



**1.5 Million Natural Gas Connections
Project in 11 Governorates**

**Site-Specific Environmental and
Social Impact Assessment**

Waqf PRS /Qena Governorate

Executive Summary

November 2018



EGAS

Egyptian Natural Gas Holding Company

Developed by



EcoConServ Environmental Solutions



Petrosafe

**Petroleum Safety & Environmental Services
Company**



List of Acronyms and Abbreviations

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



MTO	Material take-off
NG	Natural Gas
NGO	Non-Governmental Organizations
NO ₂	Nitrogen dioxide
OSH	Occupational Safety and Health
P&A	Property and Appliance Survey
PAP	Project Affected Persons
PE	Poly Ethylene
PM ₁₀	Particulate matter
PPM	Parts Per Million
PRS	Pressure Reduction Station
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
SDO	Social Development Officer
SIA	Social Impact Assessment
SO ₂	Sulphur dioxide
SSIAF	Supplementary Social Impact Assessment Framework
SYB	Statistical Year Book
T.S.P	Total Suspended Particulates
Town Gas	The Egyptian Company for Natural Gas Distribution for Cities
WB	The World Bank
WHO	World Health Organization
\$	United States Dollars
€	Euros

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

Exchange Rate: € = 20.5 EGP as of November 2018



Executive Summary

Introduction

Aiming at installing the NG to about 6,000 clients in Waqf City, the local distribution company (LDC) ReGas will construct a new PRS in Waqf City. This ESIA is site specific for construction of a new PRS in Waqf City. The local distribution company responsible for project implementation in Waqf City is ReGas (شركة غاز الاقاليم).

The objective of the proposed project is to construct a new pressure reduction station (PRS) in order to connect the NG to wider range of clients. This will enable achieving reduction of leakage, reduction of subsidy allocated for the butane gas, and reducing dependence of imported fuel.

This ESIA covers the construction of the high pressure pipeline from the off-take and the new PRS (with capacity 5,000 m³/hr). The length of the high pressure pipeline connecting the off-take from the national grid to the new PRS is 1 km.

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

Project Description

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

Utilities in the PRS include a control room, a firefighting system (firefighting water tank, firefighting valve), a staff bathroom, a storage area, and an entrance room located adjacent to the entrance gate.

The PRS in Waqf will be located in a low-population-density area on land plot occupying 5000 m². The PRS will be accessible by an existing road to ensure quick response in the case repairs or emergencies. **Annex 2** provides the land documents. The proposed location of the PRS is close to El Marashda village. The closest off-take is located one kilometer from the site. The PRS site is classified as state owned land that is being transferred to EGAS.

Operation of the PRS involves operation of the various components outlined in the construction phase. Risks associated with those activities are further addressed separately in a Quantitative Risk Assessment (QRA) (Refer to annex 10 Quantitative Risk Assessment)

Legislative and Regulatory Framework

The project will adhere to the Egyptian legislations, WB operational policies and IFC performance standards.

Applicable Environmental and Social Legislation in the Egypt legislations:

- Law 217/1980 for Natural Gas
- Law 4/1994 for the environmental protection, amended by Laws 9/2009 and 105/2015. Executive Regulation(ER) No 338/1995 and the amended ER No. 1741/2005, amended with ministerial Decrees No. 1095/2011, 710/2012, 964/2015, and 26/2016



- Law 38/1967 for General Cleanliness
- Law 93/1962 for Wastewater
- Law 117/1983 for Protection of Antiquities
- Traffic Law 66/1973, amended by Law 121/2008 traffic planning
- Law 12/2003 on Labor and Workforce Safety

World Bank Safeguard Policies

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

Waqf PRS requires a plot of land measuring 5000 m². The selected plot of land is classified as state owned land. ReGas assessed the status of available plots of lands in the project area. Finally, they selected one plot of land and negotiated with Qena Governorate to legally obtain it. Upon completion of negotiation process with the Governorate Authority, a transfer of ownership contract was in place. The selected land was acceptable in terms of its technical and financial advantages. The study team conducted a visit to verify if there is any kind of encroachment or customary ownership on the selected plot of land. The main outcome of this activity was that no customary ownership or claims of land ownership was detected in the project site. Consequently, OP 4.12 will not be applicable to the PRS land in Waqf City.

World Bank Group General Environmental, Health, and Safety Guidelines & WBG Environmental, Health and Safety Guidelines for Gas Distribution Systems- IFC Guideline.

The General Environmental, Health, and Safety Guidelines (EHS) 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 – Health and Safety Guideline are applicable to the project.

Gaps between requirements outlined by WBG guidelines and actions detailed by the ESIA have been analyzed. There are no significant differences between the requirements outlined by the WBG EHS guidelines on Gas distribution systems and the management and monitoring actions outlined by the ESIA.

In addition to the above mentioned safeguards policies, the Directive and Procedure on Access to Information¹ will be followed by the Project.

Environmental and Social Baseline

A. Environmental baseline

Waqf City is located in the Nile Valley area of Upper Egypt and is affiliated to Qena Governorate. The project site area relative to Waqf City and a close-up to the project site area where construction and operation activities of the PRS and the HP pipeline will take place in El Marashda village.

- **Climate**
 - Temperature

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



The average annual temperature is 24.3°C in Waqf City. The warmest month of the year is July, with an average temperature of 31.7 °C whereas January has the lowest average temperature at 14.5 °C.

- Site-Specific Ambient Air Quality

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

Site specific Noise Measurements

Noise level measurements were conducted in the same location of the ambient air quality measurements. The duration of the measurements is 8 hours with one hour averaging intervals. Baseline ambient noise levels are below the national and World Bank permissible limits.

- **Geology**

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

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

- **Water resources**

- Surface water

The Kalabaya Canal runs parallel to the eastern bank of the Nile river for a length of 163 km and is used for the irrigation of approximately 174,515 hectares of agricultural land east of the Nile.

- Groundwater

The project site is not located along the river banks of the Nile. Therefore, groundwater at depths encountered during excavation activities, i.e., 1.2 m, is not anticipated.

- **Terrestrial environment**

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

Flora encountered in the area include trees alongside the roads and *Phragmites australis* along the Abadey branch of the canal as shown below. **No significant flora is detected in the project area.**

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

- **Solid waste management**

The responsibility of service planning, delivery and monitoring of waste collection and disposal in the project site is deputed to Local Governmental Units. Municipal solid waste collection points, official and unofficial, are used as open transfer systems. The official dumping and collection point is located near Waqf City. It is worth mentioning that Qena Governorate falls



under a solid waste management initiative that aims at the enhancement of waste management system in the Governorate and construction of new landfills.

- **Physical cultural resources**

There are relatively limited numbers of antiquities in Waqf City. Some graveyards named El Samaina in the desert lands along with a few number of mosques and churches are located in the proximity of the city. However, the project site hosts no culturally significant buildings, mosques or churches. Yet, there is an archaeological area located 430 meters west of the project site.

- **Traffic profile**

Waqf PRS will be located in an agricultural area. There is an urban one-lane road passing by the PRS connecting Waqf to El Marashda village.

B. **Socio-economic Baseline**

The off-take main feed and PRS are located in remote areas. The nearest villages are Izbet Ali Hassan, Izbet El Mansheya El Guedida and Marshada which are located 300 m, 330 m, and 900 m away from the main feed intake, respectively. The PRS site is located 70 m from Izbet Ali Hassan, 450 m from Marashda, and 900 m from Izbet El Mansheya El Guedida. All of the above mentioned Izbets are affiliated to Waqf District.

- **Administrative affiliation**

Waqf District lies under the jurisdiction of Qena governorate. It is located on the west bank of the Nile River. Waqf is considered as a city in accordance with the Cabinet minister's decree no. 760 on 3rd July 1988.

- **Demographic characteristics**

According to CAPMAS poverty mapping data in 2013, the total population of Waqf City was estimated to be 31,709 people. Waqf district total population was estimated to be 81,095 people in 2015 with females representing 49.2% of them. Around 40.7% of them living in urban areas. The density average of households is estimated at 5.6 person/household in rural areas and 4.9 person/household in urban areas.

- **Living conditions**

A household is defined as “Family (and non-family) members who share residence and livelihood, and operate as one social and economic unit”. The average household size in Waqf is about 5 individuals, based on CAPMAS poverty mapping 2013.

- **Access to basic services**

According to CAPMAS poverty mapping data of 2013, 96.8% of individuals in Waqf use electricity for lighting. El Marashda village is served by a power station 66 kV power, constructed in 1989. The power plant serves the reclaimed desert border in El Marashda village and the hamlets of El Marashda village. It was designed to produce 60 mV/h. However, it produces 304.8 million kw/h.

Accessibility to water network is high in Waqf, as almost 94.8% of individuals have access to public water network; and 35% of individuals have tab water inside their homes, according to CAPMAS poverty mapping data of 2013.

The coverage of the public sanitation network stands at approximately 4.6%, according to CAPMAS poverty mapping 2013. The percentage of accessibility to the public sanitation network is one of the main concerns related to the eligibility of Waqf for connecting NG to



households. Though, according to the representative of the Information Center of Waqf's LGU, the expansion of the sanitation network is underway.

- **Human development profile**

According to CAPMAS poverty mapping 2013, total labor force in El Marashda village is 40.36% of the total population (15-65 years). 44.75% of the total labor forces are employed. The contribution of women in the labor force is too limited. In Waqf district the ratio of females within the labor force is 3.92%. This percentage decreased to be 2.82 % in El Marashda, where females are less likely to be allowed to work in the rural areas of Qena Governorate. Yet, almost all of the females work in their fields without getting paid. The unemployment percentage is 0.88% of El Marashda labor force.

The formal statistics obtained from the poverty mapping data 2013 regarding manpower reflected that the age of starting work is 15 years old.² Both the child law and the labor law state that children shall not be employed before they complete 14 calendar years old, nor shall they be provided with training before they reach 12 calendar years old; however children between 12 and 14 years old are permitted to work as trainees.

- **Health facilities**

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

Participants of focus group discussions expressed their dissatisfaction with the level of medical services provided. They stated that serious medical cases has to be commuted all the way to Qena, as the hospitals and clinics of Waqf do not have the capacity to deal with such cases.

- **Human activities in the project areas**

Agriculture activities are substantial in Waqf, as it absorbs 46.1% of total employed individuals. According to the Information Center of Waqf's LGU, Waqf produces a number of crops including sugar cane, corn, wheat and tomatoes.

Environmental and Social Impacts

The environmental and social impact assessment (ESIA) is a process used to identify and evaluate the significance of potential impacts on various environmental and social receptors as a result of planned activities during (construction and operation) phases of the Project. Furthermore, the analysis of environmental and social impacts is important to detail an effective management and monitoring plan which will minimize negative impacts and maximize positives.

A. Potential positive impacts

- **Positive impacts during construction**

- Impacts related to employment

Provide direct job opportunities to skilled and semi-skilled laborers

The construction of the PRS in Waqf is expected to result in the creation of job opportunities, both directly and indirectly. Based on similar projects implemented recently by EGAS and the

² Based on Labor law number 12 of year 2003 and The Child Law (No. 12, 1996). There are certain critical obligations to recruit children below 15 years old. Article 98-103 of Labor law put limitations related to age, type of occupation, hazards work...etc



local distribution company, the daily average number of workers during the peak time will be about 30 workers, being 26 laborers, 2 supervisors and 2 engineers. The workers also include drivers, drilling staff, technicians and welders.

Create indirect opportunities

As part of the construction stage, 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. These benefits could include, but are not limited to accommodation, food supply, transport, trade, security, manufacturing, etc.

- **Positive impacts during operation**

- Impacts related to employment

Provide direct job opportunities to skilled and semi-skilled laborers

The operation of Waqf PRS is expected to result in the creation of job opportunities, both directly and indirectly. The average number of workers during operation of the PRS will be about 15 workers to be recruited from the permanent workers of ReGas; two engineers, 6 technicians, 2 foremen, 2 maintenance and 3 security. With regards to health and safety, one person has assigned from ReGas.

Some of the mentioned opportunities are already occupied by ReGas staff while few of the jobs will be need to host additional staff (e.g. additional one in health and safety). The current permanent staff also might move to a new site. In this case, new staff will be trained and recruited.

Create indirect opportunities

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

B. Potential negative impacts

Various impacts were assessed in accordance with the impact assessment methodology in section 5 of this report. Ecological related impact was classified as irrelevant during construction and operation.

Assessment of significance of impacts for the accidental (non-routine) events throughout the project phases and safety issue will be included as a separate quantitative risk assessment (QRA) study. The QRA contains a well-developed assessment of the accidental events and how to mitigate such impacts.

In case of accidental gas leakage and subsequently emissions of the odorant is in the air, if it reaches the residential area it will be already dispersed and of very low concentration. In addition, it is not a harmful substance to inhale in a gaseous form especially with such low concentrations. It is only hazardous when it is in the liquid chemical form.



Summary of potential negative impacts

Potential Impact Significance (Duration, Difficulty to mitigate)											
Activity	Air emissions	Noise	Reduction of Traffic Flow	Surface Water	Solid, Hazardous Wastes and Liquid Waste	Community health and safety	Labor conditions and occupational health and safety	Child labor	Soil pollution	Land acquisition	Visual intrusion
Potential negative impacts during construction phase											
Mobilization	Temporary, medium	Temporary, low	Temporary, low	N/A	Temporary, low	N/A	Temporary, medium	Temporary, medium	Temporary, medium	No land needed	N/A
Excavation	Temporary, medium	Temporary, low	Temporary, medium	Temporary, medium	Temporary, medium	Temporary, low	Temporary, medium	Temporary, medium	Temporary, medium	No land needed	Temporary, low
PE Pipe laying	Temporary, medium	Temporary, low	Temporary, medium	N/A	Temporary, low	N/A	Temporary, medium	Temporary, low	Temporary, medium	No land needed	N/A
Leakage testing	Temporary, medium	Temporary, low	Temporary, low	N/A	Temporary, low	N/A	Temporary, medium	Temporary, low	Temporary, medium	No land needed	N/A
PRS construction work	Temporary, medium	Temporary, low	Temporary, low	N/A	Temporary, low	Temporary, low	Temporary, medium	Temporary, low	Temporary, medium	Permanent, state owned land	Temporary, low
Impact Assessment	Medium	Minor-Medium	Medium	Minor	Medium	Minor	Medium	Low - Medium	Medium	No impact	Minor
Potential negative impacts during operation phase											
PRS operation	N/A	Permanent low	N/A	N/A	Permanent medium	Permanent low	Permanent medium	N/A	N/A	N/A	N/A
Repairs	N/A	Permanent low	N/A	N/A	Permanent medium	Permanent low	Permanent medium	N/A	N/A	N/A	N/A
Impact Assessment	Irrelevant	Minor	Irrelevant	Irrelevant	Medium	Minor	Medium	Irrelevant	Irrelevant	Irrelevant	Irrelevant



Analysis of Alternatives

- **Technology Alternatives**

- **Outlet pressure**

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

- **Odorant handling**

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

- **PRS location Alternatives**

- **PRS location**

As per national and WB guidelines, PRS siting avoids habitat alteration and seeks to minimize environmental, occupational health and safety, and community health and safety impacts. The PRS selection is based on proposals of different plots of lands. A committee is formed from EGAS and ReGas to investigate the lands in full cooperation with the Governorate Authority. Three plots of lands were selected and the most appropriate one, technically and financially, was selected from state owned lands.

Environmental and Social Management & Monitoring Plan

The objective of the Environmental and Social Management and Monitoring Plan (ESMMP) is to outline actions for minimizing or eliminating potential negative impacts and monitor the application and performance of mitigation measures. The ESMMP identifies roles and responsibilities for different stakeholders for implementation and monitoring of mitigations. This section also presents an assessment of the institutional capacity and institutional responsibilities for implementing the ESMMP. Full ESMMP is presented in section 7 of this report. Special attention was given to the quantitative risk assessment recommendation illustrated in section 7.5 of this report.

Stakeholder Engagement and Public 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
- 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

For the purpose of the PRS-related ESIA; qualitative information and data were collected through identifying Project Affected Peoples (PAPs) residing in the areas surrounding the PRS station, 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 Waqf 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.

The number community members attended the public consultation hearing was 153 people held on 23rd of December 2013 during the first phase of the project.

- **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; especially people residing in the areas surrounding the PRS station.

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.

- **Summary of consultation activities**

With regard to the PRS station, stakeholders' engagement and public consultation activities were conducted in order to ensure that the views and concerns of the local communities are integrated, and guarantee that they are taken into account by the different parties in charge of implementing the project. The views and concerns of local communities are an integral part of the project, and they are to be thoroughly taken into account throughout the different phases of the project.



The field research team commissioned by EcoConServ engaged in a number of social activities. These activities include focus group discussions with potential beneficiaries; in-depth discussions with government officials, representatives of civil society, and community leaders. A panel meeting was held at Waqf's LGU headquarters, where the public officials of Waqf's LGU stressed on expediting the implementation of the project in their city.

Throughout the discussions interviewees were asked about three main points:

- The safety of the high-pressure pipelines.
- The compensation mechanisms for damages resulting from constructions
- Safety procedures during operations

It was notable that the reactions and feedbacks of the local communities are in favor of the project. The field research team noted a strong public support and eagerness towards the project. Beside some legitimate concerns expressed by the public, the field research team recorded the general view that NG is a far better substitute for the type of fuel currently in use and that it carries many economic benefits for Waqf.

- **ESIA disclosure**

As soon as the site-specific ESIA gets approval from 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 ESIA report in English and a Summary in Arabic will be made available in the customer service office. Additionally, an Arabic summary will be made available in the contracting offices. An A3 poster will be installed in the contracting office informing about the results of the ESIA and the website link for the full ESIA study.