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Hebron Regional Wastewater Treatment Facilities

This publication was produced for review by the United States Agency for International Development. It was prepared by CH2MHILL

Environmental Assessment Supplemental

Hebron Regional Wastewater Treatment Facilities

Prepared for

USAID

June 2005

CH2MHILL
Jerusalem

Contents

Figures

Acronyms and Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
BOD	Biological Oxygen Demand
CFR	Code of Federal Regulation
DOT	U.S. Department of Transportation
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
HRWWTF	Hebron Regional Wastewater Treatment Facilities
IPM	Integrated Pest Management
m^3/day	cubic meters per day
MCM	million cubic meters
MEnA	Palestinian Ministry of Environmental Affairs
mg/L	milligrams per liter
MOP	Ministry of Planning
NFPA	National Fire Protection Agency
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PERSUAP	Pesticide Evaluation Report and Safe Use Action Plan
PWA	Palestinian Water Authority
TN	Total Nitrogen
TSS	Total Suspended Solids
USAID	United States Agency for International Development
WRP3	Water Resources Program Phase III
WWTP	wastewater treatment plant

1.0 Purpose

The United States Agency for International Development (USAID) has contracted with CH2M HILL to implement a master infrastructure planning project. The project is part of the Water Resources Program Phase III (WRP3) for the West Bank. CH2M HILL began working with the Palestinian Water Authority (PWA) on Phase II in January 1999 and on Phase III in July 2000.

This contract is being implemented in close coordination with several organizations in the West Bank, in particular the PWA, the Palestinian Ministry of Environmental Affairs (MEnA), the Hebron Governorate, and the Municipality of Hebron. Other agencies that have provided expertise on an as-needed basis include the Palestinian Ministry of Agriculture, Ministry of Planning and International Cooperation, and Ministry of Health.

The WRP3 supports the development of the Palestinian water sector through completion of the following major elements:

- Integrated Water Resource Management Plan
- Institutional Capacity Building
- Improvement of Environmental Infrastructure for the Hebron Governorate
- Demonstration Options and Activities

To support the Palestinian people and to improve the management of wastewater in an environmentally and sustainable manner, USAID has proposed the financing, design, and construction of a regional wastewater treatment plant in the Hebron Governorate.

The environmental review requirements of USAID (22 Code of Federal Regulation [CFR] 216) require the preparation of an Environmental Assessment (EA) for classes of actions normally having a significant effect on the environment, such as sewerage projects.

In May 2003, an EA for the Stormwater, Domestic Wastewater Master Plan for Hebron was completed. A Scoping Statement for a supplemental to the Environmental Assessment was submitted in February 2005 to document a location change of the proposed Hebron Regional Wastewater Treatment Facilities (HRWWTF).

The HRWWTF is proposed to be located in Wadi Es-Sammen, approximately 7 kilometers northwest of the original location presented in the May 2003 Environmental Assessment. The Scoping Statement and Record of Environmental Decision is attached as Appendix A.

A Record of Environmental Decision (ANE 05-89) was signed on April 1, 2005, by the ANE Bureau Environmental Officer. The Decision stated:

"The supplemental scoping statement for the EA of the WWTP is approved with these conditions as considerations:

- *If pesticides or chemicals designed to kill pests are to be procured or used, an Integrated Pest Management (IPM) plan may be prepared and an approved Pesticide Evaluation Report and Safe Use Action Plan (PERSUAP) must be developed and implemented.*

- *Proper disposal and potential use for generated sludge, such as alternative daily landfill cover, landscaping, composting, or other beneficial use, including testing of disposed biosolids and composed material to assure that they meet appropriate screening criteria especially if application on edible crops is anticipated as highly effective biomasses often contain high levels of metals and other constituents unsuitable for edible crops.*

- *Potential safer alternatives to use of gaseous chlorine (an acutely hazardous substance), such as chlorine slurries or dissolved powders in liquids.*

- *Proper disposal and reuse of treated wastewater, including testing and assurance that WWTP effluent disposed to or mixed with receiving waters containing aquatic life be de-chlorinated prior to discharge or mixing to assure survival of chlorine-sensitive aquatic species."*

2.0 Alternatives

The report "Environmental Assessment for the Stormwater, Domestic Wastewater Master Plan for Hebron" (CH2M HILL, May 2003) documented the project alternatives. The alternatives presented were to undertake a wastewater management program or to undertake "no action." The EA concluded that the discharge of raw sewage to the natural environment by the City of Hebron with a population of over 170,000 represented a significant risk to the drinking water aquifer and to public health from exposure to raw sewage.

The selected HRWWTF project enables and integrates the goals of aquifer protection for a drinking water supply, reduced public health risk from exposure to raw sewage, development of an alternative agricultural water supply, expansion of agricultural economic activities, and significant job creation.

This supplemental to the EA addresses the proposed location change for the HRWWTF. The report "Addendum to the Detailed Feasibility of the Hebron Regional Wastewater Treatment Plant Reclaimed Wastewater and Residuals Management – Final" (CH2M HILL, April 2005) reviewed three alternative sites and documented the preferred site. The preferred site is located in Wadi Es-Sammen, approximately 7 kilometers northwest of the original location presented in the EA.

2.1 Project Description

The report "Feasibility Study – Hebron Regional Wastewater Treatment Facilities" (CH2M HILL, May 2005) provides a detailed description of the proposed works and location. A summary of the project description is provided below.

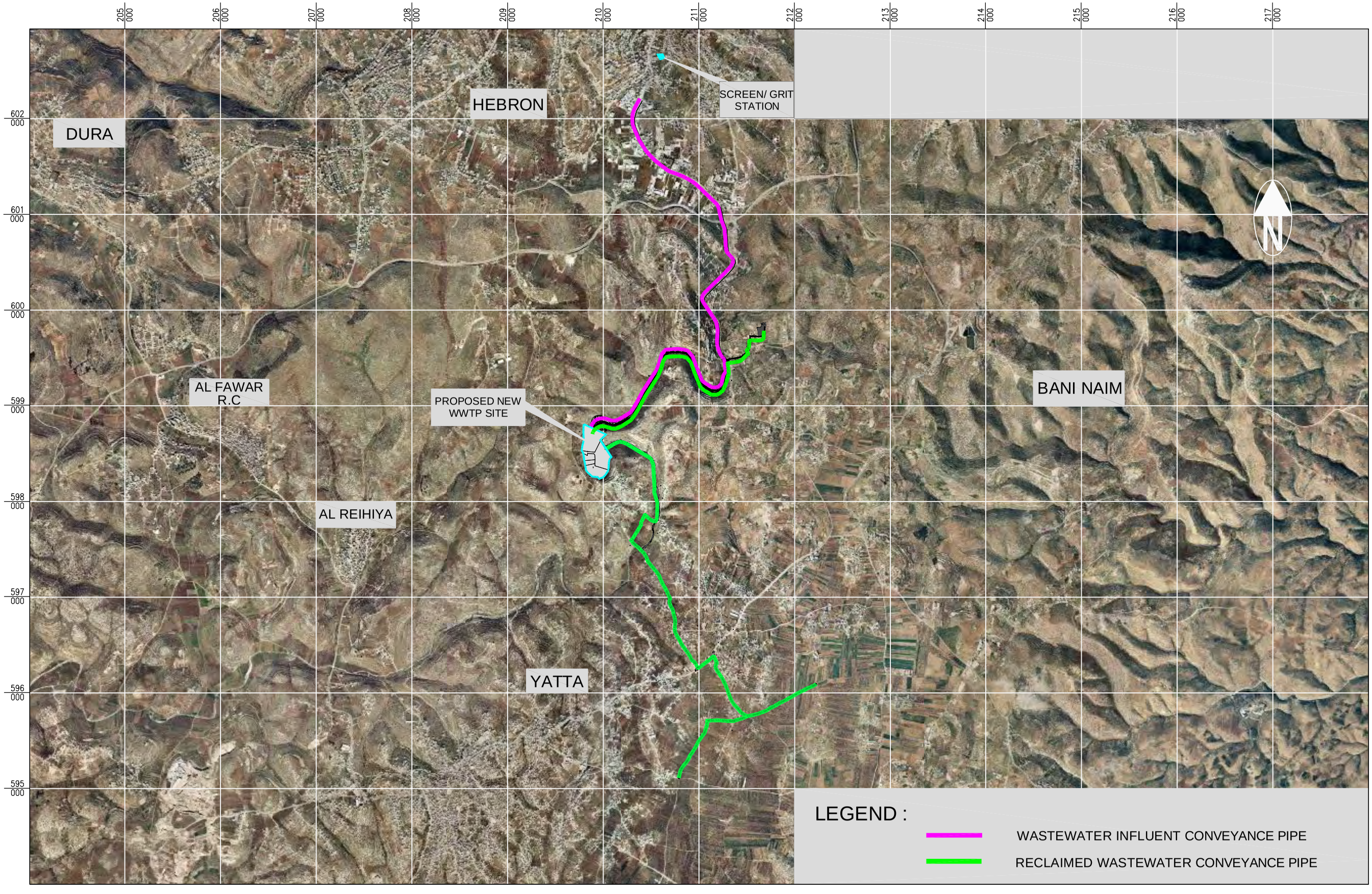
The Hebron site is located 4 kilometers south of Hebron City and 700 meters from the nearest residence. The site coordinates are 98,500 North, 160,000 East. The location HRWWTF is shown on Figure 2-1.

The site is located within a relatively flat area and flood plain in Wadi Es-Sammen. The existing land use of the site is as follows:

- 40 percent agricultural (olives, grapes, and subsidence winter wheat)
- 30 percent damaged agricultural land due to flooding raw sewage flows
- 30 percent rocky areas

The HRWWTF will be designed for the following flow and loading conditions:

- Annual Average Daily Flow = 15,000 cubic meters per day (m^3/day)
- Biological Oxygen Demand (BOD5) Influent Average = 930 milligrams per liter (mg/L); BOD5 Effluent Average = 20 mg/L
- Total Suspended Solids (TSS) Influent Average = 1008 mg/L; TSS Effluent Avg. = 30 mg/L
- Total Nitrogen (TN) Influent Average = 148 mg/L; TN Effluent Average = 50 mg/L



LAYOUT MAP
SCALE 1:20,000

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*DRAWINGS ON A3 SHEET ARE AT 1/2 SCALE SHOWN

WATER RESOURCES PROGRAM PHASE 3
PALESTINIAN WATER AUTHORITY
PROGRAM FUNDED BY THE U.S. AGENCY
FOR INTERNATIONAL DEVELOPMENT
CONTRACT 294-C-00-99-00063-00

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FIGURE 2-1
HEBRON WASTE WATER TREATMENT FACILITIES
LOCATION MAP

SHEET	
DWG	
DATE	MAY 2005
SCALE	1:20,000

PWA

FILENAME:

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The HRWWTF will include:

- Wastewater Influent Conveyance Pipe
- Wastewater Treatment Plant
  - Preliminary Treatment
  - Primary Treatment
  - Secondary Treatment – Activated Sludge
  - Disinfection (by liquid chlorine)
  - Reclaimed Wastewater Storage (onsite)
  - Sludge Drying Beds
  - Biosolids Composting
- Reclaimed Wastewater Reuse Pipeline and System Storage

2.2 Environmental Impacts

The scope and significance of the environmental impacts stated in the Scoping Statement and Record of Environmental Decision are described below.

2.2.1 Drinking Water Quality

Scope: The HRWWTF will reduce the pollutant inputs to the eastern and western aquifers that are used as a drinking water supply for both Palestinians and Israelis.

Significance: Currently raw wastewater is discharged into Wadi Es-Samen and potentially could percolate into local shallow aquifers and into the deeper aquifer that is used for water supply. The proposed HRWWTF will greatly reduce the potential for raw wastewater and associated contaminants leaching to the aquifers by both providing treatment of the raw wastewater and the use of the reclaimed wastewater on agricultural lands. Monitoring of the effluent quality is required under local regulations.

2.2.2 Pesticides Use

Scope: The HRWWTF will not use pesticides or chemicals for management.

Significance: If pesticides or chemicals designed to kill pests are to be procured or used, an Integrated Pest Management (IPM) plan may be prepared and an approved Pesticide Evaluation Report and Safe Use Action Plan (PERSUAP) must be developed and implemented.

2.2.3 Sludge and Biosolids Disposal

Scope: The HRWWTF will generate a “Class A” biosolid after composting both primary and secondary sludges. The “Class A” biosolid, as defined under local regulations, is suitable for application on agricultural lands as a soil amendment.

Significance: Proper disposal and agricultural application of generated biosolids is required under local regulatory requirements. Monitoring of the biosolids quality is required to ensure compliance with regulations.

2.2.4 Gaseous Chlorine

Scope: The HRWWTF will not use gaseous chlorine. The effluent disinfection at the HRWWTF will be liquid chlorine based. Liquid chlorine will be produced onsite from powder, tablets, salt, or sea brine.

Significance: Gaseous chlorine is on the Hazardous Substance List because it is regulated by the Occupational Safety and Health Administration (OSHA) and cited by American Conference of Governmental Industrial Hygienists (ACGIH), National Institute for Occupational Safety and Health (NIOSH), U.S. Environmental Protection Agency (EPA), U.S. Department of Transportation (DOT), and National Fire Protection Agency (NFPA).

2.2.5 Disposal of Wastewater Effluent

Scope: The HRWWTF will generate a treated and disinfected wastewater suitable for agricultural reuse as detailed in the report "Addendum to the Detailed Feasibility of the Hebron Regional Wastewater Treatment Plant Reclaimed Wastewater and Residuals Management" (CH2M HILL, April 2005). The HRWWTF includes an onsite reclaimed effluent storage facility, onsite pump station, agricultural reclaimed wastewater pipeline, and field storage. It will eliminate the discharge of untreated wastewater to the wadi. Surplus treated effluent will be discharged by gravity into the wadi for use by agriculture located downstream. There is no natural existing flow in the wadi. The existing dry weather flow in the wadi is untreated wastewater.

Significance: Proper disposal and agricultural application of wastewater effluent is required under the local regulatory requirements. Monitoring of the wastewater effluent quality is required to ensure compliance with regulations.

3.0 Affected Environment

The Scoping Statement and Record of Environmental Decision (Appendix A) have identified significant issues relating to the potentially affected environment. This potentially affected environment is the Aquifer Systems and Surface Water Systems.

3.1 Aquifer Systems

Aquifer systems in the Hebron area are considered vulnerable to pollution from surface sources because the area constitutes a potential recharge area for the Upper and Lower aquifers. The discharge of raw sewage from the City of Hebron and surrounding communities therefore represent a risk to the continued use of the aquifers as a drinking water supply. Figure 3-1 shows the Hebron Wastewater Collection System and Outfall relative to the Eastern and Western aquifers.

A total existing annual water supply of 24 million cubic meters (MCM) per year has been identified to be at varying levels of risk due to the discharge of raw wastewater in the southern Hebron Governorate.

The risk to both the eastern basin and western basin aquifer was detailed in the study "Groundwater Management Modeling, Task 7 – The Hebron Model" (CH2M HILL, March 2001) under WRP2. The drinking water wells at highest risk were identified as Rihiya, Samu'a 1, Samu'a 2, Fawwar 1, and Fawwar 3 with a combined production of approximately 1.2 MCM. However, the groundwater modeling also identified a lower potential risk to Bani Naim 2 and Bani Naim 3 wells with a combined production of approximately 2.1 MCM. The groundwater sampling conducted under WRP2 indicated that the groundwater quality of Fawwar 1 and Fawwar 3 was above Palestinian Drinking Water Standards for nitrogen indicating contamination from either agricultural or wastewater sources.

The report "Conveyance, Treatment and Reuse of Hebron Wastewater" (Israeli Ministry of Infrastructure, January 2004) noted risk to the Shoqet and Ziqlag well groups with a combined production of 20 MCM. The same report also noted odor and mosquito problems for communities in the southern region of Israel.

A groundwater model of the Hebron area was developed as part of Task 7 Groundwater Management Model – The Hebron Area, March 2001. The study area of the model is shown on Figure 3-2. The raw wastewater currently discharged from Hebron Municipality flows overland south down Wadi Es-Sammen. This overland flow is located in potential recharge areas of both the Eastern and Western aquifers.

Figure 3-3 shows the general geology and formation outcrops of the Eastern Basin. Figure 3-4 provides a general hydrostratigraphy of the Hebron Area. Figure 3-5 provides a hydrostratigraphic cross-section from Al Rihiya Well to Bani Naim 2 Well.

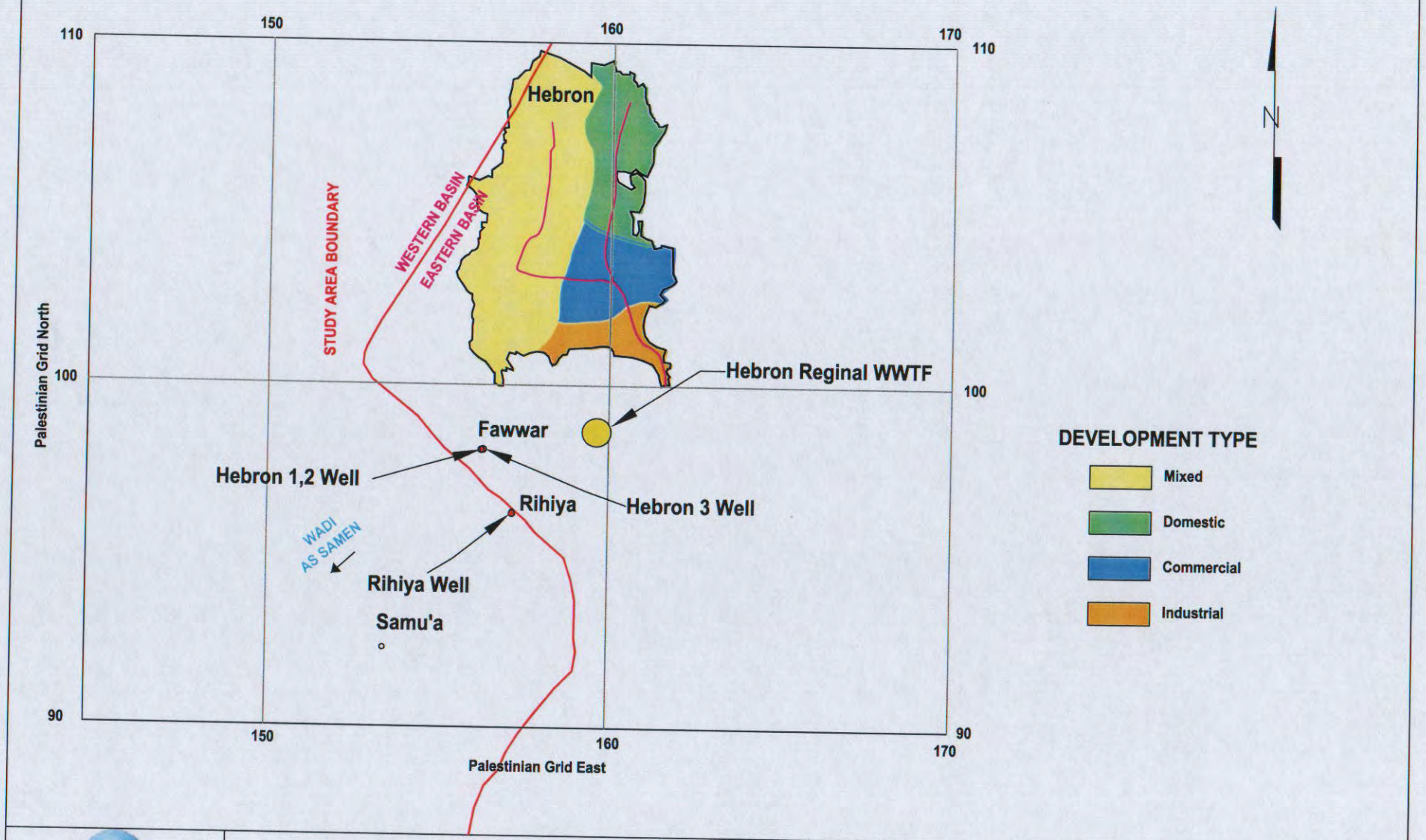

Figure 3-1 : Hebron Wastewater Collection System and Outfall

Legend:

- Groundwater Basin Boundary
- Wastewater Flow Direction (Wadi Es Samen)
- Boundary of Hebron Drainage Area
- Wastewater Trunk Lines

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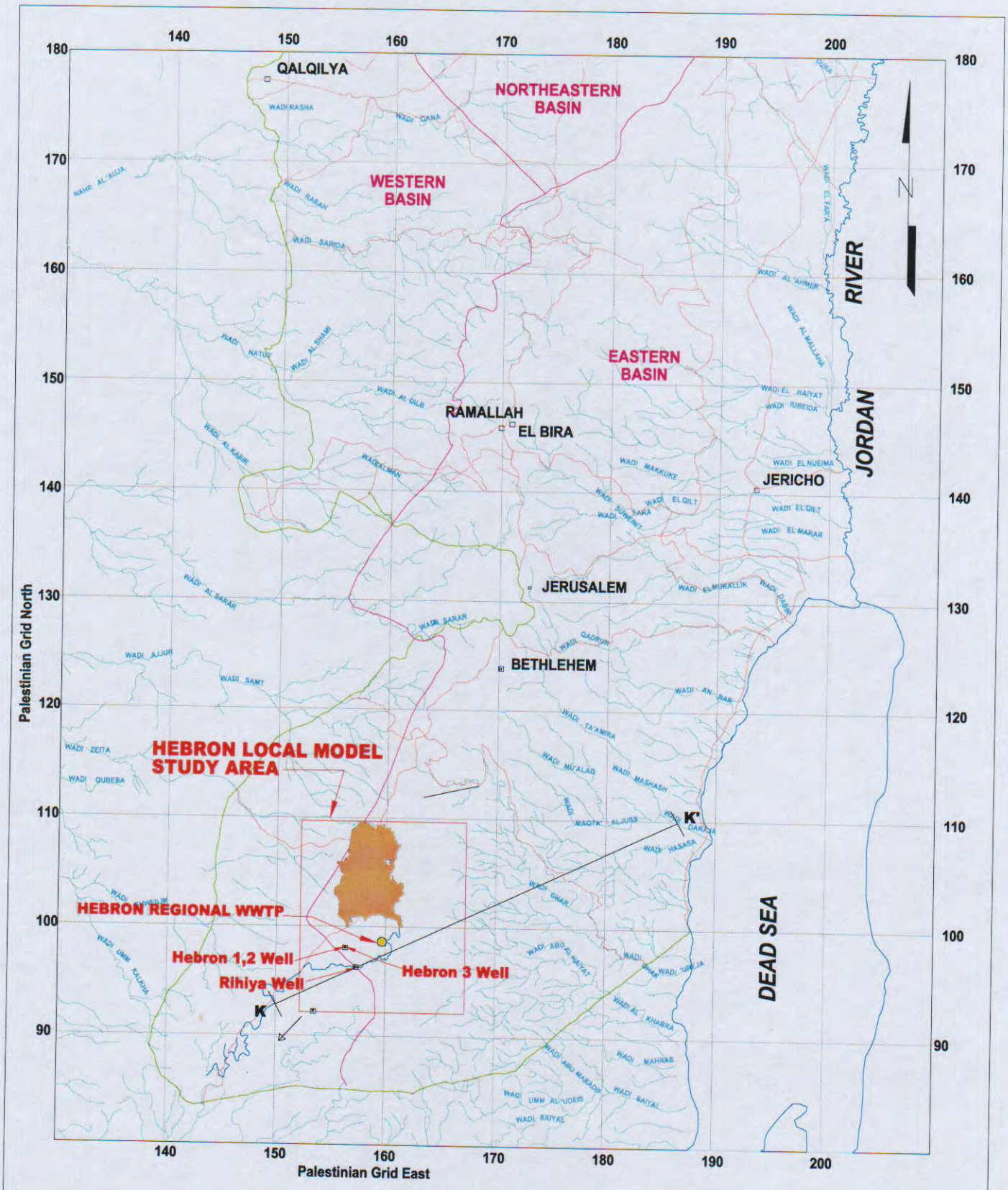

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Figure 3-2 : Hebron Model Study Area

Legend:

- Border of West Bank
- Boundary of Hebron Drainage Area
- Wastewater Flow Path (Wadi Es Samen)
- Major Highways
- Secondary Highways

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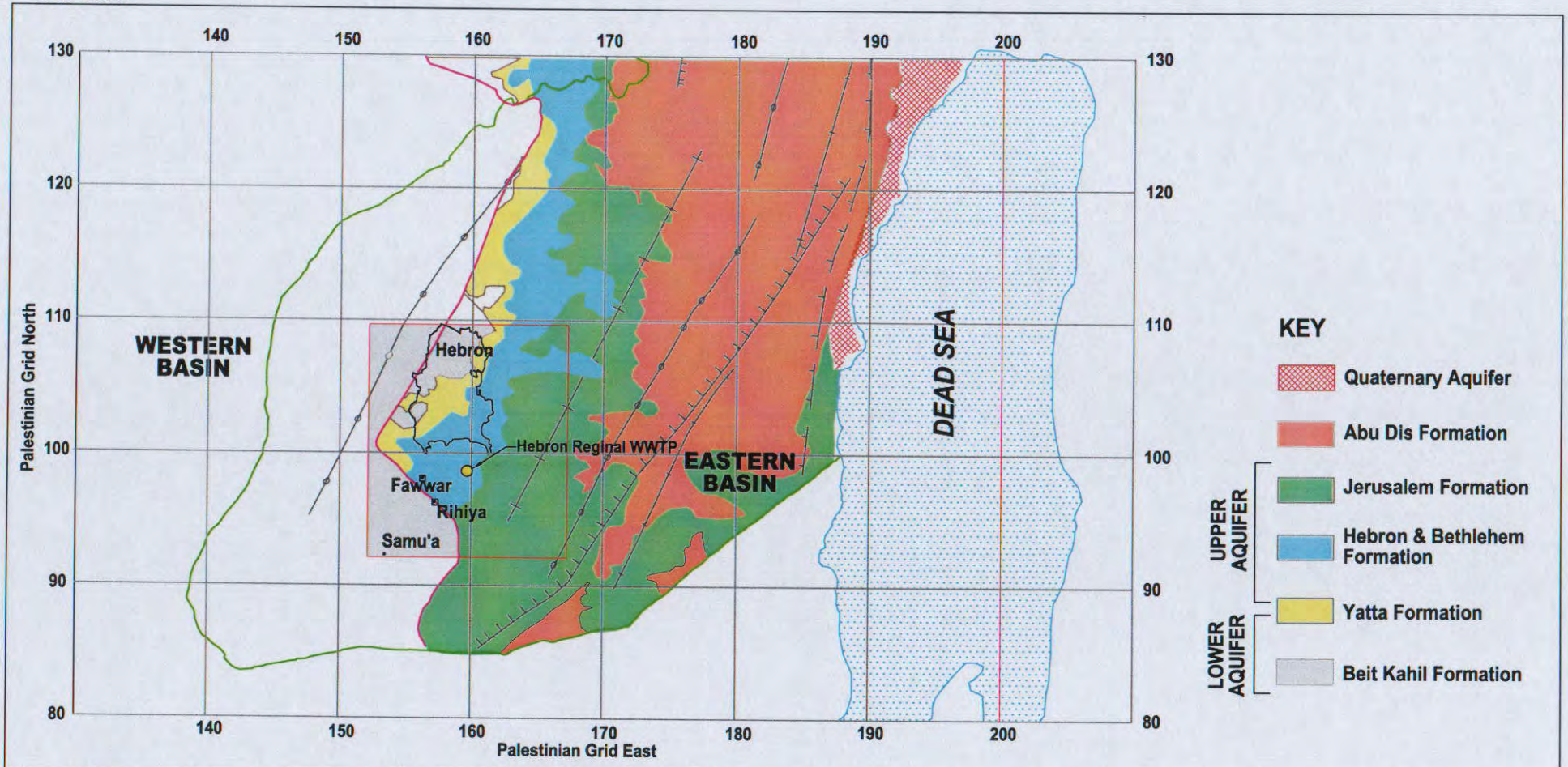

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Figure 3-3 : General Geology and Formation Outcrops

Legend:

- Border of West Bank
- Groundwater Basin Boundary
- Wastewater Flow (Wadi As Samen)
- Boundary of Hebron Drainage Area
- Anticlinal Axis
- Monocline
- Monocline
- Syncline
- Fault

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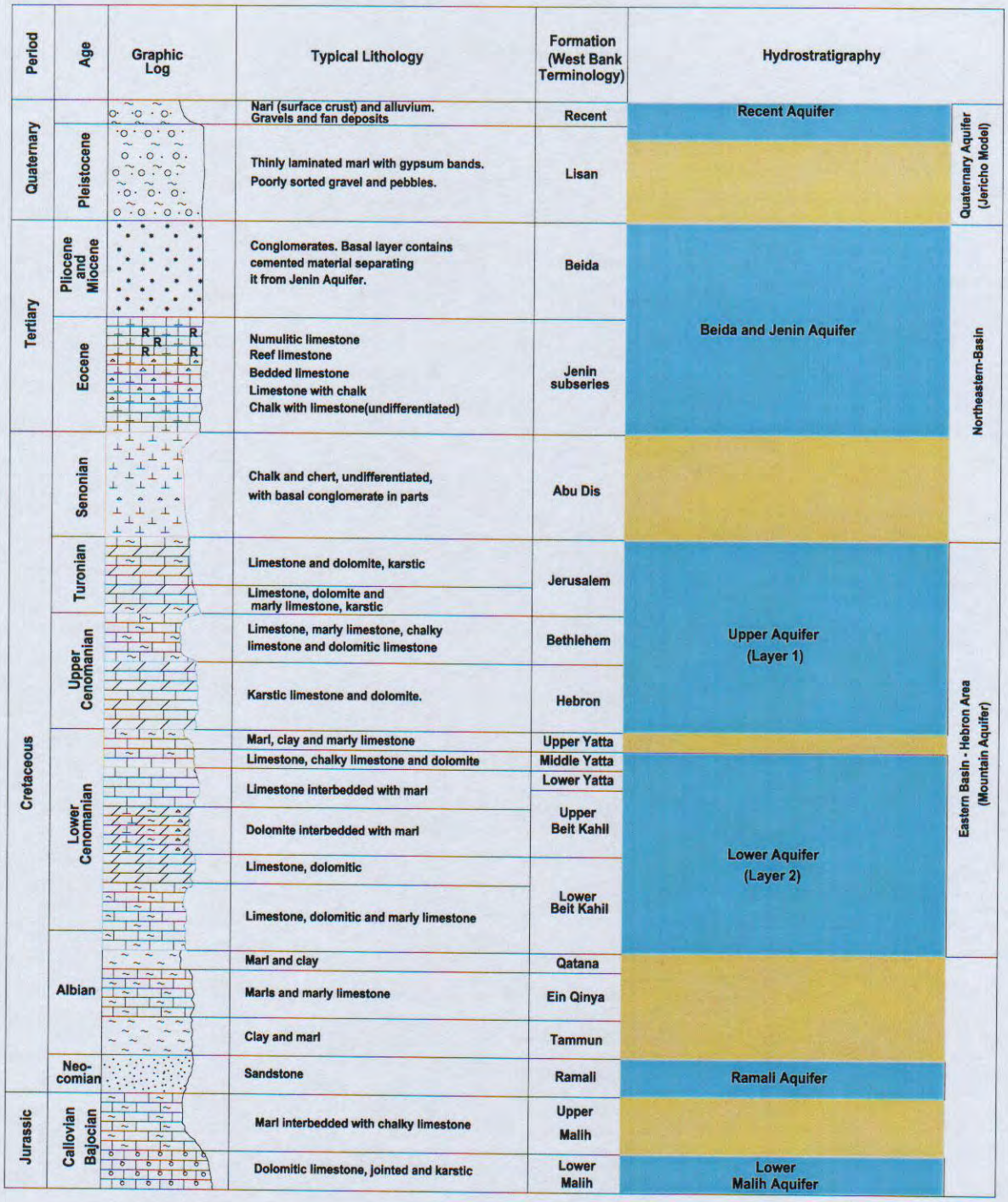

Figure 3-4 : Hydrostratigraphy of the Hebron Area

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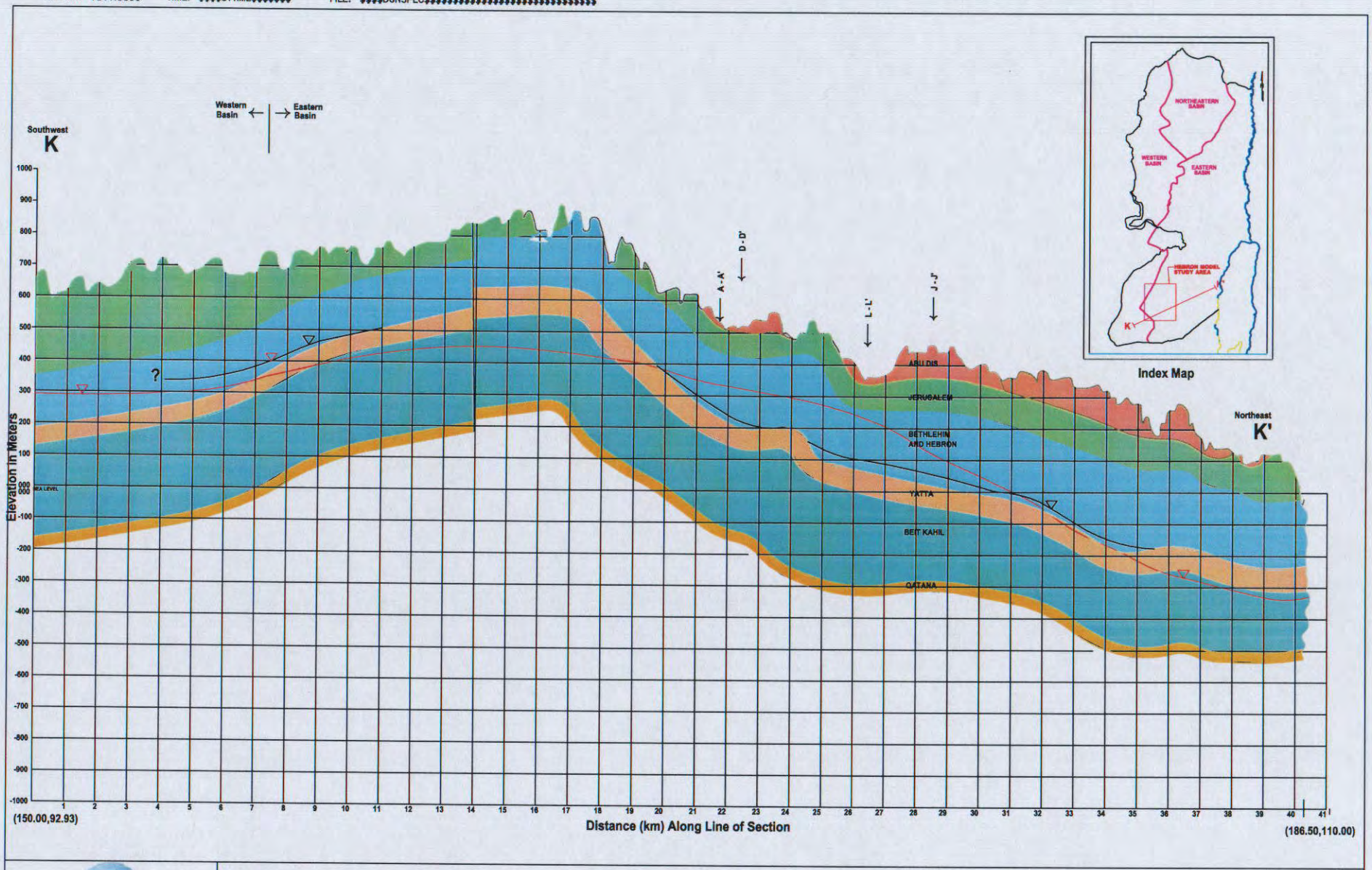

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Figure 3-5 : Section K - K' : Al Rihiya Well to Bani Naim 2 Production Well

LEGEND

- Fault
- Piezometric Surface - Upper Aquifer
- Piezometric Surface - Lower Aquifer
- x - x' Location Intersection With Indicated Cross Section
- Note : Vertical Exaggeration 10x

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3.2 Surface Water

The surface water is not considered vulnerable to environmental impacts from the HRWWTF due to the following factors:

- There is no natural groundwater flow in the wadi at the location of the proposed HRWWTF site.
- The existing flow in the wadi is untreated raw sewage discharged by the City of Hebron.
- There are no identified aquatic species living in the wadi at the proposed HRWWTF site.

The Hebron catchment area upstream of the proposed HRWWTF is approximately 26 km^2. It is located on the western flank of a mountain range extending generally north to south through the West Bank. The Hebron catchment area drains south into the Nahal Besor and Nahal Beka catchments that flow ultimately to the Mediterranean Sea. The area is characterized by exposed hard carbonate rocks with occasional colluvial mantel. There is limited vegetation. Channel beds tend to be gravelly.

The Hebron catchment upstream of the proposed site includes both the City of Hebron and rural areas. The City of Hebron has areas of separated sanitary and storm sewers, combined storm and sanitary sewers, and unsewered areas. The existing systems are generally capable to convey the small major floods (<5 year events). Medium major floods (5 year to 10 year events) and extreme events (>10 year events) are conveyed by the overland systems including the wadis.

Due to the sewered areas in the catchment, urban runoff generally results from rainfall over 5 millimeters (mm). However, the rural areas, despite significant relief in the sub-catchments, require larger rainfall events to generate runoff in the wadis.

Five natural springs clustered in an area 3 to 5 km west of the HRWWTF site and within the catchment of Wadi Es-Sammen: En Noqar, Kenar El Gharbiyeh, Kenar Esh Sharqiyeh, Abu Kheet, El Majnooneh, and Dilbeh. However, these springs are utilized for local uses and do not contribute to the flow to the wadi.

There is no natural dry weather flow in wadi Es-Sammen at the HRWWTF location. The wadi has an existing flow of untreated raw sewage of approximately 5,000 to 6,000 m^3 / day generated by the City of Hebron. During wet weather events, the combined raw sewage and rainfall runoff overflow the existing dry weather channel in the wadi and flow over and pond on adjacent agricultural areas. As a consequence of this flooding, approximately 30 percent of the selected site for the HRWWTF is damaged agricultural lands.

4.0 Environmental Consequences

4.1 Drinking Water Quality

The HRWWTF will reduce the pollutant inputs to the Eastern and Western aquifers that are used as a drinking water supply for both Palestinians and Israelis, as described in the previous sections and Section 4.2.

This reduction in pollutants will be achieved by:

- Construction and operation of the HRWWTF to treat raw wastewater currently discharged to the environment of Wadi Es-Sammen.
- Construction of a reclaimed wastewater system to distribute the treated wastewater for use in the agricultural community. This limits the discharge of treated wastewater to the environment.

The environmental consequences of constructing and operating the HRWWTF are largely positive. The remaining adverse environmental effects that cannot be avoided are addressed in Section 4.3.

4.2 Analytical Comparison

Figure 4-1 shows the results of the groundwater model for the Hebron area. The model predicts that the flow in the shallow aquifer at the location of the HRWWTF will be to the east. However, further downstream in Wadi Es-Sammen both the shallow and deep aquifers will be to the west. Therefore, the existing risk of groundwater contamination is to both to the upper and lower Eastern and Western aquifers.

Therefore, treatment of the existing raw sewage discharged to the environment from Hebron Municipality will greatly reduce the risk to the upper and lower aquifers. In addition, a further protection to the aquifer will be through the operation of a reclaimed wastewater system. The distribution of the treated effluent to agricultural users will minimize the potential for its infiltration to the aquifer. The planned reclaimed wastewater program is described in the report "Addendum to the Detailed Feasibility Study of the Hebron Regional Wastewater and Residuals Management, Final" (CH2M HILL, April 2005).

4.3 Environmental Plan of Action

The following elements comprise the Environmental Plan of Action for each project element, as applicable:

- The use of pesticides is not part of the planned works.
- Only liquid chlorine is anticipated to be used. No chlorine gas will be used as part of the planned works. Effective utility personnel protection from risks of liquid chlorine use should include the following, or equivalent, measures at the treatment plant:
  - Since liquid chlorine is not commonly used in the West Bank, operations staff would need training and maintenance guidance. A training program for

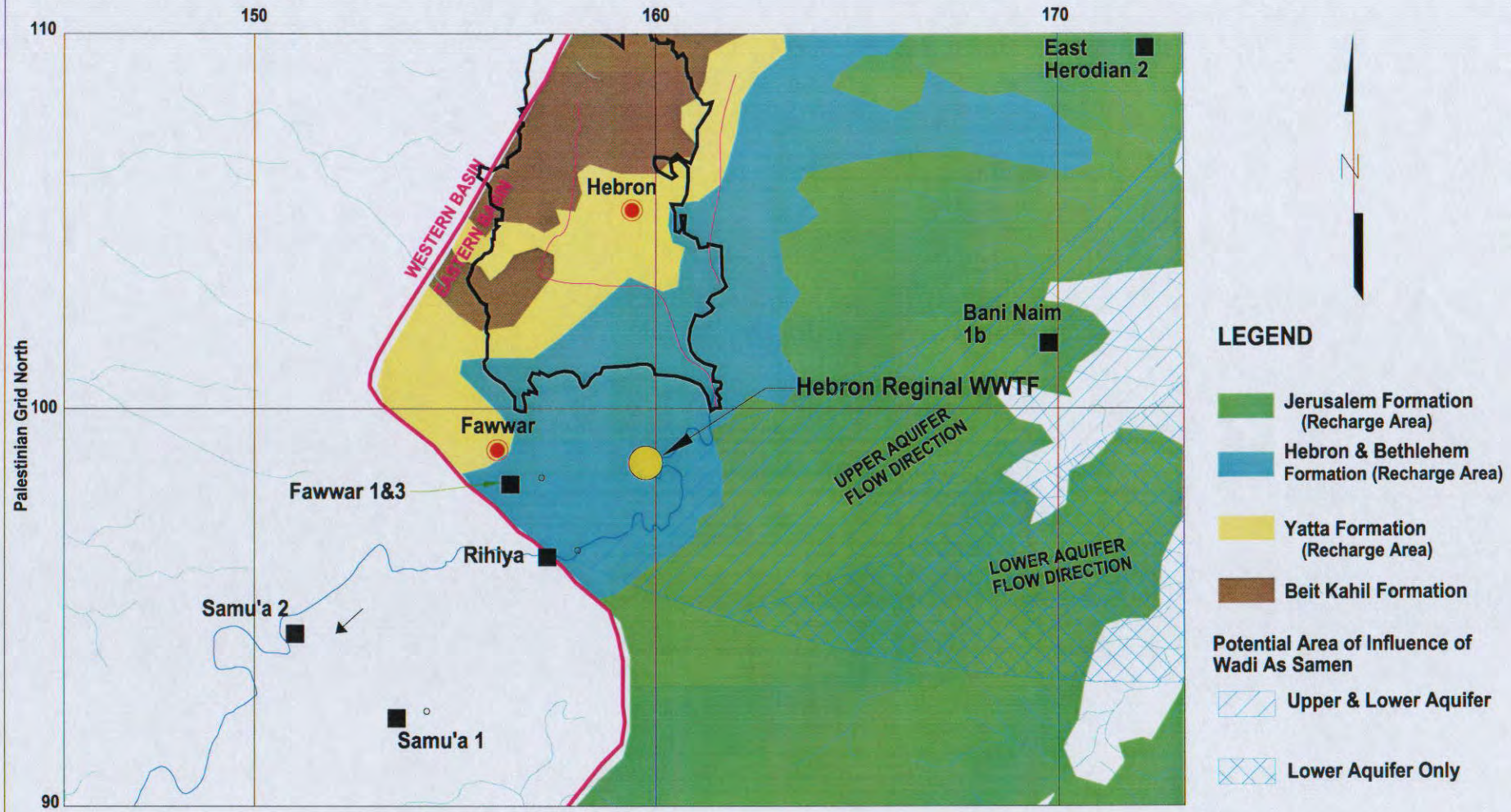

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Figure 4-1 : Aquifer Vulnerability Map

Legend:

- Groundwater Basin Boundary
- Boundary of Hebron Drainage Area
- Wastewater Flow (Wadi Es Samen)
- Existing Wells

treatment plant workers on the handling, characteristics, and risks of its use has been included in the Contract Documents.

  - Because liquid chlorine is highly corrosive, storage of liquid chlorine would need to be far away from corrodible materials. Since liquid chlorine can also produce chlorine gas if stored near ferric chloride, storage of liquid chlorine would need to be separate from ferric chloride. Project detailed design (plans and specifications) and operations and maintenance manuals should reflect the need to keep these chemicals separate from each other.

- The tender and contract documents include provisions informing contractors of their environmental responsibilities for dust, erosion, and noise abatement; minimization of traffic disruption, adherence to street repaving requirements, maintaining access to dwellings, schools and mosques, and movement of emergency service providers; identification of potential hazardous materials risks; mitigation for groundwater pollution; and coordination with utility providers.
- Before construction begins and periodically during construction, contractors will consult with Ministry of Planning (MOP) concerning proposed construction. The Hebron office of the MOP will be contacted to determine the appropriate measures for notification of the MOP during construction.
- Prior to completion of construction, staff training on safe chemical use, handling and storage is to be initiated.
- Traffic and Access. Residents and owners of buildings on affected streets must be notified at least 1 week in advance of construction. The onset and duration of construction, what to expect, and a contact name, address and phone number for questions and complaints must be communicated.
- Project construction will be coordinated with the local governments.
- To minimize erosion and siltation during construction, piles of spoil and fill will be covered and removed daily.
- A comprehensive program of public awarness and a participatory approach in the final design of the reclaimed wastewater system should be part of the program implementation. Local landowners, community leaders, and other interested parties should be identified and contacted concerning the project details. Project benefits and impacts should be communicated to elicit comments and concerns regarding project implementation. Results of the public awarness program should be used to guide project development in harmony with community concerns and interests.
- Training is required for agricultural water users prior to operation of the reclaimed wastewater system.

5.0 References

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CH2M HILL. 2005. Hebron Screen and Grit Station, Volume II Technical Specifications and Volume III Drawings.

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CH2M HILL. 2005. Supplemental for the Environmental Assessment of the Hebron Regional Waste Water Treatment Facilities, May.

Israeli Ministry of Infrastructure, 2004. Conveyance, Treatment and Reuse of Hebron Wastewater. January.

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Appendix A

Scoping Statement and Record of Environmental Decision

ANE 05-89

RECORD OF ENVIRONMENTAL DECISION
USAID/ WEST BANK AND GAZA

SO:	Water Resources Program
Program and Number:	Hebron Wastewater Treatment Plant (294-0060.42)
Funding:	Estimated at $51,000,000.00 (supplemental funding)
Activity Period:	2005 - 2008
Approval Issue	Approval of Supplemental Environmental Assessment Scoping Statement

ANE Bureau Environmental Officer Approval: John O. Wilson — Date: 4/1/05

Mission Director Approval: James Bever — Date: 3/24/05

Acting Mission Environmental Officer Approval: Barbara Belding — Date: 3/04

Clearances:

Deputy Director: Margot Ellis (A Newman for) — Date: 3/1/05

Program/Project Development: Dan Blumhagen — Date: 3/1/05

Regional Legal Advisor: Peter Sullivan — Date: 3/23/05

SO Team Leader: Alvin Newman — Date: 3/1/05

OVERVIEW:

A supplemental Environmental Assessment for the Hebron Wastewater Treatment Plant is being prepared to assure proper consideration of the final site selection for the treatment plant. The selected site differs from that proposed when the initial Environmental Assessment was approved. However, the design of the initial Treatment facility remains essentially unchanged and will provide for treatment of up to 15,000 cubic meters of wastewater per day using activated sludge methodology

ANE 05-89 West Bank/Gaza ROD EA scoping

OVERVIEW

USAID/West Bank and Gaza is preparing a supplemental Environmental Assessment (EA) for the Hebron Wastewater Treatment Plant (WWTP) to assure proper consideration of the final site selection. The selected site differs from that proposed when the initial scoping statement for the EA was approved on June 30, 2001 as part of USAID's Water Resources Program in the West Bank and Gaza. However, the design of the initial WWTP remains essentially unchanged and will provide treatment of up to 15,000 cubic meters (4.0 million gallons) of wastewater per day using activated sludge methodology.

DISCUSSION

The scoping statement does not identify any direct, indirect and cumulative potentially significant adverse effects from this project. However, it lists these issues as potentially not significant: hazardous chemicals/ materials, contaminated soils; ground or surface water contamination by leachate; reduced availability of surface water; construction site debris; dust and particulate control; vermin and disease vectors; traffic; worker and public health and safety; sludge monofil gas (methane) generation; noise; archeological/ cultural sites, odors; threatened and endangered species; seismic, geology, soils and slope stability; flood proofing; exhaust state emission; growth-inducing impacts; and light pollution.

DECISION

The supplemental scoping statement for the EA of the WWPT is **approved with these conditions as considerations**:

If pesticides or chemicals designed to kill pests are to be procured or used, an Integrated Pest Management (IPM) plan may be prepared and an approved Pesticide Evaluation Report and Safe Use Action Plan (PERSUAP) must be developed and implemented.

2) Proper disposal and potential use for generated sludge, such as alternative daily landfill cover, landscaping, composting, or other beneficial use, including testing of disposed biosolids and composed material to assure that then meet appropriate screening criteria especially is application on edible crops is anticipated as highly effective biomasses often contain high levels of metals and other constituents unsuitable for edible crops.

3) Potential safer alternatives to use of gaseous chlorine (an acutely hazardous substance), such as chlorine slurries or dissolved powders in liquids.

4) Proper disposal and reuse of treated wastewater, including testing and assurance that WWTP effluent disposed to or mixed with receiving waters containing aquatic life be de-chlorinated prior to discharge or mixing to assure survival of chlorine-sensitive aquatic species.

File No: ANE 05-89 West Bank/Gaza ROD EA scoping

DISTRIBUTION:

Mission Environmental Officer
ROD File

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
BUREAU FOR ASIA AND THE NEAR EAST
WASHINGTON, D.C. 20523

RECORD OF ENVIRONMENTAL DECISION

ANE 05-89 West Bank/Gaza ROD EA scoping

Country Code-SO: 294-0060.42
SO Name: Water Resources Program

Country or Region: West Bank/Gaza

Activity Name: Hebron Wastewater Treatment Plant (WWPT), Supplemental Scoping Statement for Environmental Assessment (EA), Record of Decision (ROD)

Funding Begin: 2005 **Funding End:** 2008 **Funding Amount:** $51,000,000

Approval Issue: **Environmental Assessment, approved with conditions**

ANE Bureau Environmental Officer
Approval: John O Wilson — 4/1/05
John O. Wilson — Date

Mission Director
Approval: (signed) — March 24, 2005
James Bever — Date

Acting Mission Environmental Officer
Approval: (signed) — March 4, 2005
Barbara Belding — Date

CLEARANCES:

Mission Deputy Director
Approval: (signed by Alvin Newman for) — March 1, 2005
Margot Ellis — Date

Program/Project Development
Approval: (signed) — March 1, 2005
Dan Blumhagen — Date

Regional Legal Advisor
Approval: (signed) — March 23, 2005
Peter Sullivan — Date

Strategic Objective Team Leader:
Leader Approval: (signed) — March 1, 2005
Alvin Newman — Date

RECORD OF ENVIRONMENTAL DECISION
USAID/WEST BANK-GAZA

SO:	**SO2, Greater Access and More Effective Use of Scarce Water Resources.**
Program and Number :	**Water Resources Program-Phase 3Hebron Wastewater (294-0042-B4003)**
Funding:	**$40.00 Million**
Activity Period:	**5 years**
Approval Issue:	**Scoping Statement**

ANE Bureau Environmental Officer Approval — see attached memo,
John O. Wilson
Date: 7/30/01

Mission Director Approval
Larry Garber
Date: 8/17/01

Mission Environmental Officer Approval: TERhodes
[Cleared by E-mail. 7/13/01]
Thomas E. Rhodes
Date: 8/6/01

Clearances:

Bill Hammink, Deputy Director: Date: 8/16/01
Rick Scott, Program/Project Development: Date: 8/15/01
David Muirhead, CTO/Phase 3: Date: 8/21/01
Alvin Newman, SO Team Leader: Date: 8/16/01

OVERVIEW:
As part of the Water Resources Program-Phase 3, USAID has prepared and will partially implement a stormwater and wastewater master plan for the Hebron governorate. The first infrastructure components will include domestic and industrial wastewater treatment facilities, including trunklines and agricultural resuse systems. Scoping activities found that potentially significant environmental issues include agricultural lands, antiquities, water quality, natural habitat, land ownership, aesthetics, seismicity, floodplain

management, public health, soil chemistry and soil erosion, and solid waste. Measures to avoid and mitigate these effects will be described in an Environmental Assessment, which is outlined in the Scoping Statement.

United States Agency for International Development
U.S. Embassy, 71 Hayarkon Street, Tel Aviv
Tel: 972-3-511-4848
Fax: 972-3-511-4888
Website: www.usaid-wbg.org

August 22, 2001

MEMORANDUM

TO: CH2M Hill and Associates

ATTN: Rick Mattson, COP

FROM: David Muirhead CC: Alvin Newman, Ahmad Sawalha, Ihab Barghouthi

SUBJECT: Environmental Scoping Statement- Hebron WWTP
Water Resources Program Phase III

Please find attached record of approval of the Environmental Scoping Statement for the document issued under your Task No.17 and made an attachment of the Masterplan for Hebron WWTP.

Please incorporate the comments provided here in the Environment Assessment document, which is forthcoming.

INTRODUCTION

To support the Palestinian people and to improve the management of wastewater in an environmentally and sustainable manner, the United States Agency for International Development (USAID) has proposed the financing, design, and construction of a regional wastewater treatment plant in the Hebron Governorate.

The environmental review requirements of USAID (22 CFR 216) require the preparation of an Environmental Assessment (EA) for classes of actions normally having a significant effect on the environment such as sewerage projects.

In May 2003 an Environmental Assessment for the Stormwater, Domestic Wastewater Master Plan for Hebron was completed. A Supplemental to the Environmental Assessment is being completed due to a location change of the Hebron Regional Wastewater Treatment Plant (HRWWTP). The HRWWTP is proposed to be located in Wadi Es-Sammen approximately seven kilometers north west of the original location presented in the May 2003 Environmental Assessment.

BACKGROUND

The Wastewater Program in Hebron is designed to protect the drinking water aquifer, treat the wastewater to reduce public health risks, and reuse the treated effluent for agricultural purposes in the vicinity of Hebron. The Hebron Wastewater Treatment Master Plan highlighted possible locations for a regional treatment plant and identified population growth, domestic and industrial sewage characteristics, and reuse potential in the region. A Feasibility Study was prepared that identified the major components of the plant's infrastructure, treatment processes, effluent quality, sewage conveyance, industrial pre-treatment program and reclaimed water program.

The Hebron Regional Wastewater Plant (HRWWTP) will have the capacity to treat 15,000 cubic meters of wastewater per day. The estimated cost of the facility is $ 40 million dollars and will be constructed on an eleven hectare site. Ultimate development at the wastewater treatment plant site will accommodate twenty years of growth with a total capacity of treating 45,000 cubic meter of wastewater per day.

Tables 1 and 2 detail the Wastewater Characteristics Currently Discharged to Wadi Es-Sammen and the: Proposed HRWWTP Effluent Requirements.

The project includes the construction, equipment, training, start-up, and commissioning of the HRWWTP.

A. A wastewater gravity sewer system (5km) from the influent screening/grit station to the new wastewater treatment plant.

B. A wastewater treatment plant (WWTP) at the South Hebron location including septage receiving facilities, preliminary treatment, primary treatment, biological treatment, disinfection, solids handling, and on-site effluent storage.

C. A reclaimed wastewater conveyance pipe (10km), pump station, and reservoir system.

D. Excavation for a future sludge monofill.

E. An industrial pump station (optional) located in the southeast section of Hebron City.

TABLE 1 - WASTEWATER CHARACTERISTICS CURRENTLY DISCHARGED TO THE ENVIRONMENT [1]

Parameter	Unit	Value
BOD5	Mg/l kg/d	930 average (Minimum 215 to Maximum 1,595) 13,950
TSS	Mg/l kg/d	*1,008 average (Minimum 200 to Maximum 4,420)* *15,120*
TDS	Mg/l kg/d	1,311 average (Minimum 100 to Maximum 3,864) 19,665
TKN	Mg/l kg/d	148 average (Minimum 14 to Maximum 270) 2,220
NH3	Mg/l kg/d	91 average (Minimum 11 to Maximum 168) 1,365
TP	Mg/l kg/d	76 average (Minimum 5 to Maximum 440) 1,140

[1] Based on the Hebron Wastewater Survey (Task 6) for the Garage Badran/Karaki Sampling Location

TABLE 2 - PROPOSED HRWWTP EFFLUENT REQUIREMENTS

Parameter	Limit
BOD_5	20 mg/l
Total Suspended Solids (TSS)	30 mg/l
Total Nitrogen (TN)	50 mg/l
Fecal Coliforms	< 1000 MPN/100 ml
Nematode eggs	< 1 egg/l
DO	> 2 mg/l

Project activities that have the potential to have direct, indirect or cumulative significant effects include the following issues.

DIRECT, INDIRECT AND CUMULATIVE POTENTIALLY SIGNIFICANT EFFECTS

1) Drinking Water Quality

Scope - The HRWWTP will reduce the pollutant inputs to the western aquifer that is used as a drinking water supply for both Palestinians and Israelis.

Significance - Currently raw wastewater is discharged into Wadi Es-Samen and it potentially could percolate into local shallow aquifers and potentially could percolate into the deeper aquifer that is used for water supply. The proposed HRWWTP will greatly reduce the potential for raw wastewater leaching to the aquifer. However, incorrect application of reclaimed wastewater could still negatively affect groundwater. The supplemental Environmental Assessment will review the proposed HRWWTP at its new location in Wadi Es-Samen and describe appropriate systems, procedures, and facilities to ensure the level of treatment and protection for the drinking water supply is maintained despite the new location. This is a highly important issue.

ISSUES THAT ARE POTENTIALLY NOT SIGNIFICANT

1) Hazardous chemicals/materials

Scope - The HRWWTP will have on-site storage of liquid chlorine for disinfection of the treated wastewater, and oil for maintenance of various equipment on-site. The WWTP has been specified to have appropriate containment facilities for these materials. In addition management will train staff how to safely handle chlorine products. The staff will be provided the ability and means to handle, store and properly inject the chlorine.

Significance - Appropriate systems and facilities have been specified to effectively deal with this issue. With proper training and facilities for containment and addition of chlorine this is not an important issue for worker safety or the natural environment.

2) Contaminated Soils

Scope - The proposed site for the HRWWTP has been used for several decades as a disposal site for raw wastewater. The soils may have been degraded through this repeated process. The Contractor will need to appropriately dispose of any surplus soils offsite that are identified as contaminated.

Significance - The Contractor will be required to evaluate the condition of any soils to be removed from the site and will be required to identify appropriate disposal sites. If the soils are found to contain an inappropriate amount of contamination a permit will need to be obtained prior to disposal. With proper control this is not an important issue for the natural environment or worker safety.

3) Ground or surface water contamination by leachate

Scope - The leachate that drains from the drying beds and composting operation of the HRWWTP potentially contains high concentrations of nitrogen that should not be allowed to enter the groundwater or the surface runoff water courses. An effective means must be provided in the drying beds and composting area to accommodate the leachate and provide for the handling and treatment of the pollutants in the WWTP process.

Significance - Although the drying beds and composting area are lined there remains limited potential for this leachate to migrate into the ground water and degrade the aquifer water quality. Prevention is relatively easy; remediation is both difficult and expensive. The deep aquifer is used for water supply by both Palestinians and Israelis however, it is very deep and is also protected by an aquaclude making this important resource unlikely to be impacted by this type of contamination. With proper maintenance of facilities this is not an important issue for the natural environment.

4) Reduced availability of surface water

Scope - Presently raw wastewater is discharged into Wadi Es-Sammen. Although this is a poor quality water resource an estimated twenty farmers (estimated from field visits) use this water resource. The poor quality water may also be used by some animal life. The introduction of the wastewater plant will improve the quality of available water but will also significantly reduce the amount of water available to downstream users.

Significance - The farmers downstream that are using raw wastewater for irrigation are using an illegal resource under Palestinian law. The discharge of reclaimed wastewater not used directly by the agricultural community will partially off-set this reduction in raw wastewater discharge. In addition raw wastewater discharged to Wadi Es-Sammen downstream of Hebron Municipality will continue to be available. This reduction in availability of raw wastewater is not a significant issue.

5) Construction site debris

Scope - Construction site debris is primarily rubble, brick, stone and asphalt; but it also includes many diverse types of metal, wood, plastics, glass, ceramics, and other non-noxious materials. Construction debris may also contain paints, asbestos, heavy metals, and other products. A site specific permit must be issued by the receiving landfill staff knowledgeable in material recognition and hazard identification.

Significance - This issue applies for any paint products that could be classified a hazardous product. The contractor will be required to follow all applicable laws and use licensed disposal sites. This issue is not significant in terms of worker health and safety or the environment.

6) Dust and particulate control

Scope - This includes dust generated during construction and also particulates from dried compost during operations.

Significance – This is a high priority of site management. However, with proper management this is not seen as a significant issue for worker health and safety or the environment.

7) Vermin

Scope – Vermin could find the existing discharge of raw sewage to the environment potentially attractive for a domicile or feeding area. These vermin include rats, crows, seagulls, feral dogs, and feral cats. The WWTP will reduce this existing risk. Management practices are needed to maintain this lower risk profile.

Significance – Vermin are carriers of disease. Vermin could spread disease from the existing raw wastewater discharge or to a lesser extent from the future WWTP to humans, other animals, sources of water and food crops or food animals. Appropriate physical barriers could further prevent access by vermin and tidy procedures could prevent the site from becoming a nuisance, allowing vermin to contact disease organisms or allowing the transfer of disease offsite. The WWTP will reduce this existing health risk from vectors. This is a minor worker health & safety and environmental issue with appropriate management practices.

8) Vectors

Scope – Vectors could find the existing discharge of raw sewage to the environment a potentially attractive for a domicile, breeding, or feeding area. Vectors include flies, mosquitoes, fleas and sand-flies. Habitat management is the key to prevention of disease through control of such vectors. Management practices are needed to minimize this risk.

Significance – Currently Wadi Es-Sammen has problems associated with vectors due to the discharge of raw sewage. Vectors are carriers of diseases such as malaria, leishmaniasis, and diarrhea diseases. Waste sites provide habitat for vectors if not properly controlled and managed. The WWTP will reduce the existing health risk from vectors. This is an issue of low significance with appropriate management practices.

9) Traffic

Scope – The site will generate between 2 - 20 truck trips each day. Truck loads of domestic septage waste, compost for agriculture, dewatered waste sludge, and domestic wastes. There will also be traffic created by the workers (5-10) who will drive to the site each day to work. The road way and entrance/exit design, driver safety, and road worthiness of the trucks are all important issues, as is the need to contain all products, wastes, trash and fluids in the load.

Significance - The road design by the Contractor will ensure that this minor level of traffic will not cause an unsafe conditions or an unacceptable nuisance. In addition, management will have to institute procedures to insure safe operation of vehicles. Typical procedures are periodic vehicle inspects, installation of speed governors on vehicles, and instituting incentives for safe operation (such as hourly payment to drivers as opposed to payment per load delivered). This is an issue of low significance.

10) Worker health and safety

Scope - Workers must be protected with knowledge of the materials they are handling, an active safety program, and appropriate safety equipment including appropriate gloves, steel toed boots, safety helmets, and protective masks (including gas masks) and hearing protective devices. Detection equipment, such as gas detection, must be used and an institutionalized monitored program set-up and monitored regularly.

Significance - Worker health and safety is extremely significant and must be the first priority of site management by the Contractor. The Contractor is required to comply with all US and local safety standards stated in the Design/Build Contract.

11) Public Health and Safety

Scope - The public and agricultural community must be protected with knowledge of the appropriate uses for reclaimed wastewater. Agriculture extension projects will be required to convey this knowledge for both safe and sustainable use.

Significance - These future agriculture extension projects and their public awareness components are an important step in ensuring safe and sustainable use of reclaimed wastewater.

12) Sludge Monofill Gas Generation

Scope- Methane gas is a product of the biological decomposition of organic materials. Sludge received at the monofill will be restricted to composted sludge that is determined to be inappropriate for agriculture. Operations at the monofill site require a drying period prior to placement of compost in the monfill. This restriction reduces the potential for further decomposition of the sludge and related gas production.

Significance- Gas generation from the compost is not a significant explosive risk due to the process chosen. While methane is the second most important "greenhouse gas" after carbon dioxide, the amount contributed by the HRWWTP will not make a significant contribution to global warming.

13) Noise

Scope - Machinery noise is the major source of noise. Strict silencer standards have been specified for the equipment and silencers must be well maintained.

Significance - Personal hearing protection devices must be worn by machinery operators when required. In addition the Contractor shall provide facilities and components in the Wastewater Treatment Plant such that noise levels are not exceeded and vibrations are isolated. The noise level should not exceed 85 decibels overall sound pressure level when measured on the "A" weighting network using survey and field methods conforming to AINSI S1.13 one meter from equipment such as air blowers and standby generators and 60 decibels at the site property line. This noise is not a significant risk for worker health and safety or the environment.

14) Archeological/Cultural Sites

Scope - A literature review and a field review for potential archeological and cultural sites were undertaken. No significant sites were identified on the lands to be used for the WWTP. One archeological site was identified on an adjacent property and it will be protected during construction activities.

Significance - Appropriate site controls will be maintained through the construction period. This is a not a significant issue with regard to the WWTP site.

15) Odors

Scope - Odors currently exist in the area due to the discharge of raw wastewater to the environment. Odor is present in the wastewater until the deleterious effects and nuisance are adequately mitigated at the WWTP. Means and methods of control are needed for the wastewater conveyance, and treatment systems, and subsequent transportation of any wastewater byproducts.

Significance - The existing environmental impact due to odors will be reduced. Odor is a nuisance and will disturb people within close proximity to the WWTP. However, the nearest residence is over 700 meters away from the WWTP. This is a significant buffer area. The ongoing environmental impact will be minor and the issue is not significant for worker health and safety or the environment.

16) Threatened and Endangered Species

Scope - The site is eleven hectares in area that does not provide habitat for any species thatare critically threatened, threatened, or vulnerable. In addition the area has a long history of resource exploitation, lack of proper management, population density, raw wastewater discharge, roads, unmanaged dumping sites, minimal plant cover, and minimal surface water resources.

Significance - This issue is not significant for this site. The IUCN data base was searched for Threatened and Endangered species in the West Bank and thirteen possible species were identified. No nature reserves, protected areas, or national forests will be affected. From literature review and on-foot reconnaissance, no sensitive terrestrial species or habitats exist on the sites.

17) Seismic, geology, soils and slope stability

Scope - Appropriate seismic ratings will be used in the design of structures. The geotechnical assessment has determined slope stability and provided recommendations for site design and foundation design.

Significance - These issues are believed to be not significant with appropriate design. The Design/Build Contractor is to adhere to seismic standards for both structural and mechanical works. Seismic design of liquid containing concrete structures shall be as per ACI 350.3-01.

18) Flood Proofing

Scope - The possibility of a flood event occurring in Wadi Es-Sammen is a significant design issue. Flooding from a storm event must be reflected in the design and construction of the site. Specifically the Design/Build Contractor will be required to complete a Basis of Design Report for the site and as a minimum to construct a major storm channel through the site, and berms upstream and downstream of the facility.

Significance - This is a design issue and is not expected to be a significant environmental or worker safety issue.

19) Exhaust Stack Emissions

Scope - Potential stack emissions from the burning of diesel fuel includes acidic gases, particulates, and metals.

Significance - The standby generators at the site will only be required periodically. An average runtime of 2 hours per week is anticipated. The stack of the generators must be located to avoid direct contact with workers. This is not a significant issue for worker safety or the environment.

20) Growth Inducing Impacts of Wastewater Treatment Plant

Scope - Higher local growth caused by more intensive agriculture adjacent to the reclaimed wastewater pipelines is anticipated.

Significance - The existing agricultural land in the project area has been classified as Class I, II, and III and is suitable for more intensive agriculture with reclaimed wastewater. However, there also is a substantial amount of land that is not suitable for agriculture and can accommodate residential and commercial growth. With appropriate agricultural land use planning the significance of this issue for the population and environment can be minimized.

21) Light Pollution

Scope - The introduction of a 24-hour facility in a presently uninhabited wadi will introduce potentially unwanted light to adjacent communities Additionally this light could affect nocturnal animals.

Significance - The Contractor is required to provide as a minimum both a Basis of Design Report and appropriate covers and shades on external lights both to improve efficiency and to reduce nuisance light pollution. The facility is located at the bottom of the wadi and will be out of the line of sight of most adjacent properties. With proper implementation this will not be a significant issue.

TIMING OF PREPARATION OF ENVIRONMENTAL ANALYSIS

It is anticipated that the Scoping Statement document will be completed in the West Bank by Friday February 25, 2005 and forwarded to the BEO for circulation. The Scoping Statement document will be circulated by the Mission Environmental Officer (MEO) to the Palestinian Water Authority. The Palestinian Water Authority will then forward the document to interested in-country agencies such as the Ministry of Agriculture, Environmental Quality Authority, Ministry of Health, Ministry of Transportation, and interested in-country NGOs concurrently with circulation to other federal agencies by the BEO. The comment period provided by REG 16 is thirty (30) days. EA preparation can commence and the work progress prior to BEO formal approval of the final Scoping Statement document. Comments received following circulation can be incorporated in the final Scoping Statement document. Following the receipt in April of comments on the Scoping Statement, the EA team can perform any additional studies necessary and prepare the final project design and the design of the monitoring and mitigation plan. The EA can be submitted before the end of May to the BEO and final approval can be obtained before the end of June 2005. The proposed date for commencement of award is August 2005.

VARIATIONS IN THE FORMAT OF THE SUPPLEMENTAL TO THE EA

No variations in the format of this Supplemental to the Environmental Assessment are needed at this time nor is it anticipated that any variations will be needed at a later time.

SCHEDULE OF PLANNING AND DECISION MAKING

February 25, 2005	- Scoping Statement sent to BEO and circulated in country
March 7, 2005	- BEO sets up Washington based EA review team
April 4, 2005	- Draft EA Supplemental prepared
April 30, 2005	- Final EA Supplemental prepared
May 2, 2005	- Final EA Supplemental sent to BEO in Washington

May 9, 2005 – EA Supplemental circulated for comment
June 30, 2005 – Final EA Supplemental approved by BEO
August 3, 2005– Award of Contract

DESCRIPTION OF HOW ANALYSIS WILL BE CONDUCTED

The analysis will be conducted in the West Bank through individual contributions of the team members with periodic ad-hoc meetings to coordinate the study of significant issues and track the progress of the work.

DISCIPLINES THAT WILL PARTICIPATE IN THE ANALYSIS

CORE TEAM

Jim Ruhl	- Civil Engineer, USAID CTO
Blair Bevan	- WWTP Task Manager, CH2M HILL
Belal Elayyan	- Project Engineer, CH2M HILL
Mustafa Nusseibeh	- Hydrogeologist, CH2M HILL
Dr. Jennifer Bubb	- Environmental Specialist, CH2M HILL

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
BUREAU FOR ASIA AND THE NEAR EAST
WASHINGTON, D.C. 20523

FAX MESSAGE

To:	Tom Rhodes
Organization:	USAID/West Bank-Gaza
Fax Number	9-011-972-3-511-4888

FROM: John Wilson, AID/ANE/SPOTS
Phone: (202) 712-4633 FAX: (202) 216-3171

Number of Pages: 8 5 Date: 30 July 2001

Comments:

Tom

I have attached for your records a signed memo approving the Environmental Assessment Scoping Statement for the Hebron Wastewater Treatment Master Plan. As we discussed, I have faxed a copy to Janet Fahey of an outline for another EA that I recommend as a model for the Hebron EA.

look forward to receiving the EA for review and approval

Best regards.

John O. Wilson
ANE BEO

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U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
BUREAU FOR ASIA AND THE NEAR EAST
WASHINGTON, D.C. 20523

July 30, 2001

ACTION MEMORANDUM

TO: Tom Rhodes, USAID/West Bank-Gaza

FROM: John Wilson, ANE Bureau Environmental Officer

SUBJ: Approval of Environmental Assessment Scoping Statement for Hebron Wastewater Master Plan

Ref: Rhodes e-mail, July 13

Per your e-mail, I have reviewed and hereby approve the Environmental Assessment Scoping Statement for the Hebron Water and Wastewater Master Plan.

I look forward to reviewing the Environmental Assessment for this activity. To expedite the review and approval process, I have attached a copy of an outline from another EA that I recommend as a model. Per your request, I have also faxed a copy of the outline directly to Dr. Janet Fahey.

cc:

Alvin Newman, USAID/WB-Gaza
Anan Masri, USAID/WB-Gaza

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LIST OF EXHIBITS

LIST OF APPENDICES

HARZA TEAM
Harza Environmental Services, Inc. In association with:
Camp Dresser & McKee International, Inc.,
Environmental Quality International,
Engineering Consultants Group