











1.5 Million Natural Gas Connections Project in 11 Governorates

Low Pressure Natural Gas Network
Environmental and Social Management Plan

Matrouh Governorate
(Marsa Matrouh City)

Executive Summary
March 2018

EGAS
Egyptian Natural Gas Holding Company

Developed by

EcoConServ Environmental Solutions

Petrosafe
Petroleum Safety & Environmental Services Company

1 Introduction

The Government of Egypt (GoE) recognizes the importance of the residential household natural gas connection program to improve the delivery of natural gas to households with affordable prices, high safety measures and the replacement of costly and troublesome LPG cylinders. The project will cover Marsa Matrouh City in the jurisdiction of Matrouh Governorate. The total anticipated household connections in the city will be about 17 thousand connections.

1.1 Environmental and Social Management Plan (ESMP)

This ESMP has been prepared based on the Terms of Reference prepared by EGAS and cleared by the World Bank, additionally the ESMP follows national and IFC requirements regarding scope and detail of assessment and procedure, and gives particular emphasis to public information and stakeholder participation. **The ESMP objectives include:**

Objectives of the ESMP include:

- Describing project components at Marsa Matrouh City areas and activities of relevance to the environmental and social impacts assessments
- Identifying and addressing relevant national and international legal requirements and guidelines
- Describing relevant baseline environmental and social conditions
- Assessing project alternatives if different from those presented in ESIA framework
- 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.

The areas and the total number of household which will be covered in this ESMP are illustrated in table 1-1:

Table 1-1 Number of Areas and Households

Governorate	Local Distribution Companies	Areas	Households connection		
Matrouh	ReGas		**First year(2017/2018)**	**Second year(2018/2019)**	**Total**
		Marsa Matrouh City	10,000	7,000	17,000

The local distribution company responsible for project implementation is ReGas

(شركة غاز الأقاليم)

2 Project Description

2.1 Background

Excavation and pipe laying of the distribution network, key activities of the construction phase also include installation of pipes on buildings, internal connections in households, and conversion of appliance nozzles to accommodate the switch from LPG to NG.

2.1 Project Work Packages

2.1.1 Intermediate Pressure Network-Main feeding line (7 bar system) Marsa Matrouh City

Marsa Matrouh city is the capital of Matrouh Governorate and is located in on Egypt's Mediterranean coast.

Figure2-1 Marsa Matrouh city

	Residential areas		Desert lands
	Agricultural areas		city borders

2.1.1.1 Route

Marsa Matrouh city is supplied from the outlet of Matrouh's PRS. It is a rented station with a capacity of 3000 m^3/hr and outlet pressure of 7 bar, owned by Egypt Gas. However, there is an upgrading project at the PRS site to increase the capacity of the station to 10,000m^3/hr.

The 7 bar pipeline will be installed parallel to EL Kasr –Agiba Road until it reaches EL Senosaya street. Thereafter, it will go through EL Senosaya Street until the intersection with EL Galaa road toward the center of the city.

Figure 2-2 shows the sectors that will be connected to the natural gas distribution network, and the route of the intermediate pressure network pipeline. Table 2-1 presents the length of the intermediate pressure pipeline at Marsa Matrouh city. The number of regulators converted from intermediate pressure (7 bar) to low pressure (0.1 bar) in the Matrouh area are 26 regulators.

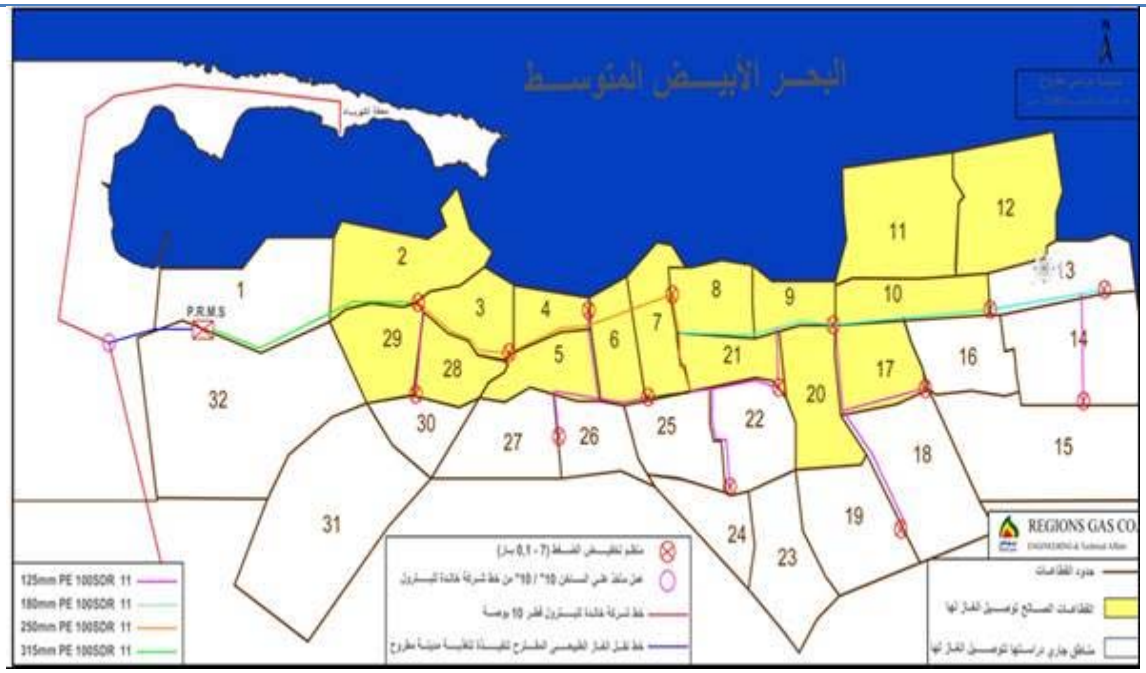

Figure 2-2 The 7 Bar network- (network sectors)

Table 2-1 Length and size of pipes in the intermediate Pressure Network for Marsa Matrouh city (7bar)

Pipe diameter	125 mm	180 mm	250 mm	315 mm
Pipe length	10797 m	5281 m	4101 m	2813 m
Laying depth	1.2 m :2 m	1.2 m :2 m	1.2 m :2 m	1.2 m :2 m

The following figures present the intermediate (7 bar) route within Marsa Matrouh city.

Figure2-3 Intake point from Matrouh PRS to the distribution Sectors (EL Senosaya street)

Figure2-4 Location of starting point of the route and pressure regulator(EL Galaa Street)

2.1.1.2 Low pressure Network-Distribution Network (Regulators, Poly Ethylene 80 Networks)

Existing low pressure gas city regulators are distributed via a gas distribution piping system consisting of low pressure service lines. The pressure of the gas in service lines is 100 mbar. In such a system, a service regulator is not required on the individual service lines. Low pressure service lines are mainly constructed from medium density polyethylene pipes (MDPE) having a maximum operating pressure (MOP) below 100 mbar. The PE80 network will be installed horizontally underground. Piping characteristics are tabulated below.

Table 2-2 Length and size of pipes in the Low Pressure Network (100 mbar)

Pipe diameter	32 mm	63 mm	90 mm	125 mm	180 mm	250 mm
Pipe length(m.)	37,695	67,110	5,850	5,265	11,190	393
Laying depth	1.2 m :2 m	1.2 m :2 m	1.2 m :2 m	1.2 m :2 m	1.2 m :2 m	1.2 m :2 m

2.2 Project Execution Methodology

2.2.1 Project area selection criteria

Preliminary project planning has applied social, economic, safety, and technical criteria to identify sub-areas eligible for connecting customers (households). The project shall introduce the service in new areas and shall further extend the network in areas which are partially covered.

A preliminary estimate was generated through a general survey, followed by a Property & Appliance (P&A) survey.

The general survey covered 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 gas networks.

While the Property & Appliance (P&A) survey covered the following:

- Obtaining the latest aerial maps of the project areas from the Egyptian Survey Authority
- Identifying Global Positioning System (GPS) coordinates of the sites
- Entering data into a central database and G.I.S system for review by a design team
- Finalizing pipe sizing, capacity & locations and routing by the design team finalizes.

2.3 Construction works of Main feeding line/network "7bar system- low pressure Network 100 mbar"

The construction activities of the network lines will involve drilling, pipeline placement, pipeline connection welding, and then surfacing. The construction activities will be located within the allocated site. The following activities will take place during the construction of the network:

- Clearing and grading activities and pipe transportation and storage
- Excavation and pipe laying
- Site preparation and excavation
- Pipe laying
- Backfill and road repair
- Leakage testing
- Construction works of household installation
- Commissioning

The construction will be mainly in urban and local roads. No construction activities will take place in main roads.

2.3.1 Clearing and grading activities and pipe transportation and storage

The first step of construction includes flagging the locations of approved access routes for the pipeline, temporary workshop for the crew, installing fences surrounding the construction areas, clearing land from any rubbish and/or clearing weeds. 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 located at the Marsa Matrouh –Siwa road. Quality control procedures during the transportation and handling of pipes should take place to ensure protection from any possible damages to the pipes, and prevent any traffic accidents.

Figure 2-5 Temporary Storage areas and Workshop

2.3.2 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, they will carefully excavate a trial pit.

2.3.3 Excavation

The most commonly used excavation technique is the open cut technique. Alternatively, borings may be excavated using hydraulic drive, and finally the horizontal directional drilling (HDD) technique.

HDD is only utilized in the case of railway crossings, waterways, and major streets where traffic cannot be interrupted. In the case of HDD under railway crossings steel, reinforced concrete sleeves will be installed to further protect the piping from fatigue**. It should be noted that there are no intersections with waterways and railway in the studied areas**.

Excavation works start by removing the asphalt layer and the base stone layer using either a mechanical excavator (used in urban roads) or an air compressor jack hammer for dusty roads (used in local roads). In case the jack hammer is used, road layers are removed by an excavator. The trench is excavated to a depth that provides sufficient cover over the pipeline after backfilling.

The road base soil, underneath asphalt and stones, is then excavated either by a backhoe excavator or by manual excavation. The advantage of manual excavation is that it reduces the risks of breaking water, sewerage, electric or telecommunication lines which are unmapped.

At locations with irregular ground elevations, additional excavation may be applied to avoid undue bending of the pipe. In addition, and in case of having crossings with other underground infrastructure lines/cables, the trench shall be deepened so that the pipeline be installed below or above the existing lines/cables.

Typically the trench (for PE100 7 bar network are orange pipes with a diameter of 0.125m to 0.315 m and for PE80 100 mmbar are yellow with diameter 0.032 to 0.25 m, and about 1.2-1.5 meter deep, depending on pipe diameter.

2.3.4 Pipe laying

Before pipe laying, the bottom of the trench is cleaned of any rocks or solid objects which may damage the pipes. Moreover, if the groundwater table is shallow, the trench should be dewatered (portable trash pumps are commonly used in construction projects) and discharge the water into a sewer manhole, according to the arrangements with local authorities. Once the trench is excavated, the pipe stretch shall be laid down.

2.3.5 Welding

During the excavation works, welding works may take place above-ground. Welding may involve built-in coil electrical fusion welding (fittings with heating coils installed inside) or butt fusion welding (hot plate softening the tips of the PE pipes before joining). In both cases, adequate electrical units are needed onsite (diesel generators, cables).

2.3.6 Backfill and road repair

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. In some cases, an inverted U-shaped reinforced concrete slab is constructed around the pipeline after laying in order to improve shock resistance.

Cathodic protection is mandatory for underground gas distribution lines. Packed magnesium and cathodic protection system will be applied to the pipeline in all cases

After that, the contractor will work on restoring the road surface to its original status. A yellow warning tape marked "Natural Gas" is placed on top of the sand layer. Appropriate signage and community safety measures will be in place in addition to covering or safeguarding any open trenches that are not promptly filled.

2.3.7 Leakage testing:

Following construction activities, the piping should be tested to locate possible leakages. As long as the operating pressure in the studied areas is low therefore pneumatic leakage testing will be required.

Pneumatic testing

A pressure test is always required for a new pressure system before the flow of natural gas starts to ensure the following:

- Safety
- Reliability of operation
- and leak tightness of pressure systems

The testing pressure is 1.5% higher than the design pressure. It is recommended only for low pressure applications. The testing media used is compressed air. Pressure relief devices are used during the test to ensure no over pressurization

Before testing, the thorough checking of weld joints is needed to be carried out. Senior experienced staff is required to monitor the test. Testing media is air. Test pressure is normally 1.5 times higher than the design pressure. During the test, a drop in pressure indicates leakage.

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

2.3.8 Construction works of household installation

After testing the piping for leakage, connections work will connect the distribution network to the households. The connection starts from the main line (PE) and crosses the road to the buildings on both sides. Connection work will include the following activities:

- Gas will be fed into the property at 100 mbar maximum, through risers and laterals for flats and an external meter box service termination for singly occupied premises.
- Sizes of risers depend on the number of dwellings in the block of flats but laterals will be normally 1 inch or 3/4 inch.
- Gas meters will be installed with a suitable regulator (governor) at internal pressures of 20 mbar.
- Internal piping inside the household will be steel pipes of 1 inch, 3/4 inch and 1/2 inch diameter and will generally supply a cooker and a water heater. Connections from steel pipes to appliances are typically flexible rubber tubing in the case of stoves and copper tubing for water heaters

The underground portion of the riser is sleeve-protected, while above-ground pipes are painted. Risers and laterals are fixed on walls by steel clips. This will involve drilling the walls to attach the necessary bolts and rivets. The laterals enter the household through the wall. Connections are tested for leakage by increasing pressure to 2 bar and monitoring pressure drop.

2.3.9 Commissioning

Before starting the flow of natural gas, the pipeline will be purged by flushing with dry nitrogen at ambient temperature to ensure that no operational problems arise from air or water left in the pipeline. The pressure of nitrogen is gradually increased till it reaches the operating pressure, and then the operation starts by replacing the nitrogen with natural gas.

2.4 Machines used

- Air compressor with jack hammer
- Portable generators
- Directional boring machine
- Trench drilling machine
- Control box welding machine
- Butt fusion welding machine
- Manual excavation tools

2.5 Conversion of home appliances

The installation contract between the household owner and the local distribution company includes the cost of converting 2 appliances (stove and water heater). Conversion involves drilling injector nozzles to become 1.25

to 1.5 times larger in diameter. Conversion works are carried out at the client's household. Typical drill bit sizes used for conversions are either 35 or 70mm.

Conversion works also involve flue gas outlet/stack installation for bathroom heaters. The stack must lead to external/ambient atmosphere outside the household. In order to allow the installation of the conversion of the heater and installation of the stack, the bathroom volume must exceed 5.6 cubic meters. Installation of the stack may require scaffolding and breaking of the wall or ceiling.

2.6 Hotline

During construction activities, 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.

It also includes reporting any possible damage to other underground utility lines (water, wastewater, electricity, phone, internet) and to buildings and physical structures or cultural sites during excavation/construction activities.

Moreover, reporting issues resulting from construction activities such as excessive/prolonged noise, vibration, waste, traffic, accessibility, visual, and other community health and safety impacts.

A section of the site may be used as a laydown area where shelters, equipment, washing and toilet facilities (portable) and containers will be located.

Workers accommodation will not be required on site because all workers will be local.

2.7 Activities of the operation phase

2.7.1 Operation of the network

The operation of the system is undertaken by local distribution companies (LDCs). Normal operation will include routine audits on pressures and condition of the network. Normal maintenance and monitoring works for the network include:

- Monitoring valves at selected points on the pipeline. Gas leaks are routinely monitored using gas detection sensors;
- Checking cathodic protection on "Flange Adaptors" by taking voltage readings and changing anodes whenever needed.

In case of a leak detection, or damage to part of the network, the damaged pipe is replaced. The following procedures are usually followed:

- Stopping leaking line by valves when available or by squeezing the lines before and after the damaged part.
- Excavating above the effected part (in case of distribution main or underground line)
- Venting the line
- Removing affected pipe, replacing and welding, backfilling and road repairing.
  The following table presents the general natural gas composition of the national network. The main activities are the monitoring of the pipeline and the routine checking for the occurrence of gas leaks.

2.7.2 Repairs in households

Repairs include appliance adjustments or piping/metering replacement.

2.8 Resources Consumption

2.8.1 During Construction

Water

Given the project's location within the city, there will be a permanent source of water from the Egyptian Holding Company for Drinking Water and Sanitation. However, no water is anticipated to be needed during the construction activities.

Fuel

Diesel fuel will be mainly used for diesel generators that supply electricity to the different construction activities such as welding. In addition, diesel will be the fuel used by trucks and excavators. The fuel will be delivered to the construction site via trucks when needed.

2.8.2 During Operation

The operation of the intermediate 'main' feeding and low pressure network do not involve permanent workers. Therefore, consumption of water will be limited to the workforce carrying out maintenance and repairs. No consistent or significant consumption of water is anticipated.

2.9 Waste Generation

All solid waste generated throughout the project, and especially during the construction phase (excavated soils, broken asphalt and other waste materials during excavation), will be managed and disposed in accordance with applicable regulations and established best management practices. In common practice, waste is loaded into trucks and transferred to licensed disposal areas. Due to the limited available space on most Egyptian streets, loading waste trucks shall be executed upon excavation, whenever possible, in order to avoid stockpiling waste on site.

2.9.1 During Construction

2.9.1.1 Solid Waste

Solid waste generated during construction phase will comprise of domestic waste, construction waste and some hazardous waste . The following table presents the expected wastes generated during construction and means of disposal.

Table 2-3 Solid wastes during Construction

Waste type	Hazardous/Non-hazardous	Treatment and Disposition
Domestic Waste (food waste, packing)	Non Hazardous	Disposed to an approved solid waste facility(by contractor) in Marsa Matrouh City
Wood – Scrap	Non-hazardous	Stored at a land site (south of the PRS) rented by ReGas . Transported to ReGas storage area in Alexandria and sold to specialized companies in a public auction
Tires		
Cardboards		
Containers		
Paints containers	Hazardous	Transported for final disposal is Nassreya - Alexandria
Batteries	Hazardous	Resold to the importer
Used oil waste (vehicles and machines)	Hazardous	Transported for final disposal to UNICO

2.9.1.2 Liquid Waste

No Liquid waste is expected to be generated during the construction phase. However, if the groundwater table is shallow, the trench should be dewatered (portable trash pumps are commonly used in construction projects) and water should be discharged into a drain or sewer manhole, according to arrangements with local authorities.

Project activities in the studied areas will take place in the city, where project workers will have access to public sanitary facilities. Therefore, **no sanitary wastewater is anticipated to be generated during the construction phase.**

2.9.2 During Operation

The pipeline operation is not expected to generate waste.

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3 Legislative and Regulatory Framework

3.1 Applicable Environmental and Social Legislation 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
- Law 38/1967 for General Cleanliness
- Law 93/1962 for Wastewater
- Law 117/1983 for Protection of Antiquities
- Traffic planning and diversions
  - Traffic Law 66/1973, amended by Law 121/2008 traffic planning during
  - 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).

OP/BP 4.12 will not be applicable to the low pressure pipelines of **Matrouh** governorate since no land acquisition or resettlement is anticipated. Particularly, as the network will pass through the main urban streets/roads and side roads without causing any damage to private assets or lands. In addition, it is not envisaged that the project will result in any physical or economic dislocation of people for the construction of low-pressure pipelines in the project areas. The pipelines network will not cross agricultural land in the project areas and accordingly no compensation will be applied

In addition to the above mentioned safeguards policies, the Directive and Procedure on Access to Information[1] will be followed by the Project.

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

As stated in IFC general EHS guidelines, when host country regulations differ from the levels and measures presented in the EHS Guidelines, projects are expected to achieve whichever is more stringent. .Gaps between requirements outlined by WBG guidelines and the Egyptian Law 4/1994 for Environment protection and the LDCs EHS guidelines has 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 ESMP.

3.3 International Finance Corporation (IFC) Guideline/LDC EHS Guidelines

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

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, it is 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 IFC 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 Guidelines are applied as required by their respective policies and standards.

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. Gas distribution system – HSE Guideline (provided in **Annex 2** from the report) are applicable to the project.

3.4 Permits Required

- Constructions permit to be obtained from the Local Governmental Unit.
- Road and Bridges Directorate permission for digging of main roads in accordance to 84 of year 1968 pertaining to the public roads
- 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.
- 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 Environmental Baseline

Marsa Matrouh is the capital of the Matrouh Governorate which is a Mediterranean coastal city located in Egypt's western section (Mariut coast) which extends from Sallum to Abu Qir for approximately 550 km. It is the narrow, less arid belt of Egypt (Zahran et al., 1985a, 1990).

4.1.1 Climate

4.1.1.1 Temperature

The area is generally characterized by a mild semi-arid climate with relatively high temperatures in summer during the months of June, July and August, and relatively low temperatures during the months of December, January and February. Maximum temperatures in Matrouh city range between 18.5^{o}C and 29.5^{o}C. The average of minimum Temperatures range between 9.5^{o}C and 22.5^{o}C.

4.1.1.2 Rainfall

Rainfall decreases rapidly south of the coast. Inland, there is a very sharp precipitation. The average annual precipitation in Marsa Matrouh was recorded to be 410 mm.

4.1.1.3 Relative Humidity

Relative humidity is high at the coast, with values highest early in the morning and lowest at noon.

4.1.2 Air Quality

The selection of the active air measurement location is based on the prevailing wind direction; site Topography, the future layout of the proposed project components and the location of the nearest sensitive receptors (if any) with respect to the project rout. Moreover, the selection is based on the guidelines stated in the American Society for Testing Materials (ASTM) reference method.

The measurement location was chosen on the basis that it's beside a school and near a residential area beside a main road and close to the pipeline route. The GPS coordinates of the selected Ambient Air monitoring locations are included in (Annex 3).

One hour average results for 8 hours continuous measurements were conducted for pollutants of primary concerns, namely, carbon monoxide (CO), nitrogen oxides (NO_2), sulfur dioxide (SO_2), Total Suspended Particulates (T.S.P) and particulate matter (PM_{10}).

4.1.3 Noise

One-hour average results for 8 hours continuous measurements were conducted for noise level measurements in the same location of the ambient air quality measurements.

The noise measurements in the studied areas are below national and WB guidelines. They are 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

Table 4-1 Average Ambient noise level measurements

	LAeq (dBA)
Marsa Matroh	57.36
National Limits	70
International Limits	70

The excavation and construction activities may cause noise levels to further surpass permissible levels at the site. As the excavation and construction are done on the same work day, therefore, the duration of permissible levels being surpassed will be intermittent for the duration of the work day i.e., 8-10 hours Management and mitigation plans for noise levels beyond permissible levels are further addressed in chapter 7.

4.1.4 Water resources

4.1.4.1 Surface water

Freshwater bodies in the areas are limited to temporary rainwater collection ponds that accumulate in wadis and low elevation areas during the rainy season. The coastal zone in the north of the area receives most of the rainfall and also receives the runoff collected by wadis in the northern tableland and drainage wadis area. According to a detailed analysis of rainfall-runoff dynamics made in two drainage wadis in the area, the vast and un-dissected tableland areas contribute little if any overland flow to the wadi runoff during the observed flooding events, and that the extreme flooding events did not cause significant damage or erosion in the valleys but was on the margin of control. Large amounts rainwater harvesting structures and systems in the coastal area bear witness to the profound hydrological experience of and successful management by the inhabitants (Local Communities). The terraced tableland fields (kurum) and lateral wadi terraces, including their supply infrastructure, are the most remarkable rainwater harvesting systems of the region. This is beside the construction of cisterns (underground water storage) to collect and save the surface run-off, but the team study did not observe these practices in the project area.

4.1.4.2 Groundwater

No site specific data is available on the groundwater in the studied areas. However, the excavation for the gas pipeline is shallow (1 meter depth) and will not reach the groundwater.

4.1.5 Terrestrial Biological Environment

- *Natural habitat*
  Given the fact that all pipelines will be in urban areas, the projected work is planned along existing roads in residential areas of the city of Marsa Matrouh.
  No natural habitats were observed in the project areas.

- *Flora*

No flora of significance were observed in the project area.

- *Fauna*

No endangered species were observed in the project area.

4.1.6 Protected Areas

4.1.7 Solid Waste Management

The municipality of Marsa Matrouh and the Local Governmental units are the responsible entities for transferring solid wastes. They use collection points where waste is accumulated and transferred to open transfer systems, existing in residential areas in the capital cities of Matrouh Governorate.

Marsa Matrouh has a controlled-landfill, located approximately 35 km from Marsa Matrouh city. The landfill contains a leachate collection system at those remote areas.

Figure 4-1 Governorate Solid waste landfilled
Source: Ministry Of Housing, Utilities & Urban Development

4.1.8 Physical cultural resources

Matrouh Governorate comprises of many archeological sites, as the area has been used by many old civilizations. Most of Matrouh's archeological sites are in Siwa, located approximately 300 km south west of Marsa Matrouh. Marsa Matrouh is home to some archeological sites that are already registered in the Supreme Council for Antiquities (SCA) and some are still under research and further excavations to extract potential antiquities.
In the case of any unanticipated archeological discoveries within the project area; a 'Chance Find Procedure,'(Annex 4) details the set of measures and procedures will be followed in such case.

4.1.9 Physical structures

The majority of buildings, to which the NG will be connected, are built with concrete and red bricks in relatively wide streets. Residential buildings in Marsa Matrouh range between 6-storey to 10-storey high. The construction materials of the walls and ceilings comply with the main bases and conditions required to install the NG. It was reported that all of the samples surveyed live in apartment buildings that are constructed with concrete and red bricks. As documented by the field research team, almost all streets, roads and alleyways are leveled out; and the condition of asphalted streets is good.

4.1.10 Traffic profile

Matrouh Governorate (a frontier governorate) occupies a wide sector in the northwest of

Egypt and is stretched from km 61 west of Alexandria up to the Egyptian- Libyan borders on the northern coast of Egypt where it extends for 450 km along the coast of the Mediterranean Sea. The governorate occupies the northern half of the Western Desert.

Marsa Matrouh City is a Mediterranean seaport and the capital of the Matrouh Governorate in Egypt. It is 240 km (150 miles) west of Alexandria and 222 km from Al Sallum, on the main highway from the Nile Delta to the Libyan border. The distance from Cairo to Marsa Matrouh is about 524 km. Another highway leads south from the town, toward the Western Desert and the oases of Siwa and Bahariya.

The streets are paved and most of the city's streets are asphalted. This enabled communities to move within the city. The majority of the main streets are two lanes.

There are three types of roads in Marsa Matrouh City:

- **The highways:** They are the roads connecting the city with Alexandria governorate and Siwa oasis. The roads available close to the project sites are Marsa Matrouh – Siwa road, Cairo- Matrouh road and Alexandria Matrouh road.

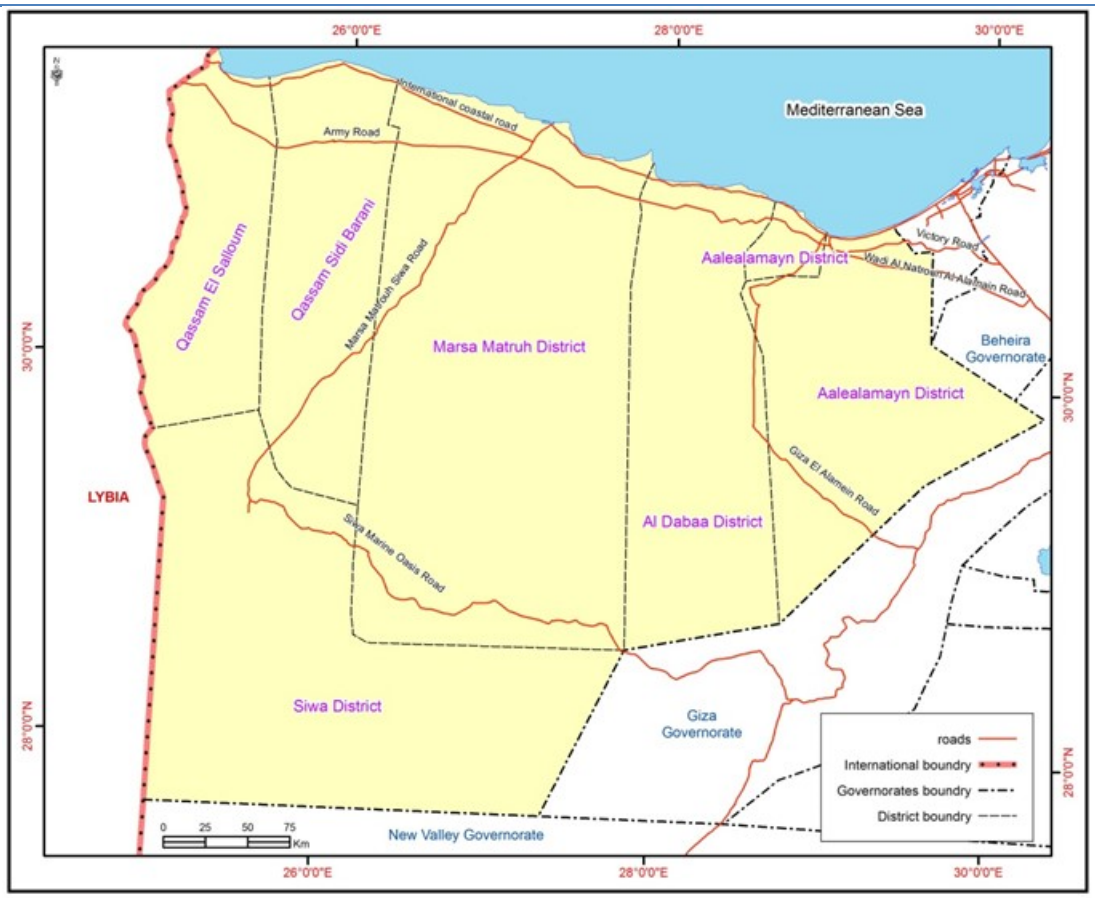

Figure 4-2: Roads in Marsa Matrouh

The urban roads: they are the main roads penetrating Marsa Matrouh i.e. Cornish street, Alam El Roum Street and Alexandria Street. The streets are relatively wide with three or four lane width.

Local streets: they are the streets passing through the city of Marsa Matrouh. They consist of two lanes or one lane streets

4.2 Socio-Economic Baseline

Marsa Matruh is a major Egyptian tourist resort and serves as a getaway resort for Europeans as well as Alexandria and Cairo Governorates. Marsa Matrouh is the base of the Egyptian sponge fishing fleet. It is also a busy trading Centre for the Bedouins of the Western Desert, as it allows them to bring their sheep, wool and agriculture products (barely, dates, olives and melons) to the local market. (Source: www.our-Egypt.com).

Administratively, Matrouh Governorate is divided into 8 districts or Centres each of them is known as a "Markaz". These are from east to west: Al Hammam, Al Alamein, Al Dabaa, Matrouh, Siwa, Al Nogila, Barani, and Al Sallum and also it comprises 8 cities, 56 rural local, and 631 sub villages (kafr) (IDSC, 2011).

4.2.1 Administrative affiliation

Marsa Matrouh City lies under the jurisdiction of Matrouh governorate. It is located on the north cost of Egypt.

4.2.2 Demographic characteristics

Total Population

According to the 2011 estimates of the Information Center at Marsa Matrouh city the total population of the city is 149,327 people. Those who reside the urban areas in Marsa Matrouh are 77.9% versus only 22.01% living in rural areas.

Rate of Natural Increase

Crude birth rate (per 1000 people) in Egypt was last measured at 23.82 in 2011, according to the World Bank. Crude birth rate indicates the number of live births occurring during the year, per 1,000 people estimated at midyear. Subtracting the crude death rate from the crude birth rate provides the rate of natural increase, which is equal to the rate of population change in the absence of migration.

In Matrouh the crude birth rate is doubled (46.47 per 1000 people). The population shows a natural increase of 4%. Indicating that there should be family planning interventions directed to remote areas in the country such as Matrouh.

4.2.3 Living Conditions

Household Size and Density

The total households in Marsa Matrouh city are about 30,757. The 2006 census reported that the average family size in the Matrouh Governorate is about 5.33 people. While the average family size in Matrouh District is 5 persons. The density rate (total number of household/total number of rooms in the residential unit) in Matrouh Governorate is 2.2 person/room, whereas, it is only 1.23 person/room in Matrouh City.

4.2.4 Access to Basic Services

Access to Electricity

According to CAPMAS poverty mapping data of 2013, almost all individuals in Marsa Matrouh use electricity for lighting.

Access to potable water and sanitary system

Accessibility to water network is high in Marsa Matrouh, as almost 94.8% of individuals have access to the public water network; and 35% of individuals have tap water inside their houses, according to CAPMAS poverty mapping data of 2013.

However, the public sanitation network covers almost all project areas. Access to sanitation systems is still limited in the suburbs of Marsa Matrouh city. The secondary data provided from the Matrouh information center revealed that only 19,329 from a total of 30,757 households residing in urban areas in Marsa Matrouh are connected to a public sewage grid. Most probably they will be covered by the NG.

4.2.5 Human development profile

Education

The census data revealed that illiteracy rate in Matrouh Governorate is 35.1% of the population in Matrouh while it represents only 28.7% of Marsa Matrouh population. Female illiteracy is higher among Matrouh residents (48.9%).

Intermediate education is the prevailing type of education in Egypt with 25.8% completion percentage for the population. While, in Matrouh Governorate the basic education is more dominant at 24.4%. In Marsa Matrouh, the basic education is also more prevalent. The variation in the percentage for the two sexes reflects the gap between males and females particularly in Matrouh governorate.

The project will pass by some schools in Marsa Matrouh City. Specific procedures will be applied in order to minimize the adverse impacts on schools and their students. Detailed procedures will be presented in the management plan.

Unemployment and Work Status

According to the Statistical Year Book of Matrouh Governorate, the total unemployment rate is 8.58% that increases among females to be 10.95%. The total workforce is estimated at 44.96%. 20.5% of Marsa Matrouh's population work as farmers with 15.8% of those employed work as skilled laborers. 11% of Marsa Matrouh's workers are specialis which stands as an indication of the availability to employ skilled workers from Marsa Matrouh city.

4.2.6 Health Facilities

There are six hospitals serving Marsa Matrouh, according to the Information Center of Marsa Matrouh's LGU. Additionally, there are a number of private clinics offering their services to the public.

Participants of focus group discussions expressed their satisfaction with the services provided by the military hospital. They recommended to have a service contract for medical treatment signed with the military hospital.

4.2.7 Poverty index

According to poverty mapping developed by CAPMAS in 2013, the number of poor people in Marsa Matrouh in 2013 is 28,072 individuals, representing 18.43%. The Gini Coefficient, which indicates income inequality, stands at 0.23. The percentage of female-headed households is 6.89%.

According to CAPMAS poverty mapping of 2013, the per capita consumption in Marsa Matrouh is 5,992.0 EGP/annually.

5 Environmental and Social Impact Assessment

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.

5.1 Impact Assessment Methodology

To determine and assess the impacts of the project phases on environmental and social receptors, a semi-quantitative approach based on Leopold was first adopted. 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 and addressed if both magnitude and importance are of minor severity.

The second approach is based on Buroz's Relevant Integrated Criteria and is used to determine the total importance, I, of the impact for each activity on all receptors and of the project overall.

Detailed assessment matrices for both approaches are in Annex 5. Following are the impact assessment scoring classification and results.

On the basis of the value of the importance of impact, I, obtained, the severity of the impact of an activity is assessed. The table below presents the classification of impact ratings and respective importance of impact values.

Importance of Impact	**Impact rating**	
0-25	**None** or irrelevant (no impact);	
26-50	**Minor** severity (minimal impact; restricted to the work site and immediate surroundings)	
51-75	**Medium** severity (larger scale impacts: local or regional; appropriate mitigation measures readily available);	
76-300	**Major** severity (Severe/long-term local/regional/global impacts; for negative impacts mitigation significant).	

5.2 Anticipated positive impacts

5.2.1 Positive impacts during construction

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

- Many variables affect the number and type of workers needed in specific time during construction. This includes but not limited to; the number of connections, nature of work required, and time plan.
- According to the information shared by ReGas, the daily average number of workers during the peak time will be about 15 workers for installation, two of them are foremen and 13 technicians in the project sites. Five workers are recruited for chimney and transformation of appliances. This number is flexible and might be changed in case of recruiting daily excavation workers. Additionally, there are some drivers, two customer services and one health and safety personnel. With regards to the permanent storage site, two people from Bedouin tribes provide security services in the site. Most of the abovementioned jobs allocated for semi-skilled and unskilled laborers are allocated for the community people.
- 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 trading 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 lease contracts, food supply, transport, trade, security, manufacturing… etc. Additionally, lease contract of permanent storage site.

5.2.2 Positive impacts during operation

- On a national level, reduced expenditure on imported LPG cylinders and subsidies
- As indicated in Baseline Chapter, women are key players in the current domestic activities related to handling LPG and managing its shortage. Being the party affected most from the shortfalls of the use of LPG, the NG project is expected to be of special and major benefits to women. This includes but is not limited to; clean and continuous sources of fuel that is safe and does not require any physical effort and is very reasonable in terms of consumption cost. Time saving is among the benefits to women. The use of a reliable source of energy will allow women to accomplish the domestic activities in less time and this will potentially open a space for better utilization for the saved time.
- The NG connection will help the household achieve a higher level of privacy by eliminating the need for informal LPG distributers from entering private homes.
- Constantly available and reliable fuel for home use.

- Significantly lower gas leakage and fire risk compared to LPG.
- Improved safety due to low pressure (20 mBar) compared to cylinders.
- Beneficiaries to benefit from good customer service and emergency response by qualified personnel/technicians.
- Eliminate the hardships that special groups like the physically challenged, women, and the elderly had to face in handling LPG.
- Limiting possible child labor in LPG cylinder distribution

5.3 Anticipated negative impacts

The impact assessment results reflected that impacts pertaining to lands, possible effect on vulnerable structures, labor influx and visual intrusion tend to be irrelevant during construction phase. However, child labor, visual intrusion during operation

Table 5-1: Summary of impacts

Impact	Description of impact	Nature of impact	Significance
	During Construction Phase		
Reduction of Traffic Flow (disruption of local and regional traffic)	During the mobilization, preparation phases and construction phases: Mobilization of heavy machinery, asphalt breaking, excavation, placement of piping, and backfill activities are bound to limit traffic and accessibility. The impact of works on traffic flow and local access will be dependent on the type of road accessed during project activity.	Negative	Minor
		Negative	Minor
	Coordinating with and obtaining approvals from local government and traffic police is vital to avoid delays, objections, and public inconvenience to the work program.	Negative	Medium
	Main roads (highways) No works are planned on main roads; therefore, the project will not directly impact circulation on main roads. An indirect impact can be increased flow of vehicles as urban roads are avoided. **Urban roads** On urban roads, mobilization, preparation and construction phases will entail narrowing roads by longitudinal and/or lateral excavation or totally blocking narrow or side roads as well as limiting or prohibiting parking along the length of the works. Access to buildings and shop entrances may be limited or constricted in cases where excavations form obstacles for pedestrians and cargo. **Local roads** As pipeline installation will be taking place on roads, local access on selected parts of the road will be ceased and will	Negative	Minor

Impact	Description of impact	Nature of impact	Significance
	likely restrict local access to residents into and out of their households. As regular sized vehicles are not the principal mode of transport on local roads, congestion of cars is not anticipated. The inconvenience is expected to affect the flow of Small vehicles by slowing them down. However, considering their small size, congestion is not likely to be significant. Inconvenience to the residents will last for the duration of the construction phase activities, namely, excavation and rehabilitation of the road, which will be done on the same day with no pits being left open overnight. Therefore, the duration of inconvenience and slowed traffic of Small vehicles etc. in affected areas will last for the duration of the work day i.e., 8 hours.		
Air Emissions	Air emissions (gases and particulates) during construction can exceed permissible limits and shall arise from: - Particulate matter and suspended solids from excavation/backfilling operations - Possible dispersion from stockpiles of waste or sand used for filling trenches. - Exhaust from excavation equipment and heavy machinery (excavators, trenchers, 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. **Dust** The impact of dust generation (particulate matter) will be limited to the working hours as excavation and backfilling are carried out within the same day. Excavation on dusty or rocky roads such as local roads and some urban roads are likely to generate more dust compared to asphalted streets due to the dusty status of those roads.	Negative	Medium
	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 WB permissible levels. 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.	Negative	Minor
Noise	Construction activities of the gas distribution network will likely increase noise levels beyond permissible limits due to excavation and heavy machinery. Typical construction noise includes noise intensity due to engine operation, and	Negative	Minor

Impact	Description of impact	Nature of impact	Significance
	intermittent impacts which may take place during demolition of asphalt by jack hammers.		
Soil pollution	Soil may be susceptible to pollution resulting from uncontrolled dumping of wastes generated during construction.	Negative	Minor
Water pollution	Subsurface exist in area may affected by inappropriate liquid and hazardous waste during construction	Negative	Minor
Waste generation	Wastes that are generated during the construction phase include: - Excavated soil and excess sand; concrete and bricks waste; - Broken asphalt in the case of paved roads; - Cans containing paint used on steel pipes in household connections - Containers of chemicals and lubricant oils used for construction machinery; - Possibly damaged asbestos water pipes during excavation; and - Dewatered product from trenches. - Construction waste estimates are in the range of 100-120 m^3/km. Excavated soil and concrete/bricks waste are inert materials. Improper disposal of such wastes will only have aesthetic effects on the disposal site. The legal standards of 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. Asphalt waste may contain hazardous components, such as tar, lubricating oils, some heavy metals, etc. However, its solid nature minimizes the transport risk of such components to the environment. Disposal of asphalt waste to a construction waste disposal site is common practice in Egypt, and is not normally associated with environmental risks because of dry weather. Empty containers of chemicals, lubricating oils, and paint are considered hazardous waste. They should be disposed of in an approved hazardous waste handling facility. This is not a direct result of construction activities, but rather relates to maintenance of equipment. By preventing fueling/lubricating activities on construction sites no empty containers will need disposal. Asbestos waste could result if an underground water pipe is broken during excavation. If encountered, wasted parts of the pipe must be sprayed with water, to prevent emissions of asbestos-containing dust, and transported to an approved hazardous waste landfill. Asbestos waste may	Negative	Minor

Impact	Description of impact	Nature of impact	Significance
	pose significant health risks to workers, pedestrians and residents of neighboring areas. Therefore, efficient management of such waste, if generated, will be very important. The probability of generating asbestos waste is relatively low as the damage is usually repaired locally without the need for pipe replacement. Management and disposal of the generated waste is the responsibility of the Water Authority performing the repairs. It is highly unlikely that groundwater may be encountered on routes of the low pressure distribution networks as these have been previously excavated with no record of groundwater. Project works will be located in residential areas. Workers and employees typically utilize the bathrooms of surrounding facilities; especially mosques.		
Risk on Infrastructure and underground utilities	Underground utilities and infrastructure pipelines (such as water, sewerage and telecommunication) have been installed years ago without accurate documentation and maps for its routes and depths. Therefore, the risk of damage to such utilities during excavations for natural gas pipeline installation is possible. The most significant potential environmental impact will arise in case a sewerage pipe is broken and wastewater potentially accumulating in the trench. There is also the possibility of overflowing to the streets causing nuisance to the surrounding environment.	Negative	Minor
	Breaking a water supply pipe may result in cutting the supply to a number of residential units, which may lead residents to use other sources of water which may be either expensive or unsafe. Damaging sanitary pipelines, electricity and water supply result in severe disturbance to community people. Yet such problem takes short time (no more than 4-8 days). Additionally, the contractor will be responsible of compensating for damaged pipes.	Negative	Minor
Street condition deterioration	Streets rehabilitation or restoration following pipeline network installation: is referred to by an Egyptian legal/institutional expression (رد الشئ لإصله) that signifies the responsibility to "restore to original condition". In the context of the project, it applies to the responsibility of the implementing company to provide the necessary resources	Negative	Minor

Impact	Description of impact	Nature of impact	Significance
	to re-pave roads and streets to the original state after natural gas excavation and installation works. The current arrangement is that the implementing entity performs the backfilling of the excavated trenches and agrees a restoration fee with the local government unit (district) to cover the balance of the restoration and pavement cost. The local unit uses the fee to include the restoration and re-pavement of the streets in its "pavements plan".		
	Delays in street restoration may lead to varying degrees of damage to vehicles, loss of access and business, traffic congestions with associated delays and emissions, and a potentially significant public discontentment.	Negative	Minor
Community health and safety	Impacts on community health and safety are expected to result from: Emissions of gaseous pollutants and dust, where increased emissions of dust can result in health problems to community members. *Increased background noise levels* resulting from the operation of jackhammers, which surpasses permissible limits for residential areas in the vicinity of commercial areas during the day *Waste accumulation* in illegal dumping and potential burning of construction waste, which will consist mainly of excavated soil and leftover PE and carbon steel pipes *Project infrastructure* Excavation works will result in the presence of open trenches in areas accessible to local community (e.g., in front of building and shops.) The presence of open trenches can pose risks of accidental falls and injuries. Trenches are expected to be open during the work day, with no trenches being left open after working hours. Installation of household connections may involve working at height, which can result in falling objects causing health and safety hazards to local community. Construction works will involve the use of equipment such as jackhammers and welding machines, which can cause injuries to local community as a consequence of contact. Excavation works may cause rupture of underground utilichties such as water supply pipes. Breaking a water supply pipe may result in cutting the supply to a number of residential units, which may lead residents to use other sources of water which may be either expensive or unsafe. Damaging sanitary pipes, electricity underground cables and water pipelines result in severe disturbance to community people. The time needed to resolve problems with damaged utilities is relatively short (no more than 4-8 days). Additionally, the contractor will be responsible of compensating for damaged pipes.	Negative	Minor

Impact	Description of impact	Nature of impact	Significance
Occupational health and safety	**Noise** The noise intensity level resulting from jackhammers surpasses permissible level of 90 dB (A) for work place with up to 8 hour shifts **Vibrations** The use of jackhammers will results in the generation of hand-arm vibrations; the typical vibration value is of 9 m/s^2, which exceeds the ACGIH Threshold limit value of 5 m/s^2 (8 hour equivalent total value), but is below the exposure limit of 12 m/ s^2 for a total daily duration of less than an hour. **Electrical** Faulty equipment or exposed cables can cause risks of electrocution. **Working environment temperature** The exposure of workers to high temperatures can result in dehydration and sun strokes. The execution of the project works for project sites are planned during the months of July and August. The average temperatures for Marsa Matrouh in July, the hottest month of the year, are above 30 °C, which can cause heat strokes. **Working at heights** Household installations will require working at heights, which can result in falls and pose a safety hazard.	Negative	Medium
Risk pertaining to child labor	As mentioned in the baseline, child labor is a common practice in Egypt at large. This could be also an applicable risk in the project areas in Marsa Matrouh. Children below 18 are favorable labor as they receive low salaries and they are less demanding. There is a risk that this common practice is used in the project. This risk should be carefully handled in the ESMP and restrict obligations and monitoring should be applied in the contractor obligations	Negative	Low-Medium
Labor conditions and Employment and workers condition	The project is expected to result in the creation of job opportunities, both directly and indirectly. 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 60 workers. The local community of Matrouh Governorate could provide a proportion of this temporary labor force dependent on skills needed and the strategies of the individual contractors in sourcing their workforce	Positive	Minor
	Influx of construction workers in may stress local health	Negative	Minor

Impact	Description of impact	Nature of impact	Significance
	services (e.g. hospitals, clinics).		
	Influx of construction workers may cause transmission of communicable disease among the villagers or workers	Negative	Minor
	Influx of construction workers village may stress local utilities (e.g. potable water, sanitation, electricity, waste management).	Negative	Minor
	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 not limited to accommodation, food supply, transport, trade, security, manufacturing… etc.	Positive	Minor
During Operation Phase			
Community health and safety	In addition to a full array of safety and emergency precautions taken by EGAS and ReGas, user safety is prioritized by stating emergency precautions on the household gas meter and by setting up emergency response centers. Impacts on user health and safety may occur through improper handling of piping and valves by the user, which can result from lack of awareness, illiteracy, or failures in piping or sealants.	Negative	Minor
Integrity of natural gas piping	Low-probability events may impact the integrity and safety of the NG network and components during the years of the operation phase Geological and geotechnical events: earthquakes may result in geotechnical instabilities that lead to network breakage or leakage in multiple locations simultaneously. Sabotage: pipelines and other components may be targeted for sabotage. Adverse impact is expected in raising the fear of disruption of Gas supply	Negative	Minor
Risk of Economic disturbance	For those who will pay in installments, this may be an added financial burden on the poor families(a grant for poor through AFD is already in place for poor families based on an eligibility criteria (section 6.5)). There could be a Minor negative economic impact on LPG cylinders distributors. (Governmental sector- private sector who have license to distribute LPG cylinders- non-official distributors). The LPG distributors will lose their income. However, their ability to move to other areas or change their business is high. Various previous NG projects have not influenced the informal LPG vendors. Based on the meetings conducted with the LPG cylinder distributors, they reported that the NG will not cover all areas. Inside the same areas covered by the NG not all of the units are technically eligible to be connected to the NG. Therefore,		Minor

Impact	Description of impact	Nature of impact	Significance
	they will continue working in the same areas and in the uncovered areas. The surveyed LPG distributors have their vehicle in transporting the LPG cylinders. They reported that this vehicle might be used in transporting other goods. Such activity is also lucrative for them in case of not being able to distribute the LPG cylinders and such approach was adopted during the shortage of LPG cylinders occurred two years ago.		

6 Analysis of Alternatives

6.1 Pipeline Installation Technology Alternatives

To install a natural gas pipeline beneath the ground level, this can either be done by digging a trench or using trenchless technologies. Trenchless technologies can be further classified as guided methods and non-guided methods. In this analysis, the most famous technology in each category will be considered; namely, horizontal directional drilling representing the guided trenchless technology, auger boring representing the non-guided trenchless technology, and the open-cut representing the trench technology.

6.1.1 Trenchless Technologies

HDD has some advantages compared to auger boring and open-cut technique as follows:

- Compared to the open-cut technology, it doesn't cause interruption to traffic flow.
- Compared to the open-cut technology, it causes fewer disturbances to the surface and sub-surface soil layers.
- Compared to the auger boring technology, it can be used for larger distances and wider range of pipeline diameters.
- Compared to the auger boring technology, it is a surface-launched process which doesn't require drive pits.
- Compared to the auger boring technology, it is a guided method, and accordingly can achieve high accuracy for the pipeline path
- Can be employed for high depths, and accordingly can avoid any breakage accidents to the existing infrastructure lines/cables.

On the other hand, HDD might result in some disadvantages including:

- Like any other trenchless technology, and according to the geologic condition, soil collapse may take place during the installation.

- In case of having existing infrastructure lines/cables, there will be less flexibility in choosing the pipeline depth, the fact which may necessitate drilling through soil layers which may be of insufficient strength to withstand the slurry's pressure.
- Not favorable with soils containing gravels and cobbles.

6.1.2 Open-Cut Method

This is the traditional method for pipeline installation. It is very simple technology which just depends on excavating the soil, laying the pipeline, and backfilling. However, it is technically not possible to be used in crossings with major waterways. It can be used in crossings with major roads and railways; however, this will cause huge interruption to traffic as this will necessitate either re-routing or reducing the number of lanes. This will lead to reduction in the average speed of the vehicles on the road, and may affect the areas devoted for parking. This may also increase the probability of having car accidents, in addition to negative socio-economic impacts as a result of interrupting the flow of people and goods. Open-cut method may be the only possible recommended solution in the 4 studied areas since the pipeline route passes through urban and local roads and does not cross any main road or railway, and this will not negatively affect the environment, and it will be a cheap and safe option

6.2 Routing

The preferred route was selected on parameters like:

- Study Area Identification: Identifying major features in the study area like main roadways, residential and commercial areas to help identify constraints during the selection of the routes
- Mapping the resources: Existing linear corridors include major streets, waterways, railroads, and utility lines. Existing linear corridors are considered opportunity areas for pipeline routing because they have already been developed and therefore are generally considered a compatible land use. In addition, these linear corridors generally provide existing access for construction and maintenance requirements.

6.3 Regulators

Two type of 100 mbar regulators outlet pressure were considered; Kiosk regulators and Wall mounted regulators, Kiosk regulators were preferred because:

- Easier maintenance
- Less expensive
- Safer to the surrounding community

6.4 Working time

As stated in the traffic baseline, some areas are overcrowded from 7 a.m. to 2 p.m. Therefore, it will be useful to apply flexible working time that can avoid working during rush hours. Additionally, in some residential areas, it will be extremely difficult to work during night. Working during morning can be applied in such areas. Moreover, in some areas, there is a weekly market e.g. the market located in Marsa Matrouh city. Such market should be avoided. As a wrap up, the three alternatives related to working time are:

- Working during day time in most of project areas
- Working during night in overcrowded areas

- Avoid market working hours

6.5 Installation Costs

The average natural gas connection installation cost is about 7000 EGP. Consumers contribute a part of this cost as the balance is subsidized by the Government. The government of Egypt is negotiating with the project's financing organizations in order to secure additional subsidy to poor and marginalized groups. Currently, they offer flexible payment schemes for the installation cost. The customer can select between various payment schemes. Paying in installment is one of the proposed alternatives that might facilitate installation of the NG, especially, for poor and disadvantaged groups. No financial assistance will be provided by the NGOs for the poor to install the NG. All NGOs interviewed expressed their willingness to act as communication channels with poor but no one of them will provide financial aid to the poor. However, the AFD in cooperation with the European Union will provide the poor with a kind of grant to be able to install the NG. Eligible households are those households with average monthly electricity consumption, calculated over a period of 12 months, is in the range of 50kWh and 130 kWh/month. This initiative has been approved and is currently being applied to all project areas. The grant covers 50% of the installation costs.

7 Environmental and Social Management & Monitoring Plan

7.1 Objectives of the ESM&MP

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 mitigation measures. 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 companies in charge of project implementation: **ReGas**

7.2 Environmental and Social Management Matrix during CONSTRUCTION

Table 07-1 Environmental and Social Management Matrix during CONSTRUCTION

Receptor	Impact	Mitigation measures	Residual Impact	Responsibility		Means of supervision	Estimated Cost of mitigation / supervision
				Mitigation	Supervision		
Ambient air quality	**Increased emissions of dust and gaseous pollutants**	• Controlled wetting and compaction of excavation/backfilling surrounding area • Excavated soil stockpiles and stored sand should be located in sheltered areas. Stored fine sand should be covered with appropriate covering material[2], such as polyethylene or textile sheets to avoid soil dispersion. • Transportation of excavation/construction waste should be through licensed and sufficiently equipped vehicles with a suitable special box or provided with a cover to prevent loose particles of waste and debris from escaping into the air or dropping on the road. • Appropriate maintenance, engine tuning and servicing of construction equipment to minimize exhaust emissions • Minimize unnecessary journeys and switching off machinery and equipment when not in use (idle mode).	Minor	- LDC - contractor	LDC HSE department	Contractual clauses + Field supervision	_ Contractor costs _ LDC management costs
Noise	**Increased noise levels**	• Ear muffs, ear plugs, certified noise PPE for workers • Avoid noisy works at night whenever possible • Complaints receipt from local administration	Minor	_ LDC _ Contractor	LDC HSE department	Contractual clauses + Field supervision (audits)	_ Contractor costs _ LDC management costs
Soil	**Degradation of soil quality**	• 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	Minor	_ LDC _ Contractor	LDC HSE department	Field supervision (audits)	_ Contractor costs _ LDC management costs
Waste generation	**Hazardous waste accumulation**	• 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 for temporary storage (at Alexandria) until disposal at a hazardous waste facility (Nasreya or UNICO in Alexandria). • Transfer to LDC depots for temporary storage (at Alexandria) • Disposal at licensed Alexandria hazardous waste facilities (Nasreya or UNICO) • • In case of damaging of asbestos pipes during excavation, the Water Authority, which will carry out the repairs, will be responsible for handling the waste asbestos according to their procedures. • To the extent practical, seek to combine leftovers or residuals of the same liquid material/waste in order to minimize the number of containers containing hazardous residuals • Ensure hazardous liquid material/waste containers are always sealed properly and secured from tipping/falling/damage/direct sunlight during	Irrelevant	_ LDC _ Contractor _ Water Authority	LDC HSE department	Field supervision and review of certified waste handling, transportation, and disposal chain of custody	Indicative cost items included in contractor bid: 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

[2] Sufficient sheets should accompany work groups during the construction phase.

Receptor	Impact	Mitigation measures	Residual Impact	Responsibility		Means of supervision	Estimated Cost of
		transportation and storage • In case of spillage: o avoid inhalation and sources of ignition o cover and mix with sufficient amounts of sand using PPE o collect contaminated sand in clearly marked secure containers/bags o Add sand to inventory of hazardous waste					
	Non Hazardous waste accumulation	1. Allocating certain areas, in each Sector, for stockpiling waste soil and construction waste, in coordination with the local authority. 2. No soil stockpiling is allowed on banks of waterways. 3. Segregate waste streams to the extent possible to facilitate re-use/recycling, if applicable 4. Maximize re-use of excavation waste as backfill for natural gas pipeline trenches. 5. Normally asphalt waste could be disposed of with other excavation waste/aggregates in the local non-hazardous waste site. 6. Solid waste from unlikely scenarios such as domestic site activities (such as temporary offices or rest areas) should be addressed in specific waste management plans, as appropriate. 7.	Irrelevant	Excavation Contractor	LDC HSE department	Official coordination proceedings signed by representatives of utility authorities _ Examination of site-specific reports and records _ Field supervision	_ Contractor management costs _ LDC management costs
Local traffic and accessibility	**Traffic congestion (and associated noise/air emissions)**	• Excavation during off-peak periods • Time limited excavation permits granted by local unit & traffic department	Minor	_ Excavation contractors	_ LDC + Traffic department _ LDC HSE _ Local Unit Traffic department LDC HSE	Contractor has valid conditional permit + Field supervision	Contractor costs LDC management costs
		Announcements + Signage indicating location/duration of works prior to commencement of work		_ LDC Excavation contractors Contractor		Ensure inclusion in contract + Field supervision Field supervision	_
		Traffic detours and diversion		Traffic Department	Traffic Department	Field supervision for detouring efficiency _ Complaints received from traffic department	Additional budget not required
		Road restructuring and closing of lanes				Fluidity of traffic flow	
Occupational health and safety	**Health and Safety**	• The project will hire a qualified contractor/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. • 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. • The contractor also should keep attendance worksheet and laborers ID in order to verify the age of workers • Health insurance should be applicable to the contractor workers and workers contracted by a sub-contractor • Full compliance to EGAS and LDC HSE requirements, manuals, and actions as per detailed manuals adopted by EGAS • Ensure the provision of the appropriate personal protective Equipment and	Minor	- LDC Excavation Contractor	LDC–HSE department	Field supervision and review of HSE report+ Field supervision (audits)	- Contractor costs LDC management costs

Receptor	Impact	Mitigation measures	Residual Impact	Responsibility		Means of supervision	Estimated Cost of
		other equipment needed to ensure compliance to HSE manuals					
	Child labor	• The ToR to be prepared for both contractor and subcontractors will prohibit any kind of hiring child labor in the project • Rigid obligations and penalties will be added to the contractor/subcontractors' ToR in order to warrantee no child labor is occurred in the project • The ToR also will oblige the contractor/subcontractor to keep a copy of IDs of laborers in order to monitor the hired staff below 18 years old • The contractor/subcontractor 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/sub contractor	LDC–HSE department	Field supervision and review of HSE report+ Field supervision (audits)	• Contractor costs LDC management costs
Infrastructure and underground utilities	**Damage to underground utilities resulting in water/wastewater leaks, telecommunication and electricity interruptions**	If maps/data are unavailable: • Perform limited trial pits or boreholes to explore and identify underground utility lines using non-intrusive equipment • In case of breaking underground utility and infrastructure line, the company supervisor stops work in the affected area, calls the Police Department and emergency department in the relevant utilities company for immediate repair of the damage, which the contractor is invoiced for. The mitigation measures on preventive measures and documentation: • Preparation and analysis of accidental damage reports • Arrange Restoration and re-pavement (رد الشئ لأصله) with local unit • Communication with local community on excavation and restoration schedules. Standard protocols adhering to national/local administrative requirements are to be followed: • Close and early coordination between the LDC (and the excavation contractor, if applicable), the local unit, and any other relevant authorities (in the case of public roads, the Roads and Bridges Directorate may become the counterpart to the LDC) • Agreement on the restoration arrangements, schedules, fees, and payment schedules • Coordination with the General Utilities before starting work especially the Traffic Department, sewerage, water, telephones and electricity departments. • Payment of restoration fees by the LDC before works commencement • Documentation of the agreement and adoption by all involved parties • Communication with the Public and relevant authorities (such as the security and the traffic departments) regarding excavation and restoration plans	Minor	• LDC • Local Governmental unit	LDC	Field supervision and review of complaints Coordination minutes of meeting with the local governmental unit	LDC management costs
Local communities and businesses	**Lack of accessibility to businesses due to delay in street rehabilitation**	Access to business due to excavating the streets will be mitigated through enabling alternative entrances to the business. Also special wooden bars will be used to enable the shoppers to get into the markets. Additionally, the duration of work will not exceed one working day. In case of excavation main streets in the commercial areas, this can be only done during night after business closing Follow up the procedure of Grievance Redress Mechanism (please see Annex 6) • Ensure transparent information sharing • The telephone numbers of the social development officer responsible for grievances should be shared with the community people	Minor	- LDC - contractors	LDC and EGAS SDO	_ Ensure the implementation of GRM (see annex 6) Supervision on Contractors performance	No cost

Receptor	Impact	Mitigation measures	Residual Impact	Responsibility		Means of supervision	Estimated Cost of
Local community Health and safety	**Threat to Safety of users and houses (due to limited level of awareness and misconceptions)**	• Prepare Citizen engagement and stakeholder plan • Awareness raising campaigns should be tailored in cooperation with the community-based organizations Following are some mitigation procedures to be adopted • Using caution tapes that help to keep people away of the site, • Informing residents and shopkeepers about the timeline of the project (street by street) in order for the residents to know when to avoid certain streets • A worker should support old people to cross the excavation areas, especially, on the wooden bars	Minor	LDC	LDC and EGAS SDO	_ List of awareness activities applied _ Lists of participants _ Documentation with photos Awareness reports	LDC management costs

7.3 Environmental and Social Monitoring Matrix during CONSTRUCTION

Table 7-2: 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
Ambient noise levels	Increased noise levels	Noise intensity, exposure durations and noise impacts	LDC HSE	Regularly during site inspections.	Construction site	Measurements of noise levels Complaints log	LDC management costs
		Complaints from residents	LDC HSE	Monthly during construction.	Construction site	Documentation in HSE monthly reports	LDC management costs
Underground utilities	Damages to underground utilities and infrastructure	Official coordination reports with relevant authorities Accidents documentation	LDC HSE	Monthly during construction.	Construction site	Documentation in HSE monthly reports	LDC management costs
Physical state of street	Waste generation	Observation of accumulated waste piles	LDC HSE	During construction. Monthly reports	Construction site	Observation and documentation	LDC management costs
		Observation of water accumulations resulting from dewatering (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
Local community	Damage to the streets	_ Streets quality after finishing digging _ Number of complaints due to street damage	LDC, EGAS	Four times per year, each three months	Site and Desk work	Checklists and complaints log	No cost
Local community	Threat to Safety of users and houses (due to limited level of awareness and misconceptions)	_ Number of awareness raising implemented _ Number of participants in information dissemination	LDC, EGAS	Quarterly monitoring	Office	Reports Photos Lists of participants	No cost

Receptor	Impact	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
Labor conditions	Occupational Health and Safety	Total number of complaints raised by workers Periodic Health report _ Periodic safety inspection report	LDC HSE	Biannual	Construction site	Documentation in H&S monthly reports Complaints log	No cost
Labor conditions	Child labor	Attendees lists with workers IDs _ Complaints and accidents reports	LDC HSE	Biannual	Construction site	Documentation in H&S monthly reports Complaints log	No cost

7.4 Environmental and Social Management Matrix during OPERATION

Table 07-3 Environmental and Social Management Matrix during OPERATION

Receptor	Impact	Mitigation measures	Residual Impact	Responsibility		Means of supervision	Estimated Cost
				Mitigation	Supervision		
Integrity of natural gas piping	**Network integrity**	_ Detailed review of the geotechnical and geological history of the project area _ Random inspections and awareness campaigns to ensure that NG piping and components (both inside the household and outside) are not be altered, violated, or intruded upon in any way without written approval from, or implementation of the alteration by, the LDC. _ Availability of 24-7 hotline service (129) to all beneficiaries and the public for reporting possible leaks, damages or emergencies evacuation of the affected area _ - Repair or replacement of failed component	Minor	LDC	LDC HSE.	- Map and local geotechnical report review - Site inspections - Awareness actions Periodical trainings and drills	LDC management costs
Economical disturbance	• **Financial burden on economically disadvantaged due to the installments** • **Loss of revenue for LPG distributors**	- Petro Trade should collect the installment immediately after the installation of NG - The installments should be collected on monthly basis in order not to add burden to the poor, as it will be easier for them to pay on monthly basis - The installment should not be high - LPG distributors should be informed about the NG potential areas in order to enable them to find alternative areas - They should be informed about the GRM in order to enable them to voice any hardship	Minor	Petro trade (Company responsible for collecting the consumption fees and the installments	EGAS	Banks loans log Complaints raised by poor people due to the frequency of collecting the installments	No cost
				LDC	EGAS	Information sharing activities with the LPG vendors Grievances received from them	No cost
Community health and safety	**Possibility of Gas leakage**	- Information should be provided to people in order to be fully aware about safety procedures - The hotline should be operating appropriately - People should be informed of the Emergency Numbers - The complete integrated, comprehensive and robust **Emergency Response Plan of the LDC** is in annex 7 A of the study and only a small part concerning the followed procedures during some emergency scenarios is translated in annex 7 B	Minor	LDC	LDC	Complaints raised due to Gas leakage	No cost
Labor conditions	Occupational Health and Safety	– Total number of complaints raised by workers – Periodic Health report - Periodic safety inspection report	Irrelevant	LDC HSE	LDC	- 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

7.5 Environmental and Social Monitoring Matrix during OPERATION

Figure 07-5: Environmental and Social Monitoring Matrix during OPERATION

Impact	Monitoring indicators	Responsibility of monitoring	Monitoring Frequency	Location of monitoring	Methods of monitoring	Monitoring Estimated Cost
Network integrity	- Earthquakes or geotechnical settlements - Emergency response time and corrective actions during	LDC HSE	Bi-annual inspections and annual emergency	Along the network and inside and outside	- Inspection, leakage detection, running the drills	LDC management costs

Impact	Monitoring indicators	Responsibility of monitoring	Monitoring Frequency	Location of monitoring	Methods of monitoring	Monitoring Estimated Cost
	emergency drills - Reports of alteration or tampering with ANY gas components		response drills	households		
Financial burden on economically disadvantaged due to the installments	- Number of economically disadvantaged people who complained - Number of those who can't pay the installment	LDC and Petro Trade, EGAS	Quarterly	Desk work	- Complaints log - Bank reports - Petro trade reports	No cost
Impact on the informal LPG distributors	- Grievance received from the informal LPG distributors - Information shared with them	EGAS, LDC	Quarterly	Desk work	- Complaints log	No cost
Possibility of Gas leakage	- Complaints raised by the community people - Number of leakage accidents reported/raised	LDC, EGAS	Four times per year, each three months	Site and Desk work	Complaints log LDC	No cost

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 for the PRS-related ESIA study, developed for Marsa Matrouh City.

8.1 Legal framework for consultation

The consultation activities were conducted in full 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 public consultation,
  - Environmental law No 4/1994 modified by Law 9/2009 modified with ministerial decrees no. 1095/2011 and no. 710/2012

8.2 Objectives of consultations

Objectives of various consultation activities are summarized as follows:

1- Define potential project stakeholders and suggest their possible roles in the project.

2- Disseminate comprehensive information about the project to enable stakeholders to identify their concerns, needs, and recommendations.

3- Document stakeholder feedback on the defined impacts as well as the social and environmental management plan and enhance the ESIA accordingly

4- Identify the most effective outreach channels that support continuous dialogue with the community

5- Discuss potential resettlement plans and impacts of involuntary resettlement (in places where this is applicable).

For the purpose of the PRS-related ESIA; qualitative information and data were collected through identifying stakeholders, and recognize their views and concerns about the project. The aim of this endeavor is to ensure a well-integrated and inclusive public review of the project. The consultation activities used multiple tools and mechanisms including scoping, interviews, focus group discussions, public hearings/consultations

8.3 Defining the stakeholder

For the purpose of the ESMP; qualitative information and data were collected through identifying Project Affected Peoples (PAPs) residing in the project areas, and recognize their views and concerns about the project. The aim of this endeavor is to ensure a well-integrated and inclusive public review of the project.

Key groups of relevance include: ordinary citizens, community leaderships, officials and government representatives, potential, local Non-Governmental Organizations (NGOs) and Community Development Associations (CDAs). In this regard, key groups of relevance in Marsa Matrouh were approached and consulted using various tools (i.e. in-depth interviews, focus group, meetings, Panel meeting and public consultation sessions). Stakeholder engagement and public consultation activities encompassed a gender aspect that women's views and concerns were taken into account, and were well documented.

8.4 Consultation Methodology and Activities

The consultation process was a dynamic and evolving process which adapted with the nature and expectations of the host community. In order to establish a more profound understanding of the local communities' perceptions and perspectives of the project, stakeholders' engagement and public consultation activities involved a broad base of community members; and Bedouin tribes.

Consultation activities in Matrouh took place in 2013 and completed on 2017. Two NGOs were recruited to take part in consultation activities with the community people. One of them is female headed NG that works with the persons with disabilities and Abnaa El Qabael NGO. (*Sons of tribes*) that work with the Bedouin tribes and headed by Bedouins.

The first step was to collect the responses and feedbacks of the local communities through conducting Focus Group Discussions (FGDs), structured questionnaires, panel meeting and public consultation sessions. The second step was to analyze these qualitative data in order to reach a conclusion regarding the general stance and attitudes of the local communities towards the project. Various NGOs participated actively in the preparation of the FGDs and providing data collectors to assist the team in collecting the data.

Figure 8-1:**Consultation event in Matrouh 25th of December 2013**

Figure 8-2: Head of handicapped NGO in Marsa Matrouh

The following table summarizes the main groups consulted during the consultation and the engagement tools used.

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

Phase	Participants	Number		Methods	Date
		Male	Female		
During Framework preparation					
During data collection phase	Potential beneficiaries and government officials	11	1	FGD	October-November 2017
	Governmental entities	7	1	In-depth	
	NGOs	2	12		
	Stakeholders and community people	19	6	Group meeting	
	Potential beneficiaries	24	35	Structured questionnaire	
Public Consultation	Stakeholders and community people	47	4		25th of December 2013
Total		110	59		
During Site Specific Studies					

During data collection phase	Potential beneficiaries and government officials	8	7	FGD	Apr-17
	Governmental entities	2	0	In-depth	
	NGOs	1	1		
	Stakeholders and community people	6	2		
Public Consultation	Stakeholders and community people	65	10	Public consultation event	27th of April 2017
Total		82	20		

A final consultation event was held in Marsa Matrouh city on the 27th of April 2017.

8.5 Summary of consultation outcomes

ESMP-related consultation activities in Marsa Matrouh City 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.

There was an overwhelming acceptance to the project. However, there were considerable concerns about health and safety measures and street conditions. There was a recommendation to coordinate with all governmental entities in order to facilitate project implementation. Additionally, employment activities remains as one of the major concerns among the community people.

8.6 ESMP disclosure

As soon as the site-specific ESIA gets approved by the World Bank and EEAA, a final report will be published on the WB, EGAS and ReGas websites. An executive summary in Arabic will be published on EGAS and ReGas websites. A copy of the ESMP 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 the results of the ESIA and the website link for the full ESMP study.