











1.5 Million Natural Gas Connections Project in 11 Governorates

Site-Specific Environmental and Social Impact Assessment

Farshout PRS /Qena Governorate

Final Report

November 2018

EGAS
Egyptian Natural Gas Holding Company

Developed by

EcoConServ Environmental Solutions

Petrosafe
Petroleum Safety & Environmental Services

Company

LIST OF ACRONYMS AND ABBREVIATIONS

AFD	Agence Française de Développement (French Agency for Development)
ALARP	Stands for "As Low As Reasonably Practicable", and is a term often used in the milieu of safety-critical and safety-involved systems. The ALARP principle is that the residual risk shall be as low as reasonably practicable.
BUTAGASCO	The Egyptian Company for LPG distribution
CAPMAS	Central Agency for Public Mobilization and Statistics
CDA	Community Development Association
CO	Carbon monoxide
CRN	Customer Reference Number
CULTNAT	Center for Documentation Of Cultural and Natural Heritage
EEAA	Egyptian Environmental Affairs Agency
EGAS	Egyptian Natural Gas Holding Company
EGP	Egyptian Pound
EHDR	Egyptian Human Development Report 2010
EIA	Environmental Impact Assessment
ER	Executive Regulation
E&S	Environmental and Social
ESIA	Environmental and Social Impact Assessment
ESIAF	Environmental and Social Impact Assessment Framework
ESM	Environmental and Social Management
ESMF	Environmental and Social Management framework
ESMP	Environmental and Social Management Plan
FGD	Focus Group Discussion
GAC	governance and anticorruption
GDP	Gross Domestic Product
GIS	Global Information Systems
GoE	Government of Egypt
GPS	Global Positioning System
GRM	Grievance redress mechanisms
HH	Households
HHH	Head of the Household
hr	Hour
HSE	Health Safety and Environment
IBA	Important Bird Areas
IDSC	Information and Decision Support Center
IFC	International Finance Corporation
IGE/SR	Institute of Gas Engineers/Safety Recommendations
LDCs	Local Distribution Companies
LGU	Local Governmental Unit
LPG	Liquefied Petroleum Gas
mBar	milliBar
MDG	Millennium Development Goal
MOP	Maximum operating pressure
MP	Management Plan
MTO	Material take-off
NG	Natural Gas
NGO	Non-Governmental Organizations

NO_2	Nitrogen dioxide
OSH	Occupational Safety and Health
P&A	Property and Appliance Survey
PAP	Project Affected Persons
PE	Poly Ethylene
PM_{10}	Particulate matter
PPM	Parts Per Million
PRS	Pressure Reduction Station
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
SDO	Social Development Officer
SIA	Social Impact Assessment
SO_2	Sulphur dioxide
SSIAF	Supplementary Social Impact Assessment Framework
SYB	Statistical Year Book
T.S.P	Total Suspended Particulates
Town Gas	The Egyptian Company for Natural Gas Distribution for Cities
WB	The World Bank
WHO	World Health Organization
$	United States Dollars
€	Euros

Exchange Rate: US$ = 17.96 EGP as of November, 2018
Exchange Rate: € = 20.5 EGP as of November 2018

Contents

List of Annexes

LIST OF TABLES

LIST OF FIGURES

1 INTRODUCTION

1.1 Preamble

Aiming at installing the NG to about 6,000 clients in Farshout City, the Local Distribution Company ReGas will construct a new PRS in Farshout City. This ESIA is site specific for construction of a new PRS in Farshout City.

The local distribution company responsible for project implementation in Farshout City is ReGas (شركة غاز الاقاليم).

1.2 Environmental and Social Impact Assessment (ESIA)

The ESIA is undertaken to assess and propose mitigations for environmental and social impacts of the proposed pressure reduction station (PRS) and HP pipeline in Farshout, Qena, Egypt.

The objectives of the ESIA include:

- Describing project components and activities of relevance to the environmental and social impacts assessments
- Identifying and addressing relevant national and international legal requirements and guidelines
- Describing baseline environmental and social conditions
- Presenting project alternatives and the no project alternative
- Assessing potential site-specific environmental and social impacts of the project
- Developing environmental & social management and monitoring plans in compliance with the relevant environmental laws
- Documenting and addressing environmental and social concerns raised by stakeholders and the Public in consultation events and activities

This ESIA covers the construction of the high pressure pipeline from the off-take and the new PRS with a capacity of 5,000 m^3/hr. The length of the high pressure pipeline connecting the off-take from the national grid to the new PRS is 400 m.

1.3 Contributors

The ESIA has been prepared by a Joint Venture between Petrosafe (Petroleum Safety & Environmental Services Company) and EcoConServ Environmental Solutions (Cairo, Egypt) with collaboration, and facilitation from EGAS, ReGas HSE and Engineering Departments. The names of the Petrosafe and EcoConServ experts who have participated in the preparation of the ESIA study are listed in **Annex 1** of this report.

2 PROJECT DESCRIPTION

2.1 Background

Natural Gas (NG) is processed and injected into the high pressure lines of the national Grid (70 Bar) for transmission. Upon branching from the main lines to regional distribution networks, the pressure of the NG is lowered to 7 Bar at the PRS. An odorant is added to the NG at PRSs feeding distribution networks to residential areas[1] in order to facilitate detection in the event of leaks.

Regulators are then used to further lower the pressure to 100 mbar in the local networks, before finally lowering the pressure to 20 mbar for domestic use within households. In addition to excavation and pipe laying, key activities of the construction phase also include installation of pipes in buildings, internal connections in households, and conversion of appliance nozzles to accommodate the switch from LPG to NG.

The diagram below presents the components of a city's distribution network. The components covered in this ESIA are lined in red. Other components are addressed in a separate ESMP:

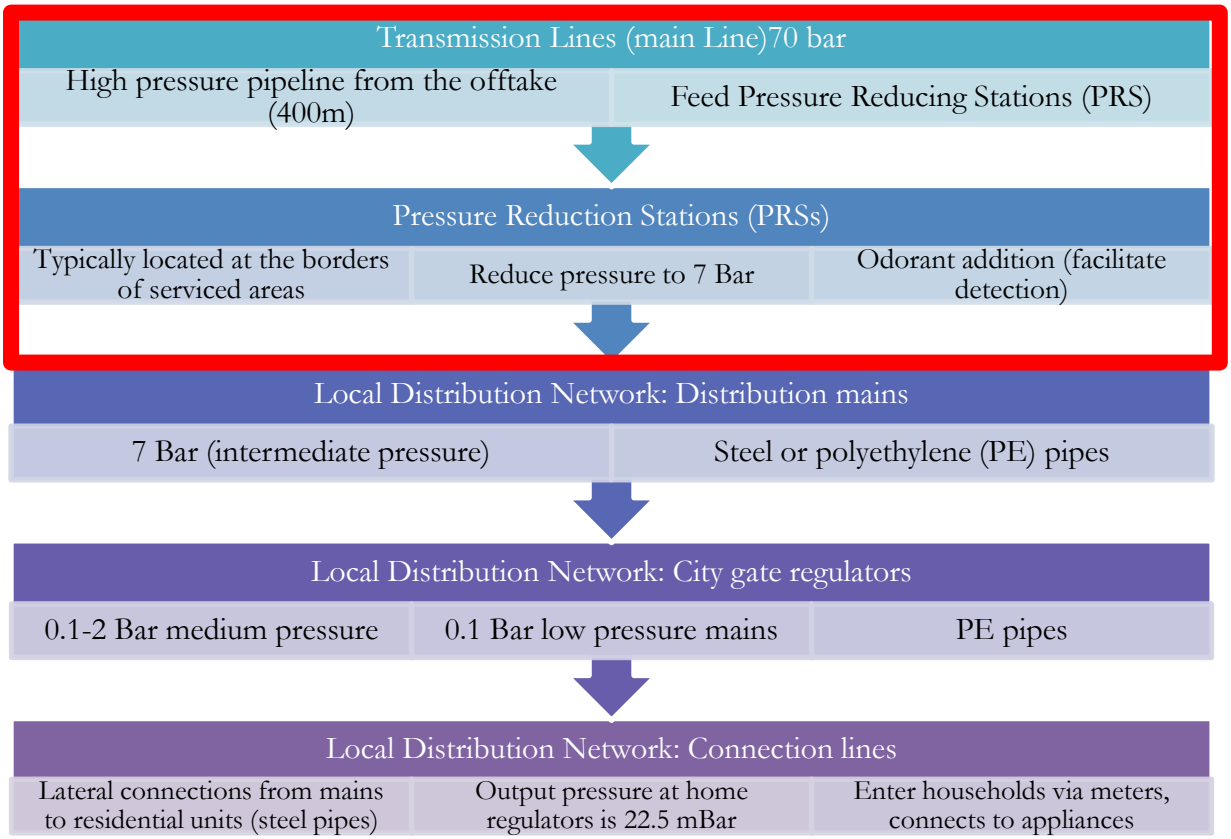

Figure 2-1: General components of the city's distribution network

[1] Because natural gas is odorless, odorants facilitate leak detection for inhabitants of residential areas.

2.2 Project Work Packages

2.2.1 Off-take and inlet connection/ 70 bar pipeline system

The national grid pipeline network have a MOP of 70 bar**.** The off take is the point on the HP national grid pipeline where a branch of the pipeline is constructed to connect the PRS to the national grid.In Farshout the high pressure pipeline (HP) connection between off-take and PRS will have an approximate length of 400 m. At the off-take location, valve rooms/valve ditching is constructed so as to control the flow of the natural gas through the pipeline (branch).

2.2.2 Pressure Reduction Station (PRS)

The PRS consists of the following components: an inlet unit (isolated cathodic system), a liquid separation unit, a filtration unit, and a pressure and temperature gauge. Other components include auxiliary devices such as a safety valve (Slam Shut), relief valves, an odorizing unit, ventilation equipment, as well as diesel and jockey pumps

Utilities existing in a PRS include a control room, a firefighting system (firefighting water tank, firefighting valve), a staff bathroom, and a storage area and entrance room located adjacent to the entrance gate. The PRS for Farshout will be designed to reduce an inlet pressure in the range of 70 to 18 bar to an outlet pressure of 7 bar at a flow rate of 5,000m^3/h.

2.3 Project Location

The off-take from the national natural gas grid will be approximately 400 m away from the PRS location shown in the figure below. The exact routing of the off-take from the main feed to the PRS was not available at the time of the submission of the report. The high pressure pipeline will be installed along existing roads...

Figure 2**-2: PRS location (yellow star)**

The PRS is located in a remote area as shown in Figure 2-2. The nearest receptor is a cemetery located 1.05 km away from the PRS. The nearest residential areas and village of Aldhsh are located 2 km and 4.7 km away from the PRS site (Figure 2-3). Considering the planned length of the high pressure pipeline (400 m), the routing is not anticipated to be in proximity of any residential areas.

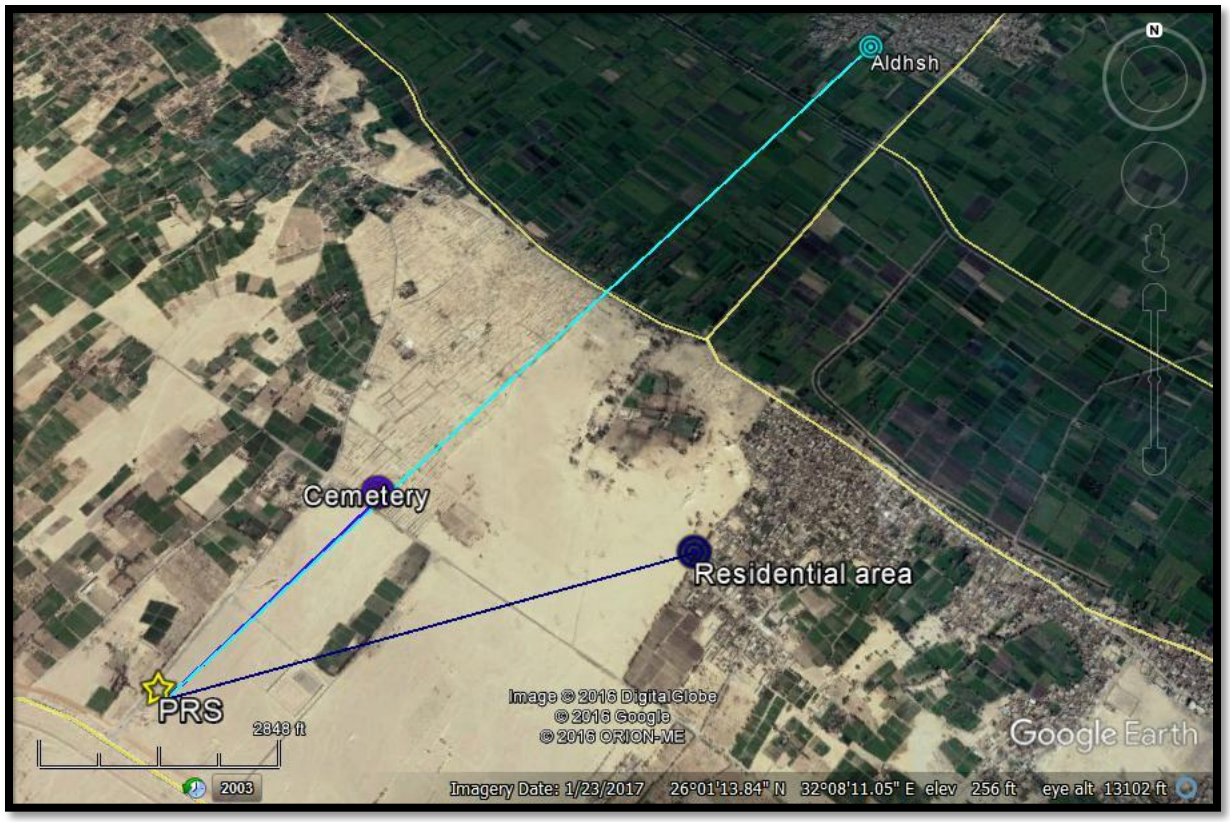

Figure 2-3: Nearest villages to the proposed PRS site (yellow star)

2.4 Project Execution Methodology

2.4.1 General survey

A general survey is conducted for the purpose of the following:

- Identifying availability of utilities in the area and their conditions (electricity, water, telephone lines, and sanitary pipelines) through data and maps from the relevant authorities.
- Identifying the location of the nearest national grid pipelines, gas networks and off-take.
- Identifying the location of the new PRS location.

2.4.2 Design and material take-off (MTO) including procurement

Once the final location of project components is finalized, a final design of the PRS is utilized to estimate the materials and equipment needed to implement the project. Procurement of the materials includes local and international components. The main international purchases may include critical components and PRSs, regulators, and metering stations.

2.4.3 Construction of the high pressure pipeline network "70bar system – S-HP"- High Pressure Network High Pressure Steel Piping

Construction activities of the HP pipeline include excavation, pipeline placement, pipeline connection welding and then surfacing. The construction activities will be located within the allocated site. The duration of the construction of the pipeline will be 2 months. Other construction activities include:

- Clearing and grading activities and pipe transportation and storage
- Site preparation
- Excavation
- Pipe laying
- Welding
- Backfilling and road repair
- Leakage testing

The construction of the HP pipeline will temporarily involve roads. The main roads will be used on a temporary basis to transport personnel, equipment and material to the project site.

- ***Clearing and grading activities and pipe transportation and storage***

The first step of construction includes flagging the locations of the approved access route of the pipeline; installing a temporary workshop for the crew; erecting fences surrounding the working areas: and land clearing. Grading is conducted where necessary to provide a reasonably leveled work surface. Additionally, equipment and piping will be transported to the site and stored at a temporary storage area. Quality control procedures during the transportation and handling of pipes should take place to ensure protection from any effects that may damage the pipes, and prevent any traffic accidents.

Locations for temporary storage areas have not been determined at the time of the submission of the report.

- ***Site preparation***

Before any excavation activities, ReGas shall coordinate with the different authorities to determine the existing infrastructure in the project's area (e.g. water lines, sewage lines, electrical cables and telecommunication lines) so as to avoid any undue damage. In case of lacking sufficient information on the available infrastructure, inspections on the presence of underground utilities are carried out by drilling exploratory drills and/or using utility detection devices. Pipeline routes are then identified and marked in the field.

The pipeline system shall consist of 70-Bar extending from the off-take of the main feed intake to the PRS. Farshout will be connected to the national Natural Gas Grid (High-Pressure Steel lines). A 400 m off-take will connect the 70-bar HP line to a new 5000 m^3/h Pressure Reduction Station (PRS).

- *Excavation*

Pipe laying of the high pressure line in Farshout will not involve crossings (e.g., railways or water bodies), therefore, the excavation technique applied will be open cut. Trenches for steel high pressure pipes will be excavated at depths of 1.2 m. The diameter of the steel-HP pipelines is 6 inches.

HP piping will take place in an area which is by and large uninhabited and exhibits minimal flora/fauna.

Excavation works start by removing the asphalt layer using either a mechanical trencher or a jack hammer. The mechanical trencher also removes broken asphalt and the base stone layer. In case the jack hammer is used, road layers are then removed by an excavator.

The road base soil, underneath asphalt and stones, is then excavated either by a backhoe excavator or by manual excavation.

Excavated soils, broken asphalt and other waste materials during excavation are loaded onto trucks, which are transferred to disposal areas. Because of the limited available space on most

Egyptian streets, loading waste trucks shall be done upon excavation, whenever possible, in order to avoid stockpiling waste on site.

- *Pipe laying*

Before pipe laying, the bottom of the trench is cleaned of any rocks or solid objects which may damage the pipes. In some cases, where the groundwater table is shallow, the trench should be dewatered before pipe laying. Dewatering pumps typically discharge into a drain or sewer manhole, according to arrangements with local authorities. To conserve water, if dewatered groundwater is free of perceivable pollution, it will be- to the extent possible- used on- or around the work site or discharged into the nearest canal to be used for irrigation.

- *Welding*

Arc welding is used with HP steel pipes. Steel pipes are protected from corrosion by isolating coats, and by fixing an anode for cathodic protection. For long segments of the steel-HP pipelines, the impressed current protection system is employed with the aid of electrical components such as transformers. Once the trench is excavated and cleared, the pipe stretch shall be laid down.

- *Backfill and road repair:*

After laying and welding works, the trench containing the HP pipe is backfilled with sand either by a front loader or manually. The trench will be backfilled immediately after the pipeline has been laid considering that the finished backfilling level will be the same as the road level. The initial backfill will be to a minimum height 20 cm of fine sieved sand either by a front loader or manually to protect the pipeline. The backfill will be then compacted by wet sand layers of 15 cm thickness in order to avoid road settlements and subsequent cracks. Natural gas pipes are surrounded by sand in order to absorb loads from the road.

A yellow warning tape marked "Natural Gas" is placed on top of the sand layer.

In some cases, if the street width is not enough to fulfill the proximity required in standards for safety to sustain pressure, an inverted U-shaped reinforced concrete slab is constructed around the pipeline after laying in order to improve shock resistance.

Upon completing the backfilling works, the contractor will proceed to restore the road surface to its original status.

- *Hydrostatic leakage testing*

Following construction activities, the piping will be tested to locate possible leaks using hydrostatic testing, which consists of filling pipes with water and then pressurizing to 1.5 times the operating pressure and measuring the pressure at different locations. Pressure drop indicates leakage. The water is then drained. This drainage takes place by the "pigging process", which includes forcing an object, the "pig", through the pipe by liquid or air pressure to totally drain the line before NG is fed.

In order to prevent deformation, dislocation, and rupture of the pipes, leakage testing through pressurization is performed after backfilling the excavation under (10 cm), around (10 cm), and above the pipes (20 cm, at least).

2.4.4 Construction works of PRS

2.4.4.1 Pressure Reduction Station area

PRS siting was performed according to international best-practice and guided by minimizing the possible negative impacts on the project's surroundings: the safety of neighboring areas from

possible gas release accidents and noise associated with reducers operations. The PRS will be surrounded by a wall for safety and security purposes (including reducing noise impacts of the PRS reducers on the surrounding receptors).

The closest buildings are approximately 50 m away from the PRS location (see figure below). The buildings are Army property and are used as temporary campsites[2].

In the event that buildings are constructed in the area surrounding the PRS, the Institute of Gas Engineers Safety Recommendations requires the following buffer zones:

- PRS will have free areas (20-30 m) from each side to allow for emergency vehicle access.

The PRS in Farshout will be located in a low-population-density area on a cleared land plot occupying an area of 2,500 m^2 (Figure 2-4.) The PRS will be accessible by an existing road to ensure quick response in the event of repairs or emergencies.

Figure 2**-4: Site surrounding Farshout site for the PRS (yellow star)**

2.4.4.2 Pressure Reduction Station Civil Works

A 7-month construction schedule is planned for the PRS in Farshout with site preparation expected to commence in 2018.

The main construction activities will include:

- Site preparation, acceptance and placement of major fabricated equipment items, construction of buildings, testing and commissioning.

[2] ReGas is in the process of obtaining all permits pertaining to the location.

- Initial construction activities involve clearing and grading of the site, sediment fences and silt traps will be installed, as necessary, to control erosion and sediment transport during site preparation activities.
- Following site preparation, individual excavations will be made for fire-fighting tanks, domestic wastewater trench, pipe racks, and a 6-m high wall (cement) around the PRS.
- Next, concrete foundations for buildings and footings for mechanical equipment are laid;
- Facility piping (inlet, outlet and 4 inch firefighting line) both above and below ground, are installed.
- A 120 m^2 control room with bathroom, an electrical units room, and a security room adjacent to the PRS gate will be constructed.

2.4.4.3 Pressure Reduction Station Mechanical Works

The PRS comprises of two pressure streams, the upstream (inlet) high pressure ranging from 30 to 70 Bar and the downstream (outlet) low pressure 7 Bar. The PRS design is in accordance with the Institute of Gas Engineers/Safety Recommendations IGE/SR/9, 10, 16, 18, 22, 23, 24, 25; Institute of Gas Engineers/Transmission Distribution IGE/TD/13; and National Fire Protection Association NFPA 15.

Figure 2-**5: A typical example of the planned PRS (example)**

Following the construction of foundation and fences, construction will continue with the installation of mechanical components. PRS mechanical components include:

- Inlet ball valve
- Solid filtration
- Liquid filtration

- Water bath heater
- Reduction regulator
- Active regulator
- Monitor regulator
- Slam shut /Safety valve
- Relief valve
- Measuring unit
- Odorizing unit
- Outlet unit

2.4.4.4 Testing

Following mechanical completion, testing of the facility components will be performed in accordance with applicable standards.

2.5 Operation phase

2.5.1 Operation of the PRS

Operation of the PRS involves operation of the various components outlined in the construction phase. Risks associated with those activities are further addressed separately in a Quantitative Risk Assessment (QRA) - (refer to annex 9. Quantitative Risk Assessment)

2.5.1.1 Inlet ball Valves

The inlet valve includes an insulation joint to completely isolate the PRS inlet from the Cathodic system applied to the feeding steel. The insulation joint isolates the PRS for protection during strikes and current.

2.5.1.2 Filtration unit

The filtration unit consists of two main stages, a liquid filtration stage and a solid filtration stage. The aim of the filtration unit is to remove dust, rust, solid contaminants and liquid traces before entering into the reduction stage. Two filters and two separators are installed in parallel; each filter-separator operates with the full capacity of the PRS to separate condensates and liquid traces. The solid filtration unit is designed to separate particulate matter larger than 5 microns. Filter-separator lines are equipped with safety devices such as differential pressure gauges, relief valves, liquid indicators, etc.

2.5.1.3 Heating unit/Water Bath Heater

Th heating unit/water bath heater ensures that inlet gas to the reduction unit enters with a suitable temperature (the temperature of gas flow entering the station should be 15°C; and to avoid the formation of natural gas water hydrates in the line downstream of the choke or regulator (due to Joule Thompson effect). Temperature increases by heat exchange between gas pipeline pass through the heating unit filled with hot water. The unit was designed to be heated to 60°C; while the heating temperatures for the outlet flow gas ranges between 35°C and 45°C.

The heating unit comprises of the following components:

- Heater body/shell
- Process gas inlet/outlet
- Water Expansion tank

- Burner , Gas Train & BMS Panel
- Removable Fire tube
- Exhaust stack
- Heating medium(Water Bath)

Each PRS is equipped with two heaters in parallel (one of them being on standby in case of emergencies).

2.5.1.4 Reduction

Each PRS includes two reduction lines in parallel (one of them being on standby in case of emergencies). The lines are equipped with safety gauges, indicators and transmitters to maintain safe operating conditions. According to the IGEM standards, the reduction unit should be installed in a well-ventilated closed area or, alternatively, in an open protected area.

2.5.1.5 Active and Monitor Regulator

The active regulator controls the outlet pressure while the monitor regulator assumes control in the event of failure of the active device.

2.5.1.6 Slam Shut Valve

The purpose of the Slam shut valve is to totally, automatically and rapidly cut off gas flow when the outlet pressure exceeds or drops below the setting pressure. The valve has to be installed to protect the system. The safety valve has to be sized for the maximum gas flow with the highest pressure that could be provided to the pressure reducing valve.

2.5.1.7 Measuring Unit

After adjusting the outlet pressure, gas flow and cumulative consumption are then measured to monitor NG consumption from the PRS and to adjust the dosing of the odorant indicated below.

2.5.1.8 Odorizing Unit

Natural gas is generally odorless. The objective of odorizing is to enable the detection of gas leaks at low concentration, before gas concentration becomes hazardous. The odorant is composed of Tertio Butyl Mercaptan (80%) and Methyl sulphide (20%). The normal dosing rate of the odorant is 12-24 mg/cm^3. The odorant system consists of a 25 L stainless steel tank, which will be refilled by the supplier (Egypt Gas or Town Gas). There will be no storage of tanks onsite. Bimonthly mechanical maintenance work will be carried out. Odorant levels will be recorded daily.

2.5.1.9 Outlet unit

The outlet unit includes an outlet valve gauge, temperature indicators, pressure and temperature transmitters and non-return valves. The outlet pipes are also, like inlet pipes, isolated from the cathodic protection by an isolating joint.

2.5.1.10 Hotline

A 24 hours /7days a week Hotline (**129**) is available for customers and the public to to request repairs or assistance. This line is also used in case of emergencies to report leaks, damage, emergencies, and/or incidents related to gas connections, components, infrastructure, and activities (inside or outside households).

2.6 Resources Consumption

2.6.1 During Construction

2.6.1.1 Water

Water is mainly used during the construction phase in concrete preparation, hydrostatic testing, and domestic uses by the workers and engineers. Water for construction and hydrostatic testing is sourced from trucks. Bottled water will be used for drinking purposes. The expected amount of water to be used during the construction phase of this project is:

- Domestic uses by the workers and engineers: 5 m^3/day
- Construction activities: 250 m^3

2.6.1.2 Fuel

Diesel fuel will be mainly used for:

- Diesel generators to supply electricity to the various construction activities including welding.
- Trucks and excavators fuel.

The expected amount of diesel fuel to be used in the construction phase of the PRS is around 60 liters per day. The fuel will be delivered to the construction site via trucks when needed.

2.6.2 During Operation

2.6.2.1 Water

Water is mainly used during the operation phase in the firefighting storage tank and for domestic uses by workers in the PRS.

Water source will be determined during construction phase: either the PRS will be connected to the public water network or water will be delivered by trucks.

2.6.2.2 Electricity

Electricity consumption during the operation phase is expected to be minimal which will be mainly consumed at the control room. The source of electricity will be the national grid.

2.7 Waste Generation

All solid wastes generating during the construction phase will be managed and disposed in accordance with applicable regulations and established best management practices. All generated wastes will be reused and/or recycled to the maximum extent possible.

2.7.1 During construction

Solid waste during construction phase will comprise domestic waste, construction waste and some hazardous wastes from the activities.

Construction waste will consist mainly of left over piping materials such as polyethylene pipes and carbon steel. The amount of waste is approximately 2% of the total amount of materials, which is collected by the Contractor and resold as scrap.

Excavated soil is used to backfill the trench after pipe laying. Small amounts of leftover soil may remain and are disposed of in legal dumpsites as per contract between the Contractor and the supplier. Official dumpsites in Qena are located near Farshout city (26°1'38"N, 32°8'3"E)

Domestic waste will be generated by approximately 10 workers per day over a period of 6 months during the construction of the PRS and by 20 workers per day over a period of 2 months for the installation of the high pressure pipeline. Workers will utilize public facilities provided by the village or city and use public resources (bins) to dispose of food waste, packaging materials etc.

Table 2-1: The waste is expected to include the following waste streams:

Waste type	Hazardous/Non-hazardous	Treatment and Disposition
Cement and Concrete Wastes (Including Cement Contaminated Soil)	Non-hazardous	Legal dumpsites in Qena
Domestic Waste (food waste, packing)	Non hazardous	Public facilities in nearby villages or within the city
Wood – Scrap	Non-hazardous	Sold to specialized companies in a public auction but empty painting cans will be transported to specialized landfills of Nasreya
Tires		
Cardboards		
Containers		
Paints containers	Hazardous	Temporary storage in the project site, for final disposal is Nasreya
Used oil waste containers		
Batteries		

2.7.1.1 Wastewater

During construction phase, liquid waste will comprise domestic wastewater, vehicles/equipment wash down water. Domestic water is the only continuous source during construction.

2.7.2 During operation

2.7.2.1 Solid waste

The operation of the high pressure networks and the PRS is expected to generate minimal solid waste, which will be limited to domestic waste.

Odorant tank replacement will be carried out by Egypt Gas. Therefore, hazardous waste,- mainly empty odor containers, will not be stored on site. Containers treatment and transport will be carried out by UNICO (certified hazardous waste vehicles and personnel) to the Egypt Gas storage facility in Abu Rawash (Giza) for final disposal at the Nasreya hazardous waste facility near Alexandria.

2.7.2.2 Wastewater

During operation the only wastewater source is domestic wastewater. Wastewater will be collected in a septic tank. The septic tank will be removed by trucks to an authorized wastewater treatment facility.

2.8 Time schedule

The duration of the construction works of the high pressure pipeline and the PRS is expected to be 8 months. A detailed time schedule will be available three months prior to construction.

3 LEGISLATIVE AND REGULATORY FRAMEWORK

3.1 Applicable Environmental and Social Legislations/ guidelines in Egypt

- Law 217/1980 for Natural Gas
- Law 4 for Year 1994 for the environmental protection , amended by Law 9/2009 and law 105 for the year 2015
  - Executive Regulation(ER) No 338 for Year 1995 and the amended regulation No 1741 for Year 2005, amended with ministerial decree No 1095/2011, ministerial decree No 710/2012, ministerial decree No 964/2015, and ministerial decree No 26/2016
    - EEAA guidelines for EIAs preparation
    - LDCs HSE guidelines, LDCs will comply with HSE Guidelines which work as regulation on PRS construction and operation (provided in Annex 2 of this report.
- Law 38/1967 for General Cleanliness
- Law 93/1962 for Wastewater
- Traffic planning and diversions
  - Traffic Law 66/1973, amended by Law 121/2008 traffic planning
  - Law 140/1956 on the utilization and blockage of public roads
  - Law 84/1968 concerning public roads
- Work environment and operational health and safety
  - Articles 43 – 45 of Law 4/1994, air quality, noise, heat stress, and worker protection
  - Law 12/2003 on Labor and Workforce Safety

3.2 World Bank Safeguard Policies

Three policies are triggered for the project as a whole: Environmental Assessment (OP/BP 4.01), Physical Cultural Resources (OP/BP 4.11), and Involuntary Resettlement (OP/BP 4.12). However, OP/BP4.11 and Involuntary Resettlement (OP/BP 4.12). will not be applicable in Farshout.

No pipelines will cross agriculture land in Farshout and accordingly no compensation will be applied .The proposed land for the construction of the PRS is state owned land. It is entirely uninhabited. Therefore, the Involuntary Resettlement (OP/BP 4.12 is not applicable for the proposed project. The transfer of ownership contract is under preparation with Qena governorate authority

In addition to the above mentioned safeguards policies, the Directive and Procedure on Access to Information[3] will be followed by the Project[4].

3.3 World Bank Group General Environmental, Health, and Safety Guidelines & WBG Environmental, Health and Safety Guidelines for Gas Distribution Systems

The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry specific examples of Good International Industry Practice (GIIP). When one or more members of the World Bank Group are involved in a project, these EHS

[3] https://policies.worldbank.org/sites/ppf3/PPFDocuments/Forms/DispPage.aspx?docid=3694

[4] All information will be shred under the following links www.egas.com.eg and www.ReGas.com.eg

Guidelines are applied as required by their respective policies and standards. These industry sector EHS guidelines are designed to be used together with the General EHS Guidelines document, which provides guidance to users on common EHS issues potentially applicable to all industry sectors. For complex projects, use of multiple industry-sector guidelines may be necessary. [5]

Gaps between requirements outlined by WBG guidelines and actions detailed by the ESIA have been analyzed. There are no significant differences between the requirements outlined by the WBG EHS GUIDELINE on GAS DISTRIBUTION SYSTEMS and the management and monitoring actions outlined by the ESIA.

In addition to the above-mentioned safeguards policies, the Directive and Procedure on Access to Information[6] will be followed by the Project.

3.4 International Finance Corporation (IFC) Guidelines

The IFC Environmental Health and Safety (EHS) Guidelines describes pollution prevention and abatement measures and emission levels that are normally acceptable to the Bank. However, taking into account borrower country legislation and local conditions.

In 2007, IFC Environmental, Health, and Safety (EHS) Guidelines were released which replace World Bank Guidelines previously published in Part III of the Pollution Prevention and Abatement Handbook.

The General EHS Guidelines are designed to be used together with the relevant Industry Sector EHS Guidelines, which provide guidance to users on EHS issues in specific industry sectors.

3.5 Permits Required

- Approval from the Ministry of Agriculture to construct the PRS on agriculture land in accordance to the presidential decree Number 615 of year 2016.
- Approval from the ministry of Agriculture to construct the Off-take on agriculture land in accordance to the presidential decree Number 615 of year 2016.
- Decree No 51 o year 2018 pertaining to transfer the ownership of PRS land to EGAS **(Annex 3 of this report)**
- Army force permits to construct the PRS
- Construction permits to be obtained from the Local Governmental Unit in Farshout - Qena.
- Environmental permit: according to Egyptian Law for the Environment, Law 4/1994 amended by Law 9/2009. EEAA approval on ESIA is considered the environmental permit.
- Utility installation permission to the PRS

[5] www.ifc.org/ifcext/enviro.nsf/Content/EnvironmentalGuidelin

[6] https://policies.worldbank.org/sites/ppf3/PPFDocuments/Forms/DispPage.aspx?docid=3694

- Permission from the High Council of Antiquities in accordance to Law No 117 of year 1983 and its amendment No 12 of year 1991

4 ENVIRONMENTAL AND SOCIAL BASELINE

4.1 Description of the Environment

Farshout City is located in the Nile Valley area of Upper Egypt and is affiliated to Qena Governorate shown in Figure 4-1. The project site area relative to Farshout city and a close-up to the project site area where construction and operation activities will occur are shown in Figure 4-2 left and right, respectively.

Figure 4-1: Farshout district

Figure 4-2: Project site areas

4.1.1 Climatology and Air Quality

4.1.1.1 Climate

4.1.1.1.1 Temperature

The average annual temperature is 24.3°C in Farshout city. The warmest month of the year is July, with an average temperature of 31.8 °C whereas January has the lowest average temperature at 14.5 °C.

Table 4-1: Average temperature

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Av. T (°C)	14.5	13.4	15.3	19.2	22.5	25.5	31.8	26.4	24.9	22.5	18.2	14.5

4.1.1.1.2 Rainfall

Table 4-2 the average annual precipitation in the Farshout area.

Table 4-2: Average Precipitation in Farshout Area

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Av. Prec. (mm.)	-	0.1	0.1	0.1	0.1	-	-	-	-	0.1	-	-

Source: http://www.weatherbase.com/weather/weather.php3?s=601788&cityname=Farshut-Egypt

4.1.1.1.3 Wind

The annual average wind speeds in the Farshout area is shown in Table 4-3.

Table 4-3: Average Annual wind speed in the Farshout

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug	Sept	Oct.	Nov	Dec
Av. Wind speed (km/hr)	11.3	11.9	12.2	12.6	13.3	13	13	12.6	12.2	12.6	7.9	7.6

Source:http://www.weatherbase.com/weather/weather.php3?s=601818&cityname=FARSHUT -Egypt

4.1.1.2 Site Specific Ambient Air Quality

The selection of the active air measurement location is based on the nature of the surrounding activities, the location of the nearest sensitive receptors7 (such hospitals, schools, protectorates, … etc.) with respect to the project plots, prevailing wind direction, site topography and the future layout of the proposed project components. Moreover, the selection is based on the guidelines stated in the American Society for Testing Materials (ASTM) reference method.

Accordingly, environmental measurements have been taken at the PRS location as a benchmark to be able to assess the impacts of the PRS construction and operation activities on air quality.

An 8-hour average measurements were conducted for pollutants of primary concerns, namely, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), Total Suspended Particulates (T.S.P) and particulate matter (PM_{10}). The air quality at the proposed site of the proposed PRS is found to exhibit acceptable levels of the measured air pollutants, in fact the levels are way below the national and international guidelines.

[7] None were observed during the site visit.

The measurements were carried out in the area surrounding the proposed PRS site location (26°0'35.58"N, 32° 8'12.78"E)

The table below present the results for ambient air quality measurements conducted at the monitoring location. Daily average results are shown in the following table for all the measured parameters.

Table 4-4: Average ambient air pollutants' concentrations (µg/m^3)

Measurements	NO	NO_2	NO_x	SO_2	CO(mg/m^3)	PM_{10}	T.S.P
Average	20.9	25.5	46.4	16.3	3.3	99	112
National	150	200	150	350 (1 h) 150 (24hrs)	30 (mg/m^3)	70 (24hrs)	230 (24hrs)
WB limits	NA	200	150 [a] mg/Nm^3 50 [b] mg/Nm^3	75 mg/Nm^3	100 mg/Nm^3	10 mg/Nm^3	60-90 long term 150-230 (24 hrs)

a. The 150 mg/NM3 NOX value is applicable to facilities with a total heat input capacity of up to 300 MWth.
b. The 50 mg/NM3 NOX value is applicable to facilities with a total heat input capacity greater than 300 MWth.

The concentrations of measured air pollutants are below permissible limits. All the measurements for the gaseous pollutants were complying with the maximum allowable limits according to law 4/1994 for Environment protection and its amendments by law No.9/2009 and the executive regulation issued in 1995 and its amendments no. 710 in 2012 and 964 in April 2015".

4.1.1.3 Site specific noise measurements

The selection of the noise measurement location is based on the nature of the surrounding activities, the location of the nearest sensitive receptors8 (such hospitals, schools, protectorates, … etc.) with respect to the project plots, prevailing wind direction, site topography and the future layout of the proposed project components. Moreover, the selection is based on the guidelines stated in the American Society for Testing Materials (ASTM) reference method.

Accordingly, environmental measurements have been taken at the PRS location as a benchmark to be able to assess the impacts of the PRS construction and operation activities on noise intensity

Noise level measurements were conducted in the same location of the ambient air quality measurements. The duration of the measurements is 8 hours with one hour averaging intervals.

[8] None were observed during the site visit.

Table 4-5: Ambient noise level measurements

Time	Sound Level Equivalent & Percentile Recordings in dBA for 24 Hours						Permissible Limits LAeq (dBA)
	LAeq	LA10	LA50	LA90	LA95	LCpeak	
	62.0	55.1	45.6	38.2	36.4	106.6	70 national limit 70 International limit

The full report for the site measurements of air and noise is presented in Annex 4.

4.1.2 Geology

The Governorate of Qena is located in the Nile Valley area of Upper Egypt and occupies a portion of a sub-regional sedimentary basin known as the Assiut Basin. The sedimentary basin has a depth of over 3 km above the basement rocks. The basin is a portion of the western structure of the Arabian-Nubian Massif with the regional dip in the western direction.

In the Assiut Basin, carbonate rocks that belong to the Eocene and Upper Cretaceous period dominate the top portion of the sedimentary section. The lower section is mainly composed of clastic rocks belonging to the Mesozoic and the Paleozoic era representing the Nubian sandstone complex. The sedimentary section is locally overlain by Neogene clays from the Pliocene and Quaternary fluviatile deposits of sand, gravels and silty clays. The discontinuous uplifting of the sedimentary and the underlying basement rocks caused several cracks and fissures to the west of the uplifting. The basin is affected by tensile stresses that are responsible for the formation of a complex fault system[9].

4.1.2.1 Soil

The nature of the area extending west of the Nile Valley consists of low series of limestone separating the Eocene. On the western side of the series lies a flat plateau within the Western Sahara. Some are spread Sand accumulations lying along these chains in a low-depth crack extending in the limestone plateau.

Regarding the land environment, Farchout city has a variety of land uses including agricultural, urbanized, and cleared land plots. The project site area is mainly of a cleared land plot. HP pipelines will be installed along the existing roads whereas **agricultural lands will not be interrupted.**

4.1.3 Water resources

4.1.3.1 Surface water

The Kalabaya Canal runs parallel to the eastern bank of the Nile river for a length of 163 km and is used for the irrigation of approximately 174,515 hectares of agricultural land east of the Nile. The canal may be divided into 8 branches; one of them called Al Gabal, reaches Farshout city. The nearest surface water is 2.4 m away from the site where construction of the HP pipeline is planned. **No pipeline will cross the canal during construction and operation activities.**

[9] Qena governorate environmental baseline EEAA, state ministry for environmental affairs Egypt.

Figure 4-3: Al Gabal branch of Kalabya canal

4.1.3.2 Groundwater

No site specific data on groundwater in Farshout is available. The figure below shows groundwater depths across Egypt. Subsurface water at depths of 2 m can be expected near the Nile River. The project site and piping route will not be along the river banks of the Nile. Therefore, groundwater at depths encountered during excavation activities, i.e., 1.2 m, is not anticipated.

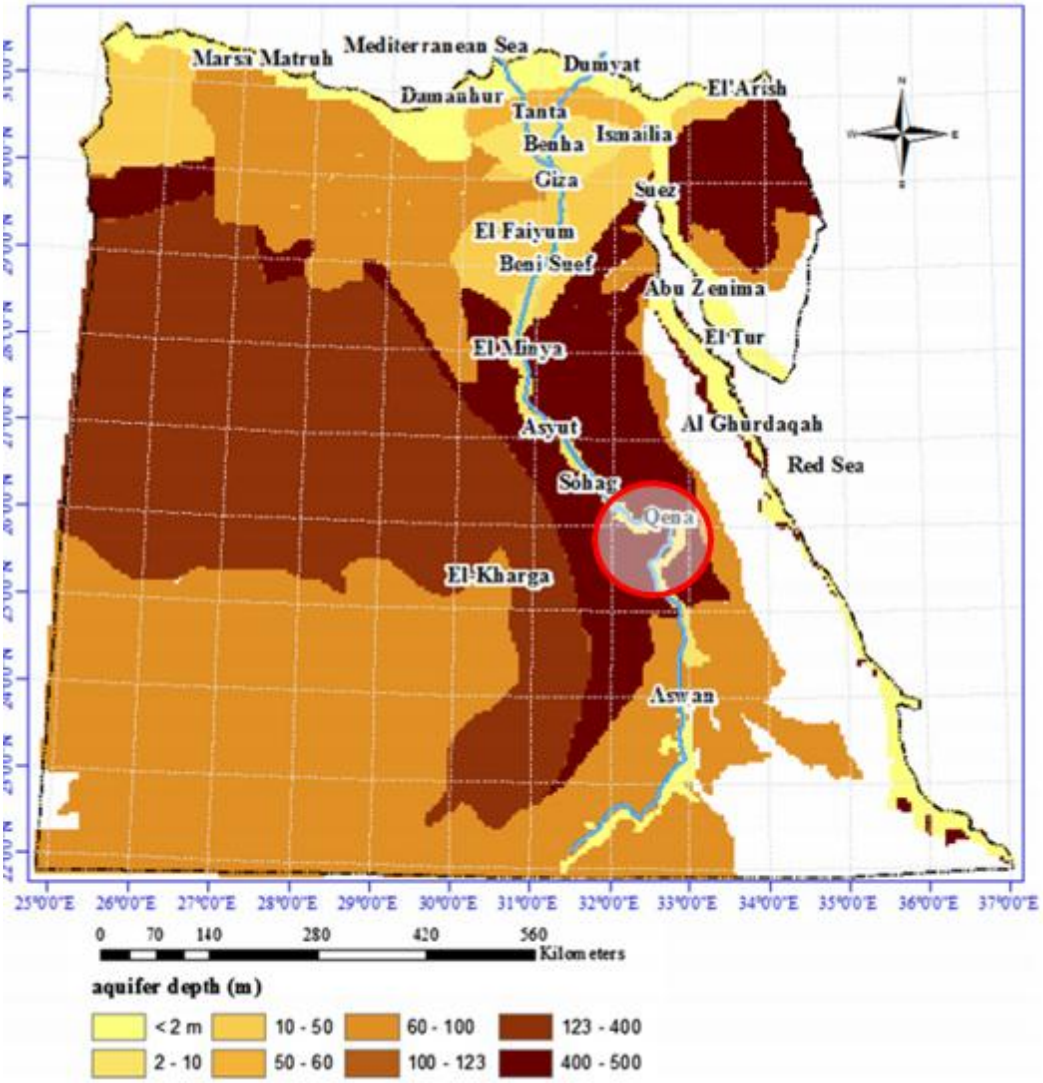

Figure 4-4: Aquifer depths

4.1.4 Terrestrial Environment

The project site area is not characterized by the presence of endangered species (fauna or flora)**. No natural habitats occur in the project area.**

4.1.4.1 Flora

Typical flora encountered in Farshout include *Phragmites* australis along the Al-Gabal canal branch. Palm trees and Cornulace Sp. are also encountered alongside of the roads as shown below.

No significant flora is detected in the project area.

Figure 4-5: *Phragmites* australis along the Al Gabal branch

Figure 4**-6: Flora typical of the areas including palm trees and Cornulace Sp**

4.1.4.2 Fauna

Species recorded in the project site area include dogs (Canis sp), sparrows (small passerian sp.), cats (Files domestica), and raven Black Desert (Corvus sp.). Grey Heron (Ardea cinera) is a fairly common visitor in the summer, but nesting has not been recorded. Buffo viridis and Varanus niloticus (Nile monitor) in very little numbers have been recorded in Al Gabal's canal.

No endangered or vulnerable species were observed in the project area.

4.1.4.3 Nearest protected Areas

The nearest Important protected area are the Red Sea Island, located approximately 141 km North-East of Farshout and Wadi El Gemal – Hamata, located approximately 185 km to the south east.

Figure 4-7: Nearest Protectorate Area

4.1.5 Solid Waste Management

The responsibility of service planning, delivery and monitoring of waste collection and disposal is delegated to the Local Administration in Farshout. Municipal solid waste is disposed in collection points located on the streets and used as open transfer systems. Waste in collection points is collected twice a day by municipal workers using waste collection trays and wheel barrows, brooms and shovels). Collected waste is transported using covered trucks[10] to Legal dumpsites in Qena or to Public facilities in nearby villages or within the city. Official dumpsites in Qena are located near Farshout city (26°1'38"N, 32°8'3"E)

[10] Zaki, T., Kafafi, A. G., Mounir Boushra, M., & Abdel Halim, M. A. (2013, September). Annual Report for Solid Waste in Egypt. (M. Saber, Ed.) Ministry of State of Environmental Affairs

4.1.6 Physical cultural resources

There were no physical cultural resources in the vicinity of the PRS. However, Qena Governorate by nature is rich in its antiquities. Therefore, in case of any unanticipated archeological discoveries within the project areas; **Annex 5**, entitled 'Chance Find Procedure,' details the set of measures and procedures to be followed in such cases.

4.1.7 Traffic profile

The City of Farshout is one of the biggest cities in Qena Governorate. It is relatively dense and overcrowded. The width of streets are usually two lanes. There are various means of transportation. Motorcycles and tuk tuks are the main type of transportation. There are also some animals that are used for transporting people.

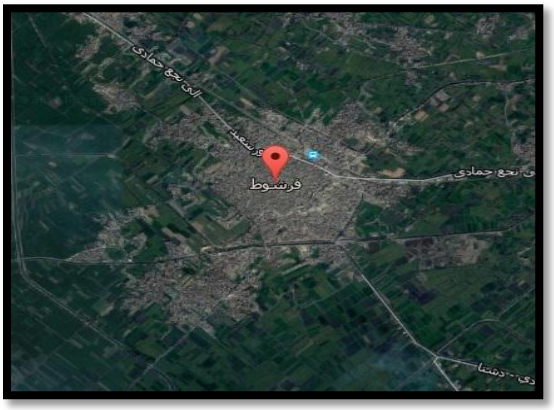

Figure 4-8 Farshout city

Figure 4-9 Tuk Tuk

The city is overcrowded, particularly from 7 a.m. to 2 p.m. No digging activities can take place in the main streets from 7 am to 2 pm

Figure 4-10 Overcrowded market

Figure 4-11 Pedestrians in a market

With regards to schools, they influence the traffic in Farshout, especially in the morning and in the afternoon. There are also some community services' buildings that are targeted by community people.

Figure 4-12:A mosque and a clinic in Farshout

Figure 4-13 : Cart in Farsahout

4.2 Socio-economic Baseline of Farshout

Farshout is located in the northern part of Qena governorate, on the western bank of the Nile. It is bordered by Abou Tesht markaz to the north, and Nagaa Hamady to the south-east, and el-Gabal el-Gharby to the west.

4.2.1 Administrative affiliation

Farshout is administratively affiliated with Qena governorate. According to the Information Center of Farshout's LGU, there are 9 villages along with Farshout City falling under the jurisdiction of Farshout markaz.

4.2.2 Urbanization trends

Farshout City is considered a semi-urbanized area. The total area of Farshout is 775 km^2. According to the Information Center of Farshout's LGU, the total area of agrarian lands in Farshout City is 588 feddans. According to CAPMAS data from 2013, the percentage of individuals living in apartments is 54%, while individuals living in rural houses represent 21.5%.

4.2.3 Demographic characteristics

4.2.3.1 Total Population

According to the Information Center of Farshout's LGU, the total population of Farshout markaz in 2016 reached 187,648 people while population of Farshout City is 65,761 people.

4.2.3.2 Rate of Natural Increase

According to 'Governorates' Description by Information 2010,' the birth rate in Qena is 26.90 births per 1000 persons, while mortality rate stands at 5.40 per 1000 persons. That gives a natural growth rate which of 21.50 per thousand persons in Qena.

The 'Governorates' Description by Information 2010' reported figures from 2010 that the newly born mortality rate 7.40 per 1000, while infant mortality is 19 per thousand whereas infant mortality rate below five years old stood at 24.50 per 1000.

4.2.4 Living Conditions

4.2.4.1 Household Size and Density

A household is defined as "Family (and non-family) members who share residence and livelihood, and operate as one social and economic unit". The average household size in Farshout City is 4 individuals, according to the Information Center of Farshout's LGU.

4.2.4.2 Dwelling characteristics

The majority of buildings, to which NG is to be connected, are built with concrete and red bricks in relatively tight streets. It was reported that all of the samples surveyed live in apartment buildings that are constructed with concrete and red bricks. The majority of streets are paved out, and in a good condition. Alleyways are mostly leveled out tracks.

The figure below displays typical streets and buildings in Farshout

Figure 4-14 busy street in Farshout

Figure 4-15: Housing project building

All of urban houses are built with concrete and red bricks. The tallest building in Farshout city is 5-storey high. The finishes and facades of residential buildings are modest.

With regard to the legal status of buildings; all buildings and neighborhoods are mostly legal, and no illegal or unplanned neighborhoods were documented by the research team.

Regarding the condition of the streets in Farshout, they are relatively narrow that the maximum width of main streets is 2-lane wide. As stated above, the majority of Farshout's streets are paved out, and almost all of the alleyways are leveled out. The conditions of asphalted streets are good, based on the observation of the field researcher.

4.2.5 Access to Basic Services

4.2.5.1 Access to Electricity

According to CAPMAS poverty mapping data of 2013, 99.1% of individuals in Farshout City use electricity for lighting. The Information Center of Farshout's LGU reports that the number of commercial subscribers to the electricity grid, in Farshout markaz, reaches 1,238 subscribers, while the number of household connected is 12,375 households.

Additionally, the majority of stakeholders interviewed throughout focus group discussions use electricity for water heating.

4.2.5.2 Access to potable water and sanitary system

Accessibility to water network is high in Farshout, as 98.7% of individuals have access to the public water network; and 80.2% of individuals have tap water inside their houses, according to CAPMAS poverty mapping data of 2013.

However, the coverage of the public sanitation network stands at 2%, according to CAPMAS poverty mapping 2013. The percentage to accessibility to the public sanitation network is one of the main concerns relating to the eligibility of Farshout City for connecting NG to households. Though, according the head of the engineering department at Farshout's LGU, the expansion of the sanitation network is underway that the construction of the sanitation plant is complete and the start of operation awaits the completion of pipework.

4.2.6 Human development profile

4.2.6.1 Education

According to the Information Center of Farshout's LGU, Farshout City has 10 primary schools, 6 preparatory schools, 1 secondary school and 5 secondary vocational training schools. Add to that Azhar education schools including, 2 primary schools, 2 preparatory schools and 2 secondary schools.

According to CAPMAS Poverty Mapping data of 2013, approximately 20% of adult individuals have finalized their basic education, while 12% have university degrees. Currently, there are 96.25% of individuals, between the age (6 to 18) years old, enrolled in schools; while the percentage of drop-outs stands at 0.5%.

In the same respect, the percentage of females with basic education stands at 19.5%. The percentage of females having university degrees is approximately 6%. The percentage of females, between the age of 6 to 18 years old, enrolled at schools is 96%. The percentage of female drop-outs from schools is 0.36%.

The illiteracy rate in Farshout stands at 33.67%, while the illiteracy rate among females stands higher at 44.1%.

4.2.6.2 Unemployment and Work Status

According to CAPMAS poverty mapping 2013, the percentage of manpower which joined labor force at the age of 15 years old and above is 38.3%. Manpower, at the age of 24 years old and above, is 46.6%. The percentage of agriculture workers from total employed persons is 11.6%. The unemployment rate in Farshout stands at 15.7%. The following table illustrates the distribution of manpower among different sectors:

In the same respect, female employment figures show female unemployment rate at 37.2%. The percentage of female workers who joined labor force at the age of 15 years old and above is 11.3%.

The formal Statistics obtained from the Poverty Mapping Data 2013 regarding manpower reflected that the age of starting work is 15 years old.[11] Both the Child Law and the Labor Law state that children shall not be employed before they complete 14 years old, nor shall they be provided with training before they reach 12 years old; however children between 12 and 14 years old are permitted to work as trainees.

4.2.7 Health Facilities

According to the Information Center of Farshout's LGU, there is one central hospital serving Farshout, in addition to 41 private medical clinics and 7 dental clinics. Additionally, there are 5 ambulance cars serving Farshout City.

The representative of the Community Development Association reported that the number of doctors serving in the central hospital is disproportionate to the number of patients. Stakeholders interviewed throughout the focus group discussions concurred with the Community Development Association's representative, stating that medical equipment are available though, the number of doctors is not enough.

4.2.8 Poverty index

According to poverty mapping developed by CAPMAS in 2013, the number of poor people in Farshout City in 2013 reached 36,310 individuals, representing 61.74%. The Gini Coefficient, which indicates income inequality, stands at 0.21. The percentage of female-headed households is 15%.

Male and female participants of the focus group discussions grumbled about the recent bulge in electricity bills. More importantly, the cost of their consumption of LPG cylinders is very high, ranging from 30 to 130 pound per cylinder.

According to CAPMAS poverty mapping of 2013, the per capita consumption in Farshout City is 3792.99 EGP. Focus group discussions revealed that the average family expenditures range between 1500 to 5000 EGP.

[11] Based on Labor law number 12 of year 2003 and The Child Law (No. 12, 1996). There are certain critical obligations to recruit children below 15 years old. Article 98-103 of Labor law put limitations related to age, type of occupation, hazards work…etc

4.2.9 Human activities in the project areas

As noted above, the size of agriculture activities are slim, compared to other activities. Agriculture activities absorb 11.6% of total employed individuals living inside Farshout City. According to the Information Center of Farshout's LGU, Farshout city hosts a number of small industries and crafts such as carpentry, carpets production, tiles production, leather products, foodstuffs production, in addition to blacksmith workshops.

Focus group discussions revealed that the majority of the people of Farshout are engaged in commercial activities and civil services.

5 ENVIRONMENTAL AND SOCIAL IMPACTS

The environmental and social impact assessment (ESIA) is a process used to identify and evaluate the significance of potential impacts on various environmental and social receptors as a result of planned activities during (construction and operation) phases of the Project. Furthermore, the analysis of environmental and social impacts is important to detail an effective management and monitoring plan which will minimize negative impacts and maximize positives. The evaluation of the potential impacts on various receptors is based on a significance ranking process described in the following subsection. Details are presented in **Annex 6**.

5.1 Impact Assessment Methodology

The impact assessment methodology adopted for this ESIA is a semi-quantitative "cause-effect" matrix modified from Leopold and Buroz´s Relevant Integrated Criteria. The Leopold matrix is two-dimensional, where the stages of the project (activities) are assessed in relation to the existing environmental characteristics and conditions that may be affected during the execution of those actions. The impact of each activity on each receptor was assessed according to magnitude on a scale of -10 to 10, where negative values indicate a negative influence on the receptor, and importance on a scale of 0 to 10, which encompasses the probability of occurrence, frequency of the impact etc. The numbering system is used as a relative measure, where more negative numbers correspond to impacts having a higher negative magnitude. Susceptible receptors and corresponding activity are deduced if magnitude and importance are of minor severity. Then the importance of each impact by activity is determined based on the Buroz relevant integrated criteria. The importance of each impact by activity is assessed by assigning a score for intensity, extension, momentum, persistence, reversibility, recoverability, synergy, accumulation, effect and frequency of the impact. The importance, I, is determined according to **I = ± (3IN + 2EX + MO + PE + RV + SI + AC + EF + PR + MC).** Details including definitions of each assessment criterion and corresponding score scale for the Buroz Relevant Integrated Criteria are presented in **Annex 6.**

For both methods, the severity of the impact is defined as either no significance , minor, medium, or major according to each method's scoring scale. Detailed tables with numbers and corresponding coloring are provided in **Annex 6**. Results from both methods are summarized and presented according to the following scheme:

Impact rating	Color
None or no significance (no impact);	
Minor severity (minimal impact; restricted to the work site and immediate surroundings)	
Medium severity (larger scale impacts: local or regional; appropriate mitigation measures readily available);	
Major severity (Severe/long-term local/regional/global impacts; for negative impacts mitigation significant).	

Detailed impact assessment score results are presented in two tables in Annex 6.

5.2 Potential Positive Impacts

5.2.1 Positive impacts during construction

5.2.1.1 Provide direct job opportunities to skilled and semi-skilled laborers

- The project is anticipated to result in creation of different job opportunities. Based on similar projects implemented recently by EGAS and the local distribution company, the daily average number of workers during the peak time will be about 20 laborers, two engineers and eighteen technicians.
- In order to maximize employment opportunities in the local communities it is anticipated that on the job capacity building activities will be required for currently unskilled workers. On-the-job training will also supplement opportunities for the local workforce for both temporary construction roles and for long-term operation phase positions, where these are available.

5.2.1.2 Create indirect opportunities

As part of the construction stage, a lot of indirect benefits are expected to be sensed in the targeted areas due to the need for more supporting services to the workers and contractors who will be working in the various locations. This could include, but will not be limited to accommodation, food supply, transport, trade, security, manufacturing… etc.

5.2.2 Positive impacts during operation

5.2.2.1 Provide direct job opportunities to skilled and semi-skilled laborers

The operation of Farshout PRS is expected to result in the creation of job opportunities, both directly and indirectly. The average number of workers during operation of the PRS will be about 16 workers from the permanent workers of the LDC. They are segregated as follows 6 technicians, 2 foremen, 2 maintenance (one engineer and one engineer's assistance) and 2 security. With regards to health and safety, one person will be assigned from the staff of ReGas. Additionally, 3 administrative and support staff will be assigned.

5.2.2.1.1 Create indirect opportunities

As part of the operation stage, a lot of indirect benefits are expected to be sensed in the targeted areas due to the need for more supporting services to the workers and contractors who will be working in the project site in Farshout City. This could include, but will not be limited to, provision of waste disposal services and septic tanks evacuation.

5.3 Potential Negative Impacts

5.3.1 Potential Negative impacts during Construction

5.3.1.1 Impact on soil

Construction activities will be carried out on cleared land (PRS) and are planned on existing roads (installation of the high pressure pipeline.) No agricultural lands will be crossed. The excavation activities will result in minor disturbance of the soil characteristics. This will be more pronounced in the trenched areas (around 1 meter depth) where excavation, pipeline laying, and soil compaction as a result of heavy equipment take place. In addition, potential soil contamination may take place as a result of spillage or leaks of oils.

Therefore the impact on soil considered **minor** impact.

5.3.1.2 Air Emission

Construction of the HP pipeline and the PRS will include several activities such as excavation, concrete foundations, transportation of construction material and equipment, burial of cables and pipes, etc. Those activities in consequence are expected to emit air pollutants to the ambient air, however it will be conducted for short periods of time. The following air pollutants are foreseeable for most of the construction activities:

- Fugitive dust emissions (PM_{10}, $PM_{2.5}$)
- Exhaust of vehicles or equipment such as temporary generators, trucks, trolley, etc

Dust emissions will negatively impact ambient air quality, particularly during the initial phases of construction Anticipated dust emissions will consist of

- Particulate matter and suspended solids from excavation/backfilling operations
- Possible dispersion from stockpiles of waste or sand .

Dust emissions from construction activities impacts will be limited to a small area in the vicinity of the project site and the dust is expected to settle in close proximity to the construction site.

The impact of dust generation (particulate matter) will be limited to the working hours only.

Therefore, it is expected that the dust impact will be of minor severity.

Emissions of CO_2, CO and PM will result from the operation of the construction machinery and road vehicles during construction of the PRS. Air emissions (gases and particulates) during construction shall arise from:

- Exhaust from excavation equipment and heavy machinery (excavators, loaders, trucks) containing SO_x, NO_x, CO, VOCs, etc.
- Traffic congestions resulting from road closure or slowing down of traffic due to excavation works.

Machinery used during construction is certified, therefore, emissions stemming from the exhaust of machinery are unlikely to increase ambient levels beyond permissible levels. Emissions will also be intermittent throughout the work day.

On urban roads, traffic congestion may lead to increased exhaust emissions. Traffic management with local authority will reduce the impact of works on road congestion and associated emissions. The intensity of work activities and the number of vehicles traveling onsite would be relatively low for all tasks.

Impacts of gas emissions due to the construction activities are expected to be temporarily negatively significant:

Air emissions impacts are expected to be temporary, local, and of **minor** severity.

5.3.1.3 Noise emissions

Construction of the PRS and the installation of the high pressure pipeline will require using various construction equipment, vehicle, etc. in addition to the other activities that generate noise. These tools signify potential major sources of different types of noise that will have an impact on the receptors who are susceptible to the generated noise.

The potential affected groups who are susceptible to the construction noise during the construction of the Farshout PRS are the following:

- Onsite Workers
- Nearbyresidential areas and village of Aldhsh (located 2 km and 4.7 km away from the PRS site respectively)

The noise of construction activities to the baseline may increase the noise level, however the activities will be temporary and for short time.

Regarding the construction of the Farshout PRS, it is expected that the generated noise will mainly have an impact on workers.

The impact on the construction workers will be **medium** impacts on construction workers
Minor impact on the nearest receptors.

5.3.1.4 Risk pertaining to child labor

As mentioned in the baseline, child labor is a common practice in the project communities in Qena. Children below 18 work almost in all developmental projects as they receive low salaries and they are less demanding. This risk should be carefully handled in the ESMP and restrict obligations and monitoring should be applied in the contractor and subcontractors obligations. Rigid penalties should also be applied to the contractor and subcontractors in case of breaching child labor restrictions.

Child labor risk is assessed as low to medium

5.3.1.5 Occupational health and safety

Potential safety and health impacts to workers during construction of Farshout PRS and the installation of the high pressure pipeline, in general, are the same as those associated with any construction project involving earthmoving, use of large equipment, transportation of overweight and oversized materials, and construction and installation of facilities. In addition, health and safety issues include working in trenches.

Occupational health and safety considered **medium**

5.3.1.6 Hazardous material and waste management

Normal construction non-hazardous solid wastes including scrap concrete, steel, bricks, packaging waste, used drums, wood, scrap metal, and building rubble will be generated. Human or domestic wastes generated by construction labor, including sewage and garbage collected from the project site location. Disposal of sewage and garbage generated from construction labor, if not transported to adequate sites, will be a continuation of the existing sanitation situation and contribute, although to a relatively low extent, to environmental deterioration. This kind of wastes has to be transported outside the site.

Solid hazardous wastes generated include empty containers, spent welding materials, solvents, paints or adhesives, and other hazardous wastes resulting from operation and maintenance of the equipment and vehicles, i.e. spent oils, spent lube, waste oil filters, batteries, etc. Among the hazardous wastes also are the wasted or faulted materials.

Adverse impacts on the environment from the possible improper disposal of the solid wastes and hazardous waste.

The impact due to waste generation is of **medium** severity

5.3.1.7 Traffic Impact

The greatest potential for traffic impacts to occur arises during the short period where construction works peaks (transportation of raw materials, equipment, and foundation materials). The traffic flow that will be created during construction period will to some extent depend on which type and number of trips to and from the proposed site. Additional activities, such as entering and exit to the site will not have significant impacts on the road.

Based on observation during the site visits, it is anticipated that during transportation of the equipment, raw materials as well as workers, it is envisaged that one lane will be used by the trolleys and the movement of one trip will not last more than 8 hours (during the midnight – morning).

Therefore impact on traffic in the project site considered **minor**

5.3.1.8 Impact on water

Groundwater

Information on groundwater in the project site, where high pressure pipeline are planned is unavailable. Considering that the excavation will be carried out in on a road that has previously been excavated and is not along the Nile river banks, where groundwater at depths less than 2 m can occur, and groundwater is not anticipated. **Impact assessment on groundwater is not applicable.**

Surface water

Surface waters consisting of canal branches may be susceptible to pollution resulting from uncontrolled dumping of wastes generated during construction. The aquatic environments can be impacted in case of improper disposal of sanitary wastewater, construction wastes or debris (generated from activities like ditching, and excavation). Usually the generated sanitary wastewater, as well as water resulting from the dewatering activities (if exist) during excavation, will be collected in tanks and transported via a certified contractor to the nearest wastewater treatment stations

The impact on surface water pollution is of **minor** severity

5.3.1.9 Ecological impact

Fauna identified is unspecific to the project areas and consist of stray dogs and cats and pigeons.

Open trenches may pose risks to stray animals, which can become trapped. Considering that trenches are backfilled in the daylight and that no trenches are left open overnight, animals trapping is not anticipated.

Dumping sites attract animals as sources of food. Uncontrolled dumping of waste can pose threats to animals accessing the uncontrolled dumping sites. Considering the nature and small quantities of the waste generated mostly composed of broken asphalt and left over pipes..

No fauna of significance have been identified in the project areas.

Impact assessment on fauna of significance is not applicable(irrelevant).

Flora have been identified along the banks of canals and along roads. The projected works are not planned in the proximity of canals or trees alongside roads.

Dumping of wastes alongside canals and roads can pose risks to the flora. Considering the nature and small quantities of the waste generated mostly composed of broken asphalt and left over pipes**, impacts on flora alongside canals and roads are of no significance .**

No flora of significance have been identified in the project areas.

Impact assessment on flora of significance is not applicable(irrelevant).

5.3.1.10 Community health and safety

Impacts on community health and safety can result from emissions of gaseous pollutants and dust, increased background noise levels, uncontrolled dumping of construction waste, accidental falls in temporary excavated trenches, accidental contact with equipment etc.

Taking into consideration that the 400 m route of the high pressure pipeline is planned to be along existing roads in the project area, which is 2 km away from the nearest residential area, we will find that the above mentioned impacts will be greatly minimized.

Therefore, the impact on nearby community's health and safety is expected to be **minor**.

5.3.1.11 Land related impact

Socioeconomic impacts

Farshout PRS will be in need for a plot of land measuring 1710 m2. This land has been selected from state owned lands. The authority of Qena governorate has transferred the ownership to ReGas. Site visits conducted by ReGas, EGAS and the study team reported no customary ownership is in place. Moreover, there was no encroachment reported.

Additionally, the high pressure pipeline tentative route passes through state-owned lands with no any customary ownership or encroachment in place. In case of any change in the route, the land status must be evaluated in order to define whether any project affected persons are in place.

There were no kind of encroachment in all lands allocated for the project. Additionally, obtaining the land have not resulted in any kind of economic displacement. Based on the meeting conducted in the site, no one of the consulted community stated that there were any kinds of customary or formal land use.

Impact related to the visual intrusion during the construction phase is **of no significance**

5.3.1.12 Visual intrusion and landscaping

During the construction of the PRS, there is a probability to result in visual intrusion due to moving construction materials and vehicles inside the lands. Given the fact that the PRS land will be fenced prior to any construction activities took place, the probability of this impact tends to be of no significance in Farshout .

Impact related to the visual intrusion during the construction phase is **of no significance**

5.3.1.13 Labor influx

There is a probability to face a labor influx impact that might originate from the migration of laborers to the work site. Additionally, some people might follow workers to provide services (the followers).

Generally speaking, such impact is viable in remote areas when thousands of workers invade rural areas causing real disturbance to the surrounding community and absorb their resources. In Farshout PRS, about 15 unskilled workers will be recruited from Farshout and only 5 workers will come from outside Farshout city. Such a number is not expected to cause any labor influx impacts, particularly, as ReGas staff is fully acquainted of norms and traditions of the surrounding communities in Upper Egypt and Qena areas.

Impact related to the labor influx during the construction phase is **of no significance**

5.3.2 Potential Negative impacts during operation

It is anticipated that the project will result in limited impacts during operation phase. Impacts pertaining to water resources, land acquisition, visual intrusion, soil, ecology, traffic and labor influx are classified as of no significance during operation.

5.3.2.1 Occupational health and safety

Possible impacts to health and safety during operations include exposures to odorant release, gas leak, fire, noise, accidental injury to workers during operation and maintenance activities of the PRS and of high pressure pipeline. In addition; health and safety issues include working around energized equipment, and possible contact with natural hazards. However, during the operation and maintenance phase, if there is any incident or emergency situation, the impact can endanger the surrounding community and establishment.

Odorant handling is part of the operation of the PRS. An odorant is added to the NG in order to enable detection upon leakage. The odorant containing Tertiobutylmercaptin (80%) and Methylehylsulphide (20%) is classified as a hazardous substance. The MSDS of the odorant identifies the following hazardous properties: Highly flammable, flammable and toxic products upon thermal decomposition, irritant, and toxic to aquatic flora and fauna. In case of emergency, the risk resulting from odorant release or gas leak will be managed by Farshout PRS's emergency response plan.

Therefore impact due to waste generation is considered of **medium** severity

5.3.2.2 Risk pertaining to child labor

Given the permanent nature of job opportunities during operation phase, children below 18 are not allowed to work in the PRS. Consequently, this risk is not valid in the operation phase .

Child labor risk is assessed as of no significance

5.3.2.3 Hazardous and non-hazardous waste management

During operation and maintenance of the PRS, besides industrial hazardous (odorant containers) and non-hazardous waste, small quantity of domestic wastes (solid and liquid waste) will be generated. Industrial hazardous wastes are generated during routine operations (e.g., lubricating oils, odorant containers, chemical containers). These wastes are typically; according to EEAA regulations for hazardous waste management should be stored briefly, and transported by a licensed contractor to an appropriate permitted off-site disposal facility as a standard practice. Concerning the domestic wastes, standard monitoring for leakage or damage for the pipeline and septic tank and it consider minor impact of the wastes generated. Poor waste management practices may also have a significant impact on environment (soil, subsurface water, visual, and health and safety). However, it is expected that waste will be managed properly and all the mitigation and management procedures will be presented in the next chapter from the report.

Therefor impact considered **medium**

5.3.2.4 Noise impact

The pressure reducers normally cause noise generated from the reducers' pipes. Maximum noise level expected from the reducers is 80 db. The generated noise is constant (not intermittent). Assuming ambient noise levels are complying with WB/IFC requirements and Law 4/1994-9/2009- 105/2015 standards for low noise residential areas, a 20-meter buffer distance kept between the reducers and the PRS fences should lead to minimal impact outside the PRS borders.

Therefor impact considered **minor**

5.3.2.5 Air emission

No gaseous emissions are expected to occur during the operation phase except for the potential natural gas leak or in case of accidents (odorant handling or storage) and during maintenance activities.

Therefor impact considered to be **of no significance**

5.3.2.6 Soil impact

The normal operation of PRS does not have any impact on soil; however risk of soil contamination is only associated with the possible spillage or leakage.

Therefor impact considered to be **of no significance**

5.3.2.7 Ecological impact

The normal operation will not have any impact on flora and fauna.

Therefor impact considered to be **of no significance**

5.3.2.8 Traffic impact

During the operation and maintenance of the PRS, there will be no expected impact. There will be only small number of staff vehicles moving in and out from the PRS. And trucks to transport odorant and spare parts to the PRS.

Therefor impact considered to be **of no significance**

5.3.2.9 Labor influx

The PRS will employ approximately 16 workers. Such number will never attract followers and therefore will result in no significant impact.

Impact related to the labor influx during the operation phase is **of no significance**

5.4 Impact during Accidental Events (Operation Phase)

Regarding to the Quantitative Risk Assessment Study (QRA), which demonstrate on the following hazards:

- Gas Release
- Fires (Heat Radiation)
- Explosion (Overpressure Waves)
- Suffocation (Odorant Leak)

And referring to the risk calculations determined in Farshout PRS QRA study, the individual risk level to the exposed workers / public based on the risk tolerability criterion have been identified in Acceptable region (Lower Tolerability Limit[12]) for workers and no effects on public. So there are some points (Study Recommendations) need to be considered to keep the risk tolerability, and this will be describe under item (7.5) (for more details refer to the QRA Study under Annex-9)

12 ***Lower Tolerability Limit***

Which the risks are broadly tolerable to society and comparable to everyday risks faced by the public. If the overall risk is below the Lower Tolerability Limit, the ALARP Assessment is likely to be straightforward and limited to ensuring compliance with Good Practice. Below the Lower Tolerability Limit, the principal risk management concern is the maintenance of existing risk reduction measures to avoid degradation.

5.5 Summary of the impact

Table 5-1: Environmental and Social impact summary

Impact	Impact Description	Nature of impact	Impact Significance
	During Construction		
Deterioration of soil	Degradation of soil quality, Excavation and movement of heavy machinery on unpaved surface soils during site preparation and foundation-laying could cause a physical breakdown of soil particles potentially causing destabilization of the soil structure.	Negative	Minor
Air emission	WB/IFC requirements and Law 4/1994 (modified by laws 9/2009 & 105/2015) stipulates strict air quality standards. Air emissions (gases and particulates) during construction shall arise from: - Particulate matter and suspended solids from excavation/backfilling operations - Exhaust from excavation equipment and heavy machinery (excavators, trenchers, loaders, trucks) containing SO_x, NO_x, CO, VOCs, etc. **Dust** The impact of dust generation (particulate matter) will be limited to the working hours as excavation and other construction activities. Which lead to temporary reduction of air quality, however is unlikely to cause major air emissions impacts as the nearbyresidential areas and village of Aldhsh are located 2 km and 4.7 km away from the PRS site respectively. **Gaseous pollutants emissions** Provided machinery used during construction is certified and maintained as per guidelines, the increase in emissions stemming from the exhaust of machinery is unlikely to increase ambient levels beyond national and IFC permissible levels.	Negative	Minor
Noise	**Noise impact on worker** Noise impacts on construction workers, technicians and engineers in direct vicinity of the excavation works and heavy machinery are considered more significant than those on residents.	Negative	Medium

Impact	Impact Description	Nature of impact	Impact Significance
	Noise impact on neighbor No major noise impacts are expected during construction of the PRS as the nearest receptors are around 100m away and the construction period is limited**.**	Negative	Minor
Risks on Occupational health and safety	Inhalation of air pollutants, exposure to high noise levels, injuries and potential death as a result of operating heavy equipment, and handling hazardous materials.	Negative	Medium
Risk pertaining to child labor	As mentioned in the baseline, child labor is a common practice in the project communities in Qena. Children below 18 work almost in all projects as they receive low salaries and they are less demanding. This risk should be carefully handled in the ESMP and restrict obligations and monitoring should be applied in the contractor and subcontractor obligations	Negative impact	Low to medium
Solid and Hazardous waste management	Inappropriate waste disposal and improper management of construction waste materials which could lead to spillages that will cause soil contamination. Excavated soil and concrete/bricks waste are inert materials. Improper disposal of such wastes will only have aesthetic effects on the disposal site. Law 4/1994-9/2009-105/2015 for the Environment and Law 38/1967 stipulate that these wastes should be disposed of in licensed sites by the local authority, which minimizes any aesthetic effects of such waste. Hazardous and non-hazardous materials available onsite during construction activities are likely to include fuel, engine oil, paints, Poor handling of those materials and their inappropriate storage may result in poor containment of induced leaks.	Negative	Medium
Traffic	It is anticipated that during transportation of the equipment, construction materials as well as workers, it is envisaged that one lane will be used by the trolleys and the movement of one trip will not last more than 8 hours (during the midnight – morning).	Negative	Minor
Surface Water contamination	inappropriate disposal of liquid and hazardous waste during construction	Negative	Minor

Impact	Impact Description	Nature of impact	Impact Significance
Ecological	During construction of the PRS, No protected species have been observed onsite and their presence is not expected within the project site. No protected areas will be affected	Negative	No significance
Community health and safety	The 400 m route of the high pressure pipeline had not been determined at the time of the submission of the report, but is planned along existing roads in the project area, which is 2 km away from the nearest residential area minimizing contact with the local community.	Negative	Minor
Land related impact	Farshout PRS will need a plot of land 50 *50 meter. This land has been selected from state owned lands. The governorate of Qena is now in the process of transfer of ownership to ReGas. Additionally, the high presser pipeline tentative route passes through state-owned lands with no any customary ownership or encroachment in place. In case of any change in the route, the land status must be evaluated in order to define whether any project affected persons are in place.	Negative	No significance
Visual intrusion and landscaping	During the construction of the PRS, there is a probability to result in visual intrusion due to moving construction materials and vehicles inside the lands. Given the fact that the PRS land will be fenced prior to any construction activities took place, the probability of this impact tends to be of no significance in Farshout.	Negative	No significance
Labor Influx	No anticipated impacts	Negative impact	No significance
During operation			
Occupational health and safety	Inhalation of air pollutants (odorant or natural gas leak), exposure to noise levels, injuries and potential death as a result of operating equipment with high pressure tools and equipment and handling hazardous materials. In case of emergency / accidents, resultant risks are studied in details in the attached Quantitative Risk Assessment, that that recommended some mitigation measures to be implemented during operation (section 7-5).	Negative	Medium

Impact	Impact Description	Nature of impact	Impact Significance
Hazardous material and waste management	**Hazardous material** Odorant spillscan result from improper handling of the odorant tanks.**Hazardous waste** Discharge of remaining odorants in containers, after use, in land or sewers; Disposal of used containers with domestic waste, or by open disposal. According to Farshout PRS QRA study, modeling vapour release will belimited inside the PRS boundary and ReGas Farshout ERP will cover this point.	Negative	Medium
Child labor pertaining risk	Given the permanent nature of job opportunities during operation phase, children below 18 are not allowed to work in the PRS. Consequently, this risk is not valid in the operation phase .	Negative impact	No significance
Noise	The pressure reducers normally cause noise generated from the reducers' pipes. Maximum noise level expected from the reducers is 80db. The generated noise is constant (not intermittent). Assuming ambient noise levels are complying with WB/IFC requirements and Law 4/1994-9/2009- 105/2015 standards for low noise residential areas, a 20-meter buffer distance kept between the reducers and the PRS fences should lead to minimal impact outside the PRS borders.	Negative	Minor
Air emission	Impact on worker health and safety during PRS operation include inhalation of air pollutants, exposure to noise levels, maintaining high pressure equipment (reduction pressure unit) and handling hazardous materials (odorant).	Negative	No significance
Soil	No anticipated impacts	Negative impact	No significance
Ecology	No anticipated impacts	Negative impact	No significance
Traffic	No anticipated impacts	Negative impact	No significance
Labor influx	No anticipated impacts	Negative impact	No significance
Land	No anticipated impacts	Negative impact	No significance

Impact	Impact Description	Nature of impact	Impact Significance
Visual intrusion	No anticipated impacts	Negative impact	No significance
Community health and safety	No anticipated impacts	Negative impact	No significance
Water	No anticipated impacts	Negative impact	No significance

6 ANALYSIS OF ALTERNATIVES

6.1 Technology Alternatives

6.1.1 Outlet Pressure

A gas pressure reducing station is reducing the pressure from a high transportation pressure 30-70 bar to a lower pressure 4 or 7 bar suitable for distribution or use in domestic or industrial applications. Farshout PRS will produce 7 bar outlet pressure for the local distribution network (intermediate pressure). The LDC chose to produce 7 Bar instead of 4 bar due to high consumption rate excepted at Farshout city and it is designed to future extension to distribution network (intermediate pressure) will feed other city and/ or village in the district.

6.1.2 Odorant handling

Environmental and safety control considerations and measures are integrated into the selected technology design. For example, in order to reduce emissions from the odorant unit, the odorants unit will be dosed automatically and not manual wise or by using plunger pump. Automatically and sophisticated unit management systems ensure safe and easy operation and can encompass complete remote operation of the units.

6.2 Location Alternative

6.2.1 PRS location

The main criteria for PRS siting are:

- Proximity to High-pressure gas main lines to minimize off-take length
- Availability of space with adequate dimensions and affordability of the land for PRS construction and possible expansion
- Presence of standard buffer zones between PRS and nearest buildings or receptors

As per national and WBG guidelines, PRS siting avoids habitat alteration and seeks to minimize environmental, occupational health and safety, and community health and safety impacts.

6.2.2 PRS land selection

EGAS seeks state owned land rather than privately owned land in order to avoid any potential adverse social impact on communities that may arise. Consequently, EGAS communicated with Qena Governorate authority to allocate a required plot of land from state owned lands. The Governorate in full cooperation with EGAS selected that land that is socially and technically acceptable. In March 2018, the ownership of the land allocated for the PRS was transferred to EGAS.

7 ENVIRONMENTAL AND SOCIAL MANAGEMENT & MONITORING PLAN

7.1 ESMMP Definition

The Environmental and Social Management and Monitoring Plan (ESMMP) consists of a set of mitigation, management and monitoring measures to be taken during implementation of the project to avoid, reduce, mitigate, or compensate or offset any adverse social and environmental impacts analyzed at the previous chapter. This ESMMP was based on the requirements of Environmental, Health, and Safety Guidelines for Natural Gas Processing.

The ESMMP has distinguished between mitigation measures and monitoring that should be implemented during the construction and operation of the project.The ESMMP identifies certain roles and responsibilities for different stakeholders for implementing, supervising and monitoring the environmental and social performance of the project during its life cycle. Roles and responsibilities for implementing the ESMMP during the construction and operation phases have been proposed. During construction EGAS/LDC will assign supervision staff who will undertake supervision over the contractor to make sure that the mitigation measures specified in the design/tender document are implemented on field. During operation phase, the PRS shall have permanently at least one staff member for health, environmental and safety during operation and maintenance of the PRS.

The objective of the Environmental and Social Management and Monitoring Plan (ESMMP), is to outline actions for minimizing or eliminating potential negative impacts and for monitoring the application and performance of mitigation measures. The ESMMP identifies roles and responsibilities for different stakeholders for implementation and monitoring of mitigations. This section also presents an assessment of the institutional capacity and institutional responsibilities for implementing the ESMMP.

Wherever applicable, the ESMMP is designed to accommodate alternative context-specific mitigations and monitoring measures.

Overall, the following Environmental and Social measures are complementary to and do not substitute compliance to the detailed HSE guidelines, procedures, and actions adopted by EGAS and its subsidiary LDCs.

In the following Management and Monitoring measures the term Local Distribution Company (**LDC**) refers to the gas company in charge of project implementation: **ReGas.**

7.2 Management of Grievance.

EGAS and the LDCs are committed to preventing, limiting and, if necessary, remedying any adverse impacts caused by its activities on local populations and their social and physical environment. Identifying, preventing and managing unanticipated impacts are facilitated by a grievance redress mechanism (GRM). As the World Bank's governance and anticorruption (GAC) agenda moves forward, grievance redress mechanisms (GRMs) are likely to play an increasingly prominent role in Bank-supported projects.

Anyone will be eligible to submit a grievance to the Project if they believe a practice is having an adverse impact on the community, the environment, or on their quality of life. They may also submit comments and suggestions to the GRM.

The GRM was designed in order to handle all grievances during the construction and operation phases. The aggrieved person has the full right to lodge his complaint anonymously. However, this might cause a challenge to inform him about any corrective procedures. Additionally, if the complaint is related to service seeking, the aggrieved person should provide full information about himself and about his residential unit.

Objectives: The objective of a grievance procedure is to ensure that all comments and complaints from any project stakeholder are considered and addressed in an appropriate and timely manner. This will manage to build trust and detect any weak signal. The process will reduce risk of litigation and conflicts with the community

Disclosure of the GRM: The Community people will be fully informed about the Grievance procedures in simple language. Information about grievance mechanism will be tailored according to the community. All information about GRM will be made available on the contracting offices during the construction phase and on customer services offices during the operation phase.

Mode and channels of Grievance: The Company will accept all comments and complaints associated with the project from any stakeholder. Comments can be made via email, post, fax, on the telephone or in person. The comments and complaints will be summarized and listed in a Complaints/Comments Log Book, containing the name/group of commenter/complainant, date the comment was received, brief description of issues, information on proposed corrective actions to be implemented (if appropriate) and the date of response sent to the commenter/complainant.

The proposed mechanism is built on three tiers of grievances:

- The foreman working on the ground in **PRS site in Farshout**
- The project manager in **PRS site in Farshout**,
- The regional department of ReGas in Qena Governorate

The aggrieved person has the full right to immediately use tier 2 or 3 upon his convenience and there is no need to exhaust the first tier. Additionally, he can resort to any other governmental entities i.e. Ministry of Petroleum. He/ She also have the full right to bring a lawsuit without resorting to any of the grievances tiers.

Grievance channels:

1. **During construction phase:**
    a) Foremen act as the main channel for complaints. They are always available on the construction sites. However, complaints raised to him/her are mostly verbal. Thus, s/he should document all received grievances in writing form using a fixed serial number that the complainant should be informed about to be able to follow up on the complaint
    b) Hotline: 129 is the hotline in ReGas.
    c) The SDO within the LDC and EGAS
    d) Email. info@***ReGas***.com.eg
2. **During construction phase:**
    a) Customer service office
    b) Hotline: 129 is the hotline in ReGas.
    c) The SDO within the LDC and EGAS

d) Email. info@***ReGas***.com.eg

Response to grievances: All comments and complaints will be responded to either verbally or in writing, in accordance to preferred method of communication specified by the complainant. Comments will be reviewed and taken into account in the project preparation; however they may not receive an individual response unless requested.

Registration of GRM: All grievances will be registered and acknowledged within 5 business days and responded to between to 15- 30 business days (depending on the nature of grievance). The project management will keep a grievance log and report on grievance management, as part of annual project progress reports, which will be available on the LDC and EGAS.

Confidentiality: Individuals who submit their comments or grievances have the right to request that their name be kept confidential, though this may mean that the LDC is unable to provide feedback on how the grievance is to be addressed.

Management of GRM: During construction and operation phases, grievances in relation to construction activities will be managed by the LDC and the construction contractor(s). The LDC will provide contact information to project areas

A separate grievance mechanism is available in the same manner for workers, including employees of both the LDC-employed and contractors.

Grievance Cycle: The grievance received via any of communication channels and tiers will follow the following cycle. The aggrieved person has the full right to submit his grievance to any of the assigned tiers. The aggrieved person also has the full right to submit his grievance to any entity he prefers i.e the Minister of Petroleum, the Governorate …etc. It is essential to mention that the acknowledgement of grievance should not exceed two working days.

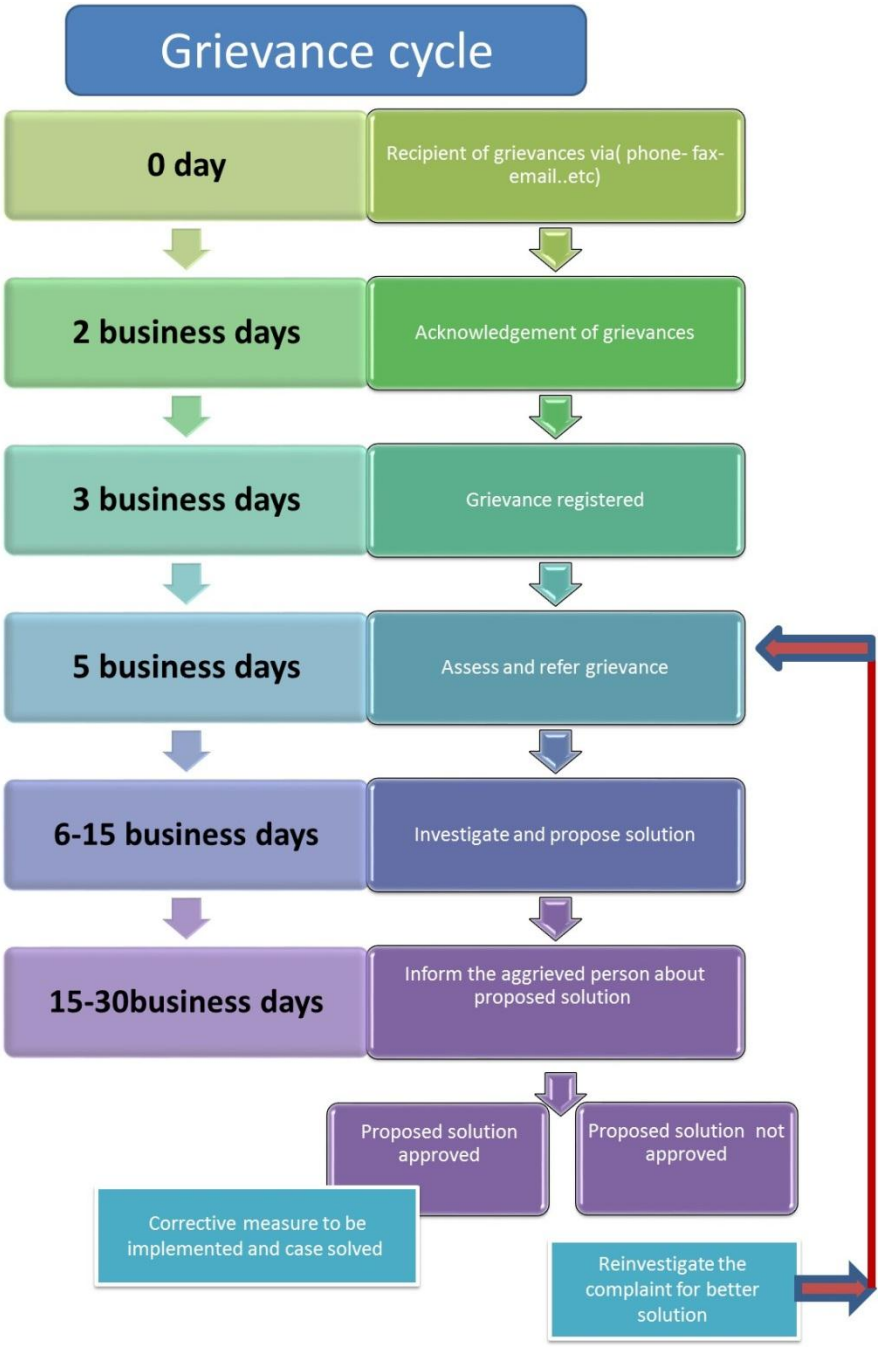

Figure7-1: Grievance cycles

Monitoring of grievances: All grievances activities should be monitored in order to verify the process. The monitoring process should be implemented on the level of EGAS and the LDC (both in the site and in the headquarter). For more information about GRM please see Annex 7

7.3 Environmental and Social Mitigation Measures

Table 7-1: Environmental and Social Management Matrix during CONSTRUCTION

Receptor	Impact	Mitigation measures	Residual impact	Institutional Responsibility for Implementation		Means of Supervision	Estimated Cost of mitigation / supervision
				Mitigation	Supervision		
Physical receptor	Impact on soil	- Decrease erosion by minimizing disturbances and scarification of the surface - Best practices for soil management should be followed - Good housekeeping to minimize spills/leaks - Proper handling and management of wastes	Negligible	Contractor	LDC –HSE department	Field supervision (audits)	- Contractor costs LDC management costs
	Air emission	- Monitoring of wind speed and direction to manage dust-generating activities during undesirable conditions. - Management of number of vehicles and equipment in the site. - Appropriate maintenance, engine tuning and servicing of construction equipment to minimize exhaust emissions - Minimize unnecessary journeys or equipment use - Adopt a policy of switching off machinery and equipment when not in use (idle mode). Additionally, the project will adhere to Environmental, Health, and Safety Guidelines for Natural Gas Processing mitigation measures requirements. Regularly monitor fugitive emissions from pipes, valves, seals, tanks, and other infrastructure components with vapor detection equipment, and maintenance or replacement of components as needed in a prioritized manner; · - Maintain stable tank pressure and vapor space by: o Coordinating filling and withdrawal schedules, and implementing vapor balancing between tanks, (a process whereby vapor displaced during filling activities is transferred to the vapor space of the tank being emptied or to other containment in preparation for vapor recovery); o Using white or other color paints with low heat absorption properties on exteriors of storage tanks for lighter distillate s such as gasoline, ethanol, and methanol to reduce heat absorption. Potential for visual impacts from reflection of light off tanks should be considered; · - Selecting and designing storage tanks in accordance with internationally accepted standards to minimize storage and working losses considering, for example, storage capacity and the vapor pressure of materials being stored; - Use supply and return systems, vapor recovery hoses, and vapor-tight trucks / railcars / vessels during loading and unloading of transport vehicles; - Use bottom-loading truck / rail car filling systems; and - Where vapor emissions contribute or result in ambient air quality levels in excess of health based standards, install secondary emissions controls, such as vapor condensing and recovery units, catalytic oxidizers, vapor combustion units, or gas adsorption media.	Negligible	Contractor	LDC –HSE department	Contractual clauses + Field supervision (audits)	- Contractor costs - LDC management costs
	Noise	**Worker** Application of the normal precautions normally taken by construction workers. Application of Environmental, Health, and Safety Guidelines for Natural Gas Processing mitigation measures requirements.	Minor	- LDC - Excavation Contractor	LDC–HSE department	Contractual clauses + Field supervision (audits)	- Contractor costs - LDC management costs

Receptor	Impact	Mitigation measures	Residual impact	Institutional Responsibility for Implementation		Means of Supervision	Estimated Cost of mitigation / supervision
				Mitigation	Supervision		
		Neighbor - Notification to the surrounding establishment prior to the construction of the PRS - Time management and construction schedule according to the IFC regulation provided by the contractor prior to the construction phase	Negligible			Field supervision Complaints receipt from local administration	
Social receptor (health and safety)	Occupational health and safety	- The project will hire a qualified sub-contractor with the high health and safety standards. In addition, the ToR for the contractor and the ESIA will provide the provision of the health, safety and precaution of the environmental impacts and its mitigation measures to be followed during construction. Additionally, the subcontractors ToR will prohibit any kind of child labor and rigid monitoring determinants will be applied - Standard protection by placing clear project signs. - Time management for vehicles movement; especially avoiding the peak hours - Standard protection for the workers especially working at elevated heights or trench. - Regular inspection to compelling worker to used their PPE - Training and licensing industrial vehicle operators of specialized vehicles. - Measures as per QRA recommendations: Firefighting brigades, mutual aids, emergency communications and fire detection / protection systems - Safe exits in building according to the modeling in the study	Minor	- LDC - Excavation Contractor	LDC–HSE department	Field supervision and review of HSE report+ Field supervision (audits)	- Contractor costs - LDC management costs
	Risk pertaining to child labor	- The project will hire a qualified contractor/ sub-contractor with the high occupational standards. Special attention will be given to add a contract term prohibiting all child labor activities - Rigid obligations and penalties will be added to the contractor ToR in order to warrantee no child labor is occurred in the project. In case of breaching these obligations, financial penalties will be applied - The ToR also will oblige the contractor/subcontractor to keep a copy of IDs of laborers in order to monitor the hired staff, especially, those below 18 years old - The contractor also will be obliged to maintain daily attendance sheets in order to verify the attendance of workers in case of accidents and provide the injured persons with proper health insurance	Minor	- LDC - Excavation Contractor/subcontractor	LDC–HSE department	Field supervision and review of HSE report+ Field supervision (audits)	- Contractor costs - LDC management costs

Receptor	Impact	Mitigation measures	Residual impact	Institutional Responsibility for Implementation		Means of Supervision	Estimated Cost of mitigation / supervision
				Mitigation	Supervision		
Physical receptor	Solid and Hazardous waste management	- Temporary storage in areas with impervious floor - Safe handling using PPE and safety precautions - Empty cans of oil-based paint resulting from painting the steel connection pipes to households are to be collected and sent back to nearest LDC depots(Abo Rawash) for temporary storage until disposal at a hazardous waste facility (Nasreya or UNICO in Alexandria). - If hazardous waste quantities generated are too small for isolated transport to the Nassreya landfill, a temporary storage site can be created. Coordination with waste authority will be imperative to secure a location and implement adequate procedures for storage depending on quantities and type of wastes until collection and shipping to Nassreya landfill. - Hand-over selected oils and lubricants and their containers to Petrotrade for recycling	Minor	- LDC - Excavation Contractor	LDC–HSE department	Field supervision and review of certified waste handling, transportation, and disposal chain of custody	- Indicative cost items included in contractor bid: - Chemical analysis of hazardous waste - Trucks from licensed handler - Pre-treatment (if needed) - Disposal cost at Nasreya - Approximate cost of the above (to be revised upon project execution): 8,000-10,000 LE per ton
Social receptor	Grievance and redress mechanism	The detailed grievance mechanism (GRM) is presented in **Annex 7).** It will to be shared with the community beneficiaries. The GRM presented various tiers of complaints, time to respond to the aggrieved person and reporting requirement for grievances. It is crucial to notify that time frame allocated for responding to a complaint will not exceed 15 business days.		Contractor	LDC –HSE department	Contractual clauses + Field supervision	- Contractor costs - LDC management costs
Social receptor (Local traffic and accessibility)	Traffic	Time management for transporting the materials, equipment, debris, etc. Clear sign surrounding construction site and the enter / exit gate. Coordination with traffic department (ministry of interior) for vehicles route and movement. Vehicle speed restrictions should be applied across the project site,	Minor	Contractor	LDC + Traffic department	Contractor has valid conditional permit + Field supervision	- Contractor costs - LDC management costs
Physical receptor	Water contamination	In general, the proposed construction activities have no impact on the quality of nearby surface water or groundwater (no information on groundwater was available at the time of submission of the report); however the following procedures should be followed: - Control all onsite wastewater streams and ensure appropriate collection, treatment and discharge. Prevent discharge of contaminants and wastewater streams to ground. - Adequate management and proper handling and storage of construction materials, oils and fuel to avoid spillages. - The implementation of a continuous and regular site inspection system.	Negligible	Contractor	LDC –HSE department	Contractual clauses + Field supervision	- Contractor costs - LDC management costs

Table 7-2: Environmental and Social Management Matrix during OPERATION

Receptor	Impact	Mitigation measures	Residual impact	Institutional Responsibility for Implementation		Means of Supervision	Estimated Cost of mitigation / supervision
				Mitigation	Supervision		
Physical receptor	Noise	- Locate noisy pressure reducers away from PRS borders in residential areas - Location of reducers should be at least 20 meters away from the PRS fences. - The reducers should be either in a well-ventilated closed area, or in a protected open area according to IGEM standards. If the reducers are in an open area there should be wall barriers to dissipate the noise from the PRS staff offices and the neighboring areas.	Negligible	LDC Design Department	LDC HSE	Review of PRS layout	LDC management costs & PRS cost
Social receptor (health and safety)	Occupational health and safety	- Remote actuation of isolation and slam-shut valves by LDC for PRS and pipelines - Produce Hazardous Area Classification drawings - Control room exit design. - Preventive maintenance policy and station manual - Provision of self-contained breathing apparatus (2 pieces for each station) for handling odorant leaks - Apply jet fire rated passive fire protection system to all critical safety shutdown valves ESDVs or Solenoid valves (As applicable) - Place signs in Arabic and English "Do Not Dig" and "High Pressure Pipeline Underneath" - Install an elevated wind sock and provision of portable gas detectors - The design should fully comply with IGE TD/3 code requirements - Provision of adequate sanitary facilities	Minor	- LDC project department - Designer	- LDC project department - Engineering dep. - HSE dept. - EGAS	- Drawing and design Document Review - Policy and manual review - Inspection by operators - Signage inspection and site visits	Included in PRS cost

Receptor	Impact	Mitigation measures	Residual impact	Institutional Responsibility for Implementation		Means of Supervision	Estimated Cost of mitigation / supervision
				Mitigation	Supervision		
Physical receptor(air, soil, water)	Solid and Hazardous waste management	- Strict use of chemical-resistant suits and PPE when handling odorant barrels, tanks, or spills - Evacuation of odorant from barrels into holding tank with utmost care and full PPE - Covering possible odorant spills immediately with sand and treatment with sodium hypochlorite as per EGAS and LDC practices - On-site treatment of empty containers with sodium hypochlorite and detergent as Per EGAS and LDC practice - Ship empty containers to a certified hazardous waste facility via company depot using certified handling and transportation contractors - Ensure full and empty (treated) odorant containers are accompanied by a trained HSE specialist during transportation to and from the depot and to/from the hazardous waste disposal facility (UNICO and/or Nasreya) In order to minimize risk of spillage of hazardous odorant, the following general precautions should be taken: - Pre-Plan the anticipated amounts of odorants to be used in order to minimize leftovers and residuals. - Handle with extreme care and always perform visual checks on the integrity of the odorant container - Avoid rough handling rolling or dropping of odorant containers - Avoid exposure to direct sunlight during storage or transportation - Ensure odorant containers are always sealed properly and secured from tipping/falling/damage during transportation and storage (temporary and long-term) - Always have sufficient amounts of sand, sodium hypochlorite and detergent on standby during usage of odorant - ALWAYS handle containers or spills with care and full PPE compliance - Never release or empty residual odorant from its container to any receptor or for any reason other than filling the odorant tank at the PRS - NEVER use empty odorant containers for any other purpose In case of odorant spillage: - avoid inhalation and sources of ignition - immediately cover and mix with sufficient amounts of sand and sodium hypochlorite using necessary PPE and tools - collect contaminated sand in clearly marked secure containers/bags - Add sand to inventory of hazardous waste Other measures as per QRA: - Review the emergency response plan and update the plan to include all scenarios in the study and other needs including: - Firefighting brigades, mutual aids, emergency communications and fire detection / protection systems. - First aid including dealing with the odorant according to the MSDS for it, with respect of means of water supply for emergency showers, eye washers - Provide the site with SCBA "Self-Contained Breathing Apparatus" (at least two sets) and arrange training programs for operators. - All operation is according to standard operating procedure for the PRS operations and training programs in-place for operators. - Inspection and maintenance plans and programs are according to the manufacturers guidelines to keep all facility parts in a good condition. -	Minor	PRS staff	LDC HSE	Quarterly auditing for each PRS	Cost to be included in PRS running budget:

7.4 Monitoring and Review

Procedures to monitor and measure the effectiveness of the management program, as well as compliance with any related legal and/or contractual obligations and regulatory requirements will be established. In addition to recording information to track performance and establishing relevant operational controls, dynamic mechanisms, such as internal inspections and audits, where relevant, to verify compliance and progress toward the desired outcomes will be utilized.

Monitoring will normally include recording information to track performance and comparing this against requirements in the management program. The monitoring results shall be documented and the necessary corrective and preventive actions in the amended management program and plans shall be identified consequently.

Table 7-3: Environmental and Social Monitoring Matrix during CONSTRUCTION

Receptor	Impact	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
Local traffic and accessibility	Reduction of traffic flow and accessibility to local community	Comments and notifications from Traffic Department	LDC HSE	Monthly during construction.	Construction site	Documentation in HSE monthly reports Complaints log	LDC management costs
Ambient air quality	Increased air emissions	HC, CO% and opacity	LDC HSE	Once before construction + once every six months for each vehicle	Vehicles licensing Department	Measurements and reporting of exhaust emissions of construction activities machinery Complaints log	LDC management costs
Labor conditions Occupational Health and Safety	- Occupational Health and Safety Total number of complaints raised by workers - Periodic Health report Periodic safety inspection report	Total number of complaints raised by workers Periodic Health report Periodic safety inspection report LDC HSE	LDC HSE Biannual for PRS	Biannual for PRSPRSs	- Construction site Safety supervisor should follow the commitment of workers to use the protective equipment - Inspection and recording of the performance -Reports about the workers and complaints	- Safety supervisor should follow the commitment of workers to use the protective equipment - Inspection and recording of the performance -Reports about the workers and complaints LDC management costs	LDC management costs No cost
		Prescence of a suitable tool for wind direction (Windsock) to be installed in a suitable place to determine the wind direction.	LDC HSE and Projects Dpt.	Daily during construction	Construction site	Supervision & reporting	LDC management costs
		Cooperation should be done with the concerned parties before planning for housing projects around the PRS area.	LDC Projects Dpt.	Daily during construction	Construction site	Supervision & reporting	LDC management costs
	Child labor	Attendees lists with workers IDs Complaints and accidents reports	LDC HSE	Biannual for PRS	Construction site	- Safety supervisor observe the laborers Random checkup for laborers IDs	LDC management costs
Ambient noise levels	Increased noise levels	Noise intensity, exposure durations and noise impacts	LDC HSE	Regularly during site inspections and once during the night in every residential	Construction site	Measurements of noise levels Complaints log	LDC management costs

Receptor	Impact	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
				area			
		Complaints from residents	LDC HSE	Monthly during construction.	Construction site	Documentation in HSE monthly reports	LDC management costs
Physical receptor (soil, subsurface water, visual)	Waste generation	Observation of accumulated waste piles	LDC HSE	During construction. Monthly reports	Construction site	Observation and documentation	LDC management costs
		Observation of soil accumulations resulting from excavation (if encountered)	LDC HSE	During construction. Monthly reports	Around construction site	Observation and documentation	LDC management costs
		Chain-of-custody and implementation of waste management plans	LDC HSE	Zonal reports	Construction site and document examination	Site inspection and document inspection	LDC management costs
		Chain-of-custody and implementation of domestic wastewater (sewage) management	LDC HSE	During construction. Monthly reports	Construction site	Site inspection and document inspection	LDC management costs

Table 7-4: Environmental and Social Monitoring Matrix during OPERATION

Receptor	Impact	Monitoring indicators	Responsibility of monitoring	Monitoring Frequency	Location of monitoring	Methods of monitoring	Monitoring Estimated Cost
Ambient air quality	Improper management of odorant during operation	- Log of spillage incidents - Number of treated containers - Odorant delivery forms	LDC HSE	Quarterly for each PRS	PRSs	- Compare Environmental Register with odorant delivery forms, observation of site	LDC management costs
Ambient noise levels	Noise of PRS operation	- Noise intensity	LDC HSE	Quarterly for each PRS	PRSs	- Noise meter	LDC management costs
Social-Health	Occupational Health& safety	Updated emergency response plan to include all scenarios and recommendations outlined in the QRA	LDC HSE (ERP document)	Yearly (ERP doc.)	PRS location	HSE annual audit	LDC management costs

7.5 Farshout Quantitative Risk Assessment Study Recommendations

It was noted through the calculation of the risk that the probabilities are within the Acceptable region for the PRS workers (where no risk on public), and to keep the risk as found, it is recommended that:

Recommendation	Timeline Phases
All facility specifications referred to the national and international codes and standards.	Design Phase
Considering that all electrical equipment, facilities and connections are according to the hazardous area classification for natural gas facilities.	Design Phase
Emergency shutdown detailed procedure including emergency gas isolation points at the PRS and Off-Take Point in place.	Design Phase
Surface drainage system is suitable for containment of any odorant spills.	Design Phase
Provide a suitable tool for wind direction (Windsock) to be installed in a suitable place to determine the wind direction.	Construction Phase
Review the emergency response plan and update the plan to include all scenarios in this study and other needs including:	Operation Phase
• Firefighting brigades, mutual aids, emergency communications and fire detection / protection systems.	Operation Phase
• Dealing with the external road in case of major fires.	Operation Phase
• First aid including dealing with the odorant according to the MSDS for it, with respect of means of water supply for emergency showers, eye washers and cleaning.	Operation Phase
• Safe exits in building according to the modeling in this study.	Operation Phase
Provide the site with SCBA "Self-Contained Breathing Apparatus" (at least two sets) and arrange training programs for operators.	Operation Phase
All operation is according to standard operating procedure for the PRS operations and training programs in-place for operators.	Operation Phase
Inspection and maintenance plans and programs are according to the manufacturers guidelines to keep all facility parts in a good condition.	Operation Phase
Cooperation should be done with the concerned parties before planning for housing projects around the PRS area.	The Three Phases

7.6 Reporting of Mitigation and Monitoring Activities

During construction and operation, environmental performance against targets is reviewed by management at monthly frequency and reported to the contractor and LDC. The plan is designed to record incidents and to ensure investigation, root cause analysis, corrective action and follow up. Records are kept of all incidents, investigations and actions.
Regulatory and HSE reporting systems will be brought together on a monthly basis to be collated and input into LDC (ReGas) reporting system to be submitted to EGAS Environment Department during the construction phase.

During operation, the reporting of any occurrence and /or the result will take the following path:

- Recording of the nature and scale of the occurrence;
- Reporting to the necessary competent/ responsible persons; and
- Internal reporting and external regulatory notification.

7.6.1 During construction phase reports should include as a minimum

- Monthly report for the implementation of the ESMP submitted by the contractor to LDC HSE staff.
- Monthly report on incident and complaint from the surrounding establishments and residents nearby the construction site.
- Unusual traffic delays or accident caused during construction or any complaints received should be reported in the monthly report prepared by the construction contractor supervisor. And /or permits and any comments or recommendations by Traffic Department
- Monthly report should include any incidents of high dust emissions or smoke during construction works including the natural dust that might be encountered.
- There should be a form prepared by LDC HSE department for the contractor to keep records of quantities, types of wastes received and the location where it has been received from.
- The monthly report of HSE supervisor from LDC should include how well does the contractor abide to the mitigation measures and any comments noticed by the HSE site supervisor about mismanagement of construction waste during the month.
- The HSE team from LDC observer should report on the monthly basis of the accident or the worker's obedience.
- Reporting on the monthly basis, the total number and the type of heavy equipment use during the construction phase.
- Monthly report on health and safety performance. This report will include any incident and complaint regarding health and safety measures perform by the contractor.

7.6.2 During Operation phase reports should include as a minimum

According to law 9-2009 and it executive regulation, each facility should prepared an environmental register; the details of environmental register was set at annex 5 from the executive regulation. All the environmental procedure will be taken under the EMMP will be recorded at the Environmental Register so that they can be communicated effectively and clearly. It will include (monitoring plan, solid waste management plan, and emergency plan).
Environmental Register shall contain:

- Monitor and report if there is any complaint related to the noise generated from the PRS and disturb the surrounding establishments.
- Regular noise and air measurement report.

- Record keeping of the admitted waste and their quantity and management shall dispose it to the designated landfill for solid waste (bills of waste transportation).
- Summary of HSE monthly report will be included in the register.

According to Article 29-32 from law 9/2009 and its executive regulation that PRS shall prepare Hazardous material and waste register contains the handling and storage of hazardous material and waste in the facility (types, quantities, Material safety data sheet, type of storage and way of transportation). Additional the register should contain contract and /or bills of hazardous waste disposal at (UNICO).

7.7 Emergency Response Plan

ReGas will develop an Emergency Response Plan (ERP) which relates to its operations for PRS and for distribution network intermediate and low pressure and will incorporate the QRA recommendations. The purpose of this document is to outline emergency responsibilities, organizational arrangements and responses and procedures to be followed by personnel based in the field in the event of an emergency.

Emergency Levels are classified as Levels (Level 1, Level 2 and Level 3) as following:

The first level of Emergency:

- Potential hazards to life, safety, property and the environment are limited, and do not exceed the emergency zone or the boundaries of the public site or facility.
- The personnel of the enterprise or the site possess adequate training, capacity, personal protection equipment and necessary tools to manage and control the situation, and there is no need for external assistance.
- Alarm bells are not required to warn those outside the site or facility.
- The situation does not require evacuation of the emergency zone.
- There is no possibility of losing control or escalating the situation.
- The accident management team is not used.

The Second level of Emergency:

- There is a serious risk to life, safety, property and the environment and may exceed the limits of the emergency zone, but do not exceed the limits of the public site or facility.
- There is a need to use the assistance of external parties to manage the emergency, or at least the presence of stand-by team in the presence of a potential escalation of the situation, but the situation does not extend its influence outside the facility or site.
- Members of the facility or site do not have sufficient capacity or resources to deal with the incident
- Requires evacuation and / or warnings to warn those outside the emergency zone
- Security breach or situation leading to constant threat to life and safety
- Accident management team intervenes

The Third level of Emergency:

- There is a serious risk to life, safety, property and the environment and may exceed the limits of the emergency zone and the possibility of exceeding the limits of the public site or facility.
- There is a need to use the help of external parties to fight fire, rescue, dealing with hazardous materials, large number of injuries and deaths.
- Measures must be taken to protect units, nearby areas and / or communities and the environment beyond the boundaries of the public site or facility

- There is a potential risk that the reputation of the company, its business or its revenues will be affected
- Any incident involving the exit of the operating system beyond the limits of safe operation with the possibility of escalation
- There is a danger to the public
- There is a possibility to start or run the communication system for emergency reporting
- The accident management team is used.

7.7.1 For full details about the PRS emergency plan, kindly refer to Annex 8A, &8B. Hotline

In case of emergency, a 24-7 Hotline (**129**) is available for customers and the public to report leaks, damage, emergencies, and/or incidents related to gas connections, components, infrastructure, and activities (inside or outside households) and to request repairs/emergency response/assistance.

7.8 Institutional Framework for ESMMP Implementation

7.8.1 Environmental Management Structures

EGAS is the supervisory body. ReGas is the implementing body. Below is the management structure of ReGas.

Being the implementing body of the natural gas network in project areas, ReGas has a direct involvement with the environmental management and monitoring of the natural gas network. ReGas has limited environmental and social background. They will be in need to upgrade their capacity regarding the environmental and social aspects. EGAS will provide ReGas staff with the needed information.

One of the standard tasks of the HSE Departments of ReGas, supervised by EGAS, is to ensure that the Environmental and Social Management Plan of the project is implemented in all the phases of the Project, through establishing an Environmental Register for Pressure Reduction Stations, with frequent auditing of this register.

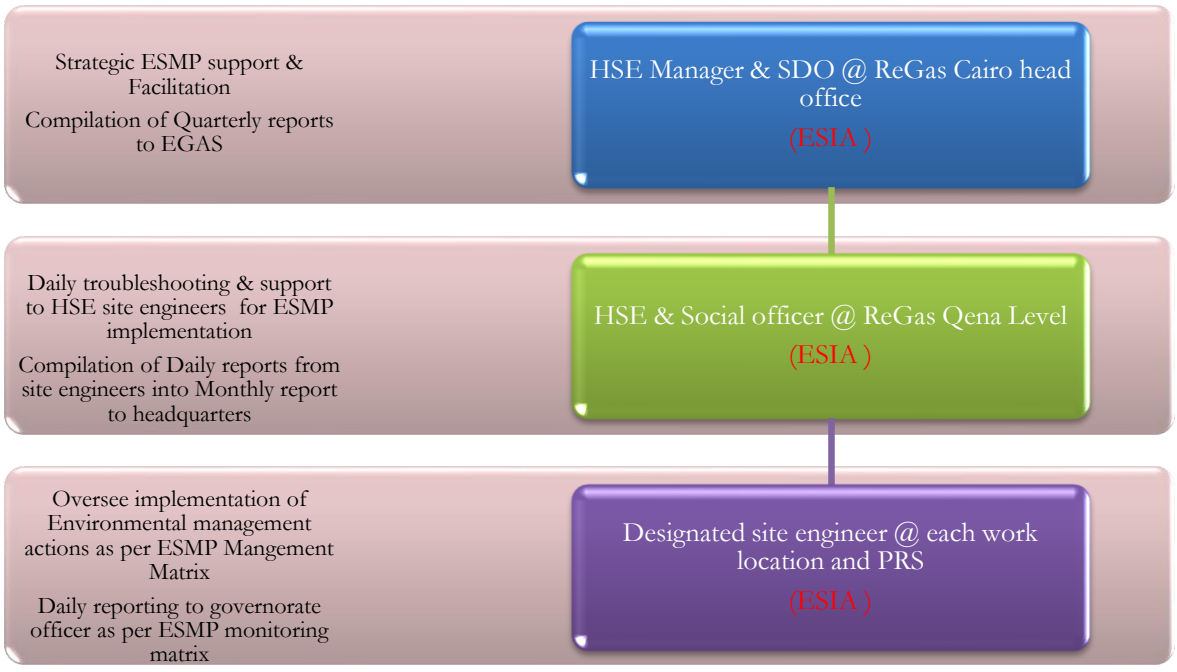

Figure 7-2: ReGas ESMP organogram

Daily reports are to be compiled and sent to the governorate HSE officer for preparation of monthly summary reports.

Monthly reports are sent to HSE officer at ReGas head office for compilation into quarterly reports to EGAS.

7.8.2 Required Actions

1- Involvement of environmental and social officers during the design, costing, tendering, and construction phases would be advantageous.
2- Detailed HSE manuals covering each activity must be developed and institutionalized in ReGas. Several versions of such manuals have been developed by Egypt Gas and should be mainstreamed to other LDCs, accompanied by the appropriate capacity-building.
3- An updated and detailed assessment of ReGas EHS institutional capacity and available resources for implementation of the ESMP
4- Specifically, ReGas should take steps to develop capacity of site engineers and HSE officers with specific courses focused on implementation of the ESMP detailed in this ESIA.

8 STAKEHOLDER ENGAGEMENT AND PUBLIC CONSULTATION

The public consultation chapter aims to highlight the key consultation and community engagement activities that took place as part of the preparation of the ESIAs and their outcomes.

Public consultation activities have been implemented during the preparation of the framework and the site-specific studies.

8.1 Legal framework for consultation

The consultation activities used multiple tools and mechanisms for the proposed 1.5 million household NG connections project in compliance with the following legislations:

- WB policies and directives related to disclosure and public consultation, namely,
    - Directive and Procedure on Access to Information
    - World Bank Operational Policy (OP 4.01)
- Egyptian regulations related to the public consultation
    - Environmental law No 4/1994 modified by Law 9/2009 and 105/2015 and its executive regulation until the last amendment by ministerial decrees no. 1963/2017

8.2 Consultation objectives

The objective of the Stakeholder Engagement is to ensure safe and successful Project delivery by:

- Informing stakeholders, including persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively;
- listening to their comments, ideas and concerns and recording the same for follow up;
- Avoiding conflict by addressing impacts and issues raised by stakeholders promptly; particularly with the communities that will not be served by the project
- Ensuring that fears and anxieties about the nature, scale and impact of the operation have been properly considered in the development and management of the Project
- Accessing and making good use of existing local knowledge of the area;

Communicating and implementing a viable community feedback mechanism. The consultation outcomes will be used in:

- Define potential project stakeholders and suggest their possible project roles
- Identify the most effective outreach channels that support continuous dialogue with the community

Thereafter the results will provide proper documentation of stakeholder feedback and enhance the ESIA accordingly.

The objective of the Stakeholder Engagement is to ensure safe and successful Project delivery by:

- Informing stakeholders, including persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its

outcome, either positively or negatively;

- listening to their comments, ideas and concerns and recording the same for follow up;
- Avoiding conflict by addressing impacts and issues raised by stakeholders promptly; particularly with the communities that will not be served by the project
- Ensuring that fears and anxieties about the nature, scale and impact of the operation have been properly considered in the development and management of the Project
- Accessing and making good use of existing local knowledge of the area;

Communicating and implementing a viable community feedback mechanism. The consultation outcomes will be used in:

- Define potential project stakeholders and suggest their possible project roles
- Identify the most effective outreach channels that support continuous dialogue with the community

Thereafter the results will provide proper documentation of stakeholder feedback and enhance the ESIA accordingly.

8.3 Consultation Methodology and Activities

The research team for this study has adopted multi-dimensional consultation activities using different tools as public meetings, Focus Group Discussion and Interviews that enable the marginalized, voiceless, youth and women to gain information about the project. As well as, gaining information about their concerns and worries regarding the project during various implementation phases. Following are the main consultation activities:

1- The study team visited the project area in order to define various stakeholders.

2- Community engagement was conducted through the following three phases:

- **Phase I (Scoping) for the** Preparation of the framework study in 2013 in Qena Governorate building which was disclosed on EGAS website as per the following link http://www.egas.com.eg/docs/RPF%20for%20NG%20connections%20project%20for%2011%20Governorates.pdf"
- **Phase II(Data Collection for the preparation) of** site-specific studies in January, 2016
- **Phase III (Consultation activities and final public consultation) in** February, 2016 which was conducted in Basma Hotel

3- All activities conducted were documented with photos and lists of participants in order to warrantee appropriate level of transparency.

8.4 Defining the stakeholder

In order to ensure an inclusive and meaningful consultation process, a stakeholder's analysis was conducted to get better understanding of the various groups and their roles, interests and influence on the project and Gender inclusion was considered in consultation activities.
For the purpose of this site specific ESIA, a focused stakeholders' identification was conducted to identify the key groups of relevance to the project in this specific location. The main identified groups are very similar to those identified on the governorate level but on a smaller scale, (elaborated details on that are included in the Governorate level ESMP). In the meantime, local communities of both men and women of projects beneficiaries, local NGOs/CDAs were among the key stakeholders on the local level. The following is the key stakeholders that were engaged during the consultation process:

- Local community representatives
- Governmental Organizations and Authorities
- NGOs / CDAs
- Educational institutions and universities
- Environmental administrations
- Formal and informal LPG distributors.
- In addition to, Re Gas company.

Stakeholders of Phase I:

The consultation session was conducted on December 2013

- Consultants (EcoConServ environmental and social) attended session
- Representatives of EGAS and ReGas
- Representatives of EEAA accompanied the teams
- Governmental entities
- NGOs
- Media
- Community people
- Potential traders
- Females and vulnerable groups

Stakeholders of Phase II:

- Consultants (EcoConServ environmental and social) attended session
- NGOs cooperated in data collection
- Community people
- Potential traders
- Females and vulnerable groups
- Governmental entities
- Media

Stakeholders of Phase III:

The Consultation session was conducted in Qena Governorate on February 2016

- Consultants (EcoConServ environmental and social) attended the meeting
- Qena Governor
- Representatives of EGAS and ReGas
- Representatives of EEAA accompanied the teams
- Media
- Community people
- Governmental entities
- Potential traders

Figure 8-1: Meeting in one of the NGOs in Farshout

Figure 8-2: Consultation event conducted with young women in Farshout

Figure 8-3: Meeting with the deputy of local unit in Farshout

Figure 8-4: Group meeting in Farshout

Table 8-1: Summary of Consultation Activities in Qena Governorate

Participants		Number		Methods	Date
		Male	Female		
During the framework					
Potential beneficiaries and governmental bodies		22	10	FGD	November and December 2013
Potential beneficiaries		75	67	Structured questionnaire	
Potential beneficiaries, government officials, NGO representatives,		96	57	Public consultation	
Total		**193**	**134**		
During the site specific phase I					
Government officials		2	1	In-depth	September and October 2015
NGOs		1	1	In-depth	
Community people		10	12	FGD	
Community people in Qena Governorate		61	18	Structured questionnaire	
Potential beneficiaries, government officials, NGO representatives,		68	42	Public consultation	7th of February 2016
Total		**142**	**74**		
During Phase II (Qeft, Farshout, Naqada, el-Waqf)					
Potential beneficiaries	Farshout	7	12	FGD	
Government/public officials	Farshout	4	1	In-depth	

Participants		Number		Methods	Date
		Male	Female		
				interview	
NGOs/CDAs representatives	Farshout	2	11	In-depth interviews	
Total		**13**	**24**		

8.5 Consultation processes

It is worth to mention that the public consultation has covered both the PRS and all the Low pressures pipelines networks activities. All questions raised during the public consultation were related to the connection activities (Low pressures pipelines networks), where most of the people are not familiar of the PRS activities. So all questions, comments and responses were concentrated on the NG connection activities and have been addressed in the ESMP study for the Low pressure network.

Final public consultation outcome (April, 2017):

Table 8-2: Consultation Session 2017

Subject	Questions and comments	Responses	Addressed in the ESIA Study
Safety of PRS	-How safe is the PRS?	The PRS adheres to the maximum safety measures. The odorization of NG is applied in order to detect any leakage, Monitoring and controlled inspections, enabling hotline to report on any leakage. There is multi-levels of safety measures. The above mentioned ones are just examples	Stakeholder section number 8
NG connections to villages and hamlets	Is the NG connection project only limited to urbanized areas? Will it include the villages and hamlets of Qena governorate, as well?	Connection to villages and hamlets is dependent on the availability of other public utilities (water, sewage, and electricity) Additionally, the village should be close to the national NG grid. If the village is big this will fulfill the requirements of economic aspect The hamlets are not targeted due to their limited population and the high cost	Stakeholder section number 8. Additionally, the ESMP report about Qena contains full technical specifications for the NG connection

Subject	Questions and comments	Responses	Addressed in the ESIA Study
Information sharing about NG	Limited information was shared about the project. It is essential to provide additional information about the average cost of installation per month and options for setting up the gas meters	-NGOs and CDAs in the four areas expressed their willingness to carry out awareness campaigns to share information with the local communities. The representative of the LGUs' Information Centers expressed the same willingness to carry out awareness campaigns.	Stakeholder section number 8 http://www.egas.com.eg/docs/ESMP%20for%20Qena.pdf
Job opportunities	Will be any opportunity to employ Farshout citizens in the PRS	There are limited job opportunities in the PRS. The total number will not exceed 30 job opportunities. Anyone can apply to be employed and the first priority will be given to Farshout residents.	Positive impact section number 5.2.1 and 5.3.1 http://www.egas.com.eg/docs/ESMP%20for%20Qena.pdf
Role of the local governmental unit	How can the LGU support the project?	This is very good question as the LGU is the primary stakeholder to the project. All permits should be obtained in full cooperation with the LGU. Sharing information with traffic department and other entities can be facilitated by the LGU.	Management plan table in section 7 http://www.egas.com.eg/docs/ESMP%20for%20Qena.pdf
Time plan	ReGas promised to start working in NG connection but nothing has been implemented to date. What exactly is the time plan?	The time plan will be identified upon receiving the PRS land and obtaining various permits. It is essential to get WB and EEAA approval on the ESIA prior to any construction activities	Project description and permits section 3.4 http://www.egas.com.eg/docs/ESMP%20for%20Qena.pdf

8.6 Summary of consultation outcomes

Site-specific consultation activities in Farshout included wide range of concerned stakeholders. This included but not limited to individuals/households affected by the project activities, civil society organizations representing the interest of the community, and governmental bodies who will play a role in facilitating or regulating the implementation of site-specific project activities.

The general stance towards the project is very supportive; even after the disclosure of the negative impacts during construction. The people realize that these negative impacts are temporary and that during operations the upsides will outweigh the downsides.

8.7 ESMP disclosure

As soon as the ESIA gets clearance from the World Bank and approval from EEAA, a final report in English language will be published on the WB, EGAS and ReGas websites. A copy of the ESIA report in English and a Summary in Arabic will be made available in the customer service office. Additionally,

an Arabic summary will be made available in the contracting offices. An A3 poster will be installed in the contracting office informing about