remnant hazardous material and all general and hazardous waste generated as a result of demolition has been disposed of correctly.
- Socio-economic: Job losses.

7.2 Positive impacts

Construction phase:

- Use of property for industrial purposes as zoned and as per location.
- Job creation.
- Sourcing of material / equipment etc. (service providers).

Operational phase:

Positive impacts will occur as part of the operational phase and include the following environmental and socio-economic benefits:

- Suppling the growing demand for LPG as an alternative energy source in light of the on-going energy crisis in South Africa.
- A contribution to the local economy during the construction and operational phase through sourcing of material and equipment.
- Employees will be trained, which will result in skill development for many employees in this trade.
- The use of a cleaner fuel source :
 - LPG has minimal sulphur content.
 - LPG has the lowest black carbon emission and therefore is a low carbon alternative to conventional fossil fuels.
 - LPG is clean burning and emits 33% less CO₂ (carbon dioxide) than coal and 15% less than heating oil, the lowest CO₂ emissions amongst all refined fuels.

- LPG has a low particle emission.
- LPG has low NOx emissions.
- LPG is less harmful to the environment (greenhouse gas emissions and carbon footprint) and people's health.
- LPG's high octane rating enables it to mix better with air and to burn more effectively, generating less carbon. It therefore has a high thermal efficiency, which is easily controlled.
- LPG can be used for a variety of applications such as heating, automotive, power & feedstock etc.
- LPG doesn't cause any noise, mess or smells. It evaporates easily and will not pollute water.
- LPG is more economical due to its very high thermal efficiency and low maintenance requirements as it avoids scaling and corrosion of parts which also extends the lifespan of infrastructure.

Due to the fact that the results are positive, no mitigation will be required.

7.3 No-go Option impacts

The aspects below are impacted upon if the No-go option should be administered. Mitigation for these impacts includes the continuation of the proposed project.

The project encourages the use of an alternative cleaner energy source, i.e. LPG, during the on-going energy crises in South Africa and the following advantages of LPG and the project would not be realised if the project is a No-go:

- LPG has minimal sulphur content compared to other energy sources.
- LPG has the lowest black carbon emissions and therefore is a low carbon alternative compared to conventional fossil fuels.
- LPG is clean burning and emits 33% less CO₂ (carbon dioxide) than coal and 15% less than heating oil, the lowest CO₂ emissions amongst all refined fuels.
- LPG has a low particle emission.
- LPG has low NOx emissions.
- LPG is less harmful to the environment (greenhouse gas emissions and carbon footprint) and people's health.
- LPG's high octane rating enables it to mix better with air and to burn more effectively, generating less carbon. It therefore has a high thermal efficiency, which is easily controlled.
- LPG can be used for a variety of applications such as heating, automotive, power & feedstock etc.
- LPG doesn't cause any noise, mess or smells. It evaporates easily and will not pollute water.
- Job opportunities will be created and skills development will take place.
- Potential income to the local economy.
- Use of a currently underutilised property which is fast deteriorating due to dilapidated buildings, alien vegetation infestation and illegal dumping of waste.

8 MANAGEMENT MEASURES

Dedicated management measures have been identified to manage the above identified impacts (Table 6). The purpose of the EMP is to ensure that undue or reasonably avoidable adverse impacts of the project are prevented, that impacts which cannot be prevented are managed to reduce their significance and that the positive benefits of the project are enhanced.

Table 6: Identified potential impacts and proposed management measures

Construction / installation phase (6 - 18 months)	
Geology & Soil	
Potential impact:	Structural damage Damage to structures and infrastructure due to swelling-and-shrinking characteristics of clayey soils found on the site.
Impact Significance: (Prior to mitigation)	Moderate High
Management Measures:	Adhere to the recommendations of the geotechnical engineer (see Appendix G) to ensure sustainability of structures and infrastructure.
Impact Significance : (Post mitigation)	Moderate Low
Ecology	
Potential impact:	<ul style="list-style-type: none"> • Loss of vulnerable Marikana Thornveld vegetation type. • Loss of habitat for threatened and/or protected faunal species. • Establishment and spread of declared weeds and alien invader species.
Impact Significance: (Prior to mitigation)	Moderate High to Moderate Low
Management Measures:	<ul style="list-style-type: none"> • Undertake an alien vegetation eradication programme and clear all alien vegetation species from the site. Implement this from the start of construction as it takes at least three (3) years to break the cycle of regeneration. • Limit construction-related activities to the extent of the site to limit disturbances to surrounding areas, which shall be designated as no-go areas. Communicate all no-go areas prior to construction commencing. • Undertake plant rescue operation prior to construction commencing to remove all geophytes and replant them in a similar area such as the protected Onderstepoort Nature Reserve. Geophytes to be rescued include <i>Hypoxis rigidula</i>, <i>Scadoxus punicea</i>, <i>Ledebouria revoluta</i>, <i>Crinum bulbisperrum</i> and <i>Aloe greatheadii</i> var. <i>daveyana</i>. The translocation should be undertaken by a suitably qualified person such as a botanist or a GDARD representative. Monitoring to ensure the plants survive must be undertaken for at least six (6) months to a year following the transplanting.

	<ul style="list-style-type: none"> No harming, trapping, capturing or poaching of fauna species encountered. Minimise the removal of large indigenous trees, shrubs and understorey vegetation are far as practically possible. In the event that any rare/endangered/protected species are found in the footprint area, such species should be relocated to a similar location/habitat not more than 300 metres from its original location. As described above, a suitably qualified professional (botanist) or an institution, e.g. GDARD, should be contacted to advise and assist the applicant to ensure that the threatened species relocation process is undertaken appropriately and does not result in the death of the species being moved. Appoint an Environmental Control Officer (ECO) to ensure mitigation measures are implemented.
Impact Significance : (Post mitigation)	Moderate Low to Low
Waste Management	
Potential impact:	<p>Handling and Disposal of Waste</p> <p>General waste will accumulate during the construction phase due to the demolition of building (building rubble), clearance of vegetation (biodegradable waste) and delivery and assembly of structures. Poor solid waste management practises can lead to contamination and unsightly areas as well as pests/vermin and odours with associated health issues. Waste streams include:</p> <ul style="list-style-type: none"> Solid construction waste generated through demolition of buildings and construction / installation activities (building rubble). Biodegradable waste due to vegetation clearance. Hazardous waste in the event of a spillage/leak (construction equipment or vehicles). General waste produced by builders (biodegradable and non-biodegradable).
Impact Significance: (Prior to mitigation)	Moderate Low
Management Measures:	<ul style="list-style-type: none"> Prevention of waste: Material storage – material storage areas should be safe, secure and weatherproof to prevent damage to material (resulting in waste generation) and theft. Reduction / minimisation of waste: Reduce waste quantities and disposal costs through a reduction in the materials ordered. “Take-back” schemes – setting up schemes with suppliers to take back surplus materials. Collect waste in suitable containers (drums/skips/bins on site). Engage with the supply chain to supply products and materials that use minimal packaging.

	<ul style="list-style-type: none"> • Reuse / recycling of waste: Separate / sort waste for collection and recycling - make arrangement with recycling contractors to provide clearly marked bins for material separation / sorting. Make sure that sub-contractors are aware of the placement of the bins and their responsibility to separate / sort materials. Segregate packaging for reuse. Vegetation cleared can be taken to a composting facility. • Waste handling on site: <ul style="list-style-type: none"> ◦ Separate / sort waste. ◦ Waste containers must have covers to prevent rainwater infiltration. ◦ Ensure sufficient containers are available for storage of waste prior to removal off site to prevent overflow and littering on the site and surroundings. ◦ Ensure no litter, refuse, waste and rubble generated on the premises will be placed, dumped or deposited on this site, adjacent or surrounding properties during the construction and clean-up phase. • Waste removal & disposal: Remove waste from site for disposal to the local licensed municipal landfill / waste management facility on a regular basis (at least weekly or when skip is full). Removal by the construction contractor or CoT. • Documentation: <ul style="list-style-type: none"> ◦ Contractors to report on the quantities of different waste streams they manage (landfill, reuse, recycling, energy recovery). ◦ Ensure copies of all waste manifests (safe disposal certificates) are kept, showing responsible handling, transport and disposal by a reputable waste handler. ◦ Include measure in contract that will ensure sub-contractors are required to clean their work area after construction.
Impact Significance : (Post mitigation)	Low
Air quality	
Potential impact:	<p>Emissions and dust</p> <p>Emissions may be released into the atmosphere resulting from vehicles and machinery/equipment (carbon monoxide emissions, smoke), solvents, and malodours as a result of waste not being removed from the construction site.</p> <p>Dust may be generated due to vegetation clearance and earthworks.</p>

Impact Significance: (Prior to mitigation) Management Measures:	<p style="text-align: right;">Moderate Low</p> <ul style="list-style-type: none"> • All vehicles and machinery/equipment used on, or entering the site, must be maintained and serviced regularly to ensure that they do not emit smoke or fumes. The contractor's representative must ensure that all on-site vehicles comply with the old SABS 0181 standards (now SANS 10181:2003 in conjunction with SANS 10282:2003) • Limit idling time of vehicles / equipment. • Avoid overloading of construction vehicles. • Any solvent based finishes such as paints, varnishes, sealants, and polishes will contain minimal levels of Volatile Organic Compounds (VOC) and no Chloro-Fluoro Carbons (CFC), which may harm the atmosphere. Water-based paints are to be used where possible and plant based stains and sealants must be considered as these are more environmentally friendly. • Waste must be disposed, as soon as possible to a municipal transfer station, skip or on a licensed landfill site. Waste must not be allowed to stand on site to decay, resulting in malodours and attracting vermin. Waste may not be burnt on site. • Water sprays and dust suppression surfactants, must be used to limit dust generated if required. • A complaints register must be kept throughout the construction and operational phase.
Impact Significance : (Post mitigation)	<p style="text-align: right;">Low</p>
Potential impact:	<p style="text-align: center;">Surface (storm water) runoff and groundwater</p> <p><u>Incorrect handling and spillage of building materials and hydrocarbons</u></p> <p>Spillages can cause soil, runoff and groundwater contamination.</p>
Impact Significance: (Prior to mitigation) Management Measures:	<p style="text-align: right;">Moderate Low</p> <ul style="list-style-type: none"> • If feasible, construction should preferably occur in the dry season, when surface water runoff is minimal. • No uncontrolled discharge from the site should be permitted (attenuation facility will be established). • Surface run-off from the site should be discharged into municipal storm water drains provided along the roads. • Contractor must ensure that all building materials / chemicals are effectively stored (sealed containers in safe & secure area) and managed to prevent contamination.

	<ul style="list-style-type: none"> Vehicles / equipment / machinery maintenance should not be undertaken on site unless it is emergency repairs in which case drip trays and absorbent material should be used to capture and contain hydrocarbon spillages. In the unlikely event of a spillage, sufficient clean-up procedures must be carried out immediately. All reagents, reagents storage tanks and mixing units must be supplied with a bund built to contain 110% of the capacity of the facility, to contain any spilled material and return back into the system if possible. The system must be maintained in a state of good repair and standby pumps must be provided.
Impact Significance : (Post mitigation)	Low
Safety requirements during construction / installation	
Potential impact:	Failure to comply with the safety requirements set out by SABS / SANS during the construction / installation phase can result in health impacts (disease, injury) and environmental damage. Fire fighting equipment and appropriate sign indicating hazard should be installed during construction and operational phase.
Impact Significance: (Prior to mitigation)	Moderate Low
Management Measures:	<ul style="list-style-type: none"> The distance between the shell of any one container in an LPG installation and the shell of any one container in another LPG installation shall be at least 6m. Where there is a firewall between them with a fire rating of at least 2h and a height of at least 1.8m, the distance measured from shell to shell around the wall shall be at least 3m (SABS 10087). The following pipes and fittings are recommended for general use in installations (SABS): <ul style="list-style-type: none"> solid drawn copper tube with copper or copper alloy fittings; ungalvanized seamless mild steel tube with mild steel fittings; stainless steel piping with associated fittings; brass fittings that are protected against seasonal cracking; high density polyethylene (HDPE) pipes and fittings (only to be used for gas in the vapour phase and where the pipes are buried); flexible tubing and hose; and composite pressure pipe. Composite pipe is subject to the following requirements (SABS): <ul style="list-style-type: none"> usage above ground is allowed subject to the pipe being protected from direct sunlight; when embedded in walls or floors, no joints will be allowed in the embedded sections;

	<ul style="list-style-type: none"> o no joints are allowed in pipe sections passing through cavity walls; o contact with solvents shall be avoided; o the pipe shall not be closer than 150mm to any heat source; o the pipe shall not be used for liquid supply installations; o the maximum supply pressure shall not exceed 150kPa; o for pipe sizes above 32mm diameter, pipes shall be joined only by welding; o where electrical cables are being run on the same wall, gas pipes shall be at least 150mm away/apart from the electrical cables and other electrical apparatus. • Burrs formed when a pipe is cut, shall be removed, and any dust, dirt and scale inside the piping and pipe fittings shall be cleaned out before assembly. • To prevent restriction of gas flow, the number of pipe fittings shall be kept to a minimum, and sharp changes of direction shall be avoided. A bend in a pipe shall be of a radius at least five (5) times the diameter of the pipe and shall be free from kinks. • Except for welded, soldered or electrofused joints, all joints, cocks, valves and unions (including the unions on gaslight fittings) shall be readily accessible for maintenance and repair, and all joints shall be so made as to avoid undue strain in the pipe system. • A pipe shall run as near to the vertical as possible throughout its full length. Horizontal runs are not recommended and shall be kept to a minimum and be as short as possible. • The incorrect repair (or adjustment) of the various components of an LPG installation can result in hazardous conditions. • On completion, and before commissioning, the installation shall be inspected, tested and approved by the registered installer, and the user shall be issued with a certificate of compliance that indicates that the installation has been tested and that it complies with this part of SANS 10087. • Installation of a dry powder fire extinguisher that complies with SANS 1910 shall be required for installations. The extinguisher shall be installed near to the tank installation. • The fire extinguisher shall be securely mounted and its position shall be indicated in an approved manner with appropriate symbolic signs. • No part of a LPG container shall be located in the area 1.8m horizontally from a vertical plane beneath overhead electric power lines that are over 600V.
Impact Significance : (Post mitigation)	Low

Cultural and heritage	
Preventative:	It should be noted that the subterranean presence of archaeological and/or historical sites, features or artifacts is always a distinct possibility. Care should therefore be taken when development commences that if any of these are discovered, a qualified archaeologist be called in to investigate the occurrence (Archaeos, 2018).

Operational phase (indefinite)	
Socio-economic	
Potential impact:	<p>Positive impact: Sustainability The project will benefit the community and clients through the provision of jobs, use of the property, financial contributions to the area (buying power, service providers etc), use of an affordable alternative cleaner energy source.</p> <p>Potential negative impact: Health & Safety Workers may be injured or their health affected if health and safety is not managed. Gas leaks (from tanks or delivery vehicles) or escape of gasses (during transfer) may impact of the environment, workers and neighbours (including school children). There is a fire, explosion and toxic release risk.</p>
Impact Significance: (Prior to mitigation)	Moderate Low
Management Measures:	<p>Aspects to be considered regarding the Above-ground Storage Tank (AST) location (SANS 10131: 2004):</p> <ul style="list-style-type: none"> • ASTs must not be near areas with poor stormwater drainage (ponding). • Areas prone to flooding must be avoided. • ASTs must be located in an area where the AST is not exposed to excessive heat or mechanical damage. • The contractor appointed to do the installation must be suitably qualified and registered with accredited associations such as LPG Safety Association of South Africa. • Area around the LPG tank must be kept clear of all combustibles or objects that may hinder access to the site (refer to layout, Drawing 2018- 02-EPG-Klerskoord). • The site may only be accessed by authorized personnel. • A LPG pipeline entering any building must have clearly marked signage every 2m displaying "LPG". • No electrical applications are to be brought within 5m of the LPG tank. • All mandatory fire equipment is to be present on site and regularly inspected. • Signs of dimensions of at least 300mm by 300mm must be displayed at all times prohibiting smoking and open flames on every side of a storage tank. • Inform staff that no source of ignition or potential source of ignition should exist within 5 metres of a storage tank. • Ensure that staff is familiar with the Occupational Health and Safety Act (OHSA), 1983 (Act 85 of 1983) and Policy. All the necessary safety regulations must be abided by including building codes and fire practice requirements. • Signage to caution employees and visitors – restrict entry in work areas; no open fires (smoking in certain

	<p>areas), personal protective equipment (PPE) required in work areas etc.</p> <ul style="list-style-type: none"> • Access to and around the tanks shall be provided for fire-fighting purposes and this area shall be kept free of obstacles at all times. • Notices setting out the emergency procedures shall be prominently displayed near the LPG storage area. • LPG fires should not normally be extinguished unless the source of LPG can be isolated. • Filling trucks shall be at least 3m away from any container. • LPG liquid, by its rapid vaporization and consequent lowering of the temperature, can cause severe cold burns when it comes into contact with the skin. Appropriate protective clothing, such as gloves, goggles, aprons, and gumboots, shall be worn when there is any possibility of such contact. Because of the hazard of the generation of static electricity, the soles of gumboots shall be made of leather or conductive rubber, and clothing shall not be made of fabrics that contain artificial fibres (SABS). • Refer to MHI as well as emergency plan. • Examples of signage: <div style="display: flex; justify-content: space-around; align-items: center;">   </div>
Impact Significance : (Post mitigation)	Moderate Low

Ecology	
Potential impact:	Reduction in extent of vegetation unit
Impact Significance: (Prior to mitigation)	Moderate Low
Management Measures:	<ul style="list-style-type: none"> Undertake an alien vegetation eradication programme and clear all alien vegetation species from the site.
Impact Significance : (Post mitigation)	Moderate Low
Waste Generation	
Potential impact:	<p>Waste generated: General waste will be produced by employees, as well as hazardous waste from equipment maintenance (oil, grease). Waste not properly managed could result in pollution of the surrounding environment.</p> <p>Spillage of Hydrocarbons: Spillage or leaks of hydrocarbons can cause soil, runoff and groundwater contamination if not contained.</p>
Impact Significance: (Prior to mitigation)	Moderate Low
Management Measures:	<ul style="list-style-type: none"> The tanks are AST on concrete slabs and / or within banded areas, decreasing the probability of soil and subsequent groundwater contamination. Spillages and/or leaks from AST are also more visible and therefore allows action to be taken quickly to prevent the spread of the contamination. Ensure separate containers (with lids) are available for storage of hydrocarbon-contaminated waste prior to removal off site to prevent overflow, rainwater contact and pollution on the site and surroundings. Drums and skip / bins must be kept onsite for waste collection. Clearly mark storage containers (and/or colour code) in terms of what waste can be stored in it. General waste must be handled as per the construction phase. Though no special disposal methods are required for non-hazardous waste, store non-biodegradable refuse such as glass bottles, plastic bags, etc. in suitable containers to allow for recycling and empty on an as-required basis. Ensure no litter, refuse and waste generated on the premises will be placed, dumped or deposited on this site, adjacent or surrounding properties during the operational phase.

	<ul style="list-style-type: none"> • Proof must be provided by the waste contractor (CoT or other) that the general waste is disposed of at a registered appropriate landfill site (safe disposal certificate). • Ensure copies of all waste manifests (safe disposal certificates) are kept showing responsible handling, transport and disposal by a reputable waste handler. • Waste manifest / safe disposal certificate must be kept on site for a period of 5 years.
Impact Significance : (Post mitigation)	Low
Air Quality	
Potential impact:	<p><u>Emissions into the atmosphere (toxic gas releases)</u></p> <p>The main compounds, associated with petroleum products that pose a potential pollution problem include the following:</p> <ul style="list-style-type: none"> • Benzene • Toluene • Ethyl benzene • Xylenes • Ethylene dichloride • Naphthalene
Impact Significance: (Prior to mitigation)	Moderate Low
Management Measures:	<ul style="list-style-type: none"> • The storage and transfer of LPG will not release quantifiable emissions into the atmosphere should the installation and handling standards be complied with. • The regular maintenance of pipelines will ensure that pipes are free from contaminants such as grease, oily deposits and welding slag. • Tanks and pipes must be checked for corrosion. • Regular monitoring of conveyance infrastructure (pipes) to ensure acceptable working conditions. • An emissions monitoring programme (in terms of air quality) should be implemented for VOC's: Vapour samples must be taken according to a three (3) monthly monitoring programme. The collection of data will provide necessary information to make informed decisions on improving air quality. • Odours should not be detectable beyond the property boundary.

	<ul style="list-style-type: none"> • Signs according to SANS 1186 will be placed. • Training of the workforce in awareness of emissions and associated dangers. • Models allow for the assessment of exposure and risk, impact areas and forecasting. • Provide a mechanism for presenting the neighbours with a comprehensive picture of what is happening within their area. • To allow for thermal expansion, the tanks are typically filled to between 80% and 85% of their capacity. • To control/limit the expansion of the LPG, an automatic sprinkler system overhead and a manual override sprinkler must be installed. • Refuelling of the tanks can be a source of LPG emissions, however, such emissions can be controlled through the use of special refuelling valves. • Tanks must have a built-in shutoff valve to seal the tank if the fuel lines start leaking. • Emergency shut-off valves shall be accessible and unobstructed at all times. • Refer to MHI and emergency plan. • A comprehensive Emergency plan must be compiled to include the following details: <ul style="list-style-type: none"> ◦ Do not use solid water stream for a diesel/petrol spillage as it may scatter and spread fire. ◦ In the event of fire, cool closed containers exposed to fire with water spray. ◦ After the elimination of all the ignition sources, all equipment is to be earthed. ◦ Personnel to be cautioned not to walk through a leaking gas stream as this can be harmful. ◦ Water spray is to be used to reduce the vapours or divert a vapour drift cloud. ◦ Dispersion of the vapours must be controlled to avoid entrance to the sewers, ventilation systems and confined areas. ◦ Should the magnitude of the event be deemed significant, a 800m evacuation must be considered. The event should be assessed by trained personnel and they must designate safe areas. Assembly points must be provided for in the emergency plan.
Impact Significance : (Post mitigation)	Moderate Low
Storm Water Management	
Potential impact:	Spillage of hydrocarbons.
Impact Significance: (Prior to mitigation)	Moderate Low
Management Measures:	Refer to construction phase. Immediate clean-up of hydrocarbons.

Impact Significance : (Post mitigation)	Low
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Decommissioning phase	
Waste Management	
Potential impact:	Demolition of structures and infrastructure. Handling of waste generated.
Impact Significance: (Prior to mitigation)	Moderate Low
Management Measures:	<ul style="list-style-type: none"> Only demolish structures and infrastructure which do not have an alternative and/or potential future use. Existing offices and ablation can remain and be used for any other future industrial use on the property. The decommissioning of the LPG facility must be conducted in compliance with municipal by-laws. After notifying the Chief Fire Officer of the cessation, all LPG equipment must be disassembled and removed from the property within 180 days. All flammable substances must be removed and safely disposed within 30 days of cessation of operations. The decommissioning phase must ensure that all general and hazardous waste have been disposed of adequately and according to the requirements stated in the construction and operational phase. All remaining steel must be sold to a legitimate scrap metal market/dealer. The site must be vacant of all waste/recyclable materials, so that the following industrial operation can commence without clean-up.
Impact Significance : (Post mitigation)	Low
Socio-economic	
Potential impact:	Job losses.
Impact Significance: (Prior to mitigation)	Moderate Low
Management Measures:	Employ skilled workers at another facility. Find alternative employment.
Impact Significance : (Post mitigation)	Low

9 MONITORING PROGRAMME

During the construction/installation and operational phase of the facility, monitoring and auditing of compliance with this EMP, the environmental authorisation conditions and with the OHSA Regulations are to be conducted. An Audit Protocol for both the construction/installation phase and the operational phase has to be drawn up by a suitably qualified person to include but not be limited to aspects listed below.

9.1 Construction Phase

The following aspects need to be audited:

a) All AST installations to comply to required standards as set out by regulatory authorities and include:

- Tank Specification and all work to comply with set Standards:
 - SANS 10131:2004
 - SANS 10087
 - SANS 10400
 - SANS 10089-2: Electrical Installation for above ground installations
- Secondary containment of tank and piping.
- Certification for tests carried out on completion of tank installation to ensure they do not leak.

b) EMP and environmental authorisation compliance (appoint an Environmental Control Officer (ECO))

c) Noise Monitoring

- A record of complaints must be kept on the premises as well as the measures taken to address these complaints.

d) Diesel

- Installation as per SANS 10131:1 2004 Edition 1. No diesel storage currently but planned for future.

e) LPG

- Installation by registered installer as per SANS 10087-7: 2013 Edition 4 & SANS 10087-3: 2015 Edition 5.
- Sizes and safety distances as per SANS 10087-7: 2013 Edition 4 & SANS 10087-3: 2015 Edition 5.
- 3m radius around each installation / facility clear of combustible material.
- Access control – access only by authorised person.
- No drains within 3m radius.
- No electrical installations within 5m radius.

f) Other:

- Presence of fire equipment as mandated – 5 X fire hose reel; 1 X fire hydrant within 90m radius; 2 X 9kg D.C.P fire extinguishers; 10 X danger LPG sign sets.
- Safety and warning notices as per SANS 1186 and Hazchem.
- Building work and safety distances as per SANS 10400.
- Electrical work as per SANS 0108 by master electrician.
- Major Hazard Installation (MHI) as per OHSA (MHI by Nature and Business Alliance is available).

- Valid certification of registration of flammable substance with the CoT Fire Department.

Sign off by an independent engineer of above audits.

9.2 Operational Phase

The following auditing systems need to be implemented by the manager of the facility:

a) Procedures for taking accurate daily opening and closing measurements, deliveries and stock transfer. This will provide information in terms of:

- Spillage due to overfill and the prevention thereof;
- Leak detection; and
- Product and client turnover.

b) Monthly audits must be undertaken by the depot manager. Log sheets must be filled in and actions noted.

c) OHSA Compliance

- A register to be compiled to indicate that all the employees have been informed as to their rights under the Act; and
- Accident records must be kept, as per the Act and reported to the Department of Trade and Industry (DTI).

d) Complaints and incident register

- Register all complaints and incidents as well as measures taken to address these.

e) Emissions monitoring

- An emissions monitoring programme (in terms of air quality) should be implemented - vapour samples must be taken according to a three (3) monthly monitoring programme and analysed for VOC.

f) Inspections to check:

- 3m radius around each LPG installation / facility clear of combustible material.
- EMP and environmental authorisation compliance.
- Access control.
- Condition and maintenance of fire equipment.
- Condition and maintenance of safety and warning notices.
- Validity of Fire Department Certificate.
- Check for corrosion and other problems on tanks and pipes which require maintenance.

10 RESPONSIBILITY

The applicant, EPG Gas, will be responsible for the implementation of all management measures as well as for compliance with this EMP and any additional conditions imposed by the environmental authorisation. Each Contractor or employee involved in the project will comply with the EMP and environmental authorisation conditions and Contractors will therefore appoint a Contractor's Representative (the title may vary such as an environmental officer (EO)), who is responsible for the on-site implementation of the EMP (or relevant sections of the EMP).

The representative will be suitably qualified to perform the necessary tasks and will be appointed at a level such that he/she can interact effectively with other site contractors,

labourers, the ECO, and the public. The representative must ensure that all sub-contractors abide by the requirements of the EMP and environmental authorisation conditions.

The representative for EPG Gas is Mr Pieter le Roux (082 314 4189).

The construction/installation contractor still has to be appointed.

The conditions of the EMP and environmental authorisation must be brought to the attention of all persons (employees, workers, consultants, contractors etc.) associated with the undertaking of these activities. EPG Gas must take such measures that are necessary to bind such persons to the conditions thereof (contracts with penalties for non-compliances).

EPG Gas can further enforce this by running workshops or seminars with all employees/contractors in order to raise environmental awareness (refer to environmental awareness plan). These workshops should cover aspects such as the handling of used hydrocarbons (grease & oil), pollution prevention, safe operating of mechanical equipment, water conservation, waste management and general duty of care.

11 RECORD KEEPING AND REPORTING

Accurate and up-to-date records will be kept (by the EO or other appointed representative) of all system malfunctions resulting in non-compliance with the EMP or authorisations/licences. EPG Gas will also, within 24 hours, ensure that the relevant authorities are notified of the occurrence or detection of any incident which has the potential to cause, or has caused pollution of the environment, health risks or which is a contravention of any EMP or environmental authorisation/licence condition. EPG Gas is then to submit an action plan indicating measures which will be taken to:

- Correct the impacts resulting from the incident;
- Prevent the incident from causing any further impact; and
- Prevent a recurrence of a similar incident.

A complaints register will be kept on site and all complaints from the public and neighbours will be noted therein as well as measures taken to rectify the situation as described above.

12 ALTERATIONS TO THE EMP

As EMPs should remain dynamic and flexible, certain conditions may require the EMP to be revised. These conditions may include the following:

- Changes in legislation;
- Published/gazetted norms and standards;
- Occurrence of unanticipated impacts or impacts of greater significance, intensity and extent than anticipated;
- Conditions in environmental authorisation which do not form part of the EMP;
- Inadequate mitigation measures, i.e. where the level of an environmental parameter is not conforming to the required level despite the implementation of the mitigation measure; and
- Secondary impacts which occur as a result of the mitigation measures.

13 ENVIRONMENTAL AWARENESS PLAN

13.1 Objectives

The objectives of an environmental awareness plan are to:

- Inform employees and contractors of any environmental risk which may result from their work, and
- Inform employees and contractors of the manner in which the identified possible risks must be dealt with in order to avoid pollution or degradation of the environment.

In general, the purpose of implementing an environmental awareness plan is to optimise the awareness of those partaking in the activities, which have the potential to impact negatively on the environment, and in doing so, promote the goal of sustainable development.

13.2 Communication

Both objectives of the environmental awareness plan indicate that employees and contractors must be informed. Information sharing is only possible through effective communication channels.

The goal for proficient communication is to provide structures for effective communication, participation and consultation that relate to the organization's occupational health and safety hazards, environmental hazards and the Safety, Health, Environment and Quality (SHEQ) management system.

The objective of the communication procedure is to ensure effective communication flow, involvement of all levels of employees in the communication chain and to comply with the requirements in terms of ISO 9001:2008 clause 5.5.3 and ISO 14001:2004 clause 4.4.3.

13.3 Communication responsibility

Communication on site will be uncomplicated due to the small size of the facility (± 2 ha) and the limited number of people involved.

The management representative for EPG Gas (Mr Pieter le Roux) has the responsibility, designated authority and accountability to ensure:

- Communication channels/processes are established, implemented and maintained.
- External communication: Communication with the media (press releases), other governmental departments (Department of Health, Department of Labour etc.), provincial (GDARD) and local authorities (CoT) as well as Interested and Affected Parties (I&APs such as neighbouring industries) on environmental issues.
- Internal communication:
 - Informing employees as to who is their representative and designated management appointee.
 - Obtaining information relating to responses required and/or requested by external parties from on-site representatives.
- Amendments to or new legislation, amendments to or new company policies, amendments to or new procedures and protocols.
- Development and review of environmental policies and management of hazards/risks/impacts.

Employees (on-site representatives/workers) have the responsibility to conduct themselves in a circumspect manner ensuring the environment is not negatively impacted by their activities and their actions do not negatively impact the company image.

13.4 Environmental risk

Employees and contractors will be informed of any environmental risk, which may result from their work through the communication channels established and described above. Employees and contractors will be informed of environmental risks through communication from management and documentation provided. Environmental principles will be communicated effectively to newly appointed employees, current employees, employees returning from leave as well as contractors and visitors upon entering the area.

Work procedures and protocols, which include potential risks, will be compiled for all tasks to be undertaken. Within each work procedure, an environmental risk section will be included. The environmental risk section will indicate whether the risk is to air, groundwater, surface water, soil, fauna or flora. The work procedure will then also include actions to be taken by the employee to prevent or minimise the risk.

13.5 General considerations

It is important to consider the level of education and literacy of the receiving audience and all information communicated should therefore be kept simple and be easy to understand, making use of pictures as much as is practically possible to also overcome possible language barriers in English documentation.

Employees, personnel, staff, workers and contractors on the project need to be equipped with the knowledge, skills and training to enable them to manage their task competently and safely without significant impact on their surrounding environment. EPG Gas will ensure that they employ people qualified for the task which is expected of them and/or provide in-house training to acceptable skill levels.

While management will ultimately be responsible and accountable, personnel will also be given responsibility and accountability to follow procedures and report to management on certain aspects.

Basic environmental knowledge, training and awareness will be included in inductions.

13.6 Aspects covered

The first objective of the environmental awareness plan is to inform employees and contractors of any environmental risk which may result from their work. The following aspects will be addressed during environmental awareness training for employees, personnel, staff, workers, contractors and visitors. The objective is to raise environmental awareness and educate people on environmentally responsible conduct.

The items have been structured to enable even uneducated visitors to comprehend it. Pictures will be added to convey the message to illiterate people. Pamphlets will be distributed and notices / sign boards will be placed around the site to continually remind workers to be environmentally responsible and cautious when entering premises.

13.6.1 General

Importance of the environment and why we need to protect it.

- Non-living elements: air, water, soil.
- Living elements: plants, animals, humans.
- Living elements depend on non-living elements for survival.
- Relationship between living and non-living elements.
- The life cycle to keep everything in balance.
- People are reliant on the natural life cycle for their existence.

Terminology

- Any change to the environment due to human activities is called an impact. Impacts can be positive or negative. A positive impact is job creation and the use of a cleaner energy source such as LPG. A negative impact is pollution such as littering and improper waste handling.
- Contamination or pollution is when a natural element such as air or water is impacted negatively due to human activities. Escape of gasses will impact air quality.
- Environmental management is the control of human activities to minimise the impact on the natural environment as much as possible. It ensures that pollution is minimised and that people living in the environment are healthy (physically and mentally). The clean-up of hydrocarbon (diesel, grease or oil) spillages is an environmental management measure.

The role of the employee.

- What can you and I do to protect the environment? Discuss environmentally acceptable behaviour such as closing of taps, correct use of ablution facilities etc.
- What can you and I do to ensure that this project does not cause unnecessary damage to the environment? Report and clean spillages, stay within demarcated areas etc.
- There is always a reason for an environmental impact or accident and generally people are the reason.
- Always work carefully so that you don't damage the environment and protect your own safety and health.
- Obey the rules.
- Report any impacts/incidents or accidents to your supervisor/manager.
- Your role is important, be environmentally responsible and always aware of the environment.
- Negative environmental impacts can cause death, injury, pain, suffering, diseases, damage to property and equipment, legal liability, cost, loss of productivity.
- We must look after our environment for the sake of our children and their children.

South African laws protecting the environment:

- Constitution of the Republic of South Africa, 1996 (Act 108 of 1996) – Section 24.
- National Water Act, 1998 (Act 36 of 1998)
- National Environmental Management Act, 1998 (Act 107 of 1998)
- National Environmental Management Waste Act, 2008 (Act 59 of 2008)
- National Environmental Management Air Quality Act, 2004 (Act 39 of 2004)
- Hazardous Substances Act, 1973 (Act 85 of 1973)

13.6.2 Animals

- No hunting, poaching, snaring or killing of any animals will be allowed.

- Report animals seen within the area to your supervisor to have them safely removed as this poses a danger to them.

13.6.3 Plants

- Vegetation will only be removed within the demarcated footprint for the installation.
- Maintain large indigenous trees, shrubs and understorey where possible (north east and south east corners of property).
- Weeds and exotic vegetation must be removed and controlled – Alien vegetation eradication programme.
- Geophytes need to be removed and relocated to the Onderstepoort Nature Reserve – Plant rescue and translocation operation.

13.6.4 Sewage and ablution

- No ablution or washing outside designated areas.

13.6.5 Waste management

- No littering is allowed on the property or neighbouring properties. A litter patrol will be conducted once a week to remove litter from the environment and properly dispose of this.
- No waste is to be buried on this site or neighbouring properties.
- No burning of waste.
- Use skips/bins/bags for general waste storage until it is collected for disposal.
- Oils / greases / hydrocarbon contaminated waste is considered hazardous and should be collected separately for recycling.
- Waste manifests or safe disposal certificates need to be obtained for all waste streams leaving the site to ensure proper recycling or safe disposal.
- Clean up any spillages and dispose appropriately of the waste which was generated as a result of spillages.

13.6.6 Water

- Use water sparingly. No wastage of water will be allowed. Close taps after use.
- Repair leaking pipes.
- Ensure all valves or taps on water lines are closed if not in use.
- Maintain infrastructure (pipes) that convey water to prevent blockages and/or spillages.

13.6.7 Sensitive environments

- Streams, rivers, wetlands and dams or any area associated with naturally occurring water is considered environmentally sensitive features and should be avoided.
- Remain within demarcated areas.
- The Onderstepoort Nature Reserve located north of the site is also an environmentally sensitive area.

13.6.8 Safety

- Keep on designated pathways.
- Report fires, incidents, accidents, injuries etc.

13.6.9 Recording & Reporting

- All complaints by members of the public or neighbours should be registered and captured in a complaints register to allow investigation and remedial action;
- All incidents should be recorded in an incident log sheet to allow investigation and remedial action (see Table 6);
- Report impacts/incidents/accidents immediately to a supervisor/manager;
- Investigate any impact/incident/accident to find out why it happened, what can be done to fix it and what should be done to prevent it from happening again; and
- Report any damage to infrastructure to supervisor/manager.

13.6.10 Recording and Reporting of Incidents / Accidents / Impacts

The second objective of the environmental awareness plan is to inform employees and contractors of the manner in which the identified possible risks must be dealt with in order to prevent degradation of the environment. Work/operational procedures and protocols will deal with this. Dealing with identified possible risks will also include recording and reporting of incidents / accidents / impacts.

Investigation Reports

All incidents / accidents / impacts (injuries, spillages etc.) will be recorded as per defined SHEQ standards. A standard format (investigation report) will be completed for each incident / accident / impact to allow further investigations into the matter.

The investigation report will contain the following information:

- Particulars and description of incident / accident / impact (date, time, area, conditions etc.)
- The investigation panel;
- Root cause;
- Corrective and preventative measures to prevent recurrence;
- Witness and Insured's statements;
- Photos and Work Instructions; and
- Risk assessments carried out for the tasks performed.

Emergency and Contingency Measures

Emergency and contingency plans will be put in place in conjunction with the necessary equipment and personnel on stand-by to manage such situations as and when necessary. Codes of Practice, operating procedures and planned maintenance systems will be established for inspection, maintenance, and to ensure effective and continuous operation and early detection of any malfunction or emergency incident.



	
Emergency assembly point indication	Location of fire fighting equipment

Plate 1: Signage and emergency items to be established on site

Table 5: Example of Emergency Contact Details

NETCARE	082 911
POLICE	10111
POLICE STATION (Akasia – 1 Piet Rautenbach Street, Rosslyn)	012 564 0700
FIRE/AMBULANCE	10177
FIRE STATION (Rosslyn)	012 358 9960
HOSPITAL (Netcare Akasia – Cnr Heinrich & Brits Avenue)	012 522 1000

Table 6: Example of Incident and Environmental Reporting Sheet

INCIDENT AND ENVIRONMENTAL LOG SHEET														
Date:		2	0		/	m	m	/	d	d	Time:	:	Location:	
Nature of incident or risk type:				Procedure/ Process			Environmental		Safety		Health		Equipment/ Machinery	
Description / nature				Quantity of Spill/ Release:							Pollutant/ Substance:			
Clean up or containment method:													Product Used:	
Hours lost:							Cost:				Root Cause:			
Corrective actions taken:														
Incident reported by:								Signature:						
Capacity of person above:								Repeat Incident		YES		NO		
Further investigation required:				YES		NO		Person handling further investigation:						