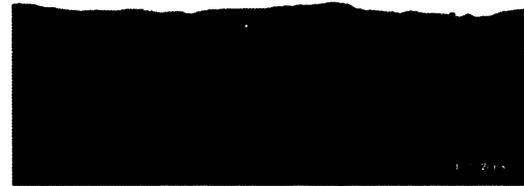
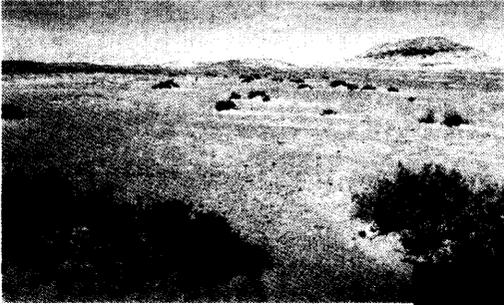


E991
Volume 2

المملكة الأردنية الهاشمية

The Hashemite Kingdom of Jordan

MINISTRY OF WATER & IRRIGATION



Environmental and Social Assessment
Disi-Mudawarra to Amman Water Conveyance System

Main Report – Part A: Overview

June 2004

TABLE OF CONTENTS

ENVIRONMENTAL AND SOCIAL ASSESSMENT REPORT

	Page
COVERING LETTER	
TABLE OF CONTENTS	i
LIST OF ANNEXES	vii
LIST OF ABBREVIATIONS	ix
Executive Summary	S-1
Main Report – Part A: Overview	
1 INTRODUCTION	A-1
1.1 Background	A-1
1.2 Project Objectives	A-2
1.3 Organization of the ESA Study	A-2
1.4 Description of Parts A, B and C of the ESA Study	A-4
1.5 Relationship between Parts A, B and C of the ESA Study	A-6
1.6 Consultations during the ESA Study	A-6
1.7 ESA Disclosure	A-8
1.8 Maps to Support Environmental and Social Management Plan	A-8
2 LEGAL AND ADMINISTRATIVE FRAMEWORK	A-10
2.1 Introduction	A-10
2.2 Institutional Framework	A-11
2.2.1 Overview of Governmental Organizations	A-11
2.2.2 Universities and Research Institutes	A-21
2.2.3 Non-Governmental Organizations (NGOs)	A-22
2.3 Major Stakeholders	A-24
2.4 Applicable National Environmental Legislation	A-24
2.4.1 Laws	A-25
2.4.2 Regulations (By-laws)	A-32
2.4.3 Strategies	A-36
2.4.4 Related Environmental International and Regional Conventions and Treaties	A-38
2.5 Applicable Policies of the World Bank	A-41
2.6 Legal and Institutional Issues	A-44
2.7 Recommendations	A-46
3 PROPOSED PROJECT	A-47
3.1 Origin and Scope	A-47
3.2 Location	A-48
3.3 Major Elements	A-50

3.4 Project Segmentation	A-53
3.5 Construction and Operational Phases	A-54
3.5.1 Project Implementing Organization	A-54
3.5.2 Operation of the Project and its Benefits	A-54

Main Report – Part B: Water Sector ESA

1 INTRODUCTION	B-1
1.1 Background	B-1
1.2 Project Objectives	B-2
1.3 Organization of the ESA Study	B-2
1.4 Description of Parts A, B and C of the ESA Study	B-4
1.5 Relationship between Parts A, B and C of the ESA Study	B-6
1.6 Consultations during the ESA Study	B-6
1.7 ESA Disclosure	B-7
1.8 Maps to Support Environmental and Social Management Plan	B-8
2 BACKGROUND ON JORDAN’S WATER SECTOR	B-10
3 ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS: JORDAN’S SCARCE WATER RESOURCES	B-12
3.1 Demand Sectors	B-12
3.2 Supply Sources	B-18
3.2.1 Surface Water	B-19
3.2.2 Groundwater Resources	B-24
3.3 Net Water Situation or Water Deficits	B-36
3.4 Key Assumptions Supporting the Projections/Objectives	B-40
3.4.1 Water Resources, Demand and Flexibility Management	B-40
3.4.2 Strategic Approach	B-41
3.4.3 Policies and Institutional Reform	B-41
3.4.4 Conjunctive Use and Development of Water Resources	B-42
3.4.5 Demand Management - Water Conservation, Pricing and Public Awareness	B-43
4 EVOLVING POLICY FRAMEWORK (1997 – 2002)	B-44
4.1 Strategy and Policies	B-44
4.1.1 Jordan Water Strategy of April 1997	B-44
4.1.2 Water Utility Policy of July 1997	B-49
4.1.3 Groundwater Management Policy of February 1998	B-50
4.1.4 Irrigation Water Policy of February 1998	B-51
4.1.5 Wastewater Management Policy of June 1998	B-51
4.1.6 Jordan Water Resources Sector Study	B-52
4.1.7 Jordan Water Sector Review	B-52
4.1.8 The Hashemite Kingdom of Jordan Water Sector Review Update Main Report	B-53
4.1.9 Water Sector Planning and Associated Investment Program 2002-2011	B-55

4.1.10	Ministry of Water and Irrigation Water Sector Action Plan 2002-2006	B-56
4.1.11	Other Water Studies	B-57
4.2	Key Challenges/Objectives for Improvement	B-59
4.3	Progress to Date	B-62
4.4	Key (Complementary) Investments	B-63
5	ANALYSIS OF DEVELOPMENT ALTERNATIVES FOR THE WATER SECTOR	B-65
5.1	Introduction	B-67
5.2	Analysis of Alternatives	B-69
5.3	“No-Project” Scenario	B-70
5.4	“With Project” Scenario	B-76
5.5	Review of Additional Alternative Actions	B-84
5.5.1	Development of Groundwater Resources	B-84
5.5.2	Water Demand Management	B-85
5.5.3	Wastewater Reuse (Municipal and Industrial)	B-86
5.5.4	Taping the Disi Aquifer in the Areas not Far from Amman	B-86
5.5.5	Brackish Water Desalination	B-86
5.5.6	Seawater Desalination	B-87
5.5.7	Red-Dead Sea Canal	B-87
5.5.8	Water Imports	B-87
5.6	Delayed Implementation of the Disi Project	B-87
6	SPECIFIC AND CUMULATIVE IMPACTS	B-89
6.1	Project Stakeholders	B-89
6.2	Specific Impacts	B-90
6.2.1	Impact of Withdrawing Groundwater from Disi Aquifer	B-92
6.2.2	Impacts on Aqaba	B-94
6.2.3	Treated Wastewater Reuse for Irrigation in Aqaba	B-95
6.2.4	Improved Water Quality for Users in Amman	B-95
6.2.5	Equitable Access of Central and Southern Areas	B-96
6.3	Cumulative Impacts	B-97
6.3.1	Reduced Pressure on Upland Aquifers and Azraq Oasis	B-98
6.3.2	Impacts on Demand for Wastewater Treatment and Jordan Valley	B-110
6.3.3	Overall Cumulative Impacts	B-112
7	ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN: MEASURES TO STRENGTHEN THE WATER SECTOR	B-114
7.1	Mid and Long Term Institutional Strengthening	B-114
7.1.1	Needs	B-115
7.1.2	Types of Training	B-115
7.1.3	Scope of Training Programs for Key Institutions	B-117
7.2	Mid and Long Term Monitoring	B-117
7.2.1	Management of the Disi Water	B-118
8	CONCLUSIONS AND RECOMMENDATIONS	B-119
8.1	Conclusions	B-119

8.2 Recommendations	B-120
---------------------	-------

Main Report – Part C: Project-Specific ESA (Volume 1)

1 INTRODUCTION	C-1
1.1 Background	C-1
1.2 Project Objectives	C-2
1.3 Organization of the ESA Study	C-2
1.4 Description of Parts A, B and C of the ESA Study	C-4
1.5 Relationship between Parts A, B and C of the ESA Study	C-5
1.6 Consultations during the ESA Study	C-6
1.6.1 First Phase of Public Consultation	C-7
1.6.2 Second Phase of Public Consultation	C-10
1.7 ESA Disclosure	C-11
1.8 Maps to Support Environmental and Social Management Plan	C-12
2 PROPOSED PROJECT	C-14
2.1 Origin and Scope	C-14
2.2 Location	C-15
2.3 Major Elements	C-17
2.4 Project Segmentation	C-20
2.5 Construction and Operational Phases	C-21
2.5.1 Project Implementing Organization	C-21
2.5.2 Operation of the Project and Its Benefits	C-21
3 ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS	C-22
3.1 Environmental Baseline Conditions	C-22
3.1.1 Physical Environment	C-22
3.1.2 Biological Environment	C-45
3.2 Agricultural Baseline Conditions	C-59
3.2.2 Description of the Current Agricultural Settings along the Alignment	C-61
3.2.3 The Sustainability of Large-Scale Agriculture in the Disi Area	C-67
3.2.4 A Comparison of Water Consumption (Disi vs. the rest of the Country)	C-68
3.3 Social Assessment	C-70
3.3.1 Social and Economic Baseline Conditions	C-70
3.3.2 Social and Cultural Characteristics of the Indigenous Peoples	C-85
3.3.3 Land Acquisition Framework and Policy	C-89
3.4 Archaeological Baseline Conditions	C-92
4 ANALYSIS OF PROJECT SPECIFIC (“TECHNICAL”) ALTERNATIVES	C-104
4.1 No Action/Without Project	C-105
4.2 Development of the Well Field	C-107
4.3 Alignment of the Pipeline	C-107

5	ENVIRONMENTAL AND SOCIAL IMPACTS	C-109
5.1	Impacts on the Physical Environment	C-109
5.1.1	Construction Phase	C-109
5.1.2	Operation Phase	C-113
5.2	Impacts on Biological Conditions	C-115
5.2.1	Construction Phase	C-116
5.2.2	Operation Phase	C-117
5.3	Impacts on Agricultural Resources	C-117
5.3.1	Impact on Local Agricultural Communities in Disi Area	C-117
5.3.2	Impact on Large-Scale Farming Companies	C-118
5.3.3	Impact on Agricultural Activities along the Route from Qatraneh to Amman	C-118
5.4	Impacts on Socio-Economic Settings	C-119
5.4.1	Construction Phase	C-119
5.4.2	Operation Phase	C-125
5.5	Impacts on Archaeological Resources	C-125
5.5.1	Archaeological Sites Located within Segment (A): Jurf Al Drawish - Disi	C-125
5.5.2	Archaeological Sites Located within Segment (B): Al Qatraneh - Jurf Al Drawish	C-125
5.5.3	Archaeological Sites located within Segment (C): Reservoir Abu-Alanda - Airport - Al Jiza	C-125
6	CUMULATIVE PROJECT SPECIFIC IMPACTS	C-128
6.1	Cumulative Impacts on the Physical Environment	C-128
6.1.1	Landscape Damage, Change of Natural Drainage System and Local Geomorphology	C-128
6.1.2	Disi Aquifer System	C-128
6.2	Cumulative Impacts on Biological Conditions	C-129
6.3	Cumulative Impacts on Social Settings	C-129
6.3.1	Positive Cumulative Impacts	C-129
6.3.2	Negative Cumulative Impacts	C-131
7	EVALUATION OF CUMULATIVE PROJECT SPECIFIC IMPACTS	C-134
7.1	Evaluation of Cumulative Impacts on the Physical Environment	C-134
7.2	Evaluation of Cumulative Impacts on Biological Conditions	C-134
7.2.1	Construction Phase	C-134
7.2.2	Operation Phase	C-135
7.3	Evaluation of Cumulative Impacts on Social Settings	C-135
8	ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN	C-136
8.1	Rational and Justification	C-136
8.2	Planning and Framework of the ESMP	C-136
8.3	Environmental and Social Management Plan (ESMP)	C-139
8.3.1	Environmental Policy and Commitment	C-139
8.3.2	Policy, Legal and Administrative Requirements	C-139
8.3.3	Structure and Responsibility	C-140

8.3.4	Environmental and Social Objectives	C-144
8.3.5	Environmental and Social Aspects	C-153
8.3.6	Management Programs for Mitigation of Impacts	C-159
8.3.7	Environmental and Social Monitoring	C-171
8.4	ESMP Control	C-175
8.5	Implementation and Operation	C-178
8.5.1	Training, Awareness and Competence	C-178
8.5.2	Communication	C-179
8.5.3	Emergency Preparedness and Response	C-180
8.6	Checking and Corrective Action	C-181
8.7	Management Review	C-182
9	CONCLUSION	C-183

LIST OF ANNEXES

Annexes Related to Part A: Overview

- A1- Interim Law No. (68) for the Year 2003 - The Investment Law
- A2- Instruction for Protection of Employees and Workers against Occupational Risks of 1998
- A3- World Bank Operational Policy 4.01
- A4- List of project team members who prepared the ESA Study and Supporting Documents

Annexes Related to Part B: Water Sector ESA

- B1- Ministry of Water and Irrigation Water Sector Action Plan 2002-2006
- B2- List of project team members who prepared the ESA Study and Supporting Documents
- B3- List of References

Annexes Related to Part C: Project-Specific ESA (Volume 2 and Maps)

- C1- Interview Records
- C2- Scoping Statement and Record of Public Consultation
- C3- Draft ESA and Record of Public Consultation
- C4- Suggested Distribution List for Disclosure of the ESA Study
- C5- Maps
- C6- Climatological Characteristic Along the Project Corridor
- C7- Characteristics of the Rainfall Stations with Effective Area for Disi Basin
- C8- Flood Flow Calculations
- C9- IDF Curves
- C10- Flow Sections
- C11- Groundwater Abstraction from Disi-Mudawarra wells during 1996-2001
- C12- Groundwater Aquifers in Disi-Mudawarra Wells
- C13- Geology, and Hydrogeology-Water Quality of Disi-Mudawarra and Aquifer System
- C14- Important Bird Areas (IBA's) Criteria
- C15- Flora along the project Alignment
- C16- Herpetofauna along the Project Alignment
- C17- Bird Species along the Project Alignment
- C18- Population Projections in the Primary Zone of Influence / Right - of - Way and in the Extended Zone of Influence / Governorate
- C19- HIV/AIDS Statistics
- C20- Details of Land Acquisition Already Completed

- C21- Legal Review Annexes
 - Jordanian Drinking Water Standards JS 286: 2001
 - Pollutants- Ambient Air Quality Standards
 - Pollutants- Allowable Limits for Gaseous Pollutants Emitted from Gasoline Engined Vehicles (703/1990)
 - Noise Regulation
 - Acoustic Guide to International Standards on the Measurement of Airborne acoustical Noise and Evaluation of its effects on Human Beings
 - The Jordanian Antiquities Law No. 12 for the Year 1976
 - Regulations of Archaeological Excavations and Surveys
 - Jordanian Ambient Air Quality Standards (JS: 1140/1999)
- C22- Specific Mitigation Measures for Archaeological Settings Located within the Project Zone of Effect
- C23- Disi Area Development Plan
- C24- Resettlement Framework
- C25- Estimated Costs of the ESMP
- C26- List of project team members who prepared the ESA Study and Supporting Documents
- C27- List of References

LIST OF ABBREVIATIONS

ARICAD	Arab International Company for Agricultural Development
ASEZ	Aqaba Special Economic Zone
ASEZA	Aqaba Special Economic Zone Authority
a.s.l	Above Sea Level
BOO	Build, Own, Operate
BOOT	Build, Own, Operate, Transfer
BOT	Build, Operate, Transfer
CC	Consolidated Consultants Engineering and Environment
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS	Conservation of Migratory Species
CRM	Cultural Resources Management
CSCs	Common Services Councils
DADP	Disi Area Development Plan
DAI	Development Alternatives, Inc.
DEHC	Department of Environment and Health Control
DOA	Department of Antiquities
DOS	Department of Statistics
Dunum	A dunum represents 1,000 m ² (1 Dunum = 0.1 hectare)
EA	Environmental Assessment
EC	Electrical Conductivity (expressed in µS/cm)
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
EPC	Executive Privatisation Commission
EPL	Environment Protection Law
ERC	Electricity Regulatory Commission
ESA	Environmental and Social Assessment
ESMP	Environmental and Social Management Plan
ESSD	Environmental and Socially Sustainable Development
EU	European Union

FAO	Food and Agriculture Organization
FOE	Friends of Environment
GCEP	Government Corporation for Environment Protection
GDP	Gross Domestic Product
GEF	Global Environment Facility
GOJ	Government of Jordan
GRAMECO	Grains, Fodders and Meat Production Company
GTZ	German Agency for Technical Cooperation
ha	Hectares (1 ha = 10 dunums)
IBAs	Important Bird Areas
IRR	Internal Rate of Return
IT	Information Technology
JACA	Jordan Aqua Conservation Association
JD	Jordanian Dinars (1 JD = 1.41 US Dollars; 1 JD = 1.16 Euros)
JES	Jordan Environment Society
JIB	Jordan Investment Board
JISM	Jordan Institute for Standards and Metrology
JREDS	Jordan Royal Ecological Diving Society
JUST	Jordan University of Science and Technology
JVA	Jordan Valley Authority
KAC	King Abdallah Canal
KTDR	King Talal Dam Reservoir
l/c/d	Litres per Capita per Day
LEMA	Lyonnaise des Eaux, Montgomery Watson Arabtech Jardaneh - a private operator
MCM	Million Cubic Meters
MEMR	Ministry of Energy and Mineral Resources
MMA	Ministry of Municipal Affairs
MOA	Ministry of Agriculture
MOE	Ministry of Environment
MOH	Ministry of Health

MOP	Ministry of Planning
MOT	Ministry of Tourism
MPWH	Ministry of Public Works and Housing
MSS	Marine Science Station
MWI	Ministry of Water and Irrigation
NES	National Environmental Strategy
NGO	Non-Governmental Organization
NPV	Net Present Value
NRA	National Resources Authority
O&M	Operation and Maintenance
OMS	Operation and Management Support project
PC	Project Company
PMU	Project Management Unit
ppm	Parts Per Million
QACU	Quality Assurance and Compliance Unit
RO	Reverse Osmosis
RSCN	Royal Society for Conservation of Nature
RSS	Royal Scientific Society
SCBA	Social Cost Benefit Analysis
SCS	US Soil Conservation Service
SOP	Standard Operating Procedures
sp./spp.	Specie(s)
SWWTP	As-Samra Wastewater Treatment Plant
TRC	Telecommunication Regulatory Commission
TOR	Terms of Reference
TSP	Total Suspended Solids
UFW	Unaccounted for Water
USAID	United States Agency for International Development
USD	US Dollars (1 USD = 0.709 JD; 1 USD = 0.83 Euros)

WADICO	Al Wafa for Agricultural and Animal Development
WAJ	Water Authority of Jordan
WERSC	Water and Environment Research and Study Centre
WHO	World Health Organization

MAIN REPORT – PART A
OVERVIEW

ENVIRONMENTAL AND SOCIAL ASSESSMENT REPORT

MAIN REPORT – PART A: OVERVIEW

	Page
TABLE OF CONTENTS	i
LIST OF ANNEXES	ii
LIST OF TABLES	iii
LIST OF FIGURES	iii
1 INTRODUCTION	A-1
1.1 Background	A-1
1.2 Project Objectives	A-2
1.3 Organization of the ESA Study	A-2
1.4 Description of Parts A, B and C of the ESA Study	A-4
1.5 Relationship between Parts A, B and C of the ESA Study	A-6
1.6 Consultations during the ESA Study	A-6
1.7 ESA Disclosure	A-8
1.8 Maps to Support Environmental and Social Management Plan	A-8
2 LEGAL AND ADMINISTRATIVE FRAMEWORK	A-10
2.1 Introduction	A-10
2.2 Institutional Framework	A-11
2.2.1 Overview of Governmental Organizations	A-11
2.2.2 Universities and Research Institutes	A-21
2.2.3 Non-Governmental Organizations (NGOs)	A-22
2.3 Major Stakeholders	A-24
2.4 Applicable National Environmental Legislation	A-24
2.4.1 Laws	A-25
2.4.2 Regulations (By-laws)	A-32
2.4.3 Strategies	A-36
2.4.4 Related Environmental International and Regional Conventions and Treaties	A-38
2.5 Applicable Policies of the World Bank	A-41
2.6 Legal and Institutional Issues	A-44
2.7 Recommendations	A-46
3 PROPOSED PROJECT	A-47
3.1 Origin and Scope	A-47
3.2 Location	A-48
3.3 Major Elements	A-50
3.4 Project Segmentation	A-53
3.5 Construction and Operational Phases	A-54
3.5.1 Project Implementing Organization	A-54
3.5.2 Operation of the Project and its Benefits	A-54

LIST OF ANNEXES

Annexes Related to Part A: Overview

- A1- Interim Law No. (68) for the Year 2003 - The Investment Law
- A2- Instruction for Protection of Employees and Workers against Occupational Risks of 1998
- A3- World Bank Operational Policy 4.01
- A4- List of project team members who prepared the ESA Study and Supporting Documents

LIST OF TABLES

Table	Page
Table 1: List of project related maps	A-9
Table 2: Fees (paid to WAJ)	A-32
Table 3: Selected international environment agreements	A-38
Table 4: Summary of the key elements of the project	A-52

LIST OF FIGURES

Figure	Page
Figure 1: Schematic diagram linking the three parts of the ESA study	A-6
Figure 2: Optimised alignment of the Disi-Mudawarra to Amman water conveyance system	A-49
Figure 3: Segmentation of the project area	A-53

MAIN REPORT – PART A: OVERVIEW

1 INTRODUCTION

The proposed Disi-Mudawarra to Amman Water Conveyance System is being undertaken by the Ministry of Water and Irrigation (MWI) of the Hashemite Kingdom of Jordan. The development and implementation of this project pose a range of significant environmental and social issues since it will be based on the use of a non-renewable fossil groundwater aquifer and require changes in the existing patterns of water use. While justified under the unique water resources management situation in Jordan, such a development was subjected to a detailed environmental and social impact study that allows decision makers and stakeholders to understand the potential impacts at the sectoral and project specific levels over the short-, medium-, and long-term.

1.1 Background

Jordan is known for its scarce water resources. Throughout history, the people in Jordan have suffered from water shortages due to the semi-arid climate that is associated with limited annual rainfall. Over the past few decades, the problem was enormous due to high natural population growth, rural to urban migration and major influxes of population in response to political and economic crises in the Middle East. These trends have resulted in increased demand from domestic and industrial users.

The main water resources in Jordan are groundwater sources, surface water resources and treated wastewater effluent. The variability in the surface water resources left no choice but the use of groundwater resources to cover part of the shortage.

The total renewable safe yield of the groundwater resources in the whole of Jordan is 277 MCM/year, which does not include the Disi aquifer as this is a non-renewable source. Although extraction from these sources exceeded this safe yield by more than 200 MCM/year in recent years, Water Authority of Jordan (WAJ) was unable to meet the substantially increasing demand. The declining per capita water availability in Jordan, the limited storage capacity and projected future water deficits are presented in **Section 3** of the Main Report - Par B.

Continuation of this overexploitation of groundwater sources at these high levels will lead to mining these sources as well as deteriorating the quality of abstracted water, which will lead at the end to an extensive damage of the aquifers. Therefore, the Ministry of Water and Irrigation (MWI) and WAJ laid out planning strategies for utilising water resources to ensure optimum use in conjunction with municipal demands. The water resources strategy included existing and potential sources. Investment programs were developed to implement new projects such as water harvesting, dams and rehabilitation and restructuring water systems to minimize the unaccounted for water (UFW). Concentration was made on demand management and public awareness programmes. New sources were identified to relief the existing groundwater source and allow the natural recharge of these sources and to restore their water quality which shall relief part of water shortage in Greater Amman area.

One of the major water demand centres is Greater Amman area. The water supply in the area has been outstripped by the demand and rationing program was implemented by WAJ during the summer months since 1988. This situation is deteriorating each year by the increase of demand and therefore, MWI had to consider the option of implementing the Disi Project by conveying water from the southern part of Jordan to Amman.

The contract for preparation of the feasibility study and preliminary design for the Water Conveyance System from Disi-Mudawarra to Amman was awarded by MWI to Harza Group. The feasibility study and preliminary design were submitted to the Ministry in 1996 and the detailed design and tender documents in 1997. An optimisation of the design was later awarded to Brown and Root North Africa who submitted their report in 2001.

The Disi Aquifer, also known as Rum aquifer system, is a transboundary aquifer that extends from south of Jordan into Saudi Arabia where it is known as Saq Aquifer System. However, both the Rum and the Saq actually form one aquifer system with the larger portion located within Saudi Arabia. Generally, the groundwater flows from the Saudi Arabia in the south towards north east Jordan and in Central Jordan it deviates to north west and lastly towards west where it discharges its water in the Dead Sea and in the deep wadis draining the eastern highlands towards the Rift Valley.

1.2 Project Objectives

The main objective of this project is to supply additional high quality water to Greater Amman region from the deep fossil Disi Aquifer by conveying the water a distance of approximately 325 km from Amman. For a number of years water has been outstripped by demand in the Greater Amman Region and MWI has no option but to implement a water rationing program during the summer months. This situation has been ongoing since 1988, and is becoming more complex each year as water demand in this area increases. The provision of this reliable additional water supply would provide an opportunity for Jordanian authorities to reduce groundwater abstractions in the Greater Amman Region and allow for partial restoration of renewable resources in this region.

The project has also a secondary objective and that is to provide five emergency turnouts from the conveyance pipeline that will run from the water well field in the south of Jordan due north to the south of Amman. These turnouts will be located at key locations to ensure reliable water supply to secondary urban areas along the pipeline under emergency conditions and for short durations.

1.3 Organization of the ESA Study

The ESA process has consisted of the following main preparation activities:

- Consultation and Communication Program
- Three Rapid Diagnostic Field Reports
- Annotated Outline of the ESA Study - Parts A, B, and C
- Preliminary Draft ESA Main Report - Parts A, B, and C
- Draft ESA Reports - Executive Summary and Parts A, B, and C
- Final ESA Reports - Executive Summary and Parts A, B, and C

The Consultation and Communication Program was prepared in the planning phase of the ESA study. This program provided the framework of principles and approaches for the communications of social and environmental concerns and information to diverse audiences. It is planned for the study team and the proponent to respond to public concerns about exposure to social and environmental impacts and risks. The overall advantage of this communication program is to ensure that the anticipated adverse impacts and risks can be effectively mitigated.

The purpose of this program is to ensure the involvement of the best available information, experience and knowledge within the local and national community in the assessment. Local communities' communication and active public participation is an important tool in the ESA and in the implementation of the project-specific environmental and social management. This tool ensures that the proposed project messages are constructively formulated, transmitted, and received and that they result in meaningful feed back by the recipient, this would result achieving the following:

- Better understanding and appreciation of target groups to the proposed project conditions and benefits.
- Project communications more credible by local communities and affected populations.
- Community participation in helping and making choices to develop suitable and acceptable avoidance/mitigation scenarios.

Also, early at the beginning of this study the Consultant conducted rapid diagnostic assessment for both biological and archaeological settings within the project corridor, this preliminary assessment served as the basis for the impacts assessment of the project-specific impacts on biological, archaeological and cultural heritage resources, and as a framework of requirements to be reviewed by the MWI and considered for the Build-Operate-Transfer (BOT) terms of reference and for other parties involved in the project. The three submitted Rapid Diagnostic Reports are as follows:

- 1- Social, Resettlement and Land Acquisition Issues in Abu Alanda to the airport highway water pipeline segment: This report investigated in a diagnostic manner four main tasks of the TOR in order to verify available data and to design and conduct relevant surveys and investigations that might lead to proper analysis of each task.
- 2- Ecological Issues in the areas close the Wadi Rum Protected Area: This revised the previous designs, updated information on previously conducted assessments and considered new areas, which were recently proved to be of great ecological values, and are important for the survival of threatened species or containing characteristic and unique communities. It addressed the current ecological status of the project alignment. It also indicated the hot spots identified along the proposed alignment.
- 3- Archaeological and Historic Issues in the northern and southern water pipeline segments: This diagnostic report provided a diagnosis of the main archaeological and cultural heritage sites and issues along the project locations of all facilities related to the pipeline.

The Annotated outline consisted of the full table of contents used for the ESA in each of Parts A, B and C.

The Final Report is the sixth and the final of the required technical reports and its purpose is to provide the complete details of all work performed, analyses made, and justification of options and recommendations proposed. This report builds upon the reports completed previously and the comments raised by MWI. The Final Report is submitted in five separate sections which comprise the executive summary and the three parts of the study. These sections are as follows:

- **Executive Summary** which is prepared in both Arabic and English languages.
- **Main Report- Part A** which presents an overview of the Disi-Mudwarra to Amman Water Conveyance System project. More specifically, this section of the study addresses the following issues:
 - Policy, Legal and Administrative Framework in Jordan
 - Applicable World Bank Policies

- Description of the Proposed Project
- **Main Report- Part B** which is the Water Sector Environmental and Social Assessment. It provides a full picture of the water shortage problem in Jordan and the steps taken to reduce this shortage by development of local sources. More specifically, Part B addresses the following issues:
 - Water resources trends and water balance
 - Water policies and trends
 - Water sector management structure
 - Improvements in water use efficiency and conservations
 - Use of economic incentives
 - Environmental and social challenges in the water sector in Jordan
- **Main Report- Part C (Volumes 1, 2 and Maps)** which is the Project Specific Environmental and Social Assessment. Volume 1 of Part C is the main report and Volume 2 includes annexes referred to within Volume 1 except for **Annex C5** which is included in the document referred to as Maps. Main Report- Part C assesses the project-specific environmental and social concerns with regard to the following major subjects:
 - Physical Environment
 - Biological Environment
 - Agricultural Resources
 - Social Settings
 - Archaeological and Cultural Heritage Sites

Each of these sections stands alone so that it can be reviewed separately from the rest of the report's sections.

1.4 Description of Parts A, B and C of the ESA Study

Main Report: Part A - Overview addresses the policy, legal and administrative framework in Jordan. It focuses mainly on the institutional and legislative framework related to the institutions involved in the management and monitoring of the environment in Jordan, the institutions concerned with legislation and regulation of the sector, and the institutions tasked with enforcing these, with a view to determine the status of the legal and institutional context and to assess the environmental management capacity of the Kingdom, in particular those of relevance to the project. Also, this section highlight salient features of Jordan's environmental management capacity, in particular factors that affect the implementation of the project. It also addresses the set of policies and procedures that guide the operations of the World Bank and that are set out in the Bank's Operational Manual and indicates what safeguard policies are applicable to the proposed project.

Main Report: Part B - Water Sector Assessment of the Environmental and Social Assessment Study for the Disi project provides a full description of the background context against which the Disi project will be implemented. More specifically, this section:

- 1- Places the project and related activities in the context of the broader series of short-, medium- and long-term actions; and
- 2- Describes the evolving water policy framework in Jordan from 1997 – 2002, the analysis of alternative development scenarios for the water sector, the specific and cumulative impacts and measures to strengthen the water sector.

In achieving those objectives, Part B addresses the following:

- Water resources trends and water balance;
- Water policies and trends;
- Water sector management structure;
- Improvements in water use efficiency and conservations;
- Use of economic incentives; and
- Environmental and social challenges in the water sector in Jordan.

Main Report: Part C - The project specific ESA assesses the project-specific environmental and social concerns with regard to the following major subjects:

- 1- Physical Environment
- 2- Biological Environment
- 3- Agricultural Resources
- 4- Social Settings
- 5- Archaeological and Cultural Heritage Sites

The assessment process is based on the findings from site investigations, field surveys, consulting affected populations and groups, literature review, and pin pointing sensitive habitat and archaeological sites.

The ESA encompasses analysis and documentation of the existing baseline conditions with regard to the assessed subject areas within the project corridor. Also, the analysis includes evaluation of the alternatives to the proposed project including the “No action” alternative and alternatives to the development of the well field, alignment of the pipeline, and siting of supporting facilities.

The direct and indirect zones of effect were identified and potential impacts were assessed and quantified whenever possible. The impacts were found to be either temporary or permanent in nature. Cumulative impacts were also evaluated and suitable mitigation and management programs were suggested.

To uphold the Governmental Environmental Policy, a planning phase to identify the shape and framework of the Environmental and Social Management Plan (ESMP) has been completed during the environmental and social assessment phase. The ESMP is structured as follows:

- 1- Rational and Justification
- 2- Planning and Framework of the ESMP
- 3- Environment and Social Management Plan (ESMP)
- 4- ESMP Control
- 5- Implementation and Operation
- 6- Checking and Corrective Action
- 7- Management Review

1.5 Relationship between Parts A, B and C of the ESA Study

The relationships between Parts A, B and C of the ESA Study are recognized in order to understand their inter linkages.

As discussed in the TOR, the proposed project’s development and implementation present a range of significant environmental and social issues since it will be based on use of a non-renewable fossil groundwater and require changes in the existing patterns of water use. This was discussed in “Part B-Water Sector Assessment” and the reflection was considered in “Part C-Project Specific Environmental and Social Assessment” with the help of “Part A-Overview” that presented the legal and institutional tools. Under the unique water resources management situation in Jordan, this development is subjected to detailed environmental and social impact studies to allow decision makers and stakeholders to understand the potential impacts at the sectoral and project specific levels. The Environmental and Social Management Plan (ESMP) in Part C provides the proposed framework for mitigation, monitoring, and institutional development actions, as investigated in Part A, to be integrated into the design and implementation of the project. It also provides a sense of the present and future implications on the water sector in Jordan. **Figure 1** presents a schematic diagram for the general links between the three parts of the ESA study.

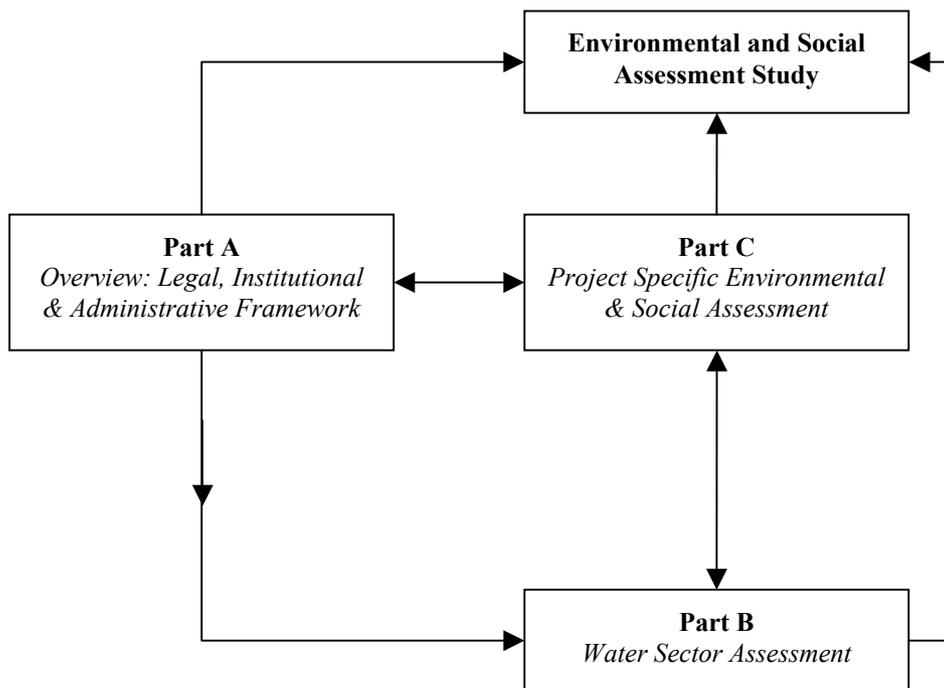


Figure 1: Schematic diagram linking the three parts of the ESA study

1.6 Consultations during the ESA Study

Public consultation is a powerful tool to ensure the involvement of potentially affected groups and national capacities in the decision-making process with regard to the environmental and social aspects of their concern. The consultations allow the participation of stakeholders so as to identify social and environmental concerns at the beginning of the ESA process. Also it is considered as an important tool for informing and educating the public in order to enhance their understanding and appreciation to the following:

- The need and nature of the proposed development;
- The need to protect and properly manage our environment;
- The potential impacts of the project on the environmental, socio-economical and archaeological settings; and
- The public role in protecting their local environment.

During the course of the ESA development, a set of communication and consultation activities have been conducted in order to ensure that the stakeholders' views, issues of concern, foreseen impacts and worries are taken into consideration while assessing the project related impacts. It is anticipated that the construction of the Disi-Mudawwra to Amman Water Conveyance System will profoundly affect all the current and future social changes of the population in the project area and to a large extent the natural and the built-up environment as well as the status of water resources in Jordan. For elaborating on the social and environmental assessment study, it was decided that two-way discussions of substantive issues must be held with stakeholders from national and local governmental organizations and interested individual citizens. Hence, the Government and the Consultant have undertaken a two phase consultation process; the first phase was when the study was started and the second when the draft ESA was ready.

For the first phase of public consultation, under the auspices of the Ministry of Water and Irrigation, two scoping sessions were held on March 27th and April 3rd 2003 in Amman and Aqaba, respectively. Both sessions have been attended by a wide spectrum of Government, national and NGO's representatives during which background materials on the project have been distributed and discussed by all parties concerned. Scoping sessions identified substantive issues of specific concern and feedback comments and views were collected and classified. These discussions were very helpful in disseminating all necessary information to the public. The outcome of these sessions indicated unanimous support to the project.

In addition to the first phase of public consultation, the Consultant started the consultation process with direct interviews with the Governors and Mayors in the five Governorates of the south in addition to other stakeholders in the region. The objectives of the project as well as the conveyance system alignment and the direct and indirect benefits to the population in the area have been extensively presented. Comments and views of the Governors have been recorded and presented in the procedures to be taken to achieve the study purposes. All views were in fact very constructive and in favour of the project as a major indispensable water project.

As for the second phase of public consultation, the sessions aimed at presenting to the project-affected groups the findings of the Draft Environmental and Social Assessment (ESA) Study and the relevant ESA material. Hence, under the auspices of the Ministry of Water and Irrigation, three second consultation sessions were held on November 13th, 18th and 20th in Abu Alanda, Amman and Aqaba, respectively. The sessions have been attended by a wide spectrum of Government, national and NGO's representatives during which Arabic and English summaries of the ESA study were distributed and discussed by all parties concerned. The outcome of these sessions was helpful in pinpointing several issues that needed to be highlighted in the final study. In addition, the second consultation sessions informed the participants that the Executive Summary in both Arabic and English would be made available at a number of locations in Jordan.

Annexes C2 and C3 present the details and significant issues identified during both the first and second phases of public consultation.

1.7 ESA Disclosure

A complete copy of the Environmental and Social Assessment Study will be disclosed at the following locations:

- Ministry of Water and Irrigation
- Ministry of Environment
- Aqaba Special Economic Zone

The Executive Summary in both Arabic and English would be made available at a number of locations in Jordan. These locations were selected in coordination with the Ministry of Water and Irrigation and are summarised below:

- Ministry of Public Works and Housing
- Ministry of Health
- Ministry of Municipal Affairs
- Ministry of Agriculture
- Royal Society for Conservation of Nature
- Department of Antiquities
- Governorates of Karak, Tafileh, Ma'an and Madaba

The complete Disclosure list is provided in **Annex C4- Part C** of the Main Report. The Government will also provide a copy of the Environmental and Social Assessment to the World Bank under a cover letter that authorizes the Bank to disclose these documents to its Board of Executive Directors and at the InfoShop in Washington, D.C. The World Bank will be provided with both printed and electronic copies of the document for this purpose.

1.8 Maps to Support Environmental and Social Management Plan

The developed Environmental and Social Management Plan (ESMP) is supported with maps produced at a scale of 1:25,000 to show the route of the conveyor and affected areas as well as proposed mitigation measures (see **Table 1**). These are included in Part C of the Main Report. The ESMP is also supported by GIS maps elaborated with a set of topographical maps and satellite imageries. This system is prepared to present the project-specific sensitive environmental, social and archaeological settings identified within the project direct and indirect zone of effect. The presented sensitive sites are linked to information sheets listing the anticipated impacts, proposed mitigation measures and monitoring programs.

It should be noted that only one biological hot spot is shown on the maps of scale 1:25000 as the remaining biological hot spots are outside the project corridor and the drawing boundary. However, all the biological hot spots are shown on the GIS maps.

The GIS base maps are reproducible and printable to facilitate maximum usability by users and adaptability to any change in the plans and/or environmental and social conditions. GIS maps are provided on three CD-ROMs included in **Annex C5**. The contents of these CDs are as follows:

- CD-1: GIS base maps and satellite images
- CD-2: Part 1-Topographical maps scale 1:25,000
- CD-3: Part 2-Topographical maps scale 1:25,000

A list of the available maps along with their respective locations is presented in **Table 1**. Copies of the base maps showing the conveyer route and hot spots are included in **Annex C5**.

Table 1: List of project related maps

Map Number	Map Description	Scale
Drawing No. (001)	From Station (0+000) to Station (6+000)	1/25,000
Drawing No. (002)	From Station (6+000) to Station (22+000)	
Drawing No. (003)	From Station (22+000) to Station (36+000)	
Drawing No. (004)	From Station (36+000) to Station (50+000)	
Drawing No. (005)	From Station (50+000) to Station (65+000)	
Drawing No. (006)	From Station (65+000) to Station (79+000)	
Drawing No. (007)	From Station (79+000) to Station (93+000)	
Drawing No. (008)	From Station (93+000) to Station (107+000)	
Drawing No. (009)	From Station (107+000) to Station (126+000)	
Drawing No. (010)	From Station (126+000) to Station (143+000)	
Drawing No. (011)	From Station (143+000) to Station (151+000)	
Drawing No. (012)	From Station (151+000) to Station (174+000)	
Drawing No. (013)	From Station (174+000) to Station (188+000)	
Drawing No. (014)	From Station (188+000) to Station (204+000)	
Drawing No. (015)	From Station (204+000) to Station (219+000)	
Drawing No. (016)	From Station (219+000) to Station (233+000)	
Drawing No. (017)	From Station (233+000) to Station (250+000)	
Drawing No. (018)	From Station (251+000) to Station (266+000)	
Drawing No. (019)	From Station (266+000) to Station (282+675.731)	
Map C1	The locations of archaeological sites within Segments B and C	Not to scale

2 LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1 Introduction

This section of the study focuses mainly on the institutional and legislative framework, which includes:

- Review of the institutions involved in the management and monitoring of the environment in Jordan, the institutions concerned with legislation and regulation of the sector, and the institutions tasked with enforcing these, with a view to determine the status of the legal and institutional context and to assess the environmental management capacity of the Kingdom, in particular those of relevance to the project.
- Highlight salient features of Jordan's environmental management capacity, in particular factors that affect the implementation of the project.

Regarding the water sector, Jordan faces challenges in institutional aspects relating to water resource management, and the huge financial requirements of the Capital Investment Program for Water, and the operation and maintenance (O&M) of the water and wastewater network. Donor agencies have an ongoing dialogue with Jordanian officials regarding appropriate water sector reforms to improve the efficiency of the water and wastewater network, industrial users and irrigated agriculture. Faced with these challenges, the Government of Jordan has implemented several groundbreaking policy reforms, with the assistance of donor agencies, and has a future agenda to carry out further reforms, which will make Jordan a pioneer in the Middle East Region in managing its scarce water resources. The Government of Jordan and the donor agencies have invested heavily in the water sector to secure water supplies to municipal, industrial and agricultural users. However, water prices do not cover operation and maintenance and capital costs. Some of the issues related to institutional and management aspects of the water sector are summarized as follows:

- Capacity of the institutions to implement the "National Water Strategy" and the water policies.
- The basic conflict of interest in the structure of the water sector, which does not provide a clear-cut between regulatory and service provision functions.
- The limitations of the Civil Service Law and regulations that limit the recruitment of highly qualified staff to work in the sector.
- High costs of water resources development.

This section provides a general background on environmental conditions in Jordan of relevance to the project. The recommendations identified in the report provide a framework for general improvement.

The principle conclusions of this section are that measures should be taken to:

- Revisit resource management policies to integrate environmental aspects into resources planning by ensuring participation of all sectors including Government, non-governmental organizations, and the private sector in environmental protection. A comprehensive national plan is necessary to achieve this objective.
- Make use of the Privatisation Law No. (25) Of 2000 that provides opportunities for private sector participation in the water sector through different investment schemes such as BOT, BOO, BOOT, etc. Significant gains can be realized by bringing the private sector to manage, operate and/or own a utility.

- Take advantage of the benefits (tax exemptions) provided by the Investment Promotion Interim Law No. (68) of 2003 (see **Annex A1**), similarly to As-Samra Wastewater Treatment Plant BOT project which was granted benefits, under Investment Promotion Law No. (16) For 1995 and its amendments of 2000 for 10 years, as it was considered water investment.
- There is an obvious need to draft and issue clear procedure(s) or instructions on how the private sector, whether Jordanian, foreign or a consortium of both, can implement, manage, lease, etc. developmental projects in Jordan, in particular in the water sector. The procedure(s) should define the general requirements, conditions, etc.
- Enhance regional cooperation and coordination with Saudi Arabia that shares the Disi aquifer.
- Continue and enhance the coordination between ministries and in particular with new Ministry of Environment (MOE). Where laws and bylaws do not adequately describe coordination responsibilities, separate written agreements should be made to clearly assign responsibilities.
- Coordinate with the concerned parties, in particular the MOE to ensure that the contracted firm adheres to environmental requirements and conditions during project execution and operation.

2.2 Institutional Framework

2.2.1 Overview of Governmental Organizations

The Hashemite Kingdom of Jordan is a parliamentary constitutional monarchy headed by His Majesty, King Abdullah bin al-Hussein. Jordan became an independent state named “Trans Jordan Emirate” in 1923 and later in 1946 the Kingdom was formed. The constitution was promulgated in 1952 and since then has been amended several times. It outlines the King is the head of state and vested with independent powers: legislative, executive and judicial authorities. There are two houses of the National Assembly: the Senate and the House of Deputies. The King appoints the members to the Senate on the basis of meritorious service or special qualification, while the members of the House of Deputies are freely elected by national suffrage, with men and women over 18 allowed to vote. The King appoints the Prime Minister and the Ministers upon recommendation of the Prime Minister. The country is divided into 12 governorates that are each subdivided into administrative regions.

The Legislative Power resides in the King and the National Assembly. A draft law is normally presented by the Government or by at least 10 deputies is initiated the House of Deputies debated and voted upon which after approved in its final reading by both Houses becomes a law if submitted to the King who has the power to grant consent through a Royal Decree.

The Executive Power is in the hand of the cabinet which consists of the Prime Minister and the Ministers. The King appoints the Prime Minister who in turn recommends to the King the appointment of Ministers. The Cabinet, after being granted the confidence from the House of Deputies being the supreme executive body, presides over and controls the Government.

The Juridical Power is independent from other powers –neither the King nor the Government has the right to interface in its duties. Its essential function is to apply justice by deciding on any dispute case filed by any person against any person whether individual or a governmental body. Cases may go in sequence from first instance court to appeal court to cassation court upon the request of any party of the dispute.

The role of environmental protection is divided between various governmental institutions, such as the Ministry of Environment, Ministry of Public Health, Ministry of Water and Irrigation, Ministry of Agriculture, Ministry of Tourism, Ministry of Energy and Mineral Resources/the Natural Resources Authority, Ministry of Planning, and the Aqaba Special Economic Zone. Each of these institutions has articles in their respective laws granting them the responsibility to maintain and monitor some aspects of environmental quality.

As for the water sector in Jordan, there are three organizations directly related to it. These are Ministry of Water and Irrigation (MWI), Water Authority of Jordan (WAJ) and Jordan Valley Authority (JVA). The Ministry of Water and Irrigation was established some years after the foundation of the Water Authority of Jordan and the Jordan Valley Authority. The Minister of MWI is the head of the Board of Directors of both organizations. Each of these organizations has its own organizational structure, responsibility area and missions.

The following is the description and main characteristics for each of MWI, WAJ and JVA separately. The ministries and institutions most directly relevant to environmental issues are presented afterwards.

2.2.1.1 Ministry of Water and Irrigation (MWI)

The Ministry of Water and Irrigation (MWI), created in 1988, is the only public sector agency at present in the region that integrates the management of different user sectors, thus allowing for a cross-sectoral perspective in water allocation and management. This integration provides MWI the chance to coordinate water resources allocation and management, taking a cross-sectoral perspective that accounts for irrigation, municipal and industrial needs (Hashemite Kingdom of Jordan Water Sector Review Update, World Bank, 2001).

In order to establish water resources management and integrate various policies under one entity, MWI main objective is to centralize the national management of substantially insufficient water resources to one ministry in order to improve it. The MWI acquired the comprehensive function to distribute and regulate the water resources in Jordan and the responsible authority to settle any disputes rose between agriculturists and water supply authorities.

The establishment of the Ministry of Water and Irrigation was in response to Jordan's recognition for the need of a more integrated approach to water management. Since its establishment, MWI has been supported by several donor organization projects that have assisted in the development of water policy and water master planning as well as restructuring the water sector.

The role of the Ministry includes the provision of policy setting and formulating water sector master plans, centralized data collection, a geographic information system, monitoring and national water planning for the water sector of Jordan and water protection related environmental issues and decision-making.

A comprehensive national water data bank has been established and kept at the Ministry of Water and Irrigation and will be aided by a decision support unit. Additionally, this data bank will be supported by a program of monitoring and a system of data collection, entry, updating, processing and dissemination of information, and will be designed to become a terminal in a regional data bank set up.

The main responsibilities and tasks of MWI are (primary source is the MWI website: <http://www.mwi.gov.jo>):

- To design and enforce a national water strategy.
- To monitor all groundwater resources in the Kingdom.
- To establish and keep a data base for water resources.
- To coordinate the funding from the international donor agencies.
- To develop water strategies and policies with the JVA and WAJ.

The Government has carried some substantial reforms in the water sector. These reforms were mainly focused on resource management, financial management, and institutional and legislative aspects.

2.2.1.2 The Water Authority of Jordan (WAJ)

WAJ is responsible for the construction, operation and maintenance of water supply and sewage facilities and the national water resources management under the Ministry of Water and Irrigation in accordance with the law No. 18/1988. It was established as an autonomous corporate body with financial and administrative independence. It formulates water supply and sewage policies and prepares water resources management plans. This organization also has the responsibility of supervising the water supply and sewage services being implemented and water protection related environmental issues. In recent years, WAJ is moving from policy setting and formulating water sector master plans into services provision.

The main responsibilities and tasks of the Authority are (primary source is the WAJ website <http://www.mwi.gov.jo>):

- Survey the different water resources, conserve them, and determine ways, means and priorities for their implementation and use.
- Develop the potential water resources in the Kingdom, increase their capacity and improve their quality, protect them from pollution, supervise them and administer their affairs and put forth programs and plans to meet future water needs by providing additional water resources from inside or outside the Kingdom and through the use of water treatment and desalination.
- Regulate, and advise on, the construction of public and private wells, investigate groundwater resources, drill exploratory, reconnaissance, and production wells, and license well drilling rigs and drillers.
- Study, design, construct, operate, maintain, and administer water and public sewerage projects including collecting, purifying, treating, disposing and the use of any other method dealing with water.
- Draw terms, specifications and special requirements in relation to the preservation of water and water basins, protecting them from pollution, and ascertain the safety of water and sewerage structures, public and private distribution and disposal networks, and take the necessary action to ensure technical control and supervision, including all necessary tests.
- Carry out theoretical and applied research and studies regarding water and public sewerage to achieve the Authority's objectives including the preparation of approved water quality standards for different uses and technical specifications concerning materials and construction in order to apply the findings to the Authority's projects in coordination with other concerned departments; and publish the final findings and standards so as to generalize their application by all means available to the Authority.

- Issue permits to engineers and licensed professionals to perform public water and sewerage works, and participates in organizing special training courses to qualify them in order to improve the standard of such works and to reduce water losses and pollution. All those involved in water and sewerage works are requested to adjust their practice in accordance with the provisions of this Article and to obtain the specified permit accordingly.
- Regulate the uses of water, prevent its waste, and conserve its consumption.

There are many Directorates and Sections within the Water Authority of Jordan (WAJ) that undertake the implementation to WAJ objectives and roles. Perhaps two of the most important sections that work on the implementation of water policies are the Wells Directorate and the Laboratories Directorate. The Wells Directorate is in charge of licensing of private wells in addition to groundwater development and utilization. Administratively, it is directly under the supervision of the Secretary General of Water Authority. The Directorate consists of two sections: the License of Wells Section and the Operations and Field Follow up Section.

Although WAJ has a wide mandate that encompass regulatory function in addition to its main mandate of providing water and wastewater services of high quality, WAJ has been able to provide high quality services and achieve good coverage of water in Jordan; hence water and wastewater services in Jordan has to be acknowledged as outstanding in the region. Water supply covers more than 98 percent of the population and the target of full coverage is underway. Wastewater services have been improving in the recent years and WAJ has managed to increase coverage to about 75 percent in urban areas in Jordan.

2.2.1.3 The Jordan Valley Authority (JVA)

JVA was founded in 1977 under the Law No. 18/1977, under which this agency acquired the prime authority to plan and implement water supply services in the Jordan Valley. Subsequently, JVA strengthened the management for the infrastructure development in the valley.

The territory mandated to the Jordan Valley Authority by its governing law, the Jordan Valley Development Law No. 30 of 2001, is extensive covering approximately 5,000 km², and is home to some 300,000 people. The main activity in the Jordan Valley is agriculture with about 360,000 dunums being cultivated. Tourism and industry are two other sectors with a significant presence in the Valley. The Valley by virtue of the water resources it has, is a major source of domestic water for the Kingdom supplying the Water Authority with 45 MCM of potable water per year. This task is being made increasingly difficult by the drought conditions that have prevailed for the past 10 years as well as the rapidly increasing demand for water. The Government has given priority to supplying domestic water over irrigation water, causing problems for the agricultural sector in terms of water quantity and quality.

A comprehensive master plan based on environmental considerations is necessary to give a holistic vision of the Valley, and shall result in a better use of land for various purposes. It will also bring into close proximity compatible uses that affect each other positively. In addition, the lack of environmental assessments for land use would result in environmental degradation and its further deterioration.

Laws and mechanisms have to be modified to protect the environment; however they are inadequate both on the regulatory side and operational side.

There are two articles in the Jordan Valley Development Law, as it was amended in 2001 that address the issue of the environment. Article 3-b of the above-mentioned law reads:

“The development, protection and improvement of the Environment in the Valley and to perform necessary works to achieve this objective, to implement the preparation of plans both Master and Detailed Plans for the lands outside the planning boundaries of the municipalities.”

Specifically, the Jordan Valley Authority is in the forefront in protecting the Valley’s environment. The other institutions also mandated to do the same include the Water Authority of Jordan, the Ministry of Agriculture, the Ministry of Environment and the Ministry of Municipal and Rural Affairs.

Examining the environmental protection status quo, it can be observed that there is no concrete system or mechanism for performing this function in the Jordan Valley. Several institutions, including JVA, are mandated to protect the environment in the Valley, but ambiguity does exist as to who does what. The result is a failure to adequately safeguard the environment from abuse and deterioration.

2.2.1.4 Ministry of Environment (MOE)

The Ministry of Environment (MOE) was established upon the ratification of the Interim Law: Environmental Protection Law (EPL) No. (1) of 2003. Under the provision of article 3, the MOE is considered the concerned authority in Jordan for environment protection on national, regional and international level. In addition, all sectors, whether governmental, non-governmental organizations or the public, have to implement the procedures, instruction, etc. issued by the MOE. Also, they have to coordinate with the MOE in relation to environmental issues when dealing with the donors.

Before January 2003, the General Corporation of Environment Protection (GCEP) in the Ministry of Municipal, Rural Affairs and Environment represented this ministry. Since 1996 and according to the EPL No. (12) Of 1995, the GCEP was formed as the major governmental agency responsible for environmental conservation and protection. This corporation included four major technical divisions. These are: Land Use, Environmental Impact Assessment (EIA), Water Quality, and Air Quality Monitoring.

The environmental duties and authorities of the new Ministry include but are not limited to:

- Establishing the general policy for protection of the environment, and putting forward, as required, essential plans and programs to implement them.
- Developing plans, projects, and programs to ensure sustainable development within the Kingdom.
- Establishing the specifications and standards for elements of the environment.
- Monitoring and verifying environmental elements in coordination with scientific research centres, and in accordance to the specifications set by the MOE.
- Proposing draft laws and regulation related to the Environment.
- Inspecting and auditing private and public institutions to ensure compliance with environmental requirements (parameters and specifications).
- Conducting and sponsoring research and studies on environment related issues.
- Coordinating activities to develop national strategies on environmental awareness and information.
- Enhancing coordination between Jordan, and the Arab, regional and international organizations regarding environmental issues.

- Issuing instructions and resolutions for the execution of articles of the Law and the regulations issued in accordance with the Law.
- Issuing conditions and instructions, as required, for agricultural, development, commercial, industrial and housing projects.
- Setting basis (essentials) for handling dangerous substances, which is harmful to the environment, including its categorizing, storage, disposal and transport.
- Setting basis for and conditions for the establishment and management of natural reserves and public parks.
- Preparing plans for environmental emergencies.

Throughout the Environment Protection Law, there are references to working in “co-ordination and co-operation of the relevant authorities.” A significant component of environmental management capacity in Jordan is dependant on the success the MOE has in working in cooperation with other ministries and the private sector that have technical capacity and experience to monitor and verify environmental performance in particular sectors. For example, the Ministry of Water and Irrigation and the Ministry of Health monitor water quality, with some of the data collected by private industry.

It is expected from the newly born Ministry of Environment to initiate co-operation with relevant ministries, authorities and institutions which will result in issuing, through the Jordan Institute for Standards and Metrology, guidelines in different fields of the environment protection.

2.2.1.5 Ministry of Municipal Affairs (MMA)

The Ministry of Municipal Affairs (MMA) is responsible for urban planning, solid waste collection and Common Services Councils development. With respect to the Common Services Councils (CSCs), the MMA is responsible for enhancing the dependence of CSCs on their own resources, assuring free elections for the CSCs, and providing support and guidance to the technical, managerial and financial workforce of the CSCs.

2.2.1.6 Ministry of Energy and Mineral Resources (MEMR) / The Natural Resources Authority

The Ministry of Energy and Mineral Resources (MEMR) is responsible for:

- Monitoring all mining activities, and planning and managing the energy sector.
- Regulating and managing the use of nuclear energy in all fields.
- Cooperating and coordinating with all concerned parties on the issue of prevention and protection against radiation.
- Putting forward national plans, conduct studies, and draft laws in order to protect water and public health against dangerous nuclear waste.
- Issuing licenses for the production, storage, use and trade of radioactive materials in accordance to the relevant legislation, and have the right to revoke these licenses if the license holder contravenes the licensing conditions or the provisions of any relevant legislation.
- Monitoring and inspecting the licensed corporation to ensure that they have effective preventive and protective systems against radiation.

- Monitoring and inspecting corporations that work in the field of petroleum field. Monitoring and inspection includes their transportation, storage and safety systems.

2.2.1.7 Ministry of Health (MOH)

The Ministry of Health (MOH) is responsible for the following:

- All health affairs in the Kingdom, including the supply of medication, medical services, vaccination programs against epidemics, public awareness campaigns with regards to health issues and health insurance to government personnel.
- Monitor the sewerage systems.
- Issue instructions, as required, to define rules for the purpose of the entry of food or medications into the Hashemite Kingdom of Jordan, and to ensure that they comply with national health standards and specifications.
- Issue licenses for the construction of hospitals, medical centres and all medical related practices in accordance to the Doctors' Association rules and regulations.
- Set the Ministry's policy, plans and future projects.
- Monitor and control drinking water to ensure its suitability for human use.

2.2.1.8 Ministry of Agriculture (MOA)

The responsibilities of the Ministry of Agriculture (MOA) include:

- Setting of agricultural policy and future plans and projects in the Kingdom.
- Management of public rangelands and forests.
- Protection of soil, pastureland and flora.
- Pesticide and fertilizers permitting.
- Protection and management of wildlife (delegated to Royal Society for Conservation of Nature (RSCN)).
- Issuance of fishing and hunting licenses and regulations, regulate fishing and hunting, determine capacity and set take limits (delegated to RSCN).

2.2.1.9 Ministry of Planning (MOP)

The Ministry of Planning (MOP) is responsible for:

- Over-viewing all development projects, from proposals to execution to ensure that environmental impact has been considered in the design and the implementation.
- Coordinating with donor agencies and facilitate grants for environmental projects.

The Environment Department within the MOP, that is not a technical department, coordinates general planning for environment related matters.

2.2.1.10 Jordan Institute for Standards and Metrology (JISM)

Jordan Institute for Standards and Metrology (JISM) is the keeper of standards and specifications. It is linked to the Ministry of Trade and Industry.

2.2.1.11 Ministry of Tourism / Department of Antiquities

The responsibilities of Ministry of Tourism / Department of Antiquities are to:

- Develop and implement the archaeological policy of the country with regards to identification, supervision, protection, maintenance, register and restoration of archaeological sites.
- Promote archaeological sites on national and international levels.
- Conduct public awareness about archaeological sites in accordance to prevalent laws and regulations.

2.2.1.12 Ministry of Public Works and Housing

The Ministry of Public Works and Housing (MPWH) was created in 1954. The MPWH is responsible for the construction and maintenance of infrastructure in Jordan including the major transportation infrastructure (highways, road, etc) that connect the main cities, towns, residential areas, industrial zones, tourist sites, etc. together. In addition, it is responsible for connecting Jordan to its neighbouring countries by major highways.

Furthermore, the MPWH is responsible for constructing and maintaining Government buildings and the capacity development of the building sector in Jordan.

Specifically, MPWH responsibilities include:

- Setting transportation plans (construction and maintenance) for cities, towns, villages and rural areas.
- Designing and supervising the construction of Government buildings.
- Conducting testing on construction material to ensure adherence to standards and specification.
- Conducting research and studies on roads and buildings.
- Drafting legislation and standards related to buildings and roads.
- Upgrading criteria and methods for construction design and maintenance.
- Coordinating with concerned parties on road and buildings related issues.

2.2.1.13 Aqaba Special Economic Zone Authority (ASEZA)

The Aqaba Special Economic Zone (ASEZ) was established in January 2001 to create a regional hub for investment and tourism around the southern port city of Aqaba. ASEZA is the legal successor of Aqaba Regional Authority which was at the level of other governorates where all ministries had departments.

A Master Plan was developed which envisages an estimated US\$6 billion of investment over the next 20 years in the areas of industry, port development, tourism, infrastructure, utilities and services.

The natural environment of the ASEZ is one of its most significant resources, and is of global importance. The waters of the Gulf of Aqaba are home to a variety of fish and other faunal species. Aqaba's coral reef represents a valuable national tourist resource, and is of international significance, representing the northern latitudinal limit for reef corals in the Western-Indo-Pacific region, and being one of the most diverse in the northern hemisphere. Also, the natural physical and topographical context of the Aqaba area - the Gulf waters set against the sand dunes of the Wadi Araba, and bordered on both sides by mountains running parallel to the coastline and constituting a uniquely beautiful aesthetic resource.

It is imperative that all development of the ASEZ remains environmentally sustainable in the long term, not least because the environmental resources of the area are themselves an integral part of its attraction to investment in tourism, which is expected to account for 50% of the economic growth in the ASEZ over the next 20 years, according to the ASEZ Master Plan.

A board of six commissioners governs ASEZA. One of these Commissioners has the title 'Commissioner for Regulation and Enforcement' and his Department is commonly known as the 'Department of Environment and Health Control' (DEHC). DEHC is responsible for the environmental management of the Zone.

This Department has responsibility for environmental and health control issues in the Aqaba Special Economic Zone, including the long term environmental management and planning for the Zone in conjunction with the ASEZ Master Plan. DEHC also has responsibility for the regular monitoring and auditing of industrial activities and other activities that may affect the environment of the zone, and ensuring the development of, and compliance with current standards. In addition, following agreement with the Ministry of Health and other bodies, DEHC will have responsibility for the supervision and monitoring of public and occupational health, including health inspection, landfill sites, pest control, and for the supervision of all food and food production related activities.

The DEHC is organized into three Directorates. Each Directorate consists of a number of divisions, each with a division head and a small number of staff. These three directorates are as follows:

- Directorate of Environmental Planning within which there are four divisions.
 - Environmental Inspection and Audit Division
 - Standards and Codes Division
 - Environmental Permitting and EIA Division
 - Environmental Studies and Monitoring Division
- Directorate of Environmental Compliance within which there are five divisions:
 - Education and Public Awareness Division
 - Consumer Protection Division
 - Legal Protection
 - Maritime Operation Division
 - Natural Reserves Division (Parks) is responsible for the management of the two reserve zones within the responsibility of ASEZA – Wadi Rum and the Aqaba Marine Park. The management of Wadi Rum is currently contracted out to the

Royal Society for the Conservation of Nature (RSCN), with a responsible officer/manager based at ASEZA.

- Directorate of Health Control which includes:
 - Food Control Division
 - Public Health

2.2.1.14 Jordan Investment Board

The Jordan Investment Board (JIB) is responsible for marketing Jordan internationally, creating linkages between national and foreign companies through joint ventures, assisting investors at all stages of the investment cycle, and acting as a contact or liaison between investors and other Government bodies whose services are needed by the investor.

Specifically, JIB provides the following services:

- Identifies investment opportunities.
- Facilitates the registration and licensing of investment projects.
- Gathers investment data and technical information and shares them with interested investors.
- Assists the investor in finding a location for business operations
- Arranges meetings between potential private sector partners and Government officials.
- Provides ongoing support and problem solving for the project once it is established.
- Facilitates arrival and departure of the investor in transit through the Queen Alia International Airport.

The website address is as follows: “<http://www.jordaninvestment.com>”

2.2.1.15 Executive Privatisation Commission

The Executive Privatisation Commission (EPC) is currently the Government's arm in implementing the privatisation program of Jordan. The Privatisation Law No. (25) Of 2000 mandates the creation of the "Privatisation Proceeds Fund" where all privatisation proceeds shall be deposited and utilized, in virtue of the law, to settle the Government debts, finance feasible socio-economic projects, and to settle issues related to employees and workers of privatised enterprises in terms of rehabilitation, training and compensation.

Attracting new investors to engage in major production projects and utilities and creating more job opportunities while safeguarding the rights of employees are goals of the privatisation program in Jordan. The expansion of the scope of certain enterprises and the entry of new firms to the privatised sectors created new job opportunities and consequently contributed to alleviating part of the unemployment problem. In this context, the Government has taken serious measures to minimize the impact of privatisation on labour.

In implementing the privatisation program, a multi-track approach is usually adopted in order to achieve the goals. The main types of privatisation followed in Jordan encompass Partial and/or total sale; Divestiture of Government shares; Concession agreements; Leases and investment contracts; Management contracts; BOT and its derivatives, and others. According to the nature of the enterprise, the best privatisation method is adopted.

To enhance the privatisation process and warrant its success without defeating the purpose of its initiation, the way was paved for the creation of a number of Regulatory Commissions, such as TRC (Telecommunication Regulatory Commission) and ERC (Electricity Regulatory Commission) entrusted with monitoring the performance of the enterprises in the post privatisation era while safeguarding the rights of both investors and consumers.

2.2.2 Universities and Research Institutes

There are several universities and research centres in Jordan that work in the environmental field. In this section we will outline few of them.

The Water and Environment Research and Study Centre (WERSC) at the University of Jordan was established in 1982 to help in developing and implementing the national plans for Jordan's scarce water resources management. The centre has been and is still involved in several activities related to water and environment through projects funded by international and national agencies such as long term studies for water conservation and management in the Azraq Oasis; low cost wastewater treatment and reuse; effect of wastewater treatment plants on water resources; decision support system for drought management; and capacity building in different aspects of water and environment.

The centre has held more than 30 workshops for strengthening the capabilities of personnel working in the area of water and environment. All aspects related to water were covered in an integrated approach. The centre has helped in establishing and strengthening "Environmental Science and Management" graduate program through the different projects that the centre undertakes.

Jordan University of Science and Technology (JUST) has an environmental engineering program since 1986, and in 1999 began curriculum in environmental sciences. The faculty and students do testing and modelling of environmental processes on a project basis, and occasionally participate in EIAs. They have identified inconsistent labelling of chemicals as a significant problem in monitoring potentially hazardous material.

Mu'tah University was founded in 1981 by a Royal Decree as a national institution for civil and military higher education. The University started functioning in its military wing in the year 1984 on its permanent site at Mu'tah in the Karak governate, 135 km. South of Amman. In 1986, the Council of Higher Education decided that a civilian wing be established at Mu'tah University to respond to the needs of the local community in particular and the country's needs in general.

In August 2002, Mu'tah University established an independent Water and Environment Centre. The centre was funded by the World Bank and it is expected to start operation by August 2003. The main goal of the centre is to conduct water and environment related research and studies leading to the improvement of environmental aspects in Jordan.

The Marine Science Station (MSS) is a joint program between the University of Jordan and the University of Yarmouk created in 1974, the MSS is primarily supported by research grants and contracts for services from Government, including ASEZA, private sector, and international donors, including USAID. The focus of MSS is research on ocean sciences, including biological and physical parameters (e.g., waves, currents, water chemistry, etc.). The MSS monitors various parameters for ASEZA and provides it with monthly and annual reports.

The Royal Scientific Society (RSS) was started in 1970 to provide the private sector and public agencies with information and technology support. RSS is a semi-governmental research institution with financial and administrative independence, largely funded by contracts for services to Government and private sector and occasional international funding. JICA recently funded substantial information technology (IT) infrastructure in RSS. They have scientific centres in engineering, IT, chemistry, environment, and renewable energy among others. The latter is now an independent national program. The environment centre started with projects related to water pollution and later added air and water quality and environmental management. In 1989 the Environment Research Centre was created. Program areas expanded into EIA, solid waste management and noise pollution. In the water sector they test and evaluate water treatment plants, funded by an annual contract with what is now GCEP. The water data is continuous since 1986. For air quality they most test in industrial areas with fixed stations and two mobile labs. Air quality testing is sporadic, but should be continuous. They also do vehicle emissions testing. They have ISO 9000 and 14000 compliance programs.

2.2.3 Non-Governmental Organizations (NGOs)

Non-governmental organizations (NGOs) provide an important part of the environmental management infrastructure in Jordan. Their programs often compliment the work of Government, adding to the existing infrastructure or filling gaps in areas where the Government is less active. NGOs sometimes advocate conservation of resources and protection of the environment in cases where the Government focus on providing services fails to protect the resource base. The NGOs discussed below provide significant programs in environmental education and public awareness, complimenting Government services in areas such as solid waste collection and water conservation. Furthermore, the NGOs have been instrumental in drawing public attention to issues of air pollution and negative consequences of proposed development projects, and in some cases their efforts have forced changes resulting in improved environmental conditions. In this section we will outline the most active ones in Jordan.

The Jordan Aqua Conservation Association (JACA) is an independent, private association based in Amman. It was established to assist the Government of Jordan in facing current water challenges by conducting research by its members, who are highly specialized in the following areas of the water sector:

- Re-evaluating water resources and depicting their harsh reality, present and future, and finding and developing new resources.
- Finding efficient means in water use in order to reduce per capita consumption.
- Inter-basin water transfers.
- Tapping deep aquifers.
- Preparing and implementing water awareness programs.
- Training professional cadre of volunteers on water awareness and rationing programs.
- Participating actively in drafting and reviewing of water related legislation.
- Putting forward water management strategies and policies that will lead to the efficient use of water in Jordan.

Friends of the Environment (FOE) is an NGO that begun in 1995 and is now with four fulltime staff and a network of volunteers. Their program is funded by member companies and international donors (METAP, GEF Small Grants, and British Government). They have extensive programs in environmental education. They support the Jordan Network of Environmentally Friendly Industries with more than 80 members, who are encouraged to apply environmental

management systems in their businesses. FOE promotes low cost or no cost environmental options that can be attained by thrifty, small businesses.

Jordan Environment Society (JES) was founded in 1988 as a non-profit, voluntary organization. They currently have 24 branch offices and 6,000 members in Jordan. The branch offices normally have a secretary and occasional volunteer assistance. The Amman office has a staff of 15. Funding is primarily from international donors, including Germany, USAID, and the Arab Fund for Social and Economic Development among others. Their extensive network of regional offices is a powerful tool for outreach and public awareness. JES outreach to farmers includes a program for integrated pest management. They are developing an eco-label program (“Lady Bird”). They promote public awareness about water issues and promote the use of water saving devices. Another program promotes public awareness regarding solid waste management, education and tools for recycling. Yet another program addresses medical waste management. There also have a program for environmental education directed to schoolchildren. JES also hosts the Global Environment Facility (GEF) Small Grants Program for Jordan.

Friends of the Earth – Middle East is a regional NGO with programs in Jordan, Palestine, Israel and Egypt. Fund comes from international donors, including USAID, European Union (EU), and Germany. Their international water programs are unique for NGOs in the region. They work in the Gulf of Aqaba to reduce the use of plastic, which is a particularly harmful form of litter in coral systems. Also, on a regional scale, they have water projects with paired communities across borders. Friends of the Earth - Middle East is advocating that the Dead Sea be declared a Biosphere Reserve and World Heritage Site. They are also active in evaluating the environmental impacts of the Euro-Mediterranean Free Trade Zone.

The Jordan Royal Ecological Diving Society (JREDS) was established in 1994 as an NGO with the mission to conserve, rehabilitate and enhance the marine eco-system in the Gulf of Aqaba through grass roots participation, lobbying, awareness generation, and the development of technical capabilities. Programs of JREDS include public awareness, beach and marine cleanup, and crown-of-thorns control. They also have a socio-economic program to improve the lives of fishermen, as an approach to providing alternatives to fishing on the reefs.

The Royal Society for Conservation of Nature (RSCN) is an NGO with about 200 employees, 40 in Amman and the rest in the field. 10 percent of their funding comes from the Government to assist with protected areas management, 25 percent from tourism, and the remainder from projects, including funding from USAID, GEF and others. RSCN manages six Government nature reserves (Shaumari, Azraq, Mujib, Dana, Ajloun, and Wadi Rum in cooperation with ASEZA) and has the mandate for enforcing hunting laws and issuing hunting licenses in Jordan. The RSCN promotes conservation of protected areas and helps local communities benefit from the protected areas through the sustainable use of nature materials. Moreover, they have successfully used the EIA process to challenge Government projects that would negatively impact the nature reserves. RSCN has identified additional areas that are high priority for being added to the protected areas system in Jordan.

Friends of Archaeology (FoA) in Jordan is a non-profit and non-governmental organization that was founded in 1958 by a small group of international and Jordanian archaeologists and residents who wanted to expand awareness and enjoyment of Jordan’s rich heritage among the general public. The main objectives of FoA are:

- To protect and preserve archaeological sites in Jordan, in cooperation with concerned Jordanian authorities and regional and international bodies.

- To promote the cultural heritage of Jordan and to support and encourage the publication of books, pamphlets and research.
- To create awareness in the community, especially among young people, of the importance of archaeological sites in Jordan and the need to preserve and protect them.

For more information the website of FoA is “www.foa.com.jo”.

With respect to archaeology, it should be noted that there is a large number of international archaeological missions based in Jordan-British, French, German, Pontifical, Spanish and United States (The American Centre of Oriental Research (ACOR) whose website is “www.asor.org/acor.html”).

2.3 Major Stakeholders

The major stakeholders related to the Disi-Mudawarra Water Conveyance System are:

- 1- Ministry of Water and Irrigation
- 2- Water Authority of Jordan
- 3- Jordan Valley Authority
- 4- Ministry of Environment
- 5- Ministry of Municipal Affairs
- 6- Aqaba Special Economic Zone
- 7- Department of Land and Survey
- 8- Ministry of Tourism and Antiquities
- 9- Ministry of Agriculture
- 10- Greater Amman Municipality and Municipalities in other governorates
- 11- Local communities
- 12- NGO sector
- 13- Ministry of Public Works and Housing
- 14- Jordan Investment Board
- 15- Executive Privatisation Commission

2.4 Applicable National Environmental Legislation

The legal framework for the environment in Jordan is primarily described in laws, by-laws (or regulations), instructions, standards and specifications. Laws and by-laws are the most general, describing, for example, the overall authorities of a ministry or perhaps one sector within a ministry. They are also the most difficult to pass or later change. Instructions, standards and specifications describe the details regarding how a law is implemented and enforced and the specific standards that must be met. Standards include for example, details such as permissible limits of specific chemicals that can be discharged into sewers or rivers.

A ministry or one of their subordinate agencies usually develops laws, by-laws, regulations, specifications and standards. For laws, by-laws and standards the ministry presents their case to the Legislative Bureau, which reviews the language and researches potential conflicts with existing laws. Negotiations between the ministry and the Legislative Bureau may take several months to resolve issues and agree on the exact language. The Council of Ministers next considers the bill. Laws approved by the Council of Ministers are sent to the Parliament, where both houses

before going to the King for ratification must approve them. By-laws and regulations approved by the Council of Ministers go directly to the King for ratification. Instructions, standards and specifications are written and enforced by the ministry or individual departments according to the authority described in the laws and regulations. The approval process for new laws or modifications to laws are often time consuming. Therefore, in order to expedite this process, “Interim Laws” are occasionally passed from the Legislative Bureau directly to the King for ratification, skipping the Council of Ministers and both houses of Parliament. The practice of passing Interim Laws has increased in recent years.

To date, Jordan has issued a number of laws, regulations, instructions, and standards regarding water management, control, monitoring, and protection against pollution. The Government has emphasized the importance of quality assurance, control and monitoring of environmental aspects, and in particular water. This activity is currently conducted in a well-coordinated manner by several bodies including public, private and NGO sector as seen below. The Jordan Institute of Standards and Metrology (JISM), which has administrative and financial independence, is the issuer and depository of all standards of Jordan. The concerned ministry will draft the standard in coordination with JISM.

2.4.1 Laws

It should be noted that in case of discrepancy, the specific private law has the precedence over the common law. Also, if the laws are of the same type, the recent law governs. An example WAJ and JVA laws are specific private laws while the Privatisation law is a common law.

(a) Water Authority Law No. (18) of 1988 and its Amendments

The WAJ Law was firstly issued and enacted as a Interim Law in 1983. In 1988, the Water Authority Law No. (18) of 1983 status was made permanent. This law was recently amended in 2001, and enacted on November 1st, 2001. This law sets the institutional framework for the creation of the WAJ within the MWI. It also defines the Authority’s duties and responsibilities as outlined above.

The WAJ reports directly to the Ministry of Water and Irrigation. However, the Cabinet of Ministers can designate responsibilities related to water to any authority other than WAJ within the public or private sector, through proper legal contracting. Board of Directors comprised of high Government officials manages the WAJ. The WAJ is financially and administratively independent.

All water resources in the Kingdom belong to the GOJ. The use of these resources must be in compliance with this law. The law defines possible violations and associated fines and penalties.

However, Article 28 of this law gives the Council of Ministers, and in accordance to the recommendation set by the Minister of MWI, the authority to designate any of the responsibilities of WAJ, including the implementation of a project, wholly or partially, to any other organization from the public or private sector, public shareholding company, and/or limited liability company that is partially or wholly owned by WAJ.

This may include the management, leasing, and transfer of ownership of projects to these organizations, in accordance to the conditions and duration specified in the contracts signed

between the two parties for this purpose. All legal provisions related to leasing or transfer of ownership must be taken into consideration.

In the case of conclusion of contracts to transfer the management of the projects or the lease thereof, the decision of the Council of Ministers may include the authorization to the officials of the bodies' contracted therewith, to exercise the same powers bestowed on the authorities' officials in pursuance of legislations enforced relevant to the execution of the contracts.

(b) Jordan Valley Development Law

Pursuant to Law No. (19) of 1988 and its Amendments in 2001, the JVA was created to develop and improve on the economic and social status of the Jordan Valley. The law gives JVA full authority over the valley area including control and protection of water resources, making decisions on the use and distribution of water for irrigation, household usage, etc. In addition, the JVA is expected to conduct and implement projects to improve on the quality of water and to combat and prevent water pollution.

Similarly to the WAJ, the JVA is managed by a Board of Directors comprised of high Government officials and is financially and administratively independent. Also, the Cabinet of Ministers can contract out or lease the management and operation of specific projects to the private sector. But the ownership of irrigation and development of water resources projects cannot be transferred to the private sector.

There are two articles in the Jordan Valley Development Law, as it was amended in 2001 that address the issue of the environment. Article 3-b of the above-mentioned law reads:

“The development, protection and improvement of the Environment in the Valley and to perform necessary works to achieve this objective, to implement the preparation of plans both Master and Detailed Plans for the lands outside the planning boundaries of the municipalities.”

This should be read in the right context that the first paragraph in Article 3 sets, i.e. carrying out the above environmental function is in support of the “social and economic development of the Valley” and in “cooperation with any concerned entity”.

In its broadness it allows JVA to do the necessary to protect the environment, which presumably includes setting standards and enforcing them. The word ‘environment’ as it appears above is not defined, but it can be inferred that it refers to land, air, water and biodiversity at the very least. This point is highlighted because the law and the articles that follow make no explicit mention of land, and air or biodiversity in an environmental context. In fact, the environment is not mentioned again in the law. The only reference to environmental issues arises in Article 38 of the law, which is concerned with the water pollution and the entry of polluting substances (as defined by the Secretary General) into the Valley, and only in the context of those pollutants contaminating water.

In speaking of environmental protection from a legal standpoint, three functions are considered: standards setting, monitoring and enforcement. Article 38 of the Jordan Valley Development law grants JVA the right to do both. Sub-paragraph a-1 of Article 38 authorizes the Secretary General to ban any substance from entry into the Valley if it is deemed polluting (standard setting). Sub-paragraph a-2 of the same article, mandates the JVA to conduct laboratory testing of water to ensure that it is not being polluted (monitoring); paragraphs b and c describe the punitive

measures to be taken against polluters and actions they must take to rectify the situation (enforcement).

The lack of specific reference to land, air pollution and biodiversity, while explicitly mentioning that of water, may be a detractor to the significance of the former three and so are afforded less attention.

(c) Public Health Interim Law

The Public Health Interim Law No. (54) of 2002 contains a number of articles related to drinking water, sewerage and repugnant sites. It gives the Ministry of Health (MOH) the responsibility for:

- Testing drinking water provided by WAJ or private sector to ensure its compliance with the national standard JS No. 286/2002 for drinking water. In the case of failure to comply with the standard, the MOH has the authority to stop the distribution or sale of water. The MOH has the right to delegate the testing responsibility to other Governmental bodies, but the MOH will still be responsible for the final output of these tests.

Furthermore, Article 4 of this law mandates the owner an industry, enterprise or any working environment to monitor and control the professional environment to ensure the public health and safety of the workers. In addition, Article 49 of this law considers the release of dust and the dumping or throwing of wastes, whether solid, liquid, and other on the streets or public land as a nuisance and must be controlled and removed in the case of waste.

(d) Environment Protection Law

Under the provisions of the Environment Protection Law No. (1) of 2003, the MOE is entrusted with the responsibility of the protection and monitoring of all environmental elements, including water, in coordination with concerned Government bodies, national, regional and international organizations. In addition, the law mandates the MOE to draft necessary by-laws, instructions, standards, etc. for environmental elements, which includes water, air, land, noise control, etc. This is where it creates confusion and overlap in responsibilities with other ministries and authorities.

(e) ASEZ Law

The Law establishing the ASEZ - Law No. (32) of the year 2000, commonly referred to as the ASEZ Law - also establishes an Aqaba Special Economic Zone Authority (ASEZA) to administer the Zone. This Law confers on ASEZA a number of environment-related responsibilities as presented below:

- **Article 9, F:** ASEZA shall protect the environment in the zone.
- **Article 10, B, 3:** ASEZA shall assume authority for protecting the environment, water resources, natural resources and biological diversity.
- **Article 43, B:** ASEZA shall administer the coastal areas.
- **Article 52:** ASEZA shall be responsible for protecting and maintaining the environment in the Zone and for ensuring sustainable development according to a basis and standards, which are not below the adopted levels in the Kingdom.

- **Article 53:** ASEZA is permitted powers of search and confiscation related to environmental protection.
- **Article 54, B:** ASEZA is authorized to extract fines and compensation from polluters of the sea or the environment within the Zone.
- **Article 56, E:** ASEZA is responsible for the regulation and administration of the Aqaba Marine Park.

Article 6 of the Law says that all legislation in force in the Kingdom shall apply to the Zone unless superseded by contradiction by the provisions of ASEZ legislation.

Article 52 says that AEZA shall assume the powers of GCEP (now the MOE). It is commonly held therefore that this Law confers on ASEZA the general authority and powers which the General Cooperation for Environmental Protection (GCEP) has in the rest of Jordan to regulate environmental matters, and that GCEP's authority within the ASEZ has effectively been transferred to ASEZA. However, to date, no written agreement or Memorandum of Understanding exists between ASEZA and GCEP.

(f) Habitat Protection Laws

Interim Agricultural Law No. (44) of 2002 gives the Ministry of Agriculture the mandate to protect, conserve and manage the wildlife in Jordan from manmade hazards.

In addition, the Environment Protection Law No. (1) of 2003, gives the MOE the mandate to protect all environmental elements including wildlife (flora and fauna), to issue by-laws, etc. as seen necessary in coordination with concerned parties.

Two national strategies on biodiversity have been already prepared in Jordan (1998 and 2002). However, a legal framework for wildlife protection from development projects does not exist.

(g) Antiquities Protection Law: Antiquities Law

Jordan has an all-encompassing law that sets and regulates policies and imposes penalties for dealing with archaeological sites, monuments and artefacts; this is the Antiquities Law No. (21) of 1988. The Department of Antiquities (DOA) is created at the Ministry of Tourism pursuant to this law. The DOA is responsible for administering, supervising, protecting and maintaining archaeological sites, monuments and artefacts in Jordan.

However, specific provisions are needed to enforce the intent of the law and the application of its penalties.

(h) Land Acquisition Law

The Land Acquisition Law No. (12) of 1987 provides the Government of Jordan the right to acquire any piece of land or property to develop a project for public benefit. However, the Government has to compensate the owner(s) fairly. In case the owner(s) are not satisfied with the compensation, they can take it to court. Such matters are considered of high urgency and will be handled by the court system as quickly as possible. The law outlines all the related specifics.

(i) Management of Government Property Law / Leasing and Authorization of Government Property By-law

Under the provisions of the Management of Government Law No. (17) of 1974 and the Leasing and Authorisation of Government by-law No. (53) of 1977, the Cabinet of Ministers have the right to lease or authorize Government property in return of rent equivalent to market prices, and in accordance to the recommendations set by the concerned ministry and higher commission of Government property. The Higher Commission is comprised of the following members: Minister of Finance (Chairman), Department of Land and Survey (Vice Chairman), Agriculture Credit Corporation, Secretary General of the Ministry of Interior, Secretary General of the Ministry of Municipal Affairs, and the Director General of Forestry and Grazing Land.

The Cabinet has to approve the lease or authorization even if it is going to be used by a Government body.

(j) Traffic Interim Law

Under the provisions of Law No. (47) of 2001, vehicles should control their air emissions to ensure that they are within the acceptable limits as specified by the equipping Vehicles Instruction of 2002. In addition, vehicles owners should not dump or release rocks, stones, solid waste, wastewater, and other into public land or streets. Violators will be fined.

(k) Investment Promotion Interim Law

Under the Investment Promotion Interim Law No. (68) of 2003, the proposed project can benefit from tax exemptions, similarly to the As-Samara Wastewater Treatment Plant BOT project. Pursuant to article 5, the Council of Ministers may decide, upon the joint recommendation of the Minister and the Minister of Finance which is based on the recommendation of the Investment Incentives Committee, to grant any Project, whether or not the Project falls within the Exempted Sectors, any benefits or exemptions from Fees and Taxes prescribed in accordance with the provisions of this Law or any additional benefits or exemptions for the period and conditions it deems appropriate, provided that the Council of Ministers' resolution is published in the Official Gazette. The Council of Ministers shall take into consideration when making its decision the considerations of economic development and the Project's geographical location and the extent of its contribution to research, development, increasing exports, transfer of technology and creating jobs for the Jordanian manpower.

Subject to the provisions of this Law, the Sectoral Licenses shall be granted according to the conditions and requirements stipulated in the pertinent legislation thereof, provided that the following principals are met:

- 1- The issuance of the Sectoral License for a certain Project shall not be contingent upon any other approval or License from any body other than the Official Body designated for each Project in the legislation that grants that Body the power to issue such, in addition to the bodies and conditions specified by the Council of Minister in preservation of the national interest.
- 2- The Official Body shall specify the procedures, requirements and conditions necessary to acquire the License and the supporting documents and the time limits within which a License must be granted, provided that they are in writing and accessible to the public without fees.

The period for issuing the Sectoral License shall not exceed one month from the date of submitting the application to receive such, provided that all the required documents are attached to the application and that it has fulfilled all the required conditions and legal requirements. If the Official Body does not issue its decision to accept or reject within the time specified (max. of one month), the applicant may, while reserving his/her right to litigate, ask the Minister to refer the matter of its issuance to the Council of Ministers to take their decision thereon, based on the recommendation of the Minister which is based on the recommendation of the Chief Executive Officer of the Jordan Investment Board. Banks, financial corporations, insurance companies, customs clearance companies and special free zones shall be excluded from the one month period restriction.

The following is the website address: “<http://www.jordaninvestment.com/>”.

Please note that in compliance with Article 94 of the Constitution of the Hashemite Kingdom of Jordan, this Interim Law, along with other interim laws are currently placed before the National Assembly, where the Assembly may approve or amend the laws. In the event of the rejection of such provisional laws, the Council of Ministers shall, with the approval of the King, immediately declare their nullity, and from the date of such declaration these interim (provisional) laws shall cease to have force provided that such nullity shall not affect any contracts or acquired rights. Provisional laws have the same force and effect as laws enacted in accordance with paragraph (ii) of Article (93) of this Constitution.

In the event of the rejection, the Investment Promotion Law No. (16) For 1995 and its amendments of 2000 shall apply.

Under the Investment Promotion Law No. (16) For 1995 and its amendments of 2000, the proposed project shall benefit from tax exemptions, similarly to the As samara Waste Treatment Plant BOT project. Pursuant to Article 3(b), the Council of Ministers may, upon recommendation of both the Minister of Industry and Trade and the Investment Promotion Committee, offer any project established within the Sectors mentioned in this Law incentives or guarantees or other privileges for the number of years the Council of Ministers sees fit according to the nature of the project’s activity, its geographic location, its contribution to increasing exports, creating jobs, exploiting national natural resources and accelerating economic development, in special cases and due to considerations determined by the Council of Ministers, and to be of national interest.

(l) Privatisation Law

The Privatisation Law No. (25) of 2000 provides opportunities for the private sector participation in the water sector through different investment schemes such as BOT, BOO, BOOT, etc. Significant gains can be realized by bringing private sector and/or own a utility.

(m) Labour Law

The Labour Law No. (8) of 1996 and its amendments mandates all the rights of the with respect to employment in Jordan from the employer and employees side. It has twelve chapters which are:

- Chapter 1: Definitions
- Chapter 2: Inspection at work premises
- Chapter 3: Employment and vocational guidance

- Chapter 4: Employment contract
- Chapter 5: Vocational training contract
- Chapter 6: Employment group contract
- Chapter 7: Protection of wages
- Chapter 8: Leaves and work organization
- Chapter 9: Safety and vocational health
- Chapter 10: Work related injuries and sickness
- Chapter 11: Labour unions
- Chapter 12: Conflict resolution regarding employment

There are several articles in this law regarding job terminations: articles 21, 23, 31 and 32. An employment contract will be considered terminated in the following three cases:

- 1- The two parties have agreed to terminate the contract
- 2- The work has been completed and/or the contract has expired (ended)
- 3- In case of death or injury that led to disability

If one party wishes to terminate the contract ahead of the end date, the party must inform the second party in writing a month before the expiry date of the contract. If the party wants to withdraw the notification, it must be accepted by both parties. In the case that the employer wants to terminate the contract, he/she must pay the employee his fees till the end date of the contract. However, the employee may be released seven days before his/her end date. Once a contract is terminated, by either party, the employee will receive all his/her benefits provided by the employer and one month salary for every year he/she has worked for calculated on the basis of the last salary.

The employer may down size, suspend or terminate contracts, given that there is some economic problems that the firm faces or change in the scope of work (type of production or service). The Ministry of Labour must be immediately informed in writing with the appropriate justifications for these measures. The Minister of Labour will form a committee to study the situation, and will decide in accordance with the recommendations of this committee. In some cases, when justifications are not valid, the employer will have to rehire all released employees.

In Chapter 9 of this Law, the owner of a project, plant, etc. must take the appropriate preventative actions and provide his/her workers with the necessary protective equipment to ensure their safety and avoid work related accidents. At the same time, it is the responsibility of the worker to take good care of the protective equipment and to maintain them. If, they are spoiled, it is the responsibility of the owner to replace them.

In addition, he/she should have written instructions and procedures on the use of equipment and the associated risks with them and the job they are undertaking. All workers should be properly informed of these instructions and procedures.

Furthermore, the owner must provide first aid facilities and adequate medical services at the premises and/or sites of operation.

(n) Roads Law

The Roads Law No. (24) of 1986 Articles 8 and 9 require any Government organizations to obtain a permit from the Ministry of Public Works and Housing, to do any construction work within the right-of-way of roads. The organization has to repair the road to the pre-construction condition, and in accordance to the conditions and instructions set out in the permit.

2.4.2 Regulations (By-laws)**2.4.2.1 Bylaws****(a) Organizational Structure of MWI By-Law**

The Ministry of Water and Irrigation (MWI) was established in 1988 pursuant to the By-law No. (54) of 1992: organizational structure of MWI of 1988. This law was amended in 1992. Under this law, the Water Authority of Jordan (WAJ) and Jordan Valley Authority (JVA) will report to the MWI. As such, the Ministry is responsible for all related matters with respect to water, water treatment, public sewers, water policy; the economic and social development of the Jordan Valley.

(b) Underground Water Control By-Law

Underground Water Control By-law No. (85) of 2002 and its amendments was issued pursuant to the WAJ Law No. (18) of 1988. Under this law, all ground water is owned and controlled by the Government, even if the land is privately owned.

Any exploration or exploitation must be authorized and a permit obtained, in accordance with the provisions of this by-law, which specifies end use, quantity and other requirements. The first trial of pumping should be under the supervision of the WAJ, otherwise the WAJ has the right to annul the permit and close down the well.

Table 2 presents the water fees paid to WAJ.

Table 2: Fees (paid to WAJ)

Description	JD
Drilling license	1,000
Renewal of drilling license	500
Water extraction license	100
Renewal of extraction license	50
Substitute drilling license	750
Well deepening license	500
Well maintenance or cleaning license	300
Possession or use of a drilling rig license	500
Renewal of Possession or use of a drilling rig license	100
Drilling license	50
Renewal of driller license	10

The WAJ requires that a person applying for a license or permit must submit cash deposit or bank guarantee in accordance to the principles set by the Cabinet, and in accordance to the recommendation of the Board of the WAJ.

The MWI is the authority responsible for conducting research and technical studies, identifying ground water, and for monitoring the quality and quantity of water to be pumped annually, in coordination with concerned parties.

The Cabinet of Ministers can specify regions where it is disallowed to dig wells. These regions have to be announced in the daily official newspapers. There will be exceptions, but they need to be approved by the Board of WAJ.

(c) **Subscribers to Drinking Water Network**

By-law No. (67) of 1994 gives the mandate and responsibility to WAJ to provide drinking water, including related activities. However, this right can be transferred to the private sector through an agreement as in the case of LEMA, where it operates mainly in Greater Amman under a management contract starting in 1999.

(d) **ASEZA Subordinate Legislation (By-Laws)**

A number of subsequent pieces of legislation have since been enacted. These include:

The Environmental Protection Regulations (No. 21 of the year 2001) provide a basis for environmental management in the Zone. They list a number of prohibited acts regarding waste management, use of seawater, and emission of harmful substances to the environment. These regulations address the legal framework for environmental management and monitoring in the Zone including environmental clearance and post-clearance phases of economic activities. The regulations also detail appropriate measures to prevent environmental pollution and protect the marine resources, and set out a legal framework for the imposition of penalties for pollution incidents.

The Regulation for the Development of Wadi Rum Area (No. 24 of the year 2001) relates to the improvement and development of the economic and social aspects of the Wadi Rum Area – which falls within ASEZA’s jurisdiction - and the conservation and preservation of its natural environment and cultural heritage.

The Aqaba Marine Park Regulation (No. 22 of the year 2001) sets out the perimeters of the Marine Park – a portion of the Aqaba coastline approximately 7 km in length - and its aims. The regulation also stipulates a number of prohibited actions and activities in the Park area that may result in the destruction, damage or deterioration of the natural environment, damage the wildlife or affect the aesthetics of the area.

The Development and Improvement of the Investment Climate Regulation (No. 11 of the year 2001) stipulates that the initiation of any economic activity in the Zone requires an operational permit from ASEZA relating to public health, health and safety and the environment. The regulation sets out the requirements that must be met before a permit can be issued, and outlines the inspection procedures for the ongoing operation of a development or facility.

In addition to these laws and regulations issued by ASEZA, there are also a number of Jordanian standards and regulations that apply in the ASEZ. With regard to the environment, it is explicit in the ASEZ Law that that all current existing environmental legislation in Jordan is applicable to the ASEZ until ASEZA issues its own superseding legislation. Also, Jordan is signatory to a number of international conventions and agreements which relate to environmental issues, many of which

relate directly to issues in the ASEZ, although there is no specific requirement or mechanism outlined in the ASEZ Law which requires ASEZA to report or coordinate with MOE regarding national issue or international conventions and agreements.

(e) Mining By-Law

Article 39 of law No. (131) of 1966 stipulates that any dynamite used for mining purposes or digging wells must be manufactured for this purpose and free of toxic gas or vapours.

(f) Prevention and Safety against the Use of Machines and Industrial Equipment at Working Sites No. (43) of 1998

This bylaw mandates the owner of a project or an enterprise to take adequate measures to prevent accidents against any mechanical, electrical or chemicals to ensure the safety of employees and/or workers in their working environment.

2.4.2.2 Instructions and Orders

The instructions and orders that are relevant to the proposed project are those that relate to water, air and noise as described below.

(a) Water

Drinking water instruction regarding connecting to drinking water and its amendments No. (1) of 2002.

Instruction No. 18 of 1998 and its amendments for industrial and commercial wastewater disposal into, and connecting to the public sewers.

There are several orders issued under the provision of the WAJ law, which specifies water prices, meter cost, etc.

(b) Air: Vehicle Equipping of 2002

This instruction specifies the permissible pollutant levels emitted by gasoline engine vehicles as follows: CO (5 percent), HC (≤ 600 /billion), O₂ (≤ 6 percent) and CO₂ (≥ 10 percent). In addition, it has provisions related to the design of the vehicles such as, tires' dimensions, horn requirements, allowed loads, fire extinguishers requirements, etc.

(c) Noise: Control and Prevention of Noise of 1997

Noise is considered as an environmental pollutant. Owners of plants and vehicles must take appropriate measures to ensure compliance with national laws, regulations and standards with regard to noise.

In 1995, and pursuant to Article 27 (a) of the Environment Law No. (12) of 1995, the GOJ issued instructions for the permissible sound levels and prevention of noise. These instructions define specific sources of noise and associated permissible upper limits in dB, in addition to setting fines and penalties for violating these instructions.

(d) Occupational Health and Safety

Initial Check-up for Workers at Corporations of 1999

No person is allowed to work in certain professions¹, which includes construction and loading and unloading of commodities, prior to having an initial medical check-up. This should include ear and eye and lung inspection in case the worker will be exposed to high noise level, radiation, or dust and other gases.

The employer will be responsible for ensuring that all employees get their medical check-up and to submit the results to the Public Health and Safety Directorate at the Ministry of Labour.

Regular Check-up for Workers at Corporations of 1999

The employer will be responsible for ensuring that all employees get their regular medical check-up and to submit the results to the Public Health and Safety Directorate at the Ministry of Labour. If the workers are exposed to noise and vibration, the check-up will be done on semi-annual basis; otherwise it is every two years.

Protection of Employees and Workers against Risks Associated with Work of 1998

This instruction (**Annex A2**) mandates the owner of a project, plant, etc. to take appropriate preventative actions and provide his /her workers with the necessary protective equipment to ensure their safety and avoid work related accidents. The equipment may include ear plugs or protectors; mouth masks gloves, boots, as required by the job. The equipment must comply with national standards and specifications.

2.4.2.3 Standards and Specifications

The standards and specifications that are relevant to the proposed project are as follows:

- 1- Jordanian specification No. 286/2001 for Drinking Water (see **Annex C21**).
- 2- Jordanian specification No. 893:2002 for Waste Water (see **Annex C21**).
- 3- World Health Organisation (WHO) Guideline for sample collection of drinking water.
- 4- Pollutants-Ambient Air Quality Standards (JS: 1140/1996) (see **Annex C21**).
- 5- Pollutants-Allowable limits for gaseous pollutants emitted to the atmosphere from gasoline engine vehicles.
- 6- Acoustics-Guide to international standards on the measurement of airborne acoustical noise and evaluation of its effects on human beings.

¹ Sectors: metal industry, mining, agriculture, petrochemical, chemical, insulation against radiation and heat, textile, carpentry, food, air and sea freight, loading and unloading, diving and fishing, dyeing construction, general service, electricity, and printing press.

2.4.2.4 Licenses, Permits, etc.

The licenses and permits that are relevant to the proposed project are as follows:

- 1- Drilling rig License
- 2- Driller License
- 3- License for drilling a well
- 4- License for drilling a substitute well
- 5- License for deepening, cleaning or maintaining a well
- 6- License for extracting water

2.4.3 Strategies

2.4.3.1 National Environment Strategy

The first National Environment Strategy (NES) was prepared in 1989, and was officially approved by the GOJ in 1991. Jordan was the first country in the Middle East to draft a NES. The NES contains over 400 recommendations and suggested actions in the field of environment protection and conservation. Because it was formulated by 180 Jordanian specialists with substantial hand-on experience in the country, it is practical, realistic, comprehensive, integrated and forward looking.

The NES covered the following sectors: surface and groundwater, land and agriculture, fauna and flora, coastal zones and marine resources, human population and settlement, atmosphere and air quality, energy and mineral resources, archaeology, cultural resources, and legal issues.

The NES formed the backbone of structuring environmental protection in Jordan. As a result, the first Environment Protection Law was drafted and enforced, the General Corporation of Environment Protection created, and many other recommendations in the various sectors were implemented.

2.4.3.2 Water Strategy and Policies

Jordan's Water Strategy (MWI, 1997b) provided the foundation and initiative to formally develop policies addressing specific issues facing Jordan's water sector. To date, four policies have been developed and accepted by the Council of Ministers. These policies are:

- 1- Groundwater Management.
- 2- Irrigation Water.
- 3- Water Utility.
- 4- Wastewater Management.

Ground Water Management Policy: The Ground Water Management Policy (MWI, 1998a) was approved by the Council of Ministers in 1998. The Policy addresses the management of groundwater resources including development, protection, management, and reducing abstractions for each renewable aquifer to the sustainable rate (i.e., safe yield). Specific policy statements address:

- 1- Resource Exploration
- 2- Monitoring
- 3- Resource Protection and Sustainability
- 4- Resource Development
- 5- Priority of Allocation
- 6- Regulation and Control
- 7- Private Sector Participation

Irrigation Water Policy: The Irrigation Water Policy (MWI, 1998b) was approved by the Council of Ministers in 1998. The Policy addresses irrigation water including agricultural use, resource management, technology transfer, water quality, and efficiency, but does not address or extend to irrigated agriculture. Many provisions of this Policy already are in practice. Specific Policy statements address:

- 1- Sustainability of Irrigated Agriculture
- 2- Resource Development and Use
- 3- Technology Transfer
- 4- Farm Water Management
- 5- Irrigation Water Quality
- 6- Management and Administration
- 7- Water Pricing
- 8- Regulation and Controls

Water Utility Policy: The Utility Water Policy (MWI, 1997b) was approved by the Council of Ministers in 1997. The Policy addresses issues related to water utilities. The Policy, the first prepared after adopting Jordan's Water Strategy, attempts to address 10 major issues relating to both water utility services as well as the basic authorities, and direction of Jordan's Water agencies. Specific sections of the Utility Water Policy are listed below and a brief discussion of key provisions follows.

Major topics of the Water Utility Policy are as follows:

- 1- Institutional Development
- 2- Private Sector Participation
- 3- Water Pricing and Cost Recovery
- 4- Human Resources
- 5- Water Resources Management
- 6- Water Quality and the Environment
- 7- Service Levels
- 8- Public Awareness
- 9- Conservation and Efficiency Measures
- 10- Investment

Wastewater Management Policy: The Wastewater Management Policy (MWI, 1998c) was approved by the Council of Ministers in 1998. The Policy addresses the management of wastewaters as a water resource including development, management, collection and treatment, reuse, and standards and regulations. Specific Policy statements address:

- 1- Resource Development
- 2- Resource Management
- 3- Wastewater Collection and Treatment
- 4- Reuse of Treated Effluent and Sludge
- 5- Pricing

Other aspects of the Policy address: Legislation and Institutional Arrangements, Standards, Regulations and Quality Assurance, Research and Development, Financing and Investment, Public Sector Participation, Human Resources Development, and Public Awareness.

2.4.4 Related Environmental International and Regional Conventions and Treaties

Jordan is a party to many international environment agreements. Most of these agreements require Jordan to comply with specified parameters for environmental protection. The GCEP, which is now MOE, is the main focal point for most of the international environmental conventions.

Table 3 lists the environmental international and regional conventions relevant to the project.

Table 3: Selected international environment agreements

Title of Agreement	Enforce in Jordan
Convention on the Protection of World Cultural Heritage and Natural Heritage	1972
Convention on Biological Diversity	1993
Convention to Combat Desertification	1996
Convention on Protection of Migratory Species of Wild Animals	2001

2.4.4.1 Convention on the Protection of World Cultural Heritage and Natural Heritage

Under the Convention Jordan has to:

- Identify and delineate the different properties situated in its territory that are considered as “cultural heritage” and “natural heritage, as defined in articles 1 and 2 of this convention, respectively.
- Recognize the duty of ensuring the identification, protection, conservation, presentation and transmission to nurture generations of the cultural and natural heritage. It can acquire, where appropriate, international assistance and co-operation, in particular financial, artistic, scientific and technical.
- Ensure that effective and active measures are taken to protect and conserve the cultural and natural heritage, by:
 - Adopting a general policy that aims to give cultural and natural heritage a function in the life of the community and to integrate the protection of that heritage into comprehensive planning programs.
 - Setting up, where such services do not exist, one or more services for the protection, conservation and presentation of the cultural and natural heritage with an appropriate staff and possessing the means to discharge their functions.

- Developing scientific and technical studies and research work and operating methods that will make the Kingdom capable of counteracting the dangers that threaten its cultural and natural heritage.
- Taking appropriate legal, scientific, technical, administrative and financial measures necessary for the identification, protection, conservation and presentation of the cultural and natural heritage.
- Fostering the establishment or development of national centres for training in the protection, conservation and presentation of the cultural and natural heritage, and to encourage scientific research in this field.

2.4.4.2 Convention on Biological Diversity

Under the Convention on Biological Diversity, Governments abide to conservation and sustainable use biodiversity. They are required to develop national biodiversity and action plans, and to integrate these broader national plans for environment and development. This is particularly important for such sectors as forestry, agriculture, fisheries, energy, transportation, construction work, and urban planning.

2.4.4.3 Convention to Combat Desertification

The objective of the Convention to Combat Desertification is to combat desertification and mitigate the effects of drought in countries experiencing serious drought and/or desertification, particularly in Africa, through effective action at all levels, supported by international cooperation and partnership arrangements, in the framework of an integrated approach which is consistent with Agenda 21, with a view to contributing to the achievement of sustainable development in affected areas.

Achieving this objective will involve long-term integrated strategies that focus simultaneously, in affected areas, on improved productivity of land, and the rehabilitation, conservation and sustainable management of land and water resources, leading to improved living conditions, in particular at the community level.

Under the provisions of this Convention, Jordan has the *General obligations* to:

- Implement its obligations under this Convention, individually or jointly; either through existing or prospective bilateral and multilateral arrangements or a combination thereof, as appropriate, emphasizing the need to coordinate efforts and develop a coherent long-term strategy at all levels.
- Pursue the objective of this Convention. To pursue the objectives, it shall:
 - Adopt an integrated approach addressing the physical, biological and socio-economic aspects of the processes of desertification and drought;
 - Give due attention, within the relevant international and regional bodies, to the situation of affected developing country Parties with regard to international trade, marketing arrangements and debt with a view to establishing an enabling international economic environment conducive to the promotion of sustainable development;
 - Integrate strategies for poverty eradication into efforts to combat desertification and mitigate the effects of drought;

- Promote cooperation among affected country Parties in the fields of environmental protection and the conservation of land and water resources, as they relate to desertification and drought;
- Strengthen sub-regional, regional and international cooperation;
- Cooperate within relevant intergovernmental organizations;
- Determine institutional mechanisms, if appropriate, keeping in mind the need to avoid duplication; and
- Promote the use of existing bilateral and multilateral financial mechanisms and arrangements that mobilize and channel substantial financial resources to affected developing country Parties in combating desertification and mitigating the effects of drought.

2.4.4.4 Convention on the Conservation of Migratory Species of Wild Animals

The Convention on the Conservation of Migratory Species of Wild Animals (also known as CMS or the Bonn Convention) aims to conserve terrestrial, marine and avian migratory species throughout their range. It is one of a small number of intergovernmental treaties concerned with the conservation of wildlife and wildlife habitats on a global scale.

Parties to CMS work together to conserve migratory species and their habitats by providing strict protection for the endangered migratory species listed in Appendix I² of the Convention; by concluding multilateral Agreements for the conservation and management of migratory species listed in Appendix II; and by undertaking co-operative research activities.

CMS has a unique role to play in focusing attention on and addressing the conservation needs of the 107 endangered species presently listed in Appendix I. The Parties acknowledge the need to take action to avoid any migratory species becoming endangered, and in particular, the parties:

- Should promote, co-operate in and support research relating to migratory species;
- Shall endeavour to provide immediate protection for migratory species included in Appendix I; and
- Shall endeavour to conclude agreements covering the conservation and management of migratory species included in Appendix II.

2.4.4.5 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international agreement between Governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival.

Because the trade in wild animals and plants crosses borders between countries, the effort to regulate it requires international cooperation to safeguard certain species from over-exploitation. CITES was conceived in the spirit of such cooperation. Today, it accords varying degrees of protection to more than 30,000 species of animals and plants (listed in the three CITES Appendices), whether they are traded as live specimens, fur coats or dried herbs. In other words, it covers trade in plants and animals that are alive or dead, and even products that derive from them.

² For a complete list, check www.wcmc.org.uk

CITES is an international agreement to which States (countries) adhere voluntarily. States that have agreed to be bound by the Convention ('joined' CITES) are known as Parties. Although CITES is legally binding on the Parties - in other words they have to implement the Convention - it does not take the place of national laws. Rather it provides a framework to be respected by each Party, which has to adopt its own domestic legislation to make sure, that CITES is implemented at the national level.

2.4.4.6 Treaty of Peace between the Hashemite Kingdom of Jordan and the State of Israel

Jordan and Israel had recognized the necessity to find practical, just and agreed solution to their water problems and with the view that the subject of water can form the basis for the advancement of co-operation between them, jointly undertake actions to ensure that the management and development of their water resources do not, in anyway, harm the water resources of the other Party.

Article six of the treaty and the Agreement for Bilateral Environmental Cooperation with Israel outline the relationship with respect to water and the environment in general, respectively.

Nevertheless, Disi Aquifer is not a shared water resource with Israel.

2.5 Applicable Policies of the World Bank

The operations of the World Bank are guided by a comprehensive set of policies and procedures, dealing with the Bank's core development objectives and goals, the instruments for pursuing them, and specific requirements for Bank financed operations. This is set out in the Bank's Operational Manual.

The core of the Manual lies in the Operational Policies (OPs) which are short, focused statements that follow from the Bank's Articles of Agreement, its general conditions, and from policies specifically approved by the Board. Other parts of the Manual address Bank Procedures (BPs), Good Practices (GPs) and Operational Directives (ODs) that advice on implementation of policies. The Manual has two volumes:

- Volume I deals with the bank's core development objectives and goals, and the instruments for pursuing them.
- Volume II covers the requirements applicable to Bank-financed lending operations.

Within the overall set of Operational Policies, Bank management has identified ten key policies that are critical to ensuring that potentially adverse environmental and social consequences are identified, minimized, and mitigated. These ten are known as the "Safeguard Policies" and receive particular attention during the project preparation and approval process

The Bank undertakes screening of each proposed project to determine the appropriate extent and type of EA to be undertaken and whether or not the project may trigger other safeguard policies. The Bank classifies the proposed project into one of four categories (A, B, C, and FI) depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts.

The Borrower is responsible for any assessment required by the Safeguard Policies, with general advice provided by Bank staff. The Bank's Legal Vice Presidency monitors compliance with the policies addressing international waterways and disputed areas. The Environmental and Socially Sustainable Development (ESSD) Network monitors all other safeguard policies through the Quality Assurance and Compliance Unit (QACU).

Operational Policy 4.01 seeks to ensure sound and sustainable environmental assessment (EA) of projects proposed for the World Bank for financing in order to assist in decision making. Such an EA should be initiated as early as possible in project processing and is integrated closely with the economic, financial, institutional, social, and technical analyses of a proposed project. The Policy emphasises that the Bank favours preventive measures over mitigatory or compensatory measures, whenever feasible. The *Pollution Prevention and Abatement Handbook* describes pollution prevention and abatement measures and emission levels that are normally acceptable to the Bank.

The EA is expected to consider natural and social aspects in an integrated way, take into account the variations in project and country conditions; the findings of country environmental studies; national environmental action plans; the country's overall policy framework, national legislation, and institutional capabilities related to the environment and social aspects; and obligations of the country, pertaining to project activities, under relevant international environmental treaties and agreements.

The borrower is responsible for carrying out the EA and the Bank advises the borrower on the Bank's EA requirements, and reviews the findings and recommendations of the EA to determine whether they provide an adequate basis for processing the project for Bank financing.

The proposed project, in accordance to WB environmental screening criteria is classified as Category A³. The World Bank requires environmental assessment (EA) of the project to help ensure that it is environmentally sound and sustainable. The EA shall comply with the requirements set out by the OP 4.01 of January 1999 (**Annex A3**).

With respect to Safeguard Policies, the following policies are applicable to the proposed project:

Operational Policy 4.04: Natural Habitats seeks to ensure that World Bank-supported infrastructure and other development projects take into account the conservation of biodiversity, as well as the numerous environmental services and products which natural habitats provide to human society. The Policy strictly limits the circumstances under which any Bank-supported project can damage natural habitats (land and water areas where most of the native plant and animal species are still present).

Specifically, the Policy prohibits Bank support for projects which would lead to the significant loss or degradation of any Critical Natural Habitats, whose definition includes those natural habitats which are either:

- legally protected,
- officially proposed for protection, or

³ (a) *Category A*: A proposed project is classified as Category A if it is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works. EA for a Category A project examines the project's potential negative and positive environmental impacts, compares them with those of feasible alternatives (including the "without project" situation), and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance. For a Category A project, the borrower is responsible for preparing a report, normally an EIA (or a suitably comprehensive regional or sectoral EA) that includes, as necessary, elements of the other instruments referred to in para. 7.

- unprotected but of known high conservation value.

In other (non-critical) natural habitats, Bank supported projects can cause significant loss or degradation only when (i) there are no feasible alternatives to achieve the project's substantial overall net benefits; and (ii) acceptable mitigation measures, such as compensatory protected areas, are included within the project.

Operational Policy Note 11.03: Cultural Property is to avoid, or mitigate, adverse impacts on cultural resources from development projects that the World Bank finances. Cultural resources are important as sources of valuable historical and scientific information, as assets for economic and social development, and as integral parts of a people's cultural identity and practices. The loss of such resources is irreversible, but fortunately, it is often avoidable.

The Bank is presently in the process of converting this Operational Policy Note to an Operational Policy providing more detailed guidance, and requiring implementation through the Environmental Assessment process.

Operational Policy 4.12: Involuntary Resettlement is triggered in situations involving involuntary taking of land and involuntary restrictions of access to legally designated parks and protected areas. The Policy aims to avoid involuntary resettlement to the extent feasible, or to minimize and mitigate its adverse social and economic impacts.

It promotes participation of displaced people in resettlement planning and implementation, and its key economic objective is to assist displaced persons in their efforts to improve or at least restore their incomes and standards of living after displacement.

The Policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to Bank appraisal of proposed projects.

Operational Directive 4.20: Indigenous Peoples, underscores the need for Borrowers and Bank staff to identify indigenous peoples, consult with them, ensure that they participate in and benefit from Bank-funded operations in a culturally appropriate way and that adverse impacts on them are avoided, or where not feasible, minimized or mitigated.

The Policy, issued in September 1991, is presently being revised into Operational Policy (OP) 4.10 and Bank Procedure (BP) 4.10.

For more information about "Safeguard Policies", the website address is "<http://lnweb18.worldbank.org/ESSD/sdvext.nsf/52ByDocName/SafeguardPolicies>".

Operational Policy 7.50: Projects on International Waterways, provides that World Bank supported projects involving the use of surface or groundwater resources which are shared between two or more countries include a process of notification and provision of information. This issue is being addressed by the Government of Jordan and World Bank on a separate basis outside the Environmental and Social Assessment..

2.6 Legal and Institutional Issues

The capacity of Jordanian Institutions to protect and enhance environmental resources has witnessed good progress on several fronts, yet there is still work that has to be done given the environmental strains resulting from population increase and economic growth. Jordan is confronted now with different types of environmental issues. In the 1970s and 1980s, reform was focused on managing water resources. In the last decade, the economy has witnessed increased development in the industrial, agriculture, and service sectors. This development has led to a variety of damage to environmental resources. The Government has taken a number of initiatives to effectively address these new challenges. The Government should continue its efforts to raise environmental awareness among the public and industry, and strengthen its partnership with the private sector to conserve environmental resources.

Furthermore, the Government has been emphasizing the importance of quality assurance, quality control and monitoring of environmental elements, and in particular water in Jordan.

This goal has been well translated into the activities of the public, private and NGO sector in Jordan.

This section highlights the key findings of the assessments, focusing in particular on those that relate to the project.

- 1- The Privatisation Law No. (25) of 2000 provides opportunities for private sector participation in the water sector through different investment schemes such as BOT, BOO, BOOT, etc. Significant gains can be realized by bringing private sector to manage and/or own a utility.
- 2- The Investment Promotion Interim Law No. (68) Of 2003, the proposed project provides benefit from tax exemptions to investors. Pursuant to article 5, the Council of Ministers may decide, upon the joint recommendation of the Minister and the Minister of Finance which is based on the recommendation of the Investment Incentives Committee, to grant any Project, whether or not the Project falls within the Exempted Sectors, any benefits or exemptions from Fees and Taxes prescribed in accordance with the provisions of this Law or any additional benefits or exemptions for the period and conditions it deems appropriate, provided that the Council of Ministers' resolution is published in the Official Gazette. The Council of Ministers shall take into consideration when making its decision the considerations of economic development and the Project's geographical location and the extent of its contribution to research, development, increasing exports, transfer of technology and creating jobs for the Jordanian manpower. The As-Samara Wastewater Treatment Plant BOT project was granted benefits, under the Investment Promotion law no. (16) For 1995 and its amendments of 2000 for 10 years, as it was considered water investment. The proposed project can pursue similar benefits.
- 3- Article 28 of the Water Authority law gives the Council of Ministers, and in accordance to the recommendation set by the Minister of MWI, the authority to designate any of the responsibilities of WAJ, including the implementation of a project, wholly or partially, to any other organization from the public or private sector, public shareholding company, and/or limited liability company that is partially or wholly owned by WAJ. This may include the management, leasing, and transfer of ownership of projects to these organizations, in accordance to the conditions and duration specified in the contracts signed between the two parties for this purpose. All legal provisions related to leasing or transfer of ownership must be taken into consideration. In the case of conclusion of contracts to transfer the management of the projects or the lease thereof, the decision of the Council of Ministers may include the authorization to the officials of the bodies' contracted therewith,

- to exercise the same powers bestowed on the authorities' officials in pursuance of legislations enforced relevant to the execution of the contracts.
- 4- The GCEP, which is now the Ministry of Environment (MOE), and according to its law and regulations, is supposed to take a leading role in coordinating the efforts of environmental protection with various related line ministries. GCEP has not been able to project itself as a leading organization to take this on this role.
 - 5- The Government of Jordan has taken the initiative to contract highly qualified personnel outside the regular civil service system for key positions. This should be adopted throughout the organization since the restrictions of the civil service system often make it difficult to attract and retain highly trained staff.
 - 6- Water sector has been progressively improving including legislative and administrative reform that ensured the involvement of the private sector in the implementation and/or management of water projects.
 - 7- The Aqaba Special Economic Zone Authority is doing an admirable job in building an environment program, and integrating development and industrial permitting with environmental management and protection.
 - 8- Jordan has signed most of the international agreements and conventions on environment. However, implementation responsibilities are still not well defined. There is a clear necessity to clarify the responsibility of governmental institutions in implementing these agreements under the supervision of the MOE.
 - 9- The NGO community provides an important component of Jordan's capacity for environmental management, particularly through their programs promoting environmental awareness and resource conservation by industries and the public.

Regarding the water sector, Jordan faces challenges in institutional aspects relating to water resource management, and the huge financial requirements of the Capital Investment Program for Water, and the operation and maintenance (O&M) of the water and wastewater network. Donor agencies have an ongoing dialogue with Jordanian officials regarding appropriate water sector reforms to improve the efficiency of the water and wastewater network. Faced with these challenges, the Government of Jordan has implemented several groundbreaking policy reforms, with the assistance of donor agencies, and has a future agenda to carry out further reforms, which will make Jordan a pioneer in the Middle East Region (MNA) in managing its scarce water resources. The Government of Jordan and the donor agencies have invested heavily in the water sector to secure water supplies to municipal, industrial and agricultural users. However, water prices do not cover operation and maintenance and capital costs. Some of the issues related to institutional and management aspects of the water sector are summarized as follows:

- Capacity of the institutions to implement the "National Water Strategy" and the water policies.
- The basic conflict of interest in the structure of the water sector, which does not provide a clear-cut between regulatory and service provision functions.
- The limitations of the Civil Service Law and regulations that do not enable the recruitment of highly qualified staff to work in the sector.
- High costs of water resources development.

2.7 Recommendations

Among the many needs for improving environmental management in Jordan identified in this report, the Consultant has selected the most important to implement in support of building environmental management capacity relative to the project.

- 1- Continue, and enhance the coordination with the concerned parties, in particular the MOE to ensure that the contracted firm adheres to environmental requirements and conditions during project execution and operation.
- 2- Enhance coordination between ministries and in particular with the new MOE. Where laws and by-laws do not adequately describe coordination responsibilities, separate agreements should be made to clearly assign responsibilities, including the need for reporting to coordinating agencies.
- 3- Recruitment of new MWI staff with advanced training in the appropriate technical and scientific fields. This can be done in collaboration with international organizations.
- 4- Train existing and additional MWI staff in a number of areas related to environmental management including groundwater monitoring.
- 5- Resource management policies should be revisited to integrate environmental aspects into resources planning by ensuring participation of all sectors including Government, non-governmental organizations, and the private sector in environmental protection. A comprehensive national plan is rather essential to arrive at this.
- 6- Enhance the means to implement the environmental international and regional conventions that Jordan has signed and ratified.
- 7- Continue and expand the implementation of the public awareness program about water scarcity, and to optimise the use of water, especially at household level, to avoid the misuse and waste of water.
- 8- Enhance regional cooperation and coordination with Saudi Arabia that shares the Disi aquifer.
- 9- Strengthen coordination among the environmental departments within MWI, WAJ and JVA as to benefit the project.

3 PROPOSED PROJECT

Rapid population increase in the main cities of Amman, Zarqa and Irbid has placed unprecedented demands on water resources. Total demand is approaching one billion cubic meters per year, which approximates the limits of Jordan's renewable and economically developable water resources. Current demands in many areas particularly in Amman have not been met satisfactorily and the costs of developing new water resources are rising rapidly. Although the water sector has been given high priority in all socio-economic development plans since early 1970's, the situation was complicated by the turmoil in the region and the compulsory migration to Jordan from other Arab Countries.

Disi is a fossil water aquifer extending from the southern edge of the Dead Sea in Jordan to Tabuk area in the Saudi Arabia. Wide exploitation of the Jordanian part of the aquifer started in 1980. At present Aqaba city is provided with 16.5 MCM for domestic purposes. Agriculture is consuming 75 MCM. The binding agreement between the Government of Jordan and the four agricultural companies working in the area indicated that growing water abstraction from Disi aquifer should not exceed 91 MCM per annum. This agreement will be terminated in 2011. Extensive hydro-geological studies carried out by the MWI indicated that additional 100-120 MCM can be drawn to Amman to elevate pressure on renewable ground water resources in the region.

Economic and technical feasibility studies of the project have been extensively studied by Harza Group in 1998 including three alignment alternatives. The pipeline alignment has been re-evaluated by Brown and Root in 2002 and readjusted in 2003 to avoid as far as possible private land acquisition. Capital and operation and maintenance costs have also been reconsidered in the light of new pricing schedule. The newly adjusted design will in most part of the project follow the alignment of the desert highway from Disi to Amman.

3.1 Origin and Scope

The Disi-Mudawarra to Amman Water Conveyance System project has been conceived by the Water Authority of the Ministry of Water and Irrigation of the Hashemite Kingdom of Jordan. The main objective of the project is to convey additional water to Greater Amman Area from the Disi aquifer, to meet the urgent municipal requirements.

The Disi project is important and of priority because it provides a reliable source of high quality water that is essential to cover part of the freshwater gap in Jordan's supply-demand balancing process. At the same time it would not close the country's growing water gap which requires additional resources to be imported to the country.

The Disi water will form the major portion of the extra water that is planned to partially replace the low quality groundwater consumed domestically in Amman. This issue is of high importance when considering that all the produced wastewater in Amman is directed towards the biggest treatment plant in Jordan As-Samra plant. This in turn will help in upgrading the quality of the treated wastewater, which is stored in King Talal Reservoir and used to fill to some extent the irrigation water urgent needs in Middle Jordan Valley.

This project will be executed on a Build, Operate, Transfer (BOT) basis. The Contractor will own and operate the project for a duration of 40 years after which the ownership of the project will be transferred to the Government of Jordan who will then continue to operate the project. However, in the BOT contract, the source of water is not specified to be the Disi Aquifer. The Conveyor is designed for a life-time that exceeds 50 years, but the Government of Jordan has kept its right to

stop the use of Disi water at any time during those 40 years and use the Conveyor to convey desalinated water from Red Sea at Aqaba. This means that the Disi aquifer will be used until a desalinization plant at Aqaba City becomes feasible. Afterwards, the Disi conveyor will be used to convey desalinated water and thus can be considered as a “Southern National Carrier” for Jordan.

3.2 Location

Jordan is located within the eastern margins of the Mediterranean climatic zone of the eastern Mediterranean. However, much of Jordan can be classified as semi-desert, with only the western high lands enjoying a Mediterranean climate.

In the highlands, the climate is relatively temperate. In the desert the temperature may reach more than 40 °C. In the Jordan Valley, wadi Araba and Aqaba region the temperature may rise to 45 °C in summer, while in winter the temperature in those areas falls to few degrees above zero.

Over 95 percent of the land area in Jordan has an annual rainfall of less than 200 mm, while only about 2 percent has more than 350 mm/year rainfall. Snowfall most frequently occurs on the higher hills. The potential evaporation rates range from about 1,600mm/year in the extreme north-western edges in Jordan to more than 4,000 mm/year in the Aqaba and Azraq areas.

Within the project area, the geology is of sedimentary origin, ranging in age from Cambrian to Recent. The lower part of the sedimentary succession comprises mainly sandstones of Paleozoic and lower Mesozoic age and is represented by three differentiated geological groups locally known by the names “Rum, Khreim and Kurnub Groups”, while the upper part is mainly composed of limestones, marls and cherts of upper Mesozoic and Cenozoic age and represented by two differentiated geological groups, named locally as “Balqa and Ajloun Groups”. The project area passes through two major geological zones. These are the Sandstone of south Jordan and the limestone plateau. The major geomorphologic features include wadis, trough mountains and hills. The structural setting within the project area is represented by a series of intercalated fluting system in addition to another folding system.

The project area is the area between the Disi well fields and Greater Amman and comprises Governorates of Greater Amman, Madaba, Karak, Tafileh, Ma’an and Aqaba. The water will mainly be abstracted from the Dubaydib well field in the Disi-Mudawarra area south of Jordan and conveyed to Amman. The average abstraction from this well field will be 100 MCM/year. Due to inevitable seasonal variations in demands, the flow will be increased in summer to 120 MCM/year and reduced to 80 MCM/year in winter.

A 325 kilometre pipeline is to convey the water from Disi-Mudawarra to Amman city. The original route of the conveyor was designed by Harza in 1997 to run adjacent to the main north-south highway with the conveyance pipeline situated within the right-of-way of the highway. A more feasible alternative route for the southern half of the conveyance was proposed by Brown and Root North Africa in 2001, where the pipeline bypasses Ma’an city through the desert and meets the original alignment just before Jurf Al Drawish. This new alignment will allow a conveyance of 150 MCM/year with minimum additional facilities in addition to a considerable reduction in the construction cost. The components of this new design are substantially the same as those in the original final design. **Figure 2** shows the optimised alignment of the conveyor to Amman.

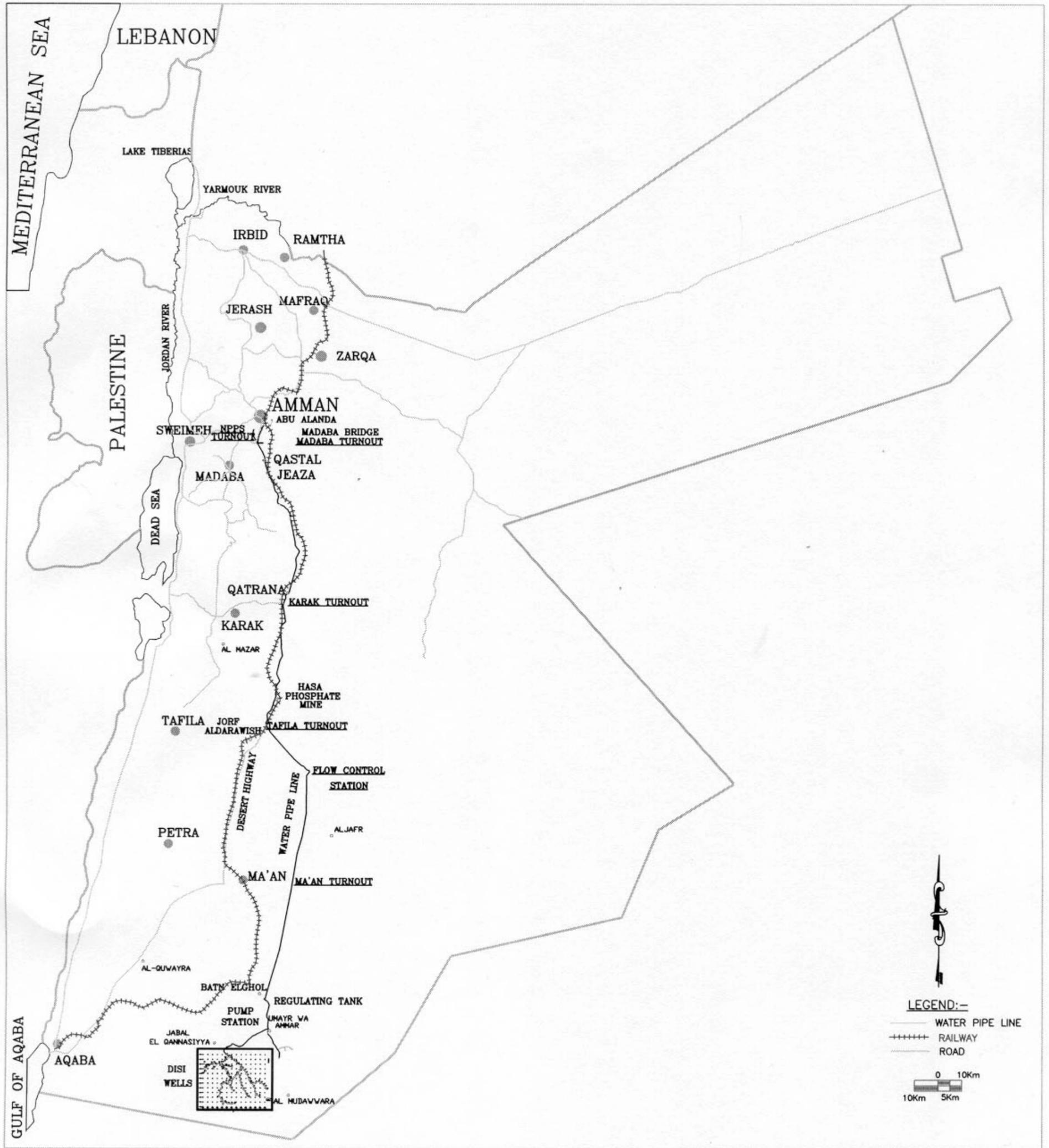


Figure 2: Optimised alignment of the Disi-Mudawarra to Amman water conveyance system

The southern well field is the promising source for water. The northern source is a standby which can be connected if the quantity dropped below the 100 MCM. This minimises the risk on Ministry of Water and Irrigation and its Guarantor and encourages participation of private sector in the BOT construction project.

3.3 Major Elements

The elements of the Disi project can be divided into the well field facilities and the conveyance facilities. These components are as follows:

- Major well field facilities:
 - Well-pump, riser and wellhead;
 - Power supplies and standby generation;
 - Control and communication facilities including associated instrumentation; and
 - Minor access roads.

- Major conveyance facilities:
 - Conveyance pipeline, appurtenances and access roads;
 - Railway, wadi and road crossings;
 - Collector reservoir/Balancing Tank and pump stations;
 - Regulating Tank;
 - Flow control station;
 - Fixed and mobile disinfection stations;
 - Power supplies, standby generation;
 - Control centres, accommodation, workshop and depot;
 - In-line booster station; and
 - Terminal Reservoir.

A total of 65 wells will be constructed in the Dubaydib well field to produce a flow rate of 120 MCM/year. It is expected that 55-60 wells will yield the required flow leaving a number of wells for standby/rotation. If production is to be increased to 150 MCM/year in the future, a total of 68 wells will be required but 80 wells are to be drilled to allow for rotation/standby or to supplement low yielding wells.

A pumping station near the well field raises the water from the well field to a regulating tank on a high point some 20 km north of the start point. The water is pumped from a collector reservoir downstream of the well field through a 1,800 mm diameter steel pipeline to the regulating tank in the vicinity of Batn El-Ghoul. The regulating tank at Batn El-Ghoul is designed to meet control requirements. The tank is also designed with internal baffle walls to ensure sufficient contact time for chlorination.

Turn-outs at Tafileh, Karak and Ma'an Governorates are emergency turn-outs recommended for operational flexibility as these three governorates currently have sufficient water supplies of suitable quality and reliability.

From the regulating tank, there is a gravity flow to a new reservoir at Abu Alanda, southeast of Greater Amman. However, before reaching Abu Alanda reservoir and at Madaba Bridge, the conveyor splits into two branches: the Dabuk and the Abu Alanda branches. The Dabuk branch is an 1,000 mm diameter steel pipe that extends from Madaba Bridge to an existing pipe at National

Park Pump Station and then towards a newly constructed tank reservoir at Dabuk. The Abu Alanda branch is a 1,600 mm diameter steel pipe that flows to an existing and new reservoir at Abu Alanda.

From the regulating tank to the bifurcation point at Madaba Bridge, the water flows under gravity through a 2,000 mm diameter steel pipe. A flow control station is located about half way along the conveyance in the vicinity of Jurf Al Drawish. There are also a number of air valves and washouts to facilitate the draining and filling of the pipeline for maintenance purposes. This pipeline follows the route of the main highway from Aqaba to Amman and crosses the highway and the adjacent railway line at several locations. There are also a number of isolation valves along the pipeline.

The final design allowed for a flow of 80 MCM/year to the Abu Alanda reservoirs at the same time as a flow of 40 MCM/year to Dabuk reservoir. At these flow rates, flow to Abu Alanda is under gravity head from Batn El-Ghoul regulating reservoir but booster pumping is required to achieve the flow to Dabuk.

The conveyance flow is directed to the new Abu Alanda reservoir which is 10 m lower than the existing reservoir. The higher reservoir will be supplied by small pumps located at Abu Alanda. Flow to the new reservoir at Abu Alanda will be by gravity from the regulating tank up to a total flow of 120 MCM. Booster pumping will be required on this branch if the conveyance flow is to be increased in the future.

At Abu Alanda there is an existing concrete reservoir of 12,000 m³ capacity with an inlet level of 999.45 m a.s.l. There is to be a new reservoir of 150,000 m³ capacity in three separate tanks at a lower elevation of 983.6 to 989.1 m a.s.l.

To the south of Abu Alanda, about a third of the flow is split and directed towards a new reservoir at Dabuk in the north west of Greater Amman. The Dabuk reservoir is higher than Abu Alanda and the recommended scheme is to include booster pumping on this branch. There is a considerable variation in elevation between the regulating tank and the lowest elevations in the pipe route and, to reduce the required pressure rating of the conveyance in the northern part of the route, a flow control station is included. The flow control station has three control valves, each located between isolating valves, plus chlorination facilities, a standby generator and fuel tank, guard room and control/switch room. The valve room and controls are enclosed under an industrial type building.

The receiving reservoir at Dabuk is a newly commissioned 250,000 m³ concrete reservoir in operation. This reservoir receives water at present from Deir 'Alla source. This reservoir will store water from both the Disi scheme and the Deir 'Alla schemes in the future.

To achieve lower head, astute control measures (i.e., a reduction in isolation valves and the introduction of an off-line pressure relief vent to be used when isolation of the downstream conveyance is achievable) will be used.

A summary about the key elements of the project is presented in **Table 4**.

Table 4: Summary of the key elements of the project

Components		
Well Field Facilities	Number of Wells	Depth
Dubaydib Well Field	65 production wells (55-60 wells for production and the rest are standby) to produce a maximum flow of 120 MCM/year	About 800m
Conveyance Facilities	Characteristics of Pipe	Remarks
Main Conveyance Pipeline	1,800-2,000 mm; Steel Pipeline	
Dabuk Branch	1,000 mm; Steel Pipeline	A connection will be made from this pipe to the reservoir
Abu Alanda Branch	1,600 mm; Steel Pipeline	This will replace or twin the existing 600 mm steel pipe from National Park Pump Stations (NPPS) to Abu Alanda
Southern Pump Stations	A total of four pumps with additional two pumps to act as a pair and one under maintenance. Each pump is designed to lift the supply through 160 m.	
Batn El-Ghoul Regulating Tank	Provide 6 hours storage; 2x42,000 m ³ Provides 3 to 4 hours emergency storage	
Jurf Al Drawish Flow Control Station	Three flow control valves, each located between isolating valves; plus chlorination facilities; standby generator & fuel tank; guard room and control/switch room	
Booster Pump Station on Dabuk Branch		
Reservoirs	Characteristics of Reservoirs	Remarks
Dabuk Reservoir	250,000 m ³ ; Concrete reservoir that is already in operation	
Abu Alanda Reservoir	12,000 m ³ ; Concrete reservoir	

It is a well known fact that this fossil aquifer in Disi has a life span which extends in the best case to 100 years; therefore the Government of Jordan laid plans that include the Disi Project as part of the framework of water management and development of new resources. The Disi water can fulfil part of the water shortage and is not the complete solution for the problem. Even with all the new sources, due to municipal demands being in excess of available water sources, by year 2015 Ministry of Water and Irrigation will have no choice but to find another new non-traditional source, this being desalination, i.e. from the Gulf of Aqaba, to not only meet local demands in Aqaba itself, but also to extend to the remainder of Jordan through either utilising this project water conveyance system and/or the proposed Red-Dead Sea Canal that will include provisions for desalinization of salt water.

Hence, there is a distinct possibility of expanding the role of the water conveyance system into becoming a genuine southern water main after its planning horizon, particularly if the pipeline were to be twinned at that stage. Any future proposals for deep sandstone demineralisation and as stated above, any future Aqaba desalination options would require conveyance to Amman. In both of these cases, the Disi conveyance system would be the obvious choice of conveyance. The Aqaba supply could be linked at the existing collector reservoir at Batn El-Ghoul. This would allow mixing of desalinated or demineralised water with Disi aquifer water to improve the water quality.

3.4 Project Segmentation

For the purpose of this Environmental and Social Assessment Study, the Consultant has divided the project area into three segments. These three segments are as follows:

- Segment A (Southern Part) which extends from the Well Field to Jurf Al Drawish - Qatraneh Junction (Desert Highway)
 - Segment A-1: from Disi wells to Batn El-Ghoul
 - Segment A-2: from Batn El-Ghoul to the cross point between Jurf Al-Drawish and the Desert Highway
- Segment B (Middle Segment) which extends from Jurf Al Drawish-Qatraneh Junction to the beginning of Al Jiza Area (South of Amman)
 - Segment B-1: from the cross point between Jurf Al-Drawish to the Qatraneh cross road
 - Segment B-2: from Qatraneh cross road to Al Jiza area
- Segment C (Northern Segment) which extends from Al Jiza to Dabuk and Abu-Alanda Reservoirs
 - Segment C-1: from Al Jiza to Airport bridge
 - Segment C-2: from Airport bridge to Abu-Alanda Reservoir
 - Segment C-3: from Airport bridge to Dabuk Reservoir

Figure 3 represents these segments.

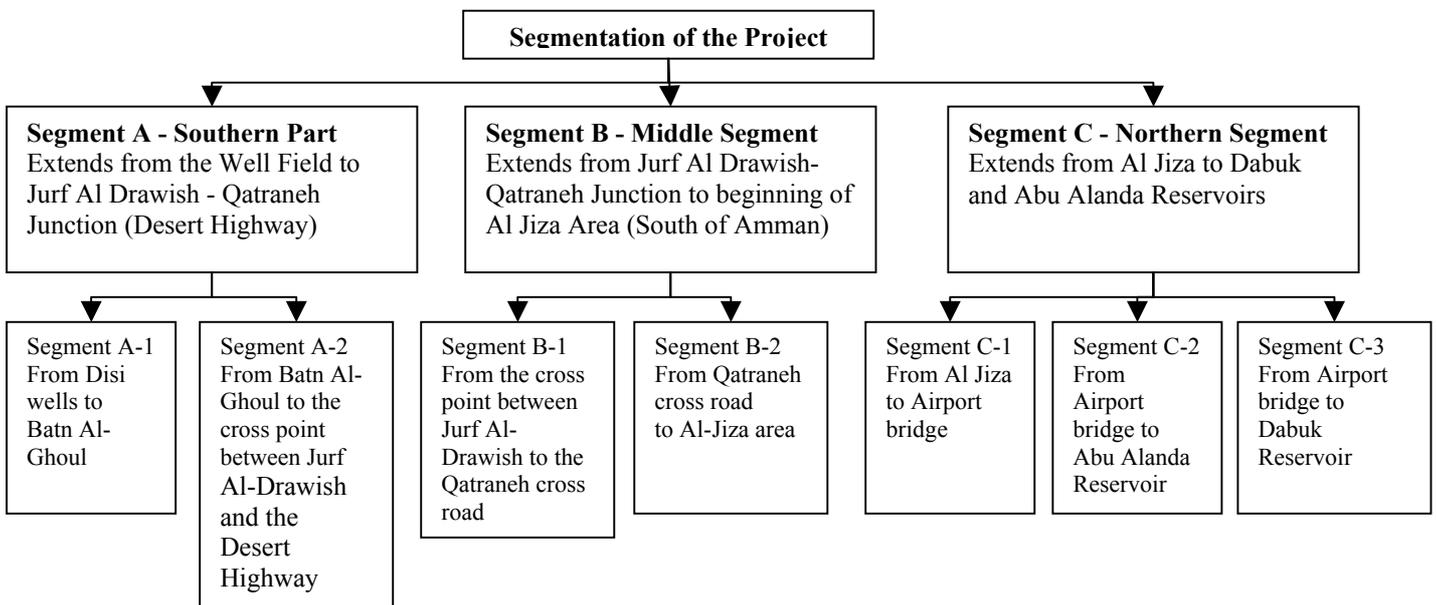


Figure 3: Segmentation of the project area

3.5 Construction and Operational Phases

3.5.1 Project Implementing Organization

The Disi Project will be constructed and operated by the private sector as BOT construction project. The Ministry of Water and Irrigation (MWI) will be responsible for coordination and monitoring the construction and operational phases of the proposed project. MWI will employ a consultant to monitor various activities during construction as well as monitoring contractors implementation of identified mitigation measures under this study.

Since the conveyance system will pass through different cities along its alignment to Amman, it is essential to get the local Government involved during the construction and operational phases. Their role will be to help the contractor in getting required local labour, approving required detours for the traffic if needed and assist in previous announcement of areas affected by construction.

3.5.2 Operation of the Project and its Benefits

Local labour and technicians will be involved in the operation of the system. Training of employees will be part of the BOT contract to ensure that they can effectively operate and maintain the project once the BOT contract ends and final transfer takes place. The systems will be linked at its final destination to Abu Alanda and Dabuk reservoirs feeding the water supply network in Amman. In addition there will be emergency turnouts along the route as mentioned earlier.

Several anticipated benefits have been identified for this new system including the following:

- Improving the quality of the supplied water to Amman;
- Relieving the over-abstracted aquifers by reducing pumping to their safe yield and allowing natural recharge to take place;
- Providing a reliable supply in Amman which enhances the implementation of the rationing program for distribution of water;
- Improving environmental health conditions especially in areas which are getting water less than what is required by any health standards;
- Improving the quality of the treated wastewater in As-Samra Wastewater Treatment plant which is directed toward the Jordan Valley and used for irrigation; and
- Providing and emergency supply to communities along the route.

ANNEXES

ANNEX A1
INTERIM LAW NO. (68) FOR THE YEAR 2003 -
THE INVESTMENT LAW

ANNEX A1: INTERIM LAW NO. (68) FOR THE YEAR 2003 THE INVESTMENT LAW

We, Abdullah the Second Ibn Al-Hussein, King of the Hashemite Kingdom of Jordan in accordance with Paragraph (1) of Article (94) of the Constitution based upon what was decided by the Council of Ministers on 12/6/2003 hereby endorse, in accordance with the Article (31) of the Constitution, the following Interim Law and order its issuance and placement through temporary enforcement and addition to the State laws based on its submission to Parliament in its first session:

Interim Law No. (68) for the Year 2003 The Investment Law

Article (1)

This Law shall be known as “The Investment Law for the Year 2003” and shall come into effect as of the date of its publication in the Official Gazette.

Article (2)

The following words and phrases wherever used in this Law shall have the meanings ascribed thereto hereunder and unless the context indicates otherwise:

Ministry	:	The Ministry of Industry and Trade.
Minister	:	The Minister of Industry and Trade.
Authority	:	The Jordan Authority for Investment Climate and Enterprise Development.
Board	:	The Board of Directors of the Authority.
Committee	:	The Investment Incentives Committee formed pursuant to this Law.
Project	:	Any economic industrial, agricultural or services activity to which the provisions of this Law and the regulations and instructions issued pursuant thereto shall apply.
Fixed Assets	:	The machinery, apparatus(es), equipment and necessary tools to be used in the Project exclusively, and the furniture, furnishings and supplies for hotels and hospitals.
Lists	:	The lists of Fixed Assets and spare parts adopted by the Committee for the purposes of benefiting from the exemptions granted pursuant to this Law and the regulations issued pursuant thereto.
Fees	:	Custom duties and other fees imposed on Fixed Assets items pursuant to the laws in force, with the exception of municipal fees.
Taxes	:	Taxes imposed pursuant to the legislation in force, including those related to Fixed Assets, with the exception of municipal taxes.
Exempted Sectors	:	The economic sectors whose operating projects are exempted from Fees and Taxes in accordance with

	:	this Law and the regulations issued pursuant thereto.
Investor	:	The natural or legal person investing in the Kingdom according to the provisions of this Law.
Production Capacity	:	The designed or actual capacity of the Project.
Sectoral License	:	Any permit, approval or permission granted by an Official Body to any Person to allow him/her to carry out a certain Project, excluding General Licenses.
General License	:	The license, the purpose of which is to achieve regulatory, health or environmental purposes, or to accomplish public safety considerations.
Official Body	:	Any ministry, department, institution or any other official entity having the authority pursuant to its own legislation to issue Sectoral Licenses for a certain Project.

Article (3)

A- 1- Any Project falling within the Exempted Sectors shall enjoy the benefits and exemptions from Fees and Taxes provided for under this Law and the regulations issued thereto. The Assets stated within the Lists shall be exempt from Fees and Taxes.

2- Notwithstanding what is stated in Subparagraph (1) of this Paragraph, the goods and services that are imported or purchased locally for an exempted Project shall be subject to a (zero) general sales tax.

B- For the purposes of this Law, the geographical areas in which Projects shall benefit from Fees and Taxes exemptions shall be defined by three development areas (A, B, C), as per the degree of economic development of such areas in each of the Exempted Sectors.

C- If a Project is relocated during the granted, exemption period from one development area to another, such Project shall be treated for the purposes of the exemption for the remaining period as the Projects of the development area to which it is relocated after obtaining the Committee's written approval on such.

Article (4)

Industrial Projects established within the industrial estates or relocated thereto are granted exemptions of income, social services and land and building according to the bases, provisions and periods to be defined in regulations issued pursuant to this Law, in addition to the exemptions prescribed to these Projects in accordance with its provisions.

Article (5)

A- The Council of Ministers may decide, upon the joint recommendation of the Minister and the Minister of Finance which is based on the recommendation of the Committee, to grant any Project, whether or not the Project falls within the Exempted Sectors, any benefits or exemptions from Fees and Taxes prescribed in accordance with the provisions of this Law or any additional benefits or exemptions for the period and conditions it deems appropriate, provided that the Council of Ministers' resolution is published in the Official Gazette.

B- The Council of Ministers shall take into consideration when making its decision pursuant to Paragraph (A) of this Article the considerations of economic development and the Project's

geographical location and the extent of its contribution to research, development, increasing exports, transfer of technology and creating jobs for the Jordanian manpower.

Article (6)

The Investor whose Project enjoy the exemptions or benefits in accordance with the Investment Promotion Legislation and their amendments that were effective prior to the effectiveness of this Law shall chose any of the following for his/her Project:

- A- Continue to enjoy the exemptions and benefits granted thereto in accordance with that Law until the expiry of the exemption period and subject to its conditions.
- B- Enjoy the benefits and exemptions provided for Projects in accordance with the provisions of this Law, provided that the Project adjusts its status and abides by the conditions and requirements specified in this Law or the regulations issued pursuant thereto. In this event, the Project's benefiting there from is limited to the period following its adjusting its status.

Article (7)

A- A committee to be known as "The Investment Incentives Committee" shall be formed at the Jordan Investment Board, chaired by the Authority's Chief Executive Officer and comprising the membership of the following:

- 1- The Chief Executive Officer of the Jordan Investment Board as vice-chairman.
- 2- The Chief Executive Officer of the Jordan Enterprise Development Corporation.
- 3- The Director General of the Income Tax Department.
- 4- The Director General of the Customs Department.
- 5- A representative of the Ministry of Planning nominated by its Minister.
- 6- A representative of the private sector appointed by the Council of Ministers, upon the recommendation of the Minister.

B- The Committee shall appoint one of the Jordan Investment Board's staff as a secretary to the Committee to keep its registers, record its decisions and sign them from the meeting's chairman and attending members.

Article (8)

The Committee shall be responsible for reviewing the applications submitted by Investors relating to the exemptions of Fees and Taxes and any other pertinent applications, and making its decisions concerning the applications according to the provisions of this Law, in addition to any functions or powers prescribed thereto in accordance with its provisions.

Article (9)

The Committee shall convene at least once a month upon an invitation from the chairman or the vice-chairman in his absence. The quorum of the Committee meetings shall be met upon the attendance of not less than five of its members, provided that the chairman or the vice-chairman is among them. The Committee shall issue its resolutions by a majority vote of at least four of the attending members. Each member with an opposing vote shall record such in writing in the minutes of the meeting and sign thereon.

Article (10)

The Investor seeking to enjoy the benefits and exemptions prescribed pursuant to the provisions of this Law shall submit to the chairman of the Committee an application, complete of all documents and conditions required. The chairman shall present such application to the Committee

in its first meeting to take a decision thereon within thirty days from the date of presentation. In the event of rejection, the Committee must indicate its reasons.

Article (11)

A- The Investor or his legal delegate shall be entitled to object to the Committee's decisions to the Minister within thirty days from the date of the notifying the applicant of such, provided that the objections is in writing and justified.

B- 1- If the Minister confirms the Committee's decision, the Minister's decision shall be subject to appeal with the Court of Higher Justice.

2- If the Minister agrees to the objection, he shall return the matter to the Committee for reconsideration. If the Committee insists on its decision, it returns the matter to the Minister, who in return refers the matter to the Council of Ministers to take a decision thereon. The Council of Ministers' decision shall be subject to appeal with the Court of Higher Justice.

Article (12)

A- Subject to the provisions of any other legislation:

1- The non-Jordanian Investor may invest in the Kingdom through entire ownership, partnership or shareholding according to bases and conditions determined in accordance with the provisions of a regulation to be issued for this purpose. The said regulation shall indicate the investment sectors or the branches thereof in which the non-Jordanian Investor may invest, the maximum percentage of ownership and the minimum foreign capital allowed therein.

2- In cases other than those stated in the regulation referred to in Subparagraph (1) of this Paragraph, the non-Jordanian Investor investing in any Project governed by this Law shall be afforded the same treatment as the Jordanian Investor.

3- The Investor shall be free to manage his Project in the manner he deems appropriate and through the person(s) of his choice. The competent authorities shall provide the required facilities for such.

B- For the purposes of this Law, the expression "Foreign Capital" shall mean monies invested in the Kingdom by a non-Jordanian in cash or in kind, or any material or corporeal rights of such investor that have a financial value, including the copyrights and patents.

Article (13)

Depriving of ownership of any Project or subjecting it to any measures that may lead to such shall not be allowed unless through expropriation for the purposes of public interest, provided that just compensation is be paid to the Investor in a convertible currency.

Article (14)

A- The Investor, whose Project has been granted the exemptions and benefits according to the provisions of this Law, must carry out the following:

1- Upon completing the installation of the Fixed Assets, notify the Committee in writing of the date of commencement of work or actual production of the Project.

2- Keep regular accounts for the Project and appoint an auditor in the Kingdom licensed to audit such.

3- Maintain a register for the exempt Fixed Assets where all details of such assets shall be recorded.

4- Supply any information, data, or documents required by the Committee which are pertinent to the Fixed Assets of the Project and allow any authorized personnel of the Committee to enter the site of the Project to check the accuracy of such data and information.

B- If the Investor fails to execute any of his/her commitments stipulated in Paragraph (A) of this Article, the Committee shall issue a notice thereto to execute such within the period prescribed thereto in the notice. If the Investor fails to do such, he/she shall be penalized with a fine not exceeding five hundred dinars. If the violation recurs, the Investor shall be penalized with a one thousand dinars fine.

Article (15)

The Investor may transfer the ownership of the Project during the exemption period to any other Investor, provided that prior to his/her completion of the procedures necessary for such inform the Committee of such and provided that the Investor indicates the reasons that justify the transfer of ownership. In this event, the Project shall continue to enjoy the granted exemptions, benefits and guarantees until the end of such period, provided that the new Investor continues to work in the Project and replaces the previous Investor in all rights and obligations provided pursuant to the provisions of this Law.

Article (16)

A- Upon obtaining the approval of the Committee, the Investor shall be entitled to sell or assign the exempt Fixed Assets as follows:

- 1- To another Investor previously benefiting from the provisions of this Law, provided that these Assets are used in the Project of such Investor.
- 2- To any Person or another Project not covered by the provisions of this Law after paying the Fees and Taxes applicable thereto.

B- If it becomes evident that the exempted Fixed Assets have been wholly or partially sold, assigned or disposed of contrary to the provisions of this Law, or have been used in other than the Project or the purposes for which the exemption was granted, the Investor must pay the Taxes, Fees and fines due on his Project according to the provisions of the laws and regulations in force.

Article (17)

If two or more Projects merge, the Committee may, according to what it deems appropriate, grant the new Project resulting from the merger the exemptions stipulated in this Law and the regulations issued pursuant thereto for a period, the maximum of which is the longest remaining period of the exemption relating to every merged Project.

Article (18)

A- The non-Jordanian Investor shall be entitled to the following:

- 1- Remitting abroad the capital transferred to the Kingdom for investment therein pursuant to the provisions of this Law or the Investment Promotion legislation and their amendments that were in effect prior to the effectiveness of the provisions of this Law.
- 2- Transferring outside the Kingdom any returns and profits accrued from his/her investment.
- 3- Liquidating of the investment, or selling his/her Project or his/her part or share therein the Project without delay, provided that the Investor has paid the Project's commitments or any commitments resulting in accordance with the legislation in force towards thirds parties.

B- The non-Jordanian Investor may remit the funds stated in Paragraph (A) of this Article abroad in any convertible currency.

Article (19)

Non-Jordanian technicians and administrators working in any Project may transfer abroad their salaries and remuneration in accordance with the legislation in force.

Article (20)

Arab and international agreements pertinent to investment, the protection thereof and dispute resolution related thereto to which the Kingdom is a party or has acceded, shall be taken into consideration when applying the provisions of this Law.

Article (21)

A- Notwithstanding what is stated in any other legislation, no Official Body may restrict the carrying out of any activity in any Project by requiring obtaining a Sectoral License unless the legislation in force requires such in achieving the requirements of Public Order and Morals, public health, education, public safety, environment, protection of natural resources, national security or execution of public economic policies and the interest of national economy.

B- 1- In all events, the purpose of a Sectoral License shall not be to restrict the market size by prohibiting the access of new Projects in certain sectors or by limiting fair competition without undue justification which shall be related to the objectives stipulated in Paragraph (A) of this Article.

2- In particular, stipulating in resolutions or procedures taken a maximum number of those to be licensed, a maximum to the volume of their productions or a minimum capital requirement as a condition to acquire Sectoral License, unless the special legislation pertinent to granting the License or the instructions issued in accordance with such legislation require such.

C- Subject to the provisions of this Law, the Sectoral Licenses shall be granted according to the conditions and requirements stipulated in the pertinent legislation thereof, provided that the following principals are met:

1- The issuance of the Sectoral License for a certain Project shall not be contingent upon any other approval or License from any body other than the Official Body designated for each Project in the legislation that grants that Body the power to issue such, in addition to the bodies and conditions specified by the Council of Minister in preservation of the national interest.

2- The Official Body shall specify the procedures, requirements and conditions necessary to acquire the License and the supporting documents and the time limits within which a License must be granted, provided that they are in writing and accessible to the public without fees.

D- 1- Subject to the provisions of Subparagraph (2) of Paragraph (C) of this Article, the period for issuing the Sectoral License shall not exceed one month from the date of submitting the application to receive such, provided that all the required documents are attached to the application and that it has fulfilled all the required conditions and legal requirements.

2- If the Official Body does not issue its decision to accept or reject within the time specified in Subparagraph (1) of this Paragraph, the applicant may, while reserving his/her right to litigate, ask the Minister to refer the matter of its issuance to the Council of Ministers to take their decision thereon, based on the recommendation of the Minister which is based on the recommendation of the Chief Executive Officer of the Jordan Investment Board.

3- Banks, financial corporations, insurance companies, customs clearance companies and special free zones shall be excluded from the period referred to in Subparagraph (1) of this Paragraph.

Article (22)

A- Where the Official Body rejects granting the Sectoral License, the rejection decision must be in writing, inclusive of the reasons for rejection.

B- The Official Body shall notify the License applicant of the decisions issued in accordance with the provisions of Paragraph (A) of this Article within a period not exceeding (7) days from the date of issuance. The applicant shall be entitled to appeal such decision at the Higher Court of Justice within (60) days from the date of his duly notification.

Article (23)

A- Notwithstanding what is stated in any other law, the following shall be taken into consideration:

- 1- All Project, the carrying out of which required a Sectoral License, should be registered prior to the submitted of the License application according to the provisions of the Companies Act in force and the provisions of the legislation in force pertaining to the registration of merchants and trade names.
- 2- Registration shall not be contingent on prior approvals or licenses.

B- Mere registration of the Project according to the provisions of Paragraph (A) of this Article does not give its own the right to start operation prior to obtaining the required Sectoral License.

Article (24)

A- General Licenses shall be granted upon fulfillment of the requirements and conditions set forth in the legislation pertaining thereto. The issuance of the General License shall not be contingent upon acquisition of the Sectoral License.

B- The bodies empowered to issue General Licenses shall abide with the same commitments due on the Official Bodies according to the provisions of Subparagraph (2) of Paragraph (C) and Paragraph (D) of Article (21) of this Law.

Article (25)

The Council of Ministers shall, upon the recommendation of the Minister and the Minister of Finance, issue the regulations necessary to implement the provisions of this Law, including determining the following:

A- The bases, provisions, procedures, percentages, periods and conditions relating to the exemptions from Fees and Taxes.

B- The development areas in the Kingdom which fall within the exemptions from Fees and Taxes, and the conditions and provisions relating to granting such exemptions.

C- The Exempted Sectors and their branches.

D- The bases for exemption the Project operating within the Sectors exempted from income and social development taxes, the percentage of such exemption and its period according to the development area in which it is located.

E- The provisions and periods related to Fixed Assets and spare parts entered into the Kingdom, which has been decided to be exempted according to the provisions of this Law.

F- The provisions related to additional exemptions from Fees and Taxes which may be granted when expanding the Project if such results in an increase in employing Jordanian workforce and the Production Capacity, provided that such increase is proportionate with the amount of increase.

G- The bases and conditions required to grant exemptions according to the provisions of this Law to a new Project resulting from merging two Projects or more.

Article (26)

A- The provisions of this Law shall not apply in the Aqaba Special Economic Zone.

B- Any provision in any other legislation contrary to the provisions of this Law shall not apply.

Article (27)

A- The Investment Promotion law No. (16) for the Year 1995 and any amendments thereto shall be repealed, provided that the provisions relating to sectors, incentives and exemptions stipulated in the Law or the Jordanian Industrial Estates Corporation Law shall remain in force until the establishment of provisions to replace such pursuant to regulations issued according to the provisions of this Law.

B- The regulations and instructions issued pursuant to the Investment Promotion law No. (16) for the Year 1995 shall remain in force until repealed or replaced by others.

C- For purposes of this Law, the phrase (Investment Promotion Law) wherever stated in any legislation in force shall mean (Investment Law).

Article (28)

The Prime Minister and the Ministers shall be responsible for executing the provisions of this Law.

ANNEX A2
INSTRUCTION FOR PROTECTION OF
EMPLOYEES AND WORKERS AGAINST
OCCUPATIONAL RISKS OF 1998

ANNEX A2: INSTRUCTION FOR PROTECTION OF EMPLOYEES AND WORKERS AGAINST OCCUPATIONAL RISKS OF 1998

تعليمات حماية العاملين والمؤسسات من مخاطر بيئة العمل لسنة 1998
المنشورة على الصفحة 1957 من عدد الجريدة الرسمية رقم 4286 تاريخ 16/6/1998
صادرة بمقتضى احكام المادة 79 من قانون العمل رقم 8 لسنة 1996

المادة 1

تسمى هذه التعليمات (التعليمات الخاصة بحماية العاملين والمؤسسات من مخاطر بيئة العمل) صادر بمقتضى احكام المادة 79 من قانون العمل رقم 8 لسنة 1996 ويعمل بها من تاريخ نشرها بالجريدة الرسمية .

المادة 2

يجب ان تكون معدات الوقاية الشخصية للعاملين قادرة على ازالة او تقليل الخطر او الضرر الى الحد المأمون المسموح به وان تكفل حماية العامل من المخاطر والاضرار وان تكون من مواد ذات نوعية ومواصفة مطابقة للمواصفات والمقاييس الفنية المعتمدة وان لا تسبب أي مضايقة للعامل اثناء استخدامها .

المادة 3

أ. يزود العامل بخوذة خاصة لوقاية الراس من خطر سقوط الاشياء والاصطدام بها وللوقاية من الكهرباء والمواد المنصهرة وذلك في اعمال تشييد المباني او الهياكل على اختلاف انواعها ، اعمال الحفريات ، تشييد المطارات ، الاحواض ، الارصفة ، الموانئ ، السدود ، الطرق ، الجسور والاتفاق ، خطوط الاتصالات ، شبكات الصرف والمجاري والماء والكهرباء ، عمليات استخراج المعادن والمقالع والتفجير ، تنقيب النفط ، التحميل والتنزيل ، تقطيع الاشجار والغابات ومكافحة الحرائق ، المناجم ، الكهرباء ، صهر المعادن وما شابهها .
ب. يزود العامل في اماكن العمل المكشوفة واماكن العمل التي تنتشر فيها الاغبرة او الاوساخ او التي تؤدي الى جذب الشعر الى الالات والماكينات المتحركة والدوارة بقبعة خاصة للوقاية من كل ذلك وحسب المواصفات المعتمدة.

المادة 4

يزود العامل بنظارات وواقيات خاصة من الاخطار الاتية :
أ. خطر الجزيئات الصغيرة المتطايرة اثناء العمل اليدوي مثل عمليات خلط المواد الاتشائية ، عمليات غربلة المواد ، عمليات الدهان بالفرشاة اليدوية ، عمليات برادة المواد البسيطة ، عمليات الكسارة وما شابهها من عمليات يدوية تعرض العين للاصابة من الجهة الامامية وذلك بواسطة نظارات ذات عدسات امامية .
ب. خطر الاجسام والجزيئات المتطايرة ذات طاقة مركبة صغيرة وكبيرة اثناء العمل اليدوي والميكانيكي مثل عمليات معالجة المعادن والمواد الصلبة الاخرى ، عمليات التفريز ، عمليات القشط ، عمليات التنقيب ، وما شابهها من عمليات وكذلك عمليات الحدادة ، عمليات التبخيم عمليات التنظيف مكان اللحام والكشف بواسطة الماكينات لمعالجة المعادن او المواد الصلبة الاخرى وما شابهها من عمليات وذلك بواسطة نظارات ذات عدسات امامية وواقيات جانبية .
ج. خطر الاجسام الكبيرة المتطايرة ذات طاقة حركية كبيرة اثناء العمل في تكسير وحف ونحت الصخور ،

الرخام ، الحجر الجيري ، الغرانيت وفي الاعمال المدنية التي تنجز بواسطة الازميل واثناء عمليات تهذيب وحف المعادن وما شابهها من عمليات تعرض العين والوجه الى خطر الاجسام الكبيرة المتطايرة وذلك بواسطة واقى خاص لكامل الوجه .

د. خطر الاشعة المرئية ، تطاير الشرر ، الحرارة ، والاشعة فوق البنفسجية والاشعة تحت الحمراء اثناء العمل في اللحام بواسطة الغاز مثل عمليات لحام سبائك الالمنيوم والمغنيسيوم عمليات حرق الرصاص عمليات ازالة القشر بواسطة اللهب ، عمليات اقتلاع الصفائح الفولاذية بواسطة الوميض ، عمليات اللحام بالصهر للبرونز وسبائك البرونز ، والنيكل وسبائك النيكل وما شابهها من عمليات وذلك بواسطة نظارات ذات عدسات واقية وخاصة للحماية من الاشعاعات المضرة والوهج .

هـ. خطر تطاير الشرر والاشعة فوق البنفسجية اثناء العمل في اللحام بواسطة الغاز ومن خطر شرر المعادن المنصهرة والتاثير المباشر والغير مباشر للاشعة فوق البنفسجية والاشعة تحت الحمراء اثناء العمل في اللحام بالقوس الكهربائي وذلك بواسطة واقى وجه خاصة لعمليات اللحام ذات عدسات خاصة للوقاية من الاشعة . و. خطر شرر المعادن المنصهرة والتاثير المباشر والغير مباشر الاشعة فوق البنفسجية والاشعة تحت الحمراء اثناء العمل في اللحام بالقوس الكهربائي بواسطة خوذة خاصة بعمليات اللحام لوقاية الاعين والوجه والراس والرقبة وذات عدسات واقية من الاشعة الضارة .

المادة 5

يزود العامل في اماكن العمل التي تعرض الاذن الى ضوضاء اعلى من المستويات المسموح بها بموجب المعايير والمقاييس الاردنية المعتمدة بهذا الخصوص بسدادات اذن خاصة وواقيات للسمع .

المادة 6

يزود العامل الذي يعمل في اجواء ملوثة بالغازات او الاغبرة او الابخرة بتركيز اعلى من الحدود العتبية المعتمدة بكمامات قطنية او فلترية تغطي الفم والانف واقية للوجه بدون اوكسجين او اقنعة واقية للوجه مزودة بالاوكسجين او اجهزة تنفس مزودة بالاوكسجين وذلك كما يلي :

1. كمامة قطنية لحماية العامل من الاغبرة غير الضارة وغير السامة .
2. كمامة فلترية لحماية العامل من دقائق الاغبرة الصناعية التي تحتوي على السيلكا او الاغبرة الصناعية والاغبرة الضارة ذات التراكيز القليلة .
3. قناع واقى للوجه مزود بكمامة فلترية وبدون اوكسجين لحماية العامل من الغازات الضارة او الاغبرة والاغبرة ذات التراكيز العالية .
4. قناع واقى للوجه مزود بالاوكسجين لحماية العامل من التراكيز العالية للغازات او الاغبرة او الابخرة في حالة نقصان نسبة الاوكسجين عن 18% اما في حالة العمل في اماكن محصورة التي تقل نسبة الاوكسجين فيها عن 16% فلا يجوز دخولها الا باستخدام جهاز التنفس المزود بالاوكسجين .

المادة 7

- يزود العامل الذي يعمل في اعمال تعرض الايدي للاخطار والاضرار بما يلي :
1. قفازات جلدية عادية لحماية الايدي من خطر الاجسام الحادة والاسطح الخشنة اثناء عمليات تركيب القطع المعدنية وعمليات النقل والتنزيل والتحميل والتخزين وما شابهها .
 2. قفازات مبطنة من الجلد والقطن والقماش لحماية الايدي من خطر الاصابات الميكانيكية اثناء عمليات

- الجلخ - الشدذ ، تركيب القطع المعدنية وما شابهها .
3. قفازات جلدية مبطنّة من الداخل بطبقة وسطية معدنية فولاذية لحماية الايدي من خطر القطع من الاسطح الحادة والسكاكين والادوات القاطعة والخدوش وما شابهها .
4. قفازات واقية للحرارة المنخفضة لحماية الايدي من خطر انخفاض درجة الحرارة اثناء العمل في مصانع الثلج او تداول مواد مجمدة او باردة وفي اماكن عمل عند درجة حرارة اقل من 5°C + .
5. قفازات واقية ومقاومة للحرارة العالية والمصنوعة من الاسبست لحماية الايدي من خطر الحرارة المشعة العالية اثناء صهر المعادن او الزجاج او المواد الساخنة او الرش بالمعادن المنصهرة او صناعة سكب الحديد او العمل في الافران الساخنة او ما شابهها من اعمال .
6. قفازات واقية من خطر الشرر وتطاير المعادن اثناء استعمال الذهب والوميض لحماية الايدي من خطر تطاير المعادن الساخنة والشرر المتطاير والحرارة المشعة والاشعة فوق البنفسجية ومن خطر الحرق عند تلامس المواد الساخنة وما شابهها .
7. قفازات مطاطية لحماية الايدي من تاثير الرطوبة ، المواد المخرشة ، المواد ذات السمية القليلة ، التعامل مع الكحول وما شابهها من مواد .
8. قفازات مطاطية عازلة لحماية الايدي من خطر التلامس مع التيار الكهربائي اثناء العمل في مجال الكهرباء .
9. قفازات واقية ومبطنّة بالرصاص للحماية والوقاية من خطر الاشعاعات .
10. القفازات الواقية والمصنعة من المواد البلاستيكية لحماية الايدي من خطر وضرر الاحماض المخرشة ، المواد الكيماوية المذيبات ، الشحوم ، القلويات وما شابهها .
11. القفازات البلاستيكية والمطاطية التي تستعمل لمرة واحدة لحماية الايدي من الاضرار الناتجة عن الصناعات الغذائية ، اعمال الخدمات للعمليات الجراحية وما شابهها .
12. واقي الاصبع من الجلد او المطاط او البلاستيك لحماية الاصابع من الاصابات الميكانيكية على ان تكون مبطنًا من الداخل بطبقة وسطية معدنية فولاذية اذا كان الخطر من الاصابة الميكانيكية الناتجة عن تعرض الاصبع الى سقوط مواد ثقيلة .
13. واقي لراحة اليدين خاصة لحماية راحة اليد من الاصابات الميكانيكية والحروق .

المادة 8

- يزود العامل الذي يعمل في اعمال تعرض القدمان او الساقان والركبتان للاخطار والاضرار بما يلي:
1. واقيات الركبة المطاطية للعاملين في صب المعادن او صهر المعادن وكذلك انجاز عمليات رصف الاحجار او التزفيت او ما شابهها من عمليات .
2. جزمة ذات الساقين الطويلتين وذات المقدمة الفولاذية الصلبة وذات الشريحة الفولاذية المثبتة في نعل الحذاء للعاملين المعرضين لاطار سقوط المواد الثقيلة او المعدات او الاجسام الساخنة او المواد المنصهرة من خطر التعرض للاصابة من معدات القطع اليدوية اثناء عمليات الحفر او تقليب الاشجار او المحاجر او المقالع وما شابهها من عمليات .
3. احذية السلامة المقاومة لمخاطر الكهرباء للعاملين في مجال الكهرباء المصنوعة من الجلد .
4. احذية سلامة غير موصلة للكهرباء للعاملين المتعرضين لمخاطر الحريق .

5. جزمة واقية من اخطار اللحام والمعادن المتطايرة لحماية القدم والساقان من الحرارة المشعة وتطهير المواد اثناء عمليات اللحام وقطع المعادن .

6. جزمة مقاومة للكيموايات للعاملين في مجالات السوائل الكيماوية والشحوم والزيوت .

7. احذية واقية من الانزلاقات للوقاية من خطر السير على الارضيات المبتلة او الملوثة بالشحوم والزيوت وللوقاية من خطر الانزلاقات .

المادة 9

يزود العامل الذي يعمل في اماكن مرتفعة تعرضه لخطر السقوط او في المقالع او المحاجر او الاعمال التي تتطلب دخول الخزانات والاحواض وقنوات المصاعد والصوامع وما شابهها من اعمال بحزام امان واقية من خطر السقوط .

المادة 10

يزود العامل الذي يعمل في اعمال تعرضه لمخاطر التعامل مع الاحماض والمنظفات المركزة والمواد المشابهة والاكاسيد او الاغبرة او اختلاف درجات الحرارة او الامطار ومواجهة انهيار الماء داخل الاتفاق وما شابهها من عمليات بملابس خاصة لحمايته من اخطار تلك الاعمال وذلك حسب المواصفات الفنية المعتمدة .

المادة 11

على كل مؤسسة انتاجية توفير غرفة استراحة للعاملين فيها للاستراحة وتناول الطعام وذلك كما يلي:
أ. اذا كان المصنع يحتوي في بعض اقسامه على مواد سامة او شديدة الضرر حيث انه من الواضح تواجد هذه الملوثات في بيئة العمل الداخلية والخارجية فانه يجب ان تراعى الامور التالية :

1. ان يكون موقع غرف الاستراحة بعيدة عن تلك الاقسام .
 2. ان لا تؤثر حركة الرياح في نقل الملوثات من اماكن اتبعائها الى هذه الغرف بعد تحديده اتجاه الرياح .
 3. ان لا يتواجد العاملون الملوثون في هذا الغرف اثناء الاستراحة الا بعد تغيير ملابسهم او استحمامهم .
 4. ان تكون سهلة الوصول اليها .
 5. ان تكون وصول وسائل الاتقاذ والاطفاء اليها من كل الجهات سهلة ما امكن .
 6. ان تتوفر لها اشارات تبين الاتجاه الموصل اليها .
- ب. يجب ان تتوفر في غرفة الاستراحة الشروط التالية :
1. ان تكون خالية من التلوث .
 2. ان تكون ذات تهوية جيدة .
 3. ان تكون ذات اضاءة مناسبة (ضمن ما جاء في الجدول المرفق) .
 4. ان تكون الضوضاء فيها ضمن الحدود المسموح بها (لا تزيد 55 DB) .
 5. ان تكون جدرانها ذات الوان زاهية .
 6. ان تكون الاثاث ذات الوان زاهية ومريحة للنظر .
 7. ان تكون مكيفة ما امكن شريطة الفوارق ما بين درجات الحرارة الداخلية والخارجية غير متطرفة (يفضل ان تكون درجات الحرارة فيها 22 C) .

8. ان تكون الارضيات مستوية وغير زلقة ويفضل ان تكون بانحدار بسيط لتسهيل عمليات الغسل والتنظيف .
- ج. يجب ان تجهز غرف الاستراحة بالاثاث والمعدات والتسهيلات التالية :
 1. مقاعد مريحة عددها مساو كحد ادنى لعدد الافراد المتوقع تواجدهم اثناء فترة الاستراحة او الوردية .
 2. طاولات متينة وذات شكل وطول مناسبين لطبيعة تصميم صالة الاستراحة او تناول الاطعمة .
 3. ابواب تفتح بالاتجاهين .
 4. باب للنجاة يكون في الجهة المقابلة للمدخل الرئيسي او في الجهة التي يتواجد فيها عدد كبير من العمال .
 5. اجهزة لقتل الحشرات (الاشعة فوق البنفسجية) حيث انه لا يفضل استخدام المبيدات فيها .
 6. ساعة حائط توضع في مكان واضح يراه الجميع ان امكن .
 7. طفايات حريق يحدد عددها وحجمها ونوعها من قبل المختصين في وزارة العمل والجهات المختصة الاخرى وتوضع في اماكن بارزة وضمن مستوى متناول يد العاملين وقرب الاماكن التي يتوقع حدوث الحريق فيها .
 8. حاويات بلاستيكية لجمع الفضلات ذاتية الاغلاق .
 9. ارضيات (دعاسات) معدنية توضع في مقدمة المداخل من الخارج لتنظيف احذية العاملين قبل الدخول الى الصالة .
 10. برادي من النوع الذي تراه الشركة مناسباً لقدراتها المالية للحماية من اشعة الشمس .
 11. شبك معدني ناعم على الشبابتك وعلى الابواب من الخارج وخاصة في الاماكن الحارة التي يكثر فيها الذباب .
 12. ممر خاص لاستلام الاطعمة والشراب لمنع التزاحم .
 13. مكان مخصص لجمع ادوات الطعام بعد انتهاء العمال من تناول وجباتهم .
- د. يفضل ان تكون المغاسل منفصلة عن صالة تناول الاطعمة ان امكن على ان تجهز بما يلي :
 1. ماء ساخن وبارد وصابون خاص لتنظيف الايدي .
 2. الحنفيات من النوع طويل العنق لتفادي اصابة ايادي العاملين عند استخدامها .
 3. جهاز او اكثر لتجفيف الايدي او استخدام نظام المناشف الدوارة لهذا الغرض .
 4. مساند خشبية تحت المغاسل لوقوف العاملين عليها .
 5. مرايا باطوال مناسبة وحسب ما تراه الادارة مناسب .
 6. تبيط اماكن المغاسل بالبلاط الصيني الابيض وخاصة الجدران .
 7. ارضية مستوية وبانحدار مناسب لتصريف المياه بسرعة وغير زلقة .

المادة 12

أ. على كل مؤسسة انتاجية توفير غرفة لتغيير ملابس العاملين تكون منفصلة عن غرفة الاستراحة والمرافق الصحية وان يتوفر فيها ما يلي :

1. خزانة لكل عامل لها مفتاح خاص وتحمل رقم خاص او اسم العامل وتكون ذات حجم يتسع لملابسه ومعداته الشخصية واشيائه الخاصة وان تكون خالية من القواطع والحواف والزوايا والمقابض الحادة .

2. الاتارة في الغرفة مطابقة للمواصفات المعمول بها (حسب الجدول المرفق) .
3. ان تحتوي على باب نجاة .
4. ان تكون ذات تهوية جيدة .
5. ان تحتوي على عدد مناسب من طفايات الحريق وبما يتناسب وتوجيهات الجهات المختصة .
6. ان تتوفر فيها لافتات تمنع التدخين فيها .
7. وضع وسائل لاطفاء السجائر (متكات رملية) عند المدخل الخارجي لغرف تغيير الملابس .
8. ان لا تزيد نسبة شدة الضوضاء فيها عن 55 ديسبل .
9. ان تحتوي على مقاعد طويلة يستخدمها العاملون اثناء تغيير ملابسهم .
- ب. اذا كانت المواد التي يتعامل معها العاملون من النوع السام مثل الرصاص فانه يجب ان تفصل الملابس الى قسمين وبنفس المواصفات اعلاه واحدة لتغيير ملابس العمل والاخرى لتغيير الملابس العادية مع احتواء الاولى على سلال معدنية لجمع ملابس العمل المتسخة .

المادة 13

- على كل مؤسسة انتاجية لا يتوافر فيها مطعم او كفتيريا ان توفر للعاملين مطبخا خاصا بهم كما يلي :
1. ان تكون كل ادوات الطبخ من الستانلس ستيل .
 2. ان يستخدم نظام التهوية الموضعي لشفط ابخرة الاطعمة والروائح خاصة عند اماكن تجهيز الطعام
 3. ان تكون افران الغاز مرتبطة مع اسطوانات الغاز باتانيب معدنية تكون على شكل تمديدات تبدأ من مكان تجمع الاسطوانات (خارج المطبخ) الى افران الغاز والتأكد من ان المرابط (المحابس) من النوع الجيد مع العمل على صيانتها لتفادي تسري الغازات .
 4. ان تتوفر فيها مفاتيح اضاءة واجهزة انارة ومصابيح من النوع المانع للشرر .
 5. ان تتوفر فيها ثلاجات يتناسب حجمها مع المواد القابلة للتبريد والتخزين مع توفر ميزان خاص للحرارة بالاضافة الى توفير مجمدة (فريزر) للمواد التي تحتاج الى تخزين طويل .
 6. ان يزود العاملين في المطبخ بمراييل بيضاء مع اغطية ثابتة لتغطية الشعر واللحية وباحذية مطاطية ذات عنق طويل .
 7. ان تتوفر فيها الاجهزة القاتلة للحشرات .
 9. اتباع نظام النقل الميكانيكي او شبه الميكانيكي (عربات) عند التعامل مع حاويات الطعام الكبيرة الحجم .
 10. حفظ السكاكين في اماكن خاصة تكون مغلقة ولا يجوز العبث بها من قبل العاملين .
 11. اجراء الفحوصات الطبية للعاملين فيها لدى الجهات المختصة مع الاحتفاظ بنسخ عن نتائج هذه الفحوصات تكون جاهزة عند الطلب او المعاينة .
 12. توفر جهاز للتأذير من الحريق .
 13. تعليق طفاية من نوع BCF عند المناطق المتوقع حدوث حريق فيها .
 14. تعليق عدد الطفايات بما يتناسب وتوصيات الدفاع المدني في مكان بارز ومناسب لاستخدامها عند .
 15. منع التدخين في داخل المطبخ .
 16. توفير باب للنجاة .

غرف تغيير
الحاجة

17. ان تكون الانارة مناسبة وحسب المواصفات المعمول بها (في الجدول المرفق) .
18. ان تكون جدرانه ميلطة بالبلاط الصيني الابيض .
جدول يبين مناسب شدة الاضاءة باللوكس لاماكن الاستراحة وغرف تغيير ملابس العمال

الموقع المكان شدة الاضاءة (لوكس)
مستوى القياس

المطابخ مخازن الطعام 150
منسوب الارضية
اماكن العمل 500 مستوى العمل

غرف الاستراحة قاعات الاكل 200
سطح الطاولة

مكان الحصول على الخدمة 300 سطح المنضدة
غرف تغيير الملابس 150
عند ارضية الغرفة

المادة 14

- على كل مؤسسة انتاجية اتخاذ الاحتياطات والتدابير اللازمة للوقاية من مخاطر الحريق وحسب نوع النشاط الذي تجري مزاويلته في مكان العمل والمواد الاولية ومواد الانتاج المختلفة المستخدمة بها مراعاة ما يلي :
1. ان تكون اجهزة وادوات الاطفاء المستخدمة سواء الثابت منها او المتنقل مطابقة للمواصفات القياسية الخاصة لتنظيم صناعة اجهزة اطفاء الحريق وتعبئتها وفقا ما تقرره الجهات المعنية (كود الحرائق) .
 2. تطوير معدات الاطفاء والوقاية اللازمة وذلك باستخدام احدث الوسائل من توفير اجهزة التنبيه والانذار المبكر والعزل والاطفاء الالي التلقائي كلما امكن ذلك وفقا ما تقرره الجهات المعنية (كود الحرائق) .
 3. اتخاذ الاجراءات الكفيلة بتوفير مخارج الامان وان تكون وسائل الخروج خالية من العوائق في جميع الاوقات .
 4. على صاحب العمل ان يقوم بتدريب العمال على كيفية استعمال معدات الاطفاء .

المادة 15

يفضل ان تتم جميع الاعمال الخاصة برفع الازان بشكل الي ما امكن واذا استدعت طبيعة العمل قيام العمال

بحمل الاوزان يجب الاخذ بعين الاعتبار توفر ما يلي :

1. بالنسبة للمهن والاعمال المتعلقة بالتحميل والتنزيل يشترط في العامل القائم بهذه الاعمال ان يكون بحالة صحية ملائمة ولا سيما حالة العضلات والجهاز الحركي والقلب وان لا تزيد الاوزان التي ترفع في هذه الاعمال بشكل يدوي دون مساعدة الغير عن 50 كغم للرجل و25 كغم للمرأة مع ضرورة تدريب العمال على طرق الرفع السليم للاوزان .

2. بالنسبة للاوزان التي يسمح لعمال الانتاج والخدمات برفعها يسترشد بالجدول التالي في تحديدها وفق كل حالة :

رفع الاوزان العمر من	/ سنة العمر اكبر من			
18-16	19-20	21-26	35-50	خمسين / سنة
رجال نساء	رجال نساء	رجال نساء	رجال نساء	رجال نساء

رفع منقطع	20	12	25	15	30	17	23	14
	11	17						
محدود / كغم								

رفع مستمر	15	8	18	10	20	12	15	10
	7	11						
متكرر / كغم								

المادة 16

أ. على كل مؤسسة انتاجية اتخاذ الاحتياطات الكفيلة لمنع او تقليل الضوضاء لوقاية العاملين من المخاطر بحيث لا تزيد شدة الضوضاء ومدة التعرض لها عن المتسويات المحددة بالجدول ادناه :

مستوى شدة الضوضاء ديسبل (A) DB^{\sim} مدة التعرض المسموح بها في اليوم
(عدد الساعات)

16	80
8	85
4	90
2	95
1	100
1/2	105
1/4	110
1/8	115

ب. بالنسبة لمستويات الضوضاء المتقطعة وعلى شكل ضربات سريعة تحسب كما هو مبين بالجدول ادناه :

مستوى شدة الضوضاء / ديسبل عدد المرات المسموح بها في

اليوم	العدد
100	140
1000	130
10,000	120

ويحسب عامل التعرض اليومي لضجة مستمرة ولفترات مختلفة متقطعة وفقا للقاعدة التالية :

$$TN = \dots\dots\dots = Feq = T 1 + T 2$$

$$\frac{L 1}{L 2} \frac{L N}{L N}$$

عامل التعرض للضجيج المكافئ = Feq

T 1 = زمن التعرض لضجيج ذي منسوب معلوم بالثانية الاولى

L1 = زمن التعرض المسموح به للضجيج ذي المنسوب المعلوم بالثانية الاولى

تكون الفترة بين كل مرة واخرى ثانية واحدة او اكثر واذا كانت الفترة اقل من ثانية واحدة تعتبر الضوضاء مستمرة ويطبق عليها المستويات المذكورة بالفقرة (أ) .

المادة 17

يجب اجراء الفحص الاول الخاص بتحديد كفاءة ومستوى السمع للعامل في الاعمال التي تعرضه للضوضاء قبل الاستخدام وان يتم اجراء الفحص الطبي الدوري له مرتين كل سنة على الاقل لتحديد كفاءة ومستوى السمع اثناء العمل .

المادة 18

يجب اتخاذ الاحتياطات اللازم توافرها لتهيئة جو العمل وتوفير اجهزة الوقاية الشخصية للوقاية من الحرارة وتحديد درجة الحرارة التي يمكن العمل تحت ظروفها دون حدوث مضاعفات للعاملين والتي تتناسب مع طبيعة العمل ومقدار الجهد المبذول في ادائه طبقا للمواصفات القياسية الاردنية المعتمدة .

المادة 19

يجب توفير اجهزة الوقاية الشخصية عند تعرض العاملين لدرجات حرارة منخفضة في بيئة العمل وفي جميع الظروف بحيث تغطي كافة اجزاء الجسم كما يجب بعد التعرض لدرجات الحرارة المنخفضة توفير اماكن مزودة بالتدفئة المناسبة .

المادة 20

أ. يجب توفير الاضاءة الكافية المناسبة لنوع العمل الذي تجري مزاولته سواء كانت اضاءة طبيعية او صناعية ويراعى في ذلك :

1. ان يكون توزيع المنافذ والمناور وفتحات الضوء الطبيعية تسمح بتوزيع الضوء توزيعا منتظما على اماكن

- العمل ويكون زجاجها نظيفاً من الداخل والخارج بصفة دائمة والا يكون محجوباً بأي عائق .
2. الاتقل قوة الاضاءة عن مستوى العمل (عند سطح افقي يرتفع متراً عن الارض) عن 20 شمعة / قدم 2 على ان يكتفي في الممرات والطرق بقوة اضاءة لا تقل عن 15 شمعة / قدم 2 على سطح الارض .
3. ان تتضمن مصادر الضوء الطبيعية والصناعية اضاءة متجانسة وان تتخذ الوسائل المناسبة لتجنب الوهج المنتشر والضوء المنعكس .
4. تجنب التفاوت الكبير في توزيع الضوء في الاماكن المتقاربة .
- ب. يسترشد بمستويات الاتارة المأمونة في الاعمال المكتبية والعمليات الصناعية وذلك حسب المواصفات القياسية الاردنية .

المادة 21

يعتبر العمل بمصادر الاشعة المؤينة التالية عملاً اشعاعياً تنطبق عليه متطلبات الوقاية

الاشعاعية المنصوص عليها في هذه التعليمات :

1. مصادر الاشعة السينية والاستخدامات الخاصة بها .
2. مصادر اشعة جاما والاستخدامات الخاصة بها .
3. مصادر دقائق بيتا والاستخدامات الخاصة بها .
4. مصادر دقائق الفا والاستخدامات الخاصة بها .
5. مصادر الايونات الثقيلة والاستخدامات الخاصة بها .
6. صادر النيوترونات والاستخدامات الخاصة بها .

المادة 22

العامل الاشعاعي يعرف بانه أي شخص يعمل في ظروف العمل الاشعاعي لمدد غير متقطعة لطبيعة مهنته او بسبب التواجد المهني في بيئة اشعاعية بصورة دائمة بحيث يؤدي ذلك الى احتمال زيادة الجرعة المكافئة لكامل الجسم عن الحد السنوي المسموح به للشخص العادي (5 ميلي سيفيرت / سنة) ومثال ذلك العاملين في المجالات التالية :

- أ. مصور الاشعة في المجال الطبي او المجال الصناعي .
- ب. فني الطب النووي .
- ج. فني المعالجة الاشعاعية .
- د. العامل في صيانة الاجهزة الاشعاعية .
- هـ. الفيزيائي الطبي او الصحي الذي يعمل في مجال الاشعة .
- و. طبيب الاشعة التشخيصية او العلاجية او الطب النووي او طبيب الاسنان اذا كان يزاول العمل الاشعاعي .
- ز. العاملون في المختبرات التي تستخدم فيها المواد المشعة على ان لا تقل الفعالية الاشعاعية المتداولة يوميا عن 100 كيلو بيكريل .
- ح. العاملون في المسارعات والمفاعلات والمنشآت النووية كالمشغلين وفنيي الصيانة .

المادة 23

لحماية العاملين من مخاطر التعرض للتأثيرات الاشعاعية يجب مراعاة ما يلي :

- الالتزام بالزمن التعرضي الذي تحدده التشريعات الخاصة بذلك .

- توفير امكانية اغلاق او ابطال تشغيل الاجهزة الباعثة لهذه الاشعة بحيث تكون سيطرة المشغل عليها سيطرة تامة .

- تزويد العاملين بمعدات الوقاية الشخصية الخاصة بذلك .

- يجب ان يكون المشغل على دراية كافية وذو خبرة وافية في مجال الاشعة .

المادة 24

يعتبر قانون الطاقة النووية والوقاية الاشعاعية رقم 14 لسنة 1987 او أي قانون اخر يحل محله او نظام او تعليمات او قرارات تصدر بموجبه مرجعاً في الحالات المتعلقة بالاشعاعات والتي لم تذكر في هذه التعليمات .

ANNEX A3
WORLD BANK OPERATIONAL POLICY 4.01

ANNEX A3: WORLD BANK OPERATIONAL POLICY 4.01



THE WORLD BANK OPERATIONAL MANUAL

OP 4.01
January 1999

Operational Policies

These policies were prepared for use by World Bank staff and are not necessarily a complete treatment of the subject.

Environmental Assessment

Note: OP and BP 4.01 together replace OMS 2.36, *Environmental Aspects of Bank Work*; OD 4.00, Annex A, *Environmental Assessment*; OD 4.00, Annex B, *Environmental Policy for Dam and Reservoir Projects*; OD 4.01, *Environmental Assessment*; and the following Operational Memoranda: *Environmental Assessments: Instructions to Staff on the Handling of the Borrower's Consultations with Affected Groups and Relevant Local NGOs*, 4/10/90; *Environmental Assessments: Instructions to Staff on the Release of Environmental Assessments to Executive Directors*, 11/21/90; and *Release of Environmental Assessments to Executive Directors*, 2/20/91. Additional information related to these statements is provided in the *Environmental Assessment Sourcebook* (Washington, D.C.: World Bank, 1991) and subsequent updates available from the Environment Sector Board, and in the *Pollution Prevention and Abatement Handbook*. Other Bank statements that relate to the environment include OP/BP 4.02, *Environmental Action Plans*; OP/BP 4.04, *Natural Habitats*; OP 4.07, *Water Resources Management*; OP 4.09, *Pest Management*; OP 4.11, *Safeguarding Cultural Property in Bank-Financed Projects* (forthcoming); OP/BP 4.12, *Involuntary Resettlement* (forthcoming); OP/GP 4.36, *Forestry*; OP/BP 10.04, *Economic Evaluation of Investment Operations*; and OD 4.20, *Indigenous Peoples*. This OP and BP apply to all projects for which a PID is first issued after March 1, 1999. Questions may be addressed to the Chair, Environment Sector Board.

1. The Bank¹ requires environmental assessment (EA) of projects proposed for Bank financing to help ensure that they are environmentally sound and sustainable, and thus to improve decision making.
2. EA is a process whose breadth, depth, and type of analysis depend on the nature, scale, and potential environmental impact of the proposed project. EA evaluates a project's potential environmental risks and impacts in its area of influence;² examines project alternatives; identifies ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts; and includes the process of mitigating and managing adverse environmental impacts throughout project implementation. The Bank favors preventive measures over mitigatory or compensatory measures, whenever feasible.
3. EA takes into account the natural environment (air, water, and land); human health and safety; social aspects (involuntary resettlement, indigenous peoples, and cultural property);³ and transboundary and global environmental aspects.⁴ EA considers natural and social aspects in an integrated way. It also takes into account the variations in project and country conditions; the findings of country environmental studies; national environmental action plans; the country's overall policy framework, national legislation, and institutional capabilities related to the environment and social aspects; and obligations of the country, pertaining to project activities,

under relevant international environmental treaties and agreements. The Bank does not finance project activities that would contravene such country obligations, as identified during the EA. EA is initiated as early as possible in project processing and is integrated closely with the economic, financial, institutional, social, and technical analyses of a proposed project.

4. The borrower is responsible for carrying out the EA. For Category A projects,⁵ the borrower retains independent EA experts not affiliated with the project to carry out the EA.⁶ For Category A projects that are highly risky or contentious or that involve serious and multidimensional environmental concerns, the borrower should normally also engage an advisory panel of independent, internationally recognized environmental specialists to advise on all aspects of the project relevant to the EA.⁷ The role of the advisory panel depends on the degree to which project preparation has progressed, and on the extent and quality of any EA work completed, at the time the Bank begins to consider the project.

5. The Bank advises the borrower on the Bank's EA requirements. The Bank reviews the findings and recommendations of the EA to determine whether they provide an adequate basis for processing the project for Bank financing. When the borrower has completed or partially completed EA work prior to the Bank's involvement in a project, the Bank reviews the EA to ensure its consistency with this policy. The Bank may, if appropriate, require additional EA work, including public consultation and disclosure.

6. The *Pollution Prevention and Abatement Handbook* describes pollution prevention and abatement measures and emission levels that are normally acceptable to the Bank. However, taking into account borrower country legislation and local conditions, the EA may recommend alternative emission levels and approaches to pollution prevention and abatement for the project. The EA report must provide full and detailed justification for the levels and approaches chosen for the particular project or site.

EA Instruments

7. Depending on the project, a range of instruments can be used to satisfy the Bank's EA requirement: environmental impact assessment (EIA), regional or sectoral EA, environmental audit, hazard or risk assessment, and environmental management plan (EMP).⁸ EA applies one or more of these instruments, or elements of them, as appropriate. When the project is likely to have sectoral or regional impacts, sectoral or regional EA is required.⁹

Environmental Screening

8. The Bank undertakes environmental screening of each proposed project to determine the appropriate extent and type of EA. The Bank classifies the proposed project into one of four categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts.

- (a) *Category A*: A proposed project is classified as Category A if it is likely to have significant adverse environmental impacts that are sensitive,¹⁰ diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works. EA for a Category A project examines the project's potential negative and positive environmental impacts, compares them with those of feasible alternatives (including the "without project" situation), and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental

performance. For a Category A project, the borrower is responsible for preparing a report, normally an EIA (or a suitably comprehensive regional or sectoral EA) that includes, as necessary, elements of the other instruments referred to in para. 7.

- (b) *Category B*: A proposed project is classified as Category B if its potential adverse environmental impacts on human populations or environmentally important areas—including wetlands, forests, grasslands, and other natural habitats—are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigatory measures can be designed more readily than for Category A projects. The scope of EA for a Category B project may vary from project to project, but it is narrower than that of Category A EA. Like Category A EA, it examines the project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance. The findings and results of Category B EA are described in the project documentation (Project Appraisal Document and Project Information Document).[11](#)
- (c) *Category C*: A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impacts.

Beyond screening, no further EA action is required for a Category C project.

- (d) *Category FI*: A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary, in subprojects that may result in adverse environmental impacts.

EA for Special Project Types

Sector Investment Lending

9. For sector investment loans (SILs),[12](#) during the preparation of each proposed subproject, the project coordinating entity or implementing institution carries out appropriate EA according to country requirements and the requirements of this policy.[13](#) The Bank appraises and, if necessary, includes in the SIL components to strengthen, the capabilities of the coordinating entity or the implementing institution to (a) screen subprojects, (b) obtain the necessary expertise to carry out EA, (c) review all findings and results of EA for individual subprojects, (d) ensure implementation of mitigation measures (including, where applicable, an EMP), and (e) monitor environmental conditions during project implementation.[14](#) If the Bank is not satisfied that adequate capacity exists for carrying out EA, all Category A subprojects and, as appropriate, Category B subprojects—including any EA reports—are subject to prior review and approval by the Bank.

Sector Adjustment Lending

10. Sector adjustment loans (SECALs) are subject to the requirements of this policy. EA for a SECAL assesses the potential environmental impacts of planned policy, institutional, and regulatory actions under the loan.[15](#)

Financial Intermediary Lending

11. For a financial intermediary (FI) operation, the Bank requires that each FI screen proposed subprojects and ensure that subborrowers carry out appropriate EA for each subproject. Before approving a subproject, the FI verifies (through its own staff, outside experts, or existing environmental institutions) that the subproject meets the environmental requirements of appropriate national and local authorities and is consistent with this OP and other applicable environmental policies of the Bank.[16](#)

12. In appraising a proposed FI operation, the Bank reviews the adequacy of country environmental requirements relevant to the project and the proposed EA arrangements for subprojects, including the mechanisms and responsibilities for environmental screening and review of EA results. When necessary, the Bank ensures that the project includes components to strengthen such EA arrangements. For FI operations expected to have Category A subprojects, prior to the Bank's appraisal each identified participating FI provides to the Bank a written assessment of the institutional mechanisms (including, as necessary, identification of measures to strengthen capacity) for its subproject EA work.[17](#) If the Bank is not satisfied that adequate capacity exists for carrying out EA, all Category A subprojects and, as appropriate, Category B subprojects—including EA reports—are subject to prior review and approval by the Bank.[18](#)

Emergency Recovery Projects

13. The policy set out in OP 4.01 normally applies to emergency recovery projects processed under [OP 8.50](#), Emergency Recovery Assistance. However, when compliance with any requirement of this policy would prevent the effective and timely achievement of the objectives of an emergency recovery project, the Bank may exempt the project from such a requirement. The justification for any such exemption is recorded in the loan documents. In all cases, however, the Bank requires at a minimum that (a) the extent to which the emergency was precipitated or exacerbated by inappropriate environmental practices be determined as part of the preparation of such projects, and (b) any necessary corrective measures be built into either the emergency project or a future lending operation.

Institutional Capacity

14. When the borrower has inadequate legal or technical capacity to carry out key EA-related functions (such as review of EA, environmental monitoring, inspections, or management of mitigatory measures) for a proposed project, the project includes components to strengthen that capacity.

Public Consultation

15. For all Category A and B projects proposed for IBRD or IDA financing, during the EA process, the borrower consults project-affected groups and local nongovernmental organizations (NGOs) about the project's environmental aspects and takes their views into account.[19](#) The borrower initiates such consultations as early as possible. For Category A projects, the borrower consults these groups at least twice: (a) shortly after environmental screening and before the terms of reference for the EA are finalized; and (b) once a draft EA report is prepared. In addition, the borrower consults with such groups throughout project implementation as necessary to address EA-related issues that affect them.[20](#)

Disclosure

16. For meaningful consultations between the borrower and project-affected groups and local NGOs on all Category A and B projects proposed for IBRD or IDA financing, the borrower provides relevant material in a timely manner prior to consultation and in a form and language that are understandable and accessible to the groups being consulted.

17. For a Category A project, the borrower provides for the initial consultation a summary of the proposed project's objectives, description, and potential impacts; for consultation after the draft EA report is prepared, the borrower provides a summary of the EA's conclusions. In addition, for a Category A project, the borrower makes the draft EA report available at a public place accessible to project-affected groups and local NGOs. For SILs and FI operations, the borrower/FI ensures that EA reports for Category A subprojects are made available in a public place accessible to affected groups and local NGOs.

18. Any separate Category B report for a project proposed for IDA financing is made available to project-affected groups and local NGOs. Public availability in the borrowing country and official receipt by the Bank of Category A reports for projects proposed for IBRD or IDA financing, and of any Category B EA report for projects proposed for IDA funding, are prerequisites to Bank appraisal of these projects.

19. Once the borrower officially transmits the Category A EA report to the Bank, the Bank distributes the summary (in English) to the executive directors (EDs) and makes the report available through its InfoShop. Once the borrower officially transmits any separate Category B EA report to the Bank, the Bank makes it available through its InfoShop.²¹ If the borrower objects to the Bank's releasing an EA report through the World Bank InfoShop, Bank staff (a) do not continue processing an IDA project, or (b) for an IBRD project, submit the issue of further processing to the EDs.

Implementation

20. During project implementation, the borrower reports on (a) compliance with measures agreed with the Bank on the basis of the findings and results of the EA, including implementation of any EMP, as set out in the project documents; (b) the status of mitigatory measures; and (c) the findings of monitoring programs. The Bank bases supervision of the project's environmental aspects on the findings and recommendations of the EA, including measures set out in the legal agreements, any EMP, and other project documents.²²

1. "Bank" includes IDA; "EA" refers to the entire process set out in OP/BP 4.01; "loans" includes credits; "borrower" includes, for guarantee operations, a private or public project sponsor receiving from another financial institution a loan guaranteed by the Bank; and "project" covers all operations financed by Bank loans or guarantees except structural adjustment loans (for which the environmental provisions are set out in OP/BP 8.60, *Adjustment Lending*, forthcoming) and debt and debt service operations, and also includes projects under adaptable lending—adaptable program loans (APLs) and learning and innovation loans (LILs)—and projects and components funded under the Global Environment Facility. The project is described in Schedule 2 to the Loan/Credit Agreement. This policy applies to all components of the project, regardless of the source of financing.

2. For definitions, see [Annex A](#). The area of influence for any project is determined with the advice of environmental specialists and set out in the EA terms of reference.

3. See OP/BP 4.12, *Involuntary Resettlement* (forthcoming); [OD 4.20](#), *Indigenous Peoples*; and OP 4.11, *Safeguarding Cultural Property in Bank-Financed Projects* (forthcoming).
4. Global environmental issues include climate change, ozone-depleting substances, pollution of international waters, and adverse impacts on biodiversity.
5. For screening, see para. 8.
6. EA is closely integrated with the project's economic, financial, institutional, social, and technical analyses to ensure that (a) environmental considerations are given adequate weight in project selection, siting, and design decisions; and (b) EA does not delay project processing. However, the borrower ensures that when individuals or entities are engaged to carry out EA activities, any conflict of interest is avoided. For example, when an independent EA is required, it is not carried out by the consultants hired to prepare the engineering design.
7. The panel (which is different from the dam safety panel required under [OP/ BP 4.37](#), *Safety of Dams*) advises the borrower specifically on the following aspects: (a) the terms of reference for the EA, (b) key issues and methods for preparing the EA, (c) recommendations and findings of the EA, (d) implementation of the EA's recommendations, and (e) development of environmental management capacity.
8. These terms are defined in [Annex A](#). Annexes [B](#) and [C](#) discuss the content of EA reports and EMPs.
9. Guidance on the use of sectoral and regional EA is available in EA Sourcebook Updates 4 and 15.
10. A potential impact is considered "sensitive" if it may be irreversible (e.g., lead to loss of a major natural habitat) or raise issues covered by [OD 4.20](#), *Indigenous Peoples*; [OP 4.04](#), *Natural Habitats*; OP 4.11, *Safeguarding Cultural Property in Bank-Financed Projects* (forthcoming); or OP 4.12, *Involuntary Resettlement* (forthcoming).
11. When the screening process determines, or national legislation requires, that any of the environmental issues identified warrant special attention, the findings and results of Category B EA may be set out in a separate report. Depending on the type of project and the nature and magnitude of the impacts, this report may include, for example, a limited environmental impact assessment, an environmental mitigation or management plan, an environmental audit, or a hazard assessment. For Category B projects that are not in environmentally sensitive areas and that present well-defined and well-understood issues of narrow scope, the Bank may accept alternative approaches for meeting EA requirements: for example, environmentally sound design criteria, siting criteria, or pollution standards for small-scale industrial plants or rural works; environmentally sound siting criteria, construction standards, or inspection procedures for housing projects; or environmentally sound operating procedures for road rehabilitation projects.
12. SILs normally involve the preparation and implementation of annual investment plans or subprojects as time slice activities over the course of the project.
13. In addition, if there are sectorwide issues that cannot be addressed through individual subproject EAs (and particularly if the SIL is likely to include Category A subprojects), the borrower may be required to carry out sectoral EA before the Bank appraises the SIL.
14. Where, pursuant to regulatory requirements or contractual arrangements acceptable to the Bank, any of these review functions are carried out by an entity other than the coordinating entity or implementing institution, the Bank appraises such alternative arrangements; however, the borrower/coordinating entity/implementing institution remains ultimately responsible for ensuring that subprojects meet Bank requirements.
15. Actions that would require such assessment include, for example, privatization of environmentally sensitive enterprises, changes in land tenure in areas with important natural habitats, and relative price shifts in commodities such as pesticides, timber, and petroleum.
16. The requirements for FI operations are derived from the EA process and are consistent with the provisions of para. 6 of this OP. The EA process takes into account the type of finance being considered, the nature and scale of anticipated subprojects, and the environmental requirements of the jurisdiction in which subprojects will be located.
17. Any FI included in the project after appraisal complies with the same requirement as a condition of its participation.
18. The criteria for prior review of Category B subprojects, which are based on such factors as type or size of the subproject and the EA capacity of the financial intermediary, are set out in the legal agreements for the project.
19. For the Bank's approach to NGOs, see [GP 14.70](#), *Involving Nongovernmental Organizations in Bank-Supported Activities*.
20. For projects with major social components, consultations are also required by other Bank

policies—for example, [OD 4.20](#), *Indigenous Peoples*, and OP/BP 4.12, *Involuntary Resettlement* (forthcoming).

21. For a further discussion of the Bank's disclosure procedures, see *The World Bank Policy on Disclosure of Information* (March 1994) and [BP 17.50](#), *Disclosure of Operational Information*. Specific requirements for disclosure of resettlement plans and indigenous peoples development plans are set out in OP/BP 4.12, *Involuntary Resettlement* (forthcoming), and OP/BP 4.10, forthcoming revision of [OD 4.20](#), *Indigenous Peoples*.

22. See OP/BP 13.05, *Project Supervision*, forthcoming.

ANNEX A4
LIST OF PROJECT TEAM MEMBERS WHO
PREPARED THE ESA STUDY AND
SUPPORTING DOCUMENTS

ANNEX A4: LIST OF PROJECT TEAM MEMBERS WHO PREPARED THE ESA STUDY AND SUPPORTING DOCUMENTS

No.	Name	Position	Credentials
Technical and Managerial Staff			
1-	Khaled Murad	Project Director	B.Sc. in Civil Engineering
2-	Dr. Sawsan Himmo	Project Team Leader / Water Resources Management	Ph.D. in Civil Engineering (Hydraulic Structures) B.Sc. in Civil Engineering
3-	Ghassan Khateeb	Deputy Team Leader / Environmental Planning and Management	Masters of Engineering Administration B.Sc. in Mechanical and Aerospace Engineering
4-	Dr. Lee Harding	Project Advisor/Environmental Specialist	B.Sc. in Wildlife Management Ph.D. in Wildlife Toxicology
5-	Suhair Khateeb	Core Team / Public Consultation-Communications-Public Participation Team Leader	M.Sc. in Industrial Engineering B.Sc. in Electrical Engineering
6-	Dr. Saleh Sharari	Environmental Legal and Policy Specialist	Ph.D. in Environmental Law Master's Degree in Environmental Law
7-	Mona Khateeb	Management and Institutional Development	M.Sc. in Biomedical Engineering B.Sc. in Industrial Engineering
8-	Dr. Adnan Al-Salihi	Core Team / Water Sector-Water Management Studies Team Leader	Ph.D. in Civil Engineering (Hydraulic Structures and Dam Engineering) M.Sc. in Civil Engineering (Irrigation and Hydraulics) Diploma of Engineering in Civil Engineering (Irrigation and Hydraulics) B.Sc. (Honour) Civil Engineering
9-	Dr. Omar Rimawi	Hydrogeologist	Ph.D. in Hydrogeology, Hydrochemistry and Isotope Hydrology M.Sc. in Geology and Mineralogy B.Sc. in Geology and Mineralogy
10-	Naser Manaseer	Water Systems- modelling	M.Sc. in Hydrology and Water Resources B.Sc. in Geology
11-	Ruba Khoury	Water Study Team	B.Sc. in Civil Engineering
12-	Adnan Budeiri	Core Team / Biotic Environment Study Team Leader	Master's Degree in Biological Sciences / Hydrobiology and Ecology
13-	Majdi Salameh	Biodiversity - Fauna	M.Sc. candidate in Environmental Science and Management B.Sc. in Genetics and Molecular Biology
14-	Sharif Jbour	Biodiversity - Avifaunal	B.Sc. in Biological Science
15-	Dr. Ibrahim Khader	Biodiversity - Flora	Ph.D. Candidate in Biological Sciences B M.Sc. Degree in Plant Taxonomy B.Sc. in Biological Sciences
16-	Ahmad Abu Hejleh	A-Biotic Environment	M.Sc. in Geology (Water Resources and Environment) B.Sc. in Applied Geology (Water Resources)

ANNEX A4: LIST OF PROJECT TEAM MEMBERS WHO PREPARED THE ESA STUDY AND SUPPORTING DOCUMENTS (CONTD.)

No.	Name	Position	Credentials
17-	Abdel Kareem Bourini	Core Team/Team Leader/Social Scientist-Resettlement and Land Acquisition / indigenous People Specialist	B.Sc. in Comm. Major Economics Diploma in Demography
18-	Dr. Issa Masarweh	Social Studies Team	Ph.D. in Sociology / Demography
19-	Mahmoud Hishmeh	Social Studies Team	M.Sc. in Population Studies B.Sc. in Sociology
20-	Abdel Rahman Jaber	Social Studies Team	B.Sc. in Civil Engineering
21-	Rola Quba'a	Environmental Health	M.Sc. in Environmental Technology B.Sc. in Environmental Health
22-	Lama El-Awad	Environmental Health	M.Sc. Environmental Management B.Sc. in Environmental Health
23-	Dr. Raoul Nasr	Core Team / Land use Planning - Regional Economist	Ph.D. in Agricultural Economics M.Sc. in Agricultural Economics B.Sc. in Agricultural Economics
24-	Baker Qudah	Agriculture and Rural Development	Postgraduate Diploma in Remote Sensing and Land Evaluation Postgraduate Diploma in Aerial Photo Interpretation and Remote Sensing for Soil Survey and Land Classification B.Sc. in Agriculture
25-	Dr. Mohammad Waheeb	Cultural Heritage - Archaeology Studies Team Leader	Ph.D. in Archaeology M.A. in Archaeology B.A. in Archaeology
26-	Niveen Hashash	Cultural Heritage - Archaeology	M.A. in Archaeology B.A. in Archaeology
27-	Mofid Hamza	Remote Sensing Specialist	Diploma in Geomorphology and Remote Sensing Engineering Geology
28-	Saed Aqel	GIS and Remote Sensing Specialist	B.Sc. in Civil Engineering M.Sc. in GIS Training courses
Support Staff			
29-	Hasan Naseef	Biotic Environment Studies	B.Sc. in Civil Engineering
30-	Husam Hawwari	CAD/GIS Specialist	Diploma in Drafting
31-	Rawshan Ramadan	Social Studies Survey Team	M.E. in Civil Engineering B.Sc. in Civil Engineering
32-	Ahmed Yousef	Public Consultation Team	B.Sc. in Civil Engineering
33-	Rami Salameh	Project Specific ESA	B.Sc. in Water and Environmental Management
34-	Hala Mesmar	Project Specific ESA	B.Sc. in Water and Environmental Management
35-	Raja' Al-A'araj	Project Specific ESA	Diploma – Secretarial Work