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SHEBERGHAN GAS GENERATION ACTIVITY (SGGA)

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Multiple Corporatization Models Including Public Private Partnerships (Deliverable 2-3)

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Acronyms and Abbreviations

ADB	Asian Development Bank
AEAI	Advanced Engineering Associates International, Inc.
AGE	Afghan Gas Enterprise
ANDS	Afghan National Development Strategy
APPF	Afghan Public Protection Force
BoD	Board of Directors
CMMS	Computerized Maintenance Management System
CNG	Compressed Natural Gas
DABS	Da Afghanistan Breshna Sherkat
DFID	Department for International Development
E&P	Exploration & Production
EAM	Enterprise Asset Management
GBU	Gas Business Unit
GIRoA	Government of Islamic Republic of Afghanistan
H ₂ S	Hydrogen Sulfide
IDA	International Development Association
ICE	Inter-Ministerial Commission for Energy
IL	Implementation Letter
IPP	Independent Power Producer
LCAM	Life Cycle Asset Management
MoF	Ministry of Finance
MoM	Ministry of Mines
MEW	Ministry of Energy and Water
MT	Monitoring Team
MW	Megawatt
NEPS	North East Power System
NHU	Northern Hydrocarbons Unit
NT	Negotiation Team
O&GS	General Directorate of Oil & Gas Survey
O&M	Operations and Maintenance
OAP	Overall Asset Productivity
OFR	On-site Field Representative
OT	Operation Team
PLCs	Programmable Logic Controller
PMU	Project Management Unit
PPD	Policy and Planning Department
PPP	Public Private Partnership
QA/QC	Quality Assurance/quality Control
RFP	Request for Proposals
RTUs	Remote Terminal Units
SCADA	Supervisory Control and Data Acquisition
SEPS	South East Power System

SGDP	Sheberghan Gas Development Project
SGGA	Sheberghan Gas Generation Activity
SOE	State owned enterprise
SPMT	Sheberghan Project Management Team
TA	Technical Assistance
TCO	Total Cost of Ownership
TFBSO	Task Force for Business and Stability Operations
TYCE	Three-Year Joint Capacity Enhancement, Training, and Mentoring Program with Expat to Afghan Transition Plan
USAID	United States Agency for International Development
USG	United States Government

1 Executive Summary

The Sheberghan Gas Generation Activity (SGGA), supported by the Task Order No. AID-306-TO-1200002 provides Off-budget technical assistance through Advanced Engineering Associates International, Inc. (AEAI) to serve as a technical and financial advisor to the Ministry of Mines (MoM) for the Sheberghan Gas Development Project (SGDP). That support also includes quality assurance/quality control (QA/QC) for the \$ (financial information omitted) On-budget funding to MoM for SGDP Phase I, Sheberghan Gas Field Development, and Phase II, Construction of a Gas Processing Plant. That scope of work is intended to support the well drilling and gas processing plant construction and operations work plus related capacity building efforts to facilitate the project contracts negotiation to achieve financial closing for the construction of the gas gathering and processing facilities along with the new power plant.

The foundation of the Sheberghan Gas Development Project (SGDP) is the United States Agency for International Development's (USAID) Strategic Objective Grant Agreement for a Thriving Economy Led by the Private Sector (USAID Grant Agreement No.306-05-00, "the Agreement"). SGDP functions as the implementing arrangement on behalf of the Government of the Islamic Republic of Afghanistan (GIROA) assisted by SGGA as a facilitator for the technical and operational work.

This document represents the Deliverable 2-3, Multiple Corporatization Models including Public Private Partnerships. According to the Amendment of Solicitation/Modification of Contract, executed by AEAI and SGGA as of the November 14, 2012, under 3) TASK 3 of C. 4 TASKS (TO REALIZE OBJECTIVES), SGGA will, "Assist MoM to modernize and commercialize the Afghan Gas Enterprise (AGE) or other appropriate entity's components relevant to the SGD Program". It further states that, "The prime objective of GIROA and USAID is to assure that the facilities or assets constructed and installed during the SGD Program will be owned, maintained and operated by a commercially viable entity, or entities, capable of entering into a commercial-quality gas supply agreement with the private sector IPP owner/operator, or with DABS."

The related scope of work for the foregoing objective is summarized below and includes:

- a. Identify viable institutional structure for the entity or entities that could own/operate the SGDP assets,
- b. Define risks and benefits resulting from each ownership structure,
- c. Define viable, internationally proven models for future exploration and production entities,
- d. Design a process for integrating the ownership structures described above,
- e. Identify the organizational structure and capabilities required to enable the entity or entities described above to support full commercial operations unsubsidized.
- f. Develop personnel position descriptions, recruitment plans, and detailed systems definitions,
- g. Develop and implement capacity and capability building programs, and
- h. Develop and apply lessons learned from the corporatization of the Afghan electric power utility DABS.

This document presents the results of these reviews but does not reach specific conclusions since there are various factors to be evaluated before decisions are made for the ultimate selection of the institutional structure(s) for the ownership and operation of the SGDP assets and other future natural gas projects. The SGDP cannot be considered in isolation, it must be evaluated in terms of

- the existing natural gas related entities in Afghanistan and the current status and likely evolution of those entities,

- the mandates of the stated Mission of the Ministry of Mines (MoM) and the Afghan National Development Strategy (ANDS),
- the factors that will be more attractive to successfully solicit private sector investment,
- the development of the Afghan natural resources in a prudent and protective manner, which is safe for the environment and economically sustainable, and
- The compliance with US government mandates due to the utilization of the funds contributed by USAID.

Currently, there is an effort to transform the existing Afghan Gas Enterprise from a state owned enterprise, which is operated with the intention of making profits, into a government corporation that has greater operational latitude and could more likely be successful in being commercially viable and making sustainable profits. The major goals are to overcome administrative and technical challenges, to operate in a modern, profitable and market driven manner, and to and to optimize the labor force size. There has been a submission to the presidential cabinet to initiate the process, which, if approved, could result in the segregation of the valuable assets and staff into a new corporation. That Proposal to the President's Cabinet is attached as Appendix A. If implemented, a corporate charter would be prepared and the entity would move forward. The unnecessary or detrimental assets or claims would be transferred to MoF for resolution while the redundant staff would be compensated and then released from employment.

Many of the corporatization lessons from DABS could be applicable to the GBU and any corporatization of AGE. Essentially, the most relevant lessons are:

- 1) Ensure that the BoD and executive management is able to comprehend the complex issues concerning utility operations and development options to assure commercial viability.
- 2) Restrict the organization's mandate to the work that it can successfully perform in the near future with the readily available labor and financial resources.
- 3) Address any technical capacity deficiencies with a proven approach such as a Technical Assistance, Risk Service (Management) Contract and/or Exploration and Production contract as appropriate.
- 4) Establish an operating company or companies with discrete objectives that the entity is or entities are fully empowered to perform while MoM focuses on investment promotion and regulation of the hydrocarbon sector.
- 5) The MoM should be more pro-active in defining and then implementing the projects offered by donors rather than allowing the donors to advocate, often in a conflicting manner, what the MoM should do.

Further, it is obvious that the SGDP must be developed in compliance with the applicable laws and regulations, especially those of Afghanistan. Those laws, including the Hydrocarbon Law, may sometimes appear ambiguous and incomplete since laws often do not clearly address all possible situations. In particular, the laws don't seem to have contemplated or have been written to specifically address the situation of USAID funding to MoM for the SGDP.

Further, there are multiple efforts under way or in the formative stage that should be coordinated to avoid conflicts and optimize the results on an aggregate basis.

First, the MoM has been working on a Request For Proposals (RFP) for Consulting Services for Improving the Business Environment: Reform of the Afghanistan State Gas Enterprise and Consulting Services for Improving the Business Environment: Development of the Natural Gas Sector of Afghanistan, RFP No.: MoM/PMU/CT-II-44-1 and RFP No.: MoM/PMU/CT-II-44-2, respectively. The

GIRoA was allocated grant funds from the International Development Association (IDA), part of the World Bank organization, for this work. The objectives of these works include:

"To assess, value, develop and implement commercialization and corporatization options for the improvement of the technical, financial and operational aspects of Afghan State Gas Enterprise ("Afghan Gas") a State owned enterprise (SOE). The primary objective is intended to be the establishment of a market-based Afghan natural gas company that is effective in the country's emerging natural gas market and may be transitioned to be in part or in full privatized. It is essential that overall sector governance Gas issues be considered notably with emphasis on actions to take during this transition." -RFP No.: MoM/PMU/CT-II-44-1

"To identify and to implement strategic, institutional, and staffing improvements that will enable the Government of Afghanistan to facilitate the sound and long-term development of the country's natural gas resources and infrastructure based on market principles."- RFP No.: MoM/PMU/CT-II-44-2

Given these future related efforts and prior related efforts including the work of Adam Smith International funded by the United Kingdom government's Department for International Development (DFID), SGGA will endeavor to coordinate and complement the work of the IDA funded consultants in order to both avoid confusion of MoM and optimize the results of the prior and future work efforts.

The effort by MoM to recreate a new corporation to replace AGE could be motivated by a few factors in addition to those previously listed. There is an apparent requirement for a permanent formal entity to execute document related to the Turkmenistan-Afghanistan-Pakistan-India (TAPI) pipeline project. Also, the TFBSO is seeking to have an entity to execute and perform gas supply contracts for CNG stations. Further, for a gas market development perspective, an ADB representative recently announced the bank's desire to perform a Gas Sector Master Plan.

Any future MoM corporatization evaluation should include some substantial legal analysis of the possible ways that all gas facility projects, especially donor funded projects by USAID, TFBSO and World Bank's IDA, be implemented and made operational to be consistent with current Afghan law. Alternatively, their efforts should facilitate some changes to the Hydrocarbon Law or regulations to eliminate any uncertainty as to the compliance of the projects to the applicable laws.

SGGA concludes that MoM should establish a clear non-redundant path forward with priorities established for all donors. Further, some substantial legal analysis is needed to ensure all the viable legal options are available to MoM for implementing these and gas projects.

In view of the number of advisors and the potentially competing priorities, it is not clear what direction the new AGE corporatization would take in order to obtain the necessary funds and management skillset to mobilize the specialized talent needed and utilize the proper industry tools to appropriately exploit the natural gas resources of Afghanistan. Therefore, the focus of this report will be primarily to review the range of options with the respective advantages and disadvantages for the SGDP.

In the case of SGDP, the appropriate structure could depend on the results from the initial gas drilling effort and the capacity building program outcome. For example, If the gas reserves level is inadequate and the local Afghans appear to need significant supplemental capacity building, then a Production Sharing Agreement, an exploration and production sharing contract, could be most appropriate. In the event that the gas reserves level is adequate but the local Afghans appear to need supplemental capacity building, then a Concession or Risk Service Contract, the service and production sharing

contract, could be most appropriate. Finally, if the gas reserves level is adequate and the local Afghans appear well qualified but some supplemental capacity building could be helpful, then a Technical Assistance, or Services, Contract, could be most appropriate.

2 SGDP Background

2.1 Sheberghan Gas Development Project

The foundation of the Sheberghan Gas Development Project (SGDP) is the United States Agency for International Development's (USAID) Strategic Objective Grant Agreement for a Thriving Economy Led by the Private Sector (USAID Grant Agreement No.306-05-00, "the Agreement"). The Implementation Letter (IL) No. 1 was issued and future Implementation Letters will be issued in accordance with Article 2, Section A.2., Annex 2 of the above-referenced Agreement. Those ILs serves to record the mutual understandings and agreement of the Government of the Islamic Republic of Afghanistan ("the Grantee" or "GIRoA"), and the United States Government (USG) to set forth the terms and conditions and their respective roles and responsibilities with regard to the SGDP.

2.1.1 SGDP Objective

The objective of SGDP is supporting the Grantee, represented principally by the MoM, to increase utilization of indigenous natural resources and support generation of electrical energy for sustained economic and social benefits, locally and at a national level. Specifically, the SGDP is to support the development of a 200 megawatt ("MW") natural gas-fired electricity generation plant in the form of an independent power producer ("IPP") in the vicinity of the city of Sheberghan in Jawzjan Province of Northern Afghanistan.

SGDP includes two distinct components to be implemented in two separate phases as follows:

Phase I: Sheberghan Gas Field Development:

This component of SGDP includes the rehabilitation of two existing gas wells and drilling of up to two additional gas wells. The objective of this component is to prove gas reserves and develop the wells for gas production.

Phase II: Construction of a Gas Processing Plant:

This component of SGDP includes the construction of a gas processing plant capable of sweetening sufficient gas from the Sheberghan wells to meet the needs of the planned 200 MW IPP which is expected to be constructed by the private sector. This includes the continuous removal of sulfur and other contaminants from the gas, a prerequisite to utilization by the IPP.

Additionally, the USG through USAID is providing off-budget technical assistance for the Sheberghan Gas Generation Activity (SGGA) to serve as a technical and financial advisor to the MoM and provide quality assurance/quality control (QA/QC) for the on-budget activities.

2.1.2 Mission and Vision of the Ministry Of Mines

The Ministry of Mines (MoM) has stated the following as its Mission and Vision, which aligns with the efforts involving the Sheberghan Gas Development Project (SGDP).

"The Ministry of Mines has a mandate to deliver on the Government's vision for sustainable, market-based, economically successful minerals and hydrocarbons sectors that encourages and protects private capital investments and enterprises as set out in the Constitution of Afghanistan and the Afghan National Development Strategy (ANDS). To achieve this, the Government is committed to establishing Afghanistan as an attractive destination for private sector investment in the exploration and development of mineral and hydrocarbon resources.

In this context, the Ministry of Mines' vision, mission and strategy are defined in the following way:

Vision: To be the leading economic ministry in the Government of Afghanistan, supporting national and local economic development and ensuring optimum revenues for Afghanistan from its mineral resources in a responsible manner.

Mission: To be an enabler of the mining sector's development and steward of all mineral, hydrocarbon and ground water resources through the implementation of international best practice policies, regulations and procedures to encourage environmentally and socially acceptable private investment."

In the implementation of the SGDP, the potential institutional structures evaluated will consider the Ministry of Mines' vision, mission and strategy as well as the objective of supporting the increased utilization of indigenous natural resources and supporting the development of a 200 megawatt (MW) natural gas-fired electricity generation plant.

3 Background on Natural Gas Development in Afghanistan

To better understand the organizational structures that are reasonably possible for future natural gas development in Afghanistan it is valuable to begin with a review of the history of the gas industry in the country.

3.1 History of Government Sponsored Natural Gas Development in Afghanistan

Since at least 1967, the Afghan gas sector has been exclusively government run with Afghan Gas Enterprise (“AGE”) and the General Directorate of Oil & Gas Survey (the “O&GS”) (formerly the Northern Directorate of the Hydrocarbon Unit), both under the control of government ministries, being the operating entities. Exploration and development operations (geological and geophysical, drilling, and well completion) were conducted by the O&GS. AGE conducted production, processing, and transportation activities.

Under the communist dominated government from 1978 and during the Soviet occupation (1979-1989), extensive exploration was conducted in Jawzjan Province by Soviet State organizations in conjunction with the Afghan State entities. Some 144 wells were drilled, of which about half were completed as production/exploitation wells. Large volumes of gas exported to the Soviet Union. Gas was also supplied to the Kud Barq fertilizer plant and 48MW power plant and a textile factory in Mazar-e-Sharif. During this period, a significant number of AGE and Northern Hydrocarbon Unit employees were trained in drilling, completion, and production operations and a number of Afghan petroleum engineers were educated at Soviet and other Communist Bloc universities. The Juma and Bashikurd Fields were discovered during this period.

Following the Soviet withdrawal in 1989, gas exploration and development activity ceased. The then existing production was dedicated principally to feedstock and small power generation at the fertilizer plant and power station at Mazar-e-Sharif and to some small scale residential and commercial distribution in Mazar-e-Sharif and in the Sheberghan area. These activities were carried out by AGE.

In 2007, the Hydrocarbon Law was adopted. That law assigns primary responsibility for the management and development of hydrocarbons to the Ministry of Mines. Within the Ministry, the hydrocarbon management was assigned to the Oil and Gas Survey Unit.

3.2 Afghan Gas Enterprise

The following section provides information on the origin and history of the Afghan Gas Enterprise (“AGE”), covers its current status, and then examines some recent developments.

3.2.1 Origin and History

AGE was established as the second branch of the Ministry of Mines in 1967 (1346) to explore for and develop natural gas in Afghanistan. It was legally converted into a State Owned Enterprise (“SOE”) in 1984 (1363).

With the technical and financial assistance of the Soviet Union, the exploitation of petroleum resources in the country grew dramatically. Eventually, 144 natural gas wells were drilled in the three major producing gas fields, named Gerquduq, Yatimtaq and Khoja Gogerdak. Approximately half of the wells were completed as exploitation (production) wells.

The large majority of the natural gas produced from the Sheberghan gas fields was exported to the Soviet Union, up to a peak of 2.7 MMCM/day, while the balance supported the operations of the Kud Barq (Northern) Fertilizer and Power Plant and a textile mill in Mazar-e-Sharif. Exploration activities were also conducted in the Juma, Bashikurd, Khoja Bolan, Jangle-e-Kolan, Checkchi and Shakarak gas fields.

Following the Soviet withdrawal in 1989, gas field development work stopped and gas production declined dramatically. According to the Ministry of Mines, by February 2011, only 34 natural gas wells in the three producing gas fields (Yatimtaq, Khoja Gogerdak, and Gerquduq) were still in limited production. Some sources indicate that perhaps as few as five wells were still producing.

3.2.2 Current Status

AGE is currently producing about 450,000 cubic meters of natural gas per day, most of which is delivered to the Kud Barq Fertilizer and Power Plant in Mazar-e-Sharif. The remaining natural gas is distributed to about 5,000 domestic customers (other sources indicate less than 3,500 domestic customers) in Sheberghan, Khoja Dokho, Aqcha and other villages in Jawzjan Province. This represents a substantial drop from the previous 20,000 domestic customers served.

Besides the Kud Barq Fertilizer Plant, AGE has not supplied fuel for power generation in the past two decades. The Kud Barq facility has an installed capacity of 48 MW but has not operated more than 16 MW since 2001, and more recently the output has been roughly 11 MW.

AGE previously operated two gas processing facilities (Khoja Gogerdak and Gerquduq, but these have not operated since the late 1980's. A compressor plant was almost fully constructed at Gerquduq by 1988 but was never commissioned. The plant was designed to increase pipeline pressure to offset declining well pressures.

The Afghanistan gas transportation infrastructure has about 440 km of welded steel pipelines, ranging from 150mm-820mm in diameter, as well as 10 local distribution systems. Corrosion protection systems are reported to be either missing or not functioning so the lines are vulnerable to corrosion. While there were no previous formal arrangements to record maintenance and repairs to the pipeline network, AGE has begun to address that issue.

Although system volumes are logged daily but are considered not reliable since many pressure gauges, meters and other measurement devices are not functional because of lack of funds for maintenance or replacement. To support a reliable pipeline system stabilization and expansion, new modern protection and monitoring systems must be deployed and maintained.

Due to severely inadequate investment in recent years, AGE does not have the necessary modern equipment to operate efficiently. In response to that challenge, the MoM has been working to create and implement a wide-ranging program to both replace obsolete equipment and infrastructure in the gas fields and to update the operations of AGE to meet the expected strong renewed demand for affordable energy. In addition to investment in infrastructure and equipment, substantial investment capacity building activities will be required.

The staff of the Sheberghan Gas Generation Activity ("SGGA") held meetings with AGE in late May 2012 to gain a better understanding of the operations of AGE in general and in the context of supporting the SGGA.

AGE has historically employed approximately 1,000 people; however, the Ministry is reducing the staff to 950 people. The current age distribution of AGE employees is relatively balanced: 30% older and near retirement, 20% fairly young, and 50% distributed in the middle age range. The national retirement age of 65 is followed. An organization chart of the AGE appears on the following page.

In these meetings AGE representatives identified several personnel and resource based challenges. First, the very low salaries of AGE limit attracting and retaining capable talent. Next, there is no longer any professional development program in AGE. A previous program has been discontinued.

Further, the professional level staff is not working in a modern and efficient manner since there are only 20 computers for a staff size of nearly 1,000, an average of 1 computer for every 50 employees and IT infrastructure is poor.

Working conditions are also inadequate. AGE offices are in need of renovation and upgrading, with main needs being adequate office furniture and air conditioning. For the field staff, the AGE equipment and vehicles are inadequate in number and quality. Presently, there are ten working buses, ten working cars, and thirty working pickup trucks. In 1986 the company had over 400 pickups. The buses are very important because they're necessary to transport workers to the gas fields, approximately 30 kilometers each way. Many of the vehicles are 25 years old and replacement parts are difficult to obtain.

While AGE has continuing experience with the operations of gas wells and gathering systems, their gas processing plant experience stopped after the Soviet Union withdrawal in the late 1980s. Their gas processing plants in Gerquduq were built in 1979 with less efficient technology compared with modern plants.

The AGE representatives indicated that the gas processing facility was in poor condition. Their assessment of the gas processing plant is that the technology was old and corrosion was a serious problem. They estimated that rehabilitation would take longer than building a new plant, and a new plant would be much more economical to operate.

The processing plant recommended by AGE is similar to the one likely to be needed for the Juma and Bashikurd fields. It consists of two parts: one section produces steam for removing sulfur and the second section removes the sulfur and water. AGE recommended that the plant should be replaced by a new technology for removing sulfur due to complications with existing process and equipment.

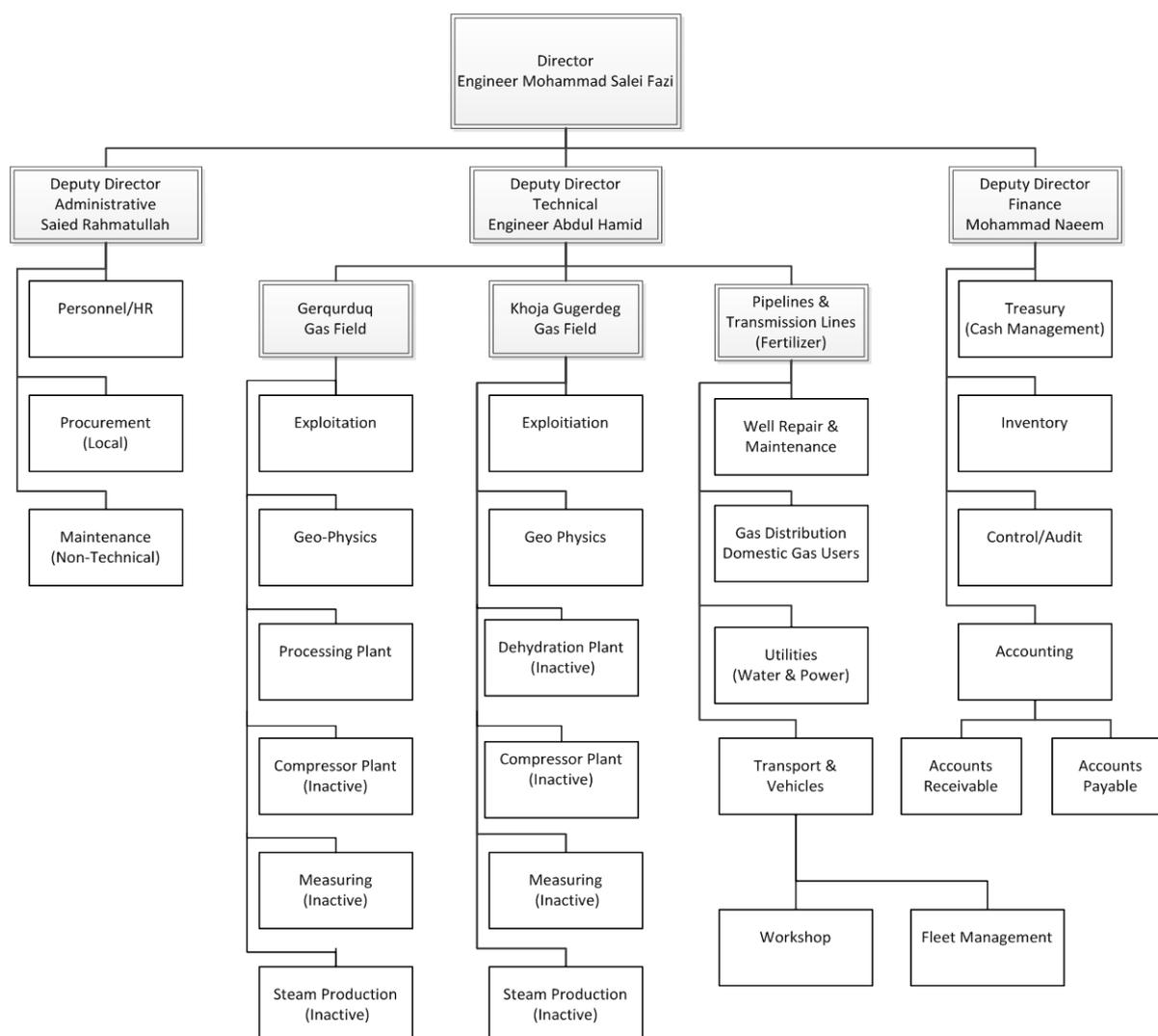
An appraisal of the two train Gerquduq gas processing plant in early 2012 was funded by the United State Department of Defense Task Force for Business and Stability Operations ("TFBSO"). The review funded by TFBSO found that the first train was inoperable since it had been cannibalized for spare parts for the second train. There had been substantial repair work on the second train several years ago, but it has never operated after the repairs were completed. Several issues, including the need for five steam boilers and at least a 2 MW power demand, led the TFBSO to the conclusion that the operation of the Gerquduq gas processing plant would probably be uneconomical. Accordingly, the TFBSO determined that no further investigation for plant rehabilitation would be planned.

3.2.3 Recent Developments

Due to lack of investment, declining production, and uneconomic tariffs, AGE has been in severe decline until recently. One positive exception occurred in early 2011 when AGE did complete the

rehabilitation of a well in the Shakarak Field, the first major addition to Afghanistan’s natural gas supplies in many years.

Figure 1: Organization Chart of the Afghan Gas Enterprise



Fortunately, there has been external assistance from 3 sources that are benefiting AGE. The TFBSO has been proving substantial support. One recent positive development is the creation of a compressed natural gas (CNG) operation in the Sheberghan area funded. That pilot program will provide domestically-produced transport fuel for vehicles at half the cost of gasoline. The first 100 vehicles applying in Sheberghan will be converted for free with dual fuel systems to allow them to operate on CNG as well as gasoline. More than fifty local vehicles had been converted to use CNG by early July 2012 and more are expected. The program is expected to expand into Mazar-e-Sharif in the near future. The AGE staff was trained to operate the CNG complex in Sheberghan and quickly became proficient and able to operate the facility without additional support. There will be a substantial discussion on the CNG market in the deliverable 3-3, Final Feasibility Report on Industrial Development and Natural Gas Market Development in Afghanistan.

There is a new vertically integrated gas supply project, the Sheberghan Gas Fields Rehabilitation project, funded by ADB and the TFBSO. That project includes ADB financing for the rehabilitation and

completion of eight wells in two proven fields, Yatimtaq and Gerquduq. The award for the contractor was executed in October 2012 and the work should be completed within one year. To utilize the gas it must first be processed to eliminate the hydrogen sulfide and then transported to the existing and new customers. The TFBSO has begun funding the installation of a gas processing plant to make the gas safe and usable by customers. Additionally, TFBSO is funding and facilitating the rehabilitation of the existing pipeline from Gerquduq to Mazar-e-Sharif as well as the construction of a new parallel pipeline to increase the total throughput to about 960 MCM/day. This work has included training of welders for the repair of the existing pipeline and construction of the new pipeline.

The addition of SGDF project and the new wells from the Sheberghan Gas Fields Rehabilitation project, and the CNG project creates the opportunity for a dramatic turnaround for the natural gas industry in Afghanistan as well as the challenges for sufficient capacity building, gas marketing efforts, and further investments to ensure that these and other future projects are commercial successes and sustainable.

Finally, there is an effort to transform the existing Afghan Gas Enterprise from a state owned enterprise, which is operated with the intention of making profits, into a government corporation that has greater operational latitude and could more likely be successful in being commercially viable and making sustainable profits. Two major goals are to operate in a market driven manner and to right-size the labor force. There has been a submission to the presidential cabinet to initiate the process, which, if approved, could result in the segregation of the valuable assets and staff into a new corporation. That Proposal to the President's Cabinet is attached as Appendix A. If implemented, a corporate charter would be prepared and the entity would move forward. The unnecessary or detrimental assets or claims would be transferred to MoF for resolution while the redundant staff would be compensated and then released from employment.

3.3 General Directorate of the Oil & Gas Survey

The Afghan Government established the Directorate of Exploration of Oil and Gas in the 1960s to accommodate expanding petroleum operations in Afghanistan. Since then the names and structures of Afghanistan's petroleum agencies have undergone various changes. Currently, hydrocarbon operations in Afghanistan are handled by the Afghan Gas Enterprise (AGE) and the Northern Directorate of the Hydrocarbon Unit recently re-named the General Directorate of Oil & Gas Survey. The Hydrocarbon Department of the Ministry oversees the activities of these two entities.

The General Directorate of Oil & Gas Survey (the O&GS) has traditionally been responsible for the exploration and development of the gas fields. However, the O&GS is suffering from the same lack of investment in modern equipment and training as AGE.

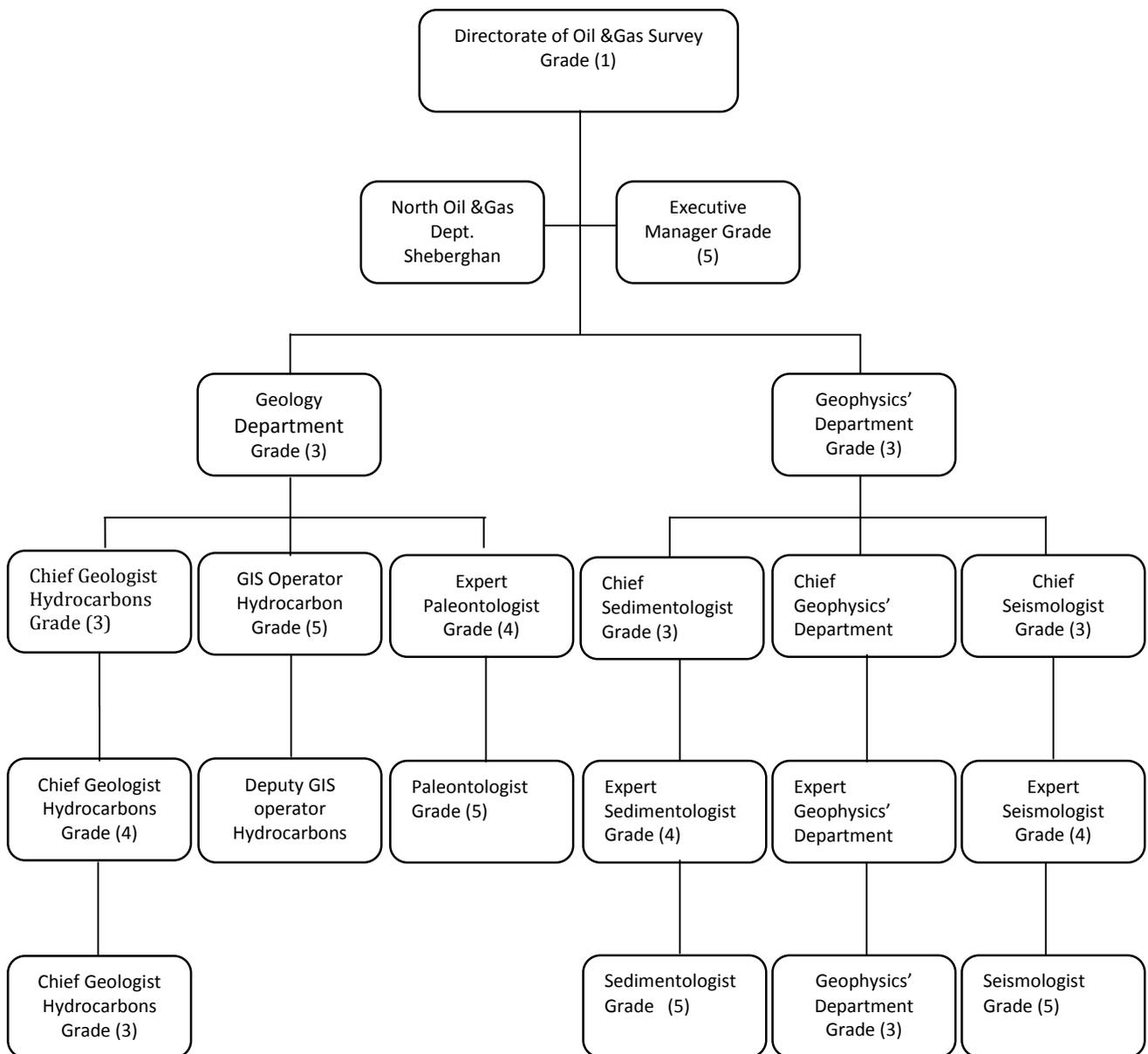
The Hydrocarbon department now employs 925 people with about one hundred engineers and two hundred technical employees. The organizational chart for the O&GS is displayed on the following page.

The staff of the SGGA held meetings with O&GS in late May 2012 to gain an understanding of the operations of O&GS in the context of supporting the SGGA. The staff provided a good history of the former drilling and completion work including many technical specifications and drawings. They also identified various challenges previously encountered and solutions employed to overcome those challenges. This will be very helpful in the tendering for and performance of the drilling and completion of the wells in the Bashikurd and Juma fields.

The O&GS maintains the paper and physical records of the historic work and maintain warehouses with drilling chemicals and materials. Their storage facilities contain core logs from the prior drilling efforts that could be useful in the development drilling of the Bashikurd and Juma fields. Another continuing service provided by the O&GS to AGE is the monitoring of the well production with reservoir management recommendations.

While the Ministry of Mines has been pursuing an expanded role for AGE through a corporatization in the near future, little or no discussions have taken place with stakeholders regarding the future of the O&GS. Vertically integrating the O&GS with AGE may be an option, though the Ministry has made no decision on this restructuring.

Figure 2: Organization Chart of the General Directorate of Oil & Gas Survey



4 Corporatization Analysis Perspectives

In the following sections there is an evaluation of the potential structures for the establishment of the entity to address the related prime objective of GIRoA and USAID, which is “to assure that the facilities or assets constructed and installed during the SGD Program will be owned, maintained and operated by a commercially viable entity, or entities, capable of entering into a commercial-quality gas supply agreement with the private sector IPP owner/operator, or with DABS.”

Currently, there is an effort to transform the existing Afghan Gas Enterprise from a state owned enterprise, which is operated with the intention of making profits, into a government corporation that has greater operational latitude and could more likely be successful in being commercially viable and making sustainable profits. The major goals are to overcome administrative and technical challenges, to operate in a modern, profitable and market driven manner, and to optimize the labor force size. There has been a submission to the presidential cabinet to initiate the process, which, if approved, could result in the segregation of the valuable assets and staff into a new corporation. That Proposal to the President’s Cabinet is attached as Appendix A. If implemented, a corporate charter would be prepared and the entity would move forward. The unnecessary or detrimental assets or claims would be transferred to MoF for resolution while the redundant staff would be compensated and then released from employment.

Additionally, the MoM has been working on a Request For Proposals (RFP) for Consulting Services for Improving the Business Environment: Reform of the Afghanistan State Gas Enterprise and Consulting Services for Improving the Business Environment: Development of the Natural Gas Sector of Afghanistan, RFP No.: MoM/PMU/CT-II-44-1 and RFP No.: MoM/PMU/CT-II-44-2, respectively. The GIRoA was allocated grant funds from the International Development Association (IDA), part of the World Bank organization, for this work. The objectives of these works include:

- “To assess, value, develop and implement commercialization and corporatization options for the improvement of the technical, financial and operational aspects of Afghan State Gas Enterprise (“Afghan Gas”) a State owned enterprise (SOE). The primary objective is intended to be the establishment of a market-based Afghan natural gas company that is effective in the country’s emerging natural gas market and may be transitioned to be in part or in full privatized. It is essential that overall sector governance Gas issues be considered notably with emphasis on actions to take during this transition.” RFP No. MoM/PMU/CT-II-44-1
- “To identify and to implement strategic, institutional, and staffing improvements that will enable the Government of Afghanistan to facilitate the sound and long-term development of the country’s natural gas resources and infrastructure based on market principles.” RFP No. MoM/PMU/CT-II-44-2

Based on the estimated 52 staff-months for the work by the 5 key professionals for the first RFPP and the estimated 76 staff-months for the work by the 5 key professionals for the second RFPP, the SGGA anticipates that these Consultants will roughly parallel the work of the SGGA staff. Given these future related efforts and prior related efforts including the work of Adam Smith International funded by the United Kingdom government’s Department for International Development (DFID), SGGA will endeavor to coordinate and complement the work of the IDA funded consultants in order to both avoid confusion of MoM and optimize the results of the prior and future work efforts.

In view of the number of advisors and the potentially competing priorities, it is not clear what direction the new AGE corporatization would take in order to obtain the necessary funds and management skillset to mobilize the specialized talent needed and utilize the proper industry tools to appropriately exploit the natural gas resources of Afghanistan. Therefore, the focus of this report will be a review of the range of options with the respective advantages and disadvantages.

The following review will be centered on a new, minimum entity necessary to perform those functions in a self-sufficient manner, which most likely will ultimately be a subsidiary of the larger corporatized AGE organization. With the appropriate safeguards, that new, minimum entity, which is usually labeled as a special purpose entity or vehicle in project finance structures, can operate on a commercially viable and sustainable basis regardless of the nature, levels and number of the organization's parent entities. There will also be some assessment of the influence of the organization's parent entities' ownership or control.

4.1 Identify Viable Institutional Structure for the Entity or Entities That Could Own/Operate the SGDP Assets

At present, it appears that the entire facilities for the SGDP would be wholly owned and operated by a GIRoA owned/controlled entity. However, in addition to that arrangement, there are other options based on management needs or capital requirements. The two other major structures would include a form of a public private partnership (PPP) and full private ownership for some or all of the assets.

The PPP form could range for a full formal partnership to an arrangement where the private sector performed most or all of the work and management but the government's stake was more than the right to taxes, royalties and other normal government charges. For instance, since the funding of the initial wells and the processing plant is expected to be covered by the USAID and MoM but future additional capital costs are likely, then MoM could contribute those assets to the PPP. The GIRoA could then decide how much management responsibility and financial risks, such liability for inadequate delivery of gas under the firm commitment Gas Sales Agreement, it would want to assume. Rather than share the risks and rewards from management, the GIRoA could take a limited liability approach and just take a percentage of the profits while allowing the private sector operate the assets and earn its return for the assumption of risks. Further, the GIRoA could decide to limit its liability further by privatizing part or all of the assets.

The viable institutional structures that are available to own/operate the SGDP assets in Afghanistan are the typical business organization structures: corporations, limited liability companies and partnerships. Under Afghan law, both foreign and local businesses may own and operate assets in the country. Historically, all hydrocarbon assets were owned by the public sector, however, the Afghan Hydrocarbons Law was written specifically to encourage private investment in the hydrocarbon sector.

The ownership and operation of the SGDP in a commercial viable and sustainable manner will require that the entity or entities is/are capable of doing the following:

1. drilling, completing, and operating a sufficient number of wells to meet the fuel supply requirements of the IPP project for about 200 MWs;
2. constructing, operating, and probably expanding a gathering system to move the gas from the wells to the gas processing facility;

3. constructing, operating, and possibly expanding a gas processing facility to "sweeten" and deliver the gas to the IPP project while properly disposing of the waste products from the sweetening process;
4. thoroughly understanding and timely enforcing its operating licenses, contracts, and other legal rights plus controlling its financial resources in order to cover its operating expenses and fund its future capital expenditures.

It is critical that there be a commitment by the relevant Afghan government to take the appropriate actions to assure that the foregoing contractual and legal rights are respected and enforced, otherwise the success of the SGDP could be at risk.

The SGDP entity or entities does not have to physically perform those tasks with its own personnel, rather what is important is the unobstructed ability to assure the performance of that work, while in full compliance with applicable laws and regulations, directly or by outsourcing to qualified persons or firms. The outcome, regardless of the manner of performance, must be a planned and coordinated response that delivers the required amount of sweetened gas to the IPP project for the full term of the Gas Sales Agreement.

The foregoing 4 critical task areas could be performed by a single entity or separately by multiple entities in a coordinated fashion. In countries where the hydrocarbon industry is very mature, it is not uncommon for some or all of those incremental steps handled by third parties, especially where those persons or firms can offer additional expertise or cost savings. There could also be a separation of assets by risk and investment needs, either by physical ownership or just operations, if deemed appropriate, for example, separating the gas exploration and production work from the gas processing. As indicated herein, there is a higher risk in exploration and production activities with an expectation of higher returns in running a gathering system or a gas processing facility. Although there is funding planned for the gas exploration and production and gas processing by USAID and MoM, there is no final agreement for funding the gathering system. Additionally, there will likely be a need for future drilling activity to ensure a continuous gas stream for the power plant. Funding the gathering system might create an opportunity for either a partial privatization of that asset as well as the two other operating segments.

Since the hydrocarbon industry in Afghanistan is being invigorated, there are not a number of domestic people or firms that could offer the appropriate expertise and cost savings. Certain foreign firms could offer the appropriate expertise, however, the higher costs for expatriates must be considered. A preliminary financial analysis was contained in the Sustainability of Operations and Maintenance for the Sheberghan Gas Development Project ("Sustainability Report"), a condition precedent in the Implementation Letter (IL) for USAID funding of SGDP. That financial analysis showed that the project was profitable even with a significant number of expatriates, so the involvement of foreign staff or firms is not precluded from a financial perspective. An update of the staffing requirements anticipated in the Sustainability Report was set forth in the subsequent deliverable 1-8, Joint Report on Capability and Needs Assessment of MoM. That re-structuring of the line staffing resulted in two groups, Exploration & Production and Mid-stream teams. That re-organization, discussed in more depth in sections 4.7 below, both increased the specialization of the line staff but also slightly decreased the number of staff, with a commensurate reduction of the staffing costs. So, with the support of good project economics, the focus should be centered on assuring the appropriate quality of personnel for the project implementation rather than excessive concern about the labor cost.

There are various structures that could be applicable to the SDGP as follows:

- a. **GIRoA Wholly Owned** - SGDP could operate in a vertically integrated manner and directly, or with some outsourcing, perform all tasks, e.g. the foregoing 4 critical tasks, while maintaining full responsibility – **Self-Sufficient** - ;
- b. **Public Private Partnership** - SGDP could undertake only those aspects of the work for which the local staff is knowledgeable and well experienced and then contract out or assign other responsibilities including the management and financial responsibilities - **Partially Self-Sufficient**; or
- c. **Privately Owned** - SGDP could perform some or all physical work aspects but utilize one or more external arrangements, e.g., privatization or services contracts for project and financial management purposes – **Externally Managed**.

The foregoing structure options should be considered relative to the primary near and long term challenges for the SGDP.

- The country of Afghanistan remains in a state of insecurity after nearing 12 years of conflict. The announced withdrawal of the bulk of the foreign troops by the end of 2014 along with presidential elections scheduled for April 2014 has heightened the perception of insecurity from both physical and political standpoints.
- The government and the economy remain highly reliant on foreign donor funding. The economy has shown some growth as indicated in the Report on Current State of Natural Gas Sector, (Deliverable 3-1) but from a very low base a GDP per capita near the US\$600 level.
- There is no strong recent history of successful management of large industrial facilities with financial penalties for non-performance.
- The perception of corruption in the country remains very high with a recent ranking in Transparency International's *2012 Corruption Perceptions Index* of 174, in a 3 way tie for last place.
- The lack of investment in AGE has resulted in substantial asset deterioration (e.g., the pipeline to Mazar) or abandonment of facilities (the Gas Processing Plant in Gerquduq) that could have provided essential services for the consumers and training for the AGE employees.
- Until the very recent effort to corporatize AGE, there has been a resistance to right-sizing the AGE workforce following the departure of the Soviet Union over 20 years.

4.2 Define Risks and Benefits Resulting From Each Ownership Structure

There are reasonable means available to enable each indicated ownership structure to be successful and supportive of the strategic objective that the SGDP projects will restart the domestic gas industry. The selection of the preferred structure(s) can be facilitated by considering the relative attractiveness of each approach following an examination of the respective risks and benefits. That examination will include the sourcing of investments for additional exploration and production facilities and gas processing facilities. It will also address staffing requirements as well as the associated capacity/capability building requirements. This section will review the risks and benefits resulting from each ownership structure: Self-Sufficient, Partially Self-Sufficient, or Externally Managed.

The conceptually ideal approach for the SGDP is the Fully Self-Sufficient approach, where SGDP has the expertise, experience, and access to capital to operate the facilities in a competent, profitable and sustainable basis. The risks for pursuing this approach are:

- 1) Without a track record of management staff with the demonstrated ability to address the expected and unexpected challenges of daily project operations and maintenance, there is a substantial risk that poor management decisions may be made or timely actions not taken to secure adequate reserves and then transport, process and deliver to meet the anticipated Gas Supply

Agreement terms in a safe and reliable manner. As a result, the delivery of inadequate fuel incurs substantial financial penalties or worst, the failure of the gas and IPP projects from the failure to deliver required fuel.

- 2) Due to the lack of recent experience in key areas such as the gas processing plant operations, there are risks of poor operations resulting in unreliable operations or worse, dangers from leaks and accidental releases of poisonous H₂S gas.
- 3) Even if the project operates well, there could be financial risks due to political pressures to hire more staff than necessary, corruption pressures that divert money, and other issues that could jeopardize sustainability.
- 4) Although the project economics show that the project should be financially self-sufficient if the operations are normal, a pre-mature interruption of operations and the associated cash flow from a major equipment failure, a terrorist attack, or other event or circumstance requiring a substantial financial expenditure, could curtail or stop normal operations of SGDP pending location of additional funds to remedy the issue.

The benefits of the Self-Sufficient approach are:

- 1) This approach could be the most profitable and therefore more sustainable if the SGDP can perform all the physical operations, except perhaps selective outsourcing, as well as properly managing the contracts, capital expenditures, and its finances.
- 2) This approach will require extensive and continuous training of the local staff in skills that could improve efficiency as well as create a training center for future gas projects in Afghanistan.
- 3) Understanding and applying the proper project and financial management skill sets could create managers that could run other industrial facilities in the hydrocarbon business, such as a refinery, as well as other non-energy business facilities, such as a chemical plant.
- 4) If SGDP can successfully operate in this manner, there will be a greatly improved impression of the local management and workers skills and ability that could more easily attract future investment capital in energy and non-energy fields.

Perhaps the most realistic approach for the SGDP is the Partially Self-Sufficient approach, where SGDP management and staff focuses on performing the work where it has the expertise and experience but contractually assigning certain work and related financial responsibilities to others with the proper expertise and experience as well as access to capital when needed.

The risks for pursuing this approach are:

- 1) Since the SGDP project is an integrated one, the curtailment or cessation of any substantial work segment could in turn curtail or stop the entire project. So it's critical that any work assigned for performance outside SGDP only goes to fully capable persons or firms, experienced in post conflict environments, and with reliable access to additional capital.
- 2) There can be a misunderstanding of responsibilities with external work assignments where there is not a full understanding of relative expectations so that work can either be duplicated or not performed at all based on the assumption that it was the other party's responsibility.
- 3) Even if the project operates well, depending on the assignment of the work, there could be little or no training of the management so that Afghanistan does not gain the global class skill necessary to operate the SGDP and other complex industrial projects.
- 4) Further, if certain work areas are continually outsourced, then there is greater likelihood that the management and staff will not thoroughly learn about and understand those areas and the SGDP and other future projects will always rely upon external staff and firms rather than becoming fully competent in all key areas and able to work independently.
- 5) There may be difficulty in attracting future capital if the assignment of work does not comprise an explicit component where the assignee has a clear revenue stream to support the returns on invested capital. For example, if the exploration and production work but not the gathering system

work was assigned to a third party and there could be unreasonable delays in constructing that gathering system, then the firm performing the exploration and production work could resist investing its capital in drilling and completion work.

The benefits of the Partially Self-Sufficient approach are:

- 1) This approach would optimize the existing skill set strengths of the local staff in areas where they were proficient and then bring global class experience to address areas of the locals' weaknesses as well as financial capital, if needed.
- 2) This approach could support the immediate, high quality operation of the SGDP while preparing for a transition to full operations by locals after additional training and mentoring was applied. This could be very valuable if there is extensive start-up or other technical issues where the involvement of highly competent outside staff or firms could more quickly resolve the issues.
- 3) This approach will require extensive and continuous training of the local staff in skills that could improve efficiency as well as create a training center for future gas projects in Afghanistan.
- 4) Understanding and applying the proper project and financial management skill sets could create managers that could run other industrial facilities in the hydrocarbon business such as refineries or non-hydrocarbon business facilities where high reliability, efficient operations are needed.

If SGDP can successfully operate in this manner, there will be a greatly improved impression of the local management and workers skills and abilities that could more easily attract future investment capital in energy and non-energy fields.

From a private sector investor approach, the ideal approach for the SGDP is the Externally Managed approach, where SGDP benefits from global proven expertise, experience and access to capital to operate the facilities in a competent, profitable and sustainable basis. The risks for pursuing this approach are:

- 1) Even if the project operates well, there could be little or delayed training of local management personnel since the primary goal is long term profitable operations, so that Afghanistan may not quickly gain the global class skill necessary to operate the SGDP and other complex industrial projects if the project is primarily managed by expatriates.
- 2) There could be political resistance, both Afghan and USG, to substantial involvement of the external managers in a project that was substantially funded with donor money. It could be viewed that external managers were improperly profiting from an Afghan and USG funded project.
- 3) There is more potential for cultural clashes and resultant problems especially if the external managers are not well versed in local tribal, labor, and other sensitive matters.

The benefits of the Externally Managed approach are:

- 1) The highest probability of successful operations would likely occur by bringing in a firm with a strong track record of similar work, which can better organize and optimize work, resolve technical and other issues, and bring any additional capital.
- 2) The openness to external management could create a more attractive environment for external investment in additional future projects because the investors would know that global class skill sets and experience will be applied, thereby improving the likelihood of profitable operations.
- 3) Experienced petroleum services companies should have been exposed to and become adept at operations in areas with both physical and political insecurity. Therefore, they could likely be prepared to prevent related operational problems and/or restore operations quickly following an incident.
- 4) Similarly, these firms would likely have extensive familiarity with corruption risks and methods, so those potential issues could be quickly identified and the possible impacts either prevented or mitigated.

4.3 Define Viable, Internationally Proven Models for Future Exploration and Production Entities

In order to re-start the gas industry in Afghanistan it is important to create an acceptable environment to encourage investment in future exploration and production ventures by the appropriate entities. The nature and extent risks beyond the high risk of exploration work, which the entities are prepared to accept, must be evaluated since those will determine whether the total risk profile would be acceptable.

Under the Hydrocarbon Law, the natural gas in the subsurface reservoirs remains the property of the state but the commercial exploitation by contractors of that gas is allowed. There are four types of contracts specifically listed in the Hydrocarbons Law: 1) exploration and production sharing contract; 2) service and production sharing contract; 3) contracts for geological/geophysical/geochemical services; and 4) contracts for pipeline operations. A contractor under an exploration and production sharing contract or service and production sharing contract acquires title to a share of the extracted hydrocarbons pursuant to the terms of the contract. The remaining share of extracted hydrocarbons is the property of the State and may be disposed as appropriate. The ability of the State to dispose of its share of extracted hydrocarbons "as appropriate" is significant because it allows the State to determine the most beneficial use of the produced hydrocarbons.

The Hydrocarbon Law defines an exploration and production sharing contract as one that grants the contractor the exclusive right to explore for and to develop and produce hydrocarbons upon making a commercial discovery, and to receive a share of the hydrocarbons. The service and production sharing contract grants the contractor the exclusive right to operate and upgrade/rehabilitate hydrocarbon production facilities and receive a share of the produced hydrocarbons. The contracts for geological/geophysical/geochemical services grant the right to conduct those services in an identified area, as long as it is not within the area covered by the first two contracts. The contracts for pipeline operations grant the right to construct pipelines and associated facilities to store and transport hydrocarbons. The latter two contract structures are relevant only where there are no existing exploration and production sharing or service and production sharing contact contracts, so only the first two contract structures will be evaluated as possible proven models for future exploration and production entities.

4.3.1 Production Sharing Agreement - Externally Managed example

Production sharing agreements are the standard international contracting option offered by governments to encourage exploration and subsequent development of a specified area or block. The production sharing contractor invests its own funds in exploration and production costs. If there is a commercial size discovery then production is established the contractor is reimbursed its costs, plus a fixed additional return, from production and shares the balance of the production with the host government. The operations are theoretically run under joint contractor/government management, although usually the contractor in fact has the final say on operational decisions. The government receives taxes and a royalty in addition to a portion of the net revenue from production. Production may be taken in kind by the government, and in this instance could be used to meet gas supply obligations.

Production sharing contracts are more commonly used to encourage exploration in new or unproven areas and are therefore structured to provide a fairly high return to the contractor for its risk of investing where there may not be adequate or any returns. This factor, and the cost recovery plus return

received by the contractor, make a production sharing agreement less attractive to the government for developing known reserves.

The production sharing contract concept could be a good match in Afghanistan for fields with little or no proximate proven reserves since:

- it does not require a capital investment by the host government;
- it shifts the exploration and production risk to the contractor; and
- Typically production sharing contracts are only awarded to knowledgeable, experienced, properly equipped and well-capitalized contractors, which bring their skills, tools, and capital.

The primary reasons why the production sharing contract might be inappropriate in the near future is

- that there is no well-established market yet for the new gas reserves, so there may be difficulty in enticing companies under this structure since it may be hard to convince them that they can readily monetize the new reserves discovered or additional reserves proven, and
- since the gas may be sour and require a large additional investment for processing to remove impurities, there could be greater challenge in attracting typical exploration and production companies, which may be looking for a faster payback on their invested capital.

Regarding prevalence, these types of contracts are frequently used in Egypt, Iraq, Kazakhstan, Libya, Oman, Qatar, and Trinidad and Tobago. A recent example is that in May 2012, Manas Petroleum Corp. announced that a PSA between its subsidiary, Somon Oil, and the Government of Tajikistan had been signed and ratified.

4.3.2 Concession or Risk Service Contract - Partially Self-Sufficient example

As traditionally used in the oil and gas industry, a risk service contract is an arrangement under which a contractor provides specified services with its own capital in exchange for an opportunity to share in the new or increased production resulting from its services or to be paid a fixed fee, sometimes in kind. Operations are usually conducted under government management. There are numerous variations on this contracting method. A concession or risk service contract may be a useful contracting tool for the further development of fields with proven or probable reserves.

It may be the most advantageous to the government where some reserves may be reasonably well known with more predictable drilling and re-entry costs, so contract terms can include a lower risk factor than for true exploration contracts. While there may be less risk in finding or proving reserves, the gas may be sour and require a large additional investment for processing to remove impurities. The companies that are interested in these type projects generally will accept a slower payback on their invested capital in return for less exploration risk.

For the management of the production assets such as the gathering system and gas processing plant, a concession contract may be employed to bring in a qualified third party and their investment. Under a concession agreement, the management and control of the facility is turned over to a third party, in exchange for an upfront fee and sometimes a share of profit for a fixed period. The concessionaire is often expected to invest capital in return for a specified rate of return taken from the revenues generated by the plant. A fixed payment to the concessionaire may also be included.

The motivation of the government to use this arrangement is more often both a funding limitation plus the assumption that it will realize more net financial benefit by an outsourced operation since their lack of experience could lead to poor and costly decision making. Training of locals is generally an ancillary benefit, not a primary goal, of these type contracts.

The term concession accurately reflects the nature of the arrangement since the contractor receives a right to operate the project for a fixed time period in an effort to stabilize and grow the business to obtain a profit. The underlying assumption is that an improved and sustainable project will be conveyed back to full government management at some point in the future. To maximize the profit potential, the contractors will employ as many locals as possible in lieu of more expensive expatriate employees. So this structure should produce a large number of experienced, effective locals for future operations. By its compensation structure, however, the contractor is incentivized to focus more on profitability of its results than the training the local staff, which would be an ancillary benefit for the locals.

For Afghanistan, the Sheberghan Gas Development Project funded by USAID and the Sheberghan Gas Field Rehabilitation Project funded by the ADB and TFBSO are possible candidates for these type contracts. In both instances, supplemental drilling will likely be required along with gathering system gas processing. These operations in established fields and working with targeted customers have lower risk and could attract firms preferring such project risk profiles. This structure could be appealing to Afghanistan if there are firm delivery gas contracts in place and there is a desire to work with experienced companies with strong track records to mitigate the risk of financial penalties for failure to fully perform under the gas contracts.

A recent example of a Concession or Risk Service Contract was an August 2011 agreement in which Oando Gas and Power PLC received a concession to rehabilitate and expand the gas infrastructure in the Port Harcourt industrial areas in Nigeria.

4.3.3 Technical Assistance, or Services, Contract - Self-Sufficient example

An alternative management arrangement for the production operations alone is a Technical Assistance, or Services, Contract. These can be an attractive option where some exploration and production assets have already been funded or a separate contract exists for the exploration and only production services are needed. Under this structure, a contractor would provide supplemental expertise to operate and maintain a facility plus deliver experience/training to local staff under a short term, fee-for-service arrangement. These arrangements are utilized by government based organizations when there is recognition of an insufficiently qualified staff or when the government wishes to transfer certain daily operational responsibilities to a third party for other reasons.

For example, a few key roles could be performed by very capable and experienced external staff under a Technical Assistance Contract while also training the local line, support and/or management staff. Potential areas for supplemental external expertise could be the Technical Managing Director, Production Operations Manager, Field Manager, Mechanical Maintenance Superintendent, Senior Instrumentation Engineer, and/or the Health, Safety & Environment Supervisor. These experts could evaluate, mentor, and develop the local staff while performing key operational functions.

Additionally, these roles may not all be provided on the same basis, i.e., full-time or part-time, for the same duration, or with the same start and end date. If there are no design and construction quality issues with the gas processing plant, then under the Technical Assistance Contract the external Production Operations Manager, Field Managers, Senior Instrumentation Engineer, and/or the Health, Safety & Environment Supervisor might start providing services before commissioning and continue through the initial operations period. Later, the Mechanical Maintenance Superintendent could begin the review of the plant status, provide stimulated and real repair training, and operationalize the computerized maintenance management system (CMMS). Thereafter, an external Technical Managing

Director may arrive to assess the overall performance and recommend equipment changes as well as prepare the Field development plan. So, this arrangement is excellent for targeting a specific need for capacity development while realizing good operational performance.

In these structures, the contractor provides the defined production services but usually does not invest capital or assume operational risks, although those options are possible. Typically, all production and operational risks remain with government "owner". The name Technical Assistance Contract can be misleading since the key decisions and ultimate management responsibilities for the project remain with the government. The Services Contract name is more properly descriptive of the relationship of the contractor to the project.

Under the Technical Assistance Contract, the contractor will work for the indicated time period, perhaps two to five years. In return, the contractor receives the agreed fixed-price compensation plus typically some performance based financial incentives, but not a portion of the project's revenues or profit.

For Afghanistan, the Sheberghan Gas Development Project funded by USAID and the Sheberghan Gas Field Rehabilitation Project funded by the ADB and TFBSO are possible candidates for these type contracts. If the Afghan government is confident that its designees can substantially perform under their gas sales contracts and they only desire some supplemental expertise in specific areas, then this could be an attractive approach.

In terms of prevalence, these types of contracts are commonly used in Latin America, Bahrain, Iran, and Oman. A recent example was a well management contract that was awarded in May 2012 to Norway's AGR Group from Cooper Energy Tunisia Bargou to run activities for a well offshore of Tunisia.

4.4 Design a Process for Integrating the Ownership Structures Described Above

As previously indicated, MoM has stated the following as its Mission and Vision to include the "...mandate to deliver on the Government's vision for sustainable, market-based, economically successful minerals and hydrocarbons sectors that encourages and protects private capital investments and enterprises..." A process, discussed below, is being finalized that could work to integrate the applicable ownership structures described above "into a corporatized AGE, or each operating as an autonomous, commercially viable entity not requiring GIRoA subsidies, that is, totally self-funded from gas revenues generated by gas sales to either the IPP or DABS."

The MoM, AGE, and SGGA recognize that the most efficient and effective way of working together in a coordinated manner would be through a joint operating committee. The MoM, AGE, and SGGA have agreed to create and operationalize a Project Management Unit. As a result, the Sheberghan Project Management Team (SPMT) is being formed with by management and employee staff from their respective organizations.

The SPMT has the role to manage daily operations and set priorities to meet the SGDP's goals and requires a dedicated support group during both Phases I and II and providing guidance to their senior management, donors and other stakeholders. The SPMT's objectives will include the following:

- Recruitment and Training: The SPMT will operate as an initial operations and maintenance recruitment and capacity building team. This SPMT work can support a number of different Ministries, international donors, financial institutions, and other stakeholders;

- Capacity building and project sustainability: The SPMT will integrate capacity building efforts into all facets of the PMU work; including the planned replacement of key expatriate staff by Afghan nationals over the next two years, development of internal training programs by existing expatriate staff and consultants, and targeted capacity building to facilitate the corporatization of Afghan Gas Enterprise (AGE); and
- Operations and Maintenance (O&M) Sustainment: The PMU will lead the formation of the O&M entity for the assets built under the SGDP. Building upon the work of the AGE and O&GS, the MoM can form an effective gas business entity, including a competent O&M entity that can ensure sustainable operations.

With the verification of the gas reserves from the drilling contract and with the feedback from the work on the above 3 objectives, it should become evident whether additional capital will be needed for drilling and whether the local Afghans will have the skills, experience and access to capital to operate the projects assets in a commercially viable and sustainable manner.

If the gas reserves level is inadequate and the local Afghans appear to need supplemental capacity building, then a Production Sharing Agreement, an exploration and production sharing contract, could be most appropriate. In the event that the gas reserves level is adequate but the local Afghans appear to need supplemental capacity building, then a Concession or Risk Service Contract, the service and production sharing contract, could be most appropriate. Finally, if the gas reserves level is adequate and the local Afghans appear well qualified but supplemental capacity building could be helpful, then a Technical Assistance, or Services, Contract, could be most appropriate.

The SPMT would review the situation and circumstances and then advocate the preferred approach. Under the Hydrocarbon Law, an exploration and production sharing contract or a service and production sharing contract would have to be tendered. The SPMT could work to facilitate the bidding process required to select the best provider. The Hydrocarbon Law does not clearly appear to address the situation of the Technical Assistance, or Services, Contract, but it would be conservative to assume that a tender would be appropriate to select the best provider and avoid the possibility later questions of the selection process.

If the SPMT can successfully handle implementation process for the SGDP, then the same Afghan managers and employees would likely be able, directly or through education of others, to handle other future projects as well.

4.5 Identify the Organizational Structure and Capabilities Required to Enable the Entity or Entities Described Above To Support Full Commercial Operations Unsubsidized

To satisfy the first two requirements of the applicable Condition Precedent in the Implementation Letter, there must be an "... operations and maintenance plan for all facilities and equipment under the SGDP..." and "... evidence that the Grantee will have qualified staff to properly operate and maintain the SGDP facilities and equipment..." The previously submitted Sustainability of Operations and Maintenance for the Sheberghan Gas Development Project ("Sustainability Report") included the initial operations and maintenance plan plus a financial analysis showing that the Grantee will have qualified staff to properly operate and maintain the SGDP facilities and equipment.

In order to design an organizational structure and identify the capabilities required to support full commercial operations of a gas production and processing project, one must first identify the nature of

the work, frequency of performance, and determine whether that work is better suited for an employee or a temporary consultant/contractor.

A precise list of the work and frequency of performance can only be determined after the wells are completed, the gathering systems and processing plant are constructed and performance tests are passed. In the interim, a generalized listing of work and the related organizational structure and needed capabilities can be identified, which is set forth in the following chart.

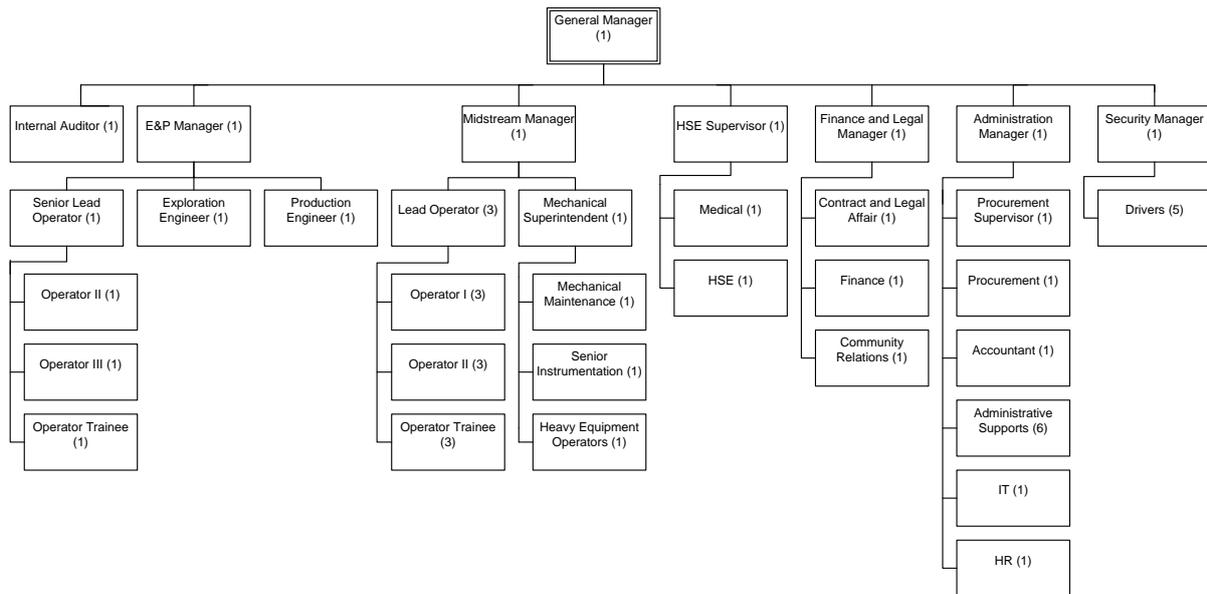
Table 1: Sustainability Operations and Maintenance Work

Sustainability O&M Work			
		Frequency	Internal/ Outsourced
Gas Wells	Reservoir modeling, production forecasting, and economic modeling	Occasional	Outsourced
	Gas stream analysis	Occasional	Outsourced
	Monitoring of gas wells	Constant	Internal
	Physical well inspection	Constant	Internal
	General maintenance of production wells	Constant	Internal
	Equipment servicing, wellhead to separator	Constant	Internal
	Disposal of produced water; sale of natural gas liquids	Frequent	Internal
	Monitoring for leaks, safety concerns or parts that need repair	Constant	Internal
	Well testing and work-over planning	Occasional	Internal
	Supervision of well work-over	Occasional	Outsourced
	Supervision of new well drilling	Occasional	Outsourced
Gathering System	Operational monitoring of the gathering system	Constant	Internal
	Physical inspection of the gathering system	Frequent	Internal
	Monitoring for any leaks, safety concerns or parts that need repair	Constant	Internal
	General maintenance of the gathering system	Periodic	Internal
	Maintenance of any compressors	Periodic	Internal
	Equipment servicing - separator to processing plant	Periodic	Internal
	Pigging the gathering system	Occasional	Internal

Gas Processing	Monitoring incremental operations through SCADA	Constant	Internal
	Checking gauges to ensure proper temperatures and pressure level readings	Constant	Internal
	Taking samples to check quality and making adjustments if results are unsatisfactory	Frequent	Internal
	Keeping logs and records of the gauges and test results.	Constant	Internal
	Checking and replenishing amine, glycol, and other consumables	Frequent	Internal
	Monitoring for any leaks, safety concerns or parts that need repair	Constant	Internal
	Conducting normal maintenance and minor repairs	Frequent	Internal
	Coordinating internal staff and external contractors involved in major repairs and major maintenance activities	Frequent	Internal
	Conducting major repairs and major maintenance	Occasional	Outsourced
	Alternating use of leak monitoring techniques (e.g. visual observation, soap bubble test, portable detectors, and fixed monitoring equipment)	Frequent	Internal
	Practicing emergency plant shutdown procedures	Periodic	Internal
	Reviewing rescue operations, notification procedures, and related matters	Periodic	Internal
General	Safety Training	Frequent	Internal
	Environmental training	Frequent	Internal

In order to perform those tasks on a continuous basis to supply the required fuel to the power plant, the staffing plans were developed as shown in the following sections 4.6.1 through 4.6.3 with those staffing plans; the following organizational structure was created.

Figure 3: Gas Business Unit Organization Chart



Based upon an earlier organizational structure included in the Sustainability Report, a preliminary financial analysis showed that the project was profitable even with a significant number of expatriates, so the involvement of foreign staff or firms is not precluded from a financial perspective. An update of those staffing requirements was set forth in the subsequent deliverable 1-8, Joint Report on Capability and Needs Assessment of MoM. The re-structuring of the line staffing resulted in two groups, Exploration & Production (E&P) and Mid-stream teams. That re-organization, shown in the chart above and discussed in more depth below and in section 4.7, both increased the specialization of the line staff but also slightly decreased the number of staff, with a reduction of the staffing costs.

As further discussed in section 4.6.4, the Operation Team (OT) will be in charge of the new Gas Business Unit (“GBU”) to operate the SGDP, and Figure 3 presents the proposed organization chart for the GBU. The E&P team will have 7 persons including the manager; the Midstream team will include 17 persons, the manager, 12 persons in the plant (since it will need 3 shifts of 4 persons each) and the mechanical maintenance team. The Finance area should have 4 persons and the rest of areas include 22 professionals. In total the GBU is planned to start operations with 51 persons excluding the security staff.

4.6 Develop Personnel Position Descriptions, Recruitment Plans, and Detailed Systems Definitions

That staff needed to operate the GBU can also be segregated into three groups based on their general responsibilities: Line Staff, Management Staff and Support Staff. The position descriptions for each of those personnel are reviewed in the following sections.

4.6.1 Line Staff Requirements

This first staffing plan covers the line workers in the field and gas processing plant who will perform the actual operations and maintenance work together with ideal experience levels and position role.

This typical line staffing arrangement will provide for appropriate coverage for a 24 hour operation of the gas supply facilities and is designed to provide full operations and maintenance support along with

training for both experienced and inexperienced personnel. The level of staffing assumes that all of the facilities are designed and constructed with the latest technology and extensively employs computer systems to monitor and control the industrial processes, i.e., supervisory control and data acquisition ("SCADA") systems.

The SCADA centralized systems should monitor and control all the related facilities from the well head through the gathering system as well as the numerous processes in the gas processing plant, such as the sulfur removal, dehydration, and regeneration of the amine and glycol solutions. Additionally, the majority of the control actions would be performed automatically by programmable logic controller ("PLCs") or remote terminal units ("RTUs"). Generally, the PLCs are utilized in the field work since they are more economical, versatile, flexible, and configurable than special-purpose RTUs. Then RTUs would be connected to sensors throughout the gas "sweetening" process, generating digital data from the sensor signals and sending that data to the supervisory system. With the high level of automation, the human interaction would be limited to host control functions such as basic overriding or supervisory level intervention.

Such high levels of automation both improve the overall operational result as well as reducing the number and skill level required of the work force. From an operations perspective, the staff would generally be focused on ensuring that there are no errors in the data collected and relayed to the supervisory system (e.g., that the temperature and pressure level readings shown in the control room actually match the analog readings in the field and in the plant). The staff would ensure the timely addition of the make-up amine, glycol, and other consumables.

Table 2: Line Staffing

Gas Wells, Gathering System, & Processing Plant Operations & Maintenance: Line Staffing			
Position	Number	Ideal Experience Years	Functional Role
Senior Lead Operator – E&P	1	7	Provides management of routine operation of the wells and coordinates with operational requirements. Responsible for scheduling and supervising personnel on shifts and addressing health, safety issues, environment and on-the-job training.
Exploration Engineer	1	7	Assist engineering and other personnel to solve well operating problems; directs and monitor the completion and evaluation of wells, well testing, or well surveys; monitors production rates, and plans rework processes to improve production; analyzes data to recommend placement of wells and supplementary processes to enhance production.
Production Engineer	1	7	Manages the reservoir and well interface, including perforations, sand control, downhole flow control, and downhole monitoring equipment; evaluates artificial lift methods; and selects surface equipment to separate any fluids

Operator II	1	4	Leads routine operation work of all facilities from wells to the processing plant; assists in solving operating problems
Operator III	1	2	Daily checking of each producing well for condition, meter (pressure, flow) function, check gathering lines/gathering point interconnect condition and meters, periodic walk/drive of transmission line to gate of processing plant(s); minor repairs
Operator Trainee	1		Entry level – basic checks and data recording, log sheets, routine simple reports
Lead Operator – Mid-Stream	3	7	Provides management of routine operation of all gathering and processing plant facilities and coordinates with maintenance requirements. Responsible for scheduling and supervising personnel on shifts and addressing health, safety issues, environment and on-the-job training.
Operator	3	5	Supervises the control room and plant work. Handles shutdowns and start-ups.
Operator II	3	2	Daily checking of gathering systems and processing plant facilities for condition, meter (pressure, flow) function, check gathering lines/gathering point interconnect condition and meters, periodic walk/drive of transmission line to gate of processing plant; minor repairs, daily reports submitted to Mid-Stream Manager.
Operator Trainee	3		Entry level – basic checks and data recording, log sheets, routine simple reports
Maintenance Superintendent	1	5	Organizing and supervising supporting all Maintenance and maintaining the computerized maintenance management system (CMMS).
Mechanical Maintenance Technician	1	3	Routine maintenance and equipment overhauls, minor repairs, welding, recording job tickets and supporting the computerized maintenance management system (CMMS).
Senior Instrumentation Technician	1	3	Calibration and basic repair of pressure flow meters; trained by meter manufacturers / suppliers. Loop-checking, commissioning, call out on emergency & start up, preventive maintenance, troubleshooting of general field measuring equipment and final control elements.

Heavy Equipment Operators	1	4	Operating construction and industrial equipment, e.g., forklifts, graders, dump trucks
Line Operations Total	<u>22</u>		

From a maintenance perspective, the staff would perform minor repairs and overhauls and support major repairs and overhauls to ensure that all the components function fully and efficiently. Additionally, they would monitor the integrity of the system to ensure that there is no safety or environmental hazards that could harm people or property.

That maintenance would include a special focus on constantly monitoring for leaks from the wells through the processing plant and the delivery to the power plant. Substantial leaks of the natural gas before processing would be an economic loss and depending on the raw gas composition, could be a safety and environment hazard, if the hydrogen sulfide level is high. Once the gas reaches the processing plant, the "sweetening" process will produce a concentrated hydrogen sulfide gas stream after its separation from the methane. In view of the toxicity of the concentrated hydrogen sulfide, it will be critical to prevent and immediately remedy any leaks. Accordingly, training for safety and environmental awareness and responses (such as emergency response drills) will be a continuous activity.

4.6.2 Management Staff Requirements

The following staffing plan shows the management team needed to supervise line and the support staff. The design assumption for the line staff plan above is that AGE management will be the ultimate managers of the facilities and operations. Since it has been several years since AGE managed a gas processing plant capable of supplying the power plant, external expertise will probably be needed the early years of operation.

The following plan is based on a typical private sector structure for a large, complex industrial facility and assumes that qualified employment candidates are readily available. The professional experience years and functional roles indicated are ideal, not minimum, levels.

There are probably many capable candidates for these positions in Afghanistan or in the Afghan expatriate community who might be persuaded to return to the country. The prospect that such good candidates exist is supported from the experience of Da Afghanistan Breshna Sherkat (DABS) in successfully recruiting management and other staff within and outside of the utility industry who were able to function effectively immediately or with some external expert support.

Although the individuals recruited might not have fully fitting experience, appropriate expert support could help to fill any gaps in training or experience. In technical areas, some of which would be significantly automated, development of key skills to be developed would focus on dealing with "exceptional developments" while maintaining continuous, safe and environmentally clean operations. Such exceptional developments could include unexpected major equipment failures, recovering from significant security breaches, and legal disputes. Significant infrequent operational matters that would require major management attention could include major overhauls while avoiding supply disruptions or gas field development or expansion with new well drilling and increasing gathering and treatment capacity.

Table 3: Management Staffing

Gas Wells, Gathering System, & Processing Plant Operations Maintenance: Management Staffing			
Position	Number	Ideal Experience Years	Functional Role
General Manager	1	15	Executive management of natural gas extraction and processing; \$ (financial information omitted) capital project; \$ (financial information omitted) revenue operation: Oversees all operational issues: technical, business, financial, profitability, contracts, human resources, safety, relations with public, community, government, etc.
Administration Manager	1	7	Oversees the Accounting, Administrative Support, HR, IT, and Procurement functions
Exploration and Production Manager	1	10	Oversees overall daily gas wells operations per production plan. Directs people, materials, equipment and tools. Coordinates maintenance and establish operating and control procedures. Engineers improvements/expansions of existing facilities to solve production and operational issues.
Mid-Stream Manager	1	10	Oversees overall daily gas gathering systems and processing operations per production plan. Directs people, materials, equipment and tools. Coordinates maintenance and establish operating and control procedures. Engineers improvements/expansions of existing facilities to solve production and operational issues.
Health, Safety & Environment Supervisor	1	7	Produces Health, Safety & Environment manual, provides training, conducts incident investigations and reports
Finance and Legal Manager	1	5	Prepares month/quarterly and year end reporting, group budget and forecast. Prepares procedures for operational expenditure, gas production value, track Capital Expenditures and Operating Expenses, maintains and improves manual & automated financial systems. Oversees the
Internal Auditor	1	5	Audits and reports to Board of Directors, Board of Supervisors, or other top level oversight group
Security Manager	1	10	Administers overall security policy, planning, management, scheduling, recruiting, dealing with APPF
Management Total	<u>8</u>		

Another key role of management is assuring that ongoing development of line and support staff capabilities through both formal and “on the job” training. Ongoing staff development at the technical/professional level as well as the administrative support level is essential for performance that meets gas industry standards.

Some technical positions, particularly for the gas processing operations, such as Senior Instrumentation Supervisor and Health, Safety, and Environment Supervisor, may not be able to be filled locally due to a lack of qualified or recently experienced local staff, although expatriate Afghan candidates may be available. If prospective local candidates can be found, then significant training from external experts may be required, as there have been no operating gas processing plants in Afghanistan since 1988, and even those plants were different than current designs. Moreover, gas production has been very limited and newer reservoir engineering and operations techniques have not been introduced.

4.6.3 Support Staff Requirements

In the support staffing plan below, the staffing is intended to be completely local although a few of the top security positions assume the use of some expatriates. The largest staff number by category is security, using personnel from the Afghan Public Protection Force (APPF). That staff might be considered as outsourced support rather than project support employees but given the large number, it was deemed important to identify them here.

Again, the professional experience years and functional roles indicated are ideal, not minimum levels.

Table 4: Support Staffing

Gas Wells, Gathering System, & Processing Plant Operations Maintenance: Support Staff			
Position	Number	Ideal Experience Years	Functional Role
Accountant	1	5	Bookkeeping, accounting, payroll, reconciling gas volume reports and billing
Administrative Support	6	5	Communication, filing, records
Drivers	5	1	Driving
Finance	1	2	Budgets, forecasts, treasury functions
HR	1	2	Personnel induction, training and forms
Health, Safety, Environment	1	2	Incident reporting, safety training, audits
IT	1	2	Network management, administration of accounts, computer set-up
Contract and Legal Affairs	1	5	Routine legal drafting and contract review, interpretation, implementation, and first level dispute resolution.
Community Relations	1	5	Spokesperson for the project represents the project at community meetings, press releases, escalation to General Manager as needed.
Medical staff	1	5	Simple and urgent medical care, referrals as needed
Procurement Supervisor	1	5	Handles procurement and inventory management
Procurement	1	2	Bids, quotations, records. Delivery, storage, inventory, and clearing customs for goods, tools, and consumables.
Support Staff Total	<u>21</u>		

There are two other groups of support staff that are not listed because it is expected that they should be supplied and managed externally – food services and domestic services. There is an Office/Camp Manager and he or she will be responsible for coordinating the provision of food services and domestic services. Since managing those services is not aligned with the typical O&M for the gas wells, gathering systems, and gas processing facilities, it was considered preferable to outsource that work to private sector entrepreneurs, like a restaurant or hotel that specialize in those services. Costs for those services are included in the O&M budget.

4.6.4 Recruitment

As previously indicated, the SPMT will operate as an initial operations and maintenance recruitment and capacity building team. They can build upon the prior work of SGGA in the Joint Report on Capability and Needs Assessment of MoM, (Deliverable 1-7), which helped identify some potential candidates as well as the Three-Year Joint Capacity Enhancement, Training, and Mentoring Program with Expat to Afghan Transition Plan, (Deliverable 1-9), to provide supplemental training.

As discussed in summary in section 4.7 and in detail in the Joint Report on Capability and Needs Assessment of MoM, (Deliverable 1-7), which helped identify some potential candidates as well as the Three-Year Joint Capacity Enhancement, Training, and Mentoring Program with Expat to Afghan Transition Plan, which creates the capacity building program, there are arrangements to recruit and train candidates for the positions required for the long-term, successful operations of the SGDP assets.

In order to launch the new Gas Business Unit ("GBU") to operate the SGDP, there are plans for the creation of 3 teams: 1) a Monitor Team ("MT") for the drilling activities and processing plant construction, [in the case of the drilling monitor SGGA will call them the "Oversight Field Representative ("OFR")"]; 2) the Negotiation Team (NT) and; 3) the Operation Team (OT). The MT will be in charge of oversight of the work activities of the Drilling Contractor and the Processing Plant Contractor. The NT will be in charge of the sale/purchase agreement negotiation between the involved parts in this project (GBU, DABS and the IPP). Finally, the OT will be formed by all the future workers of the GBU to operate the gas supply facilities.

The recruitment for the MT, NT, and OT must begin at a time that is sufficient to complete the hiring, training, follow-up assessment and, if needed, the engagement of supplemental experts before the activity of each team commences. It is also important to not have capacity building too early so that there could be deterioration of knowledge and skills. Accordingly, the training for the critical gas processing work that includes the safe removal of impurities, like the poisonous H₂S, must be delivered adequately and timed properly to optimize the training effort and learning results. Ultimately, the full details on the recruitment program design and implementation will be the responsibility of the SPMT.

4.6.5 Detailed Systems Definitions

For capital-intensive industries, their physical assets (infrastructure, equipment, and buildings) comprise a very substantial proportion of the total assets of the organization. In mature market these industries face intense competitive from competitors so the proper handling of the high value assets and equipment is essential since each failure is both disruptive and costly. Additionally, these companies must also comply with stringent regulations for occupational and environmental safety protection. So it is important for these organizations to maximize the return on investment from their asset base. The paradigms employed to achieve that goal are Life Cycle Asset Management (LCAM) and Enterprise Asset Management (EAM).

For each major physical asset, the objective of LCAM is to obtain that asset's maximum productivity while minimizing the total costs for the acquisition, operations, and maintenance. The objective of this asset management approach is to achieve the optimal balance between maximizing an asset's Overall Asset Productivity but minimizing its Total Cost of Ownership. Furthermore, LCAM provides guidance on whether it is more cost-effective to continue to maintain, overhaul or replace a failing asset.

EAM applies when the organization's entire asset portfolio is considered. Where business and market requirements are dynamic, the organization's assets should change to adapt to the changing output specifications (e.g., increasing output capacity in response to added customers). Through EAM's framework for capital and labor allocation, the appropriate decisions can be made to meet business needs across the competing priorities of equipment addition or reduction, replacement, over-hauling, redundancy setup, and maintenance budgets. EAM aggregates the LCAM efforts and reviews decisions based on the long and short-term economic considerations at the enterprise level.

While the Afghan economy and the energy industry are working to stabilize and grow, and the SGDP does not currently face domestic competition, it will be under scrutiny from a power generation price perspective. To be accepted and supported, the project should be a global class operation that produces power at a regionally competitive price. In order to achieve that goal it should utilize global class operational tools including the proper asset management systems to provides insights for all of the enterprise assets, their conditions and work processes, for better planning and control in the following areas.

1. Manage asset deployment, specifications, monitoring, calibration, costing and tracking from a single system perspective;
2. Provide enterprise asset management for long and short-term planning, preventive, reactive and condition-based maintenance, schedule management, resource optimization and key performance indicators;
3. Plan inventory to meet maintenance demand, making the right parts available at the right location when needed; and
4. Manage vendor contracts with comprehensive support for purchase, lease, rental, warranty, rate, master, blanket and user-defined contracts.

There are a number of systems that will be required for efficient and economical operation of the assets and the business. The some asset management systems are essential but will depend on the final design and construction of the project assets include:

- SCADA system - the centralized systems to monitor and control all the related facilities from the well head through the gathering system as well as the numerous processes in the gas processing plant, such as the sulfur removal, dehydration, and regeneration of the amine and glycol solutions.
- Computerized maintenance management system (CMMS) system - a computer database of information about an organization's maintenance operations to help maintenance workers do their jobs more effectively (e.g., determining which machines require maintenance and which storerooms contain the spare parts) and to help management make informed decisions (e.g., calculating the cost of machine breakdown repair versus preventive maintenance for each machine, possibly leading to better allocation of resources). That CMMS data may also be used for regulatory compliance.
- Safety and environmental controls – the physical plant assets and the staff plus the people in the community must be protected from the hazards of working with the highly flammable methane being produced, the highly toxic H₂S being removed from the raw gas, as well as the high temperatures and pressures of the operating processing plant. These systems must take coordinated action to detect risks: leaks, excessive temperatures, and pressures; and then respond with preventative or remedial actions.
- Management Information Systems - Further, there will be additional systems such as Financial or Contract Management, Accounting, IT, Human Resources, required to make the entity, or entities, fully operational. While most of the systems would probably be internal, it is possible that to outsource the operation of certain systems, where the work is only performed occasionally,

requires a sophisticated system or training, or otherwise is more cost effectively or efficiently performed by a third party.

Until the drilling is completed and the gas processing plant is designed and constructed based on the gas specifications, it is not feasible to fully identify the systems for the gas gathering systems and the gas processing plant. Further, the well completion work as well as the gas gathering systems and the gas processing plant work will be tendered on a full turnkey, design-build basis, so the specific structures and their operations cannot be foreseen. As part of the gas gathering systems and the gas processing plant tenders, the bidders will prepare and submit their proposals and prices, which will also include training on those operational designs and equipment.

Since all of the well drilling, gathering system and processing plant design and construction will be done on a turkey basis with each bidder proposing their specific system and facilities design, it is not reasonably possible to accurately forecast the system definitions with precision. For example, without the precise facilities and SCADA system design, it is not feasible to select an appropriate CMMS or safety and environmental controls for the assets.

In the absence of those specific designs, it is possible to establish criteria for those systems. Those criteria could then be used in the bid evaluation process.

The key criteria for the physical asset systems includes: Interconnectivity, Redundancy, Independence, and Common usage.

Interconnectivity—The system devices that connect applications to a control network must be able to work harmoniously with the other systems so the operational data can be shared and utilized by the control system. Rather than having devices, such as PLCs or RTUs, which will only work in exclusive manner with one or two devices or systems, it should be capable of being utilized by other systems as appropriate. For example, a remotely activated solenoid on a flow control valve should be accessible by the control room SCADA system for operational adjustments, by the safety system for shutdown in the event of a fire or similar issue, and by the environmental system in the event of an actual or suspected leak.

Redundancy – the duplication of critical components or functions of a system with the intention of increasing reliability of the system, usually in the case of a backup or fail-safe. An error or breakdown in one component may then be addressed by the redundant component. In a redundant system, the system has two sub-components, both of which must fail before the system fails. Since each one rarely fails, and the sub-components are expected to fail independently, the probability of both failing is calculated to be very small.

Independence – critical components or functions of a system must be able to operate in isolation when necessary so that a single failure does not have a cascading effect on the facilities. For example, there should be battery back-up for key systems to operate when power losses occur. Also, when there are redundant safety systems with battery back-up, each redundant safety system should have its own battery rather than a shared battery so that the systems are truly independent.

Common usage - critical components of a system should be readily available from multiple sources, in order to avoid over-reliance of a proprietary system or device. Initial costs savings at construction or exceptional operational capabilities from a rare and difficult to replace device or software could expose

the projects to risk of reduced or halted operations if the device or software did fail and could not be readily replaced with commercially available replacements.

In addition to physical operations, it is essential to have the appropriate systems for the management and support of the business and staff. Those systems include Contract management, Financial Management, and Human Resources. Since it is not clear how the entity or entities will be structured, it is difficult to provide detailed system definition. For example, if the E&P work and assets are handled separately through an exploration and production contract by one private company, the systems it needs and can afford may be much different than the systems selected if the entire project is handled as a vertically integrated project with a common owner/manager.

It is possible to provide some preferred criteria for system based on vertically integrated project with a common owner/manager. If a different arrangement is selected, then the criteria could be modified so appropriate.

Contract management – The system should ideally be digitized and have the following capabilities:

- Central Repository for Documents & Data with Search Capabilities
- Tracking & Email Alerts
- Standard Reporting with Customizable Dashboard
- Document Routing
- Workflow Module
- Contract Authoring Module

Financial Management - The system should ideally be digitized and have the following capabilities for Budgets, Billing and Reconciliation, Procurement, Payroll, Accounting, and Reporting:

Financial Accounting

- Give full financial visibility into payables and receivables with real-time access to outstanding invoices and bills
- Provide revenue recognition according to relevant contracts and ensure accounting control in accordance with applicable accounting standards
- Streamline financial planning and accounting processes using amortization schedules, such as amortizing pre-paid expenses
- Ensure strong financial compliance by continuously maintaining a complete audit trail on all entries and changes
- Simplify the period-end close process by using automated allocations and currency management tools
- Reduce the reconciliation burden through a financial system that does not require sub-ledgers and is continually updated.

Fixed Asset Management

- Easily track and manage depreciating or non-depreciating company assets
- Support all standard depreciation methods and unlimited custom depreciation methods
- Post depreciation and asset retirements directly to accounts
- Report comprehensively across assets, valuation, and depreciation.

Financial Dashboards, Reporting and Analytics

- Monitor and manage the financial performance using real-time dashboards including key revenue, expense, and receivables metrics
- Real time optimizing of cash management, reporting, analysis and allocation at the parent and subsidiary level

- Provide multiple standard reports, including income statements, balance sheets, consolidated reports, variance reports and side-by-side comparisons as well as support customized financial reports.

Procurement Workflows

- Streamline workflows with end-to-end support for procurement-to-pay processes.
- Reduce errors and improve productivity by ensuring that all users in all departments are working with the same data.

Human Resources-The system should ideally be digitized and have the following capabilities:

Administrative Functions

- Personnel Management
 - Time & Attendance
 - Benefits Administration
 - Compensation Management
 - Safety Management
 - Applicant Management
 - Job Profiles
 - Query Based Report Writer
 - Auditing Capability

Operational Functions

- Performance Appraisals
- Position Control
- Training Administration
- Process Triggers
- Workflows

Strategic Planning Functions

- Ready access to data for HR planning and managerial decisions making
- Monitor and manage the human resources based on real-time dashboards
- Organizational Development and Succession Planning

Expedited Employee Support with Employee Self Service Functionality

- Enter and edit personal information such as address, phone, emergency contact, etc.
- Enter Work time and view a current or past paycheck to see taxes, social insurance, or other deductions.
- Submit and track expense reports.
- Select benefits where choices are allowed.
- Access HR policy manuals
- Receive company communications and updates.
- Take assessment tests to identify training/development needs.
- Review personal performance appraisal records and schedules.
- Review and plan professional development activities.
- Enroll and participate in training delivered via the company's network.
- View the skill requirements for posted jobs and compare those skill requirements with the individual's skill profile.

4.7 Develop and Implement Capacity and Capability Building Programs

The development of the Sheberghan gas fields and related infrastructure, including increased electricity generation and transmission, is a shared objective of the USG and GIRoA. To achieve this objective,

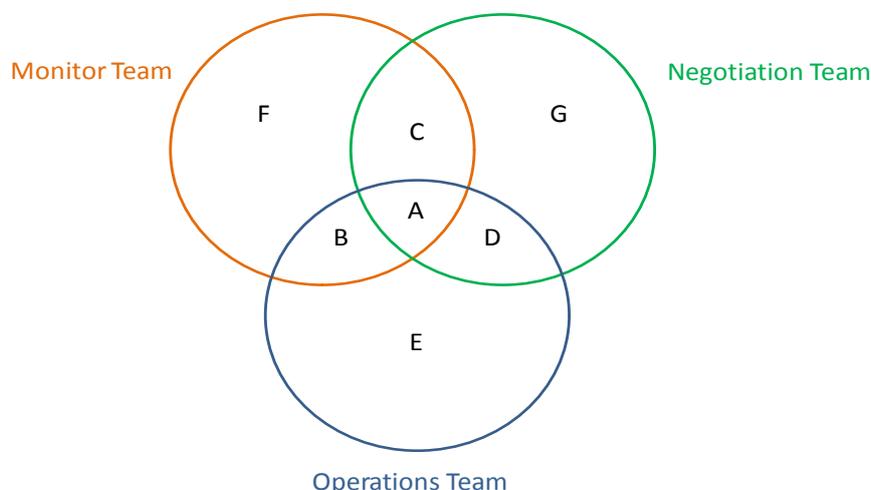
among other responsibilities, the project has to will implement a "Training and technical assistance and capacity enhancement to the MoM, particularly the Afghan Gas Enterprise (AGE) (or other appropriate corporate entity), the Northern Hydrocarbons Unit (NHU) and the Policy and Planning Department (PPD), including other government or non-government entities actively involved in Sheberghan Gas Field's development such as power utility Da Afghanistan Breshna Sherkat - (DABS) and Ministry of Energy and Water (MEW) as relevant to the activities of Sheberghan Gas Development Program (SGDP), including the sale/purchase of gas and power."

According to subsection "b" of Task 1), SGGA will "develop a comprehensive, three-year capacity enhancement, training and mentoring program for MoM staff and other GIRoA agencies and personnel working on Sheberghan Gas Development Program (SGDP)... Such capacity building may include, but not be limited to (among another skills required to successfully implement the SGDP) strategic planning, organizational structure and performance, engineering capability, environmental compliance and monitoring, procurement capability, electrical grid optimization, transmission analysis and forecasting, least-cost planning of gas infrastructure development, reserves delineation and quantification, gas network optimization, energy and operational efficiency and investment promotion".

In order to launch the new Gas Business Unit ("GBU") to operate the SGDP, there are plans for the creation of 3 teams: 1) a Monitor Team ("MT") for the drilling activities and processing plant construction, [in the case of the drilling monitor SGGA will call the "Oversight Field Representative ("OFR")"]; 2) the Negotiation Team (NT) and; 3) the Operation Team. The MT will be in charge of oversight of the work activities of the Drilling Contractor and the Processing Plant Contractor. The NT will be in charge of the sale/purchase agreement negotiation between the involved parts in this project (GBU, DABS and the private IPP).The OT will be formed by all the future workers of the GBU to operate the gas supply facilities. The following Venn diagram presents the interrelations between these three groups.

The mentioned interrelations form seven areas or seven groups of people and it is clear that an efficient capacity building has to concentrate primarily in the region "A", then B,C and D, and afterwards, regions E, F and G. An explanation of each one of these areas is:

Figure 4: SGDP Groups for Capacity Building



- **Region A:** Formed by the persons that can be part of three groups, for example, a Drilling Engineer can be part of the OFR (the monitor team in drilling), also participate in the contract negotiation and, finally, be part of the GBU in the future.
- **Region B:** Formed by the people that can be part of the Monitor Team and the Operations Team, for example, the Midstream Engineer that will monitor the construction of the Plant and, in the future, be part of the GBU.
- **Region C:** Formed by the people that can be part of the Monitor Team and the Negotiation Team, for example, a person who will monitor the contractors activities and will be part of the contract negotiations but, will not work in the GBU.
- **Region D:** Formed by people who will be part of the Negotiation Team and can be part of the GBU, for example, a lawyer who will not monitor the contractor's activities.
- **Region E:** Formed by people who will only work at the GBU, mainly the support staff (accountant, drivers, etc.).
- **Region F:** Formed by people who only will be part of the monitor team
- **Region G:** Formed by people who will only be part of the negotiation, for example, a high level servant of the MoM.

The TYCE proposed is based in three principles: simplicity; flexibility and accuracy. In that sense there are three areas proposed:

- 1) working expats of SGGA will have an office in the involved Afghan institutions for this project for a regular basis work. The rationale is that it is an efficient way to pass along some experience from the expat to the Afghan professionals in doing some work together;
- 2) training by expats in Kabul, the objective is to pass along the information and procedures (related to SGGA) done by the expats to the Afghan professionals, which can be done by regular class room sessions in the Afghan institutions; and
- 3) intensive training sessions completed in advance of each of the related critical milestones of the SGGA project.

The OT will be in charge of the GBU, which will not be fully staffed, particularly at the line and support staff levels until the project assets are closer to completion. The exploration and production ("E&P") staff will have 7 persons (including the manager). For the Midstream group there are 17 persons, the manager, in the plant 12 persons (based upon 3 shifts of 4 persons each) and the mechanical maintenance staff the Finance area has 4 persons and the rest of areas with 22 persons. In total, the GBU is planned to start and manage operations with 51 persons, not counting the security staff.

The NT is planned to have the following professionals: Drilling Engineer; Business Development Lead; Legal Services Lead; Project Finance Lead; Energy Financial Analysis Lead and; and the Engineer Lead, a total of 5 persons.

The MT will be in charge of the OFR and in the future can offer advice to the Midstream activities in the GBU. Providing advice to AGE and NHU, now known as the Oil & Gas Survey ("O&GS"), the OFR should include the following professionals: Drilling Engineer, Geologist Engineer, Well Testing Engineer, Senior Exploitation Engineer, Operation Engineer and a Plant Engineer, a total of 6 persons.

With all this inputs, the following tables were constructed to present the general view of TYCE for the period 2013-2016. A detailed description of each activity can be found in the main text of the TYCE deliverable.

Each of the teams described previously is represented by a different color: 1) The Drilling in the Gas Sector (in yellow); 2) The Gathering System and the Processing Plant (in green) and; 3) the Business

transactions (in blue). Also, the specific and important milestones for the project are highlighted in red and (because of its nature) these milestones are not associated with any target group, those are only a reference for the rest of activities. Also, is important to note that there will be Target Groups for specific capacity building areas related to the three teams described above.

The following tables summarize the Capacity Building plans for the period 2013 - 2016.

Table 5: Capacity Building Plan for 2013

2013	Target Group	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13
Drilling in the Gas Sector													
Training Drilling Course	OFR/Contract Manager												
Helps Bid Evaluation and Financial Analysis	OFR/Contract Manager												
Tender: Contract Award/Finalization													
Oversight Well Rehabilitation Work	OFR/Contract Manager												
Oversight Well Drilling Work	OFR/Contract Manager												
Gathering System & Processor Plant													
Select Expert Teams 2-4 professionals	Midstream Manager												
Training in Gas Gathering, Gas Compression, Gas Processing, Gas Sweetening, Sulfur Plant	Midstream Manager												
Travels to Turkmenistan or some other country with a sour gas processor plant for three month internship	Midstream Manager												
Select trainees and give training courses	Midstream Operators												
Help Monitor Construction TFBSO/ADB Plant	Midstream Operators												
Help start-up TFBSO/ADB plant	Midstream Operators												
Involvement in Midstream Tender Preparation	Midstream Manager												
Involvement in Bid Selection leading to Bid Award in May 2014	Midstream Manager												
Business Transaction													
Courses													
1. Economic modeling of E&P investment	MoM												
2. Energy Project Development	MoM												
3. Economic fundamentals of Natural Gas Markets	MoM												
4. Contract Negotiation	MoM/DABS/MEW												
5. Power fundamentals	DABS/MEW												
6. Contract management in Power Sector	DABS/MEW												
7. Legal aspects in the energy sector	MoM, DABS/MEW												
8. General Management- Course	MoMDABS/MEW												
Select Expert Team (10 - 15) professionals	Negotiation Team												
Intense Negotiation Preparation	Negotiation Team												

Table 6: Capacity Building Plan for 2014

2014	Target Group	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14
Drilling in the Gas Sector													
Oversight Well Rehabilitation Work	OFR/Contract Manager												
Oversight Well Drilling Work	OFR/Contract Manager												
Contractor Demobilization & Project Closeout													
Oversight Reserves Report	OFR/Contract Manager												
Select E&P Manager + Engineers	E&P Manager + Engineers												
Additional Courses	E&P Manager + Engineers												
Select E&P Team	E&P Manager + Engineers												
Gathering System & Processor Plant													
Involvement in Bid Selection leading to Bid Award in May 2014	Midstream Manager												
Contract Award / Finalization													
Involvement with Design pre-construction work Review Process Design	Midstream Manager												
Assist and monitor in plant construction	Midstream Operators												
Business Transaction													
Negotiation of Gas Supply Agreement (DABS/AGE)	Negotiation Team												
Select Support Personal of GBU	General Manager + Finance Team												
IPP Financial Closing													

Table 7: Capacity Building Plan for 2015

2015 - 2016	Target Group	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Q1 2016	Q2 2016	Q3 2016	Q4 2016
Drilling in the Gas Sector																	
Assist and monitor in plant construction	E&P Team																
Monitor operation during one year of plant contract operation by the Contractor	E&P Team																
Gathering System & Processor Plant																	
Assist and monitor in plant construction	Midstream Team																
Gas Gathering and Processing Commercial Operations Date																	
Monitor operation during one year of plant contract operation by the Contractor	Midstream Team																
Business Transaction																	
Assist and monitor in plant construction	General Manager + Finance Team																
Monitor operation during one year of plant contract operation by the Contractor	General Manager + Finance Team																
Start Operations	General Manager + Finance Team + Support Personal																
Transfer of the System to the owner	General Manager + Finance Team + Support Personal																

4.8 Develop and Apply Lessons Learned from the Corporatization of the Afghan Electric Power Utility DABS.

Upon request, the former chief of Party for the SGGA project reviewed the undertakings and operations DABS and then summarized the major concerns and suggested actions to improve DABS operations in becoming a commercially viable and electric utility.

- DABS’ mandate is too broad:** The responsibility to supply electricity to every customer in Afghanistan is not a realistic mandate for a utility that is required to become commercially viable within a short period of time)

Solution and discussion: It is highly preferable to reduce DABS’ responsibility to supply electricity to only customers in service areas that either are, or can be, grid connected in the near term (about 5 years). Those service areas could be NEPS, SEPS and Herat (or initially NEPS only). Rural electrification is not commercially viable during the foreseeable future and should not be the mandate of a commercial utility. Instead, the Ministry of Rural Rehabilitation and Development or a purpose established rural electrification entity could be the custodians for rural electrifications since principles for developing rural electrifications are completely different from commercial utility operations. Without some restructuring of DABS mandate, DABS may find it difficult to succeed because it is not realistic to expect any utility, regardless of experience, to manage all of the responsibilities that have been given to DABS. Instead, DABS should become a utility holding company with NEPS, SEPS and Herat as separate utilities in which Commercialization Management Contracts could be selectively used. Thereby, the GIROA would not lose the “sovereign” oversight of power supply sector.
- The DABS Board of Directors (BoD) is not in a position to adequately guide the CEO and DABS’ development:** To guide DABS’ development, the BoD must have substantial utility operations and commercialization expertise. It is unrealistic to expect ministers from unrelated fields, who are extremely busy, to be able to comprehend the complex issues concerning utility operations and development options to assure commercial viability.

Solution and discussion: The BoD of DABS should contain at least two members with deep utility management expertise, especially in technical/operational and commercial areas that need to be covered. That expertise is not available in Afghanistan and within the ministries populating the BoD. The select ministries, i.e., MoF and MEW, should contract with international experts directly or through a “sister” utility arrangement to represent their interests and guide DABS development. The ministers could continue to be the voting members, but the experts should

analyze and monitor DABS operations to ensure that realistic commercialization objectives are set and the required changes are made to achieve these objectives.

- 3) **Inadequate staffing and capabilities of DABS:** DABS is inadequately staffed and organized to achieve the commercialization mandate and cannot be expected to fulfill its charter.

Solution and discussion: DABS' mandate should be limited to commercially viable operations and expansion of service in assigned geographical service areas. Setting up separate utility operations in NEPS, SEPS and Herat would improve the likelihood that commercially viable operations can be achieved within a reasonable period of time. The build-up of staff and assessment and improvement of staff capabilities is a difficult and time consuming process. The process should include a clearer career path for staff being recruited or trained for utility operations. Also, a Management Contract mechanism, if properly designed and implemented, can offer an accelerated solution to improving utility operations while addressing the "sovereign" oversight issue. In Afghanistan, segments of the vertically integrated utility (such power distributions within one or more geographical service areas, i.e., Kabul, Mazar, Herat), could be placed under a Management Contract. Also, a separation of generation/power purchase from transmission or distribution operations is highly desirable to better define commercialization objectives and recruit and motivate professional staff. The current DABS structure may not be viable and could hinder commercialization objectives.

- 4) **Power sector's impractical division of responsibilities:** The prevailing division of responsibilities between DABS and MEW based on 2009 Memorandum of Understanding and between DABS, MEW and MoF appears to be an impractical and crippling arrangement.

Solution and discussion: The utility, or preferentially multiple utilities, should have full responsibility for electricity supply in their assigned service areas. This responsibility must include system expansion planning, engineering, design, construction and all operations. Where the utility or utilities lack capability then those capability deficits should be addressed through Technical Assistance agreements or through the application of Management Contracts to accelerate the capability building. MEW should be responsible for

- power sector policy planning and implementation;
- development of sector regulations to promote efficiency, accountability and transparency; and
- stimulate competition by attracting and facilitating private investment in the power sector.

The MEW should represent the interests of the GIRoA and the people of Afghanistan and should wisely guide the development of the power sector, while assuring the sector does not become a financial burden on GIRoA. The guidance should focus on assuring commercial viability of operations in designated areas is achieved. This guiding process inevitably should be an iterative process, since new, creative solutions need to be developed and tested in the real environment of Afghanistan.

- 5) **Irrational power system expansion:** The flood of grant money into the power sector in recent 8 years or so, without rational, utility based planning, resulted in each donor implementing projects only loosely guided by the Inter-Ministerial Commission for Energy (ICE). ICE cannot be a substitute for rational planning. The implemented projects frequently lack commercial viability/sustainability and true Afghan "ownership". Commercial principles of ownership and operations were never established, i.e. cost of service, operations and maintenance, facility renewal, least cost system expansion planning. Subsequently, ICE apparently has ceased operating in June 2012 due to funding constraints.

Solution and discussion: Afghan ownership of strategies, plans and assets is required. All new developments and projects in the power sector should be utility-centric, not donor-centric, because DABS does not have the required staffing and capability. DABS should be restructured and the areas of capability/capacity deficit should be bridged by utility-quality technical assistance, subcontracting or the use of Management Contracts.

Although there are many other issues that can be identified, the above summarizes the major problems facing DABS. Significant institutional and operational changes are needed in the power sector to improve commercial viability and sustainability of the utility or utilities charged with the supply and delivery of the electricity. Utility development and commercialization is a lengthy and complex process requiring constant monitoring and timely changes of course to minimize failure and maximize success. It possibly would be a catastrophic mistake to seek solutions to the existing problems by dismantling DABS or attempting to reintegrate it into MEW or any ministry. Some well-conceived and implemented changes outlined as above should contribute dramatically to the GIRoA achieving objectives of commercially viable and sustainable power supply in select geographical areas, not in the entire country.

Many of the foregoing lessons for DABS could be applicable to the GBU and any corporatization of AGE. Essentially, the most relevant lessons are:

- 1) Ensure that the BoD and executive management is able to comprehend the complex issues concerning utility operations and development options to assure commercial viability.
- 2) Restrict the organization's mandate to the work that it can successfully perform in the near future with the readily available labor and financial resources.
- 3) Address any technical capacity deficiencies with a proven approach such as a Technical Assistance, Risk Service (Management) Contract and/or Exploration and Production contract as appropriate.
- 4) Establish an operating company or companies with discrete objectives that the entity is or entities are fully empowered to perform while MoM focuses on investment promotion and regulation of the hydrocarbon sector.
- 5) The MoM should be more pro-active in defining and then implementing the projects offered by donors rather than allowing the donors to advocate, often in a conflicting manner, what the MoM should do.

5 Further Thoughts on the Gas Sector Development and Related Corporatization Efforts

It is obvious that the SGDP must be developed in compliance with the applicable laws and regulations, especially those of Afghanistan. Those laws, including the Hydrocarbon Law, may sometimes appear ambiguous and incomplete since laws often do not clearly address all possible situations. In particular, the laws don't seem to have contemplated or have been written to specifically address the situation of USAID funding to MoM for the SGDP.

Further, those laws can be subject to different interpretations. For example, the following is one extended interpretation of the Hydrocarbon Law. Assuming no ex post facto laws are applicable, any new E&P work and the gathering systems are deemed Hydrocarbon Operations, but Gas Processing is not. Further, it appears that those Hydrocarbon Operations require a contract and a license. A license is required for Hydrocarbon Operations and licenses are granted after the contract is approved, so a contract is apparently required first in order to proceed. Also, all Hydrocarbon Operations contracts are awarded through public tenders. Further, contractors must meet certain standards including a proven ability to contribute the necessary capital, machinery, equipment, tools and technical expertise for the better performance of the terms and conditions of the Contract. Arguably AGE or the new replacement corporation might not meet those standards; especially the proven ability to contribute the necessary capital for a large project subsequent to USAID/MoM's On Budget program is completed.

Although USAID committed to fund MoM for the SGDP, as the ADB and TFBSO are also funding new gas upstream and midstream facilities for MoM, there is an argument that the operation of those assets will require licenses that arise from contracts, which should be competitively bid. SGGA is not aware that any tender for the operations of the E&P, gathering systems, or gas processing facilities has been assumed by any project participants.

An alternative view relevant to SGDP is that the Hydrocarbon Law does not appear to explicitly prohibit ownership and operation of new Hydrocarbon Operations by the GIRoA, its ministries or their subdivisions. So, perhaps the Hydrocarbon Law does not apply to government owned or controlled entities.

Further, there are multiple efforts under way or in the formative stage that should be coordinated to avoid conflicts and optimize the results on an aggregate basis.

First, the MoM has been working on a Request For Proposals(RFP) for Consulting Services for Improving the Business Environment: Reform of the Afghanistan State Gas Enterprise and Consulting Services for Improving the Business Environment: Development of the Natural Gas Sector of Afghanistan, RFP No.: MoM/PMU/CT-II-44-1 and RFP No.: MoM/PMU/CT-II-44-2, respectively. The GIRoA was allocated grant funds from the International Development Association (IDA), part of the World Bank organization, for this work. The objectives of these works include:

"To assess, value, develop and implement commercialization and corporatization options for the improvement of the technical, financial and operational aspects of Afghan State Gas Enterprise ("Afghan Gas") a State owned enterprise (SOE). The primary objective is intended to be the establishment of a market-based Afghan natural gas company that is effective in the country's emerging natural gas market and may be transitioned to be in part or in full privatized. It is essential that

overall sector governance Gas issues be considered notably with emphasis on actions to take during this transition." -RFP No.: MoM/PMU/CT-II-44-1

"To identify and to implement strategic, institutional, and staffing improvements that will enable the Government of Afghanistan to facilitate the sound and long-term development of the country's natural gas resources and infrastructure based on market principles."- RFP No.: MoM/PMU/CT-II-44-2

As of February 3, 2013, SGGA contacted Director of Operations Mohammad Haroon Naim, who is the contact person for the two World Bank RFPs. He indicated that the work was still 2-3 weeks away from being awarded. SGGA explained that there is significant similarity between the RFP work and SGGA's responsibilities under our USAID contract. SGGA offered that it would like to coordinate with the selected party in order to work cooperatively and efficiently. Director Mohammad Haroon Naim welcomed the proposed joint working effort with winner of the RFP work and agreed to notify SGGA with a selection was made.

Based on the estimated 52 staff-months for the work by the 5 key professionals for the first RFP and the estimated 76 staff-months for the work by the 5 key professionals for the second RFP, the SGGA anticipates that these Consultants will roughly parallel the work of the SGGA staff. Given these future related efforts and prior related efforts including the work of Adam Smith International funded by the United Kingdom government's Department for International Development (DFID), SGGA will endeavor to coordinate and complement the work of the IDA funded consultants in order to both avoid confusion of MoM and optimize the results of the prior and future work efforts.

The effort by MoM to recreate a new corporation to replace AGE could be motivated by a few factors in addition to those previously listed. There is an apparent requirement for a permanent formal entity to execute document related to the Turkeminstan-Afghanistan-Pakistan-India (TAPI) pipeline project. Also, the TFBSO is seeking to have an entity to execute and perform gas supply contracts for CNG stations. Further, for a gas market development perspective, an ADB representative recently announced the bank's desire to perform a Gas Sector Master Plan.

Any future MoM corporatization evaluation should include some substantial legal analysis of the possible ways that all gas facility projects, especially donor funded projects by USAID, TFBSO and World Bank's IDA, be implemented and made operational to be consistent with current Afghan law. Alternatively, their efforts should facilitate some changes to the Hydrocarbon Law or regulations to eliminate any uncertainty as to the compliance of the projects to the applicable laws. In the event of project financing of a related project, such as the IPP buying gas from the Gas Business Unit, a clean legal opinion would usually be required stating that the project being financed and all related assets are in compliance with the applicable laws. A project which relies on a project financing for the funding its sole customer may be in jeopardy without some more clarity. So, for these reasons, there should be a thorough review of the Hydrocarbon and other laws to ensure that there will be full legal compliance, so these essential projects can be implemented in a timely manner and without any legal uncertainty.

SGGA concludes that MoM should establish a clear non-redundant path forward with priorities established for all donors. Further, some substantial legal analysis is needed to ensure all the viable legal options are available to MoM for implementing these and gas projects.

Appendix A



Islamic Republic of Afghanistan

Ministry of Finance

Proposal for Legal Entity Change of Afghan Gas Enterprise

Kabul
Dalw 1390

Legal Entity Change of Afghan Gas Enterprise to Corporation

Introduction

Based on the state of the country's economic system, economic reconstruction policy and privatization of governmental enterprises, Ministry of Finance in the country prepares the proposal of one of its significant enterprises' legal entity change for processing and its implementation.

Ministry of Mines owns the responsibility of monitoring and management of Afghan Gas Enterprise. Ministry of Mines and Finance agreed to transform the mentioned legal entity enterprise, from an enterprise into a governmental corporation. In order to carry out this process, based on Article (66) of Governmental Enterprises Law, the proposal of legal entity change of this enterprise to a governmental corporation should be suggested to government enterprise assessment commission and thereafter to councils of ministers of Islamic Republic of Afghanistan for approval.

Authority

As an arbitral owner of all properties of this enterprise, and also based on Article (66) of Governmental Enterprises regulations, the Ministry of Finance is authorized to prepare and implement the proposal of legal entity change of this enterprise in agreement with the sectorial ministry which is the Ministry of Mines.

History of Afghan Gas Enterprise

Afghan Gas Enterprise formerly called under the name of Gas Extraction and Transformation Directorate was established as a budgetary unit in the structure of ministry of Mines, and was operating as a budgetary unit till 1346, from 1364 hereafter it has been operating as a profit producing enterprise.

Three gas mines Khowaja Gogerdak, Jarquduq and Yatimtaq, were under the activity area of this enterprise and still it is in progress. At the gas field of Khowaja Gogerdak there are 41 gas wells, in the field of Jarquduq there are 33 gas wells and in Yatimtaq there are 3 gas wells of extraction.

The activity and revenue of the enterprise from the mentioned mines have formed annually 45% revenue and 50% impure national revenue of the country, and the major quantity of extracted gas was exported to Soviet and an insignificant portion of it was consumed in the country. This portion was exported for several years, approximately in average of 2.7 MMCM gas annually. After the withdrawal of Soviet from Afghanistan, this portion was decreased and consequently it was stopped.

During the civil war in the country, the activities of this enterprise were damaged, revenue level was reduced, some infrastructure of this enterprise was damaged and most of the extraction equipment were destroyed and expired, on the other hand, the gas wells of all three fields are not protected well, as a result it destroys the previous well which the enterprise could not operate them in the past. The professional and experienced employees were obliged to leave the country or they were retired and left the enterprise.

Therefore it is worth mentioning, that the enterprise with its current opportunities is not capable to carry out effective activities in the spheres of extraction and transmission and distribution of gas to all the

county members, although the current personnel of the enterprise try their best to implement their predicted, plans in its particular way, but the financial problems are the main-problem to identify the new gas extracting fields.

Afghan Gas Enterprise Activities

In accordance with governmental enterprises law, Afghan Gas Enterprise arranges its annual financial plan and applies it after its approval from Ministries of Mines and Ministry of Finance.

Practically the enterprise extracts a small quantity of gas and transfers and distributes it to Mazar-e-Sharif Energy and Fertilizer Enterprise, Mazar-e-Sharif and Sheberghan cities, Aqcha and Khowaja Dokoh districts. In year 1389 the enterprise planned to extract and distribute 131 MMCM gas in order to obtain its objective appropriately.

In years 1387, 1388 and 1389, the enterprise had the following expenses and revenues.

Number	Indicator	1387 Afg	1388 Afg	1389 Afg
	Basic	225,493,000	206,035,000	216,441,000
	Secondary	981,000	13,927,000	8,887,000
1	Total Revenue	226,474,000	219,962,000	225,328,000
2	Total Expenses	174,711,000	122,393,000	136,128,000
3	Benefit/Loss	51,763,000	97,569,000	89,200,000

The Enterprise has a plan for the expenses and revenue for the year 1390.

Number	Indicator	Revenue Afg	Expenses Afg	Benefit/Loss Afg
	Basic	231,300,000	138,076,000	
	Secondary	4,000,000		
	Total	235,300,000	138,076,000	97,224,000

The Enterprise in accordance with its structure in the year 1390 has 1,041 employees, which 709 of them are professional employees and 332 of them are laborers.

Justifications of Legal Entity Change of Enterprise

- The enterprise has limited technical and financial facilities; therefore it cannot invest in new sites in order to extract, transmit and distribute gas and even cannot utilize the existing establishments in modern and profit producing way.
- Extraction, sweetening, transmission and distribution of gas is vital in country and protecting this sort of activity within the structure of the enterprise has some administrative and technical problems, so it's important to change legal entity enterprise to a governmental corporation so it can act freely in accordance with the law codes of limited responsible corporations.
- Considering its available constant capital measures, its activities are not profit producing and efficient and even from economic point of view it cannot be considered logical.
- A governmental corporation by having board of directors and board of supervisors can freely act in markets in accordance with law codes in the fields of extraction, transmission, and distribution of gas. At the enterprise framework, these affairs have some limitations.
- In accordance to law codes, a governmental corporation can freely choose its board of directors; it employs profit producing and responsible employees. This principle is extremely important for proper activities of this corporation, but right now the structure of enterprise is not in accordance with its requirements, the numbers of employees are more than requirements.

Considering the above reasons, the Ministry of Mines and Ministry of Finance have decided to arrange the activities of the enterprise in governmental corporation framework and eliminate the current condition of the enterprise.

Enterprise Settlement Process

When the Ministers' council approved this proposal based of codes of procedures of governmental enterprises settlement, the settlement board is comprised of the following assigned department representatives:

- Two persons from the Ministry of Finance including the chief of board
- Two persons from the Ministry of Mines
- One person from Ministry of Economy
- One person from the Ministry of Justices
- One person from Attorney General Department (monitoring)

This board is specifically assigned to identify and settle all the accounts, transferable and nontransferable possessions of the enterprise and thereafter, prepare the property settlement /transmission plan to the corporation.

- The board declares legal entity change of the enterprise through the media in order to ensure the people who had dealing with enterprise, are informed that in case of any indebtedness and claim they could refer to the settlement board in case of claim or indebtedness.
- The settlement board starts the settlement process within four months, in case of necessity; the period is completed after it is extended by the Ministry of Finance. The board will perform all of accomplishment which relates to the process of settlement within this period.
- The settlement board divides the properties of the enterprise into two categories after the approval of the proper price selection.

(1)The properties which are transferred to new established corporation as a capital (2) the property which is not necessary for structure of corporation performances and as a result it will be transferred to Ministry of Finance.

- The settlement board arranges the settlement plan and signs it, the settlement plan will include explanations and recommendations regarding bank accounts, claims, contracts, moveable and immovable properties and finally the current available employees of enterprise, which after the approval of the Ministry of Finance they will apply and perform their activities.
- After the approval of settlement plan, the process of implementation begins. The properties which are identified for any proposes are officially submitted to the related Ministry by the settlement board.
- The termination report of the enterprise will be prepared by the settlement board and thereafter the enterprise will be announced nullified.
- The settlement termination process and settlement board are officially dismissed from the jobs and their members once again return to their relevant ministries
- On the other hand, the comprised board of the authorized representatives from Ministry of Finance, Ministry of Mines and Ministry of Justice are assigned in order to arrange the constitution process of the corporation. This board takes the accountability and responsibility of the new established corporation, until the primary meeting of shareholders is held.

Recommendations:

Afghan Gas Enterprise is profit producing units that operates as governmental enterprise in the framework of Ministry and based on the above details the following points are recommended:

- 1) Afghan Gas Enterprise should change its legal entity from an enterprise to a governmental corporation. It's all process should be carried out in accordance with the procedure of settlement and corporatization of governmental enterprises.
- 2) Through the mixed settlement board, and in accordance with approved procedure, Ministry of Finance should accomplish the settlement process of properties, claims, contracts, depts., and other affairs of enterprise. It should also identify the property which is necessary for corporation, and finally prepare and apply the plan of elective property transformation, elective claims, and depts., and elective contracts. The rest properties which are not necessary for the corporation performances, it should be transmitted to the Ministry of Finance.
- 3) On the other hand, the comprised board of the authorized representatives from Ministry of Finance; Ministry of Mines and Ministry of Justice are assigned in order to arrange the constitution process of the corporation, this board will take the accountability and responsibility of the new established corporation, until the primary meeting of shareholders is held. The corporation will start its operation after the approval of the constitution
- 4) The employees of the enterprise will be assessed by the board of the settlement. Concerning to existing activities of the enterprise, the number of employees are more than its required activities, but the corporation will only employ required employees of the enterprise, and the employees that are not qualified they are paid and dismissed.
- 5) In case of necessity, the debt will be paid either from cash capital or from property