REQUEST FOR PROPOSALS

FEASIBILITY STUDY FOR THE

ROMANIA: TULCEA WATER AND WASTEWATER SYSTEM IMPROVEMENTS PROJECT

Submission Deadline: **4:00 PM**

LOCAL TIME

MAY 27, 2009

Submission Place:

AQUASERV S.A. TULCEA
2 REZERVORULUI STR.
820131 TULCEA
ROMANIA

TEL.: +40 240 52 43 10
FAX: +40 240 52 43 10

SEALED PROPOSALS SHALL BE CLEARLY MARKED AND RECEIVED PRIOR TO THE TIME AND DATE SPECIFIED ABOVE. PROPOSALS RECEIVED AFTER SAID TIME AND DATE WILL NOT BE ACCEPTED OR CONSIDERED.

REQUEST FOR PROPOSALS

Section 1: INTRODUCTION

The U.S. Trade and Development Agency ("USTDA") has provided a grant to Aquaserv S.A. Tulcea ("Grantee") for a Feasibility Study ("Study") to:
(a) examine and propose rehabilitation methods for neglected water distribution and sewerage systems in the developed areas of Tulcea County, Romania; and
(b) examine alternatives to the use of gaseous chlorine for potable water disinfection in Romania's easternmost city of Sulina and in Tulcea.
These projects are a priority because Romania must meet EU environmental standards within the coming decade, and because water and wastewater treatment is an especially important issue in the Danube River delta region, which lies almost entirely within Tulcea County. The grant agreement is attached at Annex 4 for reference. The Grantee is soliciting technical proposals from qualified U.S. firms to provide expert consulting services to carry out the Study.

1.1 BACKGROUND SUMMARY

Tulcea County is Romania's second largest in land area (5,800 km^2 or about 2.5% of the national total). Its capital, the City of Tulcea, is located on the Danube River near the Danube Delta Biosphere Reserve, an ecologically sensitive area that was established as a World Heritage Site by UNESCO in December 1991. The area is of great importance to the ecological balance and productivity of the Black Sea, and provides nesting grounds for many migratory bird species.

Throughout Tulcea County, the availability of potable water is unreliable because water treatment stations and distribution pipelines have not been adequately maintained and upgraded. Sewerage infrastructure has also fallen into disrepair. The Grantee, which is the regional water company, was established in 2005 and is responsible for water infrastructure in Tulcea County, which includes both groundwater well fields and surface water from the Danube River. The Grantee's current treatment technologies range from no treatment for some of the groundwater well fields to rapid sand infiltration and disinfection for the treatment of Danube River water.

County authorities have prepared a master plan to improve local water infrastructure through 2025. A projected $517 million will be spent to upgrade water and wastewater systems within the county. The first phase of this effort has already been scoped and funded, and is proceeding in the municipalities of Tulcea, Sulina, Macin, and Iasccea. A second phase, to take place primarily in the City of Tulcea and the town of Sulina, is slated to begin after December of 2010, when the Study to which this Request for Proposals ("RFP") applies will support an application to the EU for project funding. A background Definitional Mission is provided for reference in Annex 2.

1.2 OBJECTIVE

There are two components to the second project phase, the first of which is water infrastructure rehabilitation. The Grantee has identified water distribution and wastewater collection system piping that requires rehabilitation and expansion based on age (some piping dates back to 1900), disrepair (leakage approaches 75% in Tulcea and Sulina) and insufficient service to some developed areas. The project will include the rehabilitation of approximately 68.1 km of subsurface water distribution piping and 68 km of wastewater collection system piping located in three separate zones in Tulcea. Given the locations of the existing piping infrastructure beneath developed areas, rehabilitation by excavation would be both time-consuming and costly. Accordingly, The Grantee is interested in

employing "trenchless" rehabilitation of the existing piping through the use of cured-in-place technology. This will improve the efficiency of rehabilitation and minimize excavation, costs and interruptions.

A second project component of phase 2 will be the replacement of the current chlorine gas disinfection system in Tulcea and Sulina with the on-site generation of sodium hypochlorite, which forms a sanitizing bleach solution when dissolved in water. This will help alleviate the environmental risk involved in the monthly transport of eight tons of chlorine gas from the producer to Tulcea over a distance of 300 km. Currently, transport is made by land and involves significant environmental and social risks. The monthly transport of chlorine gas from Tulcea to Sulina is done by boat because the water treatment plant in Sulina is not accessible by road; as such the 1 ton of chlorine gas is handled in both the ports of Tulcea and Sulina. Alternatives to sodium hypochlorite, such as the use of ultraviolet light, ozone, nanofiltration, chloramines, chlorine dioxide, or potassium permanganate, appear less suitable and less cost-effective for Sulina. The Terms of Reference ("TOR") for this Study is attached in Annex 4, and additional data regarding the current network is provided in Annex 5.

1.3 PROPOSALS TO BE SUBMITTED

Technical proposals are solicited from interested and qualified U.S. firms. The administrative and technical requirements as detailed throughout the RFP will apply. Specific proposal format and content requirements are detailed in Section 3.

COST will not be a factor in the evaluation and therefore, cost proposals should not be submitted; upon detailed evaluation of technical proposals, one firm will be selected for contract negotiations. The amount for the negotiated contract has been established by a USTDA grant of U.S. $339,400.

1.4 CONTRACT FUNDED BY USTDA

The negotiated contract will be funded by USTDA in accordance with the terms and conditions of its grant to the Grantee. The contract must include certain USTDA mandatory clauses relating to nationality, taxes, payment, reporting, and other matters. The USTDA nationality requirements and the USTDA mandatory clauses are attached at Annexes 3 and 4 for reference.

Section 2: INSTRUCTIONS TO PROPOSERS

2.1 PROJECT TITLE

The project is called "Tulcea Water and Wastewater System Improvements."

2.2 DEFINITIONS

Please note the following definitions of terms as used in this RFP.

The term "Request for Proposals" means this solicitation of a formal technical proposal including qualifications statement.

The term "Offeror" means the U.S. individual, or U.S. firm, including any and all subcontractors, which responds to the RFP and submits a formal proposal and which may or may not be successful in being awarded this procurement.

2.3 DEFINITIONAL MISSION REPORT

USTDA sponsored a Definitional Mission to address technical, financial, sociopolitical, environmental and other aspects of the proposed project. A copy of the Report is attached at Annex 2 for background information only.

2.4 EXAMINATION OF DOCUMENTS

Offerors should carefully examine this RFP. It will be assumed that Offerors have done such inspection and that through examinations, inquiries and investigation they have become familiarized with local conditions and the nature of problems to be solved during the execution of the Study.

Offerors shall address all items as specified in this RFP. Failure to adhere to this format may disqualify an Offeror from further consideration.

Submission of a proposal shall constitute evidence that the Offeror has made all the above mentioned examinations and investigations, and is free of any uncertainty with respect to conditions which would affect the execution, and completion of the Study.

2.5 PROJECT FUNDING SOURCE

The Study will be funded under a grant from USTDA. The total amount of the grant is not to exceed U.S. $339,400.

2.6 RESPONSIBILITY FOR COSTS

Offeror shall be fully responsible for all costs incurred in the development and submission of the proposal or any other cost incurred by Offeror prior to issuance of an agreement or contract. Neither USTDA nor the Grantee assumes any contractual obligation as a result of the issuance of this

proposal request, the preparation or submission of a proposal by an Offeror, the evaluation of proposals, or final selection.

2.7 TAXES

Offerors should submit proposals which note that in Annex 4, USTDA Mandatory Contract Provisions, USTDA funds are not to be used to pay taxes or duties under the laws of host country.

2.8 CONFIDENTIALITY

The Grantee will use its best efforts to preserve the confidentiality of any business proprietary or confidential information submitted by the Offeror, which is clearly designated as such by the Offeror.

2.9 ECONOMY OF PROPOSALS

Proposal documents should be prepared simply and economically, providing a comprehensive and concise description of the Offeror's capabilities to satisfy the requirements of the RFP. There is no necessity for expensive bindings, colored displays, or other promotional material unless such material is absolutely pertinent to the proposal. Emphasis should be placed on completeness and clarity of content.

2.10 SUBSTANTIVE PROPOSALS

The Offeror shall certify (a) that its proposal is genuine and is not made in the interest of, or on the behalf of, any undisclosed person, firm, or corporation, and is not submitted in conformity with, and agreement of, any undisclosed group, association, organization, or corporation; (b) that it has not directly or indirectly induced or solicited any other Offeror to put in a false proposal; (c) that it has not solicited or induced any other person, firm, or corporation to refrain from submitting a proposal; and (d) that it has not sought by collusion to obtain for himself any advantage over any other Offeror or over the Grantee or USTDA or any employee thereof.

2.11 CONDITIONS REQUIRED FOR PARTICIPATION

Only U.S. firms are eligible to participate in this tender. However, U.S. firms may utilize subcontractors from host country for up to 20 percent of the amount of the USTDA grant. USTDA nationality requirements are detailed in Annex 3.

2.12 LANGUAGE OF PROPOSAL

All proposal documents shall be prepared and submitted in English, and only English.

2.13 PROPOSAL SUBMISSION REQUIREMENTS

The **Cover Letter** in the proposal must be addressed to:

MR. SORIN ZAHARCU
GENERAL MANAGER
AQUASERV S.A. TULCEA
2 REZERVORULUI STR.
820131 TULCEA
ROMANIA

TEL.: +40 240 52 43 10
FAX: +40 240 52 43 10

An Original and eight (8) copies of your proposal must be received at the above address no later than 4:00 PM, on MAY 27, 2009.

Proposals may be either sent by mail, overnight courier, or hand-delivered. Whether the proposal is sent by mail, courier or hand-delivered, the Offeror shall be responsible for actual delivery of the proposal to the above address before the deadline. Any proposal received after the deadline will be returned unopened.

Upon timely receipt, all proposals become the property of the Grantee.

2.14 PACKAGING

Each proposal must be sealed to ensure confidentiality of the information. The proposals should be individually wrapped and sealed, and labeled for content including "original" or "copy number x"; the original and eight (8) copies should be collectively wrapped and sealed, and clearly marked for content.

Neither USTDA nor the Grantee will be responsible for premature opening of proposals not properly labeled.

2.15 AUTHORIZED SIGNATURE

The proposal must contain the signature of a duly authorized officer or agent of the Offeror empowered with the right to bind the Offeror.

2.16 EFFECTIVE PERIOD OF PROPOSAL

The proposal shall be binding upon the Offeror for sixty (60) days after the proposal due date, and Offeror may withdraw or modify this proposal at any time prior to the due date upon written request, signed in the same manner and by the same person who signed the original proposal.

2.17 EXCEPTIONS

Firms agree by their response to the RFP announcement to abide by the procedures set forth therein. Material modifications in the TOR or responsibilities of the parties will not be accepted.

Any exceptions in the proposal shall be clearly identified, and shall include the scope of such exception, and its impact, on the procurement. The Grantee shall make final determination as to the responsiveness of such exceptions and their acceptability.

2.18 OFFEROR QUALIFICATIONS

As provided in Section 3, Offerors shall submit evidence that they have relevant past experience and have previously delivered advisory and Feasibility Study services similar to those required in the TOR.

2.19 RIGHT TO REJECT PROPOSALS

The Grantee reserves the right to reject any and all proposals and to accept or reject any or all of the items in the proposal, and to award the contract in whole or in part if it is deemed in the best interest of the Grantee.

2.20 PRIME CONTRACTOR RESPONSIBILITY

Offerors have the option of subcontracting parts of the services they propose. The Offeror's proposal must include a description of any anticipated subcontracting arrangements, including the name, address, and qualifications of consultants and subcontractors. USTDA nationality provisions are set forth in detail in Annex 3. The successful Offeror shall cause appropriate provisions of its contract, including all mandatory USTDA clauses, to be inserted in all subcontracts ensuing to ensure fulfillment of all contractual provisions by subcontractors.

2.21 AWARD

An award resulting from this RFP shall be made to the best qualified Offeror, taking into consideration the evaluation factors set forth herein; however, the right is reserved to reject any and all proposals received and, in all cases, the Grantee will be the judge as to whether a proposal has or has not satisfactorily met the requirements of this RFP.

2.22 COMPLETE SERVICES

The successful Offeror shall be required to
(a) furnish all supplies, supervision, transportation, and other execution accessories, services, and facilities;
(b) provide and perform all necessary labor; and
(c) in accordance with good technical practice, with due diligence, and in accordance with the requirements, stipulations, provisions and conditions of this RFP and the resultant contract, execute and complete all specified work to the satisfaction of the Grantee.

2.23 INVOICING AND PAYMENT

Deliverables under the contract shall be delivered on a schedule to be agreed upon in a contract with the Grantee. The Contractor may submit invoices to the designated Grantee Project Director in accordance with a schedule to be negotiated and included in

the contract. Upon approval of each invoice, the Grantee will forward the invoice to USTDA which will process payment to the Contractor. All payments by USTDA under the Grant Agreement will be made in U.S. currency.

Section 3: PROPOSAL FORMAT AND CONTENT

To expedite proposal review and evaluation, and to assure that each proposal receives the same orderly review, all proposals must follow the format described in this section.

Proposal sections and pages shall be appropriately numbered and the proposal shall include a Table of Contents. Offerors are encouraged to submit concise and clear responses to the RFP. Proposals shall contain all elements of information requested without exception. Instructions regarding the required scope and content are given in this section. The Grantee reserves the right to include any part of the selected proposal in the final contract.

The proposal shall consist of a technical proposal only. No cost proposal is required as the value of the USTDA grant is established at U.S. $339,400.

Offerors shall submit one (1) original and eight (8) copies of the proposal. Proposals received by fax cannot be accepted.

The following sections and content are required for each proposal:

Transmittal Letter,
Cover/Title Page,
Table of Contents,
Introduction and Executive Summary,
Company Information,
Organizational Structure, Management Plan, and Key Personnel,
Technical Approach and Work Plan,
Experience and Qualifications, and
Miscellaneous.

Detailed requirements and directions for the preparation of each section are presented below.

3.1 SECTION 1: INTRODUCTION AND EXECUTIVE SUMMARY

An Executive Summary should be prepared describing the major facts or features of the proposal, including any conclusions, assumptions, and generalized recommendations the Offeror desires to make. Offerors are requested to make every effort to limit the length of the Executive Summary to no more than five (5) pages.

3.2 SECTION 2: COMPANY INFORMATION

3.2.1 Company Profile

Provide the information listed below relative to the Offeror's firm. If the Offeror is proposing to subcontract some of the proposed work to another firm(s), similar information must be provided for each subcontractor. Offerors are requested to limit the length of the Company Profile Information to one (1) page per firm.

1. Name of firm and business address, including telephone and fax numbers.

2. Year established (include former firm names and year established, if applicable).

3. Type of ownership and parent company, if any.

4. Project Manager's name, address, telephone and fax number, if different from (1).

3.2.2 Offeror's Authorized Negotiator

Provide name, title, address, telephone and fax number of the Offeror's authorized negotiator. The person cited shall be empowered to make binding commitments for the Offeror and its subcontractors, if any.

3.2.3 Negotiation Prerequisites

1. Discuss any impact of any current or anticipated commitments which may impact the ability of the Offeror or its subcontractors to complete the Study as proposed and within the project schedule.

2. Identify any specific information which is needed from the Grantee before commencing contract negotiations.

3.3 SECTION 3: ORGANIZATIONAL STRUCTURE, MANAGEMENT, AND KEY PERSONNEL

Describe the Offeror's proposed project organizational structure. Discuss how the project will be managed including the principal and key staff assignments for this Study. Identify the Project Manager who will be the individual responsible for this project. The Project Manager must have the responsibility and authority to act on behalf of the Offeror in matters related to the proposed Study.

Provide a listing of personnel (including subcontractors and consultants) to be engaged in the project, either U.S. or local with the following information for key staff: position in the project; pertinent experience, curriculum vitae; other relevant information. If subcontractors are to be used, the organizational relationship between the firms must be described.

A manpower schedule and the level of effort for the project period, by activities and tasks, as detailed under the Work Plan shall be submitted. A statement confirming the availability of the proposed project manager and key staff over the duration of the project must be included in the proposal.

3.4 SECTION 4: TECHNICAL APPROACH AND WORK PLAN

Describe in detail the proposed technical approach and work plan. Discuss the project requirements as perceived by the Offeror. Include a brief narrative of tasks within each activity series. Begin with the information gathering phase and continue through delivery and approval of all required reports.

Prepare a detailed schedule of performance that describes all activities and tasks within the Technical Work Plan, including periodic reporting or review points, incremental delivery dates, and other project milestones.

Based on the Technical Work Plan, and previous project experience, explain when and where Offeror will require support from the Grantee. Detail the amount of staff time required by the Grantee or participating agencies and any work space or facilities needed to complete the Study.

3.5 SECTION 5: EXPERIENCE AND QUALIFICATIONS

Provide a discussion of the Offeror's experience and qualifications which are relevant to the objectives and TOR for the Study. If a subcontractor(s) is being used, similar information must be provided for the prime and each subcontractor firm proposed for the project. Relevant experience and qualifications of key staff proposed shall be provided including letters of commitment from the individuals proposed concerning their availability for contract performance.

As many as possible but not more than six (6) relevant and verifiable project references must be provided, including the following information:

Project name,
Name and address of client (indicate if joint venture),
Client contact person (name/ position/ current phone and fax numbers),
Period of Contract,
Description of services provided,
Dollar amount of Contract, and
Status and comments.

Offerors are strongly encouraged to include in their experience summary primarily those projects that are similar to or larger in scope than the Study as described in this RFP.

Section 4: AWARD CRITERIA

Individual proposals will be initially evaluated by a Procurement Selection Committee of representatives from the Grantee. The Committee will then conduct a final evaluation and completion of ranking of qualified Offerors, and the Grantee shall promptly negotiate a contract with the best qualified Offeror. If a satisfactory contract cannot be negotiated with the best qualified Offeror, negotiations will be formally terminated. Negotiations shall then be undertaken with the second most qualified Offeror and so forth.

The selection of the Contractor will be based on the following criteria:

1. **Water and Wastewater Collection System and Disinfection Experience (25%)**
   Study team's relevant water and wastewater collection system experience for large municipal systems, including experience with water and sewer line repairs using slip-lining and other trenchless technologies. Experience with various potable water disinfection techniques is also desirable and should be evaluated.
2. **Adequacy of Proposal (25%)**
   Adequacy of Study team's work plan and approach responding to the Terms of Reference including a detailed schedule indicating each principal work activity. The proposed work plan should indicate the staffing schedule for each key activity.
3. **Regional Qualifications (10%)**
   Experience of Study team on similar projects in Romania or other Eastern European countries.
4. **Qualifications and Experience of Study Team's Key Staff (30%)**
   Capabilities and demonstrated experience of key positions such as project manager, construction manager, environmental engineer and piping engineer. Study team should also include an organization chart of key personnel.
5. **Local Capabilities (10%)**
   Capabilities of local associates or firms to assist with logistics, data collection, etc.

Proposals which do not include all requested information may be considered non-responsive.

Price will not be a factor in contractor selection.

ANNEX 1

MR. SORIN ZAHARCU, GENERAL MANAGER, AQUASERV S.A. TULCEA, 2 REZERVORULUI STR., 820131 TULCEA, ROMANIA, TEL.: +40 240 52 43 10, FAX: +40 240 52 43 10

CODE R: ROMANIA: TULCEA WATER AND WASTEWATER SYSTEM IMPROVEMENTS PROJECT

POC John Kusnierek, USTDA, 1000 Wilson Boulevard, Suite 1600, Arlington, VA 22209-3901, Tel: (703) 875-4357, Fax: (703) 875-4009. ROMANIA: TULCEA WATER AND WASTEWATER SYSTEM IMPROVEMENTS PROJECT. The Grantee invites submission of qualifications and proposal data (collectively referred to as the "Proposal") from interested U.S. firms which are qualified on the basis of experience and capability to develop a feasibility study to
(a) examine and propose rehabilitation methods for neglected water distribution and sewerage systems in the developed areas of Tulcea County, Romania; and
(b) examine alternatives to the use of gaseous chlorine for potable water disinfection in Romania's easternmost city of Sulina, as well as in Tulcea.

Throughout Tulcea County, the availability of potable water is unreliable because water treatment stations and distribution pipelines have not been adequately maintained and upgraded. Sewerage infrastructure has also fallen into disrepair. The Grantee, which is the regional water company, was established in 2004 and is responsible for water infrastructure in Tulcea County, which includes both groundwater well fields and surface water from the Danube River. The Grantee's current treatment technologies range from no treatment for some of the groundwater well fields to rapid sand infiltration and disinfection for the treatment of Danube River water.

County authorities have prepared a master plan to improve local water infrastructure through 2025. A projected $517 million will be spent to upgrade water and wastewater systems within the county. The first phase of this effort has already been scoped and funded, and is proceeding in the municipalities of Tulcea, Sulina, Macin, and Iasccea. A second phase, to take place primarily in the City of Tulcea and the town of Sulina, is slated to begin after December of 2010, when the feasibility study for which the Proposal is hereby invited will support an application to the EU for project funding.

There are two components to the second project phase, the first of which is water infrastructure rehabilitation. The Grantee has identified water distribution and wastewater collection system piping that requires rehabilitation and expansion based on age (some piping dates back to 1900), disrepair (leakage approaches 75% in Tulcea and Sulina) and insufficient service to some developed areas. The project will include the rehabilitation of approximately 68.1 km of subsurface water distribution piping and 68 km of wastewater collection system piping located in three separate zones in Tulcea. Given the locations of the existing piping infrastructure beneath developed areas, rehabilitation by excavation would be both time-consuming and costly. Accordingly, The Grantee is interested in employing "trenchless" rehabilitation of the existing piping through the use of cured-in-place technology. This will improve the efficiency of rehabilitation and minimize excavation, costs and interruptions.

A second project component of phase 2 will be the replacement of the current chlorine gas disinfection system in Tulcea and Sulina with the on-site generation of sodium hypochlorite, which forms a sanitizing bleach solution when dissolved in water. This will help alleviate the environmental risk involved in the monthly transport of eight tons of chlorine gas from the producer to Tulcea over a distance of 300 km. Currently, transport is made by land and involves significant environmental and social risks. The monthly transport of chlorine gas from Tulcea to Sulina is done by boat because the water treatment plant in Sulina is not accessible by road; as such the 1 ton of chlorine gas is handled in both the ports of Tulcea and Sulina. Alternatives to sodium hypochlorite, such as the use of ultraviolet light, ozone, nanofiltration, chloramines, chlorine dioxide, or potassium permanganate, appear less suitable and less cost-effective for Sulina.

The U.S. firm selected will be paid in U.S. dollars from a $339,400 grant to the Grantee from the U.S. Trade and Development Agency (USTDA).

A detailed Request for Proposals (RFP), which includes requirements for the Proposal, the Terms of Reference, and a background definitional mission/desk study report are available from USTDA, at 1000 Wilson Boulevard, Suite 1600, Arlington, VA 22209-3901. To request the RFP in PDF format, please go to: https://www.ustda.gov/USTDA/FedBizOpps/RFP/rfpform.asp. Requests for a mailed hardcopy version of the RFP may also be faxed to the IRC, USTDA at 703-875-4009. In the fax, please include your firm's name, contact person, address, and telephone number. Some firms have found that RFP materials sent by U.S. mail do not reach them in time for preparation of an adequate response. Firms that want USTDA to use an overnight delivery service should include the name of the delivery service and your firm's account number in the request for the RFP. Firms that want to send a courier to USTDA to retrieve the RFP should allow one hour after faxing the request to USTDA before scheduling a pick-up. Please note that no telephone requests for the RFP will be honored. Please check your internal fax verification receipt. Because of the large number of RFP requests, USTDA cannot respond to requests for fax verification. Requests for RFPs received before 4:00 PM will be mailed the same day. Requests received after 4:00 PM will be mailed the following day. Please check with your courier and/or mail room before calling USTDA.

Only U.S. firms and individuals may bid on this USTDA financed activity. Interested firms, their subcontractors and employees of all participants must qualify under USTDA's nationality requirements as of the due date for submission of qualifications and proposals and, if selected to carry out the USTDA-financed activity, must continue to meet such requirements throughout the duration of the USTDA-financed activity. All goods and services to be provided by the selected firm shall have their nationality, source and origin in the U.S. or host country. The U.S. firm may use subcontractors from the host country for up to 20 percent of the USTDA grant amount. Details of USTDA's nationality requirements and mandatory contract clauses are also included in the RFP.

Interested U.S. firms should submit their Proposal in English directly to the Grantee by 4:00 PM, MAY 27, 2009 at the above address. Evaluation criteria for the Proposal are included in the RFP. Requests for clarification on any aspect of the RFP should be directed to POC John Kusnierek, USTDA, 1000 Wilson Boulevard, Suite 1600, Arlington, VA 22209-3901, Tel: (703) 875-4357, Fax: (703) 875-4009. Any such request must be received no later than 4:00 PM, May 13, 2009 in order to be honored. Price will not be a factor in contractor selection, and therefore, cost proposals should NOT be submitted. The Grantee reserves the right to reject any and/or all Proposals. The Grantee also reserves the right to contract with the selected firm for subsequent work related to the project. The Grantee is not bound to pay for any costs associated with the preparation and submission of Proposals.

ANNEX 2

DEFINITIONAL MISSION REPORT FOR WATER AND WASTEWATER PROJECTS IN ROMANIA AND BULGARIA

FINAL

February 11, 2009

Prepared for:

United States Trade and Development Agency

Prepared by:

Millennium Science and Engineering, Inc.
14150 Newbrook Drive, Suite 120
Chantilly, VA 20151
Tel. 703-961-0710
Fax 701-961-0711

This report was funded by the U.S. Trade and Development Agency (USTDA), an agency of the U.S. Government.

THE U.S. TRADE AND DEVELOPMENT AGENCY

The U.S. Trade and Development Agency (USTDA) advances economic development and U.S. commercial interests in developing and middle income countries. The agency funds various forms of technical assistance, feasibility studies, training, orientation visits and business workshops that support the development of a modern infrastructure and a fair and open trading environment.

USTDA's strategic use of foreign assistance funds to support sound investment policy and decision-making in host countries creates an enabling environment for trade, investment and sustainable economic development. Operating at the nexus of foreign policy and commerce, USTDA is uniquely positioned to work with U.S. firms and host countries in achieving the agency's trade and development goals. In carrying out its mission, USTDA gives emphasis to economic sectors that may benefit from U.S. exports of goods and services.

Mailing and Delivery Address: 1000 Wilson Boulevard, Suite 1600, Arlington, VA 22209-3901
Phone: 703–875–4357 • **Fax:** 703–875–4009 • **Web site:** www.ustda.gov • **email:** info@ustda.gov

WATER AND WASTEWATER PROJECTS IN ROMANIA AND BULGARIA DEFINITIONAL MISSION REPORT TABLE OF CONTENTS

TABLES

APPENDICES

EXECUTIVE SUMMARY

The U.S. Trade and Development Agency (USTDA) contracted Millennium Science & Engineering, Inc. (MSE) to conduct a Definitional Mission (DM) to Romania and Bulgaria in the Water / Wastewater Sector. The purpose of the DM was to identify appropriate projects that will qualify for potential USTDA funding on the basis of potential trade export and / or developmental impacts such as market-oriented reform, human capacity building, technology transfer and productivity enhancement, or other developmental impacts. The DM visits to Romania and Bulgaria were completed during July 2008.

In conjunction with the DM, seminars on water and wastewater issues important to Romania and Bulgaria were conducted in each country. These seminars were each conducted over a two-day period in Constanta, Romania, and Varna, Bulgaria, during July 2008. Seminar attendees included water and wastewater treatment system operators; academics; local, regional, and national policymakers; and representatives of companies providing water and wastewater technology, equipment, and services. The seminars covered material of interest to each location, and although many of the topics were common to each country, they were tailored to meet local needs. For example, in Romania, MSE also covered operations and maintenance services that were of interest to local water operators. In Varna, Bulgaria, MSE covered water distribution as an additional topic. The two seminar presenters were made available for questions following each seminar, and provided information to individual seminar participants both during these sessions and following their return to the U.S. For example, information on the costs of various biosolids management technologies was provided to one seminar participant for his use in estimating the costs of local biosolids management projects.

A total of three specific projects were addressed during the DM, all in Romania. No projects have been identified in Bulgaria, despite repeated attempts to obtain information from the Ministry of Regional Development and Public Works. All projects that have been identified are reported fully in this document.

MSE recommends that USTDA provide grant funding for the two projects shown in Table 1.

Table 1. Projects Recommended for Funding

Project	Recommended Grant Funding	Summary of Recommendations
Tulcea, Romania	$339,400	Fund feasibility study to examine in-situ methods for sewer line rehabilitation and to examine use of alternate disinfection technologies at Sulina.
Poarta Alba, Romania	$328,000	Fund portion of feasibility study for wastewater treatment system and biosolids/biomass management.
Constanta, Romania	NA	Funding of cover system for new wastewater treatment system in Constanta does not appear to be cost-effective.

INTRODUCTION

1. INTRODUCTION

The U.S. Trade and Development Agency (USTDA) contracted Millennium Science & Engineering, Inc. (MSE) to conduct a Definitional Mission (DM) to in Romania and Bulgaria in the Water / Wastewater Sector. The purpose of the DM was to identify water and wastewater projects that will qualify for potential USTDA funding on the basis of potential trade export and / or developmental impacts such as market-oriented reform, human capacity building, technology transfer and productivity enhancement, or other developmental impacts.

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MSE staff arrived in Bucharest, Romania on July 20, 2008. Initial meetings were held in Bucharest, Constanta, Poarta Alba, and Tulcea, Romania, during the week of July 21. The Romanian seminar on water and wastewater issues was held in Constanta, Romania on July 24-25. The Bulgarian seminar was held in Varna, Bulgaria, on July 28-29, and meetings were held with Bulgarian officials in Varna on July 29 regarding potential projects in Bulgaria. Field work for the DM was completed during July 2008.

2. ROMANIA DM OVERVIEW

Romania has a relatively recent history of strong environmental protection. Before the fall of its communist era government, Romania lacked environmental policies and during the transition to a market economy, development took precedence over other issues. However, as a result of their accession into the EU, Romania must comply with EU environmental standards and will need to upgrade its water and wastewater treatment infrastructure within the coming decade. The cost to meet EU wastewater treatment standards in Romania has been estimated by the U.S. Commercial Service to be U.S.$ 24 billion, which is the highest wastewater upgrade cost for all EU accession countries. Romania estimates in their Implementation Plan for Directive 91/271/EEC (The Urban Wastewater Treatment Directive) that it will cost 9.5 billion euros to implement the UWWT Directive—5.7 billion euros for wastewater treatment, and 3.8 billion euros for wastewater collection systems. About 40 percent of this funding was anticipated to be provided through EU funding mechanisms, 30 percent through state and local governments, and the remaining 30 percent through other sources. The Ministry of Environment and Sustainable Development is in the process of implementing approximately 40 water/wastewater infrastructure projects, including the first major wastewater treatment facility for Bucharest, at a cost of U.S.$4.5 billion.

Romania is working steadily to improve water quality, wastewater treatment, and increasing water resource supplies. European and Japanese companies are strong competitors of U.S. companies in Romania, although American companies and their equipment and services are well-known and well-liked. There are also opportunities for U.S. companies related to infrastructure technology and environmental services (e.g., feasibility studies, environmental management systems, ISO 14001), as well as trenchless pipe repair and other services.

Romania's water collection and distribution systems, and urban wastewater sewage and purification systems, are generally inadequate because of their old equipment, fragmentation of local water and wastewater utilities, and the low revenue base of the water and wastewater utilities. An estimated 11,500,000 of Romania's 21,700,000 inhabitants (approximately 53 percent) have access to wastewater collection and treatment systems. According to Romania's Implementation Plan for Directive 91/271/EEC, of the 2,609 communities with a population greater than 2,000 and subject to the UWWT Directive, only 660 have either a sewage collection system or a wastewater treatment plant. Of these, only 2 sewage collection systems are compliant with the Directive, and 11 wastewater treatment systems are compliant only at the secondary treatment level. The population's drinking water supply is also in a

particularly dangerous situation due to the lack of investments in water delivery, water treatment stations, and distribution pipelines.

Biosolids (sludge) generated by the wastewater treatment systems operating in Romania is generally landfilled. As more wastewater treatment facilities are brought on line in the future or upgraded, additional biosolids will be produced that will require management. Energy recovery from biosolids is not practiced in Romania at the present time.

In addition to EU standards, the Black Sea basin countries (including Romania) are undertaking major efforts to upgrade pollution control and nutrient reduction in the Danube-Black Sea basin. The long-term objective is for all Black Sea basin countries to take measures to reduce nutrient levels and other hazardous substances to levels necessary to permit Black Sea ecosystems to recover to similar conditions as those observed in the 1960s. The intermediate objective includes the implementation of urgent control measures by the 16 countries in the Danube-Black Sea basin to avoid discharges of nitrogen and phosphorus to the Black Sea in excess of the levels that existed in 1997.

After years of enduring debilitating eutrophication (increased nutrient discharges that stimulate excessive plant and algae growth in the receiving water), the Western Black Sea ecosystem has started to show signs of recovery, and the present ecosystem health is better than it was in the 1970s and 1980s. Discharges of nutrients to the Black Sea have been decreasing recently, and anoxic areas (areas devoid of oxygen) have also been decreasing as treatment improvements have been made. Further reductions are anticipated under several EU directives, including the Nitrates Directive, Urban Wastewater Directive, and the Water Framework Directive. Implementation of the Integrated Pollution Prevention and Control (IPPC) Directive will also reduce pollutant loadings from industrial sources.

Romania is scheduled to implement the Nitrate Directive through national legislation by the year 2014, and is scheduled to implement the IPPC Directive by 2015, and the UWWT Directive and Water Framework Directive by 2022. Under the UWWT Directive, Romania must provide wastewater collection for communities with greater than 10,000 population by the end of December 2013, and wastewater treatment for these communities by the end of December 2015. This will encompass approximately 62 percent of the population covered by the Directive. Wastewater collection and treatment services must be provided to communities of between 2,000 and 10,000 population by the end of December 2018, covering the remaining 38 percent of the population.

Renewable energy is of significant interest within Romania given the current instability in energy prices. Wind energy is not widely harvested in Romania, and there are only three wind turbine installations that generate significant energy, one in Tihuata Pass (250 kw) and two in Tulcea County (1 MW). Consequently, there is little local expertise in renewable energy production.

With this background, the focus of the DM was on identifying projects that would help achieve the applicable EU standards and directives while increasing the amount of future

U.S. firm's involvement in future projects. During the DM, key visits were made to Poarta Alba (near Constanta and the Black Sea Coast), the coastal resort city of Constanta, and Tulcea, along the Danube River about 60 km upstream of the Black Sea. The projects identified and discussed in each of these locations are discussed in the following sections.

2.1 Poarta Alba Wastewater Treatment and Energy Recovery Facility Project

2.1.1 Background

The town of Poarta Alba is located in Constanta County, west of Constanta. The residents of Poarta Alba and Basarabi (a.k.a., Murfatlar) are currently served by an existing wastewater treatment facility (WWTF). Although originally designed for approximately 25,000 residents in 1970, only about 15,500 are currently served by the treatment facility. Treated effluent is discharged to the Poarta Alba - Midia Navodari Channel that connects the Danube River to the north with the Black Sea. The WWTF is in poor condition and cannot recycle solids from the aeration basins, which prevents the system from being operated as an activated sludge treatment system and restricts treatment performance. Additionally, the anaerobic sludge digesters and biogas facilities and chlorination equipment are not operational. Significant facility improvements will be needed to expand the existing capacity of the wastewater treatment system for additional users and improve treatment performance.

The local water and wastewater operator, S.C. Regia Autonoma Judeteana de Apa S.A. (RAJA Constanta), is the second largest water and wastewater utility within Romania. RAJA Constanta provides water and wastewater services to ten cities and 44 towns in Constanta County. Water is supplied to approximately 590,000 residents, while approximately 410,000 residents receive wastewater services. RAJA Constanta, like most water operators in Romania, has plans to upgrade and or build new facilities in their service area to comply with Romanian commitments to the EU and meet the Urban Waste Water Directive (UWWD). Currently, RAJA Constanta owns and operates nine wastewater treatment facilities, and plans to upgrade five of those facilities over the next several years. A total of 54 wastewater treatment facilities within their service area will need to be upgraded or constructed by December 2018 to meet EU requirements. Energy costs represent approximately 20 percent of their $50,000,000 annual budget. RAJA Constanta recognizes that an energy cost reduction will allow them to accomplish more facility upgrades and construction projects in a shorter period of time.

RAJA Constanta is interested in developing a model for energy-efficient wastewater treatment throughout the region that will meet EU wastewater treatment requirements and do so with minimal grid-supplied electrical power. The model would integrate wastewater treatment with sludge management and biomass utilization for energy production. With an estimated current annual sludge production of 3,800 wet metric tons from the wastewater treatment facility, additional biomass may be needed to make the energy production process economically viable. The existing sludge is currently dewatered and hauled to local landfills approximately 7 to 25 km from the facility.

Several additional sources of biomass are potentially available in the local area of Poarta Alba. The Murfatlar winery is one of the largest wineries in Europe, and is located within a kilometer of the existing WWTF. The winery produces an estimated 6,000 metric tons of biomass annually. Some of the biomass is used for cattle feed and is bartered for manure that is used in the vineyard, but most of the biomass would be potentially available for energy production. The vineyard has two digesters onsite, though these are not currently used and have not been used in some time.

Other local (within 3.5 km of the WWTF) sources of biomass include 60 to 70 annual metric tons or manure each from several local farms, 50 annual tons of septage and 1.5 annual tons of grease from a local prison, and other agricultural waste from farming. Constanta also generates septage and grease within the RAJA service area that could be diverted to the WWTF for use in energy production.

2.1.2 Project Description

The proposed project would involve several components. The first component is the construction of a new WWTF to replace the existing facility. Several candidate treatment systems will be evaluated prior to selection, and are summarized in Table 2.

Table 2. Candidate Wastewater Treatment Systems for Poarta Alba

Treatment System	Vendor	Location
Sequox	AeroMod	Manhattan, KS
Biolac	Parkson, Inc.	Fort Lauderdale, FL
Sequencing Batch Reactor (SBR)	Ashbrook Simon-Hartley	Houston, TX
Amphidrome Submerged Attached Growth Bioreactor (SAGB)	R Mahony, Inc.	Rockland, MA
ZeeWeed Membrane Bioreactor	GE Water and Process Technologies	Trevose, PA
Integrated Fixed Film/Activated Sludge Systems (IFAS)	Bentwood Industries	Reading, PA

To minimize energy requirements for the wastewater treatment system, several optimization systems that use specialized probes and program logic controllers (PLCs) would be evaluated, including Symbio (by Enviroquip of Austin, TX) and Myratek (by BioChem Technology, Inc. of King of Prussia, PA).

A second project component involves creating energy from biosolids generated by the facility, and possibly biomass from other sources. The Poarta Alba facility currently generates a reported 3,800 metric tons of wet biosolids per year. The expanded plant will generate somewhat more biosolids due to the higher wastewater flow rates anticipated. Other sources of biomass include the adjacent Murfatlar winery, several larger local farms, a local prison, and septage and biosolids/biomass available in the City of Constanta.

The waste-to-energy project component would involve conversion of a volume of biomass to biogas, and then to energy through one of several technologies. Gasification and anaerobic digestion processes would be evaluated. It is estimated that if biomass equivalent to a 4.5 million gallon per day treatment facility (approximate biomass required for cost-effectiveness) can be converted, the biomass energy recovery system would produce approximately 100 kilowatts of energy. Technologies that would be evaluated for converting the biogas into energy would include those listed in Table 3.

Table 3. Candidate Energy Conversion Technologies for Poarta Alba

Technology	Vendor	Location
Gasification	MaxWest, Inc.	TX
Anaerobic Digestion and Sonolyzer System for Increased Production	EIMCO, Inc.	TX
Reciprocating Engines	Caterpillar, Inc.	IL and WI
Fuel Cells	Fuel Cell Energy United Technologies	CT CT
Microturbines	Capstone Turbine Ingersoll-Rand United Technologies	CA NH CT

A third project component would involve the potential use of wind turbines to generate energy at and in the vicinity of the wastewater treatment facility. Limited work conducted by RAJA Constanta at the wastewater treatment facility indicates that one or more small turbines should be feasible on-site. The energy generated could be used to offset the energy required by facility operations. Small-scale wind technologies offered by NRG Systems (VT), Distributed Energy Systems (VT) and Bergey Wind Power (OK) may be feasible on-site.

2.1.3 Project Cost Estimate

The estimated project capital costs from the feasibility study application are shown below in Table 4. These costs were prepared by Coler & Colantonio, who have submitted a grant application to USTDA to prepare a feasibility study for the project.

Table 4. Estimated Poarta Alba Wastewater Treatment and Energy Recovery Facility Project Costs

Cost Item	Estimated Capital Cost (USD)
Wastewater Treatment Facility	$7,500,000
Sludge Handling/Digestion	$3,000,000
Gas-to-Energy Facilities	$250,000
Wind Turbines	$400,000
Subtotal	$11,150,000
Engineering & Contingency	$2,200,000
Total Estimated Project Cost	**$13,350,000**

Export potential for the project is estimated at approximately $4,000,000, based on Coler and Colantonio's estimate of 30 percent of the wastewater treatment and sludge management system costs, 50 percent of the energy system costs, and 25 percent of the engineering costs.

Annual costs for the proposed treatment system are estimated to be approximately $1,420,000. Revenues are estimated to be more than $1,660,000 from sewer use fees and offset energy value. Revenues and/or savings from tipping fees and green energy certificates would be an added revenue source.

The feasibility study grant application submitted to USTDA by Coler and Colantonio, Inc. estimates the feasibility study will cost approximately $550,000. The cost estimate that was provided in the application showed a proposed cost of $468,969, including a 15 percent cost share propsed by Coler and Colantonio.

2.1.4 Project Sponsor's Capabilities and Commitment

Under EU wastewater targets, Romania must provide wastewater collection services to communities with populations of greater than 10,000 inhabitants by the end of December 2013, and wastewater treatment services by the end of December 2015. The Poarta Alba area has a population of greater than 10,000, and accordingly wastewater treatment must be provided to this area within the next five years.

RAJA Constanta is the second largest water and wastewater operator in Romania, with an annual budget in excess of U.S.$50,000,000. They have the responsibility for providing services to a population of over 700,000 in Constanta County, and currently supply potable water to over 590,000 inhabitants and sewer services to over 410,000. Nine wastewater treatment facilities and 52 pumping stations are operational, and RAJA Constanta plans to upgrade and/or construct up to 54 wastewater treatment facilities, hundreds of kilometers of sanitary sewage collection mains, and necessary pumping stations during the next 20 years. A Master Plan is being prepared which will further define the wastewater treatment needs within the County.

RAJA Constanta has made a commitment to provide in-kind services during the feasibility study including technical information, environmental assessment, topographic and geotechnical studies, permits and agreements, and translation, and has provided a written memorandum of understanding to Coler and Colantonio outlining what services they will provide to the project. Given that approximately 20 percent of their operating cost is energy-related, RAJA Constanta has indicated in discussions that they may be able to fund the wind energy portion of the project should it not be fundable through other sources.

2.1.5 Implementation Financing

Project financing is expected to come from several sources, including the EU, Government of Romania, and RAJA Constanta's internal funding, as well as Development Banks, Export Credit Agencies, and Domestic Banks. Specific sources have not been identified. The estimated annual debt service and operating and maintenance costs can be paid through projected RAJA Constanta sewer use rates as well as the energy value added by energy recovery, resulting in full cost recovery on the project.

Building Romania's wastewater infrastructure to meet EU requirements is a major undertaking, and will require large capital outlays. It is estimated that 3.3 billion euros will be required just within Romania, with 2.8 billion coming from the EU, and the remaining 0.5 billion coming from the Romanian government and local sources. RAJA Constanta expects to receive over 230,000,000 euros in structural funds by 2015 for wastewater system infrastructure improvements. A feasibility study will be required for each project to ensure that RAJA Constanta has the ability to manage the project. The proposed feasibility study would provide the information needed to support the grant request for the project, and would also examine implementation financing options in more detail.

2.1.6 U.S. Export Potential

Approximately 30 percent of the total project cost of U.S.$13,350,000 is estimated to be applicable to U.S. equipment and services, or approximately U.S.$4,375,000. The remaining 70 percent of the project cost would be primarily locally provided. The potential U.S. exports include about 50 percent of the cost of the energy facilities (i.e., $325,000 of the estimated $650,000 cost of the gas-to-energy facilities and wind turbines that could be provided by U.S. firms), 30 percent of the wastewater treatment and sludge handling facility costs (i.e., an estimated $3,500,000 of the $10,500,000 cost of wastewater treatment facilities and sludge handling and digestion facilities), and 25 percent of the engineering costs (i.e., $550,000 of the $2,200,000 cost of engineering). Primary U.S. exports would include technology and equipment for the gas-to-energy facilities and wind turbines, as well as wastewater treatment technology and equipment to meet EU wastewater treatment standards, sludge handling and digestion equipment and technology, and project consulting and management expertise. Potential U.S. suppliers of equipment and technology have already been identified and are summarized in Table 5.

The proposed project is intended to serve as a demonstration project linking cost-effective wastewater treatment, renewable energy production, and greenhouse gas emissions reduction. There is significant potential for the technology to be utilized elsewhere in Constanta County at other facilities managed by RAJA Constanta, as well as at other locations in Romania. The estimated cost of wastewater treatment system construction and upgrades in Constanta County alone is U.S.$93,000,000 through 2018, with an estimated total U.S. export potential of U.S.$28,000,000. Additional export

potential exists for waste-to-energy projects associated with these new and upgraded wastewater treatment facilities. RAJA Constanta is favorably disposed towards U.S. suppliers through a visit to the U.S. Water Environment Federation Conference (WEFTEC) in San Diego in 2007, and they met with other suppliers at the WEFTEC Conference in Chicago in mid-October 2008.

Table 5. U.S. Suppliers of Equipment and Technologies for Poarta Alba

Technology	Vendor	Location
Wastewater Treatment/Sludge Management/Disinfection		
Sequox	AeroMod, Inc.	Manhattan, KS
Biolac	Parkson, Inc.	Fort Lauderdale, FL
Sequencing Batch Reactor (SBR)	Ashbrook Simon-Hartley	Houston, TX
Amphidrome Submerged Attached Growth Bioreactor (SAGB)	F. R. Mahony & Associates, Inc.	Rockland, MA
ZeeWeed Membrane Bioreactor	GE Water and Process Technologies	Trevose, PA
Integrated Fixed Film/Activated Sludge Systems (IFAS)	Bentwood Industries	Reading, PA
Sludge Dewatering	Parkson Corporation	Fort Lauderdale, FL
Disinfection	MIOX Corporation	Albuquerque, NM
Wastewater Energy Optimization	Enviroquip, Inc. BioChem Technology, Inc.	Austin, TX King of Prussia, PA
Anaerobic Digestion	Siemens Water Technologies Eimco Water Technologies, LLC	Waukesha, WI Austin, TX
Energy Technologies		
Gasification	MaxWest Environmental Systems, Inc. EnerSol Technolgies, Inc. Emery Energy Company PRM Energy Systems, Inc.	Houston, TX Fairfax, VA Salt Lake City, UT Hot Springs, AR
Wind Energy	Distributed Energy NRG Systems, Inc. Bergey Wind Power GE Wind	Barre, VT Hinesburg, VT Norman, OK Fairfield, CT
Reciprocating Engines	Caterpillar Generac Power Systems, Inc. Hess Microgen Waukesha Engine General Electric	Peoria, IL Waukesha, WI Carson City, NV Waukesha, WI Fairfield, CT
Fuel Cells	Fuel Cell Energy, Inc. UTC Fuel Cells	Danbury, CT South Windsor, CT
Microturbines	Capstone Turbine Corporation Ingersoll-Rand Energy Systems Elliot Energy Systems United Technologies Corp.	Chatsworth, CA Portsmouth, NH Stuart, FL South Windsor, CT

Key U.S. suppliers have already been contacted about the project and have expressed interest through written letters of interest. Aeromod, MaxWest Environmental Systems, Inc., and Distributed Energy Systems, Inc. all provided written letters of interest in the project to Coler and Colantonio. Several others, including GE and ITT, are already present in Romania. Major U.S. E/C firms such as Black & Veatch and Montgomery Watson Harza are already present in Romania, and others such as CDM have recently worked there.

2.1.7 Foreign Competition/Market Entry Issues

The U.S. is competitive with EU and other countries in wastewater services, and in the development of renewable energy resources. EU competitors in wastewater technology services in Romania include VA Tech Wabag of Germany (wastewater treatment and sludge management), Verder SA Romania of the Netherlands (pumps), and Mettler Toledo of Switzerland (instrumentation). Veolia, a French company, could also be a strong competitor. Romanian companies active in the wastewater arena include Grup Romet (wastewater treatment equipment), Ingo Prod SRL (wastewater treatment equipment), Parcis SRL (wastewater treatment and sanitary engineering), and DFR Systems SRL (tanks, disinfection equipment, package treatment plants). As previously noted, U.S. firms such as Black & Veatch, Montgomery Watson Harza, and SOPOLEC are already established in Romania, and other U.S. firms have recently worked there and have established relationships.

Wastewater treatment consulting competitors include Tebodin of the Netherlands, Veolia of France, and IDOM of Spain. Energy consulting services competitors include Exergia of Greece and Ramboll of Denmark.

In discussions with RAJA Constanta and others in Romania, they indicated that U.S. equipment and supplies are favorably viewed by potential buyers over Romanian and other competitors due to their product quality, durability, and reliability. Local buyers typically prefer to work with local resources that have knowledge of local conditions. Although there is some U.S. presence in Romania, as noted above, lack of additional U.S. presence limits imports to some extent.

RAJA Constanta has familiarized themselves with U.S. technology and suppliers through discussions with potential suppliers, and visited the U.S. twice during the past year to talk to U.S. suppliers at the WEFTEC Conferences in San Diego and Chicago. They perceive U.S. equipment and technology suppliers favorably, and have also signed a memorandum of understanding with Coler & Colantonio to clarify their commitment to the project and to the proposed project team.

2.1.8 Developmental Impact

2.1.8.1 Primary Developmental Benefits

The project is expected to have positive developmental benefit in the following areas:

- Infrastructure will be improved through the construction of wastewater treatment, biosolids management, and renewable energy facilities. Poarta Alba is in the greater Constanta area, a primary tourist destination. Providing wastewater services to this community will provide positive developmental benefits, including improved health benefits as well as economic growth for the area. It will also have positive impacts on the water quality of the local receiving water and the Black Sea, which has had an historic problem with nutrient discharges and eutrophication.
- Implementation of the project will help build local capacity in improved wastewater treatment, biosolids management, and renewable energy and greenhouse gas emission reduction.
- Another developmental benefit is that the proposed project will also serve as a demonstration project and technology transfer of cost-effective wastewater treatment and biosolids management, renewable energy production, and greenhouse gas emissions reduction to the local water authority. There is significant potential for the technologies used on the project to be utilized elsewhere in Constanta County at other facilities managed by RAJA Constanta, as well as at other locations in Romania.

The project is not expected to result in any market-oriented reform.

2.1.8.2 Alternatives

As part of their accession to the EU, Romania has an obligation to achieve compliance with various directives addressing water and wastewater issues. The primary options available to Romania in these areas involve the specific consultants, contractors, and vendors who can provide the necessary services to bring the country in to compliance with these directives.

For biosolids management, there are several alternatives available in addition to the proposed sludge digestion and energy generation option. The biosolids could simply be landfilled, which is a method commonly applied today. Waste biosolids could also be applied to land as a fertilizer or soil amendment. Over 40 percent of the biosolids generated in the EU presently is land-applied for these purposes, and this practice is regulated under the 1986 Sludge Directive (86/27/EEC Directive) that Romania must meet. This directive places restrictions on heavy metals in waste biosolids that is land-applied, and is currently being reviewed for new legislation that would address sustainable practices for land application of biosolids. Indeed, Secretary Stoica has voiced a concern about using biosolids for energy production that could be used in land application. Finally, the biosolids could be incinerated and the resultant ash landfilled, which would reduce the amount of material that would require landfilling.

Another alternative would be to proceed with energy generation from the wastewater treatment facility biosolids, but without supplementation by biomass from other sources such as the winery and the City of Constanta.

In the renewable energy arena, Romania is required to meet EU directives on renewable energy production. While Romania can make progress towards this goal through the use of wind power and use of biomass for energy, there are other options available such as hydropower production and solar power generation that would meet these requirements.

2.1.9 Impact on the Environment

The proposed project will have a net positive impact on the environment by improving wastewater treatment infrastructure, water quality, and biosolids handling. In addition, the project will serve as a model for integrating wastewater treatment and energy production and sustainability in the RAJA Constanta service area, as well as throughout Romania.

Negative project impacts are primarily related to short-term construction impacts, including generation of dust, odors, noise, and traffic. These impacts can be ameliorated by monitoring impacts to keep them within certain limits, and by scheduling of construction to minimize impacts. Environmental impacts, positive and negative, will be addressed in the project feasibility study.

2.1.10 Impact on U.S. Labor

The project is anticipated to have a positive impact on U.S. labor through the export of equipment and services to Romania for the project. There will be no transfer of jobs to Romania from the U.S. or any other foreign country as a result of the feasibility study. The use of specialized equipment for wastewater treatment and energy recovery that is produced by U.S. companies will directly benefit suppliers in the U.S. and the labor pool. Services exported to Romania for the feasibility study and project design and implementation will also positively impact the U.S. labor pool, and will help enhance the U.S. presence in Romania.

2.1.11 Qualifications

USTDA has already submitted a feasibility study application for the project from Coler & Colantonio. The scope of work presented in the grant application is well-documented and focused. If USTDA intends to solicit bids for the feasibility study work, MSE recommends that the qualifications of the FS Contractor be evaluated according to the following threshold and scored selection criteria:

Threshold Evaluation Criteria

Proposals should be evaluated to confirm that the Proposer has the required minimum threshold capabilities to perform the feasibility study. Those Proposers who demonstrate that they have the required threshold capabilities should be further evaluated and scored according to the Scored Evaluation Criteria. The Threshold Criteria should include the

following Technical Qualifications: municipal wastewater treatment experience, biosolids management, and renewable energy experience with wind power generation.

Scored Evaluation Criteria

The type of capabilities and experience required for this work includes implementation of wastewater treatment operations, including biosolids management, and renewable energy production. Scored selection criteria for a contractor to perform the type of work discussed in this section is as follows:

1. **Wastewater Treatment Engineering Experience (15%)**
Firm or team's relevant wastewater sector experience including studies, design, procurement, construction, training, and operations with small to mid-size wastewater treatment facilities. Biosolids management experience should be part of the firm's wastewater treatment experience.

2. **Renewable Energy Experience (15%)**
Firm or team's relevant renewable energy experience, specifically in wind power generation, including studies, design, procurement, construction, and operations of small wind power systems.

3. **Adequacy of Proposal (20%)**
Adequacy of contractor's work plan and approach responding to the terms of reference, including methods for each principal work activity.

4. **Regional Qualifications (10%)**
Experience of contractor on similar projects in Romania or other Eastern European countries.

5. **Qualifications and Experience of Firm or Team's Key Staff (30%)**
Capabilities and demonstrated experience of key positions such as the project manager, wastewater engineers, environmental engineers, renewable energy specialists, and financial advisors. The proposal should also include an organization chart of key personnel, and a proposed work plan that indicates the staffing schedule for each task.

6. **Local Capabilities (10%)**
Capabilities of local associates or firm to assist with logistics, surveys, data collection, etc.

2.1.12 Justification

The project is justified on several fronts: 1) providing needed wastewater treatment to a population of greater than 10,000 individuals, to meet EU wastewater treatment requirements; 2) recovering energy from wastewater biosolids and other locally-available biomass sources; 3) reducing greenhouse gas emissions; and 4) providing an alternative

energy source in the form of wind power generation. The project will also serve as a demonstration project for other wastewater treatment facilities in Constanta County and Romania that combine a high level of wastewater treatment (including nutrient removal), low net energy use, and minimized carbon footprint. It will also demonstrate the use of U.S. equipment, technology, and services which can be used elsewhere to meet the demand for sustainable wastewater treatment that will be exercised over the next decade.

The project is expected to be self-sustainable based on sewer use fees once the facility is constructed and operational.

2.1.13 Recommendations

The proposed project is relatively well-defined. A feasibility study grant application has already been submitted to USTDA in April 2008 by Coler & Colantonio, Inc. outlining the project and requesting funding for the feasibility study. MSE recommends that the application be approved at a reduced level of funding to cover the wastewater treatment and biosolids management portions of the project.

In discussions with State Secretary Victor Stoica of the Romanian Ministry of Environment and Sustainable Development, the Ministry was generally supportive of the wastewater treatment facility needs, but expressed several concerns about the project components, specifically the energy generation and sludge management components. Secretary Stoica was concerned that the renewable energy generation component through wind farming may not be eligible for funding as part of a wastewater project. In addition, he expressed concern that biogas generation using the wastewater treatment plant sludge would use an organic resource of potential value to local agriculture. While he did not rule out support for funding these aspects of the project, he would like to see more discussion of these components before they can be approved. He apparently had no issues with the wastewater treatment component of the project.

Elimination of the energy recovery and wind turbine portion of the project would reduce the estimated total project cost by approximately U.S.$780,000, including engineering and contingency. U.S. export potential would be reduced by an estimated U.S.$358,000. If the sludge management portion of the project were also eliminated, the total project cost would be reduced by an up to an additional $3,600,000, including engineering and contingency. The U.S. export potential would be reduced by up to an estimated U.S.$1,020,000, depending on what replacement strategy for sludge management were pursued. Actual reductions would likely be less than these amounts, depending on the sludge management approach adopted.

USTDA's minimum criteria for grant funding qualifications (for feasibility studies) include:

- National development priority;
- Significant U.S. export potential;

- Likelihood of obtaining financing and achieving project implementation; and
- Foreign competition can be addressed (to some degree) via TDA study funding.

The cost of the proposed feasibility study as proposed by Coler & Colantonio is high relative to the estimated U.S. export potential for the proposed project. Given the high cost of the study and the Romanian Government concerns over the waste-to-energy portions of the project, MSE recommends that the feasibility study cost be reduced by refocusing the effort on the wastewater treatment and biosolids management aspects of the project. Alternatively, the feasibility study could be partially funded to cover these aspects, and the remaining energy components could be funded by RAJA Constanta. If the feasibility study costs can be brought more into line with the estimated U.S. export potential, MSE recommends that the feasibility study be funded.

2.1.13.1 Terms of Reference

The Terms of Reference for this project are as follows, assuming the entire project feasibility is investigated:

Task 1—Project Initiation and Work Plan Development

The contractor would conduct a kick off meeting for the project and develop a work plan to ensure that all project team members are aware of the project goals, scope, financial commitment, schedule, responsibilities, and deliverables.

Task 2—Data Collection

This task involves collection of all existing and other data needed to complete the project, including but not limited to plans, specifications, maps and drawings, reports, and other data relevant to the project. This task will be done primarily in-country, with substantial assistance from RAJA Constanta.

Task 3—Develop Design Criteria and Data

Under Task 3, the FS contractor would compile all existing information and develop the design criteria for the project that will be used throughout the feasibility study evaluation. This will include definition of the design period for the design life of the project; determination of regulatory requirements; the preparation of base maps; development of population projections, land use, and other socioeconomic data; development of biomass availability information; and compilation of wind data needed to support the wind energy generation component of the project.

Task 4—Evaluate Existing Facilities

This task will encompass an evaluation of the existing wastewater and collection facilities, including biosolids management facilities. Improvement needs will be identified, including future treatment needs to comply with EU requirements. This task will include an evaluation of the management system in place to manage the wastewater treatment system and biosolids management.

Task 5—Develop and Evaluate Improvement Alternatives

Task 5 will comprise the evaluation of wastewater treatment system, biosolids management system, and wind energy generation alternatives that address project needs identified in the previous tasks. This analysis will focus on technologies and equipment provided by U.S. companies, as identified in Table 5. In addition to examining various wastewater treatment systems including sequential batch reactors and membrane bioreactor systems, the feasibility study will also examine biosolids and biomass conversion using anaerobic digestion, gasifiers, reciprocating engines, fuel cells, and microturbines. The potential use of wind power both on-site and off-site will be examined.

Task 6—Develop O&M Program

Under Task 6, the FS Contractor will review the existing O&M program at the Poarta Alba facility and recommend a long-term O&M program that is consistent with EU policy. The O&M program will include not only the operation of the wastewater treatment system, but also biomass/biosolids management and wind power generation.

Task 7—Perform Economic and Financial Analysis

Task 7 will develop options for financing the improvements to the Poarta Alba facility. The task will include the development of a financial model to incorporate expected revenues, capital costs, operating costs, and financial assumptions. Project benefits including carbon credits, incentives, and tax benefits will also be identified. Financing alternatives will be identified taking into account any credits and the availability of financing through various sources.

Task 8—Developmental Impact

The Contractor shall report on the potential Developmental Impact of the Project in Romania. While specific focus should be paid to the immediate impact of the specific Project, the Contractor shall include, where appropriate, any additional developmental benefits to the Project, including spin-off, demonstration, and implementation effects. The analysis of potential benefits should be as concrete and detailed as possible. The Developmental Impact factors are intended to provide the Project's decision-makers and interested parties with a broader view of the Project's potential effects. The Contractor shall provide estimates of the Project's potential benefits in the following areas:

a) Infrastructure: a statement on the infrastructure impact giving a brief synopsis.
b) Market-Oriented Reform: a description of any regulation, laws, or institutional changes that are recommended and the effect they would have if implemented.
c) Human Capacity Building: The Contractor shall address the number and type of positions that have been or will likely be created as a result of the Project as well as the number of people who have received the training and a brief description of the training program.
d) Technology Transfer and Productivity Enhancement: a description of any advanced technologies that have been implemented during or may be implemented as a result of the Project. A description of any efficiency that has or would be gained through the implemented technologies.
e) Other: any other developmental benefits to the Project, including any spin-off or demonstration effects.

Task 9 – Environmental Impact

The Contractor shall conduct a preliminary review of the Project's anticipated impact on the environment with reference to local requirements and those of multilateral lending agencies (such as the World Bank or EBRD). This review would identify potential negative impacts, discuss the extent to which they can be mitigated and develop plans for a full environmental impact assessment if and when the Project moves forward to the implementation stage. This includes the identification of steps that will need to be undertaken by RAJA Constanta subsequent to the FS's completion and prior to the Project's implementation. The review shall also include:

a) A description of the positive and negative environmental impacts during construction and operation.
b) A description of national environmental standard, mitigation measures and organizational responsibilities.
c) Specification of possible permits and/or other related requirements for the Project.

Task 10 —Final Report

The Final Feasibility Study Report will be prepared, detailing the results of Tasks 1-9. The Contractor shall prepare a Final Report in accordance with Clause I of Annex II of the Grant Agreement. The FS results will be presented in a Final FS Report that contains all of the critical information developed during the course of the study. This includes the results from each of the tasks (1-9) described above. A conceptual design for all project components, an environmental assessment including identification of all environmental and developmental impacts, an implementation plan for the project, and definition of U.S. sources of equipment and services will be provided in the report. This Final Report will also serve as the basis for the implementation phase.

A draft of the Final Report shall be submitted to USTDA for comments. The Contractor shall finalize the report for submittal to RAJA Constanta and USTDA following

incorporation of comments. The Contractor and RAJA Constanta shall be careful to ensure that the public version of the Final Report contains no security or confidential information.

2.1.13.2 Study Budget

The feasibility study budget is estimated to be $551,729 by Coler & Colantonio, and with a 15 percent contribution of services, they have requested funding of $468,969 for the feasibility study. This estimate is summarized in Appendix A2 (correcting several mathematical discrepancies in the original estimate). As shown, MSE estimates that the total estimated cost of the project is approximately $551,351, consisting of $448,078 in direct labor (including subcontractors), and $103,273 in other direct costs.

Although the costs for the wind power portion of the project, including analysis of options and development of an operating and maintenance strategy, have not been broken out by the proposer, MSE estimates that this would be approximately 30 percent of the project. Accordingly, the wastewater and biomass portion of the project would be approximately $385,946. Assuming a 15 percent contribution of services by the proposer as described in the original proposal, the remaining cost of funding a feasibility study to USTDA would be approximately $328,000.

To make the project cost-effective, MSE recommends USTDA approval of a budget of approximately $328,000 to address primarily the wastewater treatment and biomass management portions of the project. The wind power portion of the project could still be conducted, using funding through RAJA Constanta or other sources.

2.1.13.3 Schedule

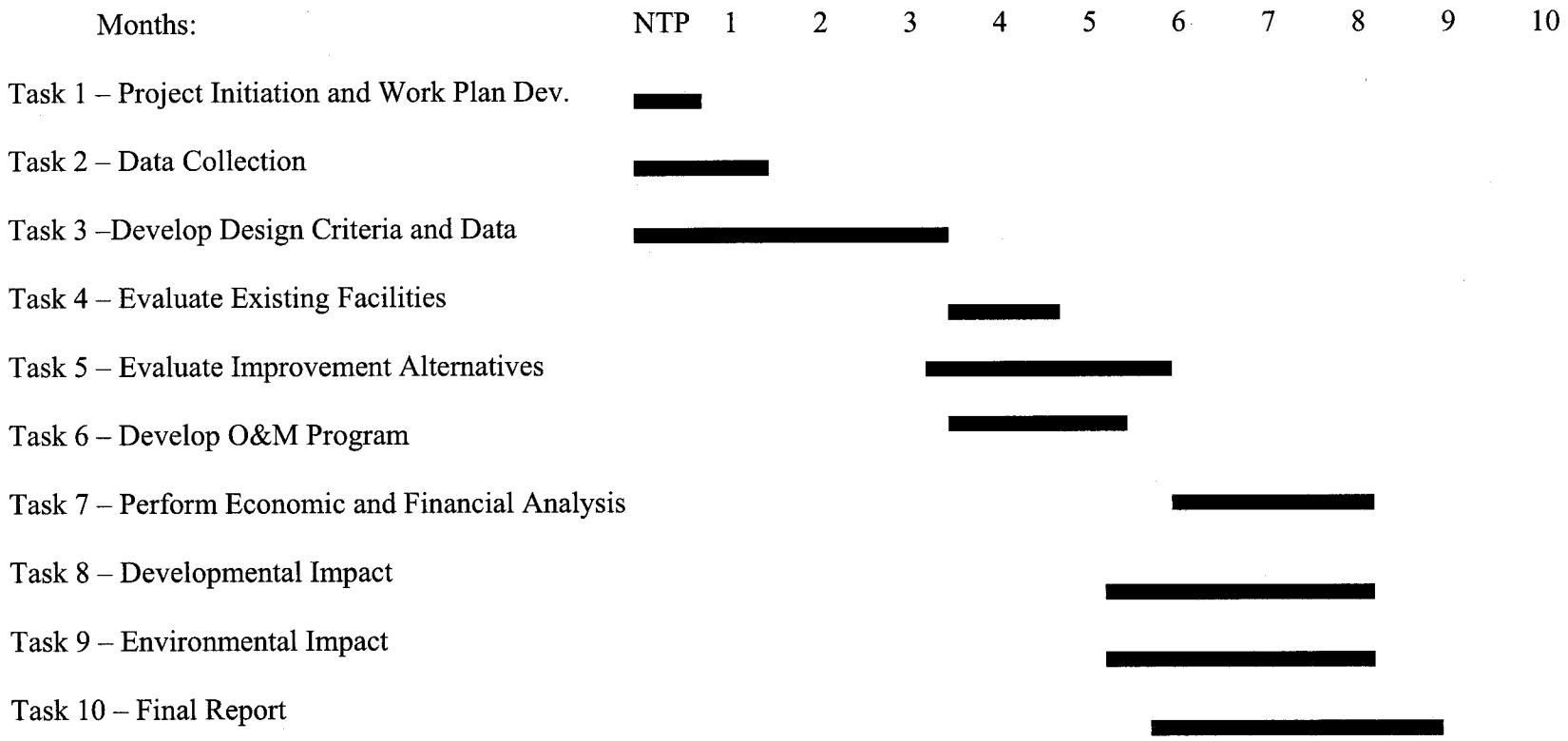
The schedule for the proposed feasibility study project is shown on Table 6. As shown, the feasibility study will take approximately ten months from project initiation to complete.

2.1.14 Contacts

Contact information for key individuals involved in the project is included in Appendix A1.

Table 6. Implementation Schedule for Poarta Alba Wastewater Treatment and Energy Recovery Facility Project

TASK COMPLETION SCHEDULE [MONTHS AFTER NOTICE TO PROCEED – NTP]



2.2 Tulcea Water and Wastewater System Improvements

2.2.1 Project Background

The City of Tulcea is located within Tulcea County, Romania, on the Danube River, within the Danube Delta Biosphere Reserve, approximately 42 miles upstream from the main navigational channel discharge into the Black Sea at Sulina. With a population approaching 100,000, it is the largest municipality in the county. Tulcea County itself is the second largest in land area (5,800 square km) within Romania (about 2.5% of the total land area in Romania), with the second smallest population (an estimated 272,000). The low population density complicates a regional approach to water and wastewater management.

The Danube Delta Biosphere Reserve is an ecologically sensitive area, and was established as a World Heritage Site by UNESCO in December 1991. An estuary of great importance to the productivity of the Black Sea, the Danube Delta also provides nesting grounds for many migratory bird species. Numerous small towns and villages also coexist within the Danube Delta Biosphere Reserve. Much of Tulcea County has been designated a Nature 2000 site, falling under the EU Habitats Directive, which promotes sustainable development over about 82 percent of the land area in the county.

The Regional Operating Company, Aquaserve, was established in 2007 and is responsible for the water infrastructure in Tulcea County, which includes both groundwater well fields and surface water from the Danube River. Current treatment technologies range from no treatment for some of the groundwater well fields to rapid sand infiltration and disinfection for the treatment of Danube River water. Water infrastructure, including treatment and distribution systems, is aged and requires upgrading. Rehabilitation of water treatment systems for the surface water is needed, as is disinfection for some of the well fields. Distribution systems within the County are in need of rehabilitation, repair, and expansion to reach developed areas, reduce water losses, and maintain water quality. Aquaserve is in the process of securing funding from the EU, the County Council, and the City of Tulcea to upgrade elements of the system.

A Master Plan for Tulcea County has been prepared to guide infrastructure development through 2025. A projected 400,000,000 euros will be spent to upgrade water and wastewater systems within the county. The first phase of this effort has been scoped and is proceeding in the municipalities of Tulcea, Sulina, Macin, and Iasccea, all within Tulcea County. This project phase is already funded at a level of 140,000,000 euros. An application for a second, distinct project phase will be submitted to the EU in December 2009, with about 80 percent of the funding expected to come from EU sources, 10 percent from the Romanian Government, and the remaining 10 percent from Aquaserve, the County Council, and the City of Tulcea. This phase will take place primarily in Tulcea and Sulina.

MIOX Corporation, an Albuquerque, New Mexico-based corporation, uses a salt electrolysis process to generate sodium hypochlorite disinfectant on demand on-site for

water use. MIOX is presently performing a pilot test on the system at a community between Tulcea and Sulina known as Mile 23.

2.2.2 Project Details

There are two components to this potential project, the first of which is piping rehabilitation. Aquaserve has identified water distribution piping and wastewater collection system piping that should be rehabilitated based on age (some piping is as old as 1900) and/or water system losses which approach 75 percent in Tulcea and Sulina. The project would include the rehabilitation of approximately 68.1 km of subsurface water distribution piping and 68 km of wastewater collection system piping located in three separate zones in Tulcea. Given the locations of the existing piping infrastructure beneath developed areas, rehabilitation by excavation is both time-consuming and costly. Accordingly, Aquaserve is interested in employing rehabilitation of the existing piping through the use of cured-in-place technology to improve the efficiency of rehabilitation and minimize excavation, costs, and interruptions.

A second project component would be the replacement of the current chlorine gas disinfection system in Sulina with the on-site generation of sodium hypochlorite. Currently, approximately 8 one-ton chlorine gas cylinders are shipped by boat down the major navigational channel of the Danube River from Tulcea to Sulina each month. The water treatment plant in Sulina is not accessible by road. Continued shipment by water is undesirable due to the potential impacts of an accidental release in this environmentally sensitive area.

2.2.3 Project Cost Estimate

The estimated cost of ongoing and future water and wastewater system improvements in Tulcea County is 400,000,000 euros. Some of the work is already being done under the first phase of improvements, which is funded at 140,000,000 euros by the EU (80 percent), Romanian government (10 percent), and local resources (10 percent). The second project phase is estimated to be approximately 50,000,000 euros. Future project phases will bring the total cost of the water and wastewater system improvements to 400,000,000 euros.

2.2.4 Project Sponsor's Capabilities and Commitment

The sponsor for this project would be Aquaserv, supported by the local municipality and county council, and the Romanian government. A first phase of the project is already being funded to provide wastewater services to portions of Tulcea County. The project sponsor has committed to continue the project in a second phase to address other areas of the County, as well as additional sewer line rehabilitation in Tulcea. The local municipality and County Council have verbally pledged to support the project.

2.2.5 Implementation Financing

The first phase of the project is already underway to bring wastewater services to parts of Tulcea County that are not presently serviced. This project is funded at 140,000,000 euros, primarily through the EU, and is currently being implemented. An additional 50,000,000 euros is estimated for the second project phase, which is in need of a feasibility study to determine and/or refine project components. Project financing for the second phase of the project is anticipated to come primarily from the EU (80 percent), with 10 percent coming from the Romanian government, 6 percent from the local water authority, and the remaining 4 percent from the local municipality and County Council.

2.2.6 U.S. Export Potential

The project includes significant U.S. export potential in several areas: sewer and water line rehabilitation, alternative disinfection techniques for remote locations, and engineering services. Cured-in-place piping rehabilitation technologies utilized by U.S. firms such as Insituform have significant export potential for areas such as Tulcea that have an aging infrastructure in established municipalities, where excavation and replacement or rehabilitation of the infrastructure is time-consuming, expensive, and potentially dangerous given geologic conditions (sandy soils that have to be shored when excavating).

Alternate disinfection technologies have an appeal for developed and undeveloped or remote areas that want to minimize the risk and potential security issues associated with shipping and using gaseous chlorine. U.S. firms such as MIOX have commercially developed disinfection technologies using salt electrolysis to generate chlorine or hypochlorite onsite instead of shipping gaseous chlorine to a site. The salt is much safer to ship and can be used onsite to generate oxidants for disinfection purposes.

There is also a potential need for U.S. engineering expertise related to conducting a feasibility study on the use of technologies for this project. The second project phase is estimated to be approximately 50,000,000 euros (equivalent to U.S.$62,500,000 in late October 2008), including engineering and contingency. An estimated half of the project (U.S.$31,250,000) is potentially exportable to U.S. firms, primarily for the piping rehabilitation. Almost this entire amount (U.S.$31,000,000) is associated with the major needs for water piping and wastewater collection system rehabilitation, including engineering and contingency, with the remaining U.S.$250,000 associated with the alternate disinfection strategy for Sulina.

2.2.7 Foreign Competition/Market Entry Issues

Foreign competition is limited for the sewer line rehabilitation for those areas where in-place sliplining is used. Insituform is an industry leader and one of the few companies doing this type of work, has an existing presence in Romania, and has an existing relationship with Aquaserv, the local water operator and project sponsor. They have already approached Aquaserv about the project as part of a project team with Froehling &

Robertson, Inc. and MIOX. Foreign competition would include Rib Loc of Australia, Aarsleff of Denmark, and a German subsidiary of SEKISUI CPT of Japan.

Providers of alternate disinfection technologies also exist in Europe and could be competitive with U.S. providers such as MIOX. Smart Water Systems and ProMinent ProMaqua of the Netherlands offer similar salt electrolysis processes for generating disinfectants. However, MIOX already has a presence in Romania, and familiarity with Aquaserv. They are currently doing a pilot project at Mile 23 on the Danube River for Aquaserv that will be hopefully establish MIOX as a preferred provider of these services.

The feasibility study will help define those areas where project expenditures will have the greatest impact on reducing potable water loss from the water supply network. Similarly, the feasibility study will help define those areas where loss of wastewater from the collection network is greatest and/or presents potential negative impacts to public health. It will also define those areas where infiltration into the system significantly increases wastewater flows and increases the amount of wastewater requiring treatment. Finally, the feasibility study will identify the optimal disinfection technique for the Sulina potable water treatment facility, and possibly other locations within Tulcea County.

2.2.8 Developmental Impact

2.2.8.1 Primary Developmental Benefits

The project is expected to have positive developmental benefit in the following areas:

- Infrastructure will be improved by enhancing the delivery of water within the Tulcea municipality. Losses in certain delivery areas are presently up to 75 percent, and would be significantly reduced following water line rehabilitation. This will improve both the infrastructure and delivery efficiency and save significant amounts of money by reducing overall water demand. Sanitary sewer line rehabilitation will also improve the sewer collection infrastructure and decrease sewer losses to the environment, with possible negative health consequences. In addition, application of alternate disinfection technology will allow Tulcea County to provide potable water in areas where gaseous chlorine cannot easily be provided, improving the water infrastructure and positively impacting future development. The project will also provide a model for other areas of Romania where alternate disinfection techniques are necessary or desirable.

- The project is expected to result in significant technology transfer and productivity enhancement through the water and sewer line rehabilitation. State-of-the-art pipe rehabilitation technologies will be employed, and will serve as a model for other communities that are experiencing similar issues. As noted above, improved ability to deliver water to the local community will result, and sewer losses will be minimized.

The project is not expected to result in any market-related reform or human capacity building.

2.2.8.2 Alternatives

There are other disinfection techniques as an alternative to the use of the Miox process, including the use of ultraviolet light, ozone, nanofiltration, chloramines, chlorine dioxide, or potassium permanganate. Each of these methods has advantages and disadvantages. The Miox process appears to be particularly suitable and likely cost-effective for the situation at Sulina, and may have applicability elsewhere in Tulcea County.

Tulcea County has several alternatives for water distribution line and wastewater collection system piping rehabilitation. One option is to accept the rate of leakage from each system, producing more water than is needed at the point of consumption and accepting a certain loss during transmission (for water) and loss of wastewater or infiltration (for wastewater). The loss of wastewater in particular from the collection system has potential negative health consequences due to potential exposure to health vectors. Another alternative is to proceed with rehabilitation using conventional excavation and repair/rehabilitation methods. This option, while viable, would result in a greater disturbance of heavily urbanized areas within Tulcea, and is likely to be more disruptive and costly than in-situ methods such as those proposed. If the excavation and rehabilitation option is implemented, another alternative is to simply rehabilitate less of the water distribution and/or wastewater collection network.

2.2.9 Impact on the Environment

The project will have many positive impacts on the environment, including the following:

- Rehabilitation of the sanitary sewer collection system will reduce the amount of sewage lost to the environment through the existing leaks and improve the quality of both groundwater and surface water. This will reduce the incidence of water-borne illness and improve public health.
- Replacement of gaseous chlorine use at Sulina with a salt electrolysis process will eliminate the water transport of gaseous chlorine through the sensitive environment of the Danube Delta region and eliminate the potential environmental risk due to an accident in the heavy shipping lanes in the delta region.
- By eliminating water distribution system leakage, the water treatment system network will require less raw water, reducing stress on water supplies. Less treated water will save on energy and other production and distribution costs.

2.2.10 Impact on U.S. Labor

Export potential resulting from this project will include engineering services, alternate disinfection technology (MIOX), and in-situ water and sewer line rehabilitation

(Insituform). All of these services can be provided by U.S. firms who have already been talking to local officials about the project.

2.2.11 Qualifications

Froehling & Robertson, Inc. has assembled a project team, including the U.S. companies MIOX and Insituform, to pursue this project with Aquaserve, and has developed a good relationship with the project sponsor. The project could be sole-sourced to F&R subject to USTDA review. However, should USTDA decide to bid the project, the qualifications of the FS Contractor should be evaluated according to the following criteria:

Threshold Evaluation Criteria

Proposals should be evaluated to confirm that the Proposer has the required minimum threshold capabilities. Those Proposers who demonstrate that they have the required threshold capabilities will be further evaluated and scored according to the Scored Evaluation Criteria. The Threshold Criteria include the following Technical Qualifications: water and wastewater collection system rehabilitation experience, experience with trenchless pipe lining or replacement services.

Scored Evaluation Criteria

1. **Water and Wastewater Collection System and Disinfection Experience (25%)**
   Firm or team's relevant water and wastewater collection system experience for large municipal systems, including experience with water and sewer line repairs using slip-lining and other trenchless technologies. Experience with various potable water disinfection techniques is also desirable and should be evaluated.

2. **Adequacy of Proposal (25%)**
   Adequacy of proposer's work plan and approach responding to the terms of reference including a detailed schedule indicating each principal work activity. The proposed work plan should indicate the staffing schedule for each key activity.

3. **Regional Qualifications (10%)**
   Experience of proposer on similar projects in Romania or other Eastern European countries.

4. **Qualifications and Experience of Firm or Team's Key Staff (30%)**
   Capabilities and demonstrated experience of key positions such as project manager, construction manager, environmental engineer, piping engineer. Proposer should also include an organization chart of key personnel.

5. **Local Capabilities (10%)**
   Capabilities of local associates or firm to assist with logistics, data collection, etc.

2.2.12 Justification

The overall objectives of the project are to rehabilitate water distribution and sewage collection lines that are prone to leakage in the developed areas of Tulcea, and to provide a viable alternative to gaseous chlorine disinfection at Sulina. The local water authority, Aquaserve, requires technical assistance to prepare a feasibility study to thoroughly examine areas of the water distribution and sewer systems that require rehabilitation. They will also require some assistance in evaluating the use of alternative disinfection systems for potable water that do not use gaseous chlorine. The feasibility study will be invaluable in determining which areas of the water distribution and wastewater collection systems are most in need of rehabilitation and will reduce water loss and wastewater leakage from the systems. The feasibility study will also ensure that the optimal disinfection strategy has been identified for Sulina given transportation and environmental concerns, as well as concerns about potential impacts to the water distribution network.

Use of technology provided by U.S. firms such as MIOX and Insituform will provide a model for other areas of Romania that have similar needs. In particular, some of the larger cities with aging sewer system piping and old buildings may benefit from in-situ sewer line rehabilitation that does not require significant excavation.

2.2.13 Recommendations

The project scope was not initially well-defined, based on information provided by a U.S. consultant (Froehling & Robertson, Inc.) with an interest in the project, U.S. vendors (Insituform) in Romania, and Aquaserve personnel. Based on discussions during the site visit, the scope of work presented herein represents our best estimate of the project work that is necessary to achieve local objectives.

As a continuation of the ongoing work in Tulcea County, the project is likely to be funded at some level. According to Aquaserve, the feasibility study is needed to accompany the application for EU funding in late 2009. The feasibility study for the project would include the following tasks:

1. Evaluation of on-site disinfection versus gaseous chlorination for groundwater well systems, including the effectiveness and costs of various types of disinfection, for the use of chlorine gas and sodium hypochlorite produced off-site, as well as the on-site generation of hypochlorite and mixed oxidants. The task would include the pilot testing of on-site disinfectant generation to determine operating requirements and disinfection characteristics. The results of the MIOX pilot test at Mile 23 would be reviewed and evaluated.
2. Evaluation and rehabilitation of water distribution system. The three zones of the Tulcea water distribution system would be modeled hydraulically to prioritize rehabilitation areas. Non-destructive examination of water distribution system piping would be conducted using remote camera systems or other methods such as the use of a "smart ball" to evaluate piping conditions, identify areas of major

leakage, and gather additional information to determine preferred rehabilitation methods. Field testing of various disinfectants on pipe conditions and the resultant impacts on final water quality would be conducted. The various pipe rehabilitation methods would be compared and evaluated on the basis of cost, effectiveness, and ease of implementation.

3. Evaluation and rehabilitation of wastewater collection systems. The three zones of the Tulcea wastewater collection system would be evaluated to determine priority areas for rehabilitation. Non-destructive examination of the wastewater collection system piping would be conducted using remote evaluation methods such as an in-pipe camera system, or use of a "smart ball", to identify leaks or obstructions in the piping network. Various pipe rehabilitation methods would be compared and evaluated on the basis of cost, effectiveness, and ease of implementation.
4. The results of the first three tasks would be summarized in a project feasibility study report. The report will include specific process recommendations, including the appropriate disinfection method for Sulina, and optimal rehabilitation methods for priority areas of the water distribution and wastewater collection networks in Tulcea.

The project appears to meet USTDA's criteria for feasibility study funding, and MSE recommends that a feasibility study be conducted to evaluate rehabilitation of water distribution and wastewater collection system piping as well as alternative disinfection techniques for the Sulina water treatment system.

2.2.13.1 Terms of Reference

The Terms of Reference for this project are as follows:

Task 1—Project Initiation and Data Collection

The Contractor shall initiate the project and develop a work plan to ensure that all project team members are aware of the project Terms of Reference, including project goals, schedule, responsibilities, and deliverables. The Contractor shall collect data that shows the water distribution and sewage piping network locations, depths, and potential entry points for the City of Tulcea, as well as background data on the chlorination system at Sulina. The data should include drawings showing the locations and elevations of all water distribution and sanitary sewage piping, manholes and other appurtenances, and piping specifications for the City of Tulcea. Available design drawings and specifications on the chlorination system at Sulina should also be obtained.

Task 2—Evaluation of Disinfection Options

The Contractor shall evaluate an alternate chlorination system for the potable water groundwater treatment facility at Sulina, Romania. The use of on-site generation of disinfection chemicals (hypochlorite and mixed disinfectants) will be evaluated along with the use of off-site chemicals (gaseous chlorine and sodium hypochlorite) produced

off-site and shipped to the site for disinfection. The evaluation will include the effectiveness and costs of various disinfection processes, and will include the pilot testing of on-site disinfectant generation to determine operating requirements and disinfection characteristics. The pilot test will evaluate chemical usage as a function of residual chlorine, energy use, ease of implementation, etc. The results of the separate, ongoing MIOX pilot test at Mile 23 along the Danube River will be reviewed and incorporated into the evaluation.

An implementation plan will also be developed for implementing improvements to the chlorination system that are needed at Sulina, based on the chlorination system evaluation. This plan will include a description of each system improvement. A rehabilitation schedule will be included, with a prioritization of rehabilitation needs.

Deliverable: The Contractor shall incorporate the results of Tasks 1 and 2 into a report for Grantee review.

Task 3—Water Distribution System Evaluation

Under Task 3, the Contractor shall conduct an evaluation of the water distribution system. All three zones of the City of Tulcea water system will be hydraulically modeled to evaluate the system and to establish priority rehabilitation areas. Non-destructive pipe evaluations will be conducted using remote camera systems and other remote sensing such as the use of "smart balls" to determine the condition of the water distribution piping, locate leaks, and gather information necessary to make an informed decision on optimal rehabilitation methods. Field testing will be conducted using various disinfectants to evaluate their impacts on pipe conditions and final water quality. A cost-benefit analysis will be conducted and the various pipe rehabilitation methods will be compared and evaluated on the basis of cost, effectiveness, and ease of implementation. A conceptual design for the water distribution system will be developed.

An implementation plan will also be developed for implementing improvements to the water distribution system that are needed, based on the distribution system evaluation. This plan will include a description of each section of the distribution system that requires improvement, along with the optimal rehabilitation method for that section. A rehabilitation schedule will be included, with a prioritization of rehabilitation needs. The prioritization will be based on rehabilitating those sections of the system that will have the greatest impact on reducing water distribution system losses.

Deliverable: The Contractor shall incorporate the results of Task 3 into a report for Grantee review.

Task 4—Wastewater Collection System Evaluation

The Contractor shall evaluate the existing wastewater collection system. All three zones of the City of Tulcea wastewater collection system will be evaluated to determine priority target zones for investigation and rehabilitation. Similar to the evaluation of water distribution system piping in Task 3, non-destructive pipe evaluations will be conducted using remote sensing technology to assess the condition of the sewer piping, locate major leaks, and gather information necessary to evaluate pipe rehabilitation methods. Various sewer rehabilitation methods, including trenchless rehabilitation, will be compared and evaluated on the basis of cost, effectiveness, and ease of implementation. A conceptual design for the wastewater collection system will be developed, as well as an implementation plan for the project.

The implementation plan will be developed for implementing improvements to the wastewater collection system that are needed, based on the collection system evaluation. This plan will include a description of each section of the collection system that requires improvement, along with the optimal rehabilitation method for that section. A rehabilitation schedule will be included, with a prioritization of rehabilitation needs.

Deliverable: The Contractor shall incorporate the results of Task 4 into a report for Grantee review.

Task 5—Developmental Impact

The Contractor shall report on the potential Developmental Impact of the Project in Romania. While specific focus should be paid to the immediate impact of the specific Project, the Contractor shall include, where appropriate, any additional developmental benefits to the Project, including spin-off, demonstration, and implementation effects. The analysis of potential benefits should be as concrete and detailed as possible. The Developmental Impact factors are intended to provide the Project's decision-makers and interested parties with a broader view of the Project's potential effects. The Contractor shall provide estimates of the Project's potential benefits in the following areas:

a) Infrastructure: a statement on the infrastructure impact giving a brief synopsis.
b) Market-Oriented Reform: a description of any regulation, laws, or institutional changes that are recommended and the effect they would have if implemented.
c) Human Capacity Building: The Contractor shall address the number and type of positions that have been or will likely be created as a result of the Project as well as the number of people who have received or will receive training and a brief description of the training program.
d) Technology Transfer and Productivity Enhancement: a description of any advanced technologies that have been implemented during or may be implemented as a result of the Project. A description of any efficiency that has or would be gained through the implemented technologies.
e) Other: any other developmental benefits to the Project, including any spin-off or demonstration effects.

Task 6 – Environmental Impact

The Contractor shall conduct a preliminary review of the Project's anticipated impact on the environment with reference to local requirements and those of multilateral lending agencies (such as the World Bank or EBRD). This review would identify potential negative impacts, discuss the extent to which they can be mitigated and develop plans for a full environmental impact assessment if and when the Project moves forward to the implementation stage. This includes the identification of steps that will need to be undertaken by the Grantee subsequent to the feasibility study's completion and prior to the Project's implementation. The review shall also include:

a) A description of the positive and negative environmental impacts during construction and operation.
b) A description of national environmental standards, mitigation measures and organizational responsibilities.
c) Specification of possible permits and/or other related requirements for the Project.

Task 7—Final Report

The Contractor shall prepare and deliver to the Grantee and USTDA a substantive and comprehensive Final Report of all work performed under these Terms of Reference. The Final Report shall be organized according to the above tasks, and shall include all deliverables and documents that have been provided to the Grantee in connection with the performance of these tasks. The report shall incorporate all findings, recommendations, and conclusions of the feasibility study. This will include specific process recommendations for the appropriate disinfection method at Sulina, and optimal rehabilitation methods for both the water distribution system network and wastewater collection system piping. Among other things the Final Report will include a conceptual design for all project components, an assessment including identification of all environmental and developmental impacts, an implementation plan for the project, and information concerning U.S. sources of equipment and services. This Final Report will also serve as the basis for the implementation phase.

Within the Final Report, the Contractor shall identify prospective U.S. sources of supply, assess their capabilities, and include their business names, points of contact, addresses, and telephone and fax numbers.

The Contractor shall ensure that the Final Report is prepared in accordance with Annex II, Clause I of the Grant Agreement.

Notes:

(1) The Contractor is responsible for compliance with U.S. export licensing requirements, if applicable, in the performance of the Terms of Reference.

(2) The Contractor and the Grantee shall be careful to ensure that the public version of the Final Report contains no security or confidential information.

(3) The Grantee and USTDA shall have an irrevocable, worldwide, royalty-free, non-exclusive right to use and distribute the Final Report and all work product that is developed under these Terms of Reference.

2.2.13.2 Study Budget

The study budget for this project is estimated to be $339,400. A summary of the budget, based on the TOR, is shown in Appendix B2.

2.2.13.3 Schedule

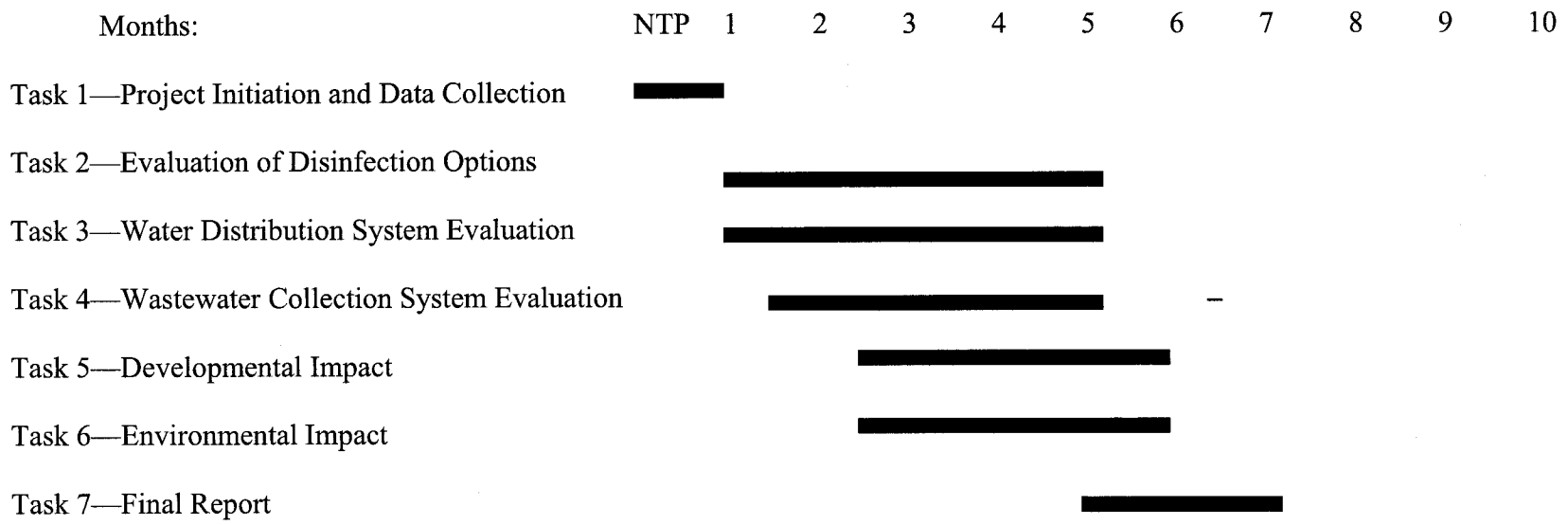
The estimated schedule for the project is shown on Table 7. As shown, MSE estimates that the project can be completed within seven months of notice-to-proceed. This will provide sufficient time to incorporate the results of the study into a request for EU funding scheduled for December 2009.

2.2.14 Contacts

Contact information for key individuals involved in the project is included in Appendix A1.

Table 7. Implementation Schedule for Tulcea Water and Wastewater System Improvements

TASK COMPLETION SCHEDULE [MONTHS AFTER NOTICE TO PROCEED – NTP]



2.3 Constanta North Wastewater Treatment System Cover

2.3.1 Project Background

The City of Constanta is in the process of constructing a new wastewater treatment facility that will serve the equivalent of 255,000 people. With a scheduled maximum dry weather wastewater flow rate of 140,000 m3/day, the facility is scheduled to be completed and commissioned in December 2008. The plant includes biological nitrogen and phosphorus removal as part of the biological treatment process in an extended aeration treatment system. Preliminary treatment processes in the plant headworks (inlet pumping station, screens, grit, oil, and grease removal, and storm water tankage) will be covered to reduce odors. Sludge treatment processes will also be covered. Off-gases from preliminary treatment and sludge processing will be collected and handled in an odor removal station, consisting of a three-stage chemical scrubbing process that is part of the current design. The off-gas handling will have a hydrogen sulfide and ammonia removal efficiency of 99 percent.

The wastewater treatment facility is located in a prime tourist area, with the Mamaia resort area located within approximately 200 meters. Although the preliminary treatment area and sludge handling area will be covered to reduce odors, there is still the potential for odors to be produced in anoxic or anaerobic zones in the four aeration basins that are used for biological nitrogen and phosphorus removal. None of these basins will be covered. RAJA Constanta, the second largest water operator in Romania, is constructing the wastewater treatment facility, and would like to evaluate the potential for covering these basins to prevent any odors from being generated in the aeration basins so close to tourist and population areas in this seaport. Gas handling would also be needed. The current gas handling system consists of chemical scrubbing of the off-gases

It is not possible to integrate covering of the aeration basins into the existing project funding, because this would be an unallowable change to the existing project funding requirements. Therefore, the aeration basin covers and vapor handling must be examined as a separate item that can be installed once the treatment facility is operational.

2.3.2 Project Details

The aeration basins currently being constructed have a total volume of approximately 85,699 m3. The estimated anaerobic volume of the basins is 10,000 m3, with an additional estimated 24,981 m3 that will be anoxic. In aggregate, approximately 34,981 m3 of the basins will have the potential to generate objectionable odors, or over 40 percent of the total volume. The basins are grouped in two groups of two, each approximately 128 m by 58 m.

The proposed project would entail the covering of the four aeration basins, with the ability to treat the off-gas either in the existing scrubber system, or in a new or expanded system, depending on the system capacity and the amount of off-gas that will be

generated in the aeration basins. Given that the basins will be aerated, this off-gas could be a substantial volume.

2.3.3 Project Cost Estimate

The estimated cost of the wastewater treatment system cover is $4,000,000 using a sprung structure or similar type of structural cover. Off-gas treatment facilities could cost as much as an additional $5,000,000.

2.3.4 Recommendations

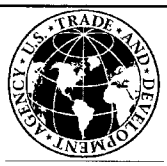
Although the project is likely to be necessary to reduce odors from the wastewater treatment system, it has not been identified as a priority project of the Romanian government. Export potential could be as high as $9,000,000; however, a portion of the off-gas treatment costs may be handled in the existing odor control system. Export potential is more likely to be approximately $4,000,000—the cost of the structure. There are multiple U.S. suppliers of sprung structures and other structural covers. RAJA Constanta has seen some of these structures in the U.S. and would like a similar installation at the wastewater treatment facility in Constanta.

RAJA Constanta intends to apply for EU financing for the project during the first quarter of 2009. It is not clear if this project will be funded. A feasibility study will need to be part of the funding application. Given that odor issues may be a significant issue locally, local funding may be pursued if they are unable to obtain financing from the EU.

The project does not appear to be a high priority project for the Government of Romania, and although it is a high local priority, it offers limited U.S. export potential beyond the cost of the cover. The cost of a focused feasibility study to evaluate alternate cover scenarios should be relatively small and could likely be borne by RAJA, the local water operator.

2.3.5 Contacts

Contact information for key individuals involved in the project is included in Appendix A1.



BULGARIA DEFINITIONAL MISSION

3. BULGARIA DM OVERVIEW

Bulgaria only has a relatively recent history of environmental protection. Before the fall of their communist era government, strong environmental policies were lacking, and during the transition to a market economy, development took precedence over all other issues. As a result, following accession into the EU in 2007, Bulgaria needs to upgrade its water and wastewater treatment infrastructure to meet EU standards within the coming decade. The cost to meet EU standards in Bulgaria has been estimated by the U.S. Commercial Service to be U.S.$11.6 billion by the year 2013. Wastewater treatment is needed for approximately 430 cities, towns, and villages with populations over 2,000 by 2015. Industries are also required to meet EU standards for wastewater treatment, and will need to construct or upgrade their wastewater treatment systems.

Bulgaria is a promising but largely unexplored market for U.S. environmental pollution control products, equipment, services and technologies. Wastewater treatment plants serve a limited portion of the population. Additionally, most industries need to implement wastewater treatment measures in order to comply with the higher environmental standards. Water shortage is a major problem in parts of Bulgaria as well. Several U.S. companies, such as GE Water, and ITT, are already working in Bulgaria successfully. The price, low U.S. dollar, quality, technological leadership, and reputations of U.S. companies are often viewed in Bulgaria as effective counterweights to pressure from European Union (EU) companies to "buy European."

In addition to EU standards, Bulgaria is undertaking major efforts to upgrade pollution control and nutrient reduction in the Danube-Black Sea basin through the Danube-Black Sea Strategic Partnership. The long-term objective is for all Black Sea basin countries to take measures to reduce nutrient levels and other hazardous substances to the levels necessary to permit Black Sea ecosystems to recover to similar conditions as those observed in the 1960s. The intermediate objective includes the implementation of urgent control measures by the 16 countries in the Danube-Black Sea basin to avoid discharges of nitrogen and phosphorus to the Black Sea that exceed those levels observed in 1997. Discharges of nutrients to the Black Sea have been decreasing recently, and anoxic areas (areas devoid of oxygen) have been decreasing as treatment improvements have been made. Further reductions are anticipated under several EU directives, including the Nitrates Directive, Urban Wastewater Directive, and the Water Framework Directive. Implementation of the Integrated Pollution Prevention and Control (IPPC) Directive will also reduce pollutant loadings from industrial sources.

Bulgaria is scheduled to implement the IPPC Directive through national legislation by the year 2012, and the Urban Wastewater Directive by 2015.

3.1 Potential Projects

The Bulgaria portion of the DM was completed in conjunction with the seminar held in Varna on July 28-29, 2008. During discussions with Mr. Plamen Nikiforov of the Ministry of Sustainable Development after the seminar, he mentioned that approximately 60 wastewater projects are active out of the 430 needed to meet EU standards. There are also about 45 active potable water supply projects out of the 120 necessary to bring Bulgaria into compliance with EU standards over the next ten to twelve years. The focus is on wastewater collection and treatment systems providing service to over 10,000 inhabitants, by 2010, followed by those systems providing service to more than 2,000 residents, by 2014. Most of these projects are projected to be financed through the EU. The total cost of the water and wastewater work is estimated to be U.S.$11.6 billion, with over U.S.$3 billion for collection systems alone. Pubic-private partnerships are being encouraged, including private operators of water and wastewater systems.

In 2007, an advertisement in The Economist assessing interest on wastewater and water projects attracted interest from 20 firms. Bulgaria has evaluated wastewater and water needs in all areas of the country, and has selected six regions that have the highest potential for future work with outside interests. These regions included Burgas, where 14 municipalities are interested in a joint wastewater treatment plant.

Minister Nikiforov also indicated that Bulgaria is preparing a new water supply law addressing water/wastewater and property ownership issues. This could affect future water and wastewater projects in the country.

Sludge management is a particular problem in Bulgaria, due to several factors, including the overall lack of landfill capacity for sludge disposal and problems with sludge constituents (mostly heavy metals) in some areas where sludge is land-applied. There is no centralized sludge management policy in Bulgaria, with most individual wastewater treatment facilities doing nothing beyond sludge dewatering and handling their own sludge according to their own initiatives. EU regulations in the form of the 1986 Sludge Directive (86/27/EEC Directive) place restrictions on heavy metals in waste biosolids that are land-applied. This regulation is currently being reviewed for further legislation that will address sustainable practices for the land application of sludge. In the future, according to Minister Nikiforov, Bulgaria may look at some type of centralized sludge incineration, recognizing that transportation of the sludge may be problematic, as would heavy metals in some sludges.

Minister Nikiforov was present at the seminar presented in Varna, Bulgaria, on July 28-29, 2008, and showed interest in U.S. technologies, equipment, and services, but did not identify any specific projects that might benefit from U.S. involvement in a meeting immediately following the seminar. The Ministry promised to provide a listing of potential projects in early August, but did not do so. Repeated requests for this

information have proven unsuccessful. Further contact with the Ministry is desirable to promote future project involvement as projects are being developed.

Immediately following the seminar, a local project was discussed with Minister Nikiforov and Plamen Petrov, the chief engineer from the local water authority. This project will address wastewater treatment for the Golden Sands resort area in Varna, where they are proposing to use sequential batch reactor technology. The merits of this technology and membrane bioreactor technology were discussed, and the local water operator promised to provide background information to both MSE and a local representative of ITT, Mike Hughes, who was present at the meeting. This information has not been received to date.

3.2 Project Contacts

Contact information for key individuals involved in potential future projects in Bulgaria is included in Appendix B2.

4. WASTEWATER/WATER SEMINARS

A major component of the DM was the performance of two seminars on water and wastewater issues important to Romania and Bulgaria, one in each country. These seminars were each conducted over a two-day period in Constanta, Romania, and Varna, Bulgaria, during July 2008. Seminar attendees included water and wastewater treatment system operators; academics; local, regional, and national policymakers; and representatives of companies providing water and wastewater technology, equipment, and services. The seminars covered material of interest to each location, and although many of the topics were common to each country, they were tailored to meet local needs, and several topics that were presented were specific to each country and audience. For example, in Romania, MSE also covered operations and maintenance services that were of interest to local water operators. In Varna, Bulgaria, MSE covered water distribution as an additional topic. The two presenters utilized by MSE, Mr. David G. Johnson, P.E., DEE, and Dr. Billy Kornegay, were made available for questions following each seminar, and provided information to individual seminar participants both during these sessions and following their return to the U.S.. For example, Mr. Johnson provided information on the costs of various biosolids management technologies to one seminar participant for his use in estimating the costs of local biosolids management projects.

4.1 Seminar in Constanta, Romania

MSE conducted a two-day seminar in Constanta, Romania on July 24-25, 2008 in the Ovidiu Hall at the Golden Tulip Hotel. The seminar covered the topics outlined in Table 8. Dr. Billy Kornegay and Mr. David Johnson conducted the seminar, which was simultaneously translated into Romanian for the seminar attendees. Some of the presentation slides were translated into Romanian, and otherwise the presentation slides were done in English. A partial listing of seminar attendees, put together by the Romanian Water Association, is included in Table 9. Additional people that do not appear on the list attended the seminar from the local water authority, S.C. Regia Autonoma Judeteana de Apa S.A. (RAJA Constanta), the Romanian Water Association, and other organizations and locations.

Approximately 40 to 50 people attended the seminar on the first day, a Thursday. As shown on Table 9, attendees included members of the Romanian Water Association, such as water and wastewater treatment system operators, academics, and others interested in the topics to be presented. Attendance on the second day, a Friday, was good but slightly

less, approximately 30 to 40 people. Several seminar participants were from the adjacent country of Moldova.

The seminar format consisted of a lecture on pertinent topics that had been previously discussed with Dr. Vasile Ciomos, the Director of the Romanian Water Association, followed by a question and answer session. The format provided a useful forum with many good questions and a free exchange of information, particularly on the second day of the seminar. Several participants asked for additional information on topics of interest, including sources for cost estimates for U.S. technologies and equipment. This additional information was provided by the seminar presenters following the seminars and upon their return to the U.S..

The seminar attendees had a wide range of backgrounds and experience, ranging from little water and wastewater experience, to direct academic and/or work experience with wastewater treatment. As a result, portions of the seminar may have been too basic for some participants, whereas other topics may have been too advanced for those with little background or experience. Significant interest was shown by the group on the capital and operating costs of various technologies. Package plants, methods for managing biomass generated by wastewater treatment processes, and operations and maintenance issues were particularly well received and generated much discussion and information exchange. Feedback received from seminar participants immediately following the seminar was generally positive.

4.2 Seminar in Varna, Bulgaria

MSE conducted a two-day seminar in Varna, Bulgaria on July 28-29, 2008. The seminar covered the topics outlined in Table 10. Dr. Billy Kornegay and Mr. David Johnson conducted the seminar, which was simultaneously translated into Bulgarian. The presentations were made with slides that were also translated into Bulgarian. A very partial listing of seminar attendees is included in Table 11. There were other seminar participants that do not appear on the list, primarily from representatives of companies that provide water and/or wastewater equipment, technology, or services within Bulgaria.

Approximately 30 to 40 people attended the seminar on the first day, a Monday. As shown on Table 11, the makeup of seminar participants differed from those who attended the seminar in Romania, and included members of the International Black Sea Club, academics, water and wastewater system operators, and representatives of various companies that provide wastewater equipment and/or services. The seminar had received advance publicity locally in Varna, and was reported on by the local news media, including interviews with Minister Nikiforov. Attendance on the second day was less than on the first day, and numbered approximately 25.

The seminar format consisted of a lecture on pertinent topics that had been previously discussed and confirmed with Dr. Plamen Nikiforov, the Director of the Ministry of Regional Development and Public Works, followed by a question and answer session. There were relatively few questions from the seminar attendees, particularly on the first

day, though more questions were forthcoming on the second day of the seminar. Following the seminar, discussions were held with the chief engineer from the local water operator on plans for constructing a wastewater treatment facility at the Golden Sands resort area in Varna, centering on which wastewater treatment technologies were appropriate for that project. Minister Nikiforov was present for those discussions.

Similar to the seminar given in Romania, the seminar attendees had a wide range of backgrounds and experience, ranging from little water and wastewater experience, to direct academic and/or work experience with wastewater treatment. As a result, portions of the seminar may have been too basic for some participants, whereas other topics may have been too advanced for those with little background or experience. Given the larger number of seminar participants who were representatives of companies that provide water and wastewater equipment or services, some topics were likely too technical for these participants. Significant interest was shown by the group on the capital and operating costs of various technologies. Methods for managing biomass generated by wastewater treatment processes were particularly well received, due to the problems with biosolids management within Bulgaria, and generated some discussion. Feedback received from seminar participants immediately following the seminar was generally positive, although MSE did receive feedback that the interpretation shown on some of the presentation slides differed from local jargon used in the water and wastewater trade. However, this was not felt to be significant, and participants were able to follow the slides and simultaneous verbal presentation.

The presentations are available on the CD-ROM submitted with this DM Report.

Table 8. Seminar Topics July 24-25 in Constanta, Romania

July 24, 2008 Seminar Topics

0900-0945 Introduction

0945-1030 Wastewater Treatment Process Overview
- Primary Treatment
- Secondary Treatment
- Tertiary Treatment
- Biosolids Management

1030-1045 Break / One-on-one Discussions with Presenters

1045-1145 Secondary Treatment Technologies
- Activated Sludge
- Aerated Lagoons
- Fixed Film Processes
- Membrane Bioreactors

1145-1300 Lunch

1300-1445 Tertiary Treatment Technologies – Nutrient Removal
- Biological Nitrogen Removal
- Biological Phosphorus Removal
- Chemical Phosphorus Removal

1445-1500 Break / One-on-One Discussions with Presenters

1500-1630 Tertiary Treatment Technologies – Other Processes
- Tertiary Filtration
- Carbon Adsorption
- Disinfection

1630 End of Day 1

July 25, 2008 Seminar Topics

0900-1045 Biosolids Management Technologies
- Biosolids Generation
  - Primary Treatment Processes
  - Secondary Treatment Processes
  - Tertiary Treatment Processes
- Biosolids Stabilization
  - Anaerobic Digestion
  - Aerobic Digestion
  - Composting

Biosolids Disposal/Reuse
Landfilling
Land Application
Biogas Utilization

1045-1100 Break / One-on-one Discussions with Presenters

1100-1145 Operations and Maintenance Services
Operational Control
Equipment Maintenance

1145-1215 Package Plants
Activated Sludge Systems
Sequencing Batch Reactors (SBRs)
Membrane Bioreactors (MBRs)

1215-1230 Approximate Cost Data

1230-1400 Lunch

1400-1500 Open for Questions and Discussion

1500 End of Day 2

Table 9. Partial List of Constanta Romania Seminar Participants

Name	Company	Function
Gheorghe Popovici	SC APA Tarvanei Mari SA	Commercial Director
Dimitru Deac	SC Compania de APA Somes SA	Secretary
Lucian Dascalu	SC Proed SA	Director
Maria Constantin	SC Hidro Prahova SA	Department Manager
Luminita Ciobanu	SC APA Service SA Giurgiu	Service UCA
Ioanid Tesu	SC APA Vital SA	Engineer
Alin Preda	SC Compania de APA OLT SA	Manager UIP
Tudorica Laurentiu	SC APA Canal SA	Statie Epurare
Csaba Bauer	SC Compania Aquaserve SA	Manager
Dalia Bociort	SC Compania De APA Arad	Engineer
Felicia Cristea	SC Compania de APA Targoviste Dambo	Laboratory
Daniela Cristea	SC Compania de APA Buzau SA	Engineer, Chemist
Ciprian Dumitrescu	SC Compania de APA Buzau SA	Biologist
Alexandru Razvan Pertica	ISPE	Engineer
Elena Virginia Preda	ISPE	Engineer
Lucian Tanasescu	SC Apavil SA Valcea	Director Planning
Eugen Brinzei-Pascu	SC Aquatim SA	Engineer Technology
Constantin Gheorghe		
Marin Sandu	Asociatia Romana a Apei	President CTS
Alexandru Manescu	Asociatia Romana a Apei	
Corneliu Negulescu	SC Aquaproject SA	Consultant
Eugenia Demetrescu	Asociatia Romana a Apei	
Silviu Lacatusu	Asociatia Romana a Apei	
Melania Voinescu	SC Edilul CGA SA	Director General
Aurel Presura	SC RAJA SA Constanta	Director
Calin Angela	SC Danex Consult SRL	Lucrari University
Adriana Stoiean	SC RAJA SA Constanta	Legal Advisor
Dimitri Ungureanu	Technical University of Moldova	Vice Rector
Raisa Cecan	SA Apa-Canal Chisinau	Chief of Department of Sewage
Vladimir Rojanschi	University of Ecology Bucharest	Prorector
Nicolae Pitu	SC RAJA SA Constanta	Technical Consultant
Felix Stroe	SC RAJA SA Constanta	Director General

Table 10. Seminar Topics July 28-29 in Varna, Bulgaria

July 24, 2008 Seminar Topics

0900-0945 Introduction

0945-1030 Wastewater Treatment Process Overview
- Primary Treatment
- Secondary Treatment
- Tertiary Treatment
- Biosolids Management

1030-1045 Break / One-on-one Discussions with Presenters

1045-1145 Secondary Treatment Technologies
- Activated Sludge
- Aerated Lagoons
- Fixed Film Processes
- Membrane Bioreactors

1145-1300 Lunch

1300-1445 Tertiary Treatment Technologies – Nutrient Removal
- Biological Nitrogen Removal
- Biological Phosphorus Removal
- Chemical Phosphorus Removal

1445-1500 Break / One-on-One Discussions with Presenters

1500-1630 Tertiary Treatment Technologies – Other Processes
- Tertiary Filtration
- Carbon Adsorption
- Disinfection

1630 End of Day 1

July 29, 2008 Seminar Topics

0900-1045 Biosolids Management Technology Overview
- Biosolids Generation
  - Primary Treatment Processes
  - Secondary Treatment Processes
  - Tertiary Treatment Processes
- Biosolids Stabilization
  - Anaerobic Digestion
  - Aerobic Digestion
  - Composting
- Biosolids Disposal/Reuse

Landfilling
Land Application
Biogas Utilization

1045-1100 Break / One-on-one Discussions with Presenters

1100-1200 Water Distribution
Rehabilitation of Water Mains
Water Audits and Leak Detection

1200-1230 Package Plants
Sequencing Batch Reactors (SBRs)
Membrane Bioreactors (MBRs)
Activated Sludge Systems

1230-1245 Approximate Costs

1245-1400 Lunch

1400-1500 Open For Questions and Discussion

1500 End of Day 2

Table 11. Partial List of Varna, Bulgaria Seminar Participants

Name	Company	Function
Plamen Petrov	Water Supply & Sewage-Ltd. Varna	Manager WWTP Varna
Vladimir Atanasov	ProChema Ltd.	Technical Director
Ognayan Hinov	Water Supply & Sewage-Ltd.	Manager
Borislava Atanasova	3K	Project Coordinator
Georgi Semerdzhiev	Chelopech Mining EAD	Environmental Engineer
Mike Hughes	ITT	Director Water and Wastewater
Ivan Valev	Aqua Products Ltd.	Director
Plamen Nikiforov	Ministry of Regional Development and Public Works	Director
Stanislava Dimitrova	U.S. Foreign Commercial Service	Coordinator
Radul Kovachev	International Black Sea Club	Secretary General
Boris Chernev	Intelpack, Ltd.	General Manager
Valentin Nenov	Bourgas Asen Zlatarov University	Dept. Water Treatment Technology
Alina Mihaela Hanes	InsituformTechnologies, Ltd.	Sales Director

APPENDIX A1

DM Contacts in Romania

DM Contacts in Romania

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ARA – Romanian Water Association Silviu Lacatusu Engineer, EXPO APA Director 202 A Splaiul Independentei Floor No. 9 Sector 6 Bucharest, Romania Tel/Fax: +40 21 316 27 88 Cell: +40 744215 772 Email: wide@ara.ro	**ARA – Romanian Water Association, and Technical University of Civil Engineering** Alexandru Manescu, Ph. D Sanitary Engineering and Water Protection Bdul.Lacul Tei 124 Sector 2 Bucharest, Romania Tel: +401 242 1208/279 Fax: +401 242 0781 Home: +401 688 2746 Email: manescu88@gmail.com
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APPENDIX A2

DM Contacts in Bulgaria

DM Contacts in Bulgaria

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ITT Corporation Mike Hughes Director Water and Wastewater Jays Close, Viables Estate Basingstoke, Hampshire, RG22 4BA Tel: +44 (0) 1256 303800 Fax: +44 (0) 1256 303801 Cell: +44 (0) 7867 656639 Email: mike.hughes@uk.itt.com	**Water Supply & Sewage Ltd. Varna** Plamen Petrov Dipl. Engineer 9000 Varna 33, Prilep Street Tel: +359 52 74 27 37 Fax: +359 52 74 27 38 Cell: +359 887 491 639 Email: pl_at_petrov@abv.bg

APPENDIX B1

TOR Study Budget for Poarta Alba Wastewater Treatment and Energy Recovery Facility Project

Budget Summary for Poarta Alba Wastewater Treatment and Energy Recovery Facility Project by Task

Appendix B1 - Budget Estimate							
Total Task Cost Summary	**Prime Labor Total**	**Travel**	**Reproduction**	**Communications**	**Subcontracts**	**Other**	**Total**
Task 1. Project Initiation And Work Plan Development	$9,254.00	$0.00	$0.00	$1,000.00	$4,050.00	$500.00	**$14,804.00**
Task 2. Data Collection	$11,004.60	$12,256.40	$1,500.00	$9,624.00	$10,600.00	$1,500.00	**$46,485.00**
Task 3. Develop Design Criteria And Data	$48,693.80	$8,026.80	$0.00	$2,504.00	$22,000.00	$500.00	**$81,724.60**
Task 4. Evaluate Existing Facilities	$9,460.60	$0.00	$0.00	$0.00	$4,200.00	$500.00	**$14,160.60**
Task 5. Evaluate Improvement Options	$55,644.80	$23,310.00	$0.00	$3,512.00	$22,000.00	$500.00	**$104,966.80**
Task 6. Develop O&M Program	$14,601.60	$0.00	$0.00	$0.00	$12,800.00	$500.00	**$27,901.60**
Task 7. Perform Economic and Financial Analysis	$36,709.60	$16,486.00	$0.00	$2,504.00	$38,000.00	$500.00	**$94,199.60**
Task 8. Developmental Impact	$16,859.20	$0.00	$0.00	$0.00	$3,400.00	$0.00	**$20,259.20**
Task 9. Environmental Impact	$17,373.20	$0.00	$0.00	$0.00	$4,700.00	$0.00	**$22,073.20**
Task 10. Final Report	$84,375.40	$7,594.40	$6,500.00	$3,432.00	$22,450.00	$500.00	**$124,851.80**
Total	**$303,976.80**	**$67,673.60**	**$8,000.00**	**$22,576.00**	**$144,200.00**	**$5,000.00**	**$551,426.40**

Task Summary Labor Days	**Project Director**	**Project Manager**	**Project Engineer**	**Staff Engineer**	**Wastewater/ Biomass Specialist**	**Financial Specialist**	**Local Engineering Consultant**	**Admin**	**Total Labor Days**
Task 1. Project Initiation And Work Plan Development	2.0	1.5	2.0	2.0	1.5	1.0	1.0	1.0	**12.0**
Task 2. Data Collection	0.0	1.0	5.0	5.0	2.0	0.0	10.0	5.0	**28.0**
Task 3. Develop Design Criteria And Data	4.5	4.5	23.5	18.0	4.0	0.0	21.0	5.0	**80.5**
Task 4. Evaluate Existing Facilities	1.0	2.0	3.0	3.0	2.0	0.0	2.0	1.0	**14.0**
Task 5. Evaluate Improvement Options	6.0	10.0	30.0	20.0	10.0	2.0	8.0	3.0	**89.0**
Task 6. Develop O&M Program	2.0	2.0	5.0	4.0	5.0	3.0	3.0	3.0	**27.0**
Task 7. Perform Economic and Financial Analysis	5.0	5.0	15.0	10.0	3.0	25.0	2.0	3.0	**68.0**
Task 8. Developmental Impact	1.0	3.0	7.5	7.0	2.0	0.0	1.0	0.0	**21.5**

Task 9. Environmental Impact	1.0	4.0	7.5	6.0	3.0	0.0	1.0	0.0	**22.5**
Task 10. Final Report	9.5	10.0	27.5	25.0	5.5	5.0	11.0	10.0	**103.5**
	32.0	**43.0**	**126.0**	**100.0**	**38.0**	**36.0**	**60.0**	**31.0**	**466.0**
Labor Costs per Day	$1,953.20	$ 1233.60	$ 822.40	$ 719.60	$ 1,300.00	$ 1300.00	$ 800.00	$ 411.20	

Task Labor Cost Summary	**Project Director**	**Project Manager**	**Project Engineer**	**Staff Engineer**	**Wastewater and Biomass Specialist**	**Financial Specialist**	**Local Engineering Consultant**	**Admin**	**Total Labor Cost**
Task 1. Project Initiation And Work Plan Development	$3,906.40	$1,850.40	$1,644.80	$1,441.20	$1,950.00	$1,300.00	$800.00	$411.20	**$13,304.00**
Task 2. Data Collection	$0.00	$1,233.60	$4,112.00	$3,603.00	$2,600.00	$0.00	$8,000.00	$2,056.00	**$21,604.60**
Task 3. Develop Design Criteria And Data	$8,789.40	$5,551.20	$19,326.40	$12,970.80	$5,200.00	$0.00	$16,800.00	$2,056.00	**$70.693.80**
Task 4. Evaluate Existing Facilities	$1,953.20	$2,467.20	$2,467.20	$2,161.80	$2,600.00	$0.00	$1,600.00	$411.20	**$13,660.60**
Task 5. Evaluate Improvement Options	$11,719.20	$12,336.00	$24,672.00	$14,392.00	$13,000.00	$2,600.00	$6,400.00	$1,233.60	**$86,352.80**
Task 6. Develop O&M Program	$3,906.40	$2,467.20	$4,112.00	$2,882.40	$6,500.00	$3,900.00	$2,400.00	$1,233.60	**$27,401.60**
Task 7. Perform Economic and Financial Analysis	$9,766.00	$6,168.00	$12,336.00	$7,206.00	$3,900.00	$32,500.00	$1,600.00	$1,233.60	**$74,709.60**
Task 8. Developmental Impact	$1,953.20	$3,700.80	$6,168.00	$5,037.20	$2,600.00	$0.00	$800.00	$0.00	**$20,259.20**
Task 9. Environmental Impact	$1,953.20	$4,934.40	$6,168.00	$4,317.60	$3,900.00	$0.00	$800.00	$0.00	**$22,073.20**
Task 10. Final Report	$18,555.40	$14,803.20	$26,728.00	$20,176.80	$7,150.00	$6,500.00	$8,800.00	$4,112.00	**$106,825.40**
	$62,502.40	**$53,044.80**	**$103,622.40**	**$72,060.00**	**$49,400.00**	**$46,800.00**	**$48,000.00**	**$12,747.20**	**$448,176.80**

Note: The labor rates used in the budget are appropriate for this industry. Estimate differs from estimate previously provided to USTDA as part of the grant application due to additional tasks and rounding.

APPENDIX B2

TOR Study Budget for Tulcea Water and Wastewater System Improvements

Budget Summary for Tulcea Water and Wastewater Infrastructure Improvement Project by Task

Appendix B2 - Budget Estimate

Total Task Cost Summary	Prime Labor Total	Travel	Reproduction and Shipping	Communications	Subcontracts	Other	Total
Task 1. Project Initiation And Data Collection	$23,600	$0	$0	$5,000	$2,800	$0	**$31,400**
Task 2. Evaluation of Disinfection Options	$36,300	$12,200	$1,000	$1,800	$16,100	$0	**$67,400**
Task 3. Water Distribution System Evaluation	$48,800	$17,000	$1,000	$2,000	$16,800	$0	**$85,600**
Task 4. Wastewater Collection System Evaluation	$32,600	$12,200	$1,000	$1,800	$15,400	$0	**$63,000**
Task 5. Developmental Impact	$8,900	$0	$500	$1,000	$2,100	$0	**$12,500**
Task 6. Environmental Impact	$8,900	$0	$500	$1,000	$2,100	$0	**$12,500**
Task 7. Final Report	$48,200	$0	$7,800	$1,200	$9,800	$0	**$67,000**
Total	**$207,300**	**$41,400**	**$11,800**	**$13,800**	**$65,100**	**$0**	$339,400

Task Summary Labor Days	Project Director	Project Manager	Project Engineer	Staff Engineer	Modeling Specialist	Subcontract Labor	Admin	Total Labor Days
Task 1. Project Initiation And Data Collection	1.0	5.0	5.0	10.0	2.0	4.0	3.0	**30.0**
Task 2. Evaluation of Disinfection Options	2.0	2.0	23.0	10.0	0.0	23.0	5.0	**65.0**
Task 3. Water Distribution System Evaluation	1.0	4.0	19.0	20.0	9.0	24.0	3.0	**80.0**
Task 4. Wastewater Collection System Evaluation	0.0	2.0	14.0	10.0	9.0	22.0	3.0	**60.0**
Task 5. Developmental Impact	0.0	1.0	4.0	5.0	0.0	3.0	1.0	**14.0**
Task 6. Environmental Impact	0.0	1.0	4.0	5.0	0.0	3.0	1.0	**14.0**
Task 7. Final Report	2.0	6.0	14.0	20.0	5.0	14.0	11.0	**72.0**
	6.0	**21.0**	**83.0**	**80.0**	**25.0**	**93.0**	**27.0**	**335.0**
Labor Costs per Day	$1,900.00	$ 1,400.00	$ 900.00	$ 700.00	$ 1,000.00	$700.00	$ 400.00	

Task Labor Cost Summary	Project Director	Project Manager	Project Engineer	Staff Engineer	Modeling Specialist	Subcontract Labor	Admin	Total Labor Cost
Task 1. Project Initiation And Data Collection	$1,900	$7,000	$4,500	$7,000	$2,000	$2,800	$1,200	**$26,400**
Task 2. Evaluation of Disinfection Options	$3,800	$2,800	$20,700	$14,000	$0	$9,100	$2,000	**$52,400**
Task 3. Water Distribution System Evaluation	$1,900	$5,600	$17,100	$21,000	$9,000	$9,800	$1,200	**$65,600**
Task 4. Wastewater Collection System Evaluation	$0	$2,800	$12,600	$14,000	$9,000	$8,400	$1,200	**$48,000**
Task 5. Developmental Impact	$0	$1,400	$3,600	$3,500	$0	$2,100	$400	**$11,000**
Task 6. Environmental Impact	$0	$1,400	$3,600	$3,500	$0	$2,100	$400	**$11,000**
Task 7. Final Report	$3,800	$8,400	$12,600	$14,000	$5,000	$9,800	$4,400	**$58,000**
	$11,400	**$29,400**	**$74,700**	**$77,000**	**$25,000**	**$44,100**	**$10,800**	**$272,400**

Note: The labor rates used in the budget are appropriate for this industry.

ANNEX 3

U.S. TRADE AND DEVELOPMENT AGENCY
Arlington, VA 22209-2131

NATIONALITY, SOURCE, AND ORIGIN REQUIREMENTS

The purpose of USTDA's nationality, source, and origin requirements is to assure the maximum practicable participation of American contractors, technology, equipment and materials in the prefeasibility, feasibility, and implementation stages of a project.

USTDA STANDARD RULE (GRANT AGREEMENT STANDARD LANGUAGE):

Except as USTDA may otherwise agree, each of the following provisions shall apply to the delivery of goods and services funded by USTDA under this Grant Agreement: (a) for professional services, the Contractor must be either a U.S. firm or U.S. individual; (b) the Contractor may use U.S. subcontractors without limitation, but the use of subcontractors from host country may not exceed twenty percent (20%) of the USTDA Grant amount and may only be used for specific services from the Terms of Reference identified in the subcontract; (c) employees of U.S. Contractor or U.S. subcontractor firms responsible for professional services shall be U.S. citizens or non-U.S. citizens lawfully admitted for permanent residence in the U.S.; (d) goods purchased for implementation of the Study and associated delivery services (e.g., international transportation and insurance) must have their nationality, source and origin in the United States; and (e) goods and services incidental to Study support (e.g., local lodging, food, and transportation) in host country are not subject to the above restrictions. USTDA will make available further details concerning these standards of eligibility upon request.

NATIONALITY:

1) Rule

Except as USTDA may otherwise agree, the Contractor for USTDA funded activities must be either a U.S. firm or a U.S. individual. Prime contractors may utilize U.S. subcontractors without limitation, but the use of host country subcontractors is limited to 20% of the USTDA grant amount.

2) Application

Accordingly, only a U.S. firm or U.S. individual may submit proposals on USTDA funded activities. Although those proposals may include subcontracting arrangements with host country firms or

individuals for up to 20% of the USTDA grant amount, they may not include subcontracts with third country entities. U.S. firms submitting proposals must ensure that the professional services funded by the USTDA grant, to the extent not subcontracted to host country entities, are supplied by employees of the firm or employees of U.S. subcontractor firms who are U.S. individuals.

Interested U.S. firms and consultants who submit proposals must meet USTDA nationality requirements as of the due date for the submission of proposals and, if selected, must continue to meet such requirements throughout the duration of the USTDA-financed activity. These nationality provisions apply to whatever portion of the Terms of Reference is funded with the USTDA grant.

3) Definitions

A "U.S. individual" is (a) a U.S. citizen, or (b) a non-U.S. citizen lawfully admitted for permanent residence in the U.S. (a green card holder).

A "U.S. firm" is a privately owned firm which is incorporated in the U.S., with its principal place of business in the U.S., and which is either (a) more than 50% owned by U.S. individuals, or (b) has been incorporated in the U.S. for more than three (3) years prior to the issuance date of the request for proposals; has performed similar services in the U.S. for that three (3) year period; employs U.S. citizens in more than half of its permanent full-time positions in the U.S.; and has the existing capability in the U.S. to perform the work in question.

A partnership, organized in the U.S. with its principal place of business in the U.S., may also qualify as a "U.S. firm" as would a joint venture organized or incorporated in the United States consisting entirely of U.S. firms and/or U.S. individuals.

A nonprofit organization, such as an educational institution, foundation, or association may also qualify as a "U.S. firm" if it is incorporated in the United States and managed by a governing body, a majority of whose members are U.S. individuals.

SOURCE AND ORIGIN:

1) Rule

In addition to the nationality requirement stated above, any goods (e.g., equipment and materials) and services related to their shipment (e.g., international transportation and insurance) funded under the USTDA Grant Agreement must have their source and origin in the United States, unless USTDA otherwise agrees. However, necessary purchases of goods and project support services which are unavailable from a U.S. source (e.g., local food, housing and transportation) are eligible without specific USTDA approval.

2) Application

Accordingly, the prime contractor must be able to demonstrate that all goods and services purchased in the host country to carry out the Terms of Reference for a USTDA Grant Agreement that were not of U.S. source and origin were unavailable in the United States.

3) Definitions

"Source" means the country from which shipment is made.

"Origin" means the place of production, through manufacturing, assembly or otherwise.

Questions regarding these nationality, source and origin requirements may be addressed to the USTDA Office of General Counsel.

ANNEX 4

GRANT AGREEMENT

This Grant Agreement is entered into between the Government of the United States of America, acting through the U.S. Trade and Development Agency ("USTDA") and Aquaserv S.A. Tulcea ("Grantee"). USTDA agrees to provide the Grantee under the terms of this Agreement US$339,400 ("USTDA Grant") to fund the cost of goods and services required for a feasibility study ("Study") on the proposed Tulcea Water and Wastewater System Improvements ("Project") in Romania ("Host Country").

1. USTDA Funding

The funding to be provided under this Grant Agreement shall be used to fund the costs of a contract between the Grantee and the U.S. firm selected by the Grantee ("Contractor") under which the Contractor will perform the Study ("Contract"). Payment to the Contractor will be made directly by USTDA on behalf of the Grantee with the USTDA Grant funds provided under this Grant Agreement.

2. Terms of Reference

The Terms of Reference for the Study ("Terms of Reference") are attached as Annex I and are hereby made a part of this Grant Agreement. The Study will examine the technical, financial, environmental, and other critical aspects of the proposed Project. The Terms of Reference for the Study shall also be included in the Contract.

3. Standards of Conduct

USTDA and the Grantee recognize the existence of standards of conduct for public officials, and commercial entities, in their respective countries. The parties to this Grant Agreement and the Contractor shall observe these standards, which include not accepting payment of money or anything of value, directly or indirectly, from any person for the purpose of illegally or improperly inducing anyone to take any action favorable to any party in connection with the Study.

4. Grantee Responsibilities

The Grantee shall undertake its best efforts to provide reasonable support for the Contractor, such as local transportation, office space, and secretarial support.

5. USTDA as Financier

(A) USTDA Approval of Competitive Selection Procedures

Selection of the U.S. Contractor shall be carried out by the Grantee according to its established procedures for the competitive selection of contractors with advance notice of the procurement published online through *Federal Business Opportunities (www.fedbizopps.gov)*. Upon request, the Grantee will submit these contracting procedures and related documents to USTDA for information and/or approval.

(B) USTDA Approval of Contractor Selection

The Grantee shall notify USTDA at the address of record set forth in Article 17 below upon selection of the Contractor to perform the Study. Upon approval of this selection by USTDA, the Grantee and the Contractor shall then enter into a contract for performance of the Study. The Grantee shall notify in writing the U.S. firms that submitted unsuccessful proposals to perform the Study that they were not selected.

(C) USTDA Approval of Contract Between Grantee and Contractor

The Grantee and the Contractor shall enter into a contract for performance of the Study. This contract, and any amendments thereto, including assignments and changes in the Terms of Reference, must be approved by USTDA in writing. To expedite this approval, the Grantee (or the Contractor on the Grantee's behalf) shall transmit to USTDA, at the address set forth in Article 17 below, a photocopy of an English language version of the signed contract or a final negotiated draft version of the contract.

(D) USTDA Not a Party to the Contract

It is understood by the parties that USTDA has reserved certain rights such as, but not limited to, the right to approve the terms of the contract and any amendments thereto, including assignments, the selection of all contractors, the Terms of Reference, the Final Report, and any and all documents related to any contract funded under the Grant Agreement. The parties hereto further understand and agree that USTDA, in reserving any or all of the foregoing approval rights, has acted solely as a financing entity to assure the proper use of United States Government funds, and that any decision by USTDA to exercise or refrain from exercising these approval rights shall be made as a financier in the course of funding the Study and shall not be construed as making USTDA a party to the contract. The parties hereto understand and agree that USTDA may, from time to time, exercise the foregoing approval rights, or discuss matters related to these rights and the Project with the parties to the contract or any subcontract, jointly or separately, without thereby incurring any responsibility or liability to such parties. Any approval or failure to approve by USTDA shall not bar the Grantee or USTDA from asserting any right they might have against the

Contractor, or relieve the Contractor of any liability which the Contractor might otherwise have to the Grantee or USTDA.

(E) Grant Agreement Controlling

Regardless of USTDA approval, the rights and obligations of any party to the contract or subcontract thereunder must be consistent with this Grant Agreement. In the event of any inconsistency between the Grant Agreement and any contract or subcontract funded by the Grant Agreement, the Grant Agreement shall be controlling.

6. Disbursement Procedures

(A) USTDA Approval of Contract Required

USTDA will make disbursements of Grant funds directly to the Contractor only after USTDA approves the Grantee's contract with the Contractor.

(B) Contractor Invoice Requirements

The Grantee should request disbursement of funds by USTDA to the Contractor for performance of the Study by submitting invoices in accordance with the procedures set forth in the USTDA Mandatory Clauses in Annex II.

7. Effective Date

The effective date of this Grant Agreement ("Effective Date") shall be the date of signature by both parties or, if the parties sign on different dates, the date of the last signature.

8. Study Schedule

(A) Study Completion Date

The completion date for the Study, which is January 29, 2011, is the date by which the parties estimate that the Study will have been completed.

(B) Time Limitation on Disbursement of USTDA Grant Funds

Except as USTDA may otherwise agree, (a) no USTDA funds may be disbursed under this Grant Agreement for goods and services which are provided prior to the Effective Date of the Grant Agreement; and (b) all funds made available under the Grant Agreement must be disbursed within four (4) years from the Effective Date of the Grant Agreement.

9. USTDA Mandatory Clauses

All contracts funded under this Grant Agreement shall include the USTDA mandatory clauses set forth in Annex II to this Grant Agreement. All subcontracts funded or partially funded with USTDA Grant funds shall include the USTDA mandatory clauses, except for clauses B(1), G, H, I, and J.

10. Use of U.S. Carriers

(A) Air

Transportation by air of persons or property funded under the Grant Agreement shall be on U.S. flag carriers in accordance with the Fly America Act, 49 U.S.C. 40118, to the extent service by such carriers is available, as provided under applicable U.S. Government regulations.

(B) Marine

Transportation by sea of property funded under the Grant Agreement shall be on U.S. carriers in accordance with U.S. cargo preference law.

11. Nationality, Source and Origin

Except as USTDA may otherwise agree, the following provisions shall govern the delivery of goods and services funded by USTDA under the Grant Agreement: (a) for professional services, the Contractor must be either a U.S. firm or U.S. individual; (b) the Contractor may use U.S. subcontractors without limitation, but the use of subcontractors from Host Country may not exceed twenty percent (20%) of the USTDA Grant amount and may only be used for specific services from the Terms of Reference identified in the subcontract; (c) employees of U.S. Contractor or U.S. subcontractor firms responsible for professional services shall be U.S. citizens or non-U.S. citizens lawfully admitted for permanent residence in the U.S.; (d) goods purchased for performance of the Study and associated delivery services (e.g., international transportation and insurance) must have their nationality, source and origin in the United States; and (e) goods and services incidental to Study support (e.g., local lodging, food, and transportation) in Host Country are not subject to the above restrictions. USTDA will make available further details concerning these provisions upon request.

12. Taxes

USTDA funds provided under the Grant Agreement shall not be used to pay any taxes, tariffs, duties, fees or other levies imposed under laws in effect in Host Country. Neither the Grantee nor the Contractor will seek reimbursement from USTDA for such taxes, tariffs, duties, fees or other levies.

13. Cooperation Between Parties and Follow-Up

The parties will cooperate to assure that the purposes of the Grant Agreement are accomplished. For five (5) years following receipt by USTDA of the Final Report (as defined in Clause I of Annex II), the Grantee agrees to respond to any reasonable inquiries from USTDA about the status of the Project.

14. Implementation Letters

To assist the Grantee in the implementation of the Study, USTDA may, from time to time, issue implementation letters that will provide additional information about matters covered by the Grant Agreement. The parties may also use jointly agreed upon implementation letters to confirm and record their mutual understanding of matters covered by the Grant Agreement.

15. Recordkeeping and Audit

The Grantee agrees to maintain books, records, and other documents relating to the Study and the Grant Agreement adequate to demonstrate implementation of its responsibilities under the Grant Agreement, including the selection of contractors, receipt and approval of contract deliverables, and approval or disapproval of contractor invoices for payment by USTDA. Such books, records, and other documents shall be separately maintained for three (3) years after the date of the final disbursement by USTDA. The Grantee shall afford USTDA or its authorized representatives the opportunity at reasonable times to review books, records, and other documents relating to the Study and the Grant Agreement.

16. Representation of Parties

For all purposes relevant to the Grant Agreement, the Government of the United States of America will be represented by the U. S. Ambassador to Host Country or USTDA and Grantee will be represented by the General Manager of Aquaserv. The parties hereto may, by written notice, designate additional representatives for all purposes under the Grant Agreement.

17. Addresses of Record for Parties

Any notice, request, document, or other communication submitted by either party to the other under the Grant Agreement shall be in writing or through a wire or electronic medium which produces a tangible record of the transmission, such as a telegram, cable or facsimile, and will be deemed duly given or sent when delivered to such party at the following:

To: Aquaserv S.A. Tulcea
2 Rezervorului Str.

820131 Tulcea
Romania

Phone: +40 240 52 43 10
Fax: +40 240 52 43 10

To: U.S. Trade and Development Agency
1000 Wilson Boulevard, Suite 1600
Arlington, Virginia 22209-3901
USA

Phone: (703) 875-4357
Fax: (703) 875-4009

All such communications shall be in English, unless the parties otherwise agree in writing. In addition, the Grantee shall provide the Commercial Section of the U.S. Embassy in Host Country with a copy of each communication sent to USTDA.

Any communication relating to this Grant Agreement shall include the following fiscal data:

Appropriation No.:	119/101001
Activity No.:	2009-81008A
Reservation No.:	2009810007
Grant No.:	GH2009810001

18. Termination Clause

Either party may terminate the Grant Agreement by giving the other party thirty (30) days advance written notice. The termination of the Grant Agreement will end any obligations of the parties to provide financial or other resources for the Study, except for payments which they are committed to make pursuant to noncancellable commitments entered into with third parties prior to the written notice of termination.

19. Non-waiver of Rights and Remedies

No delay in exercising any right or remedy accruing to either party in connection with the Grant Agreement shall be construed as a waiver of such right or remedy.

20. U.S. Technology and Equipment

By funding this Study, USTDA seeks to promote the project objectives of the Host Country through the use of U.S. technology, goods, and services. In recognition of this purpose, the Grantee agrees that it will allow U.S. suppliers to compete in the procurement of technology, goods and services needed for Project implementation.

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IN WITNESS WHEREOF, the Government of the United States of America and Aquaserv S.A. Tulcea, each acting through its duly authorized representative, have caused this Agreement to be signed in the English language in their names and delivered as of the day and year written below. In the event that this Grant Agreement is signed in more than one language, the English language version shall govern.

For the Government of the United States of America

By: James Mennin

Date: Jan 29, 2009

For Aquaserv S.A. Tulcea

SOCIETATEA COMERCIALA 1 AQUASERV S.A. TULCEA - ROMÂNIA

By:_____

Date: 29.01.2009.

Witnessed:

By:_____

Witnessed:

By:_____

Annex I -- Terms of Reference

Annex II -- USTDA Mandatory Clauses

Annex I

Terms of Reference

Task 1—Project Initiation and Data Collection
The Contractor shall initiate the project and develop a work plan to ensure that all project team members are aware of the project Terms of Reference, including project goals, schedule, responsibilities, and deliverables. The Contractor shall collect data that shows the water distribution and sewage piping network locations, depths, and potential entry points for the City of Tulcea, as well as background data on the chlorination system at Sulina. The data should include drawings showing the locations and elevations of all water distribution and sanitary sewage piping, manholes and other appurtenances, and piping specifications for the City of Tulcea. Available design drawings and specifications on the chlorination system at Sulina should also be obtained.

Task 2—Evaluation of Disinfection Options
The Contractor shall evaluate an alternate chlorination system for the potable water groundwater treatment facility at Sulina, Romania. The use of on-site generation of disinfection chemicals (hypochlorite and mixed disinfectants) will be evaluated along with the use of chemicals (gaseous chlorine and sodium hypochlorite) produced off-site and shipped to the site for disinfection. The evaluation will include the effectiveness and costs of various disinfection processes, and will include the pilot testing of on-site disinfectant generation to determine operating requirements and disinfection characteristics. The pilot test will evaluate chemical usage as a function of residual chlorine, energy use, ease of implementation, etc. The results of the separate, ongoing MIOX pilot test at Mile 23 along the Danube River will be reviewed and incorporated into the evaluation.

The Contractor also will develop an implementation plan for implementing improvements to the chlorination system that are needed at Sulina, based on the chlorination system evaluation. This plan will include a description of each system improvement. A rehabilitation schedule will be included, with a prioritization of rehabilitation needs.

Deliverable: The Contractor shall incorporate the results of Tasks 1 and 2 into a report for Grantee review.

Task 3—Water Distribution System Evaluation
Under Task 3, the Contractor shall conduct an evaluation of the water distribution system. All three zones of the City of Tulcea water system will be hydraulically modeled to evaluate the system and to establish priority rehabilitation areas. Non-destructive pipe evaluations will be conducted using remote camera systems and other remote sensing such as the use of "smart balls" to determine the condition of the water distribution piping, locate leaks, and gather information necessary to make an informed decision on optimal rehabilitation methods. Field testing will be conducted using various disinfectants to evaluate their impacts on pipe conditions and final water quality. A cost-

benefit analysis will be conducted and the various pipe rehabilitation methods will be compared and evaluated on the basis of cost, effectiveness, and ease of implementation. The Contractor will develop a conceptual design for the water distribution system.

The Contractor also shall develop an implementation plan for implementing improvements to the water distribution system that are needed, based on the distribution system evaluation. This plan will include a description of each section of the distribution system that requires improvement, along with the optimal rehabilitation method for that section. A rehabilitation schedule will be included, with a prioritization of rehabilitation needs. The prioritization will be based on rehabilitating those sections of the system that will have the greatest impact on reducing water distribution system losses.

Deliverable: The Contractor shall incorporate the results of Task 3 into a report for Grantee review.

Task 4—Wastewater Collection System Evaluation

The Contractor shall evaluate the existing wastewater collection system. All three zones of the City of Tulcea wastewater collection system will be evaluated to determine priority target zones for investigation and rehabilitation. Similar to the evaluation of water distribution system piping in Task 3, non-destructive pipe evaluations will be conducted using remote sensing technology to assess the condition of the sewer piping, locate major leaks, and gather information necessary to evaluate pipe rehabilitation methods. Various sewer rehabilitation methods, including trenchless rehabilitation, will be compared and evaluated on the basis of cost, effectiveness, and ease of implementation. The Contractor shall develop a conceptual design for the wastewater collection system, as well as an implementation plan for the project.

The implementation plan will be developed for implementing improvements to the wastewater collection system that are needed, based on the collection system evaluation. This plan will include a description of each section of the collection system that requires improvement, along with the optimal rehabilitation method for that section. A rehabilitation schedule will be included, with a prioritization of rehabilitation needs.

Deliverable: The Contractor shall incorporate the results of Task 4 into a report for Grantee review.

Task 5—Developmental Impact

The Contractor shall report on the potential Developmental Impact of the Project in Romania. While specific focus should be paid to the immediate impact of the specific Project, the Contractor shall include, where appropriate, any additional developmental benefits to the Project, including spin-off, demonstration, and implementation effects. The analysis of potential benefits should be as concrete and detailed as possible. The Developmental Impact factors are intended to provide the Project's decision-makers and interested parties with a broader view of the Project's potential effects. The Contractor shall provide estimates of the Project's potential benefits in the following areas:

a) Infrastructure: a statement on the infrastructure impact giving a brief synopsis.
b) Market-Oriented Reform: a description of any regulation, laws, or institutional changes that are recommended and the effect they would have if implemented.
c) Human Capacity Building: The Contractor shall address the number and type of positions that have been or will likely be created as a result of the Project as well as the number of people who have received or will receive training and a brief description of the training program.
d) Technology Transfer and Productivity Enhancement: a description of any advanced technologies that have been implemented during or may be implemented as a result of the Project. A description of any efficiency that has or would be gained through the implemented technologies.
e) Other: any other developmental benefits to the Project, including any spin-off or demonstration effects.

Task 6 – Environmental Impact

The Contractor shall conduct a preliminary review of the Project's anticipated impact on the environment with reference to local requirements and those of multilateral lending agencies (such as the World Bank or EBRD). This review would identify potential negative impacts, discuss the extent to which they can be mitigated and develop plans for a full environmental impact assessment if and when the Project moves forward to the implementation stage. This includes the identification of steps that will need to be undertaken by the Grantee subsequent to the feasibility study's completion and prior to the Project's implementation. The review shall also include:

a) A description of the positive and negative environmental impacts during construction and operation.
b) A description of national environmental standards, mitigation measures and organizational responsibilities.
c) Specification of possible permits and/or other related requirements for the Project.

Task 7—Final Report

The Contractor shall prepare and deliver to the Grantee and USTDA a substantive and comprehensive Final Report of all work performed under these Terms of Reference. The Final Report shall be organized according to the above tasks, and shall include all deliverables and documents that have been provided to the Grantee in connection with the performance of these tasks. The report shall incorporate all findings, recommendations, and conclusions of the feasibility study. This will include specific process recommendations for the appropriate disinfection method at Sulina, and optimal rehabilitation methods for both the water distribution system network and wastewater collection system piping. Among other things, the Final Report will include conceptual designs, an assessment including identification of all environmental and developmental impacts, implementation plans for the project, and information concerning U.S. sources of equipment and services. This Final Report will also serve as the basis for the implementation phase.

Within the Final Report, the Contractor shall identify prospective U.S. sources of supply, assess their capabilities, and include their business names, points of contact, addresses, and telephone and fax numbers.

The Contractor shall ensure that the Final Report is prepared in accordance with Annex II, Clause I of the Grant Agreement.

Notes:

(1) The Contractor is responsible for compliance with U.S. export licensing requirements, if applicable, in the performance of the Terms of Reference.

(2) The Contractor and the Grantee shall be careful to ensure that the public version of the Final Report contains no security or confidential information.

(3) The Grantee and USTDA shall have an irrevocable, worldwide, royalty-free, non-exclusive right to use and distribute the Final Report and all work product that is developed under these Terms of Reference.

Annex II

USTDA Mandatory Contract Clauses

A. USTDA Mandatory Clauses Controlling

The parties to this contract acknowledge that this contract is funded in whole or in part by the U.S. Trade and Development Agency ("USTDA") under the Grant Agreement between the Government of the United States of America acting through USTDA and **Aquaserv S.A. Tulcea** ("Client"), dated _____ ("Grant Agreement"). The Client has selected _____ ("Contractor") to perform the feasibility study ("Study") for the **Tulcea Water and Wastewater System Improvements** project ("Project") in Romania ("Host Country"). Notwithstanding any other provisions of this contract, the following USTDA mandatory contract clauses shall govern. All subcontracts entered into by Contractor funded or partially funded with USTDA Grant funds shall include these USTDA mandatory contract clauses, except for clauses B(1), G, H, I, and J. In addition, in the event of any inconsistency between the Grant Agreement and any contract or subcontract thereunder, the Grant Agreement shall be controlling.

B. USTDA as Financier

(1) USTDA Approval of Contract

All contracts funded under the Grant Agreement, and any amendments thereto, including assignments and changes in the Terms of Reference, must be approved by USTDA in writing in order to be effective with respect to the expenditure of USTDA Grant funds. USTDA will not authorize the disbursement of USTDA Grant funds until the contract has been formally approved by USTDA or until the contract conforms to modifications required by USTDA during the contract review process.

(2) USTDA Not a Party to the Contract

It is understood by the parties that USTDA has reserved certain rights such as, but not limited to, the right to approve the terms of this contract and amendments thereto, including assignments, the selection of all contractors, the Terms of Reference, the Final Report, and any and all documents related to any contract funded under the Grant Agreement. The parties hereto further understand and agree that USTDA, in reserving any or all of the foregoing approval rights, has acted solely as a financing entity to assure the proper use of United States Government funds, and that any decision by USTDA to exercise or refrain from exercising these approval rights shall be made as a financier in the course of financing the Study and shall not be construed as making USTDA a party to the contract. The parties hereto understand and agree that USTDA may, from time to time, exercise the foregoing approval rights, or discuss matters related to these rights and the Project with the parties to the contract or any subcontract, jointly or separately, without thereby incurring any responsibility or liability to such parties. Any approval or failure to approve by USTDA shall not

bar the Client or USTDA from asserting any right they might have against the Contractor, or relieve the Contractor of any liability which the Contractor might otherwise have to the Client or USTDA.

C. Nationality, Source and Origin

Except as USTDA may otherwise agree, the following provisions shall govern the delivery of goods and services funded by USTDA under the Grant Agreement: (a) for professional services, the Contractor must be either a U.S. firm or U.S. individual; (b) the Contractor may use U.S. subcontractors without limitation, but the use of subcontractors from Host Country may not exceed twenty percent (20%) of the USTDA Grant amount and may only be used for specific services from the Terms of Reference identified in the subcontract; (c) employees of U.S. Contractor or U.S. subcontractor firms responsible for professional services shall be U.S. citizens or non-U.S. citizens lawfully admitted for permanent residence in the U.S.; (d) goods purchased for performance of the Study and associated delivery services (e.g., international transportation and insurance) must have their nationality, source and origin in the United States; and (e) goods and services incidental to Study support (e.g., local lodging, food, and transportation) in Host Country are not subject to the above restrictions. USTDA will make available further details concerning these provisions upon request.

D. Recordkeeping and Audit

The Contractor and subcontractors funded under the Grant Agreement shall maintain, in accordance with generally accepted accounting procedures, books, records, and other documents, sufficient to reflect properly all transactions under or in connection with the contract. These books, records, and other documents shall clearly identify and track the use and expenditure of USTDA funds, separately from other funding sources. Such books, records, and documents shall be maintained during the contract term and for a period of three (3) years after final disbursement by USTDA. The Contractor and subcontractors shall afford USTDA, or its authorized representatives, the opportunity at reasonable times for inspection and audit of such books, records, and other documentation.

E. U.S. Carriers

(1) Air

Transportation by air of persons or property funded under the Grant Agreement shall be on U.S. flag carriers in accordance with the Fly America Act, 49 U.S.C. 40118, to the extent service by such carriers is available, as provided under applicable U.S. Government regulations.

(2) Marine

Transportation by sea of property funded under the Grant Agreement shall be on U.S. carriers in accordance with U.S. cargo preference law.

F. Workman's Compensation Insurance

The Contractor shall provide adequate Workman's Compensation Insurance coverage for work performed under this Contract.

G. Reporting Requirements

The Contractor shall advise USTDA by letter as to the status of the Project on March 1st annually for a period of two (2) years after completion of the Study. In addition, if at any time the Contractor receives follow-on work from the Client, the Contractor shall so notify USTDA and designate the Contractor's contact point including name, telephone, and fax number. Since this information may be made publicly available by USTDA, any information which is confidential shall be designated as such by the Contractor and provided separately to USTDA. USTDA will maintain the confidentiality of such information in accordance with applicable law.

H. Disbursement Procedures

(1) USTDA Approval of Contract

Disbursement of Grant funds will be made only after USTDA approval of this contract. To make this review in a timely fashion, USTDA must receive from either the Client or the Contractor a photocopy of an English language version of a signed contract or a final negotiated draft version to the attention of the General Counsel's office at USTDA's address listed in Clause M below.

(2) Payment Schedule Requirements

A payment schedule for disbursement of Grant funds to the Contractor shall be included in this Contract. Such payment schedule must conform to the following USTDA requirements: (1) up to twenty percent (20%) of the total USTDA Grant amount may be used as a mobilization payment; (2) all other payments, with the exception of the final payment, shall be based upon contract performance milestones; and (3) the final payment may be no less than fifteen percent (15%) of the total USTDA Grant amount, payable upon receipt by USTDA of an approved Final Report in accordance with the specifications and quantities set forth in Clause I below. Invoicing procedures for all payments are described below.

(3) Contractor Invoice Requirements

USTDA will make all disbursements of USTDA Grant funds directly to the Contractor. The Contractor must provide USTDA with an ACH Vendor Enrollment Form (available from USTDA) with the first invoice. The Client shall request disbursement of funds by

USTDA to the Contractor for performance of the contract by submitting the following to USTDA:

(a) Contractor's Invoice

The Contractor's invoice shall include reference to an item listed in the Contract payment schedule, the requested payment amount, and an appropriate certification by the Contractor, as follows:

(i) For a mobilization payment (if any):

"As a condition for this mobilization payment, the Contractor certifies that it will perform all work in accordance with the terms of its Contract with the Client. To the extent that the Contractor does not comply with the terms and conditions of the Contract, including the USTDA mandatory provisions contained therein, it will, upon USTDA's request, make an appropriate refund to USTDA. "

(ii) For contract performance milestone payments:

"The Contractor has performed the work described in this invoice in accordance with the terms of its contract with the Client and is entitled to payment thereunder. To the extent the Contractor has not complied with the terms and conditions of the Contract, including the USTDA mandatory provisions contained therein, it will, upon USTDA's request, make an appropriate refund to USTDA."

(iii) For final payment:

"The Contractor has performed the work described in this invoice in accordance with the terms of its contract with the Client and is entitled to payment thereunder. Specifically, the Contractor has submitted the Final Report to the Client, as required by the Contract, and received the Client's approval of the Final Report. To the extent the Contractor has not complied with the terms and conditions of the Contract, including the USTDA mandatory provisions contained therein, it will, upon USTDA's request, make an appropriate refund to USTDA."

(b) Client's Approval of the Contractor's Invoice

(i) The invoice for a mobilization payment must be approved in writing by the Client.

(ii) For contract performance milestone payments, the following certification by the Client must be provided on the invoice or separately:

"The services for which disbursement is requested by the Contractor have been performed satisfactorily, in accordance with applicable Contract provisions and the terms and conditions of the USTDA Grant Agreement."

(iii) For final payment, the following certification by the Client must be provided on the invoice or separately:

"The services for which disbursement is requested by the Contractor have been performed satisfactorily, in accordance with applicable Contract provisions and terms and conditions of the USTDA Grant Agreement. The Final Report submitted by the Contractor has been reviewed and approved by the Client. "

(c) USTDA Address for Disbursement Requests

Requests for disbursement shall be submitted by courier or mail to the attention of the Finance Department at USTDA's address listed in Clause M below.

(4) Termination

In the event that the Contract is terminated prior to completion, the Contractor will be eligible, subject to USTDA approval, for reasonable and documented costs which have been incurred in performing the Terms of Reference prior to termination, as well as reasonable wind down expenses. Reimbursement for such costs shall not exceed the total amount of undisbursed Grant funds. Likewise, in the event of such termination, USTDA is entitled to receive from the Contractor all USTDA Grant funds previously disbursed to the Contractor (including but not limited to mobilization payments) which exceed the reasonable and documented costs incurred in performing the Terms of Reference prior to termination.

I. USTDA Final Report

(1) Definition

"Final Report" shall mean the Final Report described in the attached Annex I Terms of Reference or, if no such "Final Report" is described therein, "Final Report" shall mean a substantive and comprehensive report of work performed in accordance with the attached Annex I Terms of Reference, including any documents delivered to the Client.

(2) Final Report Submission Requirements

The Contractor shall provide the following to USTDA:

(a) One (1) complete version of the Final Report for USTDA's records. This version shall have been approved by the Client in writing and must be in the English language. It is the responsibility of the Contractor to ensure that confidential information, if any, contained in this version be clearly marked. USTDA will maintain the confidentiality of such information in accordance with applicable law.

and

(b) One (1) copy of the Final Report suitable for public distribution ("Public Version"). The Public Version shall have been approved by the Client in writing and must be in the English language. As this version will be available for public distribution, it must not contain any confidential information. If the report in (a) above contains no confidential information, it may be used as the Public Version. In any event, the Public Version must be informative and contain sufficient Project detail to be useful to prospective equipment and service providers.

and

(c) Two (2) CD-ROMs, each containing a complete copy of the Public Version of the Final Report. The electronic files on the CD-ROMs shall be submitted in a commonly accessible read-only format. As these CD-ROMs will be available for public distribution, they must not contain any confidential information. It is the responsibility of the Contractor to ensure that no confidential information is contained on the CD-ROMs.

The Contractor shall also provide one (1) copy of the Public Version of the Final Report to the Foreign Commercial Service Officer or the Economic Section of the U.S. Embassy in Host Country for informational purposes.

(3) Final Report Presentation

All Final Reports submitted to USTDA must be paginated and include the following:

(a) The front cover of every Final Report shall contain the name of the Client, the name of the Contractor who prepared the report, a report title, USTDA's logo, USTDA's mailing and delivery addresses. If the complete version of the Final Report contains confidential information, the Contractor shall be responsible for labeling the front cover of that version of the Final Report with the term "Confidential Version." The Contractor shall be responsible for labeling the front cover of the Public Version of the Final Report with the term "Public Version." The front cover of every Final Report shall also contain the following disclaimer:

> "This report was funded by the U.S. Trade and Development Agency (USTDA), an agency of the U. S. Government. The opinions, findings, conclusions or recommendations expressed in this document are those of the author(s) and do not necessarily represent the official position or policies of USTDA. USTDA makes no representation about, nor does it accept responsibility for, the accuracy or completeness of the information contained in this report."

(b) The inside front cover of every Final Report shall contain USTDA's logo, USTDA's mailing and delivery addresses, and USTDA's mission statement.

Camera-ready copy of USTDA Final Report specifications will be available from USTDA upon request.

(c) The Contractor shall affix to the front of the CD-ROM a label identifying the Host Country, USTDA Activity Number, the name of the Client, the name of the Contractor who prepared the report, a report title, and the following language:

> "The Contractor certifies that this CD-ROM contains the Public Version of the Final Report and that all contents are suitable for public distribution."

(d) The Contractor and any subcontractors that perform work pursuant to the Grant Agreement must be clearly identified in the Final Report. Business name, point of contact, address, telephone and fax numbers shall be included for Contractor and each subcontractor.

(e) The Final Report, while aiming at optimum specifications and characteristics for the Project, shall identify the availability of prospective U.S. sources of supply. Business name, point of contact, address, telephone and fax numbers shall be included for each commercial source.

(f) The Final Report shall be accompanied by a letter or other notation by the Client which states that the Client approves the Final Report. A certification by the Client to this effect provided on or with the invoice for final payment will meet this requirement.

J. Modifications

All changes, modifications, assignments or amendments to this contract, including the appendices, shall be made only by written agreement by the parties hereto, subject to written USTDA approval.

K. Study Schedule

(1) Study Completion Date

The completion date for the Study, which is January 29, 2011, is the date by which the parties estimate that the Study will have been completed.

(2) Time Limitation on Disbursement of USTDA Grant Funds

Except as USTDA may otherwise agree, (a) no USTDA funds may be disbursed under this contract for goods and services which are provided prior to the Effective Date of the Grant Agreement; and (b) all funds made available under the Grant Agreement must be disbursed within four (4) years from the Effective Date of the Grant Agreement.

L. Business Practices

The Contractor agrees not to pay, promise to pay, or authorize the payment of any money or anything of value, directly or indirectly, to any person (whether a governmental official or private individual) for the purpose of illegally or improperly inducing anyone to take any action favorable to any party in connection with the Study. The Client agrees not to receive any such payment. The Contractor and the Client agree that each will require that any agent or representative hired to represent them in connection with the Study will comply with this paragraph and all laws which apply to activities and obligations of each party under this Contract, including but not limited to those laws and obligations dealing with improper payments as described above.

M. USTDA Address and Fiscal Data

Any communication with USTDA regarding this Contract shall be sent to the following address and include the fiscal data listed below:

U.S. Trade and Development Agency
1000 Wilson Boulevard, Suite 1600
Arlington, Virginia 22209-3901
USA

Phone: (703) 875-4357
Fax: (703) 875-4009

Fiscal Data:

Appropriation No.:	119/101001
Activity No.:	2009-81008A
Reservation No.:	2009810007
Grant No.:	GH2009810001

N. Definitions

All capitalized terms not otherwise defined herein shall have the meaning set forth in the Grant Agreement.

ANNEX 5

Annex 5

Activities That Must Be Reffered To In The Feasibility Study

1. Rehabilitation of water and sewer pipelines in accordance with pressure zones, accordingly the annexed tables (rehabilitation, re-sizing where necessary, and extension of water and sewer network) - expansion District Sud – Vii and Livezilor (construction of 2 (two) SP-uri).

WATER - Pressure Area I

No.	Street	Material	Diameter		Length	Remarks
1	Agricultori	cast iron	Dn	250	88.82	connections with lead
2	alee Bl. A4 zona C5	steel	Dn	100	80.95	connections with lead
3	aleea Albatrosului	steel	Dn	75	135.67	connections with lead
4	aleea Albatrosului	steel	Dn	100	126.46	connections with lead
5	aleea Albatrosului	steel	Dn	125	112.71	connections with lead
6	aleea bl. N1 Aleea Rozmarin	steel	Dn	50	81.23	connections with lead
7	aleea bl. M1 Aleea Rozmarin	steel	Dn	125	76.27	connections with lead
8	aleea Merisor	steel	Dn	100	61.29	connections with lead
9	aleea Trifoiului spre PT A4	steel	Dn	150	196.00	connections with lead
10	Babadag	steel	Dn	100	1,406.68	connections with lead
11	Babadag	cast iron	Dn	125	578.63	connections with lead
12	Babadag	cast iron	Dn	150	321.87	connections with lead
13	Babadag	cast iron	Dn	200	400.45	connections with lead
14	Babadag	cast iron	Dn	400	722.96	connections with lead
15	Bl. A2, A3 zona C5	steel	Dn	75	21.42	connections with lead
16	Bl. A2, A3 zona C5	steel	Dn	100	26.84	connections with lead
17	Bl. A2, A3 zona C5	steel	Dn	125	49.19	connections with lead
18	Bl. E1, E2, E3	steel	Dn	100	206.89	connections with lead
19	Bl. E4, E5	steel	Dn	100	174.14	connections with lead
20	Boierescu	cast iron	Dn	300	109.58	connections with lead
21	Cezar	cast iron	Dn	250	222.22	connections with lead
22	Ciurel	cast iron	Dn	200	24.37	connections with lead
23	Csteelonistilor	cast iron	Dn	250	165.35	connections with lead
24	Comertului	steel	Dn	100	135.32	connections with lead
25	Comertului	steel	Dn	150	40.34	connections with lead

26	Comertului	steel	Dn	200	105.11	connections with lead
27	Comertului	steel	Dn	600	61.55	connections with lead
28	Constantin Brancoveanu	cast iron	Dn	200	319.00	connections with lead
29	Curte Lic. Alimentar	steel	Dn	200	122.22	connections with lead
30	Curte Penitenciar	steel	Dn	200	40.99	connections with lead
31	Cuza Voda	steel	Dn	50	75.49	connections with lead
32	Cuza Voda	cast iron	Dn	80	249.57	connections with lead
33	Darius	cast iron	Dn	400	146.71	connections with lead
34	Davilla	cast iron	Dn	100	261.67	connections with lead
35	Davilla	cast iron	Dn	250	26.39	connections with lead
36	Dimitrie Sturdza	cast iron	Dn	80	216.52	connections with lead
37	Dimitrie Sturdza	steel	Dn	50	99.78	connections with lead
38	Dobrogeanu Gherea	steel	Dn	200	83.30	connections with lead
39	Dobrogeanu Gherea	steel	Dn	100	257.60	connections with lead
40	Dobrogeanu Gherea	steel	Dn	150	26.91	connections with lead
41	Dobrogeanu Gherea	steel	Dn	80	79.71	connections with lead
42	Elena Doamna	cast iron	Dn	250	414.39	connections with lead
43	Eternitatii	steel	Dn	250	419.06	connections with lead
44	Frumoasa	cast iron	Dn	100	154.02	connections with lead
45	Gavrilov Corneliu	steel	Dn	100	248.94	connections with lead
46	Gavrilov Corneliu	steel	Dn	150	43.69	connections with lead
47	Gavrilov Corneliu	steel	Dn	200	109.87	connections with lead
48	Gavrilov Corneliu	cast iron	Dn	250	876.34	connections with lead
49	Gavrilov Corneliu	concrete	Dn	600	236.88	connections with lead
50	Gloriei	cast iron	Dn	200	337.50	connections with lead
51	Grivitei	cast iron	Dn	150	341.49	connections with lead
52	Grivitei	cast iron	Dn	400	251.60	connections with lead
53	Grivitei	cast iron	Dn	250	17.16	connections with lead
54	I.L. Caragiale	steel	Dn	150	573.81	connections with lead
55	intrarea Magnsteeliei	steel	Dn	100	83.65	connections with lead
56	intre Albatros si Comertului zona C	steel	Dn	150	28.03	connections with lead
57	Labirint	steel+asbesto	Dn	100	193.19	connections with lead
58	Labirint	steel	Dn	50	57.19	connections with lead
59	Laborator DSV str. Babadag	steel	Dn	100	37.17	connections with lead
60	Linistei	cast iron	Dn	200	47.50	connections with lead
61	Marasesti	steel	Dn	100	365.99	connections with lead
62	Mihai Viteazu	cast iron	Dn	500	405.62	connections with lead
63	Mihai Viteazu	cast iron	Dn	250	99.60	connections with lead
64	Mihai Viteazu	cast iron	Dn	300	271.39	connections with lead
65	Mihai Viteazu	steel	Dn	200	349.48	connections with lead
66	Mihai Viteazu	cast iron	Dn	100	754.33	connections with lead
67	Mihai Viteazu	cast iron	Dn	150	361.80	connections with lead

68	Miron Costin	cast iron	Dn	250	112.76	connections with lead
69	Mugurel	cast iron	Dn	250	119.93	connections with lead
70	Muzelor	cast iron	Dn	80	128.03	connections with lead
71	Nicsteelae Balcescu	cast iron	Dn	200	483.21	connections with lead
72	Noptii	cast iron	Dn	200	103.99	connections with lead
73	Oborului	cast iron	Dn	500	191.67	connections with lead
74	Oborului	steel	Dn	600	55.10	connections with lead
75	Pacii	cast iron	Dn	250	90.85	connections with lead
76	Pacii	cast iron	Dn	125	51.96	connections with lead
77	Plevnei	cast iron	Dn	400	145.65	connections with lead
78	Plevnei	cast iron	Dn	100	489.51	connections with lead
79	Plevnei	steel	Dn	200	58.58	connections with lead
80	Plugarilor	cast iron	Dn	250	160.11	connections with lead
81	Prislav	cast iron	Dn	200	169.96	connections with lead
82	racord CT 17 din G. Corneliu	steel	Dn	80	71.20	connections with lead
83	racord Piata Noua	steel	Dn	100	52.30	connections with lead
84	Rasbestosieni	steel+concret	Dn	600	218.15	connections with lead
85	Rasbestosieni	asbestos	Dn	200	109.27	connections with lead
86	Rezervor	steel	Dn	600	289.14	connections with lead
87	Rezervor	steel	Dn	200	79.00	connections with lead
88	Rosetti	cast iron	Dn	400	100.57	connections with lead
89	Rosetti	cast iron	Dn	250	161.13	connections with lead
90	Rosetti	steel	Dn	150	45.94	connections with lead
91	Rosetti	cast iron	Dn	80	135.89	connections with lead
92	Rozmarin	steel	Dn	150	171.38	connections with lead
93	Sabinelor	cast iron	Dn	80	479.79	connections with lead
94	Sabinelor	cast iron	Dn	50	468.10	connections with lead
95	Sabinelor	cast iron	Dn	250	140.44	connections with lead
96	Timpului	steel	Dn	200	183.88	connections with lead
97	Viticulturii	steel	Dn	250	93.39	connections with lead
98	Viticulturii - bl. B8	steel	Dn	200	76.60	connections with lead
	TOTAL				**20,055.34**	

WATER - Pressure Area II

Nr. crt.	Strada	Material	Diametru		Lungime	Observatii
1	Aureliana	cast iron	Dn	100	227.81	connections with lead
2	Aureliana	cast iron	Dn	150	88.49	connections with lead
3	Bl. 3,1 str. Victoriei	cast iron	Dn	100	266.90	connections with lead
4	Bl. 7 sc. E str. Victoriei	cast iron	Dn	50	48.14	connections with lead
5	Bl. I3 str. Isaccei	cast iron	Dn	80	79.55	connections with lead

6	Bucovinei	concrete	Dn	600	413.30	connections with lead
7	Bucovinei	cast iron	Dn	200	413.30	connections with lead
8	Bucovinei	cast iron	Dn	80	410.00	connections with lead
9	Buna Vestire	cast iron	Dn	80	138.01	connections with lead
10	Cascadei	asbestos	Dn	80	128.97	connections with lead
11	Closca	asbestos	Dn	100	188.86	connections with lead
12	Crisan	asbestos	Dn	100	193.50	connections with lead
13	Crivat	cast iron	Dn	80	118.98	connections with lead
14	Decebal	cast iron	Dn	80	27.69	connections with lead
15	Dochiei	cast iron	Dn	80	420.40	connections with lead
16	Eroilor	cast iron	Dn	150	555.88	connections with lead
17	Eroilor	cast iron	Dn	25	65.38	connections with lead
18	Frumoasa	cast iron	Dn	100	72.77	connections with lead
19	Frunzelor	cast iron	Dn	100	228.09	connections with lead
20	Horia	asbestos	Dn	100	190.39	connections with lead
21	Ion Nenitescu	cast iron	Dn	80	876.00	connections with lead
22	Isaccei, Victoriei, Podgoriilor, Oitel	cast iron	Dn	300	1,924.27	connections with lead
23	Iuliu Maniu	cast iron	Dn	100	284.26	connections with lead
24	Iuliu Maniu	asbestos	Dn	250	203.78	connections with lead
25	Libertatii	asbestos	Dn	100	1,260.82	connections with lead
26	Libertatii	asbestos	Dn	250	699.15	connections with lead
27	Lupeni	cast iron	Dn	100	542.87	connections with lead
28	Luterana	cast iron	Dn	150	136.83	connections with lead
29	Maior Andrei Grigore	cast iron	Dn	80	263.89	connections with lead
30	Mircea Voda	cast iron	Dn	80	317.77	connections with lead
31	Mircea Voda	cast iron	Dn	200	511.50	connections with lead
32	Mircea Voda	cast iron	Dn	100	1,360.92	connections with lead
33	Muncii	cast iron	Dn	100	184.12	connections with lead
34	Nicopsteel	cast iron	Dn	100	648.75	connections with lead
35	Picherului	cast iron	Dn	50	113.75	connections with lead
36	Progresului	cast iron	Dn	125	215.71	connections with lead
37	Rezervorului	cast iron	Dn	100	215.16	connections with lead
38	Smardan	cast iron	Dn	100	236.19	connections with lead
39	Toamnei	asbestos	Dn	150	169.71	connections with lead
40	Traian	cast iron	Dn	80	886.98	connections with lead
41	Traian	cast iron	Dn	100	25.68	connections with lead
42	Trandafirilor	cast iron	Dn	80	747.57	connections with lead
43	Trandafirilor	asbestos	Dn	100	188.11	connections with lead
44	Victoriei	cast iron	Dn	150	554.57	connections with lead
45	Victoriei	concrete	Dn	600	514.45	connections with lead
46	Victoriei	cast iron	Dn	200	494.32	connections with lead
47	Victoriei	cast iron	Dn	80	314.48	connections with lead

Total	**34,573.80**

WATER - Pressure Area III

Nr. crt.	Strada	Material	Diametru		Lungime	Observatii
1	1848	cast iron	Dn	100	135.04	connections with lead
2	1848	asbestos	Dn	200	707.59	connections with lead
3	1848	steel	Dn	250	58.97	connections with lead
4	A.R.B.D.D.	steel	Dn	100	85.66	connections with lead
5	Aker	steel	Dn	320	201.56	connections with lead
6	Alunisului	steel	Dn	150	224.89	connections with lead
7	Biruintei	steel	Dn	80	94.47	connections with lead
8	Bl 19-22 str. Spitalului	steel	Dn	100	370.66	connections with lead
9	Bl 4 str. 1848	steel	Dn	100	173.09	connections with lead
10	Bl. 1B, 1A str. Portului	steel	Dn	150	84.90	connections with lead
11	Bl. 1C str. Portului	steel	Dn	100	24.74	connections with lead
12	Bl. 23 str Iuliu Maniu	steel	Dn	90	80.67	connections with lead
13	Bl. I5B, I5A, str. Isaccei	cast iron	Dn	125	201.30	connections with lead
14	Bl.1 Spitalului	steel	Dn	100	165.84	connections with lead
15	Bl.2 str. 1848	steel	Dn	100	182.34	connections with lead
16	Bl.2 str. 1848	steel	Dn	50	16.88	connections with lead
17	Bl.3 str.1848	steel	Dn	75	37.38	connections with lead
18	Bl.5 str. 1848	steel	Dn	90	20.14	connections with lead
19	Bl.5,6,7,8 str. 1848	steel	Dn	100	477.73	connections with lead
20	Buna Vestire	cast iron	Dn	80	50.68	connections with lead
21	Carpati	cast iron	Dn	150	240.20	connections with lead
22	Casa Cartii str. Isaccei	steel	Dn	100	70.94	connections with lead
23	Casa Sindicatelor	steel	Dn	100	65.80	connections with lead
24	Centrul de plasament str Spitalului-	asbestos	Dn	80	125.50	connections with lead
25	Centrul de plasament str Spitalului-	steel	Dn	100	67.92	connections with lead
26	Combustibilului	asbestos	Dn	200	340.28	connections with lead
28	Combustibilului	steel	Dn	100	251.28	connections with lead
29	CT 11 str. Isaccei	steel	Dn	100	8.62	connections with lead
30	Delfinului	cast iron	Dn	80	94.64	connections with lead
31	Eminescu	cast iron	Dn	80	475.46	connections with lead
32	Frigorifer-Hotel IPO	steel	Dn	50	452.78	connections with lead
33	Gara fluviala	steel	Dn	90	16.40	connections with lead
34	intrarea Taberei	cast iron	Dn	80	104.43	connections with lead
35	Isaccei	concrete	Dn	600	775.57	connections with lead
36	Isaccei	steel	Dn	150	1,874.69	connections with lead
37	Isaccei	cast iron	Dn	100	1,719.72	connections with lead

39	Isaccei liceul Metalurgic	steel	Dn	125	204.52	connections with lead
40	Iuliu Maniu	asbestos	Dn	200	181.81	connections with lead
41	Iuliu Maniu	asbestos	Dn	250	456.80	connections with lead
42	Lac Ciuperca-Gara fluviala	steel	Dn	100	407.70	connections with lead
43	Livezilor	steel	Dn	100	530.99	connections with lead
44	Livezilor	steel	Dn	50	457.15	connections with lead
45	Mila 42+500 Uzina de apa (cea din	steel	Dn	1000	6,474.68	connections with lead
46	paralela cu Combustibilului	steel	Dn	100	393.13	connections with lead
47	paralela cu Forestierului	steel	Dn	50	121.52	connections with lead
48	Piata Veche	cast iron	Dn	75	128.34	connections with lead
49	Psteelitie	steel	Dn	100	22.60	connections with lead
50	Prelungirea taberei	steel	Dn	100	130.68	connections with lead
51	Progresului	steel	Dn	75	123.07	connections with lead
52	PT 6 str. 1848	steel	Dn	150	100.90	connections with lead
53	PT str. Iuliu Maniu	steel	Dn	150	61.28	connections with lead
54	Rez. cota 70 Libertatii-Grausor-Car	steel	Dn	500	561.77	connections with lead
55	Sala de sport str. Isaccei zona Vest	steel	Dn	100	62.33	connections with lead
56	Sala Psteelivalenta str. Isaccei	steel	Dn	150	7.91	connections with lead
57	Scarii	cast iron	Dn	80	47.14	connections with lead
58	Spitalului	cast iron	Dn	100	474.84	connections with lead
59	Spitalului	asbestos	Dn	200	300.87	connections with lead
60	Statie de repompare Energoterm str	steel	Dn	100	84.20	connections with lead
61	Taberei	steel	Dn	320	1,177.55	connections with lead
62	Taberei	cast iron	Dn	80	610.66	connections with lead
63	Taberei	steel	Dn	50	147.86	connections with lead
64	Taberei-Aker	steel	Dn	300	865.42	connections with lead
65	terasa Garofita str. Isaccei	steel	Dn	25	59.74	connections with lead
66	Tineretului	concrete	Dn	600	475.68	connections with lead
67	Tudor Vladimirescu	steel	Dn	100	57.95	connections with lead
68	Uzina de apa-Rezervor cota 70	cast iron	Dn	400	2,634.93	connections with lead
69	Vama faleza	steel	Dn	150	372.13	connections with lead
70	Varariei-Alunisului	steel	Dn	150	97.91	connections with lead
71	Victoriei	concrete	Dn	600	238.00	connections with lead
72	Viitorului	steel	Dn	200	339.73	connections with lead
73	Viitorului	steel	Dn	100	326.47	connections with lead
74	Viitorului	steel	Dn	150	93.38	connections with lead
75	Viitorului	steel	Dn	125	151.72	connections with lead
76	Viitorului	steel	Dn	50	30.70	connections with lead
77	Viitorului	steel	Dn	25	73.81	connections with lead
78	Viitorului-Taberei	steel	Dn	500	726.02	connections with lead
	Total				**29,892.65**	

SEWER - Pressure Area I

Nr. crt.	Strada	Material	Diametru		Lungime	Observatii
1	aleea Albatrosului	asbestos	Dn	250	241.83	
2	Babadag	concrete	Dn	200	243.82	
3	Babadag	asbestos	Dn	250	218.29	
4	Babadag	asbestos	Dn	300	2,278.10	
5	Babadag	concrete	Dn	400	307.66	
6	Babadag	concrete	Dn	1000	211.68	
7	Babadag	concrete	Dn	1000x800	800.36	
8	Babadag	concrete	Dn	600x400	246.70	
9	bl. 1 Posta str. Babadag	asbestos	Dn	250	107.81	
10	Bl. 31,33 str. Marasesti	asbestos	Dn	250	114.54	
11	Bl. 31,33 str. Marasesti	asbestos	Dn	200	41.89	
12	Bl. A3, A2, A1 str. Corneliu Gavril	asbestos	Dn	200	313.34	
13	Bl. A4-aleea Merisor-bl.H1	asbestos	Dn	300	237.89	
14	bl. A6-CT 20 Corneliu Gavrilov	asbestos	Dn	200	113.62	
15	Bl. B2, B3 cartier C5	asbestos	Dn	250	148.22	
16	Bl. B4,B3,B2,B1 str. I.L. Caragiale	asbestos	Dn	300	235.59	
17	Bl. B8, A9, A8 cartier C5	asbestos	Dn	250	136.28	
18	Bl. B8, B7, B6 cartier C5	asbestos	Dn	200	143.19	
19	bl. Boema str. Corneliu Gavrilov	asbestos	Dn	250	52.65	
20	bl. C1, C2 str. Grivitei	asbestos	Dn	300	58.79	
21	Bl. C1, C2, C3 cartier C5	asbestos	Dn	250	234.41	
22	Bl. C3A, C3B, C3C, D1, D2	asbestos	Dn	250	188.50	
23	Bl. C3A, C3B, C3C, D1, D2	concrete	Dn	300	203.30	
24	Bl. C5, C1, D1, D7 cartier C5	asbestos	Dn	300	228.40	
25	Bl. C8, D5, D11, A4 cartier C5	asbestos	Dn	250	261.68	
26	Bl. D1, D2, D3 cartier C5	asbestos	Dn	250	235.92	
27	bl. E1,E2, E3 str. Sabinelor	asbestos	Dn	200	157.96	
28	Bl. H1 str.Corneliu Gavrilov	asbestos	Dn	200	53.67	
29	Bl. H2 aleea Trifoiului	asbestos	Dn	200	52.09	
30	Bl. H2 aleea Trifoiului	asbestos	Dn	250	48.49	
31	Bl. H3 aleea Trifoiului	asbestos	Dn	200	73.88	
32	Bl. J1 str. I.L. Caragiale	asbestos	Dn	200	61.44	
33	Bl. J2 str. Neptun	asbestos	Dn	200	33.17	
34	Bl. J4 str. Neptun	asbestos	Dn	200	104.06	
35	Bl. J5, J6,J3 aleea Paunului	asbestos	Dn	200	206.30	
36	bl. M1 str. Mica	asbestos	Dn	200	103.49	
37	bl. M1 str. Rasbestosieni	asbestos	Dn	200	75.30	

38	bl. M2, N2 str. Rasbestosieni, Cires	asbestos	Dn	200	122.43	
39	bl. M2, N2 str. Rasbestosieni, Cires	asbestos	Dn	300	44.14	
40	bl. N1, G1 str. Rasbestosieni	asbestos	Dn	200	73.93	
41	Bl. N4 str. I.L. Caragiale	asbestos	Dn	200	112.70	
42	Bl. N5 str. I.L. Caragiale	asbestos	Dn	200	158.56	
43	Bl. R1 str. Rozmarin	asbestos	Dn	250	89.85	
44	Bl.41,39,37,35 str. Marasesti	asbestos	Dn	250	212.89	
45	Bl. E4,E5 str. Sabinelor	asbestos	Dn	250	146.41	
46	Boierescu	asbestos	Dn	200	102.58	
47	C. A. Rosetti	PVC	Dn	250	173.55	
48	Cezar	concrete	Dn	250	205.08	
49	Comertului	asbestos	Dn	200	180.78	
50	Corneliu Gavrilov	asbestos	Dn	200	384.11	
51	Corneliu Gavrilov	asbestos	Dn	250	104.48	
52	Corneliu Gavrilov	asbestos	Dn	300	206.77	
53	Corneliu Gavrilov	concrete	Dn	400	631.87	
54	Corneliu Gavrilov	concrete	Dn	1000	163.18	
55	Corneliu Gavrilov	concrete	Dn	900x800	409.04	
56	Corneliu Gavrilov	concrete	Dn	800x600	556.70	
57	Curtea de Conturi	asbestos	Dn	200	74.17	
58	Cuza Voda	asbestos	Dn	300	75.62	
59	Cuza Voda	PVC	Dn	250	203.58	
60	Darius	PVC	Dn	250	158.47	
61	Davilla	PVC	Dn	250	263.61	
62	Dobrogeanu Gherea	asbestos	Dn	300	189.32	
63	Dobrogeanu Gherea	asbestos	Dn	400	77.60	
64	Dobrogeanu Gherea	asbestos	Dn	250	84.48	
65	Frumoasa	concrete	Dn	800x600	32.30	
66	Frumoasa	concrete	Dn	600	105.82	
67	Grivitei	concrete	Dn	800x600	207.47	
68	Grivitei	asbestos	Dn	400	694.65	
69	I.L. Caragiale	asbestos	Dn	200	117.70	
70	intrarea Magnsteelia	asbestos	Dn	200	113.02	
71	Labirint	asbestos	Dn	200	178.27	
72	Liceul de Arta	concrete	Dn	200	11.05	
73	Mica	asbestos	Dn	300	93.93	
74	Mihai Viteazu	concrete	Dn	800x600	38.05	
75	Mihai Viteazu	asbestos	Dn	400	739.31	
76	Mihai Viteazu	asbestos	Dn	250	382.99	
77	Pacii	concrete	Dn	1000	570.41	
78	Pacii	concrete	Dn	800	727.54	
79	Plevnei	PVC	Dn	250	371.37	

80	Rasbestosieni	PVC	Dn	250	106.66	
81	Rezervor 3000 mc	concrete	Dn	250	106.46	
82	Rozmarin	asbestos	Dn	300	177.32	
83	Sabinelor	asbestos	Dn	250	623.84	
84	Sturdza	concrete	Dn	800x600	213.46	
85	Sturdza	PVC	Dn	250	96.07	
86	Timpului	PVC	Dn	250	185.30	
87	Vlad Tepes	asbestos	Dn	200	77.77	
88	Vlad Tepes	PVC	Dn	250	191.29	
	Total				**19,942.26**	

SEWER - Pressure Area II

Nr. crt.	Strada	Material	Diametru		Lungime	Observatii
1	14 Noiembrie pluvial	concrete	Dn	1000	135.48	
2	9 Mai, Piata Republicii pluvial	concrete	Dn	1000	103.09	
3	Aureliana	concrete	Dn	250	222.13	
4	Bl. 10 str. Babadag	asbestos	Dn	250	31.99	
5	Bl. 10, 12 str. Babadag	asbestos	Dn	250	76.69	
6	Bl. 2 Dobrogeanu Gherea	asbestos	Dn	200	65.11	
7	Bl. 2 Dobrogeanu Gherea	PVC KG	Dn	200	90.68	
8	Bl. 32,34 Mircea Voda, bl. 4,6 Baba	asbestos	Dn	250	293.21	
9	Bl. 36 Mircea Voda, bl.8 Babadag	asbestos	Dn	250	142.41	
10	Bl. 38 Mircea Voda	asbestos	Dn	250	203.02	
11	Bl. 38 Mircea Voda pluvial	asbestos	Dn	250	122.28	
12	Bl. A1 tr.1-tr.4 str. Babadag	asbestos	Dn	200	121.09	
13	Bucovinei	asbestos	Dn	200	140.64	
14	Bucovinei	concrete	Dn	800x600	266.53	
15	Buna Vestire	asbestos	Dn	300	83.27	
16	Buna Vestire	PVC	Dn	250	58.26	
17	Closca	asbestos	Dn	200	223.34	
18	Crisan	asbestos	Dn	200	94.83	
19	Crisan	PVC	Dn	250	120.05	
20	Crivat	asbestos	Dn	200	68.47	
21	Crivat	asbestos	Dn	150	43.63	
22	Decebal	PVC	Dn	250	56.50	
23	Eroilor	asbestos	Dn	250	51.75	
24	Eroilor	PVC	Dn	250	615.11	
25	Frunzelor	asbestos	Dn	250	40.41	
26	Frunzelor	PVC	Dn	250	113.35	
27	Grigore Antipa	concrete	Dn	1000	461.46	

28	Horia	asbestos	Dn	200	217.24	
29	Independentei	concrete	Dn	1000	456.96	
30	Isaccei pluvial	concrete	Dn	1000	200.09	
31	Iuliu Maniu	asbestos	Dn	300	283.95	
32	Lac Ciuperca pluvial	concrete	Dn	800	310.15	
33	Lupeni	asbestos	Dn	250	22.68	
34	Lupeni	asbestos	Dn	200	271.32	
35	Lupeni	asbestos	Dn	250	112.55	
36	Lupeni	PVC	Dn	250	50.70	
37	Luterana	PVC KG	Dn	200	50.37	
38	Milcov	concrete	Dn	1000	75.14	
39	Mircea Voda	concrete	Dn	500	108.22	
40	Mircea Voda	concrete	Dn	400	53.67	
41	Mircea Voda	concrete	Dn	300	183.17	
42	Mircea Voda	concrete	Dn	800x600	848.81	
43	Mircea Voda	asbestos	Dn	200	148.64	
44	Mistreti, Gradinarilor, Prislav	concrete	Dn	1000	6,200.18	
45	Mr. Andrei Grigore	asbestos	Dn	250	95.54	
46	Mr. Andrei Grigore	PVC	Dn	250	164.98	
47	Muncii	asbestos	Dn	250	144.44	
48	Nicopsteel	PVC KG	Dn	200	76.43	
49	Nicopsteel	asbestos	Dn	200	259.93	
50	Nicopsteel	PVC	Dn	250	282.12	
51	Pacii	concrete	Dn	1000	139.62	
52	Piata Repubicii-SP III pluvial	concrete	Dn	1750	77.78	
53	Piata Republicii	concrete	Dn	1000	66.54	
54	Piata Republicii-Dunare pluvial	concrete	Dn	1200x100	91.94	
55	Picherului	PVC	Dn	250	114.42	
56	Podgoriilor pluvial	concrete	Dn	800	516.30	
57	Progresului	concrete	Dn	800x600	234.66	
58	Progresului	concrete	Dn	300	217.51	
59	Progresului	concrete	Dn	600	175.90	
60	Rezervorului	concrete	Dn	300	256.23	
61	Smardan	asbestos	Dn	150	141.54	
62	Smardan	PVC	Dn	250	66.27	
63	SP III-Dunare pluvial	concrete	Dn	1000	34.31	
64	Timisoarei	concrete	Dn	1000	312.54	
65	Toamnei	asbestos	Dn	300	228.06	
66	Traian	concrete	Dn	250	261.18	
67	Traian	asbestos	Dn	400	189.15	
68	Traian	asbestos	Dn	250	153.81	
69	Traian	asbestos	Dn	200	337.34	

70	Trandafirilor	asbestos	Dn	300	219.57	
71	Trandafirilor	asbestos	Dn	400	517.55	
72	Trandafirilor	asbestos	Dn	250	74.78	
73	Trandafirilor	PVC	Dn	250	169.60	
74	Troitei	PVC	Dn	250	92.81	
75	Tudor Vladimirescu	asbestos	Dn	250	121.47	
76	Unirii	concrete	Dn	400	245.42	
77	Unirii	concrete	Dn	800x600	88.66	
78	Unirii	concrete	Dn	1000	124.44	
79	Unirii	asbestos	Dn	250	107.61	
80	Unirii-Babadag bl. D	asbestos	Dn	250	56.25	
81	Unirii-parc Hotel Delta	concrete	Dn	1000	347.34	
82	Victoriei	concrete	Dn	600	1,058.97	
83	Victoriei	concrete	Dn	250	91.00	
	Total				**21,592.63**	

SEWER - Pressure Area III

Nr. crt.	Strada	Material	Diametru		Lungime	Observatii
1	1848	asbestos	Dn	300	768.27	
2	A.P.D.M.-faleza-Bl.1C	PVC-KG	Dn	200	217.35	
3	Aleea Mirela (Cicoarei)	asbestos	Dn	250	135.73	
4	Aleea Pelinului	asbestos	Dn	300	73.69	
5	Aleea Pelinului	concrete	Dn	400	111.98	
6	Aleea Sulfinei	asbestos	Dn	250	139.55	
7	Alunisului	asbestos	Dn	300	92.61	
8	Alunisului	asbestos	Dn	250	287.81	
9	Autogara pluvial	asbestos	Dn	250	203.90	
10	Bl. 1 sc.A, bl. M.Ap.N. alee Cristin	concrete	Dn	300	119.82	
11	Bl. 1 str. Spitalului	asbestos	Dn	200	105.46	
12	Bl. 1,2 str. Viitorului-SP0	concrete	Dn	200	102.06	
13	Bl. 1,2 str. Viitorului-SP0	concrete	Dn	250	255.12	
14	Bl. 1,2,3,4 str. Socului, 13,15,17 str	asbestos	Dn	250	433.36	
15	Bl. 1,2,3,5 Aleea Cristina, Bl. 14 str	asbestos	Dn	250	461.70	
16	Bl. 10,12,14 Podgoriilor	asbestos	Dn	250	217.30	
17	Bl. 13,19,17,15 str. Campului	asbestos	Dn	250	348.88	
18	Bl. 16 str. Campului	asbestos	Dn	250	44.16	
19	Bl. 16,18,20,22,24 str. Podgoriilor	asbestos	Dn	250	190.55	
20	Bl. 18 str. 1848	asbestos	Dn	250	89.99	
21	Bl. 18,20,16 str. Podgoriilor	asbestos	Dn	200	51.70	
22	Bl. 1B-1C str.Portului	asbestos	Dn	250	69.36	

23	Bl. 30,32 str. Podgoriilor	asbestos	Dn	250	115.87	
24	Bl. 4 str. 1848	asbestos	Dn	250	121.75	
25	Bl. 4 str. Pelinului	asbestos	Dn	250	62.34	
26	Bl. 5,3 str. Pelinului	asbestos	Dn	250	105.00	
27	Bl. 7,6,4,18 Aleea Cristina bl.22 str	asbestos	Dn	250	417.45	
28	Bl. 8,7,6, Lic. Moisil str.1848	asbestos	Dn	250	757.59	
29	Bl. 9 str. 1848	asbestos	Dn	250	99.05	
30	Bl. 9 str. Victoriei	asbestos	Dn	250	65.88	
31	Bl. A0 (UJCM) str. 1848	asbestos	Dn	200	10.70	
32	Bl. B1 str. Spitalului	asbestos	Dn	250	79.50	
33	Bl. B2 str. Spitalului	asbestos	Dn	200	181.37	
34	Bl. B5, B4, centre de plasament Cri	asbestos	Dn	200	386.39	
35	Bl. C1,C2,C3 liceul Saligny, Bl. N1	concrete	Dn	250	1,041.47	
36	Bl. Pelican str. Isaccei	asbestos	Dn	250	137.37	
37	Bl. V16, UGIRA, ENEL str. Victor	asbestos	Dn	200	268.35	
38	Bl.1 sc. A Aleea Cristina	asbestos	Dn	200	21.50	
39	Bl.11 str.1848, bl.2 str.Pelinului	asbestos	Dn	200	91.60	
40	Bl.11-21 str. Garii-SP2	asbestos	Dn	250	571.31	
41	Bl.2 str.1848	asbestos	Dn	200	360.16	
42	Bl.7,5,3,1 str. Barajului	asbestos	Dn	250	236.34	
43	Camin nefamilisti, centru primire st	asbestos	Dn	250	155.34	
44	Campului	asbestos	Dn	300	369.09	
45	Carpati	concrete	Dn	300	54.58	
46	Carpati	concrete	Dn	250	128.52	
47	Carpati-Piata Veche	concrete	Dn	400	119.86	
48	Casa Sindicatelor	concrete	Dn	1000x800	56.69	
49	Centrul de plasament str. Biruintei	asbestos	Dn	200	109.95	
50	Combustibilului	concrete	Dn	250	521.61	
51	Combustibilului pluvial	concrete	Dn	400	520.00	
52	Conducta refulare SP Garii	cast iron	Dn	1000	124.47	
53	Delfinului	PVC	Dn	250	91.28	
54	Forestierului	PVC	Dn	250	451.82	
55	Frigorifer-Hotel IPO-Bl. 1C	asbestos	Dn	200	1,211.44	
56	Garii	canal dalat	Dn		312.80	
57	intrarea Taberei	PVC	Dn	250	109.61	
58	intre bl. D1, D2 str. Varariei	asbestos	Dn	300	91.45	
59	intre Chiparos si Campului	asbestos	Dn	250	128.08	
60	Isaccei	concrete	Dn	600x400	338.94	
61	Isaccei	asbestos	Dn	400	906.25	
62	Isaccei	asbestos	Dn	250	2,228.93	
63	Isaccei -bl. 1B-1C pluvial	concrete	Dn	1000x800	377.63	
64	Isaccei -lac Caslita pluvial	concrete	Dn	1000	1,249.83	

65	Isaccei pluvial	concrete	Dn	600x400	310.62	
66	Isaccei pluvial	concrete	Dn	600	593.69	
67	Isaccei pluvial	concrete	Dn	800	428.04	
68	Isaccei-SP2	concrete	Dn	1000x800	260.73	
69	Iuliu Maniu	asbestos	Dn	300	277.36	
70	Iuliu Maniu	asbestos	Dn	400	75.73	
71	Lic. Moisil, Bl.5 str.1848	asbestos	Dn	200	123.39	
72	Livezilor	PVC	Dn	250	1,185.26	
73	Mihai Eminescu	pvc	Dn	100	77.36	
74	Mihai Eminescu	asbestos	Dn	300	199.18	
75	Mihai Eminescu	concrete	Dn	250	206.15	
76	Pelinului	asbestos	Dn	300	103.37	
77	peste drum (Isaccei) de canalul desc	concrete	Dn	800	259.84	
78	Prelungirea Taberei	PVC	Dn	250	656.80	
79	Sala de sport Vest	concrete	Dn	300	117.67	
80	Stadion-str. Isaccei	asbestos	Dn	200	346.26	
81	Taberei	asbestos	Dn	300	770.76	
82	Taberei	PVC	Dn	250	1,220.60	
83	Vama-faleza-Bl.1B-1C	cast iron	Dn	150	471.23	
84	Viitorului	PVC	Dn	250	1,712.26	
	Total				**28,705.81**	

2. Disinfecting instalation using on-site generated sodium hypochlorite for the Water Treatment Plant in Tulcea and in Sulina - 2 pcs.

3. Rehabilitation SP Mila 42+500, dam raising and pipeline rehabilitation Ø 1000, L = 6000 ml.