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Georgia Power and Gas Infrastructure Project (PGIP)

Work Plan, Year 3

June 2011 through September 2012

October 10, 2011

This document was produced for review by the United States Agency for International Development. It was prepared by Tetra Tech for the Georgia Power and Gas Infrastructure Project (PGIP).

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DISCLAIMER

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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Acronyms and Abbreviations

A/E	Architecture and Engineering
ADS	Automated Directives System
BEO	Bureau's Environment Officer
EA	Environmental Assessment
CCN	Cooperating Country National
CFR	Code of Federal Regulations
Component 1	Senaki 1 and 2 transmission lines, Menji and Tskaltubo Substations
Component 2	Gas transmission pipelines, Kutaisi to Poti, in three sections
CO	Contracting Officer
COP	Chief of Party
COTR	Contracting Officer's Technical Representative
CT	Current Transformer
EA	Environmental Assessment
EMP	Environmental Management Plan
Exp	Exp Energy Services, Formerly TROW, Inc.
FIZ	Free Industrial Zone
FY	Fiscal Year, October 1 through September 30
GOG	Government of Georgia
GOGC	Georgian Oil and Gas Company
GSE	Georgia State Electro System
GTC	Gas Transmission Corporation?
H&SP	Health and Safety Plan
IFB	Invitation For Bid
IQC	Indefinite Quantity Contract
km	Kilometer
kV	Kilovolt
kW	Kilowatt
kWh	Kilowatt hour
LN	Local national
LOE	Level of Effort
LOP	Life of the Project
LTTA	Long Term Technical Assistance
M&E	Monitoring and Evaluation
MoE	Ministry of Energy
mm	Millimeter
NDE	Non Destructive Examination
NDT	Non Destructive Testing
O&M	Operation and Maintenance
PMP	Performance Monitoring Plan
POWER	Power Engineers, Inc.
QA / QC	Quality Assurance / Quality Control
RFP	Request for Proposal
ROW	Right of Way
SOW	Statement of Work, Scope of Work
STTA	Short Term Technical Assistants / Assistance
TBD	To Be Determined
TO	Task Order; Tender Offer
Tt	Tetra Tech
USAID	U.S. Agency for International Development

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USG	U.S. Government
USA	United States of America
USD	United States Dollar
VT	Voltage Transformer
WO	Work Order

1 The Project's Purpose and Objective

Although much progress has been made, Georgia's infrastructure has not fully recovered from the devastation caused by the ravages of civil war, lack of regular maintenance and scant investment in physical infrastructure. New vulnerabilities have surfaced after the 2008 conflict with Russia, especially with regard to energy production and transit. The task of stabilizing and rebuilding Georgia is immense and requires the support of the donor community, as notably highlighted in the post-conflict World Bank Joint Needs Assessment.

The purpose of the Georgia Power and Gas Infrastructure Project ('PGIP' or 'Project') is to provide resident professional engineering and other technical services to support power and gas transmission improvements being undertaken by USAID on behalf of the Government of Georgia ('GOG'). The activities under this Project will support USAID's objective of promoting energy security through greater access to electricity and natural gas supplies households in Western Georgia, promote the development of the Poti Free Industrial Zone (FIZ) on the Black Sea, and secure power exports through reliability - related infrastructure improvements domestically. The activities assigned under this Task Order ('TO') will support USAID's objective of fostering sustainable development.

This Annual Work Plan describes PGIP, its objectives and approach, activities planned, timelines and additional items of direct relevance to project implementation. This Work Plan addresses the planned activities for the engineering support services including preliminary design, full design, rehabilitation design, and related activities for two identified infrastructure sectors: natural gas pipelines and electricity transmission lines and ancillaries.

There are two components of the Task Order:

1.1 Component 1: Electricity Transmission Upgrade, Reconstruction, and Operation

Reconstruction / Construction sub-component: USAID/Caucasus intends to completely reconstruct the Senaki 1 and 2 power transmission lines which connect the Menji 220 kV substation with the Tskaltubo 220 kV substation. Site inspection demonstrates that there is little usable existing infrastructure. Most of the substation terminal equipment is damaged or not available, and one of the transformers in the Tskaltubo substation will need to be replaced.

Additionally, depending on the availability of funds (as will be directed to Tetra Tech by USAID) the project may include design and construction of a 220 / 110 / 10 kV substation at Horga (previously known as Mukhuri). This will be a new facility that would service the Free Industrial Zone (FIZ) at Poti and the surrounding area of.

At this time, based on the terms of the Tetra Tech Task Order ('TO') the activities planned for Component 1 will be limited to:

- Reconstruction of the double circuit Senaki 1 and 2 220 kV high voltage power transmission lines that will connect the Menji 220 kV substation with the Tskaltubo 220 kV substation. The overall length of the two circuits of transmission is estimated to be 58.8 km.

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- Installation of 220 kV terminal bays in the Tskaltubo and the Menji substations; including requisite breakers, disconnects transformers, surge arrestors, control and protection equipment, alarm systems, buildings, etc.

The Horga substation may be constructed in whole, or in part, providing that funds remain after the reconstruction of the Senaki 1 and 2 power transmission lines and the installation of bays in the Menji and Tskaltubo substations, as described above. Depending on the availability of funds, GSE will ensure financing the remainder of construction USAID initiates but cannot complete. This subcomponent (that is, the Horga Substation) is not covered in this work plan.

System monitoring and Smart Grid sub-components: USAID's intention for this subcomponent is to provide assistance to GSE on preventative maintenance regimes to optimize the productive life of critical substation equipment through the procurement and installation or replacement of substation equipment. Such equipment may include smart grid technology, transformer gas monitoring tools or replacements for existing electro-mechanical relaying.

The purpose of this pilot activity with gas analyzers is to optimize the service life of electric system assets. System outages and failure rates for transformers and other critical substation equipment increase dramatically with age. By identifying and subverting potential failures and the productive life of equipment can be vastly prolonged. Specifically, the intent is to purchase and install equipment for a number of GSE substations to optimize the productive life of critical equipment. Based on our initial discussions with USAID, GSE, and site visits we have developed for USAID and Georgia State Electrosystem (GSE) a course of action for this subcomponent. Should the installed cost for the recommendation be higher than anticipated, the Tetra Tech team will work with GSE to prioritize the installations for USAID financing, while at the same time encouraging GSE to self-finance the remainder, to ensure that the reliability of total transmission network is improved.

The purpose of this pilot activity with system relaying is to increase system availability, and thus more electrical energy to the people, by expanding the recently installed emergency response system to include the 220 kV, 400 kV, and 500 kV lines of the southern part of Georgia.

1.2 Component 2: Gas Transit Infrastructure Construction, Replacement, and Rehabilitation

Component 2: Gas Transit Infrastructure Construction, Replacement, and Rehabilitation: Major results anticipated under this component include construction of a new 30.6 km, 700 mm gas pipeline from Senaki to Poti and the FIZ on the Black Sea coast. The work has three sub-components which have been the subject of detailed design work by GOGC.

Senaki-Poti-FIZ construction sub-component: USAID / Caucasus will construct a new DN700 (~700 mm) gas pipeline to Poti and further to the FIZ with a total estimated length of 30.6 km. An existing 100 mm pipeline, installed in the 1980s, has been out of service for many years. This line will be excavated and a new, 700 mm line purchased and installed on the existing easement to Poti. A new 1.6 km easement from Poti to the FIZ will be required, along which a DN700 pipe will be laid to provide access to prospective industry in the FIZ. Corrosion protection measures, including coatings and cathodic protection, as appropriate, will be employed on the new pipe to resist deterioration of the pipe and increase service life.

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Construction of the line will be done by subcontractors of Georgia Oil and Gas Corporation (GOGC). PGIP will provide technical assistance to USAID for the oversight of the work by GOGC, and PGIP will provide technical assistance to GOGC as and when requested.

Abasha - Senaki construction sub-component: USAID / Caucasus will construct a new DN700 gas pipeline from Abasha to Senaki with a total estimated length of 29 km. An existing 100 mm pipeline, installed in the 1980s, has been out of service for many years. Corrosion protection measures, including coatings and cathodic protection, as appropriate, will be employed on the new pipe to resist deterioration of the pipe and increase service life. Construction of the line will be done by subcontractors of Georgia Oil and Gas Corporation (GOGC). PGIP will provide technical assistance to USAID for the oversight of the work by GOGC, and PGIP will provide technical assistance to GOGC as and when requested.

Kutaisi - Abasha construction sub-component: USAID / Caucasus will construct a new DN700 gas pipeline from Abasha to Senaki with a total estimated length of 47 km. An existing 100 mm pipeline, installed in the 1980s, has been out of service for many years. Corrosion protection measures, including coatings and cathodic protection, as appropriate, will be employed on the new pipe to resist deterioration of the pipe and increase service life. Construction of the line will be done by subcontractors of Georgia Oil and Gas Corporation (GOGC). PGIP will provide technical assistance to USAID for the oversight of the work by GOGC, and PGIP will provide technical assistance to GOGC as and when requested.

2 Implementation Approach and Management Activities

Activities performed under the PGIP will complement and reinforce the activities, project management and engineering expertise of USAID / Caucasus. USAID will be undertaking work from 2010 to 2013 in the energy sector in collaboration with the Georgian Oil and Gas Company ('GOGC') and Georgia State Electro System ('GSE') to upgrade, replace, and install critical selected gas and power transmission infrastructure. These companies are state-owned entities charged with the import and transit, and in the case of GSE, dispatch of electricity throughout the country.

The construction activities are expected to run until the second quarter of year 2013. This Work Plan, however, only deals with the timeframe to the end of September 2012.

Our overall approach to the planning and implementation of PGIP encompasses the following:

2.1 Staffing

The project engineers and support staff will be managed by an expatriate senior engineering lead for each sector and will receive additional engineering support through short-term engineering assistance.

Appendix 2, page 47, shows the companies organization chart. Appendix 3, page 48, show the personnel organization chart. Appendix 4, page 49, shows the staff list. Modifications will be proposed and submitted formally to USAID for consideration should the necessity arise during project implementation.

As shown in Appendix 3, our project personnel organization, at the highest level, USAID will coordinate all work planning and construction budgeting with the Government of Georgia (GOG). As prime contractor, Tetra Tech will have overall contract management responsibility for the US - based subcontractors and primary contact with the project contracting officer on all contractual matters.

Our Chief of Party will report directly to the COTR and be responsible for all technical inputs. As a power sector expert, he will also have principal responsibility for Component 1 – Electricity Transmission Upgrade, Reconstruction and Operation. This includes providing technical guidance to Tetra Tech's subcontractor, "POWER Engineers" design and construction engineers.

The COP will be supported by the Tetra Tech home office to ensure rapid response and timely decision making and commitment of funds. The COP manages the team in the field and is responsible for compliance with technical, administrative, human resources and financial requirements of the contract, USAID rules and Tetra Tech protocols. The COP approves invoices and is responsible for all the contract deliverables. COP reports to:

- USAID Mission designated COTR on all matters;
- IQC Program Manager on matters related to:
 - Quarterly technical and financial progress reporting;

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- Matters related to contractual issues requiring amendments and modifications and significant change in budget line items.

The COP works closely with the designated Contracts Manager of Tetra Tech on all contracts related matters. Tetra Tech Contracts Manager is responsible for bid pricing, contract negotiations, modifications and invoicing related to all the task orders.

Tetra Tech will manage the project office in Tbilisi and if needed a field office in Poti. Tetra Tech will be responsible for local procurement, subproject progress reporting, budgeting field operations and implementing the performance management plan. [REDACTED], Senior Energy Sector Adviser will provide USAID and the COP with strategic advice on addressing challenges and obstacles in implementation.

[REDACTED] is our Deputy Chief of Party and Project Lead – Component 1 Electric. His responsibilities include liaison with GSE and GOGC, management of our long-term Georgian technical team and providing support to COP as necessary.

[REDACTED] is our Senior Gas Engineer and Project Lead – Component 2 Gas. He has primary responsibility for the implementation of Component 2, Gas Transit Infrastructure Construction, Replacement and Rehabilitation. As an employee of [REDACTED], [REDACTED], he will access [REDACTED] design and construction engineers as needed.

Tetra Tech has included five CCN full time technical staff to support transmission line and substation design and construction, gas pipeline design and construction, and environmental compliance.

We have also proposed US and Georgian short-term technical specialists to support our key and long-term personnel.

Power Engineers, Inc., Meridian, Idaho, USA supports the Component 1 activities. [REDACTED] [REDACTED] are pivotal persons at Power Engineers.

Exp Energy Services, Inc., Tallahassee, Florida, USA supports the Component 2 activities. Mr. Kevin McGlynn is the pivotal person at Exp.

2.2 Quality Assurance and Quality Control

Tetra Tech requires that Quality Assurance and Quality Control (QA / QC) is maintained during all phases of this project.

The purpose of QA / QC is to ensure technical completeness, efficiency, constructability, simplicity, compliance with budget, schedule, and achieving consistent, quality results. Adjustments will be made when necessary and applicable to reflect realities of USAID and host country preferences, conditions, available materials and operating and maintenance (O&M) considerations.

The two subcontractors and the COP are responsible for the overall quality of the deliverables. Both subcontractors are fully responsible for quality assurance and quality control (QA / QC) of the assigned design deliverables.

The final engineering design products and deliverables will go through an independent QA / QC process after the two subcontractors complete their own QA / QC processes.

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QA / QC for the construction supervision work will be handled by the local and expat staff following appropriate QA / QC protocols.

2.3 Design Activities

The preliminary design work will be carried out by the project team in close working relationship with GSE in Tbilisi under the leadership of the COP and DCOP with the support from the home office and engineering staff. The team will further review the design work undertaken by GOGC. All design and design review efforts will be completed at home offices of Tetra Tech, POWER and Exp. This will allow our team the flexibility to complete or review the design as applicable, drafting, specifications and bid documents with the appropriate team members, and under the supervision and mentoring of expatriate engineers. There is a need for geotechnical and land survey information as pre-design activities. Subcontracting for some required services such as detailed land surveys and geotechnical work will be handled locally by GOGC for Gas component of the Project and by the PGIP team for the Electric component.

Quality assurance procedures will be incorporated into the design process, and quality control will be maintained throughout the design process.

2.4 Tender Documents

For Component 1: The project team will prepare the necessary Volume 2 procurement documentation for rehabilitation and construction of transmission line and substations, for implementation of “smart grid” component and work closely with GSE engineers to develop capacity in this area. The project team will assist USAID in USAID’s preparation of Volume 1, and during the entire procurement process.

For Component 2: The project team will review and provide an opinion to USAID about the procurement documents for gas component prepared by GOGC. The tenders for construction related work will largely target local and regional firms. After completion of advertisement for the material and construction projects we will assist GOGC, on an as needed basis, with pre-bid conferences. For the tender documentation of GOGC, the project team’s role will include assistance to prepare specifications and technical documentation and guidance.

2.5 Construction Oversight

Tetra Tech team’s expatriate and Georgian engineers will work closely with the engineers of GOGC and GSE and the construction contractors for the planned infrastructure. Our construction oversight staff will be responsible for inspection, observations of testing, and QC at all sites.

Construction contractors will carry out construction. For Electricity component, testing of final substation and transmission line energizing will be defined in the tender documents and the contract with the successful bidder. Start up and commissioning will be supported by GSE and the PGIP team. GOGC will be responsible for carrying out final tests upon completion of the pipeline construction.

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PGIP engineers will be present at all stages of testing and present their independent observations to USAID. In addition to frequent construction supervision by our field-based teams at each site, frequent field meetings will be held with the construction contractors and project staff to evaluate progress and address any issues which may arise. Reports from these meetings will be provided to USAID, GOGC and GSE.

The project team will provide spot inspections at key junctures such as pipe placement, concrete and reinforcement placement, testing start up and commissioning. The team will develop a punch list of final improvements and final inspections will be made prior to the infrastructure being turned over from USAID to GOGC and GSE.

2.6 Capacity Building

In developing this work plan and during the course of the project implementation we have and will place capacity building at the forefront of all activities. We will work closely with the Ministry of Energy and Natural Resources (MOENR), GOGC and GSE, local governments, as well as the construction contractors to develop project-specific capacity through on-the-job-training and mentoring.

Should there be a need to carry out a tailored training program or capacity building of other form, Tetra Tech will discuss such necessity with USAID and develop a separate implementation plan.

2.7 Procurement Plan

We will closely follow the 752.225-71 Local Procurement (FEB 1997) as articulated below:

- Local procurement involves the use of appropriated funds to finance the procurement of goods and services supplied by local businesses, dealers or producers, with payment normally being in the currency of the cooperating country.
- Covered by source, origin and nationality waivers as set forth in Subpart F of 22 CFR Part 228 except as provided for in 22 CFR 228.40, local procurement.

Three distinctly separate sets of procurement processes will include:

- The equipment and furniture related to the project office;
- Transmission Line Monitoring and “Smart Grid” related equipment and software. After full consultation with USAID and GSE we will propose a list of equipment with prices and specifications and supporting documentation and after approval is obtained we will follow USAID procurement regulations and procedures to procure, deliver and install. A limited level of training will be necessary after installation of software and equipment and we shall seek that such training is provided by the vendors.
- For Component 2 construction related material and equipment - These are procured by GOGC and the project team’s role in this component will be solely advisory.

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- For Component 1, all construction related material and equipment - Activities will be carried by USAID with the Tetra Tech's organizational assistance.

2.8 Environmental Assessment (EA)

2.8.1 EA for Component 1 Electric

For the electricity component, the Tetra Tech team has lead the development of the EA for both the Government of Georgia and for the US Government.

The EA is based upon the scoping statement and addresses the following elements, as appropriate.

Purpose and project description. The EA briefly specifies the underlying purpose and need of the proposed action. A summary of the project description is also provided.

Alternatives including the proposed action. This section presents the environmental impacts of the proposal and its alternatives in comparative form, thereby sharpening the issues and providing a clear basis for choice among options by the decision makers.

Affected environment. The EA succinctly describes the environment of the area(s) to be affected or created by the alternatives under consideration. Environmental aspects included in the study are physical resources (such as topography, soils, and seismic and geological characteristics); natural biological resources; other environmental concerns noted by 22 CFR 216 (such as land use and historic and cultural resources) and additional environmental concerns (such as socioeconomic characteristics, public health, and other infrastructure systems).

Environmental Consequences. This section includes the environmental impacts of the alternatives including the proposed action, any adverse effects that cannot be avoided should the proposed action be implemented, and means to mitigate adverse environmental impacts. The impacts of the project are assessed against all of the environmental characteristics outlined under the existing conditions. Results of the EA identify the least environmentally damaging feasible alternatives for excavation, transport, and deposition of the hotspot areas and will identify appropriate mitigation measures associated with these activities.

Environmental Management Plan. Tetra Tech has prepared an environmental management plan (EMP) as part of the two EAs to ensure mitigation of adverse impacts to wildlife and human health. The Contractor will be required to develop and submit to USAID their project and sites specific EMP. The EMP has been structured to include sections relating to the proposed mitigation measures; a monitoring plan to ensure that issues such as water quality are monitored continuously; training requirements to ensure that the EMP is properly implemented. The EMP has also been structured to ensure that these considerations are incorporated by the Contactor into remediation design.

The EA for the US Government was prepared in the summer of 2011, has been reviewed by the BEO as of the date of this Work Plan, and Tetra Tech team is working on the comments and changes requested by the BEO.

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In addition to USAID EA requirements, the Tetra Tech Team helped GSE with the development of an EA to adhere to Georgian requirements. In general, the format required for a Georgian EA is similar to that required by USAID. The two EA reports (for the US Government and for the Government of Georgia) will be structured to satisfy the requirements of both USAID and the GOG.

Both EAs have been disclosed to members of the public according to the schedule and methodology outlined in the approved scoping study. The public hearings for both EAs were held on September 20, 2011 in western Georgia. The two Gamgebeli for the affected regions have accepted and signed off on the meeting notes.

2.8.2 EA for Component 2 Gas

The US and Georgian EAs for Component 2 have been prepared and have approved. Environmental activity for Tetra Tech in Component 2 involves monitoring and supervision.

2.8.2.1 Senaki – Poti Section

For the Senaki - Poti extension of Component 2, the scoping study was not done given that the Environmental Permit had already been applied for by GOGC and issued by GOG.

An EA for the US Government was conducted Tetra Tech and GOGC to meet the requirements of USAID BEO. This EA for this Section was issued in August 2010.

2.8.2.2 Abasha - Senaki Section

The EA for the Abasha – Senaki Section was prepared at the same time and along with the EA for the Kutaisi – Abasha Section. Together the encompassing EA is referred to as the Kutaisi – Senaki EA. See Section, below.

A Scoping Study was prepared for the US Government. It was approved in June 2011. Then the EA prepared, and it was approved by the US Government in August 2011.

The EA for the Kutaisi – Abasha Section and the Abasha - Senaki Section is part of the Georgian EA already approved by the GOG. See Section, above.

2.8.2.3 Kutaisi – Abasha Section

The EA for the Kutaisi – Abasha Section was prepared at the same time and along with the EA for the Abasha – Senaki Section. Together the encompassing EA is referred to as the Kutaisi – Senaki EA. See Section, above.

2.9 Health and Safety Plan and Onsite Worker Health and Safety Training Plan

Health and safety programs for this project that will be focused on preventing personnel from being exposed to construction related risks.

The programs involve the preparation of health and safety plans (HASPs) and onsite worker health and safety training plans for construction phases. The health hazard monitoring program are to include the following elements:

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- Medical surveillance program (initial, annual, and exit examinations);
- Specifying additional medical monitoring when appropriate;
- Careful selection of appropriate environmental monitoring instruments;
- Careful calculation of instrument action levels and response measures;
- Collecting samples and other data on potential exposures (such as air samples).

For Component 1 Electric the Contractor will be required by the request for proposal (RFP) of USAID to prepare and submit a project and sites specific HASP.

For Component 2 Gas GOGC has prepared and submitted HASPs for USAID and Tetra Tech approval. These GOGC HASPs are binding upon GOGC's subcontractors.

2.10 Performance Monitoring Plan

Tetra Tech has developed and submitted to USAID a performance monitoring plan (PMP) to support high-quality project management and maximize project impact. The PMP was developed using a results-based planning approach. The PMP was developed based on the project hypothesis and includes project indicators, logical framework and target values.

2.11 Additional Support Services

Tetra Tech will provide to USAID technical support for procurement processes, including evaluation of bidding specifications, invitations for bid, bid evaluation, commodities procurements, and contract modifications, among others;

Tetra Tech will prepare and review reports and recommendations as to general arrangements, viability and cost effectiveness of capital plans and processes; as to validity and economy of work plans; and for changes, additions or revisions in project activities;

Tetra Tech will develop solutions to complex project and program architecture and engineering (A/E) issues unresolved by implementers;

Tetra Tech will provide value engineering services;

Tetra Tech will provide technical assistance to the COTR in responding to proposed changes in the USAID construction contract(s), SOWs, reviewing the validity of claims and providing recommendations for USAID responses and evaluating the reasonableness of contract time extensions;

Tetra Tech will provide appropriate technical assistance to the COTR in issuance and negotiations of change orders in accordance with procedures;

Tetra Tech will perform administrative responsibilities including but not limited to activities such as drafting project implementation letters, preparing action memoranda and reports;

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estimating expenditures, reviewing payment vouchers, responding to audits, assessing claims, and performing other related activities.

Tetra Tech will provide analysis of risks associated with natural disasters and the design of structures and services to appropriate building standards in order to better withstand such disasters; and analysis, evaluation and preparation of plans and procedures for maintenance and operations. Tetra Tech will advise the benefiting companies and USAID on appropriate building standards that should be followed during the construction.

2.12 Public Relations and Branding

We will be transparent with the stakeholders and will provide advisory support to USAID, GOGC and GSE in the public relations activities under this project. At all times we will comply with the project's Branding and Marking Protocol (see Appendix 5, page 51). Our COP will be responsible for ensuring that branding and marking protocols are followed.

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2.13 Project Deliverables

Table 1 Project Deliverables Related to Administration

	Deliverables	Due Date
1	Work Plan for the entire activity.	Within 30 days of TO award for year 1 and consecutively for the remainder of project 60 days prior to end of fiscal year.
2	Monthly progress meetings with COTR	Monthly on agreed dates
3	Assist GOGC and GSE in their preparing Monthly progress reports	Monthly submitted on agreed dates.
4	Quarterly Progress Reports	10 days after end of each quarter
5	Performance Monitoring Plan	Within 45 days of TO award
6	Annual Work Plan	60 days prior to end of fiscal year.
7	Annual Report	Within 30 days of the end of the fiscal year.
8	Final Project Report	End of project
9	Periodic Success Stories	To be agreed with USAID, GOGC and GSE
10	Weekly Reports on Components 1 and 2	Close of Business on Tuesday of the following week.
11	Other *	See Note 1, below

Notes

1. Specific deliverables related to review of design and construction supervision, providing expert opinion or rendering other type of professional support to USAID for each project component are described in sections 3.1 and 3.2. Further Tetra Tech will agree with COTR, should there be a requirement to submit other deliverables such as weekly reports or hold special standing or ad hoc coordinating meetings with USAID and the counterparts.

2.14 Reporting Period

The previous Work Plan covered the period through May 2011. This work plan covers the period from June 2011 through September 2012. The change in reporting period is adopted so that the Work Plan become aligned with the Federal fiscal year (October through September), as is required by the contract.

This Work Plan covers the work through September 2012, even though the USAID – Tetra Tech contract extends to November 1, 2012, and even though the electric and gas projects may continue to the second quarter of 2013.

3 Approach to the Task Activities

3.1 Component 1: Electricity Transmission Upgrade, Reconstruction, and Operation

During the reconstruction of the Senaki 1 and 2 power transmission lines which connects the Menji 220 kV substation with the Tskaltubo 220 kV substation the project team will evaluate the following project components:

1. Scope of Work, including design basis, electrical capacity, transmission delivery, substation adequacy and operating conditions.
2. Construction contract documents based on the design-build methodology
3. Materials Acquisition Plan, including evaluation of long-lead items and receipt and storage requirements
4. Construction Quality Control Plans and Construction Progress
5. Construction Completion and Turnover to Operations
6. Commissioning and Startup
7. Design-build Contractor's Project Schedule with Milestones and Deliverables

The following identifies specific tasks and subtasks for the Senaki 1 and 2 transmission lines and the Tskaltubo and Menji Substations.

3.1.1 Senaki 1 and 2 Transmission Lines and Substations

3.1.1.1 Engineering and Design

3.1.1.1.1 Subtask 1.1 Design Basis

Task: The work will include a review of the design basis for the Senaki 1 and 2 power transmission lines, and the present condition of the Menji and Tskaltubo 220 kV substations. The design basis will be for preparation of performance drawings and specifications to allow for a design-build contract.

3.1.1.1.2 Subtask 1.2 Literature Review and Summary Opinion

Description: Review all existing drawings (plan and profile, structure detail and loadings, general arrangements, plans and sections and control and relay), previous engineering studies (geotechnical, metrological, etc.) and applicable standards. Following the review, prepare a summary opinion regarding the approach to reconstruction of the required facilities. Required ground surveys and geotechnical investigations are to be completed by local Georgian contractors.



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3.1.1.1.3 Subtask 1.3 Transmission Line Works

Description: For the Senaki 1 and 2 power transmission lines, all existing transmission towers and foundations will be replaced. This requirement is based upon field investigations. Work will include review of engineering drawings, tangent and angle tower locations, geotechnical information, metrological data, GSE tower detail loading, Optical Ground Wire (24 fiber - OPGW) standards, grounding requirements, and conductor and insulator requirements. In addition to pertinent GSE standards, the transmission design will conform to U.S. NESC "Heavy Loading" standards. All access road improvements and right-of-way clearing will be provided by local Georgian contractors. Any obstructions on the right of way that will conflict with the construction of the transmission line will be relocated by local Georgian contractors. We will drawings and specifications required for design - build construction; this is commonly referred to as Volume 2.



3.1.1.1.4 Subtask 1.4 Substation Works

Description: For the Menji and Tskaltubo 220 kV Substations the present grounding grids cannot be verified to be sufficient to accommodate the transmission line rebuild and equipment replacement and comply with GSE's standards. Also, the existing substation lightning protection is not sufficient, geotechnical data is not available, existing equipment support structures are incapable of support of any new required equipment, and the existing control houses are not sized to adequately accept new equipment. The design at the Menji substation will include the removal of wave traps and associated equipment, replacement of disconnects and switches, replacement of circuit breaker with SF6 breaker and installation of OPGW fiber optic terminals and the installation of line differential relaying and breaker control panels. The design at the Tskaltubo Substation will include the removal of wave traps and associated equipment, replacement of disconnects and switches, replacement of circuit breaker with SF₆ breaker, installation of OPGW fiber optic terminals, the installation of line differential relaying and breaker control panels.

Also included is the addition of a second, new 220 / 110kV autotransformer, 125 MVA, provided that there are available funds after the line and associated substation works are funded. If authorized to proceed on this phase of the project we will prepare drawings and specifications required for construction; this is commonly referred to as Volume 2. USAID will do the tendering for this new, additional transformer.



3.1.1.1.5 Subtask 1.5 Horga (Mukhuri) Substation

Description: The Horga (previously known as Mukhuri) substation is planned as a seven (7) terminal substation with an unknown in-service date. Should sufficient funding remain at the completion of the required Senaki upgrade project, initial design efforts for the Horga substation will begin. The work will include the preparation of a feasibility analysis of the design and construction of the substation. The analysis will include a feasibility discussion, project schedule with milestones and an estimated construction cost.



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3.1.1.1.6 Subtask 1.6 Life of Critical Substation Equipment

Description: GSE has expressed a desire optimize the productive life of critical substation equipment through the procurement and installation or replacement of substation equipment. Such equipment may include smart grid technology, transformer gas monitoring tools or replacements for existing electro-mechanical relaying. A pilot program approach will be used optimize the service life of electric system assets. By identifying and subverting potential failures and the productive life of equipment can be vastly prolonged. Should the installed cost for the recommendations be higher than anticipated, the Tetra Tech team will work with GSE to prioritize the installations for USAID financing, while at the same time encouraging GSE to self-finance the remainder, to ensure that the reliability of total transmission network is improved.



3.1.1.2 Construction

3.1.1.2.1 Subtask 2.1 Construction Execution Plan

Description: Prepare a construction execution plan, construction specifications and construction schedule for the Senaki 1 and 2 transmission lines and the Tskaltubo and Menji Substations to determine the feasibility of meeting project milestones and objectives. All construction plans and documents are to be prepared based on performance specifications and a design - build project delivery.



3.1.1.3 Materials Acquisition Plan

3.1.1.3.1 Subtask 3.1 Material List, Procurement, and Material Control Systems

Description: Review material lists for transmission lines and substations for completeness. Identify items with long-lead delivery times (i.e., transformers, switches, disconnects, CTs, conductor, steel, etc.). Work with USAID and GSE to assure timely procurement for use by the construction contractor. Reconcile material lists with requisition plans and purchase orders. Review the materials control system.



3.1.1.3.2 Subtask 3.2 Materials Receipt and Storage

Description: Materials Receipt and Storage – Assess the material receiving and storage protocol and facilities prior to mobilization; conduct regular (once a month) site visits to inspect the materials and compare inventory with material records and custody transfer to construction contractor.

[REDACTED]

3.1.1.4 Construction Quality Control and Progress

3.1.1.4.1 Subtask 4.1 Construction Inspection

Description: Construction Inspection – Site inspection and review of quality control inspection process, including reporting procedure and forms, spot-check of contractor and GSE inspector in process of quality control inspections, and review of inspection reports and documentation. Full-time construction inspection to be conducted by Georgian locals.

[REDACTED]

3.1.1.4.2 Subtask 4.2 Construction Progress Schedule

Description: Construction Progress Schedule – Develop a construction schedule based on construction plans and contract documents and report on construction progress via Microsoft Project. Reporting will identify construction spreads and key construction crews.

[REDACTED]

3.1.1.5 Construction Completion and Turnover to Operations

3.1.1.5.1 Subtask 5.1 Evaluation of Completed Installed Facilities

Description: Assist USAID and GSE in evaluation of the completed total installed facilities. Work will include development of a punch list and certification of completion. We will also assist in the process of custody of transfer of facilities.

[REDACTED]

3.1.1.6 Commissioning and Startup

3.1.1.6.1 Subtask 6.1 Commissioning and Startup Plan

Description: Review the commissioning and startup plan for the transmission line and substations as prepared by the design-build contractor.

[REDACTED]

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3.1.1.6.2 Subtask 6.2 Commissioning and Startup Execution

Description: Assist and observe the commissioning and startup of the transmission line and substations. Testing, start up, and commissioning activities are outside the scope of this contract.

[REDACTED]

3.1.1.7 Project Schedule with Milestones and Deliverables

3.1.1.7.1 Subtask 7.1 Component 1 Electric, Deliverables for Lines

Description: The following is a listing of proposed deliverables for the Senaki 1 and 2 transmission lines:

- Scope of Work narrative
 - Design criteria
 - Relay and protection schemes
 - Plan and Profile drawings
 - Typical tower types
 - Typical foundation types
 - Specifications
 - Tower and associated hardware
 - Conductors
 - Foundations
 - Insulator Assemblies
 - Miscellaneous hardware
 - Design and drawings for contract documents for design - build project delivery
- [REDACTED]

3.1.1.7.2 Subtask 7.2 Component 1 Electric, Deliverables for Substations

Description: The following is a listing of the proposed deliverables for the Tskaltubo and Menji Substations:

- Scope of Work narrative
- Design criteria
- One-line diagram
- General Arrangement drawings
- Elevation Plan drawings
- Grounding Plan drawings
- Typical foundation types
- Specifications
 - Structures
 - Foundations
 - Transformer
 - Switching equipment
 - Conductors
 - Grounding

- Relay and protection equipment
- Performance based construction contract documents for design - build project delivery

3.1.2 Power System Reliability and Availability

Tetra Tech will work with USAID and GSE on the optimal use of the funds for these two related sub-component. For example, GSE has indicated that their implementation of smart transmission grid may be to extend the recently commissioned emergency response system protection system to include the 500 kV and 400 kV lines now being constructed in South Georgia. Or, the funds may be used for one or two large power transformers (220 / 110 kV), which directly contributes to improved reliability and availability from the transmission system to the distribution company of western Georgia.

As the date of this Work Plan GSE was planning to travel to the City of Pullman, Washington, USA to visit the Schweitzer Engineering Laboratories (SEL) in late October and early November 2011. SEL equipment has already been installed in Georgia by GSE to improve system reliability on main 500 kV backbone transmission system. Under consideration now is adding more such equipment on the new 500 kV and 400 kV transmission lines to improve power system reliability and availability.

3.1.2.1 System Monitoring Sub-Component

USAID's intention for this subcomponent is to provide assistance to GSE on preventative maintenance regimes to optimize the productive life of critical substation equipment through the procurement and installation of sensors and associated computer software and networking equipment. The purpose of this pilot activity is to optimize the service life of electricity transmission assets by monitoring gas concentrations in dielectric transformer fluids in real time across the network and benchmarking those concentrations against industry standards to predict catastrophic failure before it happens. Failure rates for transformers and other critical substation equipment increase dramatically with age, and the increasing presence of certain gas concentrations in dielectric fluids has been shown to be indicative of imminent failure. By identifying and subverting potential failures, explosions that destroy transformers and associated equipment can be substantially avoided, and the productive life of equipment can be vastly prolonged. Specifically, the intent is to purchase and install dissolved gas analysis technology and associated IT assets in a number of GSE substations to optimize the productive life of critical substation equipment (e.g. transformers). Based on our initial discussions with USAID, GSE, and site visits we propose the following activities for this subcomponent.

There are 48 high voltage system critical transformers in the GSE system. Based on provisional analyses it is realistic to equip major high voltage transformers with the gas analysis technology, but for making final conclusions and estimations, more detailed study is needed. If dedicated budget of the \$1 million will not cover all necessary points, the Tetra Tech team will work with GSE to prioritize the installations for USAID financing, while at the same time encouraging GSE to self-finance the remainder, to ensure that the total transmission network is covered by the gas analysis technology.

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3.1.2.2 Smart Grid Technology Sub-Component

USAID / Caucasus intends to provide assistance to GSE in identifying and installing smart grid technologies that will increase the reliability and efficiency of the Georgia power transmission grid. Smart grid technologies optimize the integration of electrical (towers, lines, switches, transformers, etc.) and information infrastructures (computerized remote control network) by incorporating new automation and information technologies into the existing network. Such technologies can eliminate redundancies in power production and dispatch that cause waste, overload, which disrupt networks, and can optimize the routing of power from production to demand.

It is evident that the more sophisticated versions of Smart Grid, such as superconductive lines or 'smart' inclusion of renewable energy sources into the grid, is beyond the current needs of GSE and the broader energy system. The PGIP team will work with GSE and USAID to find feasible and meaningful solutions and will present relevant findings in a report.

3.2 Component 2: Gas Transit Infrastructure Construction, Replacement, and Rehabilitation

Major results anticipated under this component include construction of a new 30.6 km, DN700 (~700 mm) gas pipeline from Senaki to Poti and the FIZ on the Black Sea coast.

The project background for the Senaki – Poti Project was addressed in detail in the Work Plan covering the period from June 2010 to June 2011, and is not included in this work plan for the period from June 2011 through May 2012, or in this Work Plan. The original scope of work and work plan included Saguramo - Khashuri replacement and Saguramo - Khashuri rehabilitation. Those projects will not be supported by USAID; in their place are the Abasha – Senaki pipeline and the Kutaisi – Abasha pipeline, which are addressed in Sections B and C, respectively, below.

For each of the sub-components of Component 2: Gas Transit Infrastructure Construction, Replacement, and Rehabilitation, the Work Plan will be managed under the following categories:

1. Scope of Work, including design basis, capacity, natural gas delivery points and operating conditions.
2. Engineering and Design.
3. Health and Safety.
4. Request for Proposals / Invitation To Bid / Tender Offer Review.
5. Construction Plan.
6. Land Rights – Permission to construct the pipeline.
7. Materials Acquisition, including purchase order, production/manufacture, acceptance, logistics and delivery, and receipt and materials storage.
8. Construction Quality Assurance and Progress Reporting.

9. Project Control Schedule and Cost, including Milestones and Deliverables.

3.2.1 Senaki-Poti-FIZ Construction Sub-Component

The following identifies specific tasks and subtasks for the Senaki-Poti-FIZ pipeline construction sub-component. Each of the tasks associated with the Senaki-Poti-FIZ pipeline construction sub-component are designated by the prefix "A".

The GOGC Gantt scheduling chart dated September 6, 2011 is reproduced as Figure 2 Schedule for Senaki Poti Section, page 44. The Gantt chart shows the completion as August 23, 2011. As of the date of this Work Plan GOGC has not distributed an updated Gantt Chart. This work is expected to be conducted after sections A, B and H.

3.2.1.1 A1 Scope of Work

Task: The work will include a review of the design basis, capacity, natural gas delivery points and operating conditions.

3.2.1.1.1 Subtask A.1 Scope of Work Review

Description: Review scoping documents, including the Environmental Impact Assessment related to technical engineering (Section 3, "Technical Engineering Data of the Gas Pipeline), hydraulics and capacity, applicable standards (ASME, API, ASTM, BSI, Russian Standards and Georgian governmental regulations). Following the review, prepare a summary opinion regarding compliance with these requirements.

[REDACTED]

3.2.1.2 A2 Engineering and Design

3.2.1.2.1 Subtask A2.1 Engineering Review (preconstruction)

Description: Review engineering alignment sheets, typical drawings, site specific drawings, ownership maps, environmental exclusion areas, specifications, drawings, pulsation characteristics, cathodic protection, delivery meters, gas delivery station and other engineering and design plans. Following the review, prepare a summary opinion of the adequacy of the engineering and design.

[REDACTED]

3.2.1.2.2 Subtask A2.2 Engineering Review (construction phase)

Description: Review engineering activities during construction, including collection and processing of as-built data, preparation of as-built drawings, hydrostatic test data, design changes, and other engineering activities in support of construction.

[REDACTED]

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3.2.1.3 A3 Health and Safety

3.2.1.3.1 Subtask A3.1 Review GOGC's Health and Safety Plan

Description: Review GOGC's Health and Safety Plan for the planned project activities and identify areas of improvement.

[REDACTED]

3.2.1.3.2 Subtask A3.2 Review GOGC Contractor's Health and Safety Plan

Description: Review the contractors' Health and Safety Plan for the planned construction activities and identify areas of improvement.

[REDACTED]

3.2.1.4 A4 Request for Proposals / Invitation For Bid / Tender Offer Review

3.2.1.4.1 Subtask A4.1 Review of Proposal Documents

Description: Review RFP, IFB, TO documents prior to letting for bid.

[REDACTED]

3.2.1.4.2 Subtask A4.2 Observe Bid Openings

Description: Be present to observe bid openings for RFP, IFB, TO documents.

[REDACTED]

3.2.1.5 A5 Construction

3.2.1.5.1 Subtask A5.1 Construction Plan

Description: Review construction execution plan, construction specifications, construction schedule to assess the feasibility of meeting project objectives.

[REDACTED]

3.2.1.5.2 Subtask A5.2 Hydrostatic Testing

Description: Review hydrostatic test plan and hydrostatic tests.

[REDACTED]

3.2.1.5.3 Subtask A5.3 Non Destructive Examination (NDE)

Description: Review non-destructive examination (NDE or X-Ray inspection) test results.

[REDACTED]

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3.2.1.6 A6 Land Rights – Permission to construct the pipeline

3.2.1.6.1 Subtask A6.1 Right of Way (ROW) Permission

Description: Review status of right-of-way permission (determine existing rights of GOGC to maintain and upgrade facilities on existing ROW).
[REDACTED]

3.2.1.6.2 Subtask A6.2 Landowner Interface

Description: Review landowner interactions and identify landowner issues.
[REDACTED]

3.2.1.7 A7 Materials Acquisition

3.2.1.7.1 Subtask A7.1 Material List Review

Description: Review the material list with the engineering plans for completeness of required materials, including materials to be procured by GOGC and materials to be provided by contractor. Reconcile the material list with the requisition plan and the purchase orders. Review the materials control system
[REDACTED]

3.2.1.8 A8 Construction Quality Assurance, Environmental Compliance and Progress Reporting

3.2.1.8.1 Subtask A8.1 Construction Inspection

Description: Construction Inspection – Site inspection and review of quality control inspection process, environmental compliance with permit and specifications requirements, including reporting procedure and forms, spot-check of contractor and GOGC inspectors in the process of quality control inspection, and review of inspection reports and documentation.
[REDACTED]

3.2.1.8.2 Subtask A8.2 Environmental Compliance Plan Review

Description: Environmental Compliance Plan – Review environmental conditions for construction activities for compliance with regulations.
[REDACTED]

3.2.1.8.3 Subtask A8.3 Environmental Compliance Monitoring

Description: Environmental Compliance Monitoring – Review construction activities for compliance with environmental conditions.
[REDACTED]

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3.2.1.8.4 Subtask A8.4 Progress Schedule

Description: Construction Schedule Progress Reporting – Develop a construction schedule based on construction plans provided by GOGC and report on construction progress via Microsoft Project, identifying construction spreads and key construction crews.

[REDACTED]

3.2.1.8.5 Subtask A8.5 Construction Completion and Turnover to Operations

Description: Assist GOGC in the evaluation of the total installed facilities, in the development of a punch list and certifying completion for custody transfer of facilities to GTC.

[REDACTED]

3.2.1.9 A9 Project Control Schedule, including Budget, Milestones and Deliverables

3.2.1.9.1 A9.1 Develop Gas Transit Oversight Schedule

Description: Develop an overall schedule of oversight activities and deliverables to be reported.

[REDACTED]

3.2.1.9.2 A9.2 Provide Schedule Updates

Description: Report progress and deviations.

[REDACTED]

3.2.1.9.3 A9.3 Review Project Cost Estimate

Description: Review the project cost estimate, including evaluation of detailed cost estimate basis, where appropriate.

[REDACTED]

3.2.1.9.4 A9.4 Provide Cost Expenditure Updates

Description: Provide review and recommendations of contractor progress payments based on work completed.

[REDACTED]

3.2.2 Abasha – Senaki Construction Sub-Component

The following identifies specific tasks and subtasks for the Abasha-Senaki construction sub-component. Each of the tasks associated with the Abasha-Senaki construction sub-component are designated by the prefix “B”.

The GOGC Gantt scheduling chart dated September 6, 2011 is reproduced as Figure 3 Schedule for Abasha - Senaki Section, page 45; the forecast completion date is September 30, 2012. This work is expected to be conducted after sections A, B and H.

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3.2.2.1 B1 Scope of Work

Task: The work will include a review of the design basis, capacity, natural gas delivery points and operating conditions.

3.2.2.1.1 Subtask B1.1 Scope of Work Review

Description: Review scoping documents, including the Environmental Impact Assessment developed by GOGC related to technical engineering (Section 3, "Technical Engineering Data of the Gas Pipeline), hydraulics and capacity, applicable standards (ASME, API, ASTM, BSI, Russian Standards and Georgian governmental regulations). Following the review, prepare a summary opinion regarding compliance with these requirements.

[REDACTED]

3.2.2.1.2 Subtask B1.2 Capital Cost Estimates

Description: Provide capital cost estimates as requested by USAID for materials, construction and other project activities to establish a basis of comparison for contractor and supplier bids.

[REDACTED]

3.2.2.2 B2 Engineering and Design

Task: Review of Engineering and Design Plan

3.2.2.2.1 Subtask B2.1 Engineering Review (preconstruction)

Description: Review engineering alignment sheets, typical drawings, site specific drawings, ownership maps, environmental exclusion areas, specifications, drawings, pulsation characteristics, cathodic protection, delivery meters, gas delivery station and other engineering and design plans. Following the review, prepare a summary opinion of the adequacy of the engineering and design.

[REDACTED]

3.2.2.2.2 Subtask B2.2 Engineering Review (detailed engineering phase)

Description: Provide direct engineering services as requested for geotechnical review (such as for river crossings), structural engineering review (such as for aerial crossings), and river hydrological analysis (scour and migration analysis) to assist in detailed design.

[REDACTED]

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3.2.2.2.3 Subtask B2.3 Engineering Review (construction phase)

Description: Review engineering activities during construction, including collection and processing of as-built data, preparation of as-built drawings, hydrostatic test data, design changes, and other engineering activities in support of construction.

[REDACTED]

3.2.2.3 B3 Health and Safety

3.2.2.3.1 Subtask B3.1 Review GOGC Health and Safety Plan (HSP)

Description: This activity was conducted under Subtask A3.1. Review plan for modifications based on experience in completed work.

[REDACTED]

3.2.2.3.2 Subtask B3.2 Review GOGC Contractor's Health and Safety Plan

Description: Review the contractors' Health and Safety Plan (H&SP) for the planned construction activities and identify areas of improvement.

[REDACTED]

3.2.2.3.3 Subtask B3.3 Construction Safety

Description: Provide spot reviews of the H&SP inspector and ongoing review of H&SP reports and H&SP performance statistics

[REDACTED]

3.2.2.4 B4 Request for Proposals / Invitation For Bid / Tender Offer Review

3.2.2.4.1 Subtask B4.1 Review of Proposal Documents

Description: Review RFP, IFB, TO documents prior to letting for bid.

[REDACTED]

3.2.2.4.2 Subtask B4.2 Observe Bid Openings

Description: Be present to observe bid openings for RFP, IFB, TO documents.

[REDACTED]

3.2.2.5 B5 Construction

3.2.2.5.1 Subtask B5.1 Construction Execution Plan

Description: Review construction execution plan, construction specifications, and construction schedule to assess the feasibility of meeting project objectives.

[REDACTED]

3.2.2.5.2 Subtask B5.2 Hydrostatic Testing

Description: Review hydrostatic test plan and hydrostatic tests.
[REDACTED]

3.2.2.5.3 Subtask B5.3 Non Destructive Examination (NDE)

Description: Review non-destructive examination (NDE or X-Ray inspection) test results.
[REDACTED]

3.2.2.6 B6 Land Rights – Permission to Construct the Pipeline

3.2.2.6.1 Subtask B6.1 Right of Way (ROW) Permission

Description: Review status of right-of-way permission. Since this is existing right of way, it is expected that this review will be conducted quickly.
[REDACTED]

3.2.2.6.2 Subtask B6.2 Landowner Interface

Description: Review landowner interactions and identify landowner issues.
[REDACTED]

3.2.2.7 B7 Materials Acquisition Plan

3.2.2.7.1 Subtask B7.1 Material List Review

Description: Review the material list with the engineering plans for completeness of required materials, including materials to be procured by GOGC and materials to be provided by contractor. Reconcile the material list with the requisition plan and the purchase orders. Review the materials control system.
[REDACTED]

3.2.2.8 B8 Construction Quality Assurance, Environmental Compliance and Progress Reporting

3.2.2.8.1 Subtask B8.1 Construction Inspection

Description: Construction Inspection – Site inspection and review of quality control inspection process, environmental compliance with permit and specifications requirements, including reporting procedure and forms, spot-check of contractor and GOGC inspectors in the process of quality control inspection, and review of inspection reports and documentation.
[REDACTED]

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3.2.2.8.2 Subtask B8.2 Environmental Compliance Plan Review

Description: Environmental Compliance Plan – Review environmental conditions for construction activities for compliance with regulations.

[REDACTED]

3.2.2.8.3 Subtask B8.3 Environmental Compliance Monitoring

Description: Environmental Compliance Monitoring – Review construction activities for compliance with environmental conditions.

[REDACTED]

3.2.2.8.4 Subtask B8.4 Progress Reporting Schedule

Description: Construction Schedule Progress Reporting – Develop a construction schedule based on construction plans provided by GOGC and report on construction progress via Microsoft Project, identifying construction spreads and key construction crews.

[REDACTED]

3.2.2.8.5 Subtask B8.5 Construction Completion and Turnover to Operations

Description: Assist GOGC in the evaluation of the total installed facilities, in the development of a punch list and certifying completion for custody transfer of facilities to the Gas Transmission Corporation (GTC).

[REDACTED]

3.2.2.9 B9 Project Control Schedule, including Budget, Milestones and Deliverables

3.2.2.9.1 Subtask B9.1 Develop Gas Transit Oversight Schedule

Description: Develop an overall schedule of oversight activities and deliverables to be reported.

[REDACTED]

3.2.2.9.2 Subtask B9.2 Provide Schedule Updates

Description: Report progress and deviations.

[REDACTED]

3.2.2.9.3 Subtask B9.3 Review Project Cost Estimate

Description: Review the project cost estimate, including evaluation of detailed cost estimate basis, where appropriate.

[REDACTED]

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3.2.2.9.4 Subtask B9.4 Provide Cost Expenditure Updates

Description: Provide review and recommendations of contractor progress payments based on work completed.

[REDACTED]

3.2.3 Kutaisi – Abasha Construction Sub-Component

The following identifies specific tasks and subtasks for the Kutaisi - Abasha construction sub-component. Each of the tasks associated with the Kutaisi - Abasha construction sub-component are designated by the prefix "C".

The schedule provided by GOGC on September 6, 2011 indicates that construction of this work, including sections D, E, F and I will begin on April 16, 2012 and will be completed on March 16, 2013. The GOGC Gantt scheduling chart is reproduced as Figure 4 Schedule for Kutaisi - Abasha Section, page 46. This work is expected to be conducted after sections A, B and H.

3.2.3.1 C1 Scope of Work

Task: The work will include a review of the design basis, capacity, natural gas delivery points and operating conditions.

3.2.3.1.1 Subtask C1.1 Scope of Work Review

Description: Review scoping documents, including the Environmental Impact Assessment related to technical engineering (Section 3, "Technical Engineering Data of the Gas Pipeline), hydraulics and capacity, applicable standards (ASME, API, ASTM, BSI, Russian Standards and Georgian governmental regulations). Following the review, prepare a summary opinion regarding compliance with these requirements.

[REDACTED]

3.2.3.1.2 Subtask C1.2 Capital Cost Estimates

Description: Provide capital cost estimates as requested by USAID for materials, construction and other project activities to establish a basis of comparison for contractor and supplier bids.

[REDACTED]

3.2.3.2 C2 Engineering and Design

Task: Review of Engineering and Design Plan.

3.2.3.2.1 Subtask C2.1 Engineering Review (preconstruction)

Description: Review engineering alignment sheets, typical drawings, site specific drawings, ownership maps, environmental exclusion areas, specifications, drawings, pulsation characteristics, cathodic protection, delivery meters, gas delivery station and other engineering and design plans. Following the review, prepare a summary opinion of the adequacy of the engineering and design.

3.2.3.2.2 Subtask C2.2 Engineering Review (detailed engineering phase)

Description: Provide direct engineering services as requested for geotechnical review (such as for river crossings), structural engineering review (such as for aerial crossings), and river hydrological analysis (scour and migration analysis) to assist in detailed design.

3.2.3.2.3 Subtask C2.3 Engineering Review (construction phase)

Description: Review engineering activities during construction, including collection and processing of as-built data, preparation of as-built drawings, hydrostatic test data, design changes, and other engineering activities in support of construction.

3.2.3.3 C3 Health and Safety

3.2.3.3.1 Subtask C3.1 Review GOGC Health and Safety Plan

Description: This activity was conducted under Subtask A3.1. Review plan for modifications based on experience in completed work.

3.2.3.3.2 Subtask C3.2 Review GOGC Contractor Health and Safety Plan

Description: Review the contractors' Health and Safety Plan (H&SP) for the planned construction activities and identify areas of improvement.

3.2.3.3.3 Subtask C3.3 Construction Safety

Description: Provide spot reviews of the H&SP inspector and ongoing review of H&SP reports and H&SP performance statistics

3.2.3.4 C4 Request for Proposals / Invitation for Bid / Tender Offer Review

3.2.3.4.1 Subtask C4.1 Review of Proposal Documents

Description: Review RFP, IFB, TO documents prior to letting for bid.

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3.2.3.4.2 Subtask C4.2 Observe Bid Openings

Description: Be present to observe bid openings for RFP, IFB, TO documents.
[REDACTED]

3.2.3.5 C5 Construction

3.2.3.5.1 Subtask C5.1 Construction Execution Plan

Description: Review construction execution plan, construction specifications, construction schedule to assess the feasibility of meeting project objectives.
[REDACTED]

3.2.3.5.2 Subtask C5.2 Hydrostatic Testing

Description: Review hydrostatic test plan and hydrostatic tests.
[REDACTED]

Subtask C5.3 Non Destructive Examination (NDE)

Description: Review non-destructive examination (NDE or X-Ray inspection) test results.
[REDACTED]

3.2.3.6 C6 Land Rights – Permission to construct the pipeline

3.2.3.6.1 Subtask C6.1 Right of Way (ROW) Permission

Description: Review status of right-of-way permission. Since this is existing right of way, it is expected that this review will be conducted quickly.
[REDACTED]

3.2.3.6.2 Subtask C6.2 Landowner Interface

Description: Review landowner interactions and identify landowner issues.
[REDACTED]

3.2.3.7 C7 Materials Acquisition Plan

3.2.3.7.1 Subtask C7.1 Material List Review

Description: Review the material list with the engineering plans for completeness of required materials, including materials to be procured by GOGC and materials to be provided by contractor. Reconcile the material list with the requisition plan and the purchase orders. Review the materials control system.
[REDACTED]

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3.2.3.8 C8 Construction Quality Assurance, Environmental Compliance and Progress Reporting

3.2.3.8.1 Subtask C8.1 Construction Inspection

Description: Construction Inspection – Site inspection and review of quality control inspection process, environmental compliance with permit and specifications requirements, including reporting procedure and forms, spot-check of contractor and GOGC inspectors in the process of quality control inspection, and review of inspection reports and documentation.

[REDACTED]

3.2.3.8.2 Subtask C8.2 Environmental Compliance Plan Review

Description: Environmental Compliance Plan – Review environmental conditions for construction activities for compliance with regulations.

[REDACTED]

3.2.3.8.3 Subtask C8.3 Environmental Compliance Monitoring

Description: Environmental Compliance Monitoring – Review construction activities for compliance with environmental conditions.

[REDACTED]

3.2.3.8.4 Subtask C8.4 Progress Reporting Schedule

Description: Construction Schedule Progress Reporting – Develop a construction schedule based on construction plans provided by GOGC and report on construction progress via Microsoft Project, identifying construction spreads and key construction crews.

[REDACTED]

3.2.3.8.5 Subtask C8.5 Construction Completion and Turnover to Operations

Description: Assist GOGC in the evaluation of the total installed facilities, in the development of a punch list and certifying completion for custody transfer of facilities to GTC.

[REDACTED]

3.2.3.9 C9 Project Control Schedule, including Budget, Milestones and Deliverables

3.2.3.9.1 Subtask C9.1 Develop Gas Transit Oversight Schedule

Description: Develop an overall schedule of oversight activities and deliverables to be reported.

[REDACTED]

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3.2.3.9.2 Subtask C9.2 Provide Schedule Updates

Description: Report progress and deviations.
[REDACTED]

3.2.3.9.3 C9.3 Review Project Cost Estimate

Description: Review the project cost estimate, including evaluation of detailed cost estimate basis, where appropriate.
[REDACTED]

3.2.3.9.4 Subtask C9.4 Provide Cost Expenditure Updates

Description: Provide review and recommendations of contractor progress payments based on work completed.
[REDACTED]

3.2.4 Component 2 Deliverables

Deliverables will include the following reports:

- A report for each segment of the East-West pipeline repaired, rehabilitated, or constructed with USG resources that will be reviewed and approved, including discussion of the capacity building efforts undertaken to improve GOGC engineering and cost estimating competence.
- A report covering procurements conducted by the GOGC for works funded by USAID, including an analysis of GOGC procurement capability and capacity, a summary of procurement procedures followed and degree of adherence to procedure, documentation of non-compliances, inconsistencies or areas of concern observed and a discussion of the capacity building efforts undertaken to improve GOGC procurement competence.
- A report for each subcomponent documenting and depicting actual construction activities and costs, including descriptive text, contracts, invoices, as-built drawings and other relevant information.

Appendix 1: Implementation Schedule (Timelines)

The Gantt Charts for Components 1 and 2 as of the date of this Work Plan are in this Section.

Schedules for Electric Transmission Lines and Substations

This subsection contains the Gantt chart for Component 1 as of July 15, 2011. The chart was developed by PGIP.

Schedules for Gas Transmission Pipelines

This subsection contains the Gantt chart for Component 2 as of September 6, 2011. The charts are provided by GOGC.

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The following Gantt chart for the Senaki – Poti Section is as of September 6, 2011. As of the date of this Work Plan the new completion date was September 9, 2011.

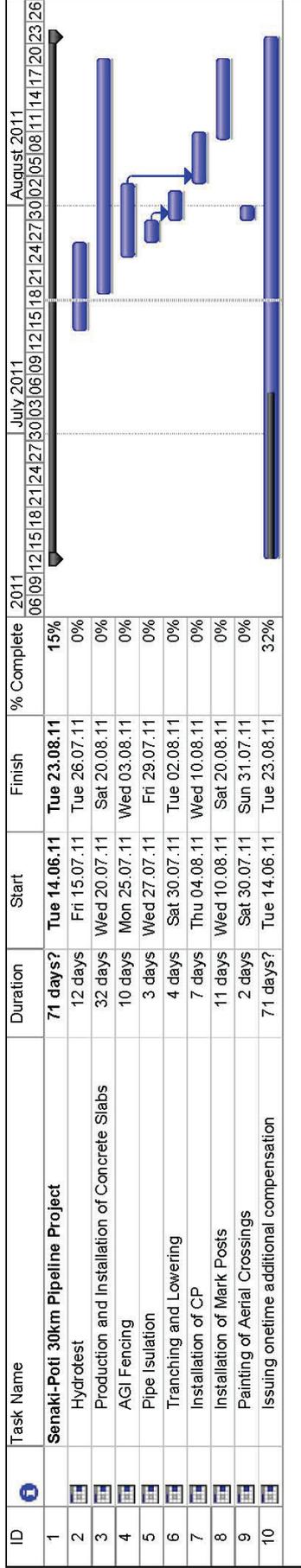


Figure 2 Schedule for Senaki Poti Section

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The following Gantt chart for the Abasha – Senaki Section is as of September 6, 2011.

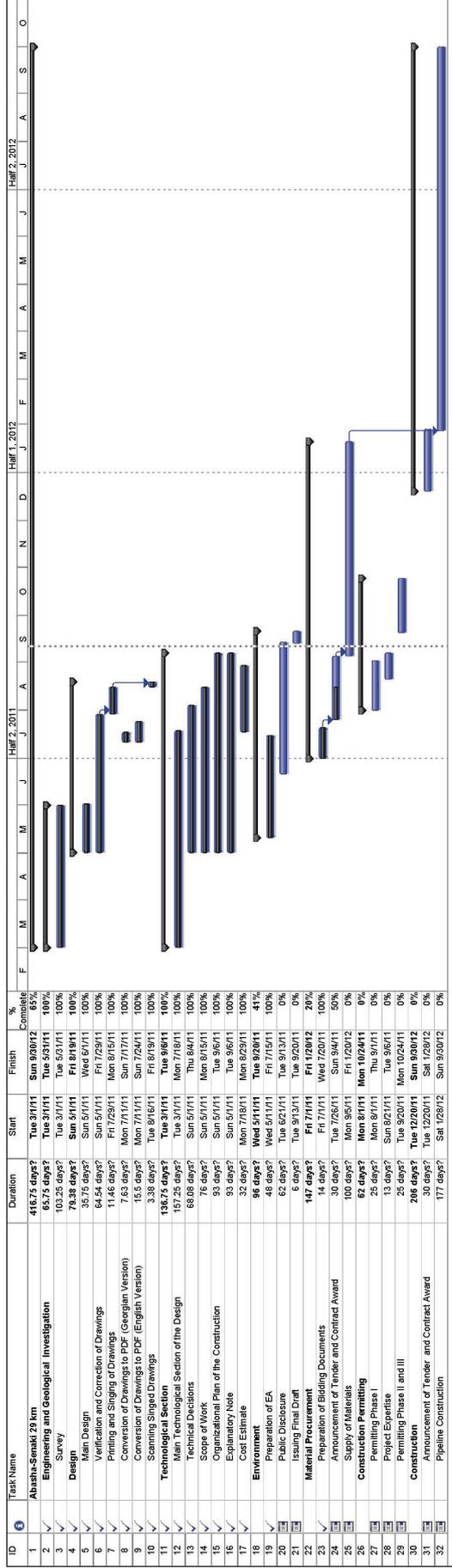
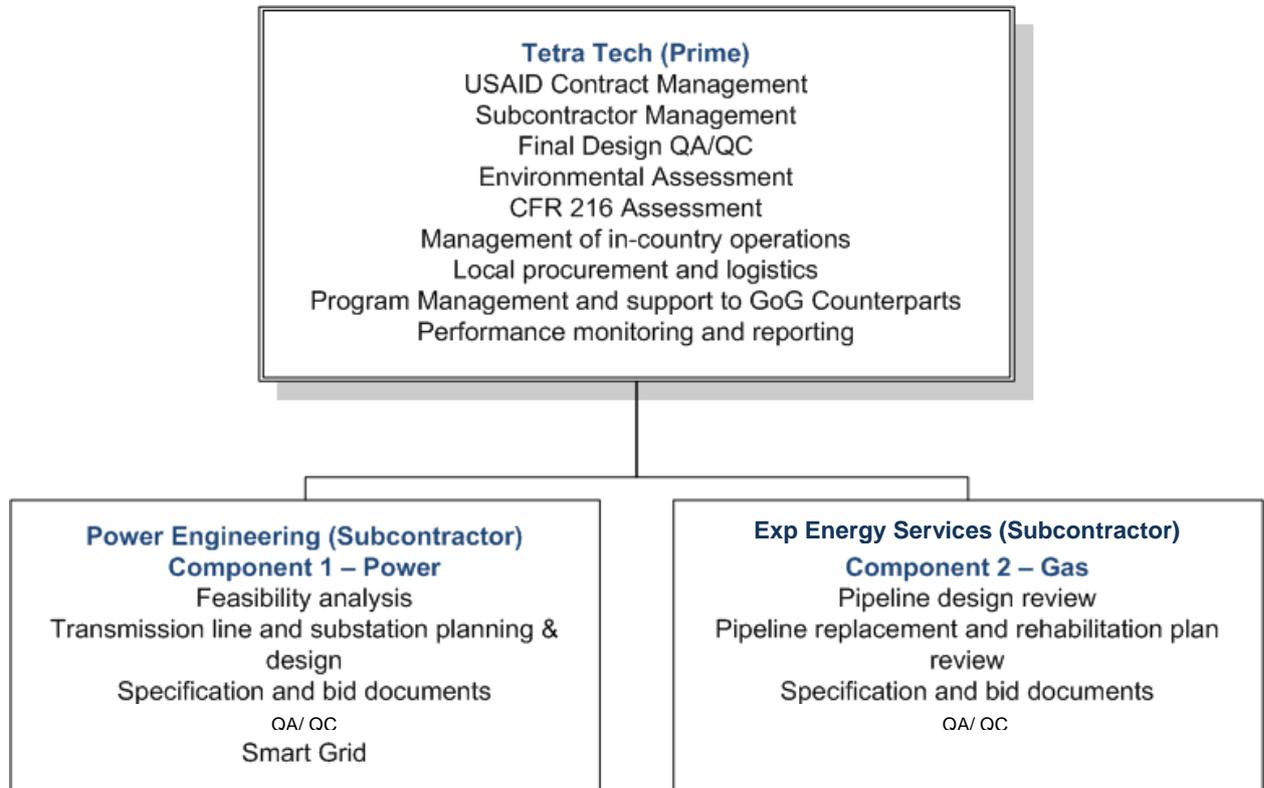


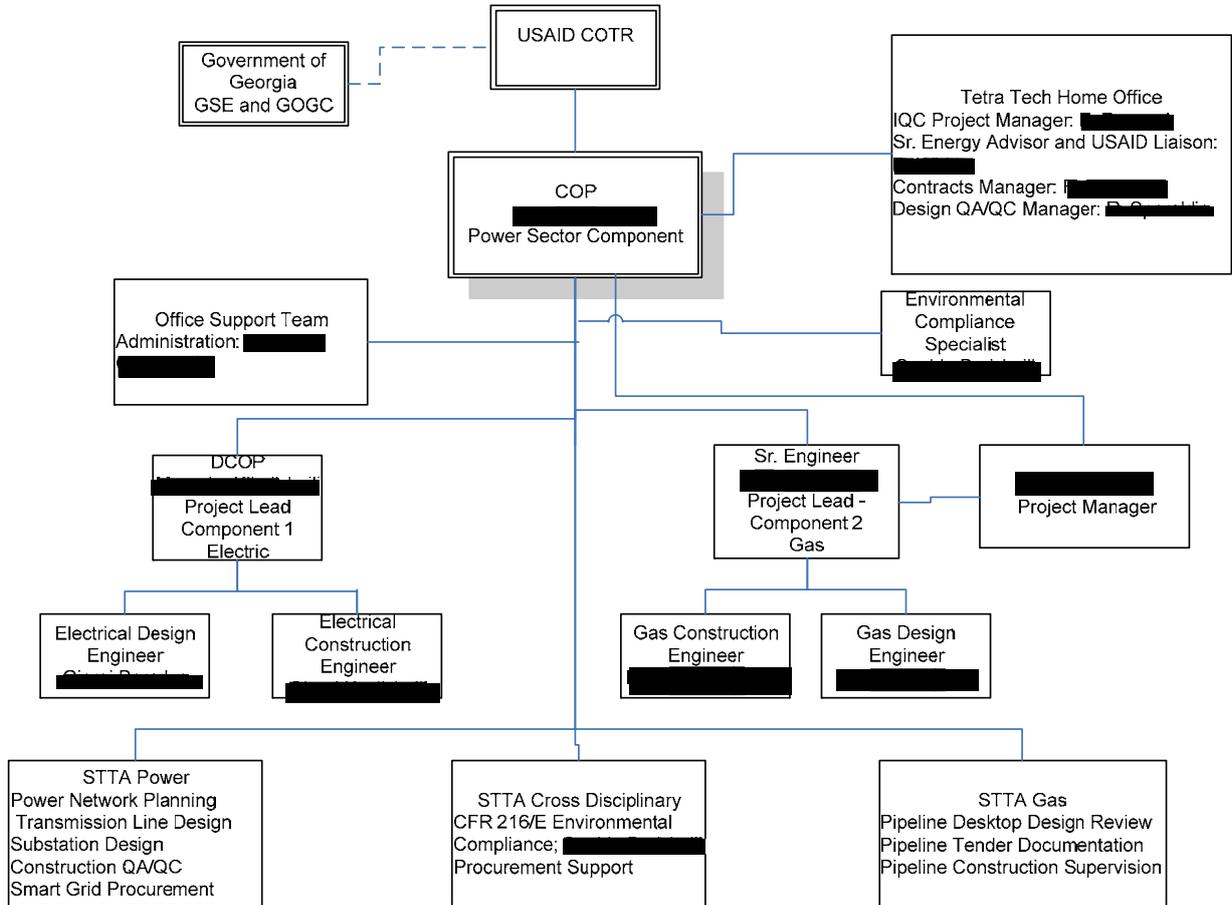
Figure 3 Schedule for Abasha - Senaki Section

Appendix 2: Team Composition, Roles and Responsibilities



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Appendix 3: Project Personnel Organization



Appendix 4: List of Personnel

Home Office

Person	Title
[REDACTED]	[REDACTED]

Field Office Key Personnel

Person	Title
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]

Field Office Long-Term Personnel

Person	Title
[REDACTED]	[REDACTED]

Appendix 5: Branding and Marking Plan

Branding Implementation Plan and Marking Plan Georgia Power and Gas Infrastructure Project

Tetra Tech is experienced in implementing and complying with Automated Directives System (ADS) 320, which addresses branding and marking requirements for USAID acquisitions. We understand the importance of integrating the branding and marking plans into the implementation activities of the Georgia Power and Gas Infrastructure Project. By using this approach, all U.S. foreign assistance activities under this task order will be best identified as being provided “from the American People.” Tetra Tech is committed to working with the USAID Mission to help reinforce its identity as America’s “good-news story” and make this particular foreign assistance effort more visible and better known in Georgia. Ensuring visibility is the purpose of branding and marking. The strategy outlined below will be developed into a detailed branding and marking plan after the contract award in consultation with and upon approval by USAID/Caucasus.

BRANDING STRATEGY

With reference to Section 320.3.2.1 of ADS 320, below is the required branding strategy for the PGIP Project.

- **Program Name:** Georgia Power and Gas Infrastructure Project (PGIP)
- **How the materials will be positioned:** The PGIP will use full branding and the USAID tagline “From the American People” on materials and communications, which may be translated into local languages as appropriate. Co-branding and no branding will only be considered on a case-by-case basis as considered appropriate by the contracting officer’s technical representative (COTR) and contracting officer (CO).
- **Desired level of visibility:** PGIP has a desired high level of visibility within USAID since the purpose of the project is to raise the awareness to government, industry, and community leaders about USAID’s support of water and environmental issues in Georgia.
- **Any other organizations to be acknowledged:** Project documents will not use the Tetra Tech logo but will acknowledge that the document was prepared for USAID/Caucasus by the PGIP prime contractor, Tetra Tech. Georgian beneficiary organizations will also be acknowledged on documents and informational materials as appropriate.

There are no controls on the contractor’s release or use of data that Tetra Tech, or any subcontractor, produces in performing the contract. The IQC contract for this task order states that copyrights and rights to data shall be in accordance with the clause of the IQC contract entitled “Rights in Data – General” (FAR 52.227-14, Alternates III and IV).

Branding Implementation Plan

With reference to Section 320.3.2.2 of ADS 320, below is the required branding implementation plan for the PGIP Project.

1.0 HOW TO INCORPORATE THE MESSAGE

Tetra Tech will use full branding and the USAID tagline “From the American People” on materials and communications. Co-branding and no branding will only be considered on a case-by-case basis as considered appropriate by the contracting officer’s technical representative (COTR) and contracting officer (CO).

2.0 HOW TO PUBLICIZE THE PROGRAM

This section discusses how Tetra Tech plans to publicize the program and also includes a description of the communications tools to be used.

2.1 Audiences

Subject to approval by USAID, the PGIP has the following target audiences with whom it will promote and publicize USAID sponsorship:

2.1.1 Primary audience: The primary audience for all materials and documents produced under this task order is the Government of Georgia officials, industry leaders, city officials, and community leaders.

2.1.2 Secondary audience: The secondary audience for materials and documents produced by the PGIP includes Georgian citizens in general.

2.2 Messages

In all materials and events, the project will be branded as from USAID and prepared by Tetra Tech as part of the PGIP Project. As such, all materials will acknowledge that they were produced with support “from the American people.” In cases where a local language predominates above English, the appropriate translation into the local language will be used in branding the program.

Additional ideas to increase awareness that the American people support this program include the fact that all of the trainers will be trained to include in each presentation or training session a statement at the beginning of the meeting or training session that the technical assistance that they provide and the other program services are made possible as a result of “the assistance from the American people.” The PGIP Project will follow specific procedures for including the branding implementation plan requirements as stated in the mandatory internal reference, Branding and Marking in USAID Direct Contracting in the Automated Directives System, Chapter 320.

3.0 TOOLS

Specific communications tools we develop will be determined by task order requirements. Typically, in-person meetings and events are the most effective means of spreading awareness among citizens. To reach the attention of the broader public in Georgia, Tetra Tech may cooperate with local media to publicize projects via newspapers, radio, and television coverage. For “higher tech” audiences at a group event such as workshops, we

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may distribute CDs with electronic versions of promotional materials. Examples of communication tools we anticipate using to publicize contract activities include the following:

- Press releases
- Press conferences
- Media interviews
- Site visits
- Workshops and scoping sessions
- Success stories
- Beneficiary testimonials
- Professional photography
- Public service announcements
- Videos
- Webcasts, e-invitations, blast e-mails, or other internet activities

4.0 KEY MILESTONES AND OPPORTUNITIES

The following key milestones are anticipated to generate awareness that the program is from the American people. These milestones may be linked to specific points in time, such as at the beginning or end of a program, or to an opportunity to showcase reports or other materials. These include, but are not limited to:

- Holding training events
- Publishing reports
- Highlighting success stories
- Promoting final or interim reports
- Communicating program impact/overall results

5.0 ACKNOWLEDGEMENTS

5.1 Acknowledging USAID and Indefinite Quantity Contract Funding Mechanism

The following acknowledgment will be included on external USAID PGIP publications and internal publications, such as quarterly reports, as appropriate:

“This document was produced for review by the United States Agency for International Development. It was prepared by Tetra Tech for the Georgia Power and Gas Infrastructure Project (PGIP).”

5.2 Acknowledging Host-County Governments

All PGIP documents will follow USAID branding guidelines. If during the course of this program other major sponsors are involved, we will advise the COTR of their involvement and request permission to include them, as necessary.

5.3 Acknowledging Other Host-Country Partners

Co-branding with civil society groups will occur when these organizations have contributed funds to the activity. Co-branding with in-country partners may also be desirable when trying to promote local ownership and capacity building. However, when products are fully funded by USAID, CO approval is required for any exceptions to full branding requirements.

5.3 Co-Branding with Other International Organizations

In cases involving co-branding with other international organizations, USAID guidelines for co-branding will be followed, assuming the funding contributed is more than a token amount.

Marking Plan

With reference to Section 320.3.2.3 of ADS 320, below is the required marking plan for the PGIP Project. Tetra Tech developed this marking plan to specify the types of public communications, commodities, and program materials that will be marked with the USAID Identity under the PGIP Project. We will ensure compliance with USAID's policy that programs, projects, activities, communications, and commodities implemented or delivered under contracts and subcontracts exclusively funded by USAID are marked exclusively with the USAID Identity. In general, each required item will be marked with the following statement:

"This project/report/document/equipment (specify) was made possible by the United States Agency for International Development and the generous support of the American People through the USAID-funded Georgia Power and Gas Infrastructure Project (PGIP)."

Table 1 outlines the types of materials that may be produced under PGIP. Any materials that are not anticipated below but are produced under the initiative will also be subject to branding guidelines and CO approval, as appropriate. Please note that marking is not required on items used as part of the administration of the contract, such as stationery products, equipment, and offices. The goal is to mark programs and projects, not implementing partners. Thus, letterhead, name tags, business cards, office space, equipment, and supplies are not subject to branding.

Every contract deliverable that is marked with the USAID identity for the PGIP will follow design guidance for color, type, and layout in the *Graphic Standards Manual* as related to equipment, reports, studies, events, and public communication (including printed products, audio, visual, and electronic materials). The USAID logo will be used for programmatic correspondence. Tetra Tech letterhead will be used for administrative matters and will not have the USAID logo. Business cards will not show the USAID logo.

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Table 1. Marking Plan for Materials to be Produced Under the PGIP		
Category	Type of Marking	Remarks
Administrative		
Stationery products (administrative business)	USAID standard graphic identity will not be used.	Pertains to letterhead, envelopes, and mailing labels
Stationery products (program related)	USAID standard graphic identity will be used.	Pertains to letters that accompany program materials
Business cards	USAID standard graphic identity will not be used on business cards. Tetra Tech will use its own business cards but include the line "PGIP" on the business card.	
Office signs	USAID standard graphic identity will not be used to mark project offices.	
Project deliverables	Follows guidelines for full branding	
Website		
Technical		
Technical reports and studies	The USAID identity will be printed on the cover of documents; design follows guidelines for full branding unless co-branding is acceptable or an exemption is provided for no branding.	
Briefing papers, memoranda, and policy recommendations	The USAID identity will be printed on the cover of documents; design follows guidelines for full branding unless co-branding is acceptable or an exemption is provided for no branding.	
Government policies, strategies, plans, and guidelines (regional, national, and sub-national levels) or other materials positioned as being from the host-country government	The USAID identity will be printed on the cover of documents; design follows guidelines for full branding unless co-branding is acceptable or an exemption is provided for no branding.	
Organizations' policies, strategies, plans, and guidelines Logistics, a workplace antidiscrimination policy) or other materials positioned as being from the host-country partner	The USAID identity will be printed on the cover of documents; design follows guidelines for full branding unless co-branding is acceptable or an exemption is provided for no branding.	

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Table 1. Marking Plan for Materials to be Produced Under the PGIP		
Category	Type of Marking	Remarks
Training materials and manuals	The USAID identity will be printed on the cover of documents; design follows guidelines for full branding unless co-branding is acceptable or an exemption is provided for no branding.	
CDs-ROM	The USAID identity will be printed on the CD label, splash screen/menu, and packaging; design follows guidelines for full branding unless co-branding is acceptable or an exemption is provided for no branding.	
PowerPoint presentations	The USAID identity is required on title breaker slides; design follows guidelines for the full branding unless co-branding is acceptable or an exemption is provided for no branding.	
Conference posters and presentations	The USAID identity will be printed on the poster or presentation; design follows guidelines for professional meetings or full branding unless co-branding acceptable or an exemption is provided for no branding.	
Videos	The USAID identity will be printed on the cover of documents; design follows guidelines for full branding unless co-branding is acceptable or an exemption is provided for no branding.	
Program materials	The USAID identity will be printed on the cover of documents; design follows guidelines for full branding unless co-branding is acceptable or an exemption is provided for no branding.	
Technical web portal	Follows guidelines for co-branding; the USAID identity will be included on the homepage and sub-pages as appropriate	Individual documents included on the portal will be branded as appropriate.
Promotional		
Event signs, banners, and exhibition booths materials	The USAID identity will be printed on the materials; design follows guidelines for full branding unless co-branding is acceptable or an exemption is provided for no branding.	

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Table 1. Marking Plan for Materials to be Produced Under the PGIP		
Category	Type of Marking	Remarks
Project promotional materials (e.g., success stories, beneficiary announcement of research, testimonials, findings, or project results)	The USAID identity printed on the materials; design follows guidelines for full branding.	
Materials for policy launch	The USAID identity will be printed on the cover of documents; design follows guidelines for full branding unless co-branding is acceptable or an exemption is provided for no branding.	
Materials for site visits	The USAID identity will be printed on the cover of documents; design follows guidelines for full branding unless co-branding is acceptable or an exemption is provided for no branding.	
Commodities		
All commodities	The USAID identity will be printed on the cover of documents; design follows guidelines for full branding unless co-branding is acceptable or an exemption is provided for no branding.	

The Georgia Power and Gas Infrastructure Project ('PGIP' or 'Project') provides in-country professional engineering and other technical services to support power and gas transmission improvements being undertaken by USAID on behalf of the Government of Georgia. Activities performed under the PGIP will complement and reinforce the activities, project management, and engineering expertise of USAID/Caucasus.

USAID will be undertaking work from 2010 to 2013 in the energy sector in collaboration with the Georgian Oil and Gas Company ('GOGC') and the Georgia State Electrosystem ('GSE') to upgrade, replace, and install critical selected gas and power transmission infrastructure. These companies are state-owned entities charged with the import and transit, and in the case of GSE, dispatch of electricity throughout the country.

The activities under this Project will support USAID's objective of promoting energy security through greater access to electricity and natural gas supplies households in Western Georgia, promote the development of the Poti Free Industrial Zone (FIZ) on the Black Sea, and secure power exports through in-country reliability related infrastructure improvements. The activities assigned are managed by Tetra Tech and support USAID's objective of fostering sustainable development.

The PGIP project includes the following infrastructure projects:

- Construction of a new 31 kilometer, 700 mm gas pipeline from Senaki to the Poti FIZ;
- Construction of a new 76 kilometer, 700 mm gas pipeline from Kutaisi to Senaki;
- Replacement of 58 kilometers of 220 kV transmission lines (referred to as Senaki I and II) which were dismantled in 1992 during Georgia's civil war; and,
- Restoration of the power substations in Tskaltubo and Menji to support the Senaki I and II 220 kV transmission lines.

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