



**The Hashemite Kingdom of Jordan  
Ministry of Water and Irrigation  
Jordan Valley Authority (JVA)**

**Invitation to Tender**

**For**

**Consulting Services for Environmental and Social Impact  
Assessment Study (ESIA)**

***For***

***Aqaba - Amman Water Desalination and Conveyance Project***

**Tender No. SW/1/2018**

**February 2018**

## Invitation to Tender

No SW/1/2018

The Hashemite Kingdom of Jordan

Jordan Valley Authority (JVA)

### Consulting Services for Environmental Impact Assessment Study for Aqaba-Amman Water Desalination and Conveyance (“AAWC”) Project

1. The Ministry of Water and Irrigation / Jordan Valley Authority (MWI/JVA) of the Government of Jordan requires the services of an **Independent Local Jordanian Qualified Consulting Firms** classified as First Grade in: Water and Environment, **or Environment** as per the Ministry of Public Works and Housing Government Tenders Department (GTD) classification system, and they shall associate themselves in any form of association including Joint Venture with International Firms specializes in performing marine studies, in accordance with the ToR requirements , and any other services to be agreed between the association members to conduct and prepare the Environmental and Social Impact Assessment Study for Aqaba-Amman Water Desalination and Conveyance Project. The structure and content of the ESIA shall be consistent with applicable requirements in the United States Agency for International Development (USAID) 22 CFR 216 Agency Environmental Procedures and the Ministry of Environment (MoE) of the Government of Jordan (GoJ) ESIA Regulation No. 37 of 2005 for a "Comprehensive ESIA" for Category 1 projects.
2. Project Tentative Schedule:

(19 – 25) February/ 2018	Purchase of tender documents.
11 March/ 2018	Deadline to receive clarification requests from bidders, 12:00 p.m, Jordan Local Time.
25 March/ 2018	Final Submission Date: 2 weeks after 11 March/ 2018.

3. Any question, communication or request for additional information concerning this Call for Tenders are only permitted in writing to the PEA and up to two weeks before the deadline for the submission of the proposals.
4. Tenders should be submitted in sealed envelopes, delivered to the address in the tender document before **25 March, 2018 14:00 p.m** (Submission Deadline), and be clearly marked **“Consulting Services for Environmental and Social Impact Assessment Study for Aqaba-Amman Water Desalination and Conveyance Project.**

**Eng. Saad Abu Hammour**

Chairman of the Special Tender Committee  
Secretary General / Jordan Valley Authority

Ministry of Water and Irrigation

P.O. Box 2769

Shmeisani

Amman 11181 Jordan

## CONDITIONS OF TENDER

### 1 Tender Procedure

#### 1.1 General

The rules of the present Tender are in accordance with the latest Government of Jordan rules on procurement. The Jordanian provisions of the laws, regulations and instructions in force, shall be applied upon the signing and they should be observed when applying to the conditions of this contract.

#### 1.2 Project Executing Agency

The Project Executing Agency subsequently called PEA is:

Ministry of Water and Irrigation  
Jordan Valley Authority  
P.O. Box 2769  
Shmeisani  
Amman 11181 Jordan

#### 1.3 Presentation of Tender

The Tender should be submitted on the basis of the following TOR in one package containing two clearly marked separate envelopes: one with the "Technical Proposal", and the other with the "Financial Proposal". The Financial Proposal shall be sealed and no financial information shall be contained in the Technical Proposal.

The package shall display the following information:

- the address where Tenders have to be sent
- the title and tender no. of the call for Tenderers such as indicated in the Invitation to Tender
- the Tenderer's name
- the following words clearly visible: "Call for Tenders - Not to be opened by the Postal Service"

#### 1.4 Language of the Tender

The technical and financial proposals as well as all communication related to the present Tender shall be prepared in the English language.

#### 1.5 Submission of Tender

The Applicant shall submit (1) one original (hard copy) and (1) soft copy of the documents comprising the Tender Application and clearly mark it "ORIGINAL". The original of the Application shall be typed or written in indelible ink and shall be signed by an authorized representative of the applicant.

The Applicant shall also submit (2) two copies (hard and soft copies) of the signed original Application and clearly mark them "COPY". In the event of any discrepancy between the original and the copies, the original shall prevail.

Tenders shall be submitted to the PEA at the following address:

**Ministry of Water and Irrigation/ Jordan Valley Authority**

Attention: Eng. Saad Abu Hammour  
Chairman of the Special Tender Committee  
Secretary General Office/ Jordan Valley Authority  
Ministry of Water and Irrigation  
P.O. Box 2769  
Shmeisani  
Amman 11181 Jordan

The deadline for receipt of Tenders is specified in the Invitation to Tender. The submission of the Tender documents at the address of the JVA is decisive regarding the timely delivery.

All Tenderers, who intend to submit a tender for the envisaged consulting services, shall inform the PEA in writing latest 7 days before deadline for submission of the proposal.

**1.6 Validity period of Tenders**

The period of validity of the Tenders is 120 days from the deadline for receipt of Tenders indicated in section 1.5.

**1.7 Information visit to the site**

Tenderers are encouraged to carry out an information visit to the site in order to familiarise themselves with the local conditions relevant for the execution of the services to be provided. It is understood that all information visits to the site are at the Tenderer's own expense and risk.

**1.8 Request for additional information**

Any question, communication or request for additional information concerning this Call for Tenders are only permitted in writing to the PEA and up to two weeks before the deadline for the submission of the proposals. If any clarification of the Call for Tenders proves necessary, the answers will be communicated simultaneously in writing to all the Tenderers two weeks before the deadline for the submission of proposals.

**1.9 Amendments to the Tender dossier**

Any change made to the Tender dossier during the Tender period by the PEA will be communicated forthwith in writing to all prospective Tenderers who have been provided with the Tender documents, together with notice of any extension of the Tender period, which the PEA may consider necessary to enable Tenderers to take into account of such a change.

## 1.10 Eligible Applicants

This Consulting Services for Environmental Impact Assessment Study application is open to Local Jordanian Consulting Firms classified as First Grade in Water and Environment as per the Ministry of Public Works and Housing Government Tenders Department (GTD) classification system, and they shall associate themselves in any form of association including Joint Venture with International Firms specializes in performing marine studies as specified in Task 13 herein, including sub-sea sampling and the effect of brine discharge to the Red Sea and any other services to be agreed between the association members. The leader of the association shall be the local consulting firm.

A letter of intent to form a Joint Venture (JV) or association with the local firm as the leader of the JV or association should be provided in the technical proposal, and that the partners recognize that they shall be capable and responsible for completion of the project should the leader or a partner fail or retire from the contract for any reason. .

Applicants shall not have a conflict of interest. Applicants shall be considered to have a conflict of interest, if they participated as a consultant in the preparation of the design or technical specifications or have been hired or proposed to be hired by the Employer as Engineer for contract implementation of the works that are the subject of this prequalification.

## 1.11 Source of Finance

This tender will be financed by MWI/JVA.

## 1.12 Tender Duration

The duration of the consultant assignment is 6 months from the commencement order date.

## 2 CONTENTS OF THE TENDER

### 2.1 Technical proposal

The technical proposal shall contain:

#### a) Critical analysis of project objectives and Terms of Reference

This part will comprise a detailed critical analysis and the Consultant's interpretation of the project's objectives (including indicators of achievement) and the Terms of Reference (ToR). The Consultant is explicitly encouraged to present critical comments and doubts about the suitability, consistency and feasibility of individual aspects and the concept as a whole, if any. The methodology suggested must take constructive account of these.

#### b) Proposed concept and methods

This section will contain at least:

- Conceptual and methodological approach proposed to carry out the services. In this context, the Consultant is explicitly encouraged not to repeat the ToR but to show the suitability of his concept in regard to the ToR and his comments made on these.

- Working programme (bar chart) showing clearly the different project phases as well as the main tasks planned, their duration and their interactions. The chart shall also include e.g. milestones, deadlines for discussions, decisions and submission of reports.
- Staffing schedule (bar chart) showing clearly times and places of effective assignment (home office/field) for each professional. The chart shall be completed or accompanied by a table (the bidders have to follow strictly the model shown in Annex G) stating the precise periods of duty (in man-months) for each professional by places of assignment. In this table (only for basic services) the assignment of expatriate and local staff will be treated separately.
- Statement of work organisation and an organisation chart showing the Consultant's internal organisation as well as the interactions with the PEA as well as with other stakeholders. Responsibilities within the project team have to be defined.
- Envisaged back-up services by the home office for the team working locally on technical and administrative questions that could arise during project implementation as well as for the controlling and monitoring of the work.
- Planned logistics and facilities for the execution of the services.

The Consultant is invited to comment those items of the above-mentioned charts that require additional explanation.

The texts and information should be compiled and presented in a way that is related to the project. Tenderers shall refrain from long explanations in the style of a textbook. The presentation of diagrams, tables and graphics is preferred.

#### c) Consultant Experience

A detailed listing of the experience and qualification of the Firm/ Joint Venture, providing information on specific experience in similar projects for which consultancy services were provided in the last 10 years including: Project name, Description & location, contract price & period, percentage of participation and any other pertinent/ relevant information that will demonstrate the degree of qualification of the Firm for the specific project under consideration.

#### d) Key staff

The Consultant shall provide a detailed listing of the nominated technical staff for each main activity, together with the qualifications and experiences of all required professional staff, as applicable to the project requirements, in addition to a detailed description of tasks to be performed by each team member (including back-up staff in the home office) as well as details on the selection and experience of the proposed members with regard to their tasks.

Furthermore, the Consultant shall provide updated curricula vitae (CV) of the proposed staff containing at least the headings illustrated according to the model given in Annex (B), where applicable experience shall be clearly stated. The CV shall indicate whether the proposed staff member belongs to the Tenderer's permanent personnel or not. Key staff presented in

the Consultant's proposal may not be replaced without the prior approval of the PEA. The Consultant shall only replace the same with a staff member with at least equal qualification.

e) List Sub-contractors

The Consultant will clearly specify the services to be carried out by sub-contractors other than those being part of the Consulting association. This basically includes all additional services. He shall indicate the firms to whom he intends to sub-contract such services.

Any subcontract to be made by the applicant relating to the services he is committed to render under this Agreement shall be made only to such extent and with such dully qualified specialists and entities as shall be approved in writing in advance by MWI/JVA, and upon his request, the Consultant shall submit for the prior approval the terms of reference of any such subcontract and any amendment thereof.

## **2.2 Financial proposal**

The Financial Proposal shall be worked out and shall be structured as per the model in Annex (C). The Consultant shall make his quotations as a Lump Sum in JOD.

A detailed breakdown for all the deliverables mentioned in Annex C.

**For both Technical and Financial Proposals, the submitted tender shall** comprise the following documents:

- Terms of Reference as it appears in the invitation to tender, documents shall be stamped and initialled on each page by the Tenderer.
- The Tenderer proposal shall include evidence and certification from the concerned Governmental bodies and/or Public entities that the information and experience record contained in the technical proposal are correct.
- Tenderers attention should be drawn to the fact that they must submit a tender, which in all respects fulfills the Terms of Reference. Failing to do so will result in their tender being declared null and void.

## **3 PAYMENT CONDITIONS**

### **3.1 Currency**

All payments will be made in JOD.

### **3.2 Taxes and duties**

Parties to the contract are subject to all laws, regulations and instructions in force in the Hashemite Kingdom of Jordan with respect to taxes unless the context of the contract provides otherwise. The consultant shall pay the Revenue Stamps fees and fees of the University prior to



the signing of the contract according in accordance with the applicable laws, regulations and instructions. The consultant is not tax exempt and will include such in his rates.

### 3.3 Terms of Payment

The Consultant shall assume for the preparation of his Financial Proposal that payments will be made in the following sequence:

No.	Deliverable	Payment % from contract total sum
1.	Draft and Final Scoping Statement	10%
2.	Draft and Final Environmental and Social Management Plan	25%
3.	Findings Reports upon completion of each task of sections (5.1-5.19), subject to MWI/ JVA approval at the end of each sub-tasks	15%
4.	Final Assessment of Marine Studies including Intake and Brine Structures Report	10%
5.	Draft Environmental Impact Assessment Report	15%
6.	Final Environmental Impact Assessment Report	25%

All payments have to be approved by the PEA.

### 3.4 Guarantees

A Performance Guarantee is required. A Performance Guarantee is required with a value of 10% of the contract amount and as per the form in Annex (F).

## 4 ORGANISATION OF SERVICES

### 4.1 Project duration

The duration of the consultant assignment is foreseen to last up to 6 months.

### 4.2 Services required

The services must in all respect satisfy the requirements laid down in the Terms of Reference (ToR) given in Annex (A). The preparation of the Consultant's proposal includes a critical verification of these services and, if necessary, their completion or modification according to the Consultant's own assessment of the local situation and his professional experience in order to achieve the set project objectives. In this context, the local Jordanian standards and laws will be adhered to.



### 4.3 Performance of services

The Consultant shall co-ordinate all his activities with the Project Manager designated by the PEA.

## 5 TENDER EVALUATION

### 5.1 Technical proposal

Only the Technical Proposals will be opened on the submission date. Financial Proposals remain sealed until the technical evaluation is completed.

The quality of each Technical Proposal will be evaluated on a scale of 0 to 100 points, according to the criteria given below, which will be examined in accordance with the requirements as indicated in the Terms of Reference.

#### Criteria

<b>1. Concept and method</b>	<b>25</b>
1.1 Clarity and completeness of the tender	5
1.2 Critical analysis of the project objectives and the ToR	10
1.3 Proposed concepts and methods	10
<b>2. Specific experience of the bidder relative to the assignment</b>	<b>30</b>
2.1 General Experience	
2.2 Similar Experience	
<b>3. Qualifications of proposed staff</b>	<b>45</b>
3.1 Key staff to be employed on the project, in particular the Project manager (Refer to Annex (A))	45
<b>Total (maximum)</b>	<b>100</b>

If there are minor omissions in relation to the ToR points will be deducted. Omissions that considerably restrict comparison with other tenders can cause the exclusion of the applicant.

### 5.2 Financial proposal

After evaluation of the Technical Proposal, the Financial Proposals of those Tenderers will be opened whose Technical Proposal achieved a minimum score of 80 points. After correcting any arithmetical errors, the evaluation of the price quotations will be made.

Any items missing in individual offers can be added. This will be done on the basis of the most expensive unit price of all tenders.

### 5.3 Final evaluation

For the purpose of a combined evaluation the Technical Proposal of a Tenderer will be weighted 70 % as follows:

$$PT = 70 * T/T_o, \text{ with}$$

PT = attributed score for Technical Proposal,  
T = Tenderer's score in the technical evaluation,  
T<sub>o</sub> = highest 'technical' score of all Tenderers.

The Financial Proposal of a Tenderer will be weighted 30 % as follows:

$$PF = 30 * C_o/C, \text{ with}$$

PF = attributed score for the Financial Proposal (points),  
C = Tenderer's corrected price of the Financial Proposal,  
C<sub>o</sub> = lowest corrected Financial Proposal.

The total score of the Tender is

$$P = PF + PT.$$

The Tenderer, who submitted the proposal with the highest total score, will be invited for contract negotiations.

### 5.4 Consulting contract

The Technical and Financial Proposals of the successful Tenderer will become part of the Contract to be concluded. The PEA, however, reserves the right to negotiate and adapt those parts of the Consultant's proposal, which are considered inadequate with the requirements of the work.

Fees and unit prices that were taken into account in assessing the price quotation are not subject to negotiation.

A standard contract form is attached to these Tender documents Annex (D), which forms the basis of the contract to be concluded with the successful Tenderer. In case of contradiction the stipulations of the present conditions of tender prevail.

## 6 OTHER

### 6.1 Unsuccessful Tenderers

After the evaluation of the Technical Proposals, Tenderers that have not achieved the minimum required score of 75 points will be notified in writing. The unsuccessful tenderers may collect their unopened Financial Proposals within a delay of one month after the day of notification.

After the successful Tenderer has been notified of the award of Contract, the remaining Tenderers will be informed in writing about the rejection of their proposals.

## 6.2 Cancellation of Tender

The tender procedure may be cancelled, prior to awarding the Contract, without thereby incurring any liability to the Tenderers, and notwithstanding the stage in the procedures leading to the conclusion of the Contract, if:

- the project has been cancelled;
- circumstances underlying the invitation to tender have changed materially;
- no Tender satisfies the criteria for the award of the Contract;
- competition was inadequate;
- the conditions for a fair competition have not been implemented; and
- the price quotations are obviously unreasonable and/or exceed the financial resources earmarked for the contract. In this case, the PEA and the Tender Agent may, as an alternative to re-tendering, enter into negotiations with the winning Tenderer to try to obtain a satisfactory offer.

In the event of cancellation of the Tender procedure, Tenderers shall be notified thereof by the Tender Agent. Such Tenderers shall not be entitled to compensation.

## 6.3 Other Conditions

Bidders shall treat this request for proposal document and contents therein as private and confidential. If at any time during bid preparation a bidder decides to decline the invitation to bid, all documents must be immediately returned.

Although details presented in this request for proposal have been compiled with all reasonable care, it is the bidders' responsibility to satisfy them that the information/documents are adequate and that there are no conflicts between various documents/stipulations.

Bid proposal preparation is the responsibility of the bidder and no relief or consideration can be given for errors and omissions.

Bidders shall inform the PEA and the Tender Agent by email of their receipt of the letter of invitation.

### **List of Annexes**

- Annex A: Terms of Reference (ToR)
- Annex B: Presentation of Curricula Vitae (CV)
- Annex C: Model for Financial Proposal
- Annex D: Model for Consulting Contract
- Annex E: Model for Summary Table of Staff Input
- Annex F: Model of Performance Guarantee
- Annex G: Declaration of the Other Payments
- Annex H: Declaration of the Illicit Payments

**ANNEX A**

**Terms of Reference (TOR)**

**PREPARATION OF AN ENVIRONMENTAL AND SOCIAL IMPACT  
ASSESSMENT (ESIA) FOR  
AQABA - AMMAN WATER DESALINATION AND CONVEYANCE PROJECT**

**1 Purpose**

The Ministry of Water and Irrigation/Jordan Valley Authority (MWI/JVA) of the Government of Jordan requires the services of a Consultant to conduct and prepare the Environmental and Social Impact Assessment Study for Aqaba- Amman Water Desalination and Conveyance Project.

The structure and content of the ESIA shall be consistent with applicable requirements in the United States Agency for International Development (USAID) 22 CFR 216 Agency Environmental Procedures and the Ministry of Environment (MoE) of the Government of Jordan (GoJ) ESIA Regulation No. 37 of 2005 for a "Comprehensive ESIA" for Category 1 projects, and shall generally include the main elements described below.

**2 Background**

The Aqaba-Amman Water Desalination and Conveyance ("AAWDC") project ("the **Project**") was conceived to address the challenges associated with the on-going water crisis in Jordan and has one primary objective and several secondary opportunities. The primary objective will be to provide a safe and reliable freshwater supply for Amman and other governorates in Jordan and areas along the project pipelines route.

The project calls for supplying up to 150 million cubic meters of freshwater on a continuous basis to the Amman area.

Since the country of Jordan has limited surface and groundwater resources, other water sources must be developed to meet the country's growing demand for water. While several water plans have been considered, the only option that provides an entirely in-country and Jordan-controlled new water opportunity is the treatment and desalination of Red Sea water.

While the existing groundwater and limited surface-water supplies are insufficient to maintain the expanding population of the country, the Red Sea provides an unlimited source of water that can be accessed within Jordan's border. The need to desalinate this source and the inherent cost associated with that process makes this water more expensive than traditional sources. However, throughout the Middle East and in many arid coastal areas around the world, the desalination of sea and brackish water has been embraced as one sure way to ensure a reliable water supply regardless of drought and/or political and institutional concerns. The application of this technology for Jordan is both prudent and reasonable.

The Government of Jordan (GoJ) has established four (4) primary objectives for the AADC Project to accomplish:

- Establish a secure and affordable water supply for Jordan
- Support widespread economic growth in Jordan.
- Facilitate and enhance private and public partnership.
- Provide Jordan with additional reclaimed water for irrigation resulting from the new water resources.

The project is undertaken in the context of the urgent need for potable water in Jordan, the project concept involves the development of an infrastructure, to be located on the territory of Jordan starting from the Southern Red Sea coast in Aqaba and ending in the capital city of Amman, and meant to (i) abstract and pump seawater from the Southern Red Sea coast in Aqaba near the Jordanian-Saudi border, (ii) desalinate seawater in Aqaba at a site located about 5 km's from the intake point from Red Sea, (iii) rehabilitation and expansion of RUM wells, (v) deliver freshwater to Amman and other governorates via a main transmission and collection pipelines and a series of booster pump stations, and (iv) transfer brine water back to the Red Sea.

The Aqaba-Amman water desalination and conveyance project (AAWDC) is a proposed initiative by Jordan and has the following main goals:

- Desalinate 80 MCM/yr of seawater in Aqaba at affordable prices for Jordan.
- Rehabilitation and expansion of Rum wellfields to produce 70 MCM/yr.
- Deliverer a total of 150 MCM/yr in two discrete phases composed of both desalinated and ground water to Amman and other governorates.
- Maximize the economic benefits to Jordan by the implementation of the AAWDC project.

In addition to providing a reliable source of freshwater, the secondary benefits of the project include the following:

- Provide domestic water for Aqaba and governorates along the pipeline route.
- Provide water for tourist/recreation and economic opportunities in Aqaba, Wadi Araba, areas along the pipeline route, and Amman area.
- Provide additional water for irrigation use from the treated waste water resulted from the additional new resources.
- Provide the potential for the development in partnership with the private sector of new schemes of large agricultural projects using the resulting additional TWW.
- Provide the potential for developing environmental and climate change enhancement projects.
- Assist to enhance and stimulate economic development projects in the Amman, Aqaba, and other areas.

The project would provide water service, economic and environmental benefits to the region as well as the Amman water service area.

### 3 Concept for Aqaba-Amman Water Desalination and Conveyance Project

The envisaged concept for the AAWDC project components can be summarized as follows:

#### 3.1 Seawater Conveyance System

The *Seawater Conveyance Plan* for the project includes:

- Intake Structure: to be built on the south coast of Aqaba near the Jordanian- Saudi border to abstract 200 MCM/yr of Red Sea water and shall have a maximum capacity to abstract up to 500 MCM/yr.
- Intake Pump Station (IPS): to pump 200 MCM/yr from the intake to BPS01. The building shall be designed and built to handle installation of new pumps for future expansion, while the electro-mechanical pumps, motors, and switch gears shall be installed to handle only the delivery of 200 MCM/yr to the desalination plant.
- IPS Conveyance: the IPS Conveyance shall be built to convey 200 MCM/yr from the IPS to the desalination facility located on the Aqaba back road at a distance of about 5 km's from the location of the IPS.
- BPS01 to lift 200 MCM/yr of seawater from elevation of about +165m a.s.l to the desalination plant at elevation of +320m a.s.l

#### 3.2 Pre- Treatment and Desalination Facility

Pre-treatment and desalination facility with a capacity to treat and desalinate about 200 MCM/yr of Red Sea water to produce 80 MCM/yr of freshwater to be built at allocated site on the Aqaba back road at a distance of about 5 km's from the IPS. The facility will include:

- Chlorination stations along the raw- and treated-water pipelines
- Sea water reverse osmosis (SWRO) pretreatment facilities
- Sea water reverse osmosis (SWRO) water treatment (desalination) plant

#### 3.3 Freshwater Conveyance

The AAWDC Freshwater Conveyance System will include pipelines, booster pump stations, regulating tanks, well collection pipelines, drilling new wells, rehabilitation of existing Rum Wells, and reservoirs. The envisaged infrastructure components for this system include:

- Freshwater Conveyance from the Desalination Plant to Rum Wells:

Freshwater conveyance system to convey 80 MCM/yr from the desalination plant to the new collection reservoir at Rum with a length of about 100 km's including booster pump stations. The conveyance pipeline capacity shall be designed for up to 125 MCM/yr to handle future expansion.

- Freshwater Conveyance from the RSDS Phase I Desalination Plant to AAWDC main transmission pipeline:

Freshwater conveyance system to convey 35MCM/yr from the RSDS Phase I desalination plant to the AAWDC main transmission pipeline with a total length of about 20Km's including booster pump stations.

- Freshwater Conveyance from Rum Wells to the new Rum Collection Reservoir:

Freshwater collection pipes to connect all the existing wells including the new wells to be drilled as part of this project to the new Rum collection reservoir. It is inveigled that about 50 km's of 300-400mm pipelines will be required for this purpose.

- Freshwater Conveyance from Rum Collection Reservoir to Amman:

Consisting of one pipeline with a capacity to convey flows of 150 MCM/yr ( 80 MCM/yr from desalination plant and 70 MCM/yr from Rum wells) from the new collection reservoir at Rum to Amman, with a length of about 296 km's including booster pump stations. The conveyance pipeline capacity shall be designed for up to 200 MCM/yr to handle future expansion

### **3.4 Freshwater Conveyance Booster Pump Stations:**

- Freshwater booster pump stations from the desalination plant to Rum collection reservoir

About four freshwater booster pump stations (BPS02-BPS05) will be required to lift 80 MCM/yr of the freshwater flows from the desalination plant at elevation of about + 320m a.s.l to Rum collection reservoir located at elevation of about +840m a.s.l .

Each pump station shall be equipped with the necessary number of vertical centrifugal pumps. The pump stations along the freshwater pipeline are sited at various locations based on field observations. Specific criteria shall be used for sitting the pump station locations include constructability of the site, topography and hydraulic considerations (balanced pumping lifts).

- Freshwater booster pump stations from Rum collection reservoir to Amman

About three freshwater pumping stations (BPS06-BPS08) are required to lift 150 MCM/yr (80 MCM/yr from desalination + 70 MCM/yr from Rum wells) of the freshwater flows from the new collection reservoir at Rum to to Amman at an elevation of +1100 a.s.l.

Each pump station shall be equipped with the necessary number of vertical centrifugal pumps. The pump stations along the freshwater pipeline are sited at various locations based on field observations. Specific criteria shall be used for sitting the pump station locations include constructability of the site, topography and hydraulic considerations (balanced pumping lifts).

### **3.5 Freshwater Conveyance Regulating Tanks and Reservoirs:**

Two regulating tanks and two freshwater reservoirs will be required along the conveyance route. Preliminary possible locations are;

- RT01 at station 00+17km at elevation +800m a.s.l
- Rum collection reservoir at station 00+103km at elevation +840m a.s.l.
- RT02 at station 00+148km +800m a.s.l (near Disi regulating reservoir)



- New reservoir in Amman at station

The design and capacity of these reservoirs shall be determined during the preparation of the concept design.

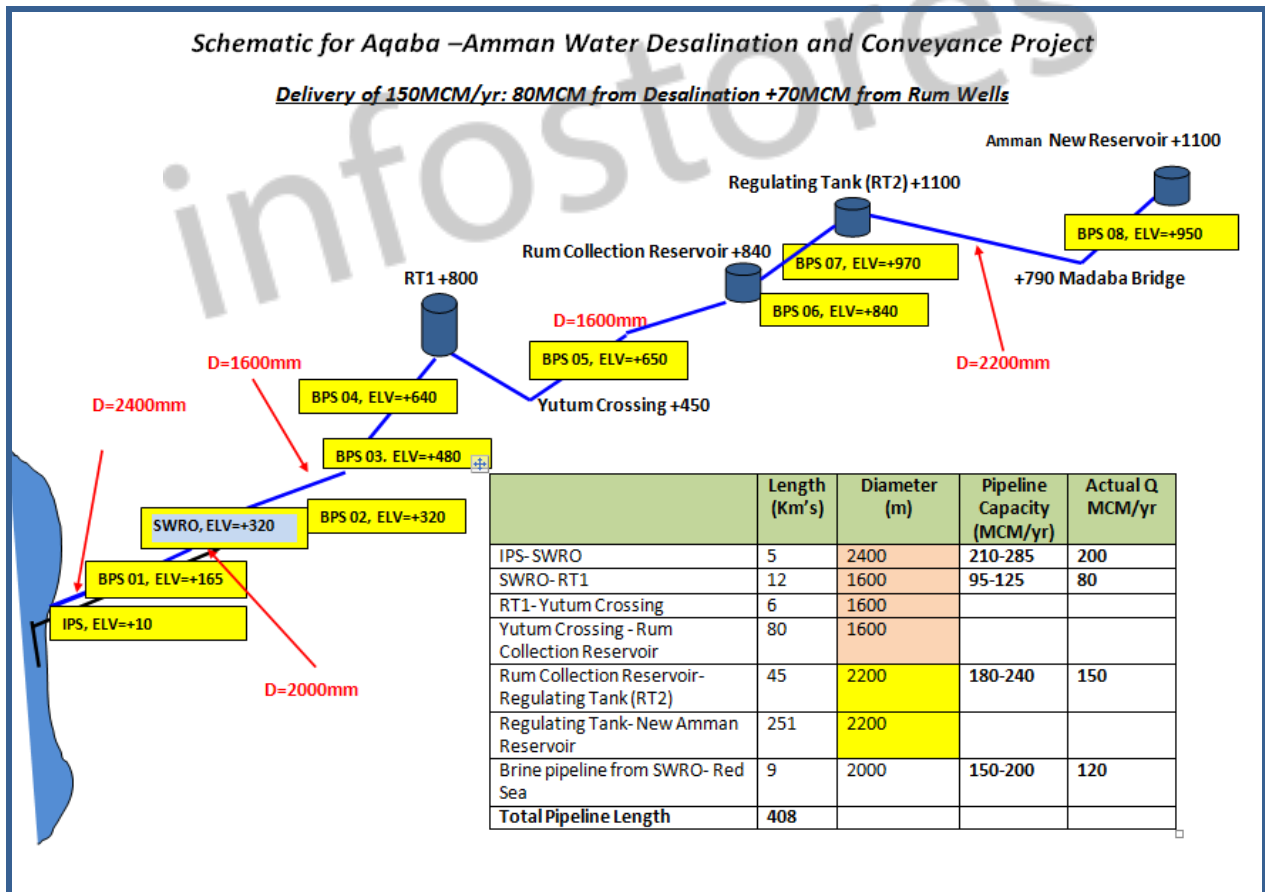
### 3.6 Rehabilitation and Expansion of Rum Wells

Rehabilitation and expansion of the existing Rum wells located at about 100 km’s north of Aqaba in Wadi Rum area, including pump replacement and rehabilitation, drilling of new wells, construction of collection and transmission pipelines, and construction of new collection reservoir to ensure the production of 70 MCM/yr.

### Brine Pipeline conveyance system from the SWRO to the discharge location at the Red Sea

Brine water conveyance pipeline to a capacity to convey 120 MCM/yr from the SWRO to the discharge location inside the Red Sea, with a length of about 5 km’s from the SWRO to the IPS, and then about 1 km inside the sea and then turns 3 km’s towards the south.

*The below schematic diagram illustrates the AAWDC project, as it is currently envisioned.*



## **4 Aqaba- Amman Water Desalination and Conveyance Project Implementation Scheme**

The Aqaba- Amman Water Desalination and Conveyance Project (AAWDC) structure is to be designed as a.) 25 years Build-Operate-Transfer (BOT) scheme and b.) Design, Built, and Operate (DBO) , whereby construction and operation shall be implemented in two phases: Phase I and Phase II, in order to facilitate the project finance and bankability options and to encourage more BOT contractors to invest in the project, in addition splitting the delivery of water will provide MWI with more flexibility in the distribution of the additional quantities in its national water carrier and in its supply zones.

### **4.1 Description of Aqaba- Amman Water Desalination and Conveyance /Phase I Project**

The Aqaba- Amman water desalination and conveyance Phase I project will deliver 70 MCM/yr from Rum and Disi Wells to Amman. The existing Rum and Disi wells shall be rehabilitated and new wells shall be drilled in order to secure a total of 70 MCM/yr production. The envisaged Phase I project components includes:

1. Rehabilitation and Expansion of Rum and Disi Wells:

Rehabilitation and expansion of the existing Rum and Disi wells located at about 100 km's north of Aqaba in Wadi Rum area, including pump replacement and rehabilitation, drilling of new wells, construction of collection and transmission pipelines, and construction of new collection reservoir to ensure the production of 70 MCM/yr.

2. Freshwater Conveyance from Rum Wells to the new Rum Collection Reservoir(s):

Freshwater collection pipes to connect all the existing wells including the new wells to be drilled as part of this project to the new Rum collection reservoir. It is envisaged that about 50 km's of 300-400mm pipelines will be required for this purpose.

3. Rum Collection Reservoir(s):

New reservoir to be built in Rum to collect all the water produced by the existing and the new wells, with a capacity to be determined by the consultant.

4. Freshwater Conveyance from Rum Collection Reservoir to Amman:

Consisting of one pipeline with a capacity to convey flows of 150 MCM/yr ( 80 MCM/yr from desalination plant and 70 MCM/yr from Rum wells) from the new collection reservoir at Rum to Amman, with a length of about 296 km's including booster pump stations. The conveyance pipeline capacity shall be designed for up to 200 MCM/yr to handle future expansion.

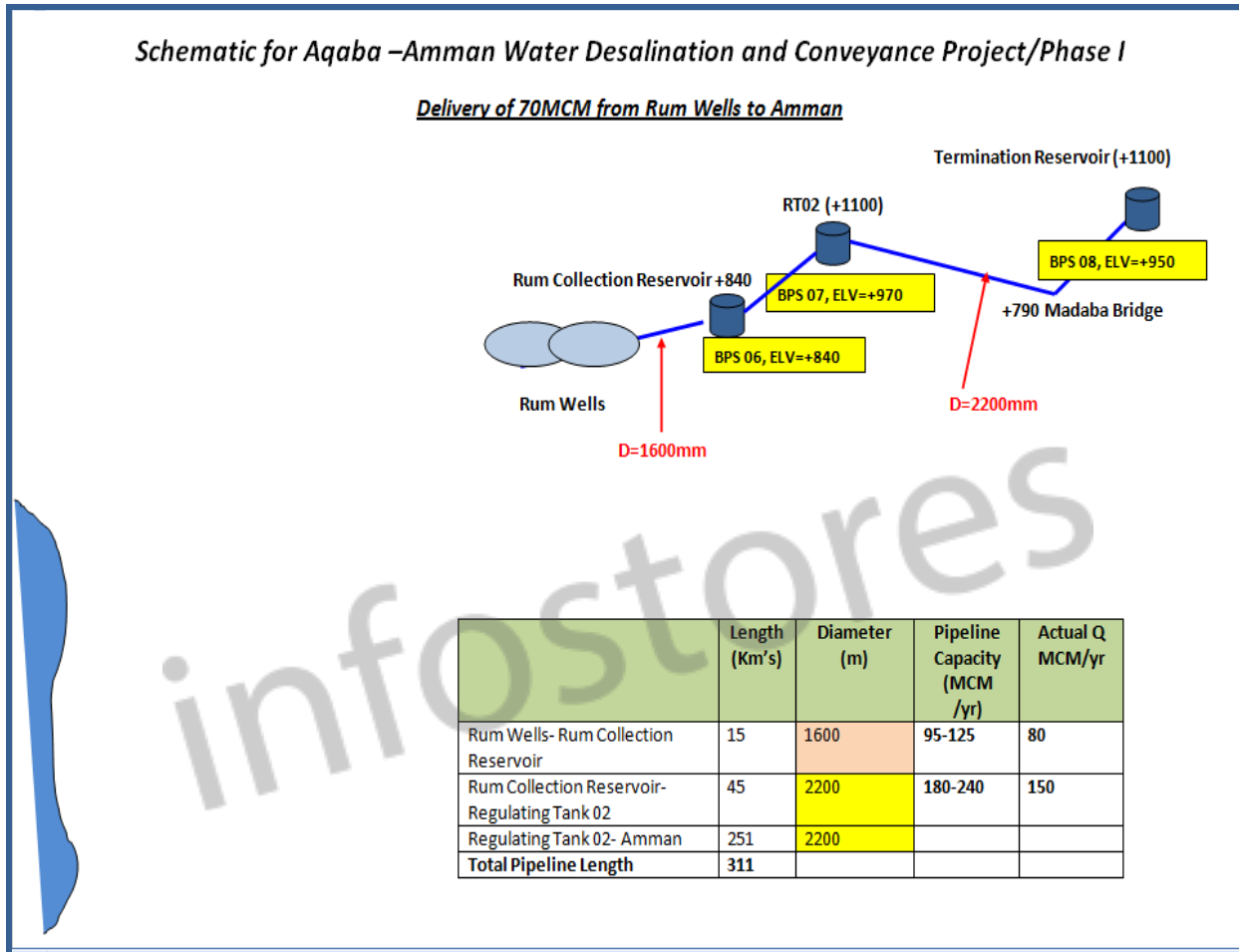
5. Freshwater booster pump stations from Rum collection reservoir to Amman

About three freshwater pumping stations (BPS06-BPS08) are required to lift 70 MCM/yr from Rum wells of the freshwater flows from the new collection reservoir at Rum to Amman at an elevation of about +1100 a.s.l. The civil works of the booster pump stations shall be designed and constructed to be able to install additional pumps, electrical, and mechanical equipments required for phase II.

6. Regulating Tank and Termination Reservoir in Amman

(RT02) at station 00+148km at an elevation of about +800m a.s.l (near Disi regulating reservoir) and termination reservoir in Amman. The design and capacity of the reservoir and the regulating tank shall be determined during the preparation of the concept design.

*The following schematic illustrates Phase I project components*



## 4.2 Description of Aqaba- Amman Water Desalination and Conveyance /Phase II Project

The Aqaba- Amman water desalination and conveyance Phase II project will deliver 80 MCM/yr from the desalination plant in Aqaba to Rum collection reservoir, and then to be pumped together with Phase I quantities to Amman. Upon completion of phase II, the total quantities delivered to Amman will be 150 MCM/yr. The envisaged Phase II project components include:

### 1. Seawater Conveyance System

The *Seawater Conveyance Plan* for the project includes:

- Intake Structure: to be built on the south coast of Aqaba near the Jordanian- Saudi border to abstract 200 MCM/yr of Red Sea water and shall have a maximum capacity to abstract up to 500 MCM/yr.
- Intake Pump Station (IPS): to pump 200 MCM/yr from the intake to BPS01. The building shall be designed and built to handle installation of new pumps for future expansion, while the electro-mechanical pumps, motors, and switch gears shall be installed to handle only the delivery of 200 MCM/yr to the desalination plant.
- IPS Conveyance: the IPS Conveyance shall be built to convey 200 MCM/yr from the IPS to the desalination facility located on the Aqaba back road at a distance of about 5 km's from the location of the IPS.
- BPS01 to lift 200 MCM/yr of seawater from elevation of about +165m a.s.l to the desalination plant at elevation of +320m a.s.l.

### 2. Pre- Treatment and Desalination Facility

Pre-treatment and desalination facility with a capacity to treat and desalinate about 200 MCM/yr of Red Sea water to produce 80 MCM/yr of freshwater to be built at allocated site on the Aqaba back road at a distance of about 5 km's from the IPS. The facility will include:

- Chlorination stations along the raw- and treated-water pipelines
- Sea water reverse osmosis (SWRO) pretreatment facilities
- Sea water reverse osmosis (SWRO) water treatment (desalination) plant

### 3. Freshwater Conveyance from the Desalination Plant to Rum Wells:

Freshwater conveyance system to convey 80 MCM/yr from the desalination plant to the new collection reservoir at Rum with a length of about 100 km's including booster pump stations. The conveyance pipeline capacity shall be designed for up to 125 MCM/yr to handle future expansion.

### 4. Freshwater booster pump stations from the desalination plant to Rum collection reservoir

About four freshwater booster pump stations (BPS02-BPS05) will be required to lift 80 MCM/yr of the freshwater flows from the desalination plant at elevation of about + 320m a.s.l to Rum collection reservoir located at elevation of about +840m a.s.l .

Each pump station shall be equipped with the necessary number of vertical centrifugal pumps. The pump stations along the freshwater pipeline are sited at various locations based on field observations. Specific criteria shall be used for sitting the pump station locations include constructability of the site, topography and hydraulic considerations (balanced pumping lifts).

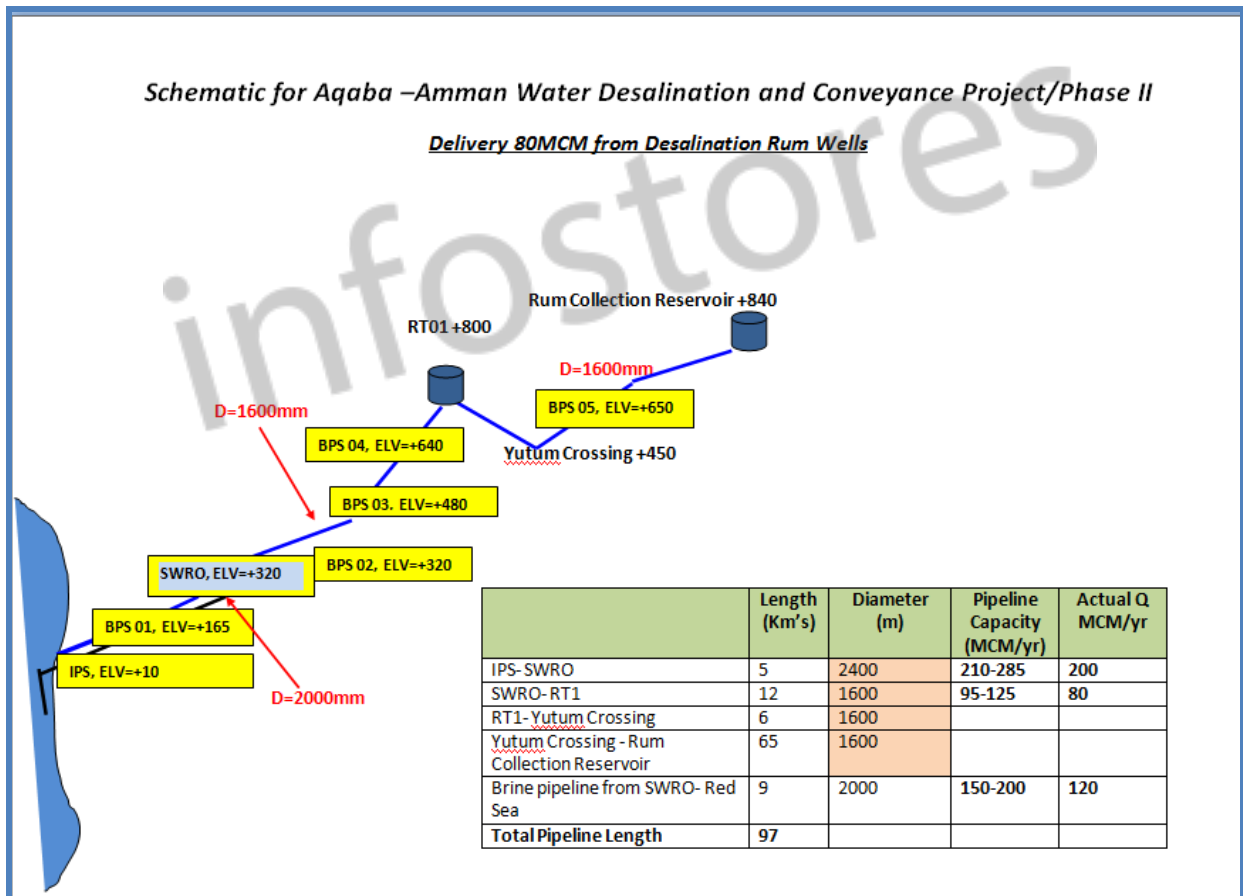
5. Regulating Tank

RT01 at station 00+17km at elevation +800m a.s.l

6. Brine Pipeline conveyance system from the SWRO to the discharge location at the Red Sea

Brine water conveyance pipeline to a capacity to convey 120 MCM/yr from the SWRO to the discharge location inside the Red Sea, with a length of about 5 km’s from the SWRO to the IPS, and then about 1 km inside the sea and then turns 3 km’s towards the south.

*The following schematic illustrates Phase II project components*



## **5 Scope of the Services for the Environmental and Social Impact Assessment Study (ESIA) for AAWDC Project**

The consultant shall perform the following tasks under the Environmental and Social Impact Assessment Study for the Aqaba- Amman Water Desalination and Conveyance Project

### **5.1 Task 1 – Overview of Policy, Legal, and Administrative Framework**

The objective of this task is to provide an overview of the policy, legal and administrative framework under which environmental and social aspects of the Project would be evaluated and implemented.

The Consultant shall:

- Prepare a review of applicable regulations and standards governing water and sanitation, environmental quality, protection of sensitive areas, protection of endangered species, land use controls, etc., at international, national, regional, and local levels. The status of proposed regulatory changes should also be considered and discussed. Environmental and social requirements of any co-financiers, contractors, and third parties should be delineated. Various environmental-related licenses, permits, and approvals from public authorities that will likely be required from public authorities (GOJ, regional, and/or municipal jurisdictions in which the Project is located) should be identified. Detailed annexes should be included as needed and summarized in the main report.
- Consider and discuss the status of proposed regulatory changes. Environmental and social requirements of any co-financiers, contractors, and third parties should be delineated.
- Various environment-related licenses, permits and approvals from public authorities that will likely be required from public authorities (government, regional, and/or municipal jurisdictions in which the Project is located) should be identified. Detailed annexes should be included as needed and summarized in the main report.

The ESIA shall be prepared in the context of applicable USAID and Jordanian requirements, which include but are not limited to the following:

- USAID 22 CFR 216 Agency Environmental Procedures
- Environmental Protection Law No. 52, for the year 2006, amended in 2017
- Environmental Impact Assessment Regulation No.37, for the year 2005
- Instruction for the Reduction and Prevention of Noise
- Standards for Drinking Water No. 286 of 2001 (as amended in 2008)
- The Antiquities Law No.21, 1988, as amended By Law No.23, for the year 2004
- Public Health Law No.47 for the year 2008
- Law for Protection of Architectural and urban Heritage No. 5, for the year 2005

## 5.2 Task 2 – Project Description

The objective of this task is to provide a full description of the proposed project based on the status of on-going feasibility study at the time the ESIA is completed. At a minimum, the project description shall include:

The Consultant shall:

- Describe in a summary manner the Project alternatives examined in the Feasibility Study.
- Describe the current proposed approach to the Project design.
- Include diagrams, maps, tables and descriptive text based on the existing information.
- location, layout, capacity, and operating plans of the water system to be constructed or rehabilitated;
- description of project activities, including rehabilitation, reconstruction, construction, operation and maintenance, and institutional development activities;
- description of construction activities, including location and extent of construction activities, quarries, borrow pits, spoil dumps, and other supporting facilities or activities; and,
- Construction staffing and implementation schedule.
- Update the Project description throughout the preparation of the Environmental and Social Assessment

## 5.3 Task 3 – Scoping and Scoping Statement

In addition, a formal public scoping and consultation program shall be undertaken to inform project stakeholders in the national, regional and local levels of the proposed investments, outline the ESIA preparation and review process, and obtain their views and perspectives on the key environmental and social issues that should be taken into account in designing and implementing the project. Participants in the session shall include NGOs, Jordan Environment Society and the Royal Society for the Conservation of Nature, local and national government organizations such as the Department of Antiquities, Water Authority of Jordan, Ministry of Environment, Ministry of Social Development, local residents, and other key stakeholders identified during the review period. The list of invitees is subject to the approval of JVA.

The scoping program will focus on the preliminary list of anticipated impacts and contribute to determining the significance of these impacts as well as identifying others that had not been included. The Consultant shall prepare and distribute any background material or other documents necessary to facilitate an informed, two-way discussion with stakeholders and to document the opinions of all participants in the session. The final list of significant environmental issues will be submitted to JVA for approval and will then be considered as the basis for the environmental and social analysis that will follow.

In order to document the findings of the public scoping program as well as the research and analysis conducted thus far, the Consultant will prepare a Scoping Statement. The statement will include, at a minimum, the following main items:



- brief description of the proposed project (investment program);
- general description of the project area and impacted areas;
- proceedings of the Scoping Session(s) (including participants, venue and date, agenda and activities, etc.);
- results of the Scoping Session(s) highlighting the views and concerns of stakeholders, and distinguishing between significant and non-significant issues; and
- proposed methodology, format, and content for the ESIA including proposed table of contents and schedule.

The Scoping Statement will be submitted to the MoE and JVA in accordance with their respective environmental approval procedures. The Consultant shall not commence preparation of the ESIA until the methodology, format, and content presented in the Scoping Statement is approved by MoE and JVA.

#### **5.4 Task 4 – Describe Regional and Project Specific Baseline Environmental and Social Conditions**

The Consultant shall assemble, evaluate, and present baseline data and information on the relevant environmental characteristics of the project area including existing studies and data pertaining to climate, water resources and quality, demographic and socio-economic conditions, public health, and cultural resources. The environmental description should be concise and focused on the potential impacts of the proposed project. Background and supporting studies should be provided in annexes. In addition, the Consultant should carry out site visits, field surveys, interviews, and consultations to fill any information gaps critical to the potential impacts and to development of mitigation measures. The aim of these visits will be to verify and support the collected information regarding the surrounding environment and obtain any further information that may be necessary. The Consultant will also ensure that the site visits are visually documented through photographs taken of the surrounding areas.

Baseline data should generally include, but not be limited to, the following:

- *physical environment*: geology; topography; soils; climate and meteorology; ambient air quality; surface and groundwater hydrology; water resources and quality; existing sources of noise and air emissions; existing water pollution discharges; and receiving water quality;
- *biological environment*: flora; fauna; rare or endangered species; sensitive habitats, including parks or preserves, significant natural sites, etc.; and
- *socio-cultural environment* (disaggregated by gender and socio-economic strata, and including historical and future projections where appropriate): population; land use; planned development activities; community structure; employment; distribution of income, goods, and services; labor standards and status in construction sector, recreation; public health; and cultural properties (including archaeological sites, historical sites, graveyards and burials).

- *institutional and legal framework in Jordan and applicable laws and regulations associated with a project of this type.*

### **5.5 Task 5 – Design and Conduct of a Social Assessment at the Regional and Project Specific Levels**

The objective of this task is to provide for an understanding of the social conditions and social issues that may be positively and negatively affected by the Project at the regional and project specific levels. Information developed by the Sub-Studies, among other sources, will be used by the Consultant in undertaking this task.

The Consultant shall:

- Prepare a social assessment, as part of the Environmental and Social Assessment, to determine how the Project will affect local communities and to serve as a broader analysis of Project related social issues beyond those concerning potential impacts and risks. The Consultant must use specialized anthropological and sociological experts to conduct the Social Assessment.
- Identify the various stakeholders and on the basis of a literature survey, field visits, focus groups and other methods, clarify and assess the most relevant issues at the regional and project specific levels.
- Detail how all communities are affected and how they would be influenced by the Project including the implementation and operational phases.
- The consultant shall prepare a Gender Integration Plan.

### **5.6 Task 6- Analysis of Potential Environmental and Social Impacts**

The objective of this task is to provide an assessment of the potential positive and negative impacts at the regional and project specific levels. In undertaking this task, the Consultant will use information developed by the Feasibility and Sub-Studies, among other sources.

The Consultant shall:

- Assess the proposed Project's likely environmental impacts and social influences, both positive and negative, based on changes brought about by the Project to the baseline conditions described above at the regional and project specific levels. These impacts should be quantified to the extent possible, in terms of costs and benefits.
- Distinguish between positive and negative impacts, direct and indirect impacts, and immediate and long-term impacts. Normal conditions, start-up and shutdown activities during construction and commissioning and emergency situations should all be considered.
- Identify the type, relative likelihood, and broad consequences of major hazards or accidents that might occur. Mitigation measures and any residual negative impacts that cannot be mitigated should be determined.
- Investigate opportunities for environmental enhancement.
- Identify and estimate the extent and quality of available quantitative data, key data gaps, and uncertainties associated with predictions, and note topics that do not require further attention.

- Categorize the environmental impacts and social influences based on construction and operational phases, and summarize them according to issues and themes in the main report text, with the detailed findings documented in annexes.

A table should be prepared for both regional and project specific impacts during the implementation and operational phases of the Project on a thematic and area specific basis

As necessary, the Consultant shall carry out public consultation and stakeholder engagement to solicit views and ideas about the project which may help assess potential environmental and social impacts and develop appropriate mitigation strategies.

### **5.7 Task 7– Assess Risks Related to Archeological, Historical and Other Cultural Sites**

The objective of this task is to assess possible impact of the construction and operation of the Project on the known, discovered, or inferred sites or artifacts of archeological, cultural or touristic value. As part of this task, the Consultant shall commission a field based archaeological and historical sites survey of the potentially Project affected areas at the Gulf of Aqaba , Wadi Rum, and along the pipeline rout. This will include the proposed sites for the sea water intake, Solar power facilities, desalination plant and major elements of the water transmission system.

The Consultant shall:

- Based on a literature review, discussions with relevant ministries and individual scholars, and a field-based survey undertaken specifically for the Project, prepare an inventory of sites of spiritual significance, archeological, historical, social and touristic value. This will include an inventory of graveyards and burials that may be affected by the proposed Project.
- Using a combination of expert opinion, historical inference, and field investigations, identify any sites with significant probability of future interest.
- Determine the impact on the Project of avoiding known and inferred archeological, cultural, or tourism sites.
- Develop and propose mitigation measures, where applicable, to minimize the impact of the Project on known or inferred archeological, cultural, and touristic sites.
- Develop a set of procedures to address "archaeological chance finds" if buried sites are uncovered during the course of construction activities.

### **5.8 Task 8 – Identify and Assess Environmental and Social Impacts on the Gulf of Aqaba and the Aqaba Region**

The objective of this task is to identify and assess all relevant environmental and social impacts of the Project in the: (a) coastal and marine environment of the Gulf of Aqaba; and (b) terrestrial environment in the Aqaba Region. Identification will consist of projecting future conditions with the Project, then comparing these with conditions over the same time period without the Project. If alternative project configurations are under consideration, this task will be performed for each configuration of the Aqaba-Amman Water Desalination and Conveyance Project. In undertaking this task, the Consultant will use information developed by the Feasibility Study, among other sources.

The Consultant shall:

- Identify and assess possible impacts on the Red Sea marine environment, including the coral reefs, and on the coastal zone in the Gulf of Aqaba.
- Identify and assess possible impacts on the marine environment and coastal zone in the Gulf of Aqaba from construction and operation of the Project.
- Evaluate the potential short-term and long-term impacts of the Project on coral reefs and other elements of the marine ecosystem of the Gulf of Aqaba affected by the intake.
- Identify and assess environmental impacts of construction and operation of the Project in the Gulf of Aqaba including impacts on navigation, fishing, recreation and tourism activities.
- Assess air quality impacts from the generation of power for the pumping station and its operation.
- Identify and assess social impacts of construction and operation of the Project in the Aqaba region, including the impact of the temporary influx of construction workers.

#### **5.9 Task 9 – Identify and Assess Environmental and Social Impacts in the Wadi Rum, Disi, Mudawara, and Desert Highway Rout Including Geological and Hydrological Aspects**

The objective of this task is to identify and assess all relevant environmental and social impacts of the Project. Identification will consist of projecting future conditions with the Project and comparing this with conditions without the Project. If alternative project configurations are under consideration, this task will be performed for each configuration of the project. In undertaking this task, the Consultant will use information developed by the Feasibility Study and Sub-Studies, among other sources.

The Consultant shall:

- Assess the geological and seismic hazards and define geologically sensitive areas on maps.
- Identify and assess environmental impacts of construction and operation of the Project in the Wadi Rum, Disi, Mudawara, and Desert Highway Rout, including impacts related to loss of ecological connectivity across the conveyance and associated risks to natural habitats and biodiversity.
- Identify and assess environmental impacts associated with the potential need to have the conveyance cross a number of wadis, which could have an impact on their hydrology, sediment transport and erosion characteristics.
- Identify and assess environmental and social impacts on the limited vegetation in Wadi Rum and Disi due to construction and operation of the conveyance, along with the potential for successful stabilization of the land surface and re-vegetation where appropriate.
- Identify and assess aesthetic impacts associated with the construction and operation of the conveyance and associated structures, which will cross through an area viewed by many players as a semi-natural setting of significant beauty.
- Assess impact of unidentified water leakage on groundwater resources and undertake mapping of leakage sensitive areas.
- Assess impact of a failure of the water conveyor, from an earthquake or other major event, on groundwater resources.
- Identify and assess social impacts of construction and operation of the Project, including the impact of a temporary influx of construction workers and the impacts on Bedouin and their herds.

### **5.10 Task 10 – Identify and Assess Environmental Impacts of Expected Changes to the Red Sea**

The objective of this task is to identify and assess all relevant environmental and social impacts of the Project on the Red Sea. Identification will consist of projecting future conditions with the Project and comparing this with conditions without the Project. If alternative project configurations are under consideration, this task will be performed for each configuration of the project. In undertaking this task, the Consultant will use information developed by the Feasibility Study and Sub- Studies, among other sources.

The Consultant shall:

- Review the past and current studies/research related to the limnology of the Red Sea with particular attention to the recent efforts by the Red-Dead Phase I Project, previous studies conducted by the World Bank for Red-Dead project, previous studies conducted by EIB for Red-Dead project and Jordanian marine science station Aqaba in modeling the dynamic limnology of the Red Sea. This will include:
  - Study of the dynamics of stratification and Evaluation of the chemical impact due to reject brine water disposal to the Red Sea.
  - Assessment of micro-biological blooming such as intensity, duration and other parameters.
  - Review of the impact of inflow on the rate of evaporation.
- Identify and assess environmental impacts of the introduction of reject brine to the Red Sea, with particular attention to the changes in the chemical composition of the Red Sea, salts precipitation, increased frequency of water column turnovers, and/or changes in ecology and appearance.
- Provide recommendations for the future water level of the Gulf of Aqaba at the intake location and the optimal design of the discharge system; including:
  - Proposed amount and rate of seawater/reject brine inflow;
  - Proposed site for discharge of inflow into the Red Sea/Gulf of Aqaba ; and
  - Proposed depth below the surface of the Red Sea/Gulf of Aqaba for the discharge of the inflow.

### **5.11 Task 11 – Identify and Assess Environmental and Social Impacts of Construction and Operation of the Desalination Plant for Production of Drinking Water**

The objective of this task is to identify and assess all relevant environmental and social impacts of the Project related to construction and operation of the desalination plant for drinking water production. Identification will consist of projecting future conditions with the Project and comparing this with conditions without the Project.

This will include an analysis of alternative site locations for the desalination facilities and a comparative analysis of their potential impacts during both construction and operation. In undertaking this task, the Consultant will use information developed by the Feasibility Study and Sub-Studies, among other sources.

The Consultant shall:

- Analyze geological conditions at sites proposed for hydropower facilities and the desalination plant.
- Identify and assess environmental and social impacts of construction and operation of the desalination plant for drinking water production. This will include impacts related to the desalination facilities, as well as their support facilities, storage yards, housing facilities and the necessary electric transmission lines.
- Identify and assess social impacts of construction and operation of the desalination plant. Particular attention should be given to the effect of these facilities on landscape values, and the impact of any visual disamenity on landscape and cultural values, and on tourism.
- Conduct sensitivity analysis of water (raw, desalinated and brine) leakage on groundwater resources at the proposed site for the desalination plant. This includes mapping of leakage sensitive areas.
- Evaluate the potential impact of desalination plant failure (major break-down scenario) on groundwater resources.

### **5.12 Task 12 – Identify and Assess Environmental and Social Impacts of Drinking Water Pumping and Conveyance**

The objective of this task is to identify and assess all relevant environmental and social impacts of the Project related to drinking water production, pumping and conveyance. Identification will consist of projecting future conditions with the Project and comparing this with conditions without the Project. If alternative Project configurations are under consideration, this task will be performed for each configuration of the project. In undertaking this task, the Consultant will use information developed by the Sub-Studies, among other sources.

The Consultant shall:

- Identify and assess environmental impacts of construction and operation of the desalination phase of the Project in the areas adjacent to drinking water transmission facilities. This includes a review of potential alignment alternatives and/or adjustments to alignments for these facilities, as well as impacts related to the pipelines themselves, including the pumping stations, storage tanks, and the necessary electric transmission lines.
- Identify and assess social impacts of construction and operation of the desalination phase of the Project in areas adjacent to drinking water transmission facilities.



Particular attention should be given to the effect of these facilities on landscape values, and the impact of any visual disamenity on landscape and cultural values, and on tourism.

### **5.13 Task 13- Assessment of Intake Structure Depth at the South Coast of the Gulf of Aqaba**

An Environmental and Social Assessment (ESA) was prepared in 2011 and finalised in 2014 for the Red Sea- Dead Sea Project as part of a series of preparatory and preliminary studies led by World Bank. The study identified the location of the Intake Structure to be at the eastern Gulf of Aqaba at 140m deep. The AAWDC project has identified the new location for the intake structure to be near the eastern location identified by the WB for the Red- Dea project, the new location shall be studied in sufficient details.

The Services expected to be delivered under task 13 of the ESIA study shall be carried out by External International Consultant specialized in marine survey studies and shall the following main activities:

- (a) Carrying out a plankton survey;
- (b) Establishing a hydrodynamic and larval tracking model;
- (c) Conducting a habitat survey; and
- (d) Conducting a pre-feasibility study of sea water intake options.

The above will entail, *inter alia*, the delivery of the following Services:

- (a) The provision of the necessary information required to feed into the Environmental and Social Impact Assessment (ESIA);
- (b) Collection of up to date, site specific plankton data, required to understand the density / biomass / taxa of plankton, in particular the proportion of larvae (coral, fish and invertebrate) along the pipeline corridor and at the intake site. This in turn will support the establishment of baseline data and for the impact assessment of the "base case" and any alternative shallower options;
- (c) Development of a model of the impact (locally and/or further afield) of the pipeline and intake on the local currents and sediment transport pathways, and on the coral reefs in the Gulf, as a result of removing / destroying larvae (coral, fish and invertebrate). This will feed into an assessment of the resulting indirect significance this may have on various parameters such as water quality (temperature, salinity, turbidity) and sensitive habitats and species (coral reefs, seagrass beds, fish, invertebrate and coral larvae);
- (d) Collection of up to date, site specific habitat maps along the pipeline corridor and at the intake site, with a view to establishing baseline data and for the impact assessment of pipeline/intake construction/operation activities of the "base case" and any alternative shallower options;
- (e) Carrying out a technical, financial (CAPEX, OPEX) and environmental pre-feasibility assessment of the proposed option at 140m against other options (to be identified using the model) to assess if the pipeline intake point can be moved shallower / closer to the seabed whilst avoiding a significant impact on local habitat and significant intake of larvae.



#### **5.14 Task 14 – Assess Occupational Health and Safety**

The objective of this task is to assess and prepare an Occupational Health and Safety Plan to minimize health and safety risks to permanent and temporary employees of contractors during the construction phase, to the staff during the operational phase; and to the public during both phases.

The Consultant shall:

- Prepare an Occupational Health and Safety Plan as a mechanism to reduce health and safety risks to workers and the public at large. This plan should present in table form a description of the actions to be taken, describe the benefit of the proposed actions, identify the organizations responsible for the action and specify the costs for the program during the planning and implementation phases.

#### **5.15 Task 15 – Assess Health and HIV/AIDS Risks**

The objective of this task is to prepare a Health and HIV/AIDS Management Plan to provide a framework to protect the health of, and prevent transmission of HIV/AIDS to, employees and the public during the construction and operational phases of the Project.

The Consultant shall:

- Review potential health risks, including the transmission of HIV/AIDS, from the temporary influx of construction workers and permanent operation and maintenance staff in the various sections of the Project area.
- Prepare a Health and HIV/AIDS Management Plan to provide a framework to protect the health of, and prevent the transmission of HIV/AIDS to, employees and the public during the construction and operation phases. This plan should present in table form a description of the actions to be taken, the benefit of the proposed actions, identification of the organizations responsible for the action and the costs for the program during the planning and implementation process.

#### **5.16 Task 16 – Prepare a Set of Topographic Base Maps for Data Display and Locations for Mitigation Actions**

The objective of this task is to provide for preparation of a set of topographic base maps for display of baseline data and information of mitigation and monitoring actions on a site-specific basis. This approach is routine practice at the international level for oil and gas pipelines. In undertaking this task, the Consultant will use information developed by Feasibility Study and the Sub-Studies, among other sources.

The Consultant shall:

- Prepare a set of topographical base maps with an overlay of property ownership boundaries along the alignment of the proposed route for the conveyance at the scale of approximately 1:25,000 or smaller. The corridor width should be sufficient to include all related permanent facilities (e.g., pumping stations, hydropower and desalination facilities, etc.) and temporary facilities (construction camps, material storage yards, etc.).
- These basic alignment maps will be used to produce two sets of maps for the project specific assessment described below: (a) map set to illustrate all key environmental

and social baseline data and all major constraints; and (b) map set to clearly indicate the nature and locations for all site-specific mitigation measures and all other recommended site-specific actions.

### **5.17 Task 17 – Characterize and Assess Major Environmental, Social, and Security Risks**

The objective of this task is to assess the risks of certain low-probability, high magnitude events that deserve special treatment. In addition to the various environmental and social consequences of the Project described above, there are events that are highly uncertain, and not easily addressed in the usual procedure of comparing expected positive outcomes to expected negative outcomes. Information developed by Previous Studies, among other sources, will be used by the Consultant in undertaking this task.

The Consultant shall:

- Identify, characterize, and assess any major Project-related environmental risks not addresses in the previous tasks. These include large-magnitude events, which are highly uncertain, such as catastrophic failure of the conveyance system due to a seismic event or a deliberate act.
- Identify, characterize, and assess any major Project-related social risks not addresses in the previous tasks. These might include significant social unrest caused by the presence of non-national workers, or Project-related events that cause local populations to lose any means of livelihood for periods of time.
- Identify, characterize, and assess the potentially significant Project-related security risks. These include the potential for facility destruction as well as interference with operations.

### **5.18 Task 18 – Identify and Assess Cumulative Environmental and Social Impacts at the Project Specific Level**

The objective of this task is to identify and assess the cumulative environmental and social impacts from the Project including Aqaba and the Gulf of Aqaba, Wadi Rum and Disi Region, areas close to the pipeline route, and Amman Region. It will also examine the cumulative impacts, both positive and negative, on the region. This analysis will examine the complex environmental, social and economic linkages of this large Project during construction and operation of the Project. Information developed by the Feasibility Study and the Sub-Studies, among other sources, will be used by the Consultant in undertaking this task.

The Consultant shall:

- Using materials prepared for preparation of the Feasibility Study, especially on the environmental, social and economic aspects identify and assess the cumulative environmental and social impacts from construction and operation of the Project. This analysis will look at the “big picture” of potential impacts, both positive and negative, as they might occur in a systemic manner over time and space. It will focus on identification of larger patterns of impacts that are not readily identified using the regional or project specific approaches to analysis of impacts.
- Prepare a management and monitoring plan to address cumulative impacts in a cost-effective and timely manner. This plan will include a table that identifies the actions to be taken, the reason they are recommended, their investment and operational costs, and which organizations should undertake these activities.

### 5.19 Task 19 – Develop an Environmental and Social Management Plan

The objective of this task is to prepare a detailed Environmental and Social Management Plan (ESMP) to mitigate and monitor potential environmental and social impacts during implementation and operation of the Project.

The Consultant will prepare an Environmental and Social Management Plan to identify: (a) the set of mitigation measures to address potentially adverse impacts; (b) the legal framework and institutional structure and strengthening required to implement the mitigation measures; and (c) the monitoring program to verify compliance with the recommended mitigation measures and to monitor unanticipated impacts that might arise. Specific details concerning each of these components are discussed below.

The Consultant shall prepare an Environmental and Social Management Plan that:

- Identifies and describes a detailed plan for mitigation and monitoring of potential environmental and social issues associated with the Project at the regional and project specific level.
- Provides for a phased program of Project implementation and identifies a process for development, review and approval of supplemental ESMPs for Project elements that may need to be developed in detail in the future.
- Provides an evaluation of projected mitigation and monitoring activities for the Project elements, which should be presented in a table format for the design, construction and implementation phases, including the recommended action, why it should be undertaken, when it should be undertaken, who will be responsible and what would be the investment and/or operational cost for this action.
- Includes a cost estimate and implementation schedule that is fully coordinated with those to be used for the final design, implementation and operation of the Project.

#### *Sub-Task 1 – Design of Mitigation and Monitoring Measures*

Mitigation measures should include feasible and cost-effective measures to prevent significant adverse environmental and social impacts or reduce them to acceptable levels. There should be a distinction made between measures associated with the construction phase of the Project and those associated with the operational phase. Each mitigation measure should be described in as much technical detail possible, to a level of detail equivalent to preliminary engineering. The type of impact to be minimized and the conditions under which it is required should be described, along with clear objectives for construction methods, equipment selection and performance criteria.

At a minimum, the Consultant should prepare the following:

- Construction Phase Mitigation and Monitoring
  - *Archaeology/Cultural Resources Mitigation Plan* to manage any archeological or cultural impacts that may be encountered during construction.
  - *Involuntary Resettlement and Land Acquisition Framework and Involuntary Resettlement and Land Acquisition Plans (if required)* to manage the relocation and income restoration of persons that might be subject to involuntary resettlement and/or land acquisition.
  - *Indigenous Peoples Development Framework and Indigenous Peoples*

- *Development Plan (if required)* to manage potential impacts to Bedouin populations and their herds during the construction and operational phases.
- *Construction Spoils Management Mitigation Plan* to manage the disposal in an environmentally friendly manner of the generated construction spoils.
- *Erosion and Sediment Control Mitigation Plan* to describe the measures during construction to minimize sediment carried by runoff from entering downstream surface water drainage systems (particularly for urbanized areas).
- *Fugitive Dust Control Mitigation Plan* to control fugitive dust control emissions during construction activities.
- *Noise Control Mitigation Plan* to control noise impacts on the surrounding communities during blasting and construction activities.
- *Wadi Crossing Mitigation Plan* to minimize the pollution and disruption associated with the construction crossings.
- *Tree Planting and Restoration of Natural Habitats Mitigation Plan* to ensure proper revegetation of areas disturbed by construction activities.
- *Traffic Control Mitigation and Public Communications Plan* to minimize the disruption of daytime traffic flows along important access roads.
- *Occupational Health and Safety Plan* to minimize health and safety risks to permanent and temporary employees of contractors during the construction phase, to staff during the operational phase, and to the public during both phases.
- *Health and HIV/AIDS Management Plan* to provide a framework to protect the health of, and prevent the transmission of HIV/AIDS to, both employees and the public during the construction phase.
- *Updated Public Consultation and Community Communications Plan for Construction Activities* to take into account all the impacts and mitigation measures identified during preparation of the Final Environmental and Social Assessment.
- *Operations Phase Mitigation/Monitoring*
  - *Health and Safety Mitigation/Monitoring Plan* for operations/maintenance personnel and the general public during operation activities;
  - *Residuals Handling and Disposal Mitigation/Monitoring Plan* during operations;
  - *Updated Public Consultation and Community Communications Plan for Operations Activities* that takes into account all the impacts and mitigation identified during preparation of the Final ESIA.

### *Sub-Task 2 – Identification of Institutional Needs to Supervise Mitigation and Monitoring*

The Consultant shall review the authority and capability of institutions at local, regional, and national levels and recommend steps to strengthen or expand them so that these institutions can provide oversight of environmental and social management and monitoring of the construction and operation phases of the Project.

The Consultant shall also prepare: (a) an implementation schedule for achieving the institutional strengthening that must be carried out as part of the Project, showing phasing and coordination with overall Project implementation plans, from construction to commissioning (start-up/turnover) to operations; and (b) the capital and recurrent cost estimates and sources of funds for implementing the institutional strengthening measures.

The level of monitoring should include at least weekly, and at some sites daily, inspections during construction activities to ensure compliance with the recommendations in the Environmental and Social Management Plan, and should clearly indicate roles and responsibilities. Monitoring should be detailed for choice of parameters, quantitative performance standards and frequencies (e.g., noise levels, dust levels, sediment management, restoration of disturbed land areas, special provisions for wadi crossings, etc.).

Post-construction frequency and performance indicators should also be developed, as well as the longer term environmental monitoring of operations. A reporting format that is simple and cost-effective should be developed to document monthly and annual progress in monitoring.

### *Sub-Task 3 – Resettlement and Land Acquisition Policy Framework and Plan(s)*

Although the vast majority of the land required for the Project is owned by the Government of Jordan, measures will be taken by the Consultant to prepare a project specific Resettlement and Land Acquisition Policy Framework. The Policy Framework will be available for use in case it is required during the course of Project implementation. This Policy Framework will provide a detailed review of the potential need for involuntary resettlement and land acquisition and the general approach, procedures and principles of compensation for residents, compensation for relocations of businesses, compensation for the involuntary acquisition of land, compensation for temporary disruption of businesses, and compensation for damage to crops, trees or other types of property.

### *Sub-Task 4 – Environmental and Social Management Plan: Schedule, Responsibilities and Costs*

The Consultant shall provide: (a) an activities description and time-line schedule for implementing the: (i) Environmental and Social Management Plan; (ii) Resettlement and Land Acquisition Plan (iii) Occupational Health and Safety Plan; and Health and HIV/AIDS Management Plan, with a breakdown of the sub-activities of mitigation measures, institutional strengthening and monitoring activities that are recommended for the Project, showing phasing and coordination with overall Project plans from construction to operations; (b) the entity responsible for each activity, and to whom they report functionally and legally, and (c) the capital and recurrent cost estimates and sources of funds for implementing the Environmental and Social Management Plan.



## **6 Preparation, Submittal, and Disclosure of Final ESIA Report**

The resultant ESIA report, including the ESMP will incorporate all the findings of the environmental investigations described in the previous sections and alternatives including the proposed action. The report structure shall be consistent with and MoE requirements. Preliminary draft and final draft versions of the report shall be prepared for review by MoE and JVA, prior to finalizing the report for submittal to MoE, and JVA and public disclosure.

An Executive Summary shall be prepared for of the ESIA/ESMP in Arabic and English to facilitate public review in a manner that can be accessible to non-technical reader. The main reports can be prepared in English only.

Provisions shall be made for the disclosure of information to local communities before the construction phase of the Project. The Consultant shall prepare a suggested distribution list for the copies, with the objective of a wide dissemination of the reports to stakeholders, universities and the public. Public disclosure shall be coordinated and undertaken consistent with applicable MoE and JVA requirements associated with environmental approval of the proposed project.

In addition, a master hard copy and master soft electronic copy suitable for reproduction purposes should be provided to JVA to meet any future needs for reprinting.

## **7 Deliverable Requirements**

The Consultant shall prepare and submit the following reports to get MoE and JVA approval consistent with the regulations and procedures identified in the TOR:

1. Draft and Final Scoping Statement;
2. Draft and Final Environmental and Social Management Plan;
3. Findings Reports upon completion of each task of sections (5.1-5.19), subject to MWI/JVA approval at the end of each sub-tasks;
4. Final Assessment of Marine Studies including Intake and Brine Structures Report;
5. Draft Environmental Impact Assessment Report;
6. Final Environmental Impact Assessment Report.

## **8 Payment Schedule**

The following payments shall be made to the Consultant after having approved by MWI/JVA.

Findings Reports to be paid upon completion of the submittals of all the findings for each task:

No.	Deliverable	Payment % from contract total sum
1.	Draft and Final Scoping Statement	10%
2.	Draft and Final Environmental and Social Management Plan	25%
3.	Findings Reports upon completion of each task of sections (5.1-5.19), subject to MWI/ JVA approval at the end of each sub-tasks	15%
4.	Final Assessment of Marine Studies including Intake and Brine Structures Report	10%
5.	Draft Environmental Impact Assessment Report	15%
6.	Final Environmental Impact Assessment Report	25%

## 1. Key Exeprts

A suggested composition is as follows (key team members, to be complemented as appropriate):

- **Project manager:** a consultant with experience in managing ESIA's and E&S due diligence audits, with excellent communication skills
- **Environmental specialist** with experience in ESIA's and E&S due diligence audits in the water and wastewater industry
- **Health and safety specialist** with experience in the transport industry
- **Other environmental specialists**
- **Social specialist(s)** with experience in the host country, including public consultation in the local context, gender expertise, and/or resettlement expertise, as required



**ANNEX B**

**Presentation of Curricula Vitae (CV)**

The comprehensive Curricula Vitae of the definitely assigned personnel shall be presented in the form as shown below:

1. Proposed position:
2. Firm
3. Family name:
4. First names:
5. Date of birth:
6. Nationality:
7. Civil status:
8. Education:

Institution	
Date: from (month/year) to (month/year)	
Degree(s) or Diploma(s) obtained	

9. Language skills, mark 1 (worst) to 5 (best) for competence:

Language	Reading	Speaking	Writing

10. Memberships of professional bodies:
11. Other skills:
12. Work experience:
13. Regional experience/Experiences in foreign countries during stays of longer than 2 months (project details shall be shown under 14.):

Country	Date: from (month/year) to (month/year)

14. Professional experience record (projects):

Date, project, location, company, position, description of activities, financing source (i.e. donor)

15. Others (e.g. publications):

**ANNEX C**

**Model for Financial Proposal – Cost breakdown**

No.	Description	Unit	Quantity	JOD
1	Lump sum: (Scoping Session Handout) including the General Sales Tax	Lump sum	10%	
2	(Draft and Final Scoping Statement) including the General Sales Tax	Lump sum	25%	
3	Lump sum: (Draft Preliminary Environmental Impact Assessment Report) including the General Sales Tax	Lump sum	35%	
4	Lump sum: (Final Preliminary Environmental Impact Assessment Report) including the General Sales Tax	Lump sum	30%	


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**ANNEX D**

**Model for Consulting Contract**

The C-1 Engineering Services Contract (Latest Edition)

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**ANNEX E**

**Model for Summary Table of Staff Input**

	<b>Total</b>		
	Jordan (Man-Days)	Overseas (Man-Days)	Total (Man-Days)
<b>1. Local &amp; Expatriate staff</b> 1.1 Project Director 1.2 Team Leader 1.3 Expert 1 1.4 Expert 2 1.5 Expert 3 1.6 Expert 4 1.7 Expert 5			
Support Staff (technical/CAD, secretary)  <b>TOTAL (incl. supporting staff)</b>			

**ANNEX F**

**Model Performance Guarantee**

Address of guarantor bank:

.....  
.....  
.....

Address of beneficiary (Client):

.....  
.....  
.....

On.....you concluded with (name and full address)  
.....  
.....("Consultant") a Contract for  
..... (project, object of  
the Contract) at a price of.....

We are pleased to inform you that our Bank .....has agreed to provide a financial guarantee to the Consultant for an amount of ..... Jordanian Dinars as a performance guarantee to ensure that the Consultant performs the services in accordance with the conditions of contract.

We agree to pay you right at your first demand the said amount with no reservation, stipulation or any other condition and regardless to any objection from the consultant.

This guarantee shall remain valid from the date of issuance until the final completion of the services under contract agreement, which is reckoned to be on the Day ..... month ..... of the year ....., unless extended or renewed upon the Employer's Request.

This Guarantee is governed by the Laws of the Hashemite Kingdom of Jordan.

Guarantor's signature / Bank: .....

Authorized to sign: .....

In the presence and witness of: .....

Date: .....

**ANNEX G**

**Declaration of the Other Payments**

I, the undersigned and fixing my seal below.....

We, the undersigned and fixing our seals below.....

We declare that we are aware of the provisions under article (22-R) of the General conditions of the Contract Agreement of the Engineering Services (C1) and in compliance with this article; we enclose a properly signed declaration disclosing all direct or indirect commissions, consulting fees, agent fees or others and anything of a financial value paid or agreed to be paid to "the others" we also attach a detailed description of these Other Payments and to whom they were paid to and the basis thereof whether made or to be made directly or indirectly by us or on our behalf or by our Sub-Consultants or on their behalf or by their staff, agents or representatives in connection with the Invitation to submit offers for the execution of this Contract or the Bidding / Auctioning itself or the award to the Consultant or the negotiations to sign the Contract or for its actual execution.

We also agree to promptly present a written declaration to the First Party of the existence of any Other Payments including, for example, a detailed description of the reason thereof, on the date of paying or obliged to pay, whichever occurs first. We also agree that the First Party to take the actions stated under the aforementioned article at the event of any violation or breach by us of the provisions of article (22/R/1) thereof, and we abide ourselves to all what provided for in this article.

Accordingly, we sign on: .....  
Consultant's name: .....  
Name of authorized person to sign.....  
Signature of authorized person to sign.....  
Seal.....

*\* The Consultant shall submit the Declaration of the Other Payments. In the event that the he did not pay any commissions, fees or any of the matters stated in article (R-22) he shall mention so in the submitted Declaration. Any one do not submit such Declaration, his offer will be rejected. Consultant shall put the declaration in a separate sealed envelope.*

**ANNEX H**

**Declaration of the Illicit Payments**

I, the undersigned and fixing my seal below.....

We, the undersigned and fixing our seals below.....

We declare that are aware of the provisions under article (22-Q) of the General condition of the Contract Agreement of the Engineering Services (C1) and in compliance with this article; we enclose a properly signed declaration disclosing that we did not pay any direct or indirect commissions, consulting fees, agent fees or others and anything of a financial value or give promises or pledges to pay or offer such things whether directly or in directly regardless whether this was made by us or on our behalf or by our Sub-Consultants or on their behalf or by their staff, agents or representatives to the First Party including without limitation any "official" whether or not acting in an official capacity, in connection with the Invitation to submit offers for the execution of this Contract or the Bidding / Auctioning itself or the award to the Consultant or the negotiations to sign the contract or for its actual execution.

We also agree not to pay or promise to pay such payments whether directly or indirectly regardless whether this was made by us or on our behalf or by our Sub-Consultants or on their behalf or by their staff, agents or representatives to any "official" in connection with the amendment, renewal, extension or execution of this Contract.

Accordingly, we sign on: .....  
Consultant's name: .....  
Name of authorized person to sign.....  
Signature of authorized person to sign.....  
Seal.....

---

*\* The Consultant shall submit the Declaration of the illicit Payments. In the event that he did not pay any commissions, fees or any of the matters stated in article (Q-22) he shall mention so in the submitted Declaration. Any one do not submit such Declaration, his offer will be rejected. Consultant shall put the declaration in a separate sealed envelope.*

*\*NOTE: In the event of any difference in interpretation between the English and Arabic text, the Arabic text shall prevail.*



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