GLOBAL ENVIRONMENT FACILITY

15290

The Hashemite Kingdom of Jordan

Gulf of Aqaba Environmental Action Plan

Project Document
May 1996

THE WORLD BANK

GEF Documentation

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Natural Resources, Water and Environment Division
Middle East Department
Middle East and North Africa Region

CURRENCY EQUIVALENT

Currency Unit = Jordanian Dinar (JD)
US$1.00 = .688 Jordanian Dinars
JD 1.00 = US$1.453

WEIGHTS AND MEASURES

dunum	0.1 hectare, or 0.247 acres	M	million
ha	hectare	m	meter
hp	horsepower	m^3	cubic meter
K	thousand	MCMY	Million Cubic Meters per Year
kcal	kilogram calorie	MW	megawatts
km	kilometer	mg	milligram
km^2	square kilometer	ppm	parts per million

CHEMICAL COMPOUNDS

BOD	Biological oxygen demand	NH_3	Ammonium
CO_2	Carbon dioxide	NO_x	Nitrogen oxide
DAP	Di-ammonium Phosphate	P	Phosphorus
N	Nitrogen	SO_2	Sulfur Dioxide

ACRONYMS

ARA	Aqaba Region Authority
CIDA	Canadian International Development Agency
CZM	Coastal Zone Management
EAP	Environmental Action Plan
EIA	Environmental Impact Assessment
EIS	Environmental Impact Study
EU	European Union
GAEAP	Gulf of Aqaba Environmental Action Plan
GEF	Global Environment Facility
GIS	Geographical Information System
GOJ	Government of Jordan
GTZ	Gesellschaft fuer Technische Zusammenarbeit
ICB	International Competitive Bidding
IMO	International Maritime Organization
IUCN	International Union for Conservation of Nature
JEA	Jordan Electricity Authority
JPMC	Jordan Phosphate Mine Company, Ltd.
JSS	Jordan Standard Specifications
LCB	Local Competitive Bidding

MARPOL	International Convention for the Prevention of Pollution from Ships
MEPA	Meteorological & Environmental Protection Agency
MP	Marine Park
MSS	Marine Science Station
NEPA	National Environment Protection Agency
NCB	National Competitive Bidding
NGO	Non-Governmental Organization
PERSGA	Programme on the Environment of the Red Sea and Gulf of Aden
PMT	Project Management Team
PPA	Project Preparation Advance
RSCN	Royal Society for the Conservation of Nature
RSS	Royal Scientific Society
SOE	Statement of Expenditures
TOR	Terms of Reference
UGAOSCP	Upper Gulf of Aqaba Oil Spill Contingency Project
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Protection Agency
USAID	United States Agency for International Development
WAJ	Water Authority of Jordan
WGE	Multilateral Working Group on Environment of the Middle East Peace Process

PART I: Project Summary

THE HASHEMITE KINGDOM OF JORDAN

GULF OF AQABA ENVIRONMENTAL ACTION PLAN

Grant and Project Summary

Grantee	The Hashemite Kingdom of Jordan
Beneficiary	The Aqaba Region Authority
Amount	SDR 1.9 million (US$2.7 million equivalent)
Terms	Grant

Financing Plan

GEF

	Local	Foreign	Total
		US$ million	
GEF Grant	1.32	1.38	2.70
Govt.	0.80	--	0.80
TOTAL	2.12	1.38	**3.50**

Parallel Financing

	Total
Japan-Oil	5.60
EU-Oil	1.90
EU-MP	0.03
USAID-MP	0.24
Gvt. Industrial Pollution Control	1.40
TOTAL	**9.17**
GRAND TOTAL	**12.67**

Poverty Category	Not Applicable
Economic Rate of Return	Not Applicable

THE HASHEMITE KINGDOM OF JORDAN

GULF OF AQABA ENVIRONMENTAL ACTION PLAN

I. COUNTRY/SECTOR BACKGROUND

1. **Overview.** The Red Sea, which contains globally unique ecosystems and biodiversity, is threatened with serious degradation as a result of pollution, physical destruction and unsustainable exploitation of marine and coastal natural resources. The primary environmental "hot spot" of the region, the Gulf of Aqaba, is threatened by significant recent and planned developments that are leading to transboundary degradation of Red Sea ecosystems (paras. 11-19). As a result of its semi-enclosed nature, the Gulf of Aqaba is particularly susceptible to marine pollution and ecosystem degradation. Development and implementation of a comprehensive strategy and plan for environmental protection of the entire Red Sea will require a considerable gestation period. A framework for collaboration and cooperation among the littoral nations must be established, one which would demonstrate its replicability for integrated management and development of Red Sea natural resources appropriate for the region.

2. **Links with Regional Strategic Work.** The proposed project would address priority threats to the international waters of the Gulf of Aqaba and Red Sea in a comprehensive manner. It would facilitate development of an approach to halt and prevent marine pollution, and protect globally important coral reefs throughout the Red Sea area. As the primary "hot spot" activity it represents, this project is being prepared in parallel to the recently GEF-approved Strategic Action Programme for the Red Sea and Gulf of Aden Region, which supports the Programme on the Environment of the Red Sea and Gulf of Aden (PERSGA). The proposed project would also contribute to operationalizing the Regional Convention for the Conservation of the Red Sea and the Gulf of Aden Environment (Jeddah Convention).

3. The project complements ongoing and planned GEF projects which address broad development impacts on the Red Sea. These include: (a) Egypt Red Sea Coastal Zone Management, focusing primarily on tourism impacts; and (b) Yemen Marine Ecosystem Protection, targeted primarily at environmental monitoring and mitigation of oil-based pollution activities. Other current efforts designed to facilitate regional environmental cooperation between Red Sea littoral states at a policy level include United Nations Environmental Protection Agency's (UNEP) ongoing Regional Seas Programme and the recent signing by Jordan of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78). In addition, coordination with the Bank's program in the region — including the Egypt Private Sector Tourism Project, the proposed Jordan Second Tourism Project, the proposed Jordan Aqaba Thermal Power II Project, and the Rift Valley exercise — is ongoing. The proposed Aqaba program would provide an important sub-regional activity and an essential complement to ongoing activities, catalyzing the development of a more comprehensive and coherent system of resources management and ecosystem protection for the entire Red Sea region.

4. **National and Regional Actions in the Gulf.** In November 1991, the Jordanian Government requested that a proposal for a regional Gulf of Aqaba Environmental Action Plan be submitted to the GEF participants. The Jordanian Government asked the Bank to facilitate the preparation of the proposed Aqaba program. Subsequently, a World Bank mission assisted the Government in preparing a framework for an environmental action plan for the Jordanian portion of the Gulf of Aqaba. In May 1992, the Government of Jordan (GOJ) presented the framework for a proposed Environmental Action Plan to the Multilateral Working Group on Environment of the Middle East Peace Process (WGE), in Tokyo. In

October 1993, the Government of Jordan, with GEF and World Bank assistance, prepared the "Gulf of Aqaba Environmental Action Plan, Jordan" (GAEAP). The Plan was presented at the 4th meeting of the WGE in Cairo, in November 1993.

5. The GAEAP proposes 23 actions (investments and technical assistance) in six categories of activity, namely: legal and regulatory framework; institutional strengthening; infrastructure investments; marine park management; monitoring and applied research; and public awareness and environmental education. A number of crucial transboundary "priority 1" actions would be undertaken under the first phase of the proposed GEF project. The highest priority action is setting up the legal and regulatory framework for implementation of curative and preventive environmental measures addressing transboundary water issues.

6. During 1994 and 1995, Egypt, Israel and Jordan have taken a first step toward developing a regional approach to Gulf of Aqaba environmental protection through the preparation of an Upper Gulf of Aqaba Oil Spill Contingency Plan funded by the European Union (EU) and the Government of Japan. Under this plan, currently under implementation, emergency response centers in each of the three nations coordinate in the event of a spill requiring a regional response. Moreover, components of a Jordanian Marine Park strategy are being developed with U.S. Agency for International Development (USAID) and U.S. National Park Service funding. In parallel, Egypt has recently extended protected area status to cover the entire Egyptian coastline of the Gulf of Aqaba, an important step toward ensuring the protection of coastal biodiversity while allowing for environmentally sustainable tourism development.

7. Jordan's commitment to pursuing a regional approach to Gulf of Aqaba environmental protection was further advanced by the signing of a peace treaty with Israel, in October 1994. Under Annex IV of that treaty, the two Governments agreed to cooperate in developing legislative, regulatory, planning and emergency response measures to protect key areas including the Gulf of Aqaba. As a specific outgrowth of the peace treaty with Israel, Jordan has advanced a Binational Red Sea Marine Park Concept, involving cooperation between the two nations in developing and implementing a marine park management strategy for the upper Gulf of Aqaba. Building upon this regional model, the Government of Jordan has recently responded favorably to the Government of Egypt's offer of technical assistance in marine park management, to be provided by Ras Mohammed National Park, under the auspices of the Egyptian Environmental Affairs Agency. Jordan's commitment to tackling the Gulf's marine pollution problems is further indicated by signature, and expected ratification in 1996, of the MARPOL 73/78.

8. **Geographic Characteristics and Global Biological Significance.** The Gulf of Aqaba, one of the two northward extensions of the Red Sea, is bounded by Egypt, Israel, Jordan and Saudi Arabia. The Gulf of Aqaba is 180 km long, 14-26 km wide, has an average depth of 800 m, and is connected to the Red Sea at the narrow (6 km) Strait of Tiran. Atypical oceanographic characteristics of this semi-enclosed portion of the Red Sea have resulted in the evolution of biological diversity that is unique to the Gulf of Aqaba, making the area a global priority for conservation. Many endemic species occur among the Gulf of Aqaba's coral reef communities. The Gulf's coral diversity, which includes over 192 scleractinian (reef-building corals) and 120 soft coral species, is higher than in other parts of the Red Sea. Twelve percent (80 known species) of mollusks and a similar proportion of echinodermata occurring in the Gulf may be endemic. Fifteen percent of the Gulf's amphipod species have only been recorded in the Gulf of Aqaba and adjacent neighboring Red Sea areas. Of the 268 species of fish that have been recorded, seven are recognized as endemic.

9. **Environmental Threats and Priorities.** The same semi-enclosed characteristics of the Gulf of Aqaba that have led to its rich and unique biodiversity also results in limited water exchange with the Red Sea and Indian Ocean. Based on preliminary observations made in the Strait of Tiran, the residence time for shallow water is one to two years, while the lower mass of water experiences a three-year average residence time. The Gulf's relatively small size, combined with the low rate of water circulation and renewal, reduces the potential for dispersion of oil and other water pollutants. The problem of confinement and concentration of pollutants is particularly acute in the Jordanian portion of the Gulf of Aqaba, whose relatively shallow waters lie at the Gulf's northern tip, furthest from the narrow Strait of Tiran that separates the Gulf from the Red Sea.

10. Until the 1960s, the Gulf of Aqaba was relatively unaffected by development, with its coastline only sparsely populated by Bedouins. Since then, the Gulf has become a strategy international resource, with major industrial facilities, shipping activities and rapidly expanding tourism. These developments have already caused severe disturbance and damage to the Gulf's coastal and marine ecosystems. Phosphate deposition from ship loading operations, frequent small to moderate oil spills, sewage discharges, and thermal pollution from coastal industries have severely eroded coral life, particularly in the Gulf's intensively developed northern reaches. Transboundary movement of pollutants is a priority issue. Moreover, poorly regulated resort development and over-fishing have transformed coastal and marine ecology in many areas, causing particular devastation to near-shore reefs in a number of popular diving areas.

11. **Focus on Aqaba — the Red Sea's Primary Environmental Hot Spot.** Jordan's Gulf coastline has been modified by a variety of developments which accompanied the nation's economic growth from the mid-1970s to the mid-1980s. The Port of Aqaba gives Jordan its only outlet to the Red Sea and is of crucial importance to the Jordanian economy. Since the 1970s, the port has changed from a modest complex servicing Jordan's local needs to a regional transportation hub through which diversified cargo has moved at a rate of 11.6 to 18.7 million tons per year since 1989. The increase in shipping activities through Aqaba over the past decade has made it, in times of political stability, the busiest Red Sea port after Suez in Egypt and Jeddah in Saudi Arabia.

12. Along Jordan's northern Gulf shoreline lies the city of Aqaba, whose population has grown from 10,000 in 1972 to 65,000 today. Aqaba's existing hotel district has developed along a half-kilometer stretch of sandy beachfront in this area, to the immediate north of Aqaba's main port area where 3.6 to 6.4 million tons of phosphate rock have been exported annually since 1989. South of the main port are specialized berths for rice, cement, livestock, and containers, as well as a ferry terminal serving some 1.26 million passengers and 87,000 motor vehicles per year. South of the ferry terminal begins Jordan's only stretch of undeveloped shoreline — a 6 km expanse that the Government has slated for hotel and resort development. Between this proposed "South Coast Tourism Zone" and the Saudi Arabian border lies Jordan's South Coast Industrial Zone, featuring a 260 MW oil-fired power station (soon to be doubled in capacity), major fertilizer manufacturing and storage facilities, storage tanks for chemical solvents and vegetable oil, and a petroleum export jetty. Ready access to large quantities of cooling water, unavailable elsewhere in Jordan, is a major inducement to industrial development in this zone.

13. The rapid pace and intensive scale of development along Jordan's Gulf of Aqaba coastline are reflective of broader threats to Gulf ecosystem stability that call urgently for regional and sub-regional solutions. Pollution prevention and resource conservation measures are urgently needed to prevent irreversible loss to the biodiversity and overall ecosystem functioning of the Gulf of Aqaba and Red Sea environments. Recognizing that the ecosystem in this part of the Gulf of Aqaba is truly indivisible,

Jordan has found it both appropriate and necessary to take this vital first step toward facilitating an overall marine pollution action plan for the Gulf of Aqaba.

14. **International Waters Impacts.** The semi-enclosed nature of the environment of the Gulf of Aqaba, which has given rise to its unique biodiversity, causes the sea to be particularly susceptible to pollution. Marine pollution sources include oil spills originating from both shipping and road haulage activities, discarded solid waste, and spills of minerals (e.g., phosphate, sulfur) and organic matter (such as grains) resulting from bulk cargo loading operations.

15. With intensive port, industrial and tourism development activities concentrated along Jordan's 29-km shoreline, environmental protection measures advanced under the proposed GEF project would have a profound beneficial impact extending beyond Jordan's territorial waters. Oil pollution and discarded garbage from land-based recreational activities and from ships traveling to and from the Port of Aqaba have tangible adverse impacts on coastal and marine habitats in all adjacent littoral states. The introduction of non-indigenous species into the Gulf's marine waters through ballast water discharges may also threaten the delicate balance of marine organisms in reef areas through the Gulf.

16. Other transboundary environmental impacts affecting all four gulf-bordering states include pollution from mineral-loading operations in the adjacent ports of Aqaba (Jordan) and Eilat (Israel). Phosphate deposition on marine waters, a problem that has been substantially mitigated by the recent installation of two choke feeders in the Port of Aqaba, should be further monitored to determine any threat to coral growth in adjacent waters. Routine and non-routine chemical and thermal discharges from fertilizer factories, power generation facilities and chemical tank farms in Jordan's South Coast Industrial Zone may endanger marine life in adjacent waters if adequate measures are not taken to mitigate this problem.

17. Indiscriminate fishing of Jordanian coastal waters poses an immediate threat to the diversity and abundance of fish life throughout the Upper Gulf. The widespread use of cage traps and small-aperture nets in fragile reef areas has caused direct damage to reefs and has all but eliminated larger fish species from Jordanian waters. Poorly regulated fishing in adjacent coastal areas of Egypt and Israel further contributes to depletion of this resource.

18. Major plans for tourism development along the Egyptian, Israeli and Jordanian coasts further threaten marine water quality and ecosystem stability, unless effective coastal management guidelines and marine protected area plans are effectively implemented. In Jordan's South Coast Tourist Zone, construction of marinas and beachfront accommodations may result in the direct destruction of near-shore reefs; inadequate flood control measures may result in damaging siltation and nutrient deposition in highly sensitive reef areas; and anticipated large numbers of snorkelers, divers and tour boats may cause further direct damage to near-shore reefs. Effective coastal zone management and marine park initiatives in Jordan will require parallel and coordinated counterpart measures addressing present and potential tourism impacts in Egypt and Israel.

19. Pollution of the shallow, brackish water aquifer immediately underlying the coastal towns of Aqaba and Eilat is another important area of international waters concern. Sewage from the municipal sewage treatment ponds infiltrates this aquifer, whose depth averages only 1.5 to 2 m below the land surface near these ponds. Waste oil from truck repair facilities in Aqaba, located at a higher elevation, is a further identified threat to this shallow groundwater resource. Given the region's extreme water

scarcity, desalinated water from the Aqaba-Eilat transboundary aquifer is a valuable resource, currently providing 75% of Eilat's water needs. Pollution of this aquifer may render it unusable in future years.

II. PROJECT OBJECTIVES

20. **Background.** The proposed GEF project is part of the broader GAEAP (paras. 4-5). The primary objective of the GAEAP is to contain existing damage and prevent further environmental degradation of the Gulf of Aqaba's coast, coral reefs and marine ecosystems through the implementation of environmental management activities accompanied by required investments. The GAEAP was presented at the 4th meeting of the WGE in November 1993. Implementation of the GAEAP is currently underway and includes: (a) preparation and implementation of an oil spill contingency plan for Egypt, Israel and Jordan (funded by the EU and Japan); (b) installation of two choke feeders to reduce phosphate dust pollution from shiploading operations at the Port of Aqaba (funded by the Aqaba Ports Corporation); (c) as part of the activities funded by the GEF Project Preparation Advance (PPA), preparation of guidelines for environmental impact assessment, coastal zone management, industrial environmental auditing and pollution prevention, and marine vessel pollution prevention; and (d) development of preliminary management guidelines for the Jordanian portion of the Red Sea Marine Peace Park (using PPA funding and partial USAID funding and technical support — see para. 25E).

21. **GEF Project.** The proposed GEF project specifically targets those components of the GAEAP which address international waters issues from which expected additional global benefits will only be attained through joint action. The primary objective of the proposed GEF project is to enable Jordan to take the lead in establishing and implementing a regional collaborative framework for sustainable management and protection of the Gulf of Aqaba and the conservation of its unique coral reefs. The project utilizes the comprehensive approach outlined in the GEF Council strategy for international waters to develop mechanisms for control of transboundary pollution, and addresses environmental issues that constitute regional and global priorities. A related international waters issue addressed by the proposed project is the prevention of further degradation of the transboundary aquifer in the Aqaba coastal zone (see para. 25C).

22. Specific project objectives are to: (a) develop regional collaborative mechanisms for environmental management to strengthen capacity for the protection of the coastal zone and marine biodiversity; (b) develop and implement the legal framework and regulations for control of transboundary pollution; (c) provide for safeguards against oil pollution of aquifers and the marine environment; (d) establish and implement guidelines for the sustainable development of the coastal zone; (e) assess the effects of wastewater seepage on the quality and level of the transboundary groundwater table; (f) implement a plan to control transboundary solid waste impacts on the marine and coastal water resource systems; and (g) establish the Jordanian segment of the Red Sea Marine Peace Park.

III. PROJECT DESCRIPTION

23. Under the proposed GEF project, the Government of Jordan, in concert with parallel efforts in Egypt and Israel, would develop and implement priority measures to halt and prevent further pollution of the marine environment and the transboundary aquifers in the Aqaba coastal zone.

24. **Work Prepared with PPA Funding**. Important groundwork for this project has been laid by a GEF-funded PPA in the amount of $295,000 for the Gulf of Aqaba, which has been implemented by the Aqaba Region Authority (ARA) under the supervision of the Ministry of Planning. Using PPA funding, Jordanian and foreign engineers, lawyers and planners have worked together to produce recommended regulations addressing priority Gulf of Aqaba environmental protection concerns. Primary documents produced using PPA funding include environmental impact assessment procedures for new developments in the Aqaba region; coastal zone management guidelines for Jordan's planned South Coast Tourism Zone as well as other development areas; environmental auditing procedures applicable to existing industries in the Aqaba region; performance and discharge standards for industries located along or near Jordan's Aqaba coast; preliminary management guidelines for the Jordanian Red Sea Marine Peace Park; and a report on marine vessel pollution prevention and port reception facility needs. A report on marine vessel pollution prevention and port reception facility needs, prepared with PPA funding by the International Maritime Organization's (IMO) leading expert on MARPOL implementation, was submitted to the ARA and the Aqaba Ports Corporation in May 1995. Since that time, at the invitation of both the ARA and the Ports Corporation, further IMO involvement has carried these recommendations forward. In July 1995, EIA and environmental auditing procedures were prepared, which are to be adopted by the ARA pursuant to the Law of the Aqaba Region Authority No. 7 (1987). Coastal zone management guidelines were finalized in October 1995, and recommended pollution standards for coastal industries are being finalized. Activities achieved with PPA financing are further detailed in Part II.

25. Project components are the following:

A. ***Development of Regulatory and Institutional Framework for Gulf of Aqaba Environmental Protection.***

(i) **Definition of Overall Goals, Policies and Guidelines for Environmental Management of International Water Transboundary Issues of the Aqaba Region, and Establishment of Collaborative Mechanisms for Coordination of Relevant Institutions and Regional Partners, i.e. Egypt and Israel:** A priority feature of the proposed project is to further implement collaborative mechanisms to foster Gulf-wide cooperation in addressing priority environmental concerns. The EU-sponsored Upper Gulf of Aqaba Oil Spill Contingency Project (UGAOSCP), forging important ties between Egypt, Israel and Jordan in responding to oil spills, provides an important beginning that the GEF project would build upon and expand to embrace the broader sphere of marine water quality and coral reef protection concerns. Direct consultation, coordinated planning and information exchange would be promoted through enhanced communication between national ministries, local government entities, port authorities, coast guard officials and marine research institutions in the Gulf bordering states. In Egypt, the main counterpart institutions are the Ministry of Foreign Affairs and the Egyptian Environmental Affairs Agency. In Israel, key partner institutions include the Ministry of Environment at the national level and the Eilat Municipality at the local level.

(ii) **Implementation of a Legislative and Regulatory Framework for the Control and Management of Transboundary Pollution:** Building on the pollution control and prevention guidelines developed with PPA financing, this component would implement performance and discharge standards to control pollution from industries, port facilities and ships. Priority targets for pollution prevention and control guidelines will be preservation of marine water quality, promotion of coral reef ecosystem stability, and

prevention of further erosion of water quality in the transboundary aquifer in Aqaba and Eilat. Active consultations with neighboring states will be undertaken to ensure that standards and guidelines developed under this element are a harmonious component of a broader Gulf of Aqaba environmental protection regime accepted by all.

(iii) **Coastal Zone Management and Implementation of EIA Guidelines:** Building upon the coastal zone management (CZM) and environmental impact assessment (EIA) guidelines developed with PPA financing, this component would help to strengthen the ARA's capacity to minimize the adverse transboundary environmental impacts associated with hotel resort development, tourist services, and recreational facilities, particularly in the South Coast area. This component would include: (i) assistance to ARA in adopting and implementing proposed CZM and EIA guidelines; (ii) training of ARA staff in implementing CZM and EIA guidelines; and (iii) assistance to ARA in preparing project-specific EIA requirements and in reviewing environmental impact statements prepared during the initial period following adoption of EIA guidelines. Consultation with neighboring states will include a regional workshop, within the framework of the WGE, to develop similar guidelines for CZM and EIA guidelines with the regional counterpart agencies.

(iv) **Transboundary Environmental Management, including Monitoring with a Regional Focus:** Institutional needs assessment for strengthening the capacity of the Aqaba Region Authority Environment Unit would include: (a) preparation and implementation of a marine water quality management and implementation strategy including program elements for water quality monitoring with a regional focus; preparation and implementation of a coral reef ecosystem monitoring program with a regional focus; (b) a program for pollution prevention in recharge zones; (c) preparation and implementation of a strategy for managing residual phosphate dust emissions[1]; (d) provision of training to support environmental planning, implementation of monitoring programs, and for inspectors of regulated facilities; and (e) establishment of information technology systems including GIS and database records to support planning, monitoring and enforcement in collaboration with neighboring states.

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[1] Phosphate dust resulting from shiploading activities settles on all surfaces in the loading terminal and environs. Some, however, is blown into the adjacent sea where it sinks and settles on the seabed and coral reef communities. Environmental concerns relate primarily to the possible detrimental effects that the dust may have on marine and coral reef resources. Coral reef ecosystems in the immediate vicinity of the phosphate loading terminal have been substantially altered due to the physical effects of dust blocking light infiltration and settling on the polyps, which inhibits exchange of metabolites. Divers report that this effect may be spreading to neighboring reefs as the dust is progressively dispersed through the marine environment by wind and water currents. In addition, some of the inorganic phosphate dust from the phosphate loading terminal is converted through biological processes in the marine environment to organic phosphorous, which in turn may be a cause of eutrophication in nearby coastal waters. In the case of the enclosed water body of the Gulf of Aqaba, where natural seawater phosphorous levels are relatively low (0.2 micrograms/liter), a small increase in the available phosphorous content of sea water could have a relatively large impact on ecological systems especially coral reefs. These effects of phosphate dust need scientific verification.

B. ***Emergency Assessment of Oil Pollution Hazards and of Pollutants Contained in Ballast and Bilge Water and Measures to Promote Waste Oil Recovery and Reuse.***

While the UGAOSCP, developed with EU and Japanese assistance, addresses risks associated with small to moderate Gulf oil spills, there is an urgent need to develop adequate measures to minimize the risk of potentially catastrophic oil spills[2]. Measures to promote environmentally responsible management of ship operations, including the provision of adequate port reception facilities for bilge and ballast water, are also needed[3]. In addition to developing proposed measures to address these hazards, this component would assess the hazards to transboundary aquifers and marine waters caused by waste oil from land transport vehicles[4]. Factors to be examined include possible leakage from underground fuel storage tanks, the use of waste oil as a dust suppressant at transportation repair facilities, and the roadside dumping of waste oil. Based on this assessment, the component would help develop a strategy and plan for collection and recycling of waste oil from ships as well as transport vehicles. Enforcement tools and financial incentives to promote waste oil recovery and reuse would also be developed under this component, with a particular emphasis on promoting private sector investment in waste oil recovery, transportation and reuse.

C. ***Safeguarding Transboundary Groundwater Resources through Groundwater Monitoring and Assessment of the Effects of Wastewater Seepage on the Quality and Level of the Groundwater Table in the Gulf of Aqaba Region.***

Transboundary pollution of the shallow aquifer near Aqaba and Eilat should be controlled on both sides of the border. The quality of the groundwater around the periphery of the Aqaba and Eilat municipal wastewater treatment plant will be assessed and reciprocate mitigation measures would be defined in close collaboration between Jordan and Israel. Under a second phase, a water resources assessment would be undertaken with the objective of establishing sustainable future rates of usage and management of wastewater effluent. The water resources assessment would include a multi-sector analysis of current water resource uses, an evaluation of water quality applied to these uses, and projections as to future water supply and demand. Specific attention would be given to present management and potential uses of sewage effluent (e.g. agricultural irrigation, a proposed golf course development and landscaping in the South Coast Tourism

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[2] Under the UGAOSCP, emergency response centers are to be established in Egypt, Israel and Jordan, each with a capacity to handle spills of up to 200 metric tons of oil. As tankers now plying the Gulf's waters carry 100,000 to 150,000 tons of oil, measures to maximize tanker safety are urgently needed. The project would explore the possibility of promoting regional agreement on tanker design and operational requirements, and other measures to reduce the likelihood of a major oil spill in the Gulf.

[3] In the enclosed waters of the Gulf of Aqaba, the cumulative effects of oil contamination caused by bilge and ballast water discharges can cause serious environmental degradation. The Port of Aqaba does not have facilities for the reception and treatment of ballast or bilge water.

[4] Trucks servicing Aqaba's port and industrial facilities, numbering well in excess of 300,000 per year, are a major source of oil contamination in sensitive coastal areas as well as in areas overlying the shallow brackish water aquifer that straddles the Jordan-Israel border in the Araba valley. Poorly managed repair facilities and transport depots, combined with the uncontrolled roadside dumping of waste oil, pose major hazards. Following Jordan's signing of a peace treaty with Israel, commercial road traffic around the coast of the Gulf of Aqaba is due to escalate dramatically with the anticipated increase in commercial exchange between littoral states.

Zone), the preparation of a plan to control potential adverse impacts on nutrient-sensitive coral reefs in nearby marine waters and transboundary pollution of the aquifer near Aqaba and Eilat.

D. ***Development of an Integrated Marine and Land-Based Transboundary Solid Waste Management Strategy.***

Large quantities of solid waste (plastic bags, foam cups, animal carcasses, glass, metal, etc.) pollute the Gulf's international waters. Sources include recreational beach waste, litter generated by passengers aboard the Aqaba (Jordan) — Nuweiba (Egypt) ferry, and the discharge of dead livestock from cargo ships. This component would ensure control of litter and transboundary garbage contamination of coral reefs and the marine environment. The following activities would be included: (i) the development of consultative mechanisms to promote the development of an effective regional action plan for transboundary solid waste management for waste originating from marine and land-based sources; (ii) the improvement of port reception facilities for ship-generated solid waste; (iii) the strengthening of current mechanisms to ensure that ship operators strictly enforce anti-litter provisions against passengers and crew; (iv) the development of a solid waste collection, recycling and disposal plan that would ensure reliable collection of domestic garbage, effective sorting of recyclable materials, and environmentally sound disposal (containment) of non-recyclable waste; (v) development of strong anti-litter and anti-dumping provisions to be adopted by the Aqaba Region Authority; and (vi) the hiring and training of staff and the purchase of equipment for patrolling beach areas and coastal waters to enforce anti-litter provisions.

E. ***Protection of Globally Important Coral Reefs — Development and Implementation of the Jordanian Marine Park.***

This component would be undertaken within the framework of a tri-partite collaboration between Egypt, Israel and Jordan. The marine reserve proposal prepared by the International Union for Conservation of Nature (IUCN) was updated using PPA funding and has produced draft marine park regulations. Hence, the component would entail: (i) establishment of a multi-use Marine Park (MP) incorporating detailed zonation and numerical and spatial limitations on different user activities (including commercial and recreational fishing regulations); (ii) installation of mooring buoys, the marking of boundaries, user zones and reef crossovers points; (iii) hiring and training of Marine Park staff engaged in controlling park entry, enforcement of zoning regulations, interpretation and visitor education, and implementation of monitoring and public awareness programs; and (iv) in collaboration with ARA, the Port Corporation, NGOs and the private sector, development and implementation of a public awareness campaign targeting hotel visitors, dive center customers, park visitors and the general public.

IV. INSTITUTIONAL FRAMEWORK AND PROJECT IMPLEMENTATION

26. The Government of Jordan has requested that the Bank continue its leading role in facilitating the GAEAP. The Bank would continue to support Egyptian, Israeli and Jordanian cooperation under the GAEAP which would be linked to initiatives in other sectors to promote the development of the area as part of the Middle East Peace Process (para. 4). The GAEAP is an integral element of the Bank's regional environmental strategy and is a priority action of the Environmental Business Plan of the Middle East and North Africa Region. As in the preparation phase, the project would be closely coordinated

with Bank activities in the region. This would include development of linkages with the Private Sector Tourism Project in Egypt, the proposed Second Tourism Project in Jordan, and the proposed Aqaba Thermal Power II Project, as appropriate. It would also be coordinated with studies being prepared for potential cooperative activities between Israel and Jordan in the Jordan Rift Valley.

27. Project implementation would be undertaken by the Aqaba Region Authority under the supervision of the Ministry of Planning. In addition, ARA environmental activities will be coordinated with the General Corporation for Environmental Protection, established under Jordan's recently enacted Law of Environmental Protection No. 12 (1995).

28. The Aqaba Region Authority was established in 1984 under the authority of the Prime Minister in order to ensure coordination and integration of all development taking place in the Aqaba region. The ARA and its recently established Environment Unit (including role and activities to be undertaken) are described in the Technical Annex. In order to enable ARA to perform its mandate for overseeing the integrated development of the region, the Government issued a special law, which identifies the organization's goals and guides its activities. The law states that the ARA is responsible for the coordination of social and economic development of the region and the formulation of necessary policies, plans, regulations and programs in collaboration with the concerned public and private agencies. This law also enables ARA to introduce rapidly, and enforce, environmental regulations for the Aqaba region. While ARA currently lacks the capacity to fully address environmental issues, it would be strengthened to that effect through this project.

29. **Regional Collaboration Implementation**. As described in the above paras. 11-19, port and industrial activities along Jordan's Gulf coastline which impact international waters prompted Jordan to plan specific protection activities to be undertaken under the proposed project and these activities are expected to have substantial beneficiary transboundary environmental impacts. As briefly described in para. 25 and further detailed in Part II, the project components will also include activities to be undertaken jointly between Jordan, Egypt, and Israel. The Government of Jordan, in concert with Egypt and Israel, would develop and implement priority measures to halt and prevent further pollution of the marine environment and the transboundary aquifers in the Gulf of Aqaba coastal zone.

30. The framework for these activities to take place is provided through the Middle East Peace Process Working Groups. Active consultations on Gulf of Aqaba environmental protection are already well under way between Jordan, Egypt and Israel. The WGE established Gulf of Aqaba environmental protection as its first target for regional cooperation. The UGAOSCP, with Egypt, Israel and Jordan as active partners, has emerged as a direct outgrowth of the Working Group's deliberations. Under the auspices of the Regional Economic Development Working Group, the Taba-Eilat-Aqaba Macro Area ("TEAM" Area) Experts Group is further sponsoring, through World Bank facilitation, the preparation of GAEAPs for the Jordanian and Israeli portions of the Gulf. Under the auspices of the GEF-sponsored PPA for the Gulf of Aqaba Environmental Action Plan, important strides have also been made toward forging regional cooperation in addressing priority Gulf of Aqaba environmental protection concerns. The GEF funded PPA enabled coordinated efforts in coral protection. Through this initiative, the Ras Mohammed National Park Sector Development Project has been invited to contribute expertise for preparation of a marine park strategy for Jordan, in conjunction with leading scientists from the U.S. National Oceanic and Atmospheric Administration.

31. **Implementing Institutions**. The regional collaboration activities under this proposed project will directly build on, and support, the Middle East Peace Process Working Groups operations. In Jordan,

regional collaboration activities will be the responsibility of the ARA. ARA will, through its Board of Directors, oversee project implementation, forward planning, and sustainability of the project. Within the ARA, oversight of implementation will be the responsibility of the Secretary General, to which the Environment Unit is attached. A Director will be appointed to head the Environment Unit and the Unit's role and activities are detailed in Attachment D. The Environment Unit will coordinate with regional partners. Specific regional collaboration tasks will be undertaken by the Director of the Environment Unit and are described under the position's Terms of Reference (TOR) in Attachment E. The Project Manager will also assist in coordination of regional activities. In Egypt, the main counterpart institutions are the Ministry of Foreign Affairs and the Egyptian Environmental Affairs Agency. In Israel, key partner institutions include the Ministry of Environment at the national level and the Eilat Municipality at the local level. High level officials of these institutions will directly collaborate with ARA's Environment Unit Director.

32. Collaborative mechanisms will be developed for region-wide consultation and cooperation in addressing priority areas of environmental concern. The mechanisms will address options for establishing specialized committees to promote dialogue on particular issues (e.g. land-based industrial pollution concerns; sewage and solid waste management; marine vessel pollution prevention; environmental performance of port operations; environmental data-sharing). Included would be mechanisms for organizing regional workshops on priority policy areas (e.g. environmental impact assessment, industrial pollution monitoring, marine vessel pollution prevention, fisheries management) and for implementing transboundary scientific research projects on issues pertaining to coral reef ecology, fisheries management, and terrestrial flora and fauna.

33. **Regional Activities** to be undertaken are detailed and budgeted in Part II. They include:

(a) the development of an action plan for transboundary consultation and cooperation. In developing and implementing this plan, the ARA Environment Unit Director will work with counterparts in Egypt, Israel and, if possible, Saudi Arabia to establish consultative mechanisms on priority areas of environmental concern. Tri-national committees would be strengthened or created to promote harmonized laws and policies in specialized areas (e.g. marine pollution from land-based industries; sewage management and sewage water reuse; collection, disposal and recycling of solid waste from marine and land-based sources);

(b) the development of joint research projects on issues pertaining to coral reef ecology, fisheries management, and pollution impacts from land-based and marine sources. The current research capabilities of the Aqaba Marine Science Station and other Jordanian institutions will be strengthened through the development of a research agenda targeted at priority environmental protection concerns. Augmenting this agenda will be fellowship support and research grants, awarded on the basis of the proposals' substantive areas of focus as well as the shared involvement of researchers from two or more Gulf-bordering states in research projects. Direct cooperation between the MSS and counterpart institutions in Israel and Egypt will be promoted;

(c) the provision of training workshops on topics of shared relevance (e.g. environmental impact assessment, industrial pollution monitoring, marine vessel pollution prevention, fisheries management);

(d) the joint development between the Governments of Jordan, Egypt and Israel of standards and regulations for ship-based pollution, including bilge and ballast water waste, noxious liquid substances, solid waste and sewage;

(e) the provision of regional institutional strengthening through the establishment of a Geographical Information System (GIS) compatible for the three bordering countries and necessary regional staff training;

(f) the development of regional measures to minimize the risk of potentially catastrophic oil spills;

(g) assessment of the feasibility of building a coordinated (Jordan-Egypt-Israel) waste oil reception and recovery scheme, and launching of a demonstration project in waste oil recovery[5];

(h) joint (Jordan-Israel) groundwater monitoring and assessment of the effects of wastewater seepage on the quality and level of the groundwater table in the Gulf of Aqaba region;

(i) development of a transboundary solid waste management strategy; and

(j) the implementation of the transboundary Marine Park within the framework of a tri-partite collaboration between Egypt, Israel and Jordan.

V. PARTICIPATION AND SUSTAINABILITY

34. **Participation**. Preparation of the GAEAP, including its proposed GEF components, has involved extensive and broad-based participation by representatives of national and local Government, the ARA, academic and research institutions, private sector interests and non-governmental organizations (NGOs). Ongoing dialogue with potential private sector investors in the tourism industry is currently being enhanced through the sharing of experience gained from Egypt. The participation process was facilitated through a series of consultative meetings conducted in Amman and Aqaba both in Arabic and English. At the regional level similar meetings were held in Egypt and Israel. An element of the participatory process included the preparation and distribution of GAEAP-related documentation in Arabic and English in the cooperating countries. Preparation of the GAEAP within Jordan directly involved the Royal Scientific Society (RSS), the leading applied research institute, and the Royal Society for the Conservation of Nature (RSCN), a major Jordanian non-governmental organization. The participation process related to the Marine Park is detailed in Attachment H. At the local level, the future Marine Park is not inhabited and the setting of its boundaries will not involve any resettlement. Local perspectives, goals, aspirations, and priorities were discussed with communities in the area surrounding the proposed park.

35. **Sustainability.** Project sustainability rests on the overall commitment of the Government of Jordan and other riparian states. Project activities and implementation are designed (including the participation process) to achieve sustainability. The project would develop mechanisms for the

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[5] Safeguards will be developed to preclude making such an installation a dump site for waste oil deliberately brought into the area.

establishment of financial incentives, private sector investment, and cost recovery in environmental management.

36. The Law of the ARA of 1987 allows for establishment of financial mechanisms to generate and utilize funds to cover recurrent costs. A recurrent cost recovery plan for operation and maintenance of the Environment Unit will be developed during project implementation (Technical Annex). Following adoption of the recurrent cost recovery plan, the necessary by-laws would be enacted. Recurrent costs would be met through Government contribution, camping fees, and increased revenues from the Royal Diving Center by strengthening service quality and charging fees reflecting market rates. In addition, revenues, that will ensure long term funding for the Environment Unit, could be generated from: (a) special assessment or impact fees levied by ARA on new construction in the coastal zone; (b) solid waste; (c) emissions; (d) environmental services (e.g. EIAs and environmental audits) and user charges; (e) tourist bed tax; (f) regulations' enforcement fees; (g) corporate and individual sponsorship; and (h) revenues from the park (e.g. entrance fee, concession fees for activities such as diving and cafes). As regards park revenues, an entrance fee structure will be developed and applied.

37. The Government has committed itself to the proposed project by the preparation of the GAEAP. In addition, the Government is contributing $1.4 million for the funding of a priority component of the GAEAP, i.e. installation of two choke feeders at phosphate loading terminals to reduce airborne phosphate. The Government is also committed to contribute an additional estimated $800,000 in cash or in kind to support environmental management and capacity building, as well as the financing of environmental audits for the major industries in the Aqaba region, notably the power plant and fertilizer factory. Finally, the regional parties (Egypt, Israel and Jordan) have requested, within the context of the Regional Economic Development Working Group in Amman in June 1995, that coordinated environmental action plans be developed for the Egyptian and Israeli portions of the Gulf of Aqaba. The World Bank has agreed to assist in the preparation of the plans for Egypt and Israel.

VI. PROJECT FINANCING AND BUDGET

38. A detailed budget of the GEF project components is contained in the Technical Annex, Attachment A, and a full description of these outputs is provided in the text of the Technical Annex. A breakdown of project costs and the financing plan are shown in Schedule A. Procurement methods, disbursement amounts, and the disbursement schedule are shown in Schedule B and detailed in the Technical Annex. Retroactive financing of up to $300,000 is being made available for priority goods and consultant services. A timetable of key project processing events and the status of Bank Group operations in Jordan are in Schedules C and D, respectively.

39. The total cost of the project is estimated at $12.67 million, representing $2.2 million supported by the Government of Jordan, $7.77 million of bilateral assistance and GEF financing of $2.7 million. The Jordanian contribution includes nominal funding of about $100,000 annually (or $300,000 over the life of the project) to address environmental issues in Aqaba which are of significance to Jordan, together with $1.4 million to reduce phosphate dust pollution negatively affecting water quality and a commitment by the ARA to reallocate $500,000 toward the institutional framework of the proposed project. The GEF-funded PPA has been instrumental in catalyzing funds from bilateral donors. The EU and Japan are financing $7.5 million for the oil spill contingency planning and implementation component of the GAEAP, and USAID and the EU are assisting the Government of Jordan in the development of a marine park with a contribution of $272,500. In addition, it is envisaged that GTZ may contribute up to $1.3

million to this initiative. Through this contribution, GTZ would conduct an area-wide EIA of the South Coast, including the planned Tourism Zone.

VII. INCREMENTAL COSTS

40. The incremental costs of the project (set out in Technical Annex, Attachment B) have been calculated on the basis of a component-by-component analysis of reasonable project baseline costs, taking into account the relative government commitment to finance environmental management and protection measures as part of its established or expected sustainable development plans. The incremental costs to be borne by GEF financing have been estimated at $2.7 million.

41. Domestic benefits accruing to Jordan, as well as the other littoral states of the Gulf of Aqaba, would be: (a) an increase in water quality through reduction of oil, industrial pollution and solid waste; and (b) potential tourism revenue from the MP. Although these benefits cannot be readily calculated due to their uncertain distributive characteristics as well as the speculative nature of tourism development in the region, it should be noted that 87% of project costs associated with the components supporting these potential benefits (oil pollution hazards, transboundary solid waste management and marine park) will be borne through identified bilateral financing. The remaining 13% of these costs, covering other transboundary benefits, would be funded by the GEF.

VIII. LESSONS LEARNED

42. Lessons learned from previous international waters projects in the region indicate that a programmatic approach to country-based international waters projects is required. The proposed project would provide linkages with ongoing regional seas initiatives, and would ensure a concerted international approach to achieve global benefits through linkages with the Strategic Action Programme for the Red Sea and Gulf of Aden Region as described in paras. 2-3.

IX. RATIONALE FOR GEF FINANCING

43. **Urgent Global Priority**. The proposed project meets GEF eligibility criteria by addressing critical transboundary threats to the ecological viability of a globally significant waterbody, and urgent biodiversity conservation needs that, if not addressed, would result in irreversible damage to globally important coral reef biodiversity. The Gulf of Aqaba is identified as a globally significant biogeographic zone in the 1995 World Bank/IUCN report "A Global Representative System of Marine Protected Areas." Pollution resulting from development on the coast of the Gulf of Aqaba is endangering the balance of marine ecosystems. Biological and economic value of these unique marine ecosystems may be lost as a result of poorly planned or managed coastal developments which are established without due regard for environmental consequences. The comprehensive approach of this project, addressing multisectoral issues, has direct application to development pressures being placed upon threatened coral systems worldwide. The project is fully consistent with the Bank Group Country Assistance Strategy discussed by the Board on October 24, 1995, which inter alia emphasizes environmentally sustainable development.

44. While some elements of the project would be focused on addressing regional priority hot spot issues at a national level, the benefits would be global due to their transboundary nature, both in terms

of the significance of Red Sea biodiversity, and also as a demonstration of the successful establishment of mechanisms for regional pollution management that could be replicated in other parts of the world. The proposed project would strengthen basin-wide pollution monitoring and management efforts in cooperation with the other projects in the region, and would establish the basis for further regional cooperation.

45. In addition, GEF support to implement the GAEAP, in particular the marine pollution component and the coral reef conservation strategy, is expected to leverage supplemental assistance from the EU, Japan, USAID, other donor agencies, and environmentally friendly private tourism developers.

X. ENVIRONMENTAL ASPECTS

46. This environmental project is expected to have an overall positive environmental impact. All project components are "Category C" components except for the MP component which is a "B" component. The MP component may support small-scale physical work for the effective management of ecologically sensitive areas in the coastal zone. This component would be subject to an environmental review, consistent with OD 4.01, Annex C during the project. A preliminary environmental analysis of the environmental impacts and a preliminary environmental mitigation plan for the Marine Park component is described in Attachment I, which would be detailed during the project by the implementing agency ARA. Review of the detailed mitigation plan and of its implentation would be carried out by the Bank.

XI. PROJECT MONITORING AND EVALUATION

47. Utilizing key process and status indicators would be an intrinsic process of the project through the establishment and integration of monitoring tools into project components. A monitoring and evaluation plan is detailed in the Technical Annex, Attachment C. The objective of this monitoring is to contribute to improving and, if needed, adapting management of project activities as well as creating the basis for project evaluation. A Mid-Term Review will be undertaken jointly by the Government and the World Bank after two years, on or about August 1998.

XII. PROJECT BENEFITS

48. The project would result in the following benefits: prevention of further environmental degradation, including the containment of marine pollution; improvement of the overall quality of the urban and natural environment; reduction in existing point sources of pollution; maintenance of the ecological balance of threatened ecosystems; and improvement of the efficiency of water use. It would also establish standards and procedures which could be adopted at the national level, and provide an opportunity to initiate regional cooperation in managing the environmental impacts of development throughout the Gulf of Aqaba.

XIII. ISSUES, ACTIONS AND RISKS

49. The major issue is the need for a strengthened institutional framework. By providing a proper institutional, regulatory and enforcement system, as proposed under the project, the risks of continued environmental degradation and failure to achieve the project's objectives would be minimized. While the ARA has legal authority to introduce new regulations for the Aqaba Region, there is also a risk associated with the possible delay in enforcement of those regulations. Toward this end, the ARA Environment Unit should be strengthened to allow for effective management with enforcement authority. At a minimum, provision of incentives for career development and the elaboration of management enforcement authority is required. Finally, there is a risk that following project completion the Environment Unit could not be sustained. The adoption of a recurrent cost recovery plan and government assurance to continue meeting recurrent costs after the project minimize this risk.

XIV. AGREED ACTIONS

50. During negotiations, the following agreements were reached with the Government:

(i) that ARA will establish an Environment Unit with staffing and TORs satisfactory to the Bank by July 1, 1996;

(ii) that official designation of the Gulf of Aqaba Marine Park, including boundary delineation, would be a condition for disbursement of those components of the Grant related to the MP;

(iii) that based on the MP regulations to be developed during the first three months of the project, a by-law establishing the regulations for the operation of the MP will be presented to the Cabinet of Ministers by December 31, 1996;

(iv) that immediate steps will be taken toward the formal adoption, by September 1, 1996, of recommended guidelines and standards developed with PPA funding, including EIA, CZM, environmental auditing, and industrial pollution prevention;

(v) that the key project activities would be carried out according to the Schedule set forth in Attachment F;

(vi) that a recurrent costs recovery plan will be designed by December 31, 1996 and implemented within 6 months; charges would be updated regularly according to the plan;

(vii) that the equipment to implement the monitoring of sea water quality program will be based at the Marine Science Station;

(viii) that quarterly progress reports will be submitted to the Bank, with supporting documentation, describing actions taken in the following areas:

- hiring and training of Project consultants and staff;
- progress in meeting milestones set forth in the Project Implementation Plan;

- adoption and implementation of environmental protection regulations, including but not limited to guidelines and standards developed with PPA funding;

- inter-agency coordination in addressing priority concerns addressed under the Project;

- preparation and implementation of a MP management plan, marine water quality monitoring program, GIS, waste oil recycling plan, groundwater quality mitigation plan, and solid waste collection plan;

- development of mechanisms and implementation of activities to advance regional cooperation with neighboring Gulf of Aqaba states, in accordance with specified Project implementation activities (Technical Annex, Attachment D); and

- development of physical facilities and infrastructure, in accordance with specified Project implementation activities (Technical Annex, Attachment D).

(ix) that annual audit reports will be provided to the Bank within five months after the close of the Government's fiscal year; and

(x) that a Project Completion Report will be prepared within four months after project completion.

Schedule A

JORDAN
Gulf of Aqaba Environmental Action Plan
Estimated Costs and Financing Plan
Project Cost Estimates
(US$ thousands)

	Components	Local	Foreign	Total	Foreign Exchange (%)
A.	Institutional & Regulatory Framework	1,054.0	894.0	1,948.0	45.9
B.	Oil Pollution Hazards & Waste Oil Recovery	62.5	37.5	100.0	37.5
C.	Groundwater Resources	50.0	50.0	100.0	50.0
D.	Solid Waste Management	90.0	60.0	150.0	40.0
E.	Marine Park	863.0	89.0	952.0	9.3
	Contingencies	0.0	250.0	250.0	100.0
	TOTAL	**2,119.5**	**1,380.5**	**3,500.0**	**39.4**

Project Financing Plan
(US$ thousands)

	Local	Foreign	Total	Foreign Exchange %
GEF Grant	1,319.5	1,380.5	2,700.0	51.1
Government of Jordan	800.0	0.0	800.0	0.0
TOTAL	**2,119.5**	**1,380.5**	**3,500.0**	**39.4**

Schedule B
Page 1 of 2

JORDAN
Gulf of Aqaba Environmental Action Plan
Proposed Procurement & Disbursement Arrangements
(US$ thousands)

	Project Element	ICB	NCB	Other*	Not Bank Financed	Total
1	Works					
	1.1 MP Building		320.0		142.0	462.0
			(320.0)			(320.0)
	1.2 MP Infrastructure		162.0		0.0	162.0
			(162.0)			(162.0)
2	Goods					
	2.1 Laboratory and GIS Equipment	220.0	100.0			320.0
		(220.0)	(100.0)			(320.0)
	2.2 Computer, Audio-Visual and Office Equipment		120.0			120.0
			(120.0)			(120.0)
	2.3 Vehicles & Mobile Equipment		88.0	77.0(a)	50.0	215.0
			(88.0)	(77.0)		(165.0)
	2.4 Solid Waste and Waste Oil Pilot Equipment			60.0(a)		60.0
				(60.0)		(60.0)
3	Consultant Services					
	3.1 Implementation and Training Activities			708.0 (b)	107.0	815.0
				(708.0)		(708.0)
	3.2 Technical Assistance			790.0 (b)	314.0	1104.0
				(790.0)		(790.0)
4	Miscellaneous					
	4.1 Operating Expenses for MP			55.0		55.0
				(55.0)		(55.0)
	4.2 Other Operating Expenses				187.0	187.0
	TOTAL	**220.0**	**790.0**	**1690.0**	**800.0**	**3500.0**
		(220.0)	**(790.0)**	**(1690.0)**		**(2700.0)**

*(a) National Shopping (US$0.137 million), and (b) World Bank Guidelines for the Use of Consultants.
Note: Amount in parentheses indicates GEF grant financing.

Cumulative Disbursements Schedule
(US$ thousands)
Bank's Fiscal Year
(ending June 30)

	1996	1997	1998	1999
Works and Goods	300	400	300	150
Consultant Services and Miscellaneous	300	500	500	250
Total	**600**	**900**	**800**	**400**

Estimated Disbursements

	Category	Amount of Grant Allocated (US$ thousands)	Percent of Expenditures to be financed*
1	Works	482	100% of foreign expenditures 95% of local expenditures
2	Goods	665	100% of foreign expenditures 100% of local (ex factory cost) and 90% of national expenditures for other items procured locally.
3	Consultant Services	1498	100% of foreign expenditures 100% of local expenditures
4	Miscellaneous	55	100% of foreign expenditures 100% of local expenditures
Total		**2700**	

*The estimated Closing Date of the project is December 31, 1999.

Schedule C

JORDAN
Gulf of Aqaba Environmental Action Plan

Timetable of Key Processing Events

Time taken to prepare[1]	36 months
Project Prepared by	Government with IBRD Assistance
First IBRD Mission	May 1994
Departure of Appraisal Mission	February 15, 1996
Negotiations	April 1996
Planned Date of Effectiveness	December 1996

1/ The preparation of the Gulf of Aqaba Environmental Action Plan (GAEAP) started in July 1992 as part of the Multilateral Working Group on the Environment of the Middle East Peace Process (WGE). The GAEAP was finalized in October 1993. The preparation of the GAEAP was funded by the MNA Region and the GEF. Subsequently, portions of the GAEAP were implemented within the framework of the WGE. The preparation work of the GEF portion of the GAEAP started in December 1994 using Project Preparation Advance (PPA) funding.
2/ Key staff for project preparation were N. Glineur (TM), A. Halldin (sr. industrial pollution specialist), A. Rotman (environmental specialist), J.F. Stewart (consultant) and P. Warburg (PPA coordinator). Support was provided by E. Marinova, M. Darlington and P. McPoland.

Schedule D

THE HASHEMITE KINGDOM OF JORDAN

STATUS OF BANK GROUP OPERATIONS IN JORDAN

A. STATEMENT OF BANK LOANS AND IDA CREDITS
(As of January 31, 1996)

Loan No.	Fiscal Year	Borrower	Purpose	Bank	IDA	Undisbursed
				(US$ million)		
15 Credits closed					86.13	
33 Loans closed				810.80		9.70
		Of which SECALS, SALs, and Program Loans		150.00		
Ln. 31060	89	Jordan	Human Resources Sector Investment	73.00		3.96
Ln. 35680	93	Jordan	Transport III	35.00		27.81
Ln. 35740	93	Jordan	Health II	20.00		19.49
Ln. 36510	94	Jordan	Energy Sector Loan	80.00		40.00
Ln. 37380	94	Jordan	Jordan Telecommunications	20.00		18.94
Ln. 38170	95	Jordan	Agricultural Sector Adjustment Loan	80.00		30.00
Ln. 38180	95	Jordan	Technical Assistance for Agriculture	6.60		6.60
Ln. 38640	95	Jordan	Human Resources Dvt. SIL	60.00		60.00
Ln. 39470	96	Jordan	Economic Reform & Development Loan	80.00		0.00
			Total	1,265.40	86.13	216.50
			of which has been repaid	411.53	16.76	
			Total now held by Bank and IDA	853.87	69.36	
			Amount sold 11.53			
			of which repaid 11.53			

B. STATEMENT OF IFC INVESTMENTS
(As of December 31, 1995)

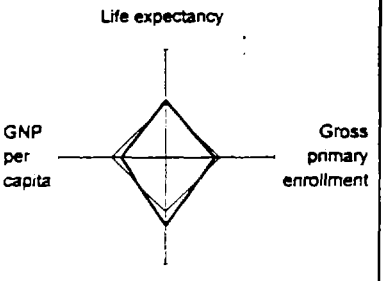
Fiscal Year	Borrower	Type of Business	Loan	Equity	Total
				(US$ Million)	
1974	Ceramic Industries Company	Cement & construction material	1.60	0.23	1.83
1975/78/82	Phosphate Mines Company	Phosphatic fertilizer	79.48	8.75	88.23
1979	Securities Corporation	Financial services	0.00	0.67	0.67
1979/85	Lime and Silicate Brick Ind.	Building materials	2.50	1.35	3.85
1982	Leasing Company Ltd.	Financial services	0.00	0.29	0.29
1987/91/93/95	Al-Hikma Pharmaceuticals	Chemicals & petrochemicals	7.19	2.70	9.89
1995	Al-Keena Paper Products	Timber, pulp and paper	8.00	0.00	8.00
1995	Indo-Jordan Chemicals Co.	Fertilizers	30.00	0.00	30.00
1996	Mobile Telephone Services	Infrastructure	35.00	3.00	38.00
	Total commitments		163.77	16.99	180.76
	Less: Total repaid, sold or cancelled		105.77	11.29	117.06
	Total commitments now held by IFC		58.00	5.70	63.70

Schedule E

Jordan at a glance

POVERTY and SOCIAL	Jordan	M. East & North Africa	Lower-middle-income
Population mid-1994 *(millions)*	4.0	267	1,097
GNP per capita 1994 *(US$)*	1,390	1,870	1,660
GNP 1994 *(billions US$)*	5.6	499	1,843
Average annual growth, 1990-94			
Population *(%)*	6.0	2.8	1.4
Labor force *(%)*	4.2	3.2	1.6
Most recent estimate *(latest year available since 1989)*			
Poverty: headcount index *(% of population)*	..	..	..
Urban population *(% of total population)*	72	54	54
Life expectancy at birth *(years)*	70	65	67
Infant mortality *(per 1,000 live births)*	32	49	35
Child malnutrition *(% of children under 5)*	17	..	..
Access to safe water *(% of population)*	99	..	78
Illiteracy *(% of population age 15+)*	20	45	..
Gross primary enrollment *(% of school-age population)*	94	97	104
Male	94	104	105
Female	95	90	101

Development diamond*

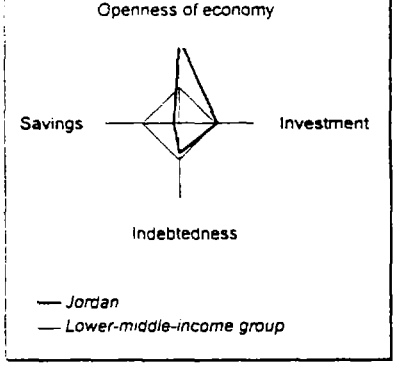


KEY ECONOMIC RATIOS and LONG-TERM TRENDS

	1975	1985	1994	1995
GDP *(billions US$)*	..	5.0	6.1	..
Gross domestic investment/GDP	..	21.7	26.4	..
Exports of goods and non-factor services/GDP	..	37.2	48.9	..
Gross domestic savings/GDP	..	-17.4	3.3	..
Gross national savings/GDP	..	-2.4	14.6	..
Current account balance/GDP	..	-19.9	-11.8	..
Interest payments/GDP	..	3.8	3.2	..
Total debt/GDP	..	80.6	115.5	..
Total debt service/exports	3.7	17.2	12.2	..
Present value of debt/GDP	..	..	88.0	..
Present value of debt/exports	..	..	129.4	..

	1975-84	1985-95	1994	1995	1996-04
(average annual growth)					
GDP	..	*-0.1*	5.4	..	..
GNP per capita	..	*-5.6*	1.8	..	..
Exports of goods and nfs	..	*8.7*	1.9	..	..

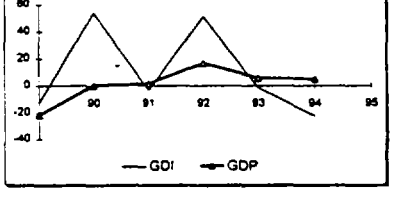
Economic ratios*



STRUCTURE of the ECONOMY

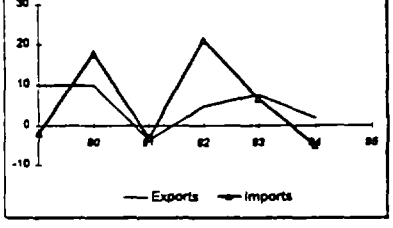
	1975	1985	1994	1995
(% of GDP)				
Agriculture	..	4.9	7.9	..
Industry	..	26.9	27.0	..
Manufacturing	..	11.9	..	..
Services	..	68.2	65.0	..
Private consumption	..	90.6	75.1	..
General government consumption	..	26.8	21.6	..
Imports of goods and non-factor services	..	76.3	72.0	..

Growth rates of output and investment (%)



	1975-84	1985-95	1994	1995
(average annual growth)				
Agriculture	..	*11.9*	1.0	..
Industry	..	*2.0*	6.5	..
Manufacturing	..	*5.3*	9.3	..
Services	..	*-3.3*	5.5	..
Private consumption	..	*-3.0*	12.4	..
General government consumption	..	*-0.9*	5.5	..
Gross domestic investment	..	*9.9*	-22.6	..
Imports of goods and non-factor services	..	*5.8*	-5.1	..
Gross national product	..	*-0.8*	5.9	..

Growth rates of exports and imports (%)



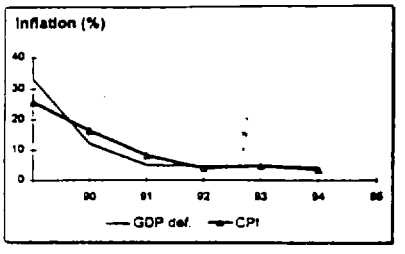
Note: 1995 data are preliminary estimates. Figures in italics are for years other than those specified.

* The diamonds show four key indicators in the country (in bold) compared with its income-group average. If data are missing, the diamond will be incomplete.

Jordan

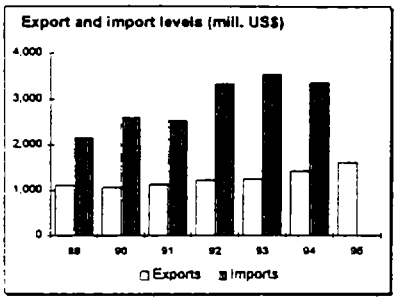
PRICES and GOVERNMENT FINANCE

	1975	1985	1994	1995
Domestic prices				
(% change)				
Consumer prices (1995 to October: 1.9)	12.0	3.0	3.5	..
Implicit GDP deflator	..	-0.3	4.3	..
Government finance				
(% of GDP)				
Current revenue	..	22.4	29.2	..
Current budget balance	..	-11.6	0.0	..
Overall surplus/deficit	..	-21.6	-5.9	..



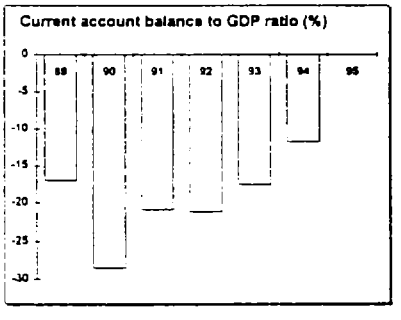
TRADE

	1975	1985	1994	1995
(millions US$)				
Total exports (fob)	..	789	1,424	1,616
Phosphorus	..	168	144	187
Other metals	..	79	133	138
Manufactures	..	282	813	698
Total imports (cif)	..	2,720	3,374	..
Food	..	386	586	684
Fuel and energy	..	490	430	425
Capital goods	..	661	859	2,580
Export price index *(1987=100)*	..	94	122	90
Import price index *(1987=100)*	..	92	107	..
Terms of trade *(1987=100)*	..	102	114	..



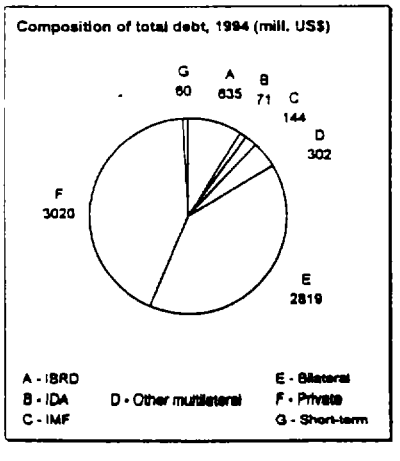
BALANCE of PAYMENTS

	1975	1985	1994	1995
(millions US$)				
Exports of goods and non-factor services	379	1,976	2,985	..
Imports of goods and non-factor services	942	3,723	4,395	..
Resource balance	-562	-1,747	-1,410	..
Net factor income	26	-89	-315	..
Net current transfers	172	845	1,002	..
Current account balance, before official transfers	-365	-991	-723	..
Financing items (net)	538	1,145	781	..
Changes in net reserves	-173	-154	-58	..
Memo:				
Reserves including gold *(mill. US$)*	571	770	716	..
Conversion rate *(local/US$)*	0.3	0.4	0.7	0.7



EXTERNAL DEBT and RESOURCE FLOWS

	1975	1985	1993	1994
(millions US$)				
Total debt outstanding and disbursed	345	4,022	6,905	7,051
IBRD	0	168	592	635
IDA	33	82	73	71
Total debt service	21	531	560	505
IBRD	0	21	101	102
IDA	0	2	2	2
Composition of net resource flows				
Official grants	357	453	73	306
Official creditors	71	210	51	109
Private creditors	19	190	-108	-162
Foreign direct investment	26	25	-34	3
Portfolio equity	0	0	0	0
World Bank program				
Commitments	12	97	135	107
Disbursements	10	64	89	58
Principal repayments	0	10	59	58
Net flows	10	54	10	0
Interest payments	0	12	44	46
Net transfers	10	42	-33	-46



PART II: Technical Annex

TABLE OF CONTENTS

PART II: TECHNICAL ANNEX

I. BACKGROUND

A. Gulf of Aqaba Physical Setting, Climate & Topography

1. The Gulf of Aqaba is a small semi-enclosed northwestern branch of the Red Sea, 180 km long and 5 to 26 km wide. Egypt occupies most of the Gulf's western shore, stretching some 200 km northward from Ras Mohammed National Park, at the southern tip of the Sinai peninsula, to the resort complex at Taba, before the Israeli border. Israel, with a coastline of approximately 14 km, runs from the Taba border crossing, through the resort town of Eilat (pop. 36,000) to the Jordanian border, halfway across the Gulf's 5 km north shore. From the town and port city of Aqaba (pop. 65,000), Jordan's 26.5 km stretch of Gulf coast runs southward to Saudi Arabia, which has some 130 km of largely undeveloped coastline.

2. The Gulf of Aqaba is one of two northern extensions of the Red Sea. To its west lies the shallower, sandier and less ecologically diverse Gulf of Suez, with the Suez Canal providing a vital maritime transportation link to the Mediterranean Sea. Passage of ships into the Gulf of Aqaba is restricted to two navigation channels in the Strait of Tiran. The safer and more widely used of these routes is the Enterprise Channel, 1189 m wide, which lies in Egyptian territorial waters between the Sinai peninsula and Tiran Island. Less widely used is the 869 m wide Grafton Channel.

3. The Gulf of Aqaba is a southern extension of the Syrian-African Rift, which reaches the Gulf region after passing through the Jordan River Valley, the Dead Sea and the Wadi Araba desert. As the southern extension of the 6,000 km long Rift, the Gulf — despite its narrow breadth — reaches a maximum depth of 1828 m and an average depth of 800 m. Rising from the Gulf's western and eastern shores are mountains primarily of Precambrian origin, with Gulf-fronting peaks reaching 1700 m in the Egyptian Sinai, 900 m in Israel, 1600 m in Jordan, and 1800 m in Saudi Arabia. Inland ridges reach a maximum height of 2600 m in the southern Sinai peninsula.

4. Climate in the Gulf region is arid, with an average annual rainfall of 25 to 30 millimeters. Mean daily air temperatures range from 14°C in January to a maximum of 32°C in August. Relative humidity ranges from 30 to 55 percent. Prevailing winds are from the north, with occasional winter storm winds blowing from the south.

5. Marine water temperature in the Gulf remains at a constant 21.5°C below a depth of 200 meters, and varies from 20.5°C in February to 27.3°C in September at the surface. Salinity ranges from 40.3 to 41.6 parts per thousand. The unusually high salinity of the Gulf is explained by two factors: (i) a high rate of evaporation caused by the Gulf's hot, dry year-round climate and (ii) a slow rate of water exchange between the semi-enclosed Gulf and the main body of the Red Sea. Tides are semidiurnal, with a tidal range of 30 to 100 centimeters, but circulation in the Gulf is primarily affected by evaporation, with replacement water entering via the Strait of Tiran.

6. Because of a low rate of exchange between the Gulf of Aqaba and the main body of the Red Sea, there is a long average residence time for water. Based on preliminary observations made in the Strait of Tiran, the residence time for shallow water is one to two years, while the lower mass of water experiences a three-year average residence time. The Gulf's relatively small size, combined with the low rate of water circulation and renewal, reduces the potential for dispersion of oil and other water pollutants.

B. Marine and Terrestrial Ecology in the Aqaba Region

7. Though a relatively small body of water, the Gulf of Aqaba hosts an extraordinary diversity of corals and related marine life. An estimated 50 percent of the Gulf's shoreline is fringed with coral reefs. Over 192 scleractinian (reef-building) coral species and 120 species of soft coral have been observed in the Gulf's waters. Within Jordan's Gulf waters, some 120 species of scleractinian coral and 10 species of soft coral have been noted.

8. In areas where coastal mountains rise steeply from the shoreline, corals reside primarily in narrow fringing reefs (typically less than 30 m in breadth), yielding to steeply sloped fore reefs that host living coral at depths exceeding 100 m. Alluvial fans formed by the outflow of wadis, particularly in the southern Sinai, have produced broader reef flats and lagooner reefs in a number of areas. In Jordan, the greatest diversity of corals has been observed in steeply sloped fore reef areas.

9. According to conservative accounts, tropical and semi-tropical fish observed in Gulf waters number 268 species. Other estimates place the total number at 1,000 species. While most species find their habitats in reef or sea grass areas, pelagic fish species including skipjack tuna and bonito are commonly found in the Gulf's open waters. Blacktip, hammerhead and whale sharks have also been frequently observed.

10. Sea grasses exist quite commonly in the Gulf's coastal waters, particularly in the immediate vicinity of coral reefs, providing an important nursery for fish, shrimp and other invertebrates and serving as host organisms for many species of micro- and macroalgae. Intermittent mangrove stands are also in evidence in Egypt, most notably in the Nabq area of the southern Sinai.

11. The Jordan Rift Valley and Wadi Araba desert serve as a flyway for millions of birds migrating from Europe and Asia to Africa and back. Over 200 bird species have been observed traveling this route, among them the white and black stork and several species of birds of prey, the latter passing through the Aqaba region and Wadi Araba particularly on their springtime northward migration. Many migrants also rest and feed in the Aqaba area. The Gulf-fringing highlands may be inhabited by rare predators such as Lammergeier and Sooty Falcon while the lower wadis contain typical desert and tropical species including rarities such as Little Green Beeeater, Hooded Wheatear and Arabian Warbler.

12. Marine mammals in the Gulf of Aqaba include dugongs (sea cows), observed in small numbers feeding on sea grasses in the Tiran Island area. Spotted and bottle-nosed dolphin also inhabit the Gulf's waters. Sea turtles observed in the Gulf include the green, hawksbill and leatherback turtles.

II. GULF OF AQABA ECONOMY AND DEMOGRAPHY

A. Regional Overview

13. Rapid economic development and population growth have occurred in the Gulf of Aqaba coastal zones of three of the four Gulf-bordering states (Egypt, Israel and Jordan) over the past two decades. These trends have placed an unprecedented strain on city and regional planning agencies as well as local, regional and national fiscal resources in these nations. Laws and regulations needed to ensure environmentally sound and sustainable growth are deficient in many respects, and the institutional staffing and training needed to implement such laws and regulations are lacking. In many instances, infrastructure

to accommodate essential urban needs (sewage, solid waste collection and disposal, transportation) has fallen far behind existing demand. With growth trends predicted to continue and, in some areas, increase in the coming years, the strains on government resources, pressure on the physical infrastructure and the environment are expected to mount in the years ahead.

14. In Egypt's Sinai peninsula, resort development is fast transforming the Gulf of Aqaba shoreline. In the south Sinai town of Sharm el Sheikh, the number of hotel beds has multiplied tenfold in less than a decade, from 1030 in 1988 to 12,248 today. With a development ceiling for the Sharm el Sheikh area set at 23,000 beds and major new resort complexes currently under construction, hotel capacity is expected nearly to double in the coming decade. Development along other portions of Egypt's Gulf of Aqaba coast is also proceeding apace. In the Taba Tourism Planning Sector, running along 45 km of shoreline south of the Egypt-Israel border, new resort hotels with an estimated 40,000 beds are projected to be completed by the year 2005. These new facilities are expected to generate employment for some 22,000 workers, to be housed in nearby planned residential communities.

15. Egypt's Gulf of Aqaba coastal zone currently hosts no significant manufacturing industries. Salt brine from desalination plants in Sharm el Sheikh, Dahab, Nuweiba and Taba are the only significant sources of land-based water discharges into the Egyptian Gulf. A single port facility exists at Nuweiba whose primary function is to serve as the terminal for a trans-Gulf ferry service running between Aqaba and Nuweiba. This service is owned and operated by the Arab Bridge Maritime Company, a joint enterprise between the Egyptian, Jordanian and Iraqi Governments. Some 1.2 million passengers and 87,000 motor vehicles are transported by this service annually.

16. In Israel, domestic and international tourism has fueled an intensive development drive along the country's short, 14 km Gulf coastline. From a frontier town of a few hundred households in the 1960s, Eilat has become a bustling resort town of 36,000 today, with holiday surges bringing the city's population to 80,000-100,000. Just under 6,000 hotel rooms exist in Eilat today; by the year 2000, an additional 4,000 hotel rooms are slated for completion.

17. Other significant features of Israel's Gulf coastal zone are a naval dry dock facility, two oil jetties, a phosphate storage and shiploading berth, a container vessel and "Ro-Ro" (roll-on, roll-off) port facility, a commercial marina built on one of the Eilat's three artificial lagoons, a dolphinarium and a marine research laboratory. The Eilat Coral Reserve stretches along 1.2 km of shoreline and extends some 200 m into the Gulf, to a depth of 60 m. While no commercial fishing vessels dock in Eilat, Israel produces approximately 1,000 tons of fish in mariculture cages in the Gulf's coastal waters, and additional harvesting occurs at onshore fish ponds in the Eilat vicinity.

18. Along Saudi Arabia's Gulf of Aqaba coastline, there is no port facility, no industry of any magnitude, no significant tourist-oriented development, and only a few small human settlements. Pilgrims on the way to the Mecca regularly travel through Saudi Arabia's Gulf of Aqaba coastline with a peak at Ramadan.

19. With the exception of the Aqaba-Nuweiba ferry service, economic development along the Gulf of Aqaba has primarily taken place within individual littoral states, with little or no transboundary consultation. Through multilateral and bilateral negotiations related to the Middle East peace talks, a number of joint economic development and environmental initiatives in the Gulf of Aqaba region are now under active discussion. Most notable and controversial among these is a proposed Red Sea-Dead Sea Canal, which would utilize the 400 m drop in altitude between the Gulf of Aqaba and the Dead Sea to

generate electricity sufficient to produce 800 million cubic meters per year (MCMY) of desalinated water. Other regional development projects now being debated include a Free Trade Zone in the Taba-Eilat-Aqaba area, a regional airport servicing the Taba-Eilat-Aqaba area, a bypass highway network allowing commercial vehicles to skirt urban settlements in the Taba-Eilat-Aqaba area, and a port development scheme that would shift Eilat's phosphate-loading operations to the Port of Aqaba.

B. Economic Development in Jordan's Aqaba Coastal Region

20. During the past two decades, the Jordanian Gulf of Aqaba coastline has been transformed by a variety of developments associated with economic growth. These include the construction of port and storage facilities, power generation stations, fertilizer production industries, hotels, restaurants, beachside concessions and roads. Industrial production is the largest revenue generator in the Aqaba region, with annual revenues from fertilizer and mineral processing currently exceeding JD 200 million (US $360 million). While cargo handling activities in the Port generate more modest revenues totalling JD 41 million (US $70 million) in 1993, the Port is the largest single employer in the region, with over 5000 workers on the payroll as compared to 1700 workers in the industrial sector.

21. As Jordan's only outlet to the sea, Aqaba is of crucial importance to the national economy. The Port of Aqaba has emerged in the last two decades, pending political circumstances, as a major regional shipping center, now ranking as the third largest Red Sea port after Suez, in Egypt, and Jeddah, in Saudi Arabia. Between 1989 and 1993, the Port of Aqaba received an annual average of 2332 vessels handling 11.6 to 18.7 million tons of cargo each year. Total port revenues during this period ranged from JD 29 - 41 million (US $50 - 70 million).

22. Exports through the Port of Aqaba during the 1989-1993 period ranged from 6.4 to 10 million tons. Of these exports, phosphate has been the leading commodity in terms of overall tonnage, ranging from 3.6 to 6.4 million tons in the 1989-1993 period (approximately 13 percent of world exports). During the same period, general cargo exports totalled 1.3 to 2.6 million tons; potash exports were in the 1.2 to 1.4 million ton range; cement exports ranged from 367,000 to 1.4 million tons; and fertilizer exports were 412,000 to 668,000 tons.

23. Imports through the Port of Aqaba during the 1989-1993 period ranged from 5.2 to 8.7 million tons. Leading imports included grains (1.7 to 4.1 million tons); general cargo (1.2 to 1.8 million tons); sugar (316,000 to 715,000 tons); steel and iron (315,000 to 524,000 tons); ammonia and sulphur (218,000 to 354,000 tons); and vegetable oils (112,000 to 323,000 tons).

24. Along with industrial and port activities, tourism is a key force in Aqaba's growing economy. Tourism in the region generates estimated revenues of JD 40 million (US $68 million) and employs an 800-person workforce. The city of Aqaba's 40 hotels, with some 3600 beds, hosts an estimated total of 300,000 hotel bed nights annually. Significant expansion of the Aqaba tourism sector is envisioned by the Aqaba Region Authority (ARA), which serves as the chief planning agency for the Jordanian coastal region. According to current ARA plans, up to 10 new four-to-five star resort hotels will be built in

Aqaba's South Coast Tourism Zone, an undeveloped stretch of shoreline between the southern end of the Aqaba port complex and the South Coast Industrial Zone, bordering Saudi Arabia. Some 2000 hotel beds and 1000 vacation villas are slated for development along a five km stretch of shoreline.

25. Commercial fishing is a modest though important feature of Jordan's Aqaba region economy. The Aqaba Fishermen's Cooperative, with 120 fee-paying members, catches approximately 105 tons of fish annually. This fish, primarily sold to local restaurants and hotels, is caught with shallow-water (5 to 15 m) baited cage traps, hand-drawn gill and seine nets, and hand lining with baited hooks and lures. As Jordanian fishing vessels are barred from operating outside Jordan's confined territorial waters, the local fishing fleet consists entirely of small outboard motor boats, approximately 5 m in length. With fishing concentrated in or immediately adjacent to reef areas, damage to reefs from short-line anchors, snagged nets and lines, abandoned bait traps, and direct human contact is an ongoing concern. Marked reductions in the abundance and diversity of coral-dwelling fish, observed in recent years, are also attributed to current fishing practices.

26. Aqaba's economic growth over the past two decades has been accompanied by a parallel growth in population. Since 1972, Aqaba has expanded from a small town of 10,000 to a city of 65,000 inhabitants today. By the year 2000, Aqaba is predicted to reach a population of 75,000. Beyond the year 2000, the region's planners anticipate a doubling of the coastal population to approximately 150,000 by the year 2020, taking into account current plans for resort hotel and vacation community development as well as a new town of "Taibeh" in the upland area of Jordan's southern coastal zone.

III. ENVIRONMENTAL IMPACTS OF GULF OF AQABA DEVELOPMENT

A. Reef Damage Caused by Aquatic Tourism

27. The mounting numbers of divers, snorkelers and boaters who visit reef areas have inflicted major, widespread damage on Gulf of Aqaba coral. Direct destruction of fragile reef structures has been caused by divers who rest on the sea bottom while adjusting their gear; snorkelers who inadvertently drag their fins across shallow fringing reefs; underwater photographers who steady their cameras by bracing themselves on reef formations; and boaters who drop anchor in coral areas. With the rapid expansion of hotel rooms and related tourist accommodations along the Egyptian, Israeli and Jordanian Gulf coastline, the numbers of tourists swimming, diving, snorkeling and boating in the Gulf's coastal waters are certain to increase in the years ahead. Absent a strong commitment to public education, to a thorough patrolling of heavily visited reef areas, and to enforcing prohibitions against coral-damaging activities, major added damage will be done to Gulf reefs.

28. In Egypt during 1995, a total of 520,000 visitors are expected to visit the Sharm el Sheikh area alone. Of these visitors, an estimated 38 percent are divers, bringing the expected number of reef visitors to nearly 200,000. To accommodate the growth in Sharm el Sheikh dive tourism, the number of area dive centers rose from 6 to 26 between 1989 and 1994, and the number of dive boats correspondingly increased from 25 to 200. Even with the intensification of dive activity in the Sharm el Sheikh area, area park managers maintain that damage to coral has been substantially reduced through the use of fixed moorings, a ban on the use of anchors, a ban on fish feeding, and a diver education program.

29. In Israel's Coral Reserve, dive activity reaches a Gulf-wide high of 200,000 to 300,000 dives per year along a 1.2 kilometer stretch of shoreline south of Eilat. Added to this extraordinary number of dives is an undetermined number of snorkel visits to the Reserve, where very substantial damage to coral is evident.

30. Aquatic tourism in Jordan has yet to approach the levels now experienced in neighboring Egypt and Israel. Rough estimates place the total number of divers in Jordan's Gulf waters during 1993 at a modest 3000, up from 1250 divers in 1989. Jordan's three dive centers have a maximum combined capability of hosting 160 divers at a time. Yet even at this relatively low level of dive visitation, Jordan's reefs show significant physical damage at a number of prime dive spots. With regional tourism increasing as a result of Jordan's peace treaty with Israel, and with major new resort hotel developments planned for Jordan's South Coast Tourism Zone, a swift rise in the numbers of divers and snorkelers visiting Jordanian reefs is expected in the coming years.

B. Oil Spills

31. Ship traffic in the Gulf poses a major, sustained risk of damage to coral reefs and related marine life through oil pollution. Over 2300 ships pass through the Port of Aqaba annually, yet the Port has no reception facility for oil-contaminated bilge or ballast water. Tankers with a cargo capacity of 100,000 to 150,000 tons of crude oil arrive almost weekly in Eilat, discharging some 3.5 million tons of oil per year at the Eilat-Ashqelon Pipeline terminal. In the 1970s, nearly ten times the current volume of oil was transported from Iran to this terminal. Jordan's oil terminal, though presently unused, may at some future point resume operations as a major shiploading facility for truck-transported Iraqi crude oil.

32. Ship traffic in the Gulf poses a risk of oil pollution from the following sources: (i) small spills caused by the accidental or intentional release of oil-contaminated bilge or ballast water from freighters (0-2 tons); (ii) minor spills caused by the release of oily ballast water from an oil tanker or the release of bunker oil during terminal operations (2-20 tons); (iii) medium spills caused by the release of oil as a result of defective equipment or procedures at an oil terminal or pipeline facility (100 tons); (iv) major spills caused by the rupture of a bunker oil tank in a bulk/cargo vessel collision (500 tons), shipwreck of a bulk/cargo vessel (1500 tons), or a tanker collision causing the rupture of a single oil tank (7500 tons); and (v) disastrous spills caused by the wreckage of a fully loaded oil tanker (100,000-150,000 tons).

33. Small to minor oil spills have occurred frequently in the Gulf, causing localized damage to coral and marring popular beach areas especially in the northern Gulf area, where shipping is most heavily concentrated. In 1990, some 22 small to minor spills were reported in Israeli waters alone. Reliable figures in other Gulf-bordering states are not available.

34. To reduce the occurrence of small, intentional oil discharges (0-20 tons) into the Gulf, the Gulf-bordering states may develop regulations requiring visiting cargo vessels to discharge oil-contaminated bilge and ballast water into designate port reception facilities. The estimated capital cost of bilge water reception facilities in the Port of Aqaba is US $350,000, with annual operating costs of $40,000 fully recoverable through waste oil resale. The GEF project will finance preparation of an action plan for waste oil port reception, including partial capital funding for a demonstration project in waste oil recovery.

35. Under the auspices of the Multilateral Working Group on the Environment, within the Middle East Peace Talks, an Upper Gulf of Aqaba Oil Spill Contingency Project (UGAOSCP) has been launched by the Governments of Egypt, Israel and Jordan, with the support of the EU and the Government of Japan. The target of this joint effort is to create, in its first phase, an effective strategy for combatting small to medium-sized spills (up to a combined total of 600 tons), with oil spill response centers located in each of the three nations. Israel currently has an oil pollution response center, staffed 24 hours per day, but parallel centers have yet to become operational in Egypt and Jordan. To complement these efforts, the GEF project will finance a pre-feasibility study of measures to reduce the risk of major oil spills, including electronic navigational aids, pilotage requirements, and tanker design specifications.

36. Even once the oil pollution response centers in Egypt, Israel and Jordan are fully operational, the threat of ecological devastation posed by a major spill or an oil tanker disaster, although reduced, will remain. Given the Gulf's very finite dimensions, a spill occurring anywhere in its waters will quickly travel to vulnerable coastal areas, where coral reefs and related marine life are primarily concentrated. The slow rate of exchange between Gulf waters and the main body of the Red Sea will further hinder dispersion and dilution of oil contamination.

37. Short of a ban on tanker traffic in the Gulf, options to reduce the risks of major oil spills include the adoption by the Gulf-bordering states of mandatory design and operational standards for cargo vessels and oil tankers operating within the Gulf. Requiring double-hull or double-skin oil tanker designs and introducing new navigational safety provisions are among the options to be considered.

C. Waste Oil Contamination & Air Pollution Associated with Land Transportation

38. Environmental hazards associated with land transportation are particularly acute in Jordan's Aqaba region, largely because of the high volume of bulk/cargo transportation via truck to and from the Aqaba Port and the industrial facilities in the South Coast Industrial Zone. An estimated 1200 haulage vehicles enter or leave the Port of Aqaba each day, and several hundred additional trucks make deliveries to or pickups from the South Coast Industrial Zone, resulting in total of over 400,000 truck trips along local roads each year.

39. Inadequate provisions for waste oil collection and recovery pose a hazard both to the Aqaba marine environment and to shallow underground water resources in the Aqaba region. Despite an official prohibition barring trucks from entering beach areas, truck drivers commonly drive their heavy haulage vehicles to off-road areas within a few dozen meters of the water's edge. In many instances, waste oil has been discharged from trucks in sensitive tidal areas, posing a direct hazard to near-shore coral and related marine life. At a few points along the coastal truck route, prominent signage prohibiting trucks from entering unpaved beachfront areas can be seen, but this ban remains to be enforced.

40. The use of waste oil as a dust suppressant in unpaved truck repair yards is a further environmental hazard, endangering shallow aquifers in the Aqaba coastal area. At the repair yard of the Iraqi-Jordanian Land Transportation Company, some 85 heavy haulage vehicles are serviced each day. Waste oil from these trucks is transferred to an on-site underground storage tank which is believed to be concrete-lined. While most of the waste oil is pumped from the storage tank and transported to Jordan's oil refinery in Zarqa, some 5-10 m^3 of waste oil is sprayed on the unpaved surface of the truck yard each month to reduce dust blowing into adjacent truck repair sheds. As this practice has been employed throughout the 13-year duration of the facility's operation, an undetermined quantity of waste oil now resides in the surface and subsurface soil strata. Soil and groundwater monitoring are urgently needed

to determine the extent of this contamination, and particular to determine whether oil contamination has percolated down to the shallow underlying groundwater of the transboundary (Israel-Jordan) Wadi Araba aquifer.

41. While waste oil mismanagement is the most urgent environmental hazard associated with land transportation in the Aqaba region, other associated waste management problems must also be addressed. In the absence of a clear hazardous waste management policy, used asbestos brake linings, exhausted automotive batteries and worn tires are discarded in a haphazard and, in some cases, health-endangering manner. At the Iraqi-Jordanian Land Transportation Company repair yard, a number of oil drums filled with asbestos brake linings sat uncovered and unsealed in outdoor areas immediately adjacent to the main repair shed. Tens of thousands of discarded tires were also observed both within the repair yard and around its periphery. The handling of used batteries, though not observed, is another matter of probable concern.

42. Air pollution and noise pollution from truck traffic in the Aqaba region are additional environmental hazards. Although levels of exhaust gases have not been monitored, visual levels and preliminary modeling results indicate high pollution concentration and noise levels in urban areas adjacent to truck routes. Diversion of trucks from inhabited areas would reduce these impacts, but a recently constructed bypass road through the Aqaba mountain zone remains largely unused because its grade and slope length pose grave hazards to heavily loaded trucks. In 1994 alone, 20 drivers lost their lives in truck accidents on the bypass road.

D. Solid Waste

43. Unlike the sporadic environmental impacts of oil pollution, solid waste generated by ship crews, ferry passengers, beach vacationers and local residents poses a constant, high-visibility environmental problem. Jordan's Gulf of Aqaba beaches and near-shore reef and sea grass areas are heavily impacted by discarded plastic and other synthetic materials. Because of prevailing winds from the north, Egypt's south Sinai coastline is particularly affected by garbage discarded into the Gulf's more heavily settled northern reaches. Plastic, styrofoam and other synthetic materials wash ashore in such large quantities that the visual gains of periodic beach cleaning efforts are quickly erased. Large numbers of animal carcasses also wash up on south Sinai beaches, having been thrown overboard by livestock freighter crew members prior to docking at Aqaba.

44. The Port of Aqaba has solid waste receptacles in port areas and additionally provides a daily garbage collection service via barge to ships anchored offshore. Some 30 tons of garbage are collected by the Port of Aqaba each day, as compared to a daily average of 60 tons collected from Aqaba homes and businesses. No such port reception capacity currently exists in the Egyptian port of Nuweiba, where the Aqaba-Nuweiba ferry line docks one to two times daily. Much of the styrofoam and plastic garbage found washing ashore in the south Sinai is traceable to the ferry service, with its 1.2 million passengers per year.

45. The efficient reception of marine vessel-generated waste in Jordan is not reflective of broader solid waste management practices in Jordan's Aqaba region. A properly maintained solid waste landfill is lacking. Instead, garbage from Aqaba households and businesses as well as the Port is transported to an upland wadi due east of the planned South Coast Tourism Zone. At this site, piles of discarded waste

line both sides of a winding one-km road leading to the primary dumping area. Combustible garbage is burned in open fires, and non-combustibles remain exposed to the elements. No systematic recycling is currently practiced.

E. Phosphate Dust from Port Activities

46. Phosphate dust generated by shiploading facilities in Aqaba and Eilat is a major environmental problem. Prior to the 1994 installation of two choke feeders on the phosphate berths in Aqaba, an estimated 1 percent of the 3.5 to 6.4 million tons of phosphate loaded annually at the facility between 1989 and 1993 was released into the air. Following installation of the choke feeders, Aqaba Port officials estimate that dust emissions from the phosphate facility have been reduced by 80 to 85 percent. Nevertheless, substantial quantities of phosphate dust continue to be generated by shiploading operations. Significant additional phosphate dust emissions occur during the unloading of phosphate from trucks and train cars into the 6 store houses at the phosphate port.

47. A large proportion of the phosphate dust generated by loading and unloading operations settles on the Gulf's waters. By reducing water clarity, phosphate dust deposition is believed to be a factor contributing to depressed coral growth rates in Jordanian coastal waters. In addition, phosphate emissions raise dust levels in Aqaba residential areas well above maximum standards set by the World Health Organization (WHO). Monitoring conducted by the Royal Scientific Society found maximum 24 hour concentrations of dust in Aqaba residential areas to be 900 micrograms per m^3, 7.5 times higher than the WHO maximum 24 hour concentration of 120 micrograms per m^3. Maximum one hour dust concentrations were found to be more than 5000 micrograms per m^3. Jordan's Ministry of Health found a high incidence of restrictive lung disease (pneumonoconiosis and silicosis) in Aqaba phosphate workers.

48. Substantial further reductions in phosphate dust emissions from port loading and unloading operations are technically feasible. Improved operation of choke feeders can reduce dust emissions during shiploading, technological changes can be made in the equipment used to unload phosphate from trucks and train cars, and the design of conveyors and storage sheds can be enhanced. The cost of a comprehensive dust collection system for the phosphate port at Aqaba has been estimated at US $4.5 million.

F. Chemical & Thermal Pollution from Coastal Industries

49. Jordan's South Coast Industrial Zone, immediately south of Jordan's planned South Coast Tourism Zone and adjacent to the Saudi Arabian border, contains the primary polluting industries along the Gulf of Aqaba coastline. The principal industries located within this Zone are: a large fertilizer manufacturing facility owned and operated by the Jordan Phosphate Mine Company Ltd. (JPMC); a storage area and loading terminal for potash from the Arab Potash Corporation; the "Solvochem" tank farm for chemicals, oils and solvents, and an associated port facility owned by the Aqaba Port Corporation; and a 260 MW thermal power station operated by the Jordan Electric Authority.

50. The **JPMC fertilizer factory** produces 740,000 tons of di-ammonium phosphate (DAP) and 270,000 tons of phosphoric acid annually. Sulfuric acid used in producing DAP is produced on-site from elemental sulfur. A primary environmental concern pertaining to this facility is the possibility of reef-damaging runoff during occasional flash floods from a "gypsum mountain" due east of the plant, where 2 million tons of fluorine-containing gypsum waste are deposited annually in an unlined, unconfined setting. Chlorinated cooling water from the factory, released into the Gulf at a rate of 20,000 m^3 per

hour, is an added concern. At the discharge point located 145 m from shore at a depth of 50 m, the cooling water is approximately 8°C above ambient marine water temperature, above World Bank guidelines stating that the temperature of thermal effluent should not exceed 3°C above ambient water temperature. This issue will be addressed by the GEF project, as part of Activity A #3 - Action plan for implementing a permit-based regulatory structure for Aqaba region industries and coastal development projects (see Attachment D).

51. Shiploading and unloading operations pertaining to the JPMC facility present added environmental hazards. Raw sulfur used at the facility is unloaded from ships berthing at a nearby jetty, and fertilizer product is loaded onto ships at the same jetty. Small quantities of sulfur and DAP are routinely spilled during these processes, and there is a risk of larger accidental spills. Ammonia spillage during transport to the plant from a separate, nearby jetty poses a further risk to the environment and human health.

52. Other concerns pertaining to the JPMC facility include the possibility of explosion or health-endangering gas releases from a 30,000-ton on-site ammonia storage tank, in which cooled ammonia is maintained in a liquid state through refrigeration at -32°C. As over 1,000 people are employed at the facility, immediate health hazards as well as broader ecological dangers require careful attention.

53. At the **Arab Potash Company's storage facility** in the South Coast Industrial Zone, 75,000 tons of potash are stored in two partially enclosed storage sheds. Closed conveyors, adjustable booms in the storage sheds, and dust collection equipment are generally effective in reducing on-site dust levels. Nevertheless, inattention to proper operation of equipment suggests that elevated on-site dust levels may still pose a health hazard to the facility's 100 workers.

54. The **Solvochem tank farm** serves as a port reception and storage facility for imported chemicals including toluene, xylene, acetone and other ketone, vinyl acetate monomer and ethanol. Imported vegetable oils and beef tallow are also received from ships and stored on-site. The tank farm presently has 17 tanks meeting American Petroleum Institute standards, and an additional 14 new tanks are currently under construction. Approximately 12,000 tons of chemicals and 4000 tons of oils are received at the site annually. As a safeguard against the release into the environment of hazardous chemicals and oils, staff training and proper maintenance of firefighting and spill containment equipment are essential.

55. The **Jordan Electric Authority** (JEA) currently operates a 260 MW thermal power station in Jordan's South Coast Industrial Zone and is already under way with the construction of a second 260 MW power station at the same site. High-sulfur oil transported from Iraq via tanker truck is used at the current facility, with a 3.2 to 3.5 percent sulfur content. No desulfurization equipment is currently used at the site, nor is such equipment planned for the new unit. With 1100-1200 tons of oil burned per day, approximately 35 tons of sulfur are released from a 125 m stack with twin flues into the atmosphere daily by the current plant, with double this amount expected to be emitted once the new facility begins operation. While winds carry SO_2 and other flue gas emissions into inland desert areas southeast of the plant 90 to 95 percent of the time, SO_2 and other emissions may pose a health risk to workers in the South Coast Industrial Zone and additionally present an aesthetic intrusion into the planned South Coast Tourism Zone, directly north of the Industrial Zone. Special measures are being planned for the storage and selective use of low-sulfur fuel during periods when wind shifts may direct plant emissions toward populated areas.

56. Heated cooling water discharges from the present and planned power stations warrant careful monitoring given their potential impact on nearby coral and related marine life. At the present facility,

some 38,000 m^3 of cooling water is discharged into the Gulf from an outlet 200 m from shore and 20 m below the surface. The temperature of this water is 5-8°C above ambient water temperature. With an identical cooling system planned for the new plant, the volume of thermal discharges from the combined power stations will double in the coming years.

G. Sewage Discharges into the Marine and Terrestrial Environment

57. Low nutrient levels are a major contributor to the diversity and abundance of coral in the Gulf's coastal waters. Sewage discharges into the Gulf have resulted in the proliferation of algae, depressing coral growth particularly in the Gulf's heavily settled northern beaches. The Municipality of Eilat, in Israel, is the primary source of ongoing sewage discharges into the Gulf. Some 4 million m^3 of sewage flow into the Gulf annually, after only primary treatment, from a creek located a few hundred meters east of the city's north beach hotel district and just 700 m from the Jordanian border. In addition to causing occasional beach closures because of health-endangering coliform levels, this sewage is an attributed cause of coral degradation along the Gulf's north shore.

58. According to an agreement reached early in 1995 between the Municipality of Eilat and kibbutz farmers in the Hevel Eilot region, in Wadi Araba, sewage previously discharged into the Gulf is diverted to two inland reservoirs, one 7 km north of Eilat and the other some 30 km north of the city. From these reservoirs, sewage is intended to be pumped for agricultural irrigation. However, with distribution pipes yet to be fully installed, sewage overflow from the reservoir system now spills over onto desert land on both sides of the Jordanian-Israeli border. There is an acute problem related to contamination of groundwater near these installations.

59. The City of Aqaba, in Jordan, has a sewage collection network that reaches approximately 65 percent of the city's population of 65,000 people. The remaining 35 percent of the population, primarily residing in the city's older, densely settled "Old Aqaba" and "Shalala" neighborhoods, are required by the local building code to have operable septic tanks. Many households lack such systems, however, with the result that untreated sewage is believed to percolate into underlying groundwater.

60. Sewage entering Aqaba's sewage collection network is piped to the Municipal Sewage Treatment Works, approximately 4 km north of the city. The sewage is then treated by oxidation in a three-stage lined pond treatment system, capable of handling 9000 m^3 of sewage per day. Current daily loading is at 4500 m^3 per day, or about 50 percent of capacity. Of this influx, an estimated 1700 m^3 daily is lost to seepage into the shallow, underlying brackish water aquifer and another 1300 to 1600 cubic meters per day is lost to evaporation. Subtracting these losses, treated sewage in amounts up to 1400 m^3 per day in winter and 750 m^3 per day in summer is available for landscape tree and agricultural irrigation.

61. The cumulative daily loss of 3000 m^3 per day from the Aqaba sewage treatment process represents a lost opportunity for agricultural irrigation and for reducing demand on scarce fresh water supplies. In addition, the seepage of treated sewage through unsealed pond linings into the shallow transboundary (Israel-Jordan) aquifer poses a pollution threat both to the aquifer itself and possibly through percolation into the Gulf's coastal waters. However, there are seven observation wells in the vicinity of these ponds and monitoring of groundwater quality is an ongoing process.

62. Along Egypt's Sinai coastline, hotel resorts and urban settlements generally adhere to a no-discharge policy pertaining to sewage releases into the Gulf. Larger settlements are served by municipal sewage treatment works, which apply post-treated effluent to barrier tree and other landscape irrigation.

A number of the larger hotel complexes have their own "package" treatment plants, whose effluent is used for on-site landscape irrigation. These treatment plants have mixed performance records. At the Hilton Hotel at Taba, on the Egypt-Israel border, raw sewage is periodically discharged directly to the sea because fluctuations in hotel occupancy cause bacterial levels in the package plant to drop below acceptable levels of efficiency. Smaller beachside hotels in the Egyptian Sinai have septic tanks that are periodically pumped by tanker truck. Gray water (from showers and sinks) is segregated in some instances for direct landscape application.

63. Cargo vessels, tour boats, ferries and private yachts are additional sources of sewage discharges into the Gulf. An undetermined proportion of cargo vessels using the ports of Aqaba and Eilat have on-board sewage treatment systems, but none of the Gulf-bordering states employ measures to ensure the effective operation of these systems while ships are in port. Moreover, the three vessels operated by the Arab Bridge Maritime Company, servicing the Aqaba-Nuweiba ferry route, have no onboard sewage treatment systems. As a result, untreated sewage from the 1.2 million passengers who travel this route annually is dumped directly into the sea. In Eilat, tour boats carrying 800 to 1500 passengers daily discharge their sewage into the Gulf by day or into the lagoon at Eilat's North Beach marina by night.

64. Shipping Law No. 51 (1961) broadly prohibits the discharge of pollutants from ships into the Gulf's waters. Nevertheless, ship-based sewage remains an unregulated and uncontrolled environmental hazard. Because of the Gulf's narrow dimensions, cargo ships as well as recreational vessels frequently ply near-shore waters, with the result that direct sewage discharges may pose a health hazard as well as an aesthetic aggravation to swimmers, divers, snorkelers and sun bathers.

H. Potential Environmental Impacts of Proposed Regional Infrastructure Projects

65. As the Middle East peace process has progressed, a number of regional economic development projects that raise environmental protection concerns, in the Aqaba region and elsewhere have been envisaged. These concerns, in turn, have fostered an increased perception of the need for transboundary consultation on major projects with potentially significant environmental impacts.

66. The proposed Red Sea-Dead Sea Canal, generating hydroelectricity sufficient to produce 800 million cubic meters per year of desalinated water, is a prime focus for environmental concern. Weather patterns and humidity levels in the now-arid Wadi Araba may be altered by the presence of open reservoirs and a canal network stretching from the Gulf of Aqaba to the Dead Sea. Changes in regional flora and fauna may result. Given recent earthquake activity in the Rift Valley, concern has been expressed that the added weight of the proposed canal network and reservoirs could place destabilizing pressure on the valley floor.

67. A Free Trade Zone in the Taba-Eilat-Aqaba area is another economic development prospect now under discussion. Establishment of such a zone raises a number of environmental planning and regulatory concerns. Site selection will be one important factor influencing the environmental impacts of the zone. The application of environmental laws, regulations and standards within the zone will also be a crucial variable. To date, it remains unclear whether Egyptian, Israeli or Jordanian law, a hybrid of the three nations' laws, or a newly created set of laws and regulations specially formulated for the zone would apply. In the absence of a clearly established and rigorously enforced regulatory framework, the proposed zone risks becoming a haven for industries seeking lenient environmental controls.

68. Other projects (e.g., a regional airport servicing the Taba-Eilat-Aqaba area, a bypass highway for commercial freight in the Taba-Eilat-Aqaba area, a shift in Eilat's phosphate-loading operations to the Port of Aqaba) are seen as highlighting the need for immediate development and implementation of environmental impact assessment procedures for major new development projects, with transboundary consultation an integral feature of these procedures.

IV. CURRENT INSTITUTIONAL FRAMEWORK

A. Governing Institutions in Jordan's Aqaba Region

69. **Aqaba Region Authority.** General governing responsibility for the Aqaba Region, comprising approximately one-tenth of Jordan's land area including Jordan's Gulf of Aqaba coastal zone, is assigned to the ARA under the Law of the Aqaba Region Authority No. 7 (1987). The President of the ARA, who has ministerial authority in running the ARA, is appointed by the Cabinet of Ministers and is subject to approval by Royal Decree. The President chairs a 12-member ARA Board of Directors, which includes representatives of national ministries, the Aqaba Ports Corporation, the Mayor of Aqaba, and two other local representatives (see also para. 90).

70. Daily management of the ARA is the primary duty of the ARA Secretary General, who supervises the ARA's six main departments: Aqaba Town Planning; Tenders and Public Works; Finance; Administrative Services; Regional Planning; and Research and Studies. Through its Town Planning and Regional Planning departments, the ARA takes the lead in commissioning or drafting the plans for new neighborhood development and urban renewal projects within the Town of Aqaba as well as for industrial zones, road siting, and hotel and residential development outside the Municipality's boundaries.

71. Within the ARA, an Environment Unit was established as part of the Special Bureau under the Secretary General in 1994. A marine chemist and a civil engineer have recently been hired to staff the Environment Unit. This Unit, at current levels of staffing, expertise and equipment, is vastly under-equipped to address the complex tasks of environmental governance now facing the ARA. Existing port and industrial activities on a very large scale call out urgently for effective environmental oversight; the need for coherent planning of future port, industrial and tourism development projects present equally pressing challenges that the ARA Environment Unit cannot currently meet. The absence of clear regulatory guidelines for industrial plant performance, port activities and development planning further hampers ARA efforts to ensure that environmental protection concerns are properly addressed.

72. The **Ports Corporation** is directly responsible for the construction, operation and maintenance of Aqaba port facilities, which currently occupy nearly 30 percent of the Jordanian Gulf of Aqaba shoreline. Given the economic importance of port activities and the physical scale of port operations, the Ports Corporation is a key partner to ARA efforts to address priority environmental protection concerns in the region. The Ports Corporation also bears responsibility for ensuring the health and safety of the largest work force in the Aqaba region. The Ports Corporation Director General is a member of the ARA Board of Management.

73. Assignment of responsibility for the sound environmental performance of shiploading conveyors, jetties and port storage facilities has yet to be determined. Ports Corporation financed the installation of two choke feeders at phosphate-loading berths in the main port area. For example, the environmentally

consequential operations of the fertilizer jetty, which is located some 20 km south of the Ports Corporation's offices are not overseen.

74. In addition to its responsibility for port facilities, the Ports Corporation has a Marine Department, which is responsible for the safety of ship operations in port areas. Within the Marine Department is a Marine Inspectorate, whose five inspectors periodically inspect ships for compliance with international maritime safety rules. These inspections primarily focus on the adequacy of navigational tools, communication equipment, fire-fighting appliances, life boats and other life-saving gear, and safety-related record-keeping. Observations pertaining to the environmental performance of ships are not part of the routine inspection report, but if ships are observed discharging oil or garbage into the marine environment, the Inspectorate works with the Royal Jordanian Navy to ensure that the violating ship remains in custody while formal charges are brought before a court of law.

75. The **Royal Jordanian Navy**, formerly the Royal Jordanian Coast Guard, is the most active presence in policing the environmental performance of marine vessels operating in Jordanian waters. Using a 31-foot pleasure cruiser donated by His Majesty King Hussein and three sailors whose salaries are paid by the RSCN, the Navy conducts daily patrols of port areas to monitor merchant vessel activities. In addition, the Navy keeps a patrol boat on 24-hour watch in the ship anchorage area adjacent to the main port. Where a ship is found to be discharging oil or garbage, the Navy boards the vessel, orders the polluting activity to cease, and works with the Port to obtain a court order barring the ship from leaving Port pending an emergency court hearing on the alleged violation, typically held within 48 hours of initial detection of the polluting activity. Reportedly, fines have been imposed in the JD 1000 to 10,000 (US $1600 to 16,000) range, though, as a result of serious enforcement, no incidents have led to prosecution during the 1993-1995 period. The Navy also engages in preventive measures including periodic meetings with shipping agents, at which the agents are urged to alert ship captains to Jordan's readiness to take tough enforcement actions against marine polluters.

76. The **Aqaba Municipality** plays a limited role in addressing environment-related concerns. Major planning decisions reside with the ARA, and building permits are subject to ARA approval. Planning of new park and landscape areas is conducted by the ARA, with execution of these plans assigned to the Municipality for projects within the municipal boundaries. The Aqaba Municipality's 1995 budget includes JD 186,000 (US $316,000) for landscape maintenance. Street cleaning and solid waste collection are the other areas where the Municipality bears significant responsibility within its boundaries. In the 1995 budget, JD 200,000 (US $340,000) is earmarked for sanitation services. While five Municipality-owned trucks collect garbage within the city, solid waste disposal is not controlled by the Municipality. The existing dump site, located 15 kilometers outside the city, is the responsibility of the ARA. Moreover, solid waste collection outside the Aqaba Municipality boundaries is the ARA's responsibility.

77. Police protection in Aqaba is provided by a local unit of the Jordanian national police, the **Public Security Force**. Though police officers seldom act against illegal littering, garbage dumping, illegal truck parking in beach areas and other environmental violations, such actions lie within their official mandate. Greater efforts to educate police officers about the need for greater vigilance in addressing these concerns could result in more effective control over activities that adversely affect the terrestrial as well as marine environment of the Aqaba region.

78. The **Aqaba Marine Science Station (MSS)**, administered jointly by the University of Jordan and Yarmouk University, was established in the early 1980s with the objective of monitoring coral reef ecological trends and providing facilities for training and research. Since its founding, the MSS has

conducted baseline research on coral life, marine water quality and the impacts of selected pollutants on the marine environment. The MSS is also responsible for maintaining Jordan's only Marine Nature Reserve, along a 500-m stretch of coastline immediately south of the Aqaba ferry terminal.

79. A number of national authorities bear responsibility for particular environment-related concerns in the Aqaba region. The **Ministry of Health** monitors effluent from the Aqaba sewage treatment works and conducts hygiene inspections at restaurants, swimming pools and other public facilities. The **Water Authority**, within the Ministry of Water and Irrigation, is responsible for the operation and maintenance of the Aqaba sewage treatment works, including the use of wastewater effluent for landscape and agricultural irrigation. The **Ministry of Water and Irrigation** is responsible for transporting sewage to the Aqaba treatment plant and is responsible for issuing commercial licenses. And the **Ministry of Tourism and Antiquities** manages the Eyla archaeological site as well as the Aqaba castle museum. In addition, the **General Corporation for Environmental Protection**, has been established pursuant to the recently enacted Law of Environmental Protection No. 12 (1995), and will assume important environmental protection responsibilities in the coming years.

80. Other non-governmental and semi-governmental organizations play a significant role in addressing Gulf of Aqaba environmental concerns in Jordan. The **RSCN** and the **RSS** contract with the ARA, the Ports Corporation, and individual industries in the Aqaba region to monitor environmental quality and industrial discharges. An independent environmental research and education organization, the **Jordan Environment Society,** has spearheaded the creation of a seven-member Aqaba Environment Committee, which seeks to introduce environmental awareness programs in the Aqaba public schools, and plans to serve as an independent "watchdog" of Aqaba development activities.

B. Institutions Fostering Regional Cooperation

81. Active consultations on Gulf of Aqaba environmental protection are already well under way between Jordan, Egypt and Israel, largely as an outgrowth of the Middle East peace process. The **Multilateral Working Group on Environment** established Gulf of Aqaba environmental protection as its first target for regional cooperation. The UGAOSCP, with Egypt, Israel and Jordan as active partners, has emerged as a direct outgrowth of the Working Group's deliberations.

82. In mid-1995, under the auspices of the Regional Economic Development Working Group (REDWG), the EU sponsored the launching of the **Taba-Eilat-Aqaba Macro Area ("TEAM" Area) Experts Group**, whose agenda is to identify priority economic development projects involving Egypt, Israel and Jordan. A Special Economic Zone, a regional bypass road for commercial transit, and development of a regional airport are among the topics now under discussion for the northern Gulf of Aqaba area. Environmental action plans will be prepared for the Egyptian and Israeli portions of the Gulf of Aqaba. Feasibility studies are being undertaken for a handicraft center, water and waste water use, land use suitability, visitors management and joint marketing.

83. Another consultative mechanism has been the ad-hoc **Aqaba-Eilat Committee** which drafted the "Agreement on Special Arrangements for Aqaba and Eilat between the Government of the State of Israel and the Government of the Hashemite Kingdom of Jordan". Under Article 11 of this Agreement, a Aqaba-Eilat coordinating committee will be established to assist in the implementation of the Agreement which includes important provisions in environmental protection and marine park establishment (para. 85). The Israel-Jordan Binational Red Sea Marine Park Concept involves the creation of a cooperative mechanism for marine park management in the Upper Gulf area.

84. Under the auspices of the **GEF-sponsored PPA for the Gulf of Aqaba Environmental Action Plan**, important strides have also been made toward forging regional cooperation in addressing priority Gulf of Aqaba environmental protection concerns. The GEF PPA financing enabled the coordination of efforts in coral protection. Experts from the Egyptian Environmental Affairs Agency have advised on the creation of a marine protected areas strategy for the Aqaba coastline. Through this initiative, the Ras Mohammed National Park Sector Development Project was invited to contribute to the formulation of a marine park strategy for Jordan, in conjunction with leading scientists from the U.S. National Oceanic and Atmospheric Administration.

V. LAWS AND REGULATIONS AFFECTING JORDAN'S GULF OF AQABA REGION

A. Relevant Treaties and International Conventions

85. Four principal international conventions to which Jordan is a party are relevant to the protection of the Gulf of Aqaba:

- The **Regional Convention for the Conservation of the Red Sea and the Gulf of Aden Environment (Jeddah Convention, 1982)** aims to protect the Red Sea, Gulf of Aden and Gulf of Aqaba environments. Article 6 of the Convention calls for appropriate measures against water and airborne pollution originating from land. Under the Protocol concerning Regional Cooperation in Combatting Pollution by Oil and Other Harmful Substances in Cases of Emergency, a marine pollution emergency response center is to be established, along with procedures for the exchange of scientific data and regional technical assistance.

- The **International Convention for the Prevention of Pollution of the Sea by Oil (1954)** establishes controls on oil discharges into the sea from ships. Under this Convention, the Red Sea including the Gulf of Aqaba is considered a special zone where heightened protection applies.

- The **Convention of the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention 1973)** regulates the disposal at sea of waste and other matter from ships, aircraft, platforms and other structures.

- The **Convention for the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal (Basel Convention 1989)**. In addressing the general secretariat of this Convention, Jordan's delegate declared Jordan to be an area forbidden to the importation or trans-shipment of foreign hazardous wastes.

86. In addition, Jordan signed the **International Convention for the Prevention of Pollution from Ships (MARPOL 73/78)** in December 1994. Jordan's ratification of this Convention is expected during 1996. Annex I of this Convention establishes the Red Sea and Gulf of Aqaba as a special area where the discharge of oil and oily residues is prohibited. To foster compliance with this ban, Parties are required to provide reception facilities for oil and oily residues from tankers and other ships using their ports. Under Annex II, bans on the discharge of certain categories of noxious liquid substances are established, along with the required provision of port reception facilities for such substances where needed. Annex V prohibits the dumping from ships of garbage other than food wastes.

87. The **Peace Treaty between The State of Israel and The Hashemite Kingdom of Jordan (24 October 1994)** establishes a firm basis for environmental consultation and cooperation between these two Gulf-bordering states. Under Annex IV of the Treaty, the two parties agreed to cooperate in several key areas including the following:

- Environmental planning, the conduct of environmental impact assessment, the exchanging of data on proposed development projects.
- Environmental legislation, regulations, standards, and the enforcement thereof.
- Emergency response, monitoring, related notification procedures and control of damage.

Among the geographical areas identified as prime targets for bilateral cooperation, the Treaty gave first priority to the Gulf of Aqaba marine environment and littoral zone. Effective controls over the environmental impacts of industry, power generation, hazardous materials, solid waste, ports and tourism were among the specific areas for cooperative effort.

88. Further elaborating upon the objectives set forth in the Israel-Jordan peace treaty is the **Agreement between the Government of The Hashemite Kingdom of Jordan and the Government of the State of Israel on Cooperation in Environmental Protection and Nature Conservation**, initialed by both nations in May 1995. Enhancement of legislative strategies and enforcement measures and the development of improved monitoring of regulated activities are highlighted in this Agreement. The need for effective methods of preparing and presenting environmental impact assessments of projects with transboundary impacts is also reiterated. Regular exchanges of professional delegations and environmental experts, timely data exchange, and "activities to support international environmental projects to help solve global and regional environmental problems and to create an atmosphere of cooperation" were advocated.

89. In January 1996, an Agreement was signed on **Special Arrangements for Aqaba and Eilat Between the Government of the State of Israel and the Government of the Hashemite Kingdom of Jordan**. Key environmental protection provisions included in this agreement, are as follows:

- A binational marine park called The Red Sea Marine Peace Park is to be established, with the landward boundaries of the Park are to be set by each Party and the marine boundaries generally established at the 70 m benthic line. Park regulatory procedures are to be developed by a special joint team with a view toward adopting similar and comparable standards and guidelines;
- The Parties are to ensure that joint development projects are environmentally sound, with minimal transboundary environmental impacts;
- There is to be an exchange of timely and pertinent information related to environmental monitoring and control measures taken by each Party;
- Joint environmental education efforts are to be promoted, and mutual assistance in emergency preparedness and response, including direct communication links and joint training programs, is to be advanced;

- Ship-based pollution (including oil, hazardous materials, and sewage) is to be abated and combatted to the fullest extent possible, in conformity with internationally recognized norms; and

- Pollution from land-based sources is to be minimized to the fullest possible extent, toward the goal of phasing out pollution by hazardous substances and substances that bioaccumulate.

B. Domestic Laws, Standards and Guidelines

90. Under the **Law of the Aqaba Region Authority No. 7 (1987)**, broad powers of governance are assigned to the ARA, including the authority to plan and execute projects in the industrial, tourist, agricultural and services sectors (art. 6), and to supervise other public and private agencies undertaking projects in these sectors. The ARA Board of Directors includes representatives of key ministries (Municipal, Rural Affairs and Environment; Planning; Industry and Trade; Tourism; Interior) as well as the Ports Corporation, the Army, the Department of Lands and Survey, Mayor of Aqaba and two other local representatives (art. 8). The Board is empowered to appropriate lands, dispose of Government property, and promulgate permits and licenses for activities carried out in the Region (Art. 10). Regulations for the implementation of the ARA Law are to be prepared by the ARA President (art. 11), and are to be submitted to the Council of Ministers for approval (art.22).

91. In September 1995, a **Law of Environmental Protection, Law No. 12 (1995)** was approved by the Jordanian Parliament. This law establishes a national framework for environmental policy, including the formation of a Higher Council for Environmental Protection on which the Secretary General of the ARA will sit as a member. The Higher Council will set national environmental policy and will review proposed environmental laws, specifications and standards prepared by a separate executive body, the General Corporation for Environmental Protection. The General Corporation will be the primary body at the national level responsible for implementing pollution prevention regulations including inspection and monitoring of regulated premises.

92. Despite the recent enactment of the **Law of Environmental Protection**, Jordanian environmental protection standards and regulations remain piecemeal and largely without effective monitoring and enforcement. Important progress in filling regulatory gaps pertaining to priority environmental protection concerns in the Aqaba region have been made using PPA funding. Already completed are environmental impact assessment procedures for proposed development projects; these procedures are now awaiting final approval by the ARA. In addition, environmental auditing procedures for Aqaba region industries have been prepared and are awaiting formal adoption by the ARA. Once adopted, the EIA and environmental auditing procedures will be the first such regulations in Jordan. They are currently being viewed as models for environmental regulation at the national level.

93. Environmental planning in the Aqaba region has also been targeted for strengthening using PPA funding, through the introduction of guidelines for coastal zone management (CZM). Draft CZM regulations, developed with PPA financing, establish a multi-tier CZM system with separate zones for tourism development, industrial activities, mixed use, and wilderness protection. The regulations also include architectural, landscaping and environmental protection guidelines for coastal zone development as well as aesthetic design standards for industrial and port facilities.

94. Standards and procedures governing industrial activities in the Aqaba region have also been prepared with PPA funding. While some standards for industrial wastewater discharges exist in Jordan (para. 96), standards for ambient air quality or industrial air emissions have yet to be adopted. Air emission and wastewater discharge standards specifically targeting priority pollutants in the Aqaba region were also produced using PPA funding. A permit-based regulatory regime for Aqaba region industries has also been recommended, and the guidelines for such a regime have been finalized.

95. Marine Park regulations and boundary designation have been undertaken using PPA funding in conjunction with the U.S. National Oceanic and Atmospheric Administration. Under the proposed scheme, a Jordanian Red Sea Marine Peace Park will soon be officially established, to be governed by the regulations prepared with PPA funding. A full Marine Park management plan is to be prepared as part of the proposed project.

96. In controlling industrial waste water discharges, **Jordan Standard Specifications No. 202 (1982) (updated in 1991)** establishes maximum allowable limits for some 37 pollutants discharged into streams, wadis, or the sea, or used for natural recharge or irrigation. JSS 202 also includes narrative standards for the protection of public and worker health, groundwater quality and aquatic life. The Water Authority of Jordan (WAJ) is reportedly responsible for monitoring industrial discharges semi-monthly, to ensure compliance with JSS 202. However, to date such monitoring is unenforced.

97. Publicly owned wastewater treatment works operated by the WAJ are subject to a new standard, **Jordan Standard Specifications No. 893 (1994)**. Under this standard, maximum limits are set for a number of pollutants in sewage plant discharges, but no standards or guidelines are established for sewage sludge.

98. Several legal provisions address ship-based pollution. **Shipping Law No. 51 (1961)** bans ships from dumping soil, stones, sand, scum, toxic and chemical waste, or any other material on land or water. Appropriate measures are required under this law for the prevention of spills during the loading and unloading of ships. The law sets fines for the violation of any of its provisions. **Quarantine Aqaba Port Law No. 32 (1972)** bans the discharge of ship-based pollution, including bilge water. Daily feeds to be paid by ships for garbage collection are established under **Port Services Fees Law No. 49 (1976).** And **Circular No. 31 - Waste Discharges from Ships (1971)** requires that all sweepings, including wood, paper, and soil collected from ships be transported outside the Aqaba City limits. Ship captains are made personally liable for polluting substances released from their vessels under Article 24 of the new **Law of Environmental Protection**. In addition to setting applicable fines and prison terms, the Law requires remediation at the responsible party's expense.

99. Some protection of fisheries and coral is provided under **Agriculture Law No. 20 (1973)**. This Law provides for the issuance of fishing licenses pursuant to specified conditions, and additionally prohibits damage to or removal of corals. More explicit in banning the removal of coral or shellfish from the Gulf, or harm to these forms of marine life, is Article 25 of the **Law of Environmental Protection**, which specifies fines and prison terms for violators.

VI. PROJECT OBJECTIVES

A. Overview

100. The overriding objective of the proposed GEF project is to enable Jordan to develop and implement the first phase of a strategic environmental action plan that will establish a regional collaborative framework for sustainable environmental management and protection of the Gulf of Aqaba and adjacent terrestrial areas. Central to the success of the project will be the development of institutions that are capable of demonstrating Jordan's commitment to addressing priority environmental protection concerns within Jordan's Aqaba region, and to provide institutional capacity for effective regional cooperation in addressing these concerns.

101. In an emerging era of Middle East peace, Jordan's Gulf of Aqaba coastal region is currently the focus of intensive development pressure. Aware of the enormous economic benefits that neighboring Egypt and Israel have derived from recreational tourism along their Gulf coastlines, Jordanian government officials and private entrepreneurs are now targeting the nation's 27-kilometer Gulf coast for major resort hotel and vacation villa development. At the same time, ambitious plans to expand mineral export and other activities in Jordan's already bustling port are under active consideration.

102. The objectives of this project are:

(i) institutional capacity-building in Jordan's Aqaba region;

(ii) establishing laws and regulations addressing priority environmental protection concerns within Jordan; and

(iii) environmental protection of coral reefs and coastal waters.

B. Institutional Capacity Building Objectives

103. In the Aqaba region, a preliminary commitment to environmental protection has been signalled by the creation of an Environment Unit within the ARA. Primary objectives for institutional capacity-building are:

(i) strengthening management capacity at the ARA to achieve international, national and regional environmental protection through a combination of training and technical assistance for new management responsibilities;

(ii) strengthening administrative capacity at the ARA in the areas of procurement, financial management and accounting procedures; and

(iii) strengthening technical capabilities of the ARA Environment Unit through technical assistance and training.

C. Regulatory Framework Objectives

104. While there is an active debate about environmental protection concerns among Jordanian government officials and in the non-governmental sector, effective regulation of Jordanian industry and

Jordanian development activity is presently lacking. In the fall of 1995, the Jordanian Parliament approved a Law of Environmental Protection (Law No. 12 of 1995), which establishes a broad framework for addressing environmental concerns within Jordan. To meet the objectives of this Law, a strong regulatory framework will need to be developed for the Aqaba region, supported by the strengthened technical capacity of the ARA.

105. Primary objectives for building an effective regulatory framework are:

(i) to develop a legal framework ensuring that new development activities are subject to environmental planning guidelines and permitting procedures;

(ii) to strengthen regulations governing the activities of land-based industries as well as marine vessels operating in the Gulf;

(iii) to strengthen enforcement tools applicable to violators of environmental protection and planning laws and regulations;

(iv) to endow the ARA Environment Unit with appropriate powers to carry out necessary environmental protection functions; and

(v) to introduce legal measures to promote consistency and harmonization of environmental laws, regulations and standards in accordance with internationally recognized principles and standards.

D. Environmental Protection Objectives

106. Given the intimate and intricate relationship between the Gulf of Aqaba and adjacent terrestrial areas, environmental protection initiatives in the region must seek to advance an integrated approach to resource conservation and management. Workshops, joint research projects, and technical consultations will be developed between Jordan, Egypt and Israel to ensure that priority environmental protection needs are addressed. The primary environmental protection objectives of the Gulf of Aqaba Environmental Action Plan for Jordan are:

(i) protection of globally important coral reefs through the development and implementation of a managed resource marine park;

(ii) prevention of oil contamination by marine vessel bilge and ballast water discharges and coordination of planning and investments in oil spill response;

(iii) prevention of marine pollution from land-based sources including industries, hotel developments, sewage discharges, land transport vehicles and port facilities;

(iv) development of an integrated strategy addressing ship-based as well as land-based sources of solid waste;

(v) protection of coastal groundwater resources from contamination; and

(vi) promotion of municipal and regional development that minimizes damage to coastal environmental resources including terrestrial flora and fauna and landscape aesthetics.

VII. PROJECT DESCRIPTION

107. Under the proposed GEF project, the Government of Jordan, in concert with Egypt and Israel, will develop and implement priority measures to halt and prevent pollution of the marine environment and the transboundary aquifers in the Aqaba coastal zone. Project components are the following:

(i) development of a regulatory and institutional framework for Gulf of Aqaba environmental protection;

(ii) measures to reduce the risk of major oil spills and steps to promote waste oil recovery and reuse;

(iii) safeguarding transboundary groundwater resources through groundwater monitoring and assessment of the effects of wastewater seepage on the quality and level of the groundwater table in the Gulf of Aqaba region;

(iv) development of an integrated marine and land-based transboundary solid waste management strategy; and

(v) protection of globally important coral reefs - development and implementation of a managed resource marine park. The individual implementation activities to be carried out under each project component, described more fully in Attachment D, are summarized briefly below.

108. **Development of a regulatory and institutional framework for Gulf of Aqaba environmental protection:** Under this component, institutional reforms necessary to achieve environmental protection priorities in the Gulf of Aqaba region will be identified and implemented. As a necessary first step, the ARA will be designated as the lead agency for the project and the existing ARA Environment Unit will be elevated to full departmental status within the ARA.

109. An action plan for transboundary consultation and cooperation will be developed under this component. In developing and implementing this plan, the ARA Environment Unit Director will work with counterparts in Egypt, Israel and, if possible, Saudi Arabia to establish consultative mechanisms on priority areas of environmental concern. Existing tri-national committees will promote harmonized laws and policies in specialized areas (e.g. marine pollution from land-based industries; sewage management and sewage water reuse; collection, disposal and recycling of solid waste from marine and land-based sources). Joint research projects will be undertaken on issues pertaining to coral reef ecology, fisheries management, and pollution impacts from land-based and marine sources. Training workshops will be developed on topics of shared relevance (e.g. environmental impact assessment, industrial pollution monitoring, marine vessel pollution prevention, fisheries management).

110. The current research capabilities of the Aqaba Marine Science Station and other Jordanian institutions will be strengthened through the development of a research agenda targeted at priority environmental protection concerns. Augmenting this agenda will be fellowship support and research

grants, awarded on the basis of the proposals' substantive areas of focus as well as the shared involvement of researchers from two or more Gulf-bordering states in research projects. Direct cooperation between the MSS and counterpart institutions in Israel and Egypt will be promoted.

111. The GOJ will be assisted under this component in developing standards and regulations for ship-based pollution, including bilge and ballast water waste, noxious liquid substances, solid waste and sewage. Regulatory, monitoring and enforcement measures will be developed to ensure GOJ compliance with the International Convention for the Prevention of Pollution by Ships (MARPOL 73/78), signed by His Majesty King Hussein in 1994 and expected to be ratified in 1996. Other areas in which environmental regulations will be developed and implemented under this component are industrial facility permitting and pollution prevention; coastal zone management including the adoption of a statutory CZM map; and environmental impact assessment.

112. Further institutional strengthening will be provided through the purchase of computer database/GIS systems and necessary staff training; and the strengthening of laboratory analysis and field sampling capabilities to address priority pollutants and pollution indicators.

113. **Measures to reduce the risk of major oil spills and steps to promote waste oil recovery and reuse:** While the UGAOSCP, developed with EU and Japanese assistance, addresses risks associated with small to moderate Gulf oil spills, there is an urgent need to develop adequate measures to minimize the risk of potentially catastrophic oil spills.[1] This component of the GEF project will finance a pre-feasibility study of measures to reduce the risk of major oil spills, including electronic navigational aids, pilotage requirements, and tanker design specifications.

114. In the absence of bilge or ballast water reception facilities in the Port of Aqaba, oily waste from marine vessels is periodically discharged into the Upper Gulf. Impacts of these discharges are visible in beach tar and surface oil slicks in port area waters. Waste oil from trucks, caused by roadside dumping of lube oil by freight haulers and poor management of truck repair yards, is an additional source of waste oil contamination in the coastal region. To address this problem, the feasibility of building a coordinated (Jordan-Egypt-Israel) waste oil reception and recovery scheme will be assessed and a demonstration project in waste oil recovery will be launched with partial grant support from the project.

115. **Safeguarding transboundary groundwater resources through groundwater monitoring and assessment of the effects of wastewater seepage on the quality and level of the groundwater table in the Gulf of Aqaba region:** To control transboundary pollution of the Wadi Araba aquifer, the quality of the groundwater around the transboundary periphery of the Aqaba municipal wastewater treatment plant will be assessed, and mitigation measures will be defined. Under a second phase, a water resources assessment will be undertaken with the objective of establishing sustainable future rates of usage and management of wastewater effluent. The water resources assessment will include a multi-sector analysis of current water resource uses, an evaluation of water quality applied to these uses, and projections as to future water supply and demand. The potential for deterioration or depletion of groundwater resources

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[1] Under the UGAOSCP, emergency response centers are to be established in Egypt, Israel and Jordan, each with a capacity to handle spills of up to 200 metric tons of oil. As tankers now plying the Gulf's waters carrying 100,000 to 150,000 tons of oil, measures to maximize tanker safety are urgently needed. The project would explore the possibility of promoting regional agreement on tanker design and operational requirements, and other measures to reduce the likelihood of a major oil spill in the Gulf.

under different development scenarios will be given priority focus, and measures to mitigate or avoid these negative impacts will be proposed in the form of a prioritized action plan, including management practices for pollution prevention in the recharge zone. Specific attention will be given to present management and potential uses of sewage effluent, (e.g. agricultural irrigation, the proposed golf course development and landscaping in the South Coast Tourism Zone), the preparation of a plan to control potential adverse impacts on nutrient-sensitive coral reefs in nearby marine waters and transboundary pollution of the Wadi Araba aquifer.

116. **Development of an integrated marine and land-based transboundary solid waste management strategy:** Large quantities of solid waste (plastic bags, foam cups, animal carcasses, glass, metal, etc.) pollute the Gulf's international waters. Sources include recreational beach waste, litter generated by passengers aboard the Aqaba (Jordan) - Nuweiba (Egypt) ferry and the discharge of dead livestock from cargo ships. This component will ensure control of litter and transboundary garbage contamination of coral reef and the marine environment. The following activities will be included: (i) the development of consultative mechanisms to promote the development of an effective regional action plan for transboundary solid waste management for waste originating from marine and land-based sources; (ii) the improvement of port reception facilities for ship-generated solid waste; (iii) the strengthening of current mechanisms to ensure that ship operators strictly enforce anti-litter provisions against passengers and crew; (iv) the development of a solid waste collection, recycling and disposal plan that ensures reliable collection of domestic garbage, effective sorting of recyclable materials, and environmentally sound disposal (containment) of un-recyclable waste; and (v) development of strong anti-litter and anti-dumping provisions to be adopted by the ARA.

117. **Protection of globally important coral reefs - development and implementation of a managed resource marine park:** This component will be undertaken within the framework of a tripartite collaboration between Egypt, Israel and Jordan. Using PPA funding, the marine reserve proposal prepared by IUCN was updated and draft marine park regulations were produced. Hence, the component would entail: (i) establishment of a multi-use marine park incorporating detailed zonation and numerical and spatial limitations on different user activities (including commercial and recreational fishing regulations); (ii) installation of mooring buoys, the marking of boundaries, user zones and reef crossovers points; (iii) hiring and training of marine park staff engaged in controlling park entry, enforcement of zoning regulations, interpretation and visitor education, and implementation of monitoring and public awareness programs; and (iv) in collaboration with ARA, the Port Corporation, NGOs, and the private sector, development and implementation of a public awareness campaign targeting hotel visitors, dive center customers, park visitors, and the general public.

VIII. PROJECT IMPLEMENTATION

A. Project Management

118. The ARA is the implementing agency for this Project, under the supervision of the Ministry of Planning. ARA will, through its Board of Directors, oversee project implementation, forward planning, and sustainability of the project. Within the ARA, oversight of implementation will be the responsibility of the ARA Secretary General, to which the ARA Environment Unit is attached. A Director will be appointed to head the Environment Unit. The role and activities of the Environment Unit are detailed in Attachment D. The Unit will implement and enforce guidelines and regulations which integrate environmental protection into Aqaba region development planning and economic activities. The Unit

would also develop and implement required action plans including a Marine Park management plan, a marine water quality monitoring program, GIS, a waste oil recycling plan, a groundwater quality mitigation plan, and a solid waste collection plan. In addition, the Environment Unit will coordinate with the other ARA departments and with the other Jordanian governmental authorities at the national, regional and local levels. For example, the Environment Unit Director will coordinate project functions with the Ports Corporation, the Marine Science Station, the Royal Jordanian Navy, and non-governmental organizations (inter-alia the Royal Red Sea Divers Association and the Royal Society for the Conservation of Nature). Full consultation and coordination will also be promoted between the ARA and the General Corporation for Environmental Protection, to be established under the recently enacted Law of Environmental Protection No. 12 (1995). Figure 1 provides an organization chart for the ARA Environment Unit.

119. To assist the ARA in project implementation, a Project Manager and a Project Procurement/Disbursement Specialist (part-time) will be hired. The Project Manager will manage the implementation of the GEF component of the GAEAP, based upon a Project Implementation Plan which will be developed four months after Project signature. The Project Manager will also assist in coordination of regional activities. The Project Procurement/Disbursement Specialist will be responsible for assisting the ARA Finance Department in implementing all financing, procurement, disbursement, accounting, and auditing functions pertaining to the project. The Project Management Team (PMT) will be equipped with vehicles to facilitate movement of staff to ensure appropriate communication. The ARA will provide equipment, office and clerical support to the PMT to ensure the continuity of the project. The Government will maintain the composition of the PMT during the execution of the project.

120. The Project is scheduled to be implemented over a three-year period, with an anticipated starting date of mid-1996. Attachment F describes the key project activities over the three-year period. At negotiations, agreement was reached that the Project Management Team will submit quarterly progress reports on Project implementation and annual audit reports. A recurrent cost recovery plan for operation and maintenance of the Environment Unit will be developed towards the end of the first year of project implementation. Following adoption of the recurrent cost recovery plan, the necessary by-laws would be enacted.

B. Project Monitoring

121. The Project Manager's primary responsibility will be the timely execution of project implementation as specified in the Key Activities Schedule (Attachment F). The Project Manager will monitor project Key Monitoring Indicators (Attachment C) to track the progress and impact of the project. Specific tasks include:

(a) preparing the Project Implementation Plan, including updating if needed, of key activities schedule and key monitoring indicators; the implementation plan will be submitting to the Bank for review within four months of signature of the project;

(b) preparing quarterly progress reports on project implementation, with supporting documentation in the following areas:

- hiring and training of Project consultants and staff;
- progress in meeting milestones set forth in the Project Implementation Plan;

- adoption and implementation of environmental protection regulations, including but not limited to guidelines and standards developed with PPA funding;
- inter-agency coordination in addressing priority concerns addressed under the Project;
- preparation and implementation of a Marine Park management plan, marine water quality monitoring program, GIS, waste oil recycling plan, groundwater quality mitigation plan, and solid waste collection plan;
- development of mechanisms and implementation of activities to advance regional cooperation with neighboring Gulf of Aqaba states, in accordance with specified Project implementation activities (Technical Annex, Attachment D); and
- development of physical facilities and infrastructure, in accordance with specified Project implementation activities (Technical Annex, Attachment D).

(c) measuring quantitative and qualitative objectives achieved and reporting such information in annual progress reports, to be submitted to the Bank by December 30 of each year;

(d) identifying priority areas for further analysis;

(e) conducting background studies for possible follow-up activities and/or follow-up project; and

(f) preparing the Project Completion Report.

122. Monitoring by the Bank would be carried out through visits to Aqaba two to three times per year, to review progress in implementing the project and to revise, as necessary the Project Implementation Plan and Key Activities Schedule.

C. Procurement

123. Procurement of works and goods under the proposed project would be carried out in a manner consistent with Bank Procurement Guidelines (January 1995). Consultant services would be contracted in accordance with Bank Guidelines for Use of Consultants (August 1981). Country procurement practices have been reviewed, and found to be acceptable. Standard documentation of the country for works and goods would be used, and World Bank standard forms of contracts would be used for consultant services. Procurement would be carried by the ARA Finance Department, with technical assistance from a procurement\disbursement specialist. The procurement arrangements are summarized in Schedule B.

124. The total cost for works financed by the GEF is estimated at US$482,000, all of which would be procured through national competitive bidding (NCB) procedures, because they would not be of interest to foreign contractors. The works will consist mainly of small on-shore facilities for the Marine Park and associated reef protection infrastructure. The Marine Park headquarters/visitor center, estimated to cost about US$320,000, is the single largest physical work in the project.

125. Contracts for goods above US$200,000 would be procured through international competitive bidding (ICB). Contract packages for goods between US$50,000 and US$200,000 would be awarded on the basis of NCB. Contract packages for goods below US$50,000 would be awarded based on national shopping procedures acceptable to the Bank. The total cost for goods and equipment is estimated at US$665,000 of which only one package for laboratory equipment (estimated at US$220,000) would be procured through ICB.

126. The total cost for consultant services is estimated at US$1.498 million, which would consist of packages for technical assistance for staff positions, and packages for studies, strategies, action plans, and training activities, referred to as implementation and training activities.

127. The Bank's prior review of procurement would apply to all contracts procured under ICB and to the first two contracts under NCB regardless of the amount, and to all contracts in excess of US$100,000 under NCB. The Bank will also subject to prior review all documentation (terms of reference, short lists, evaluation methodology, evaluation of proposals, award recommendations and contract) for all staff positions funded under the project. As most of the other consultant services are technically specialized and are of low amounts (estimated from US$25,000 to US$100,000), prior review is required for all other consultant services included in the project, when contract values for firms exceed US$75,000 and when contract values for individuals exceed US$25,000. TORs for implementation activities and technical assistance staff positions are provided in Attachments D and E. It is estimated that the prior review process would cover about 75% of the Bank-financed contracts. All other contracts will be subject to selective post review.

D. Disbursement and Special Account

128. Funds from the GEF grant are expected to be disbursed over a period of three years, including retroactive financing of US$270,000. Disbursements of the GEF grant would be made against: works for 100% of foreign expenditures and 95% of national expenditures; goods for 100% of foreign expenditures and 100% of national (ex factory cost) expenditures and 90% of national expenditures for other items procured locally; consultant services for 100% of all expenditures; and miscellaneous items for 100% of all expenditures for electricity, fuel, repairs, maintenance services, and other operational services related to the marine park facilities.

129. Actions agreed at negotiations include development of a detailed Project Implementation Plan, that will demonstrate adherence to the procedures described in this Project Document and the Bank Guidelines for Procurement and for Use of Consultants.

130. **Documentation of Expenditures**. Withdrawal applications would be made on the basis of Statements of Expenditures (SOE) for expenditures for each contract for goods and works costing less than the equivalent of $100,000, except for the first two contracts under NCB regardless of the amount; for each contract for the employment of consulting firms estimated to cost less than the equivalent of $75,000; for each contract for the employment of individual consultants estimated to cost less than the equivalent of $25,000; and for all training and operating expenditures under such terms and conditions as the Bank shall specify by notice to the Recipient. For expenditures on staff positions, the SOEs would state that all staff positions had been previously approved by the Bank. The relevant documentation in support of SOEs would be maintained at the ARA Finance Department and would be made available for Bank staff review. Because of the large volume of disbursements expected to be claimed under SOEs,

special effort would be made for the selective review of SOE documentation by visiting Bank missions. Expenditures in excess of the previous amounts would be fully documented.

131. **Special Account**. A Special Account in U.S. dollars with a maximum authorized allocation of US$300,000 representing approximately four months of average projected expenditures, would be opened at the Central Bank of Jordan. The Special Account would be used for all payments less than 20% of the Authorized Allocation. Applications for replenishment of the Special Account would be submitted on a monthly basis or more frequently if the amount withdrawn from the Special Account exceeded one-third of its value.

E. Accounting and Auditing

132. The ARA would maintain records (in electronic and paper medium) for each project component, and consolidate them into the project accounts and SOEs. Supporting documentation would also be maintained by the ARA and be made available to Bank mission and independent auditors as required.

133. Project accounts, including the special accounts and SOE, would be audited annually in accordance with appropriate auditing principles applied by external private independent auditors acceptable to the Bank, with TORs and reports approved by the Bank; this was agreed at negotiations. Cost of the consultant services to be employed by ARA for the annual audits would be eligible for financing included in the GEF grant. Audit reports would be furnished to the Bank within five months after close of the Government's fiscal year.

IX. PROJECT BENEFITS AND RISKS

134. The major issue is the need for a strengthened institutional framework. By providing a proper institutional, regulatory and enforcement system, as proposed under the project, the risks of continued environmental degradation and failure to achieve the project's objectives would be minimized. While the ARA has legal authority to introduce new regulations for the Aqaba Region, there is also a risk associated with the possible delay in enforcement of those regulations. Toward this end, the ARA environment unit should be strengthened to allow for effective management with enforcement authority. At a minimum, provision of incentives for career development and the elaboration of management enforcement authority is required.

135. The project would result in the following benefits: prevention of further environmental degradation, including the containment of marine pollution; improvement of the overall quality of the urban and natural environment; reduction in existing point sources of pollution; maintenance of the ecological balance of threatened ecosystems; and improvement of the efficiency of water use. It would also establish standards and procedures which could be adopted at the national level, and provide an opportunity to initiate regional cooperation in managing the environmental impacts of development throughout the Gulf of Aqaba.

X. AGREEMENTS REACHED

136. During negotiations, the following agreements were reached with the Government:

(i) that ARA will establish an Environmental Unit with staffing and TORs satisfactory to the Bank by July 1, 1996;

(ii) that official designation of the Gulf of Aqaba Marine Park, including boundary delineation, would be a condition for disbursement of those components of the Grant related to the MP;

(iii) that based on the MP regulations to be developed during the first three months of the project, a by-law establishing the regulations for the operation of the Marine Park will be presented to the Cabinet of Ministers by December 31, 1996;

(iv) that immediate steps will be taken toward the formal adoption, by September 1, 1996, of recommended guidelines and standards developed with PPA funding, including EIA, CZM, environmental auditing, and industrial pollution prevention;

(v) that the key project activities would be carried out according to the Schedule set forth in Attachment F;

(vi) that a recurrent costs recovery plan will be designed by December 31, 1996 and implemented within 6 months; charges would be updated regularly according to the plan;

(vii) that the equipment to implement the monitoring of sea water quality program will be based at the Marine Science Station;

(viii) that quarterly progress reports will be submitted to the Bank, with supporting documentation, describing actions taken in the following areas:

- hiring and training of Project consultants and staff;
- progress in meeting milestones set forth in the Project Implementation Plan;
- adoption and implementation of environmental protection regulations, including but not limited to guidelines and standards developed with PPA funding;
- inter-agency coordination in addressing priority concerns addressed under the Project;
- preparation and implementation of a Marine Park management plan, marine water quality monitoring program, GIS, waste oil recycling plan, groundwater quality mitigation plan, and solid waste collection plan;
- development of mechanisms and implementation of activities to advance regional cooperation with neighboring Gulf of Aqaba states, in accordance with specified Project implementation activities (Technical Annex, Attachment D); and
- development of physical facilities and infrastructure, in accordance with specified Project implementation activities (Technical Annex, Attachment D).

(ix) that annual audit reports will be provided to the Bank within five months after the close of the Government's fiscal year; and

(x) that a Project Completion Report will be prepared within four months after project completion.

ATTACHMENT A

GULF OF AQABA ENVIRONMENTAL ACTION PLAN

PROJECT COST SUMMARY

		Cost
A(i).	**Transboundary Water Issues: Overall Goals, Policies, Guidelines, and Coordination with Egypt and Israel**	**144,000**
	-Further implementation of collaborative mechanisms	50,000
	-Computer equipment and vehicles	94,000
A(ii).	**Implementation of a Legislative and Regulatory Framework**	**565,000**
	- Finalization of draft standards and regulations	50,000
	- Hiring and training of project management staff	340,000
	- Training for implementation	25,000
	- Consultant services	150,000
A(iii).	**Coastal Zone Management and Implementation of EIA Guidelines**	**106,000**
	- Implementation Guidance for CZM\EIA Permitting Procedures[1]	70,000
	- Hiring and training of ARA personnel	36,000
A(iv).	**Transboundary Environmental Management with a Regional Focus[2]**	**475,000**
	- Hiring and training of ARA staff	72,000
	- Preparation and implementation: marine water quality monitoring with regional focus[3]	90,000
	- Establishment of GIS\data management systems with regional focus[2]	113,000
	- Laboratory equipment[2]	200,000
B.	**Oil Pollution Hazards**	**100,000**
	- Reduction of oil spill risks pre-feasibility study	35,000
	- Demonstration project in waste oil recovery	65,000

[1] Consultation with neighboring states will include a regional workshop, within the framework of the WGE, to discuss the implementation of the CZM and EIA guidelines which were developed in consultation with the regional counterpart agencies.

[2] This component will be prepared in close collaboration with neighboring states.

[3] The water quality monitoring program and GIS will be developed with neighboring states and the laboratory equipment has been identified to ensure compatibility within the region.

C.	**Transboundary Groundwater Resources**	**100,000**
	- Assessment and mitigation of groundwaters[4]	100,000
D.	**Transboundary Solid Waste Management Strategy**	**150,000**
	- Development of solid waste collection, recycling, disposal plan	90,000
	- Action plan for ship-generated waste	60,000
E.	**Implementation of Marine Park**	**810,000**
	- Management plan for marine park	40,000
	- Capital expenditures of Marine Park facilities/equipment	600,000
	- Hiring and training of Marine Park staff	120,000
	- Marine Park operation and maintenance costs, Years 1 & 2	50,000
Contingencies		250,000
TOTAL		**2,700,000**

[4] This component will be carried out in close collaboration between Jordan and Israel and relevant institutional responsibilities will be adopted for both countries.

ATTACHMENT B

GULF OF AQABA ENVIRONMENTAL ACTION PLAN

INCREMENTAL COSTS

Project Component	Reasonable Baseline Analysis & (Cost/$mil)	Total Cost ($mil)	Incremental Cost ($mil) [Funding Source]
A(i). Regional Coordination Mechanism	The objectives of this component consist of regional environmental management and coordination among the regional actors which the Government of Jordan cannot reasonably be expected to bear (0).	.144	.144 [GEF]
A(ii). Legislative & Regulatory Framework	The legislative and regulatory framework needed for transboundary pollution control and management falls beyond the scope of provisions established by the Government for national environmental management (0).	.565	.565 [GEF]
A(iii). Coastal Zone Management & EIA Guidelines	Although the Government of Jordan is committed to developing EIA guidelines to address national environmental concerns, the objective of this component is to minimize adverse environmental impacts of a transboundary nature and, as such, is an eligible incremental cost (0).	.106	.106 [GEF]
A(iv). Transboundary Environment Management & Monitoring	The Government of Jordan is committed to providing funding of $100,000 annually, or $300,000 over the life of the Project, to address environmental management issues in the Aqaba area which are of significance to Jordan. In addition, the ARA is committed to reallocating $500,000 toward the institutional framework underlying the component. However, the Government cannot reasonably be expected to finance the preparation of a regional coral reef and water quality management strategy or the establishment of regional monitoring systems and requisite capacity (.80).	1.275	.475 [GEF]
B. Assessment of Oil Pollution Hazards	The objectives of this component - to minimize the risk of potentially catastrophic transboundary oil spills and to assess the oil pollution hazards to transboundary aquifers and marine waters - require a coordinated regional response (0).	7.6	7.6 [GEF .10 EU 1.90 Japan 5.60]

Project Component	Reasonable Baseline Analysis & (Cost/$mil)	Total Cost ($mil)	Incremental Cost ($mil) [Funding Source]
C. Safeguarding Transboundary Groundwaters	The cost of controlling transboundary pollution of the shared aquifer and to undertake, as proposed under this component, a water resources assessment of sustainable future rates of transboundary usage qualifies as legitimate incremental expenditures (0).	.10	.10 [GEF]
D. Transboundary Solid Waste Management	Inasmuch as this component seeks to control transboundary solid waste contamination of the Gulf's coral reefs and marine environment, the Government cannot adequately address this issue in the absence of regional commitment for, and coordination of, a transboundary solid waste management plan, as proposed under this component (0).	.15	.15 [GEF]
E. Marine Park	This component will be undertaken within a tri-partite collaborative framework among Egypt, Israel and Jordan. The close geographic proximity of the three countries, the concentration of their industrial and urban developments at the head of the Gulf where the Marine Parks are located, and the globally significant nature of the coral reefs make this component a legitimate incremental expenditure (0).	1.08	.810 [EU .03; US .24]
F. Industrial Pollution Control	The Government has committed $1.4 to reduce phosphate dust pollution negatively affecting water quality. (1.4)	1.40	0
G. Contingencies	Contingencies for Government and other donor-financed component costs have been included in the respective component cost calculations. GEF cost contingencies are provided for separately.	.25	.25 [GEF]
Total	**(2.2)**	**12.67**	**10.47 [GEF 2.7; EU 1.93; Japan 5.6; US .24]**

ATTACHMENT C

GULF OF AQABA ENVIRONMENTAL ACTION PLAN

KEY MONITORING INDICATORS

Table A. Project Implementation Plan Indicators

Project Component	End of Year 1	End of Year 2	End of Year 3
A. Institutional and Regulatory Framework	(i) 100% of project staff hired (ii) initiation of Environment Unit mandate (iii)development of collaborative mechanisms for Gulf-wide cooperation on environmental issues (iv) 100% of all implementation activities initiated (v) draft recurrent cost recovery plan	(i) 100% of all equipment delivered (ii) fully operating environment unit (iii)decisions on recommendations of all studies and implementation initiation of action plans, including regulation enforcement (iv)final recurrent cost recovery plan (v) review of Gulf-wide collaborative mechanisms	(i) 100% of staff and equipment functional (ii) full performance of Environment Unit (iii)recurrent cost recovery plan adoption (iv)definition of collaborative guidelines
B. Oil Spill Measures and Waste Oil Recovery	Preparation of action plans	Initiation of implementation	Completion of all activities
C. Transboundary Groundwater Protection	Preparation of Water Quality Assessment	Initiation of water quality monitoring	Completion of all activities
D. Transboundary Solid Waste Management	Preparation of action plans	Initiation of pilot activities	Completion of all activities
E. Marine Park and Protection of Coral Reefs	(i) official designation, by-laws and regulations (ii) initiation for all activities and equipment	(i) 100% of equipment delivered (ii) initiation of construction of park infrastructure (iii) draft sustainability plan	(i) completion of all activities and construction (ii) sustainability plan submitted

Table B: Performance Monitoring Indicators

Project Component	Input	Output	Outcome	Impact
A. Institutional and Regulatory Framework	Capacity building (staffed environment unit) and environmental regulations	Adoption and implementation of land uses and performance standards for sources of pollution	Enforcement and policing actions; transboundary cooperation	Preservation and improvement of CZM,coral reefs and marine water quality (standards met for nutrients, coliform, suspended solids, thermal and sediment contaminants content)
B. Oil Spill Measures and Waste Oil Recovery	Measures for environmentally sound management of ship operations and road transport	Plans for reduced risk of catastrophic oil spills and for waste oil recovery	Demonstration actions for waste oil recovery	Reduced oil spill risks, reduced oil and ballast water discharges reduced waste oil discharges
C. Transboundary Groundwater Protection	Assessment of the quality of the groundwater around the transboundary periphery of the wastewater treatment plant including data sharing and field measurement	Transboundary groundwater quality monitoring plan	First phase groundwater assessment including definition of shallow groundwater contamination	Improved transboundary cooperation; groundwater issues defined as supported by data collection monitoring
D. Transboundary Solid Waste Management	Strategy	Plans for land based and ship based solid waste management	Demonstration actions for litter control, collection and landfill management	Reduced visible surface (land and marine) and underwater wastes
E. Protection of Coral Reefs	Staff and equipment; marine park boundaries, zoning, and regulations; visitor center	Marine park management plan and public awareness plans; permitting, policing and enforcement actions	Fully operating marine park	Maintenance or improvement of coral reefs; maintenance or improvement of biological diversity

ATTACHMENT D

GULF OF AQABA ENVIRONMENTAL ACTION PLAN

IMPLEMENTATION ACTIVITIES

Terms of Reference

I. Role and Activities of the Environment Unit

A. The Environment Unit would be strengthened with environmental specialists with technical background and experience in environmental coastal zone management issues (including land and sea uses, planning and EIAs) and industrial and port pollution. Training for specific requirements to fulfill the Unit's role will be provided. ARA Environment Unit's role and activities are detailed below.

B. **Role.** The principal role of the unit would be to guide the ARA in addressing environmental concerns in land and marine allocations, and investment decisions. Hence, the unit would set general environmental objectives and requirements, and implement the environmental action plan while ensuring public participation. In undertaking this role, the Environment Unit will give priority attention to:

(a) defining the environmental goals for the Aqaba region, and adopting policies and guidelines for environmentally sound development of the coastal and marine areas;

(b) ensuring overall coordination with other institutions on environmental matters; and

(c) defining, developing, and implementing regional collaboration activities in close consultation with neighboring countries.

C. **Activities** to be undertaken by the unit will be detailed, and responsibilities and mechanisms for implementation will be devised. They include:

(a) in view of proposed developments and their likely impact on the environment, review of the Aqaba master plan for the development of tourism, industrial and associated activities (in particular, the South Coast Tourist Area, Aqaba Master Plan). Specific areas and zones (including: the three coral reef reserves of the southwest coast; the Aqaba fortress, Eyla city and other archeological sites; and the Wadi Rum Reserve) should be designated as sensitive and requiring higher levels of regulation and protection; the assessment phase of this work has been completed with PPA financing;

(b) assigning environmental requirements and guidelines for development of each land and marine (e.g., shipping lanes, coral reserves) use zones of the "Aqaba Town Land Use and Transportation Context Plan" with a regional focus;

(c) updating (relaxing or tightening) environmental protection regulations as required following review of the plans and options for development;

(d) ensuring enforcement of the environmental criteria, standards and regulations for each terrestrial and marine zone;

(e) implementing environmental impact assessments procedures for all development projects, review of EIAs, and issuance of permits in close collaboration with neighboring countries;

(f) monitoring environmental audits, to be conducted in accordance with EU procedures, by the power plant and other large industries (at present, the JPMC fertilizer plant is the only industry which monitors environmental impacts). The audits should include provision for monitoring of sources of significant pollution production and should specify the control measures to be implemented;

(g) establishing revenue generating mechanisms (e.g. special assessment or impact fees levied by ARA on new construction in the coastal zone, solid waste, emissions, service and user charges, bed tax and concessions for activities such as diving) that will ensure adequate long term funding for the Environmental Unit, and possibly also could cover the cost of environmental maintenance of beaches and coral reef reserves, etc.; and

(h) devising an air quality management strategy and provisions for implementation including design of an air quality monitoring program in collaboration with RSS;

(i) identifying and quantifying point and non-point sources of nutrients to the Gulf. Preparation of a costed sea water quality management and implementation strategy including regional program elements for water quality monitoring;

(j) ensuring the implementation of water and air quality monitoring programs with a regional focus;

(k) increasing public awareness by provision of full information on the status of the Aqaba environment, including air and water quality, and the diversity of coral reef ecosystems; and

(l) in collaboration with the ad hoc committee: (i) assessing the role of the institutions involved in environmental matters; and (ii) designing and implementing clear coordination mechanisms, with appropriate enforcement authority, so as to avoid duplication of responsibilities.

II. Activities to be Implemented under the GEF Project

COMPONENT A. DEVELOPMENT OF A REGULATORY & INSTITUTIONAL FRAMEWORK FOR GULF OF AQABA ENVIRONMENTAL PROTECTION

Activity A #1: Development of collaborative mechanisms for transboundary cooperation and consultation in addressing Gulf of Aqaba environmental protection. Collaborative mechanisms will be developed for region-wide consultation and cooperation in addressing priority areas of environmental concern. The mechanisms will address options for establishing specialized committees to promote

dialogue on particular issues (e.g. land-based industrial pollution concerns; sewage and solid waste management; marine vessel pollution prevention; environmental performance of port operations; environmental data-sharing). Included would be mechanisms for organizing regional workshops on priority policy areas (e.g. environmental impact assessment, industrial pollution monitoring, marine vessel pollution prevention, fisheries management) and for implementing transboundary scientific research projects on issues pertaining to coral reef ecology, fisheries management, and terrestrial flora and fauna.

Activity A #2a: Implementation plan for industrial pollution monitoring and abatement. An integrated, cross-media approach will be undertaken to minimize pollution loads to the Gulf of Aqaba region, including prevention of accidental/catastrophic events. Pollution prevention measures will be discussed directly with industries and the financial feasibility of specific technology options will be examined. A key feature of the industrial pollution monitoring and abatement plan will be the introduction of the "polluter pays" principle to industrial discharge sampling and monitoring functions.

Activity A #2b: Development of marine vessel pollution prevention and control standards and regulations. Pollution prevention and control standards for marine vessels, consistent with the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78), will be developed under this task. Jordan, now a signatory to MARPOL 73/78, is expected to ratify the Convention and certain key Annexes to the Convention during 1996. To meet its obligations as a MARPOL Party, Jordan may be expected to develop regulations for marine vessel management of oily waste (bilge and ballast water and tank washings), noxious liquid substances, solid waste, and possibly sewage. A study will be conducted to examine the nature of the Kingdom's obligations under MARPOL, with specific attention to the introduction and implementation of ship record-keeping and reporting requirements, port inspection functions, and port reception facility needs.

Activity A #2c: **Training in implementation of Gulf of Aqaba environmental protection policies and regulations.** A carefully targeted training program will be developed to strengthen Jordanian and regional capacity to address key Gulf of Aqaba environmental protection concerns. Within Jordan, priority will be given to training staff that promote the full and effective implementation of industrial pollution prevention standards and permitting procedures, CZM and EIA guidelines, and Marine Park regulations developed under the project. Special region-wide training efforts will also be carried out, focusing on skill-building and institutional strengthening in areas of shared policy concern. Training initiatives may consist of one or more of the following:

- Twinning arrangements to provide on-site instruction and supervision by an outside consultant in particular areas (e.g., water discharge sampling and monitoring techniques, computer database development, marine vessel inspection, marine park management);

- Workshop training in particular areas (e.g. environmental auditing, management skills, enforcement training); and

- Site visits and/or apprenticeships in relevant agencies outside Jordan (e.g. park management authorities, environmental protection agencies).

Training coordination efforts will make maximum use of expertise through grants, apprenticeship opportunities, and workshop resources made available by bilateral donor agencies (e.g. USAID, CIDA, GTZ), specialized international agencies (e.g. International Maritime Organization), and non-governmental organizations (e.g. International Union for the Conservation of Nature).

Activity A #3: Implementation guidance for CZM and EIA/permitting procedures. Building upon the preparatory studies and draft CZM and EIA procedures and the proposed industrial pollution prevention regulations developed with PPA funding, the ARA will develop and implement guidelines to supplement the existing requirements of governmental bodies at the national, regional and local levels. Provisions will be made for the full coordination of responsibilities assigned to the ARA with the existing and anticipated functions of national authorities (e.g. Ministry of Planning, Ministry of Municipal, Rural Affairs and Environment, Ministry of Industry and Trade, and the General Corporation for Environmental Protection, to be established pursuant to Jordan's newly enacted general environmental law) and key local entities (e.g., Municipality of Aqaba, the Ports Corporation). Key features of this implementation guidance will be:

- **Development and adoption of a statutory coastal zone management map, compatible with CZM regulations developed with PPA funding.** To make CZM regulations operable as applied to individual development activities in the Aqaba coastal zone, boundaries of coastal sub-zones (marine waters, beach, backshore, upland, etc.) must be established through an official CZM map. Preparation of this map will rely largely on existing topographical and planning maps presently available at the ARA.

- **Action plan for implementing a permit-based regulatory structure for Aqaba region industries and coastal development projects.** Drawing upon the draft pollution prevention regulations for Aqaba region industries prepared with PPA funding, an action plan will be developed for establishing a permit-based system of environmental regulation for industries and major development projects in the Aqaba region. Pilot efforts will be targeted at enforcement of pollution prevention regulations applicable to selected major industries in the Aqaba region. Consultations between Jordan and neighboring Gulf of Aqaba-bordering states will be undertaken, toward the goal of harmonizing pollution prevention regulations among the neighboring states. Regional counterpart agencies will include the Egyptian Environmental Affairs Agency, the Israeli Ministry of Environment, and Saudi Arabia's Meteorological and Environmental Protection Agency (MEPA).

- **Project-specific EIA requirements and EIS review**. The EIA procedures for the ARA developed with PPA funding will need to be supplemented by guidance as to the application of those procedures to specific projects or categories of projects. This guidance will be undertaken in the early stage of the GEF project, with priority given to identified high-impact activities. Outside expertise may also be required to assist the ARA in reviewing environmental impact statements prepared during the early phase of EIA implementation. Under this task, outside experts in the natural sciences, engineering, economics, or other related disciplines may be hired on a project-specific basis.

Activity A #4a: Marine Water Quality Monitoring. A program for monitoring the Gulf's waters will be designed by the Environment Unit in collaboration with MSS and implemented by MSS. The framework for a marine water quality monitoring program is presented in Annex 9 of the October 1993 green cover report: "Gulf of Aqaba Environmental Action Plan-Jordan". Its objectives are to assess the current water quality, and to establish measures to maintain and improve water quality. The monitoring program should include baseline monitoring of the water quality once a month at selected localities along the coast (including bathing areas) and from the offshore oceanic waters, so as to assess the horizontal and vertical distribution and movement of nutrients, inorganic components, algae, and oxygen, salinity, etc. The program would include monitoring water, currents and circulation. This could involve the use of tracer techniques to analyze the dispersion characteristics in the Gulf. Equipment purchases to implement the monitoring program will be based at MSS. Equipment shall only be recommended where a sustained demand for sampling/monitoring functions justifies the expenditure. The equipment is listed in Attachment G. The monitoring program will be coordinated with other riparian countries monitoring activities.

An outline of priority research activities, which will provide ARA with understanding of critical and essential environmental and ecological processes, will be prepared. Design of the research program must be guided by the need for solutions to existing and foreseen problems. Consequently, design and subsequent review of the applied research program must be directed by specialists directly involved in formulation and implementation of program actions. Research topics are likely to include:

(a) assessment of the causes of atypical filamentous algal growth on the reefs and of unseasonal algal blooms;

(b) investigations of dissolution of plant available phosphate from the raw phosphate dust;

(c) assessment of status and trends of the coral reefs diversity and abundance by updating the Mahasneh 1984 Coral Reef Survey;

(d) monitoring of sedimentation levels associated with phosphate loading activities, and of heavy metal and other toxic contamination of the coastal sea bed associated with the application and use of antifouling agents; and

(e) applied research in coral reef ecological systems with emphasis on demonstrating and measuring significant ecological responses to the principal anthropogenic influences.

Activity A #4b: Procurement specifications and bid evaluation assistance for computer/GIS database implementation. Under this activity, an assessment will be conducted of the information technology needs compatible with an effective pollution and environmental monitoring capability for the Aqaba region. Information technology systems will be designed specifically to promote planning, monitoring and enforcement actions to be implemented under the project. Specifications shall include the purchase and installation of appropriate hardware and software and necessary staff training in information technology applications directly applicable to the project. Competitive bids for information technology software, hardware and training will be evaluated. In addition, professional qualifications and terms of employment will be developed for database technicians, positions will be advertised, and candidates will be screened. Mechanisms for facilitating data exchange and coordinated data management between Jordan and other Gulf-bordering states will be identified as a priority feature of this activity.

COMPONENT B. MEASURES TO REDUCE THE RISK OF MAJOR OIL SPILLS AND STEPS TO PROMOTE WASTE OIL RECOVERY AND REUSE

Activity B #1: Reduction of oil spill risks through tanker safety improvements and navigational aids. Through the Upper Gulf of Aqaba Oil Spill Contingency Project (EU-Japan), significant steps have been taken to prepare for small to moderate oil spill response through the establishment (ongoing) of oil spill response centers in Nuweiba (Egypt), Eilat and Aqaba. The Contingency Project, targeting spills of up to 600 metric tons of oil, leaves unaddressed the risk of a potentially catastrophic spill (up to 150,000 metric tons) resulting from a tanker collision or grounding in the Gulf. To address this hazard, a pre-feasibility study of measures to enhance tanker safety will be conducted, examining the economic feasibility and practical benefits of electronic navigational aids, pilotage requirements for tankers operating in the Gulf, and tanker design specifications (e.g. double-hull design). Harmonization of proposed measures among Gulf-bordering states will be explored as integral to this analysis.

Activity B #2: Demonstration project in waste oil recovery. Phase one of this activity will be the preparation of an action plan for waste oil collection, recovery and reuse in the Upper Gulf of Aqaba region. Building upon consultations with the International Maritime Organization initiated with PPA funding, different technology options for collection, storage, transport and recycling of waste oil from ships will be examined. Provisions for integrating waste oil from land transport vehicles into the collection and reuse system will be introduced. The feasibility of building a coordinated (Jordan-Egypt-Israel) waste oil recovery scheme will also be assessed. Fee-based measures of cost recovery will be proposed, and sources of initial financing will be explored for a demonstration project in integrated waste oil recovery and reuse. In phase two, procurement specifications will be prepared, bids will be invited, and bid evaluations will be carried out for the demonstration project. In phase three, the demonstration project will be implemented with partial grant support from the GEF project.

COMPONENT C. SAFEGUARDING TRANSBOUNDARY GROUNDWATER RESOURCES THROUGH GROUNDWATER MONITORING AND IMPLEMENTATION OF WATER RESOURCES MANAGEMENT POLICIES IN THE GULF OF AQABA REGION

Activity C #1: Assessment and mitigation of contamination of groundwater recharge and coastal areas. Under this activity, contamination of groundwater recharge and coastal areas by sewage, waste oil and other industrial wastes will be assessed through selective soil and well sampling, and through inspected of surface and underground fuel storage tanks. In areas where waste oil or other industrial wastes are found to pose a significant hazard to aquifers or the marine environment, mitigation and remediation measures, including estimated costs, will be proposed. Pre-feasibility concepts for more effective utilization of treated sewage water will be presented, reinforcing Jordan's "no-discharge" policy regarding sewage influx into the Gulf of Aqaba. Technical and economic feasibility of sewage water reuse will be examined with respect to both the existing treatment plant and the new facility planned for Jordan's South Coast Tourism Zone.

COMPONENT D. DEVELOPMENT OF AN INTEGRATED MARINE AND LAND-BASED TRANSBOUNDARY SOLID WASTE MANAGEMENT STRATEGY

Activity D #1: Development of a solid waste collection, recycling and disposal plan for Jordan's Aqaba region. A systematic plan for solid waste collection, recycling and disposal will be developed

under this component of the project. This study will entail the preparation of a solid waste collection, recycling & disposal plan examining the financial feasibility and environmental impacts of such options as separation of compostable organic waste and recycling of plastics, paper, and metal waste. Mechanisms for safe handling, transport and disposal of medical waste will be presented in the study, and measures to ensure the segregation of hazardous wastes from the solid waste stream will be examined. Fee-based systems for cost recovery will be examined, and options for bidding out specific solid waste management functions to private contractors will be explored.

Activity D #2: Action plan for regional management of ship-generated solid waste. In phase one of this activity, an action plan to address ship-generated solid waste will be developed, and will include an evaluation of current port reception facilities and recommendations for expanded facilities and collection services, including fee-based systems for cost recovery. Options for bidding out specific functions to private contractors will be explored. Measures shall be developed to educate ships' crews and passengers against discarding solid waste overboard, and enforcement mechanisms shall be developed. Under phase two, the ARA and the Ports Corporation will work with counterparts in other Gulf-bordering states to develop and implement an effective management plan for ship-based solid waste.

COMPONENT E. PROTECTION OF GLOBALLY IMPORTANT CORAL REEFS - DEVELOPMENT AND IMPLEMENTATION OF A MANAGED RESOURCE MARINE PARK

Activity E #1: Management plan (including regulations) for Gulf of Aqaba Marine Park. Under this task, a multi-use Marine Park will be officially established in Jordan, drawing upon the guidance and recommendations made with PPA funding. Authorizing legislation will be finalized, and a management plan will be developed. This plan will include:

- specific regulations governing different user activities (e.g. motorized and non-motorized boating, diving, snorkeling, swimming, fishing, beach recreation);
- detailed specification of boundary demarcations for different user zones within the Marine Park, including design specifications and locational mapping for mooring and marker buoys, terrestrial fencing, floating platforms, reef crossovers, and informational signs;
- development of gift shop concession bidding documents;
- preliminary design specifications for Marine Park visitor facilities and staff offices;
- procurement specifications for major capital expenditures (e.g. furnishings and office equipment for visitor center and staff offices, patrol boats, 4-wheel drive land patrol vehicles);
- a detailed operating budget (itemizing projected office expenses, operation and maintenance of land and marine patrol vehicles, and building and landscape maintenance) incorporating user fees and other means of financing ongoing Marine Park operations; and
- development and implementation of a public information & awareness program. Under this element, printed information brochures for different user categories (divers & snorkelers, boaters, fishermen, sun bathers & swimmers) will be developed. Audio-visual presentations will also be prepared, for use at the Marine Park visitor center, in Aqaba area hotels, and in public school and adult educational settings.

Table D1 - Cost Estimates for Implementation Activities

Activity Number	Descriptions	Cost Estimates (US$)
A #1	Development of collaborative mechanisms for transboundary cooperation	50,000
A #2a	Implementation plan for industrial pollution monitoring	25,000
A #2b	Development of marine vessel pollution prevention and control standards and regulations	25,000
A #2c	Training in implementation of environmental protection policies and regulations	25,000
A #3	Implementation guidance for CZM and EIA/permitting procedures	70,000
A #4a	Marine water quality monitoring program design	90,000
A #4b	Procurement specifications for computer/GIS database	23,000
B #1	Reduction of catastrophic oil spill risks pre-feasibility study	35,000
B #2	Demonstration project in waste oil recovery	30,000
C #1	Assessment and mitigation of shallow groundwater contaminations	100,000
D #1	Development of regional solid waste plan	90,000
D #2	Action plan for ship-generated waste	40,000
E #1	Management plan for marine park	40,000
TOTAL		**643,000**

ATTACHMENT E

GULF OF AQABA ENVIRONMENTAL ACTION PLAN

TECHNICAL ASSISTANCE STAFF

Terms of Reference

I. Project Management Team

The Project Management Team will consist of a full-time Project Manager (technical assistance), for the three-year duration of the Project, and a Project Procurement/Disbursement Specialist on a part-time consultant basis. Both consultants will be financed by the GEF funds.

1. **Project Manager (Consultant).** The Project Manager shall have the following duties:

   - development and implementation of a management plan for all project components;
   - management of implementation activities (see Attachment D) to ensure full and timely achievement of stated tasks in accordance with defined objectives;
   - provision of specialized environmental guidance to the Environment Unit Director;
   - preparation of progress reports on Project implementation activities, in accordance with World Bank/GEF requirements;
   - refinement of job profiles, and participation in the screening and selection of personnel to be hired under the project, pursuant to procedures set forth for project oversight;
   - collaboration with the Project Procurement/Disbursement Specialist in overseeing project financing and procurement activities;
   - facilitation of GOJ contacts and communication with counterparts in Egypt and Israel;
   - planning for and oversight of training efforts targeted at providing GOJ officials, scientists and technicians with the skills and knowledge needed to perform their assigned duties under the project; and
   - collaboration with ARA Secretary General and Ministry of Planning in ensuring effective project coordination with related activities.

Necessary professional qualifications and skills of the Project Manager shall include:

- Master or PhD in management, environmental planning, and marine biology, or other relevant professional skills;
- strong executive and managerial skills, as demonstrated by 10 years' prior work experience in project management in the public or private sector;
- strong professional experience in managing international environmental protection and/or environmental development projects;
- ability to work effectively with management-level personnel and technical staff at national, regional and local government agencies and regulated enterprises in Jordan, and at counterpart agencies in Egypt and Israel; and
- English-language fluency required, including strong demonstrated oral presentation, writing and report preparation skills. Arabic proficiency desired.

2. Project Procurement/Disbursement Specialist. The Project Procurement/Disbursement Specialist shall be hired as a part-time consultant to the Project, and shall have the following duties:

- qualification of consultants, suppliers and contractors, preparation of short list for bidding, review and evaluation of bidding documents for adherence to procurement procedures;
- ensuring timely disbursement of project funds for consultants, equipment purchases, and other project-related expenditures in accordance with procurement and disbursement guidelines;
- ensuring timely preparation of financial accounting reports and replenishment applications to World Bank/GEF; and
- training of ARA Finance Department personnel in the management of project funds, including procurement procedures, payment of consultants, and World Bank/GEF financial accounting and reporting requirements.

Necessary professional qualifications and skills of the Project Procurement/Disbursement Specialist shall include:

- Certified Public Accountant or equivalent degree in administration, accounting and procurement skills;
- a minimum of 5 years' work experience in procurement and accounting, using international and local procedures; and
- fluency in written and spoken Arabic and proficiency in written and spoken English.

II. Project Technical Specialists

The Project Implementation Team shall be composed of two categories of personnel: (i) consultants to be financed by the GEF funds and seconded to positions at relevant GOJ entities; and (ii) personnel to be financed directly by the GOJ. It is expected that a core environmental management team will be maintained by the Government of Jordan following project completion.

The following positions are to be filled by full-time project consultants, to be funded by the GEF funds over a three-year period:

1. Industrial Pollution Prevention Specialist (ARA Environment Unit). Within the ARA Environment Unit, a consultant will be hired to implement pollution prevention guidelines and standards for land-based industries in the Aqaba region prepared with PPA funding. The Industrial Pollution Prevention Specialist shall have the following duties:

- supervision of task-specific implementation activities pertaining to industrial pollution prevention (see Attachment D);
- negotiation of environmental permits for Aqaba region industries;
- conducting periodic (announced and unannounced) inspections of industrial and port facilities;
- on-site sampling of industrial wastewater discharges (assisted, as necessary, by the ARA Environmental Monitoring Technician);
- review of air emissions and wastewater discharge monitoring data prepared or commissioned by facility operators;
- inspection of solid and hazardous waste management practices;
- review of industrial emergency preparedness plans;
- preparing inspection reports, including identification of regulatory violations and recommended remediatory measures;
- entering inspection report findings and recommendations into the ARA computer database;
- overseeing the preparation of industrial environmental audits consistent with the auditing procedures prepared with PPA funding; and
- assisting the ARA Environment Unit Director in consulting with counterpart officials in Egypt and Israel, to promote harmonization and cooperation in addressing industrial pollution problems affecting the Gulf of Aqaba.

Necessary professional qualifications and skills of the Industrial Pollution Prevention Specialist shall include:

- university training in chemical engineering, environmental auditing, or industrial management;

- a minimum of 3-5 years' experience in mechanical engineering and/or industrial engineering;
- demonstrated skills and prior professional experience in field sampling techniques and laboratory analysis procedures for air and water quality monitoring;
- ability to work effectively with management-level personnel and technical staff at regulated industries;
- demonstrated aptitude, or willingness to be trained, in computer database management; and
- Arabic and English-language proficiency.

2. Environmental Monitoring Technician (ARA Environment Unit). An Environmental Monitoring Technician shall be hired to assist the ARA Environment Unit's Industrial Pollution Prevention Specialist in monitoring industrial wastewater discharges and in analyzing the impacts of different substances (either from wastewater discharges or cross-media air pollution) on marine water quality. The Technician shall perform the following functions:

- sampling of marine water quality and industrial wastewater discharges, as directed by the ARA Industrial Pollution Prevention Specialist;
- ambient air quality monitoring and industrial air emissions sampling, where feasible and as directed by the ARA Industrial Pollution Prevention Specialist; and
- laboratory analysis, preparation of laboratory reports, and database entry of analysis results, where feasible.

Necessary professional qualifications and skills of the Environmental Monitoring Technician shall include:

- technical training in areas directly relevant to the Technician's specified duties;
- demonstrated skills and a minimum of 3 years' prior work experience in environmental sampling techniques and laboratory analysis procedures;
- demonstrated aptitude, or willingness to be trained, in computer database/GIS management; and
- Arabic and English-language proficiency.

3. Coastal Zone Management & EIA Specialist (ARA Environment Unit). Within the ARA Environment Unit, a consultant shall be hired to implement coastal zone management (CZM) and environmental impact assessment (EIA) guidelines applicable to coastal region development. With respect to CZM, this consultant shall perform the following functions:

- participation in the finalization of CZM guidelines, including CZM statutory map;
- assisting the ARA Environment Unit Director in establishing an inter-agency CZM advisory committee, responsible for reviewing all proposed development projects in the Aqaba coastal zone to ensure their compliance with the ARA's CZM regulations;

- serving as a technical resource to the CZM advisory committee in its review of proposed development projects;

- communication with developers (including state agencies and enterprises, company executives, architects, engineers, landscape planners) through all stages of project review, to ensure that ARA CZM regulations and any directives of the CZM advisory committee are complied with; and

- consultation with counterpart planning agencies in Egypt and Israel, in order to promote harmonization of CZM guidelines for development projects throughout the Gulf of Aqaba coastal zone.

With respect to EIA, the consultant shall perform the following functions:

- supervise implementation activities related to project-specific EIA guidelines for development projects in the Aqaba region (Attachment D);

- communication with developers (including state agencies and enterprises, company executives, architects, engineers, landscape planners) through all stages of EIA preparation and review, to ensure that ARA EIA regulations and any project-specific requirements developed for particular projects are complied with;

- assisting developers in identifying qualified experts to undertake EIA-related studies or assignments;

- assisting the ARA Environment Unit Director in providing input and guidance to developers during the scoping stage and subsequent EIS review stage for all development projects that are subject to EIA; and

- assisting the ARA Environment Unit Director in consultations with counterpart planning agencies in Egypt and Israel, in order to promote harmonization of EIA procedures and cooperation in EIA preparation and review of all development projects with potentially significant transboundary environmental impacts in the Aqaba region.

Necessary professional qualifications and skills of the CZM/EIA Specialist shall include:

- university training in environmental management, natural sciences, economics, engineering, architecture, urban and regional planning, or other pertinent field(s);

- a minimum of 3-5 years' work experience in management, planning, design or another professional occupation with application to CZM and EIA implementation;

- ability to work effectively with business leaders as well as professionals in the engineering, planning and design professions; and

- Arabic and English-language proficiency.

4. ARA Environment Unit Computer & GIS Programmer. The ARA Environment Unit Computer & GIS Programmer shall perform the following functions:

- full operation of GIS system, including data entry and retrieval;
- management of all computer data functions of the ARA Environment Unit, including entry and retrieval of data on environmental audit findings, industrial wastewater discharges, marine water quality, air emissions, and ambient air quality in the Aqaba coastal zone; and
- training of ARA, Ports Corporation and Marine Science Station personnel in computer database skills pertaining to their particular job functions.

Necessary professional qualifications and skills of the Computer & GIS Programmer shall include:

- university training in computer programming, database management, or related skills;
- a minimum of 3-5 years' work experience in computer programming or database management;
- ability to work effectively with ARA Environment Unit administrative and technical personnel;
- demonstrated ability to teach technical applications related to computer programming and database management; and
- Arabic and English-language proficiency.

5. Marine Park Manager. A core management team for the Marine Park will be established. Heading this team will be the Marine Park Manager, who shall have the following duties:

- overall management of the protected area and of Marine Park team including facilitation of local consultation for the development and implementation of the management plan;
- implementation of Marine Park regulations and preparation of supplemental, user-specific regulations pertaining to diving activities, fishing, boating, etc.;
- oversight of construction and maintenance of Marine Park visitor and staff facilities, and of purchase and maintenance of marine and land patrol equipment;
- supervision of Marine Park wardens and other Marine Park staff, including organization of training for Marine Park staff;
- direction of Marine Park visitor information and public awareness activities;
- representation of the Marine Park at official meetings, including consultations with regional counterparts in Egypt and Israel; and
- management of Marine Park budget and finances.

Necessary professional qualifications and skills of the Marine Park Manager shall include:

- Master or Ph.D in protected area management, marine biology, marine ecology, or other field directly relevant to marine protected area management;
- prior full-time employment in park management, or a related area;
- demonstrated ability or aptitude for financial and administrative management;
- ability to work effectively with top management in the private and public sectors, as well as with technical personnel within the MSS, the ARA, the Ports Corporation, and other relevant agencies;
- ability and commitment to maintaining a strong "field" presence, including Marine Park patrolling and enforcement actions and communication with Marine Park users (e.g. hotel managers, recreational boaters, dive shop operators, tourists), ARA Environment Unit administrative and technical personnel;
- certification as a life guard and certified training in emergency medical assistance; and
- Arabic and English-language proficiency.

6. Marine Park Wardens (2 positions). Two Marine Park Wardens will be hired as assistants to the Marine Park Manager, and shall have the following duties:

- visitor orientation at Marine Park facilities;
- terrestrial and marine patrolling of Marine Park, including active enforcement of Marine Park regulations;
- regular communication with identified user constituencies (dive center operators, snorkelers and swimmers, boaters, fishermen);
- public education through lectures, brochures, and radio/TV announcements; and
- park maintenance oversight.

Necessary professional qualifications and skills of Marine Park Wardens shall include:

- training in marine biology, marine ecology, or other field directly relevant to marine protected area management;
- strong interpersonal communication skills;
- ability and commitment to maintaining a strong "field" presence through direct contact and communication with Marine Park users (e.g. hotel managers, recreational boaters, dive shop operators, tourists);

- certification as a life guard and certified training in emergency medical assistance; and
- Arabic and English-language proficiency.

III. Staff Positions to be Financed by the Government of Jordan

It is expected that the Government of Jordan (ARA, Ports Corporation) will provide full funding and overhead for the following positions, as counterparts to project implementation team members hired under II, above.

1. ARA Environment Unit Director. Within the ARA Environment Unit, a new position will be established for a Unit Director, who shall have the following duties:

- development and implementation of a management plan for all project components;
- oversight of all activities assigned to the ARA Environment Unit (e.g. industrial pollution prevention and industrial environmental auditing; emergency oil and chemical accident preparedness and response; waste oil collection, recycling and reuse; implementation of coastal zone management guidelines and EIA procedures; solid waste management; and marine protected area management);
- periodic reportage on the ARA Environment Unit's areas of responsibility to the ARA President, Secretary General and Board of Governors; and
- development and oversight of joint projects with regional counterparts (Egypt and Israel) on such matters as:
    - harmonization of environmental protection policies and pollution prevention standards;
    - establishment of cooperative environmental monitoring networks, including computer data-sharing and computer linkages;
    - joint research projects on marine and terrestrial ecology;
    - coordinated regional management of solid waste, waste oil, marine protected areas, and emergency preparedness; and
    - joint training workshops on priority policy or technical subjects (e.g. environmental impact assessment, industrial pollution monitoring, marine vessel pollution prevention; fisheries management).

Necessary professional qualifications and skills of the ARA Environment Unit Director shall include:

- Master or Ph.D in environmental or natural sciences management;
- prior managerial experience (public or private sector);

- ability to work effectively with management-level personnel and technical staff at national, regional and local government agencies and regulated enterprises in Jordan, and at counterpart agencies in Egypt and Israel; and

- Arabic and English-language proficiency (written and spoken).

2. ARA Environment Unit Marine Chemist and Civil Engineer. The Marine Chemist and Civil Engineer currently assigned to the ARA Environment Unit will be made available to the Project by the GOJ, with job descriptions to be developed by the ARA Environment Unit Director.

3. Marine Vessel Pollution Prevention Specialist (Ports Corporation Marine Inspectorate). Within the Ports Corporation's Marine Inspectorate, a qualified official will be trained to serve as a Marine Vessel Pollution Prevention Specialist, with the following duties:

- conducting regular (announced and unannounced) inspections of marine vessels operating in Jordanian waters or harbored at Jordanian port facilities;

- taking samples of marine vessel discharges, bilge and ballast water, and potentially harmful liquid, packaged or containerized substances to detect or prevent violations of marine vessel pollution control and pollution prevention regulations;

- preparing inspection reports, including identification of regulatory violations and recommended remediatory or enforcement measures;

- entering inspection report findings and recommendations into a Ports Corporation computer database;

- preparing periodic reports on marine vessel performance, based on inspection reports and any enforcement actions taken, for submission to the ARA Environment Unit Director;

- consulting with MARPOL implementation officers at the International Maritime Organization (which serves as the MARPOL secretariat), to promote full Jordanian compliance with its obligations under the treaty; and

- consulting with counterpart officials in Egypt and Israel, to promote harmonization and cooperation in addressing marine vessel-based pollution problems affecting the Gulf of Aqaba.

Necessary professional qualifications and skills of the Marine Vessel Pollution Prevention Specialist shall include:

- university training in naval engineering, chemical engineering, or marine biology; or prior work experience as an engineer on board a cargo or naval vessel;

- willingness to maintain an active "field" presence in fulfilling the duties outlined above;

- ability to work effectively with ship owners, operators and crew;

- demonstrated aptitude, or willingness to be trained, in computer database management; and

- Arabic and English-language proficiency.

Additional relevant skills include prior work experience as captain or crew member on a cargo or naval vessel; prior work experience in a management position at the Ports Corporation; or managerial experience in a government agency or the industrial sector.

4. Two bilingual secretaries (ARA Environment Unit). Two full-time bilingual secretaries shall be financed by the GOJ, one to be assigned to the Environment Unit Director, the other to be assigned to the Environment Unit's Marine Park division. They shall have the following professional skills and qualifications:

- a high level of proficiency in computer word-processing skills, in both Arabic and English;
- proficiency in the generation of computer graphics for inclusion in technical reports; and
- strong oral communication skills in both Arabic and English.

5. Marine Park Rangers (2 positions). After-hours protection of Marine Park facilities will be provided by two guards, to be financed by the GOJ.

6. Two drivers (ARA Environment Unit). Two full-time drivers shall be financed by the GOJ for assignment to the ARA Environment Unit.

Table E1: Costs for Consultant Staff

Position	Funding	Duration	Cost ($)
ARA Env. Unit Industrial Pollution Prevention Specialist	GEF	3 years	36,000
ARA Env. Dept CZM\EIA Specialist	GEF	3 years	36,000
ARA Env. Unit Computer\GIS Specialist	GEF	3 years	36,000
ARA Env. Unit Marine Park Manager	GEF	3 Years	54,000
ARA Env. Unit Env. Monitoring Technician	GEF	3 years	22,000
ARA Env. Unit Marine Park Wardens (2)	GEF	2 x 3 years	44,000
Project Manager	GEF	3 years	300,000
Project Procurement/Disbursement Specialist	GEF	52 weeks (part-time status)	40,000
Consultant Services	GEF	3 years	150,000
Total:			**718,000**

Table E2: Costs Financed by The Government of Jordan

Description	Funding	Duration	Costs ($)
Environment Unit Director	Government of Jordan	1 x 3 years	72,000
Environment Unit Technical and Administrative Staff (5) Marine Chemist, Civil Engineer, Computer Engineer, Accountants (2))	Government of Jordan	5 x 3 years	108,000
Environment Unit and Marine Park Bilingual Secretaries (2)	Government of Jordan	2 x 3 years	31,000
Marine Park Rangers (2)	Government of Jordan	2 x 3 years	31,000
Environment Unit Drivers (3)	Government of Jordan	3 x 3 years	47,000
Port Corporation Marine Vessel Pollution Prevention Specialist	Government of Jordan	1 x 3 years	25,000
Environmental Studies	Government of Jordan	3 years	107,000
Marine Park Infrastructure	Government of Jordan	1 year	142,000
Vehicle (1)	Government of Jordan	1 year	50,000
Operation and Maintenance for 3 Vehicles	Government of Jordan	3 x 3 years	75,000
Office Services and Office Equipment	Government of Jordan	3 years	82,000
Office Space	Government of Jordan	3 years	30,000
Total:			**800,000**

ATTACHMENT F

JORDAN

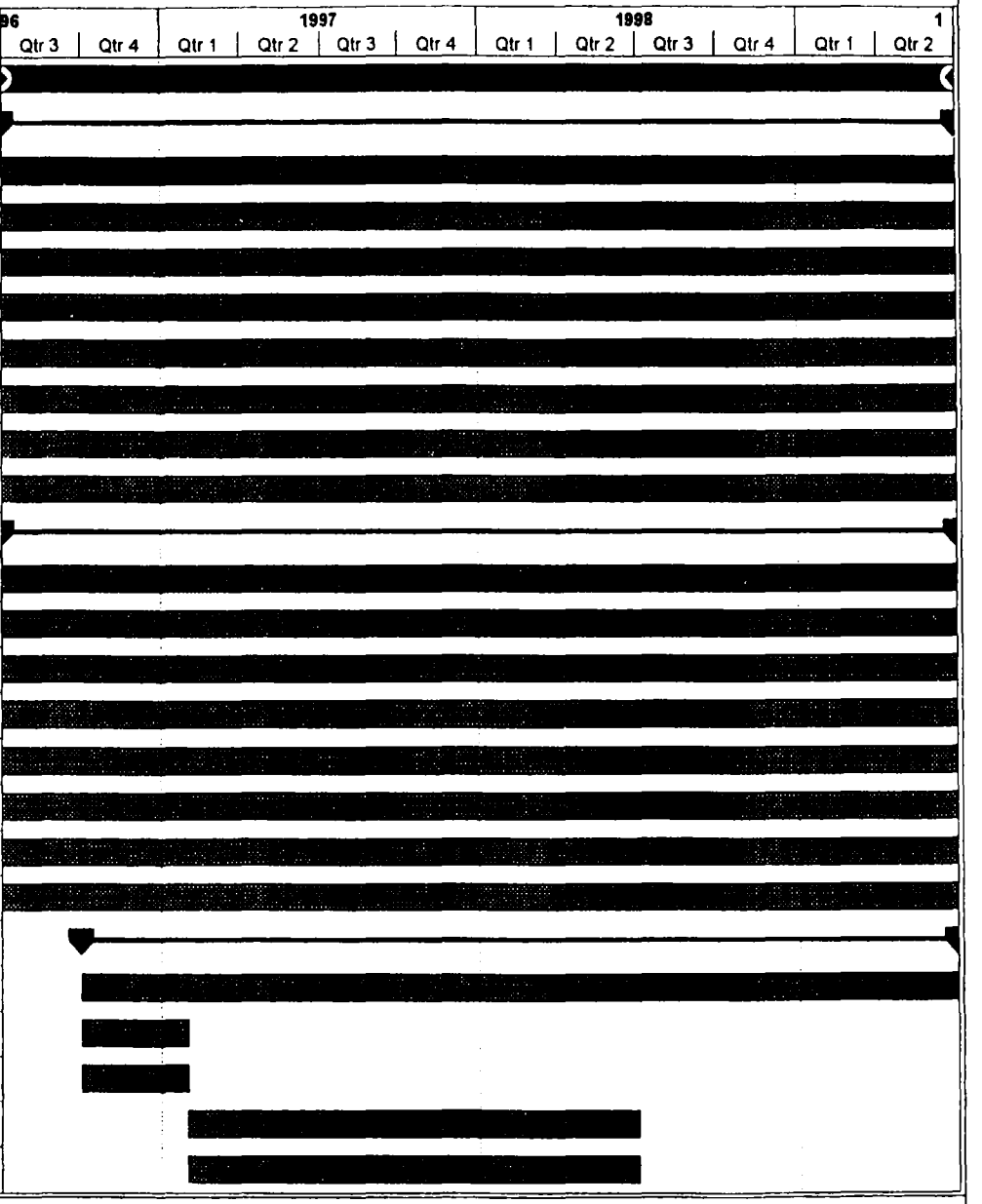
GULF OF AQABA ENVIRONMENTAL ACTION PLAN

IMPLEMENTATION: KEY ACTIVITIES SCHEDULE

1

JORDAN: Gulf of Aqaba Environmental Action Plan

ID	Task Name	Duration	Start	Finish
1	**A. INSTITUTIONAL**	**783d**	**7/1/96**	**6/30/99**
2	**Project Staff**	**783d**	**7/1/96**	**6/30/99**
3	Industrial Pollution Spec.	783d	7/1/96	6/30/99
4	CZM\EIA Specialist	783d	7/1/96	6/30/99
5	Computer\GIS Specialist	783d	7/1/96	6/30/99
6	MP Manager	783d	7/1/96	6/30/99
7	MP Wardens (2)	783d	7/1/96	6/30/99
8	Project Manager	783d	7/1/96	6/30/99
9	Procure\Disburse Spec	783d	7/1/96	6/30/99
10	Consultant Services	783d	7/1/96	6/30/99
11	**Government Staff**	**783d**	**7/1/96**	**6/30/99**
12	Env. Unit Director	783d	7/1/96	6/30/99
13	Marine Chemist	783d	7/1/96	6/30/99
14	Civil Engineer	783d	7/1/96	6/30/99
15	Computer Engineer	783d	7/1/96	6/30/99
16	Accountants (2)	783d	7/1/96	6/30/99
17	Secretaries (2)	783d	7/1/96	6/30/99
18	MP Rangers (2)	783d	7/1/96	6/30/99
19	Drivers (3)	783d	7/1/96	6/30/99
20	**Institutional Activities**	**717d**	**10/1/96**	**6/30/99**
21	A #1:	717d	10/1/96	6/30/99
22	A #2a:	89d	10/1/96	1/31/97
23	A #2b:	89d	10/1/96	1/31/97
24	A#2c:	368d	1/31/97	6/30/98
25	A #3:	368d	1/31/97	6/30/98



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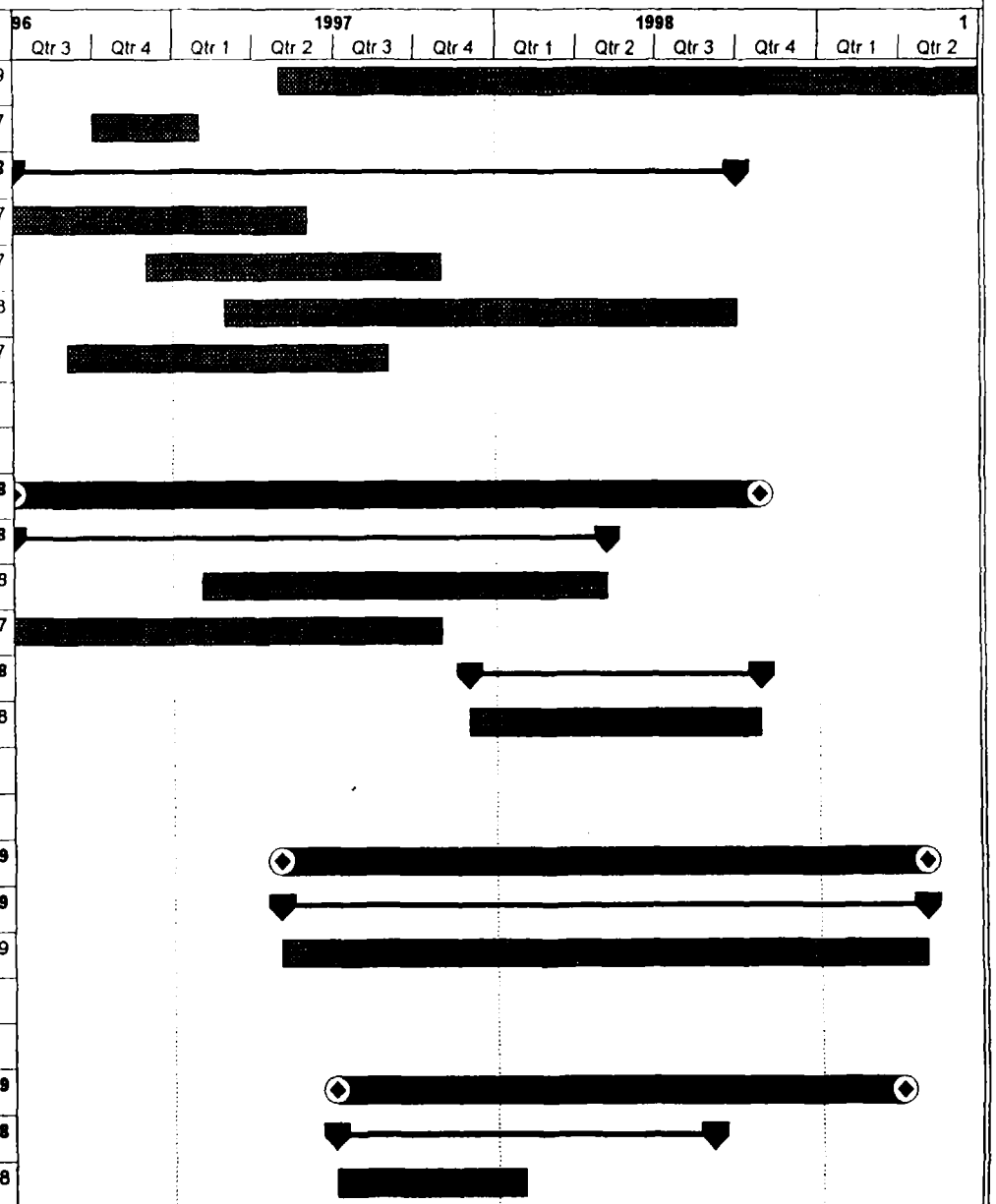
2

JORDAN: Gulf of Aqaba Environmental Action Plan

ID	Task Name	Duration	Start	Finish
26	A #4a:	565d	5/1/97	6/30/99
27	A #4b:	89d	10/1/96	1/31/97
28	**Institutional Goods**	**589d**	**7/1/96**	**10/1/98**
29	Office Equipment	240d	7/1/96	5/30/97
30	Vehicles	240d	12/2/96	10/31/97
31	GIS System	415d	2/28/97	10/1/98
32	Laboratory Equipment	261d	9/2/96	9/1/97
33				
34				
35	**B. OIL POLLUTION**	**607d**	**7/1/96**	**10/27/98**
36	**Oil Pollution Activites**	**482d**	**7/1/96**	**5/5/98**
37	B #1:	327d	2/3/97	5/5/98
38	B #2:	349d	7/1/96	10/30/97
39	**Waste Oil Recovery**	**237d**	**12/1/97**	**10/27/98**
40	Pilot Equipment	237d	12/1/97	10/27/98
41				
42				
43	**C. GROUNDWATER**	**522d**	**5/1/97**	**4/30/99**
44	**Groundwater Activities**	**522d**	**5/1/97**	**4/30/99**
45	C #1:	522d	5/1/97	4/30/99
46				
47				
48	**D.SOLID WASTE**	**458d**	**7/1/97**	**4/1/99**
49	**Solid Waste Activities**	**306d**	**7/1/97**	**9/1/98**
50	D #1:	154d	7/1/97	1/30/98



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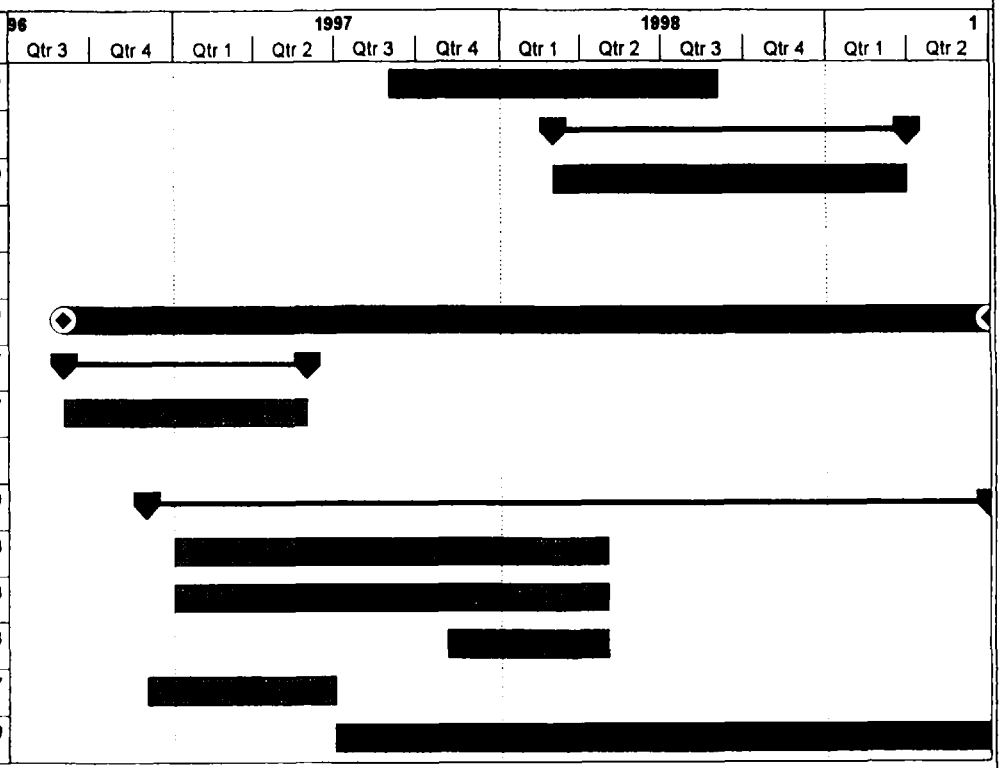
3 JORDAN: Gulf of Aqaba Environmental Action Plan

ID	Task Name	Duration	Start	Finish
51	D #2:	262d	9/1/97	9/1/98
52	**Solid Waste Goods**	**284d**	**3/2/98**	**4/1/99**
53	Pilot Equipment	284d	3/2/98	4/1/99
54				
55				
56	**E.MARINE PARK**	**738d**	**9/2/96**	**6/30/99**
57	**Marine Park Activities**	**195d**	**9/2/96**	**5/30/97**
58	E #1	195d	9/2/96	5/30/97
59				
60	**MP Works\Goods**	**673d**	**12/2/96**	**6/30/99**
61	MP Building	348d	1/1/97	5/1/98
62	MP Infrastructure	348d	1/1/97	5/1/98
63	MP Office Equipment	130d	11/3/97	5/1/98
64	MP Mobile Equipment	152d	12/2/96	7/1/97
65	MP O&M Costs	522d	7/1/97	6/30/99



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ATTACHMENT G

GULF OF AQABA ENVIRONMENTAL ACTION PLAN

EQUIPMENT AND PHYSICAL WORKS

COMPONENT A. DEVELOPMENT OF A REGULATORY AND INSTITUTIONAL FRAMEWORK FOR GULF OF AQABA ENVIRONMENTAL PROTECTION

COMPONENT A(i): Office Equipment and Vehicles for ARA Unit

Description	Unit	Price	Cost (US$)
Basic computer system based on: IBM compatible 486/mhz, 8MB Ram 3.5" floppy disk drive, 850MB capacity Super VGA Graphics Card Keyboard & mouse Operating system: DOS 6.22/Windows 3.11 or Windows 95	4	1,500	6,000
CD-ROM computer system: IBM compatible mhz Pentium CPU, 8MB Ram 3.5" floppy disk drive, 850MB capacity CD ROM drive Super VGA Graphics Card Keyboard & mouse Operating system: DOS 6.22/Windows 3.11 or Windows 95	1	2,500	2,500
Monitors: Color SVGA	4	300	1,200
Printer: Black and white laser printer, 4 MB RAM	1	2,000	2,000
Software: Microsoft office packages with Arabic and English	5	400	2,000
Fax Machine:	1	300	300
Vehicles: Four-wheel drive pick-up trucks	2	40,000	80,000
TOTAL:			**94,000**

COMPONENT A(iv): Transboundary Environmental Management **Geographic Information System (GIS) / Data Management System**	**(US$)**
Basic computer system based on high performance SCSI Data Bus:	
IBM compatible 133Mhz Pentium CPU, PCI mainboard, 32MB Ram	
3.5" floppy disk drive, 2Gbyte capacity wide-SCSI hard disk, SCSI-CD-Rom drive	
4 serial & 2 parallel ports	
2MB Ram Super VGA Graphics Card, 1280x1024 pixels res., 72hz refresh rate	
Keyboard & 3 button Logitech mouse	
Operating system: DOS 6.22/Windows 3.11 or Windows 95	7,000
Backup system (SCSI 1Gbyte changeable hard disk system, inc. 10 cartridges)	3,700
Monitor (20", 1280x1024 pixels at 72hz refresh rate)	3,500
Plotter & Printer	
Color inkjet plotter, 600dpi, single sheet, inc. standard printing software	7,500
Black & white laser printer with 4MB Ram	1,600
Plotter software (to print ENVI Vector information on color plotter)	1,000
GPS data logger	2,900
Graphical data presentation software	800
Scanner (1200dpi inc. scan software)	2,000
Digitizer	3,500
Interface Software to use digitizer under ENVI	1,000
Power Supply (uninterruptible power supply, 1200W, 20min. battery power supply)	1,200
GIS Software	
ENVI 2.0 GIS Software for image processing, image overlay & vector overlay running on Windows 3.1 and Windows 95	8,000
Satellite Images (Jordan coastline)	
7 band Landsat Thematic Mapper, 30x30m resolution,	
Full scene 173x183km	5,500
Quarter scene 95x88km	3,900
1 ban Spot Pan panchromatic, 10x10m resolution, 60x60km	4,100
Export handling & shipping of complete system	1,800
Installation & Initial Training (2 weeks)	
Installation of GIS computer system in Jordan	
Basic training for local staff on hardware & operating system	
Consulting services inc. fees, accommodation, transport & expenses	8,000

Supplemental GIS training and/or training with ENVI specialist	8,000
Replacement parts & service (3 years at $5,000.00 per year)	15,000.00
TOTAL	**90,000**

COMPONENT A(iv): Transboundary Environmental Management
Marine Water Quality Monitoring Equipment to be based at MSS

Nutrient Monitoring (phosphates, nitrogen, ammonia)

Analytical balance (digital, 6 decimals)	3,000
Multi-purpose pH meter	1,000
Portable dissolved oxygen meter for sea water	1,000
Water samplers, Nishken type with thermometer	1,000
Auto-analyzer for nutrients, phenol, cyanide, etc. and all accessories	3,000
COD analyzer	10,000

Bathing Water Quality Monitoring (pathogenic coliforms)

Bacterial colony counters (2)	2,000
BOD incubator	5,000
Hood (sterilized) for bacteriological analyses	8,000
Autoclave	2,000
Bacteriological water sampler	2,000
Centrifuge	3,000

Phosphate Dust and Sediment Monitoring

Marine compass and global positioning system instrument	2,000
Echo sounder and/or depth indicator	2,000
Turbidity meter in-situ with probe	3,000
Submarine photometer	1,000
STD with salinity range of 0-70%, and related probes	15,000
Tide gauge	1,000
Outboard motors (2 x 65 HP)	35,000
Set of light measuring equipment	8,000
Conductivity meter	2,000

Petroleum Hydrocarbon Monitoring

Still and video monitoring equipment	3,000
Cellular telephone	1,000
Fluorimeter, digital with all accessories	5,000
Gas chromatograph, with all accessories and spares	40,000

Thermal and Coral Reef Monitoring

Biological field sampling equipment	3,000
Computer hardware, software, and printer	3,000
Underwater still camera	3,000
Underwater video camera	2,000
TOTAL	**200,000**

COMPONENT B: OIL POLLUTION HAZARDS
Demonstration Project in Waste Oil Recovery

Collection equipment (pumps, barrels, reservoirs, adsorbent materials, piping etc.)	15,000
Transfer / temporary storage facilities (above ground reservoirs, pumps, meters, etc)	20,000
TOTAL	**25,000**

COMPONENT D: TRANSBOUNDARY SOLID WASTE MANAGEMENT
Action Plan for Ship-Generated Waste

Bins for ships and at port\terminal facilities	10,000
Transfer and temporary storage facilities	15,000
Audio-visual equipment and publicity materials	5,000
TOTAL	**30,000**

COMPONENT E: IMPLEMENTATION OF MARINE PARK

Building for Marine Park Headquarters and Visitor Information Center	
Marine Park headquarters & visitor information center (includes exhibition room, small auditorium for slide show orientation and lecture programs, gift shop, store room, cafeteria, and toilet\shower facilities) 350 square meters @ $750 per square meter	262,500
Dive equipment cleaning & storage facilities	5,000
Professional fees (architecture/engineering)	22,500
sub-total	290,000
Infrastructure for Marine Park	
Infrastructure hookups (water, sewage, electricity, phone)	30,000
Landscaping, parking areas, walkways	
Security fencing	15,000
Shore markers	2,000
Signage	
Reef crossover walkways	45,000
sub-total	146,500

Equipment for Marine Park	
Office and audio-visual equipment:	
Office equipment (copying machine, computer, fax)	15,000
Slide projectors (2) & screen	700
Video camera, VCR, TV monitor	3,500
Furniture (office, auditorium, cafeteria, gift shop)	75,000
sub-total	94,500
Mobile equipment:	
24-foot hard boat with outboard motors (2 x 65 HP)	35,000
One spare 65 HP motor	7,000
One 14-foot semi-rigid inflatable boat with motor (40 HP)	14,000
Two boat trailers	4,000
Safety and rescue equipment	2,500
Marine VHF radio (base & two hand-held)	1,500
Diving gear (4 sets, 8 tanks)	5,000
sub-total	69,000
TOTAL (capital expenditures for Marine Park facilities and equipment):	**600,000**
Operation and maintenance costs for Marine Park, Years 1 and 2	
Building operation & maintenance, inc.. electricity ($10,000/yr x 2)	20,000
Landscape maintenance, inc. water ($10,000/yr x 2)	20,000
Boat maintenance and moorings, marker buoys, fencing ($5,000/yr x 2)	10,000
TOTAL (Marine Park operation and maintenance costs, years 1&2):	**50,000**

ATTACHMENT H

GULF OF AQABA ENVIRONMENTAL ACTION PLAN

SOCIAL ASSESSMENT OF THE MARINE PARK COMPONENT

Although the biodiversity value of the Marine Park is high, its geographical area is small. It is likely to cover an area (terrestrial and marine) of approximately 100 m of beach front along a 6 km stretch and will extend approximately 200 m into the water. Therefore, social impacts are minimal and will be fully addressed through the preparation of the management plan.

Consultation. Extensive and broad-based public participation consultations on the Marine Park component of the proposed project were held with representatives of national and local Government, the ARA, academic and research institutions, private sector interests and NGOs. The participation process was facilitated through a series of consultative meetings conducted in Amman and Aqaba both in Arabic and English. At the regional level, similar meetings were held in Egypt and Israel. Ongoing dialogue with potential private sector investors in the tourism industry is currently being enhanced through the sharing of experience gained from Egypt. International consultations were jointly held with the Governments of Jordan, Egypt, and Israel, IUCN, NOAA and USAID. The non-government stakeholders consulted during the preparation of the Marine Park component include the Royal Society for the Conservation of Nature, the Jordan Environment Society, the Aqaba Fishermen's Cooperative (AFC), MSS, diving clubs, ferry operators, glass boat operators, and hotels. Government stakeholders include ARA, the Ports Corporation, the Aqaba Municipality, the Ministry of Tourism, the Ministry of Planning and the Ministry of Municipal, Rural Affairs and the Environment, and the Royal Jordanian Navy.

At the local level, the future Marine Park is not inhabited and the setting of its boundaries will not involve any resettlement. Local perspectives, goals, aspirations, and priorities were discussed with communities in the area surrounding the proposed park. All stakeholders share the common goal of conserving the coral reefs. There were no concerns about adverse impact on the local community who will retain access to the recreational use of the beach and its reef.

Fishermen. There are no resident fishermen inside the envisaged boundaries of the future Marine Park. However, approximately 50 small boats illegally fish on an occasional basis within the boundaries of the future park. These fishermen have other income sources besides illegal intrusion of coral reefs into the Park. A number of members of the fishing community have converted to non-fishing activities and are deriving income from the non-consumptive use of coral reef resources via tourism. For example, some fishermen have converted their boats to glass bottom boats. The management plan will explore with the fishermen alternatives to illegal fishing and a small fund will be established for assisting them, if necessary during the transition. This aspect will be closely monitored during project implementation and discussed in the mid-term review.

Preparation of the Management Plan. The management plan will be prepared by the Environment Unit through a participatory process. Stakeholder involvement will continue throughout

project implementation. All stakeholders would be represented on the Park's board or similar structure to be established including representatives from the Aqaba Fishermen's Cooperative. The management plan will provide a framework for local participation. Meetings with all stakeholders will be held at each stage of the planning process. The discussion meetings will enable the project team to receive information and to discuss ideas and issues. In addition, components of the plan will also be implemented by stakeholders such as RSCN, MSS, the Fishermen's Cooperative and the diving clubs.

ATTACHMENT I

GULF OF AQABA ENVIRONMENTAL ACTION PLAN

PRELIMINARY ENVIRONMENTAL ANALYSIS FOR THE MARINE PARK COMPONENT

Background. The Marine Park is located along the southern portion of the Jordanian coastline, in an area that is mainly undeveloped. It extends from near the Marine Science Station southward to the Royal Diving Center, as illustrated on the map entitled Red Sea Marine Peace Park Plan (IBRD 27865). Once designated, the Marine Park will extend outward into the sea until the 70 m isobath (underwater topographical contour), and approximately 100 m landward from the mean high water mark.

Marine Park Zoning based on Environmental Baseline Conditions. Current knowledge on the environmental baseline conditions for the area has been taken into consideration in developing the proposed activity zones for the Marine Park, which are illustrated on the above referenced map. The most sensitive fringing reef coral areas have been designated as no entry zones, with adjacent swimming and diving zones. Another valuable coral reef area has been zoned exclusively for scientific research and is located adjacent to the Marine Science Station at the northern end of the Marine Park. Multi-use areas are to be located in the Marine Park in areas that do not have living coral reef, and are characterized by sand and seagrass. A comprehensive Marine Park management plan and formal Marine Park regulations will be drafted to specify the activities allowed and prohibited in the marine and land portions of the Marine Park.

Impacts of Small Scale Marine Park Structures. The small scale structures planned for the Marine Park include a small building to serve as a Marine Park headquarters and visitor information center, and above surface structures to allow swimmers and divers to cross over the coral reefs to prevent physical damages to the reef (called "crossovers"). The preliminary site selection and design concepts for these small scale structures already minimize impacts, and further studies are planned to improve the mitigation measures.

The Marine Park headquarters and visitor center is currently planned near the proposed marina at Big Bay. This location would minimize any impacts of onshore construction, but the final location will have to be coordinated with the other adjacent planned land uses. Water runoff control plans will be prepared and runoff control infrastructure will be constructed to provide mitigation for the Marine Park building and other adjacent land uses.

The site locations for the crossovers will be selected based on field inspections to locate areas of minimum impact. It is anticipated that several gaps with sandy bottoms in the coral reef will be found where marker buoys can be set up to guide swimmers in crossing over the reef. Alternatively, low impact structures such as floating docks with simple anchoring systems or fixed docks supported by posts will be located at appropriate locations.

Impacts of Planned Adjacent Land Uses. Activites already included in the Project, will regulate the impacts of adjacent land uses and other infrastructure that could affect the Marine Park. The Marine

Park management plan, EIA requirements and CZM regulations will be developed under the Project, and they will apply to high-impact activities that are proposed on the lands within and\or adjacent to the Marine Park. High impact land uses include proposed sites for international hotels, the proposed amusement park and road construction. Potential impacts involve sedimentation onto coral reef areas, quality of surface runoff waters and percolating groundwaters, locations for accesses to the Marine Park and aesthetic impacts. The Marine Park regulations, CZM regulations and EIA reports will develop mitigation measures and standards.

Family camping, the Qaboos tourist village, a zone for family and resort uses and a proposed golf course are all examples of planned moderate intensity land uses. A proposed marina site, to be financed by private investors, is tentatively projected for the sandy Big Bay area where the growth of seagrass indicates effects from wadi runoff, and lack of living coral reefs. Although the construction of finger piers, would have minimal direct impacts to the marine ecosystem, a full environmetal analysis would be required to develop a comprehensive set of mitigation measures.

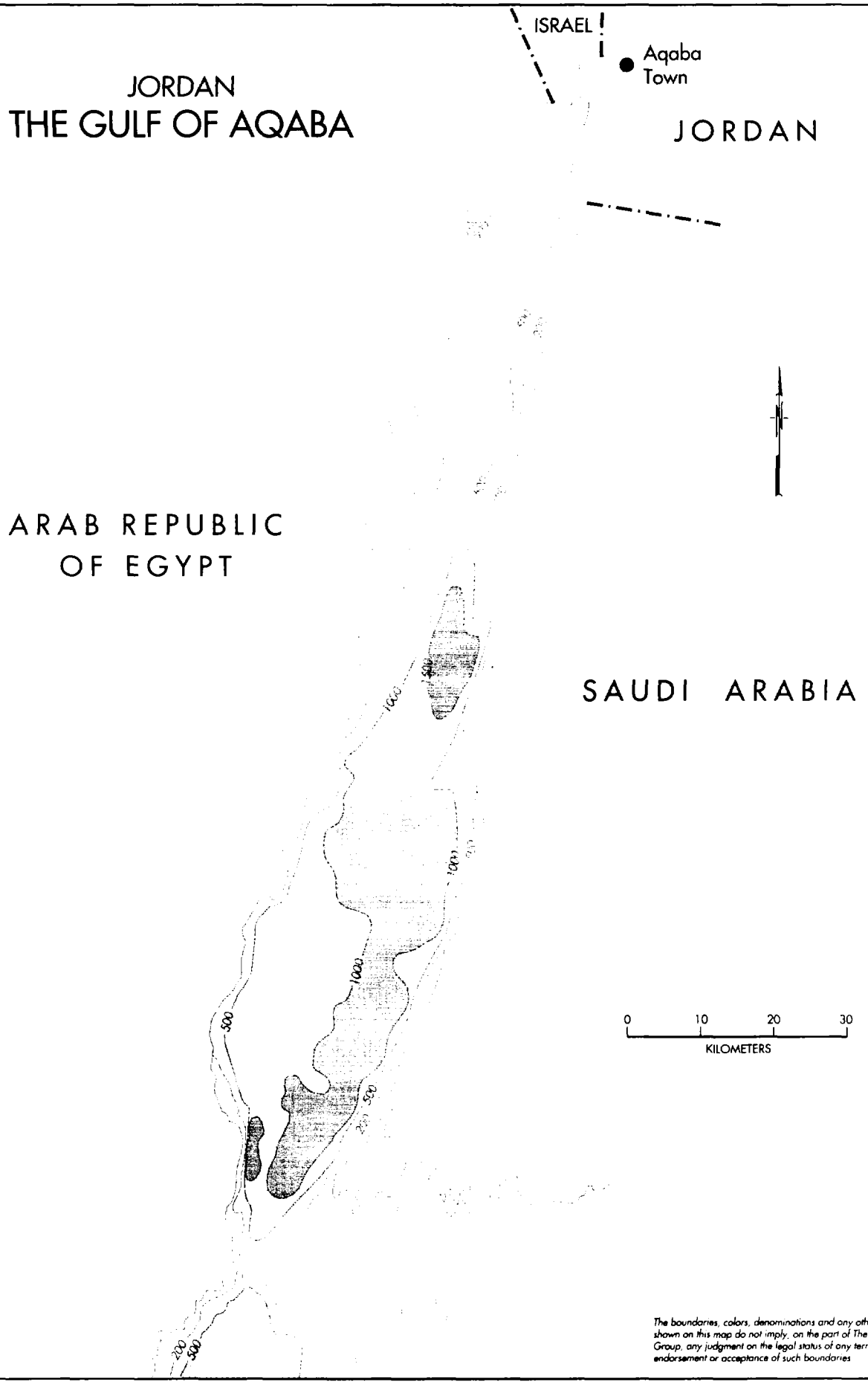
GULF OF AQABA ENVIRONMENTAL ACTION PLAN

Preliminary Environmental Mitigation Plan

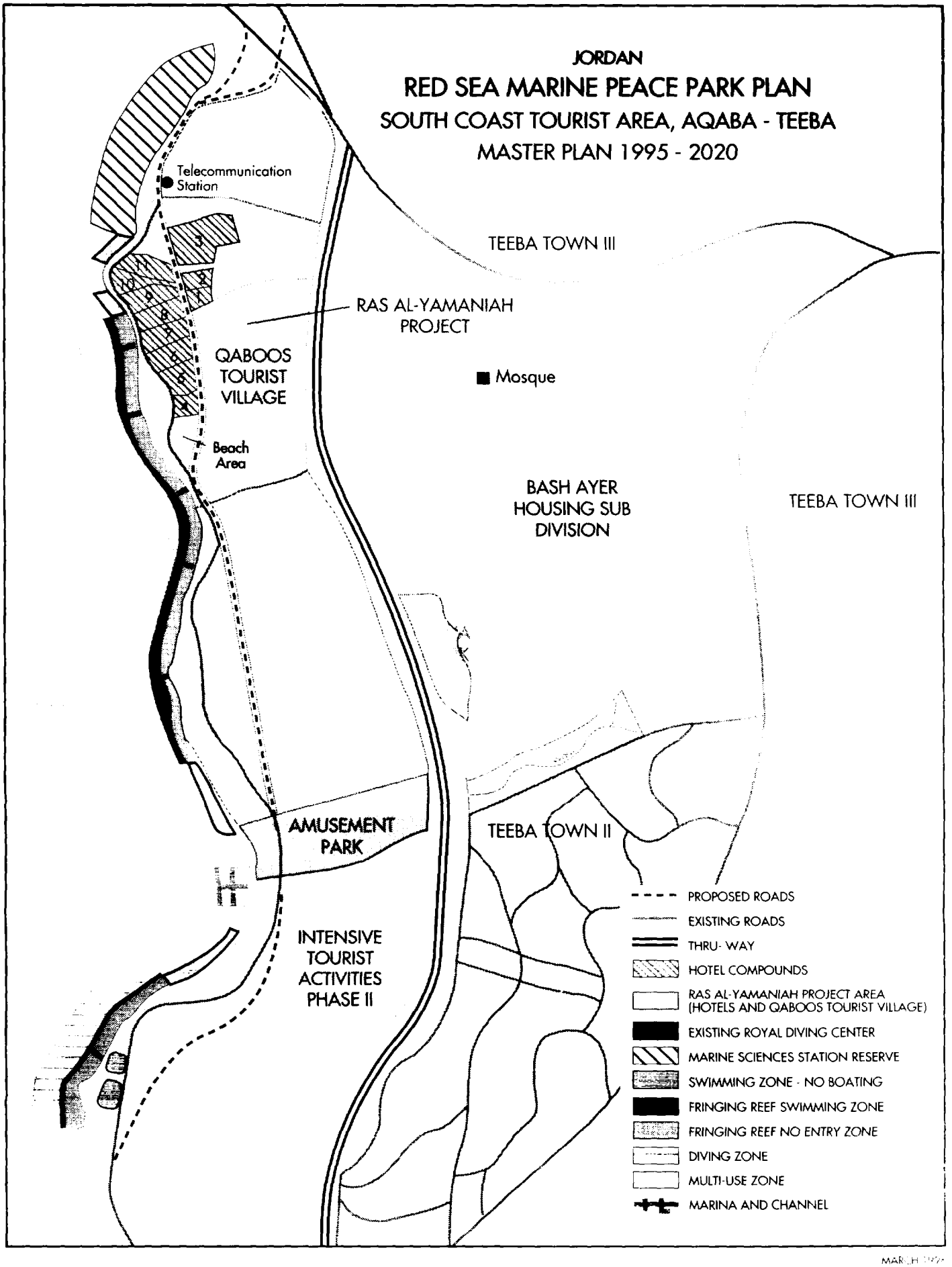
Actions with Potential Impacts	Preliminary Environmental Mitigation		Agency Responsible for Mitigation
	Ongoing Major Mitigation	Future Detailed Mitigation	
1. Construction of Small Scale Structures for Marine Park:			ARA
- Marine Park headquarters and visitor information center	Preliminary location of a small building in the Big Bay area beyond 100 m landward of the mean high water	- development of aesthetic landscape and architectural plans - development of a runoff control plan with appropriate structures integrated into the landscape plans - development of specifications for sewage management - development of visitor management plan.	ARA
- crossovers	Use of natural sandy gaps for swimming crossovers; use of floating docks and finger docks for crossovers	- visual field surveys to identify locations for minimal impact - development of specifications and pre-qualification lists of specialized suppliers and contractors - close environmental monitoring and inspection of construction activities	ARA

Actions with Potential Impacts	Preliminary Environmental Mitigation		Agency Responsible for Mitigation
	Ongoing Major Mitigation	**Future Detailed Mitigation**	
2. Zoning of Activities within the Marine Park:	Development of a Marine Park management plan (including regulations) (see Attachment D, Activity E #1)	- develop regulations for operation of marine vessels - develop regulations for swimming, snorkeling, diving and interference with marine life - develop restrictions on fishing activities through a participatory process - develop regulations for limited access areas, temporary closure areas and other measures to allow recovery of living marine resources	ARA
3. Development of Adjacent Land Uses:	Adoption and implementation of CZM map and regulations (see Attachment D, Activity E #3)	- designation of specific land uses for the South Coast Tourist Area - development of setback criteria and low density land uses along shoreline - establishment of controlled public parking and public access areas to the Marine Park - establishment of runoff control plans and performance standards for runoff control structures	ARA
	Implementation of EIA requirements for specific projects (see Attachment D, Activity A #3)	- specify EIA guidelines for proposed international hotels, for proposed golf course, for proposed amusement Marine Park, for proposed marina and for intensive tourist activities - phase II	ARA and private developers
	Marine water quality monitoring (see Attachment D, Activity A #4)	- locate sampling stations for monthly monitoring of nutrients, of bathing water quality and of sediment deposition - locate sampling stations for visual observations of filamentous algal growth on the reefs, unseasonal algal blooms and solid waste deposition	ARA and MSS

JORDAN
THE GULF OF AQABA



JANUARY 1996


JORDAN
RED SEA MARINE PEACE PARK PLAN
SOUTH COAST TOURIST AREA, AQABA - TEEBA
MASTER PLAN 1995 - 2020
Telecommunication Station
TEEBA TOWN III
RAS AL-YAMANIAH PROJECT
QABOOS TOURIST VILLAGE
Mosque
Beach Area
BASH AYER HOUSING SUB DIVISION
TEEBA TOWN III
AMUSEMENT PARK
TEEBA TOWN II
INTENSIVE TOURIST ACTIVITIES PHASE II
PROPOSED ROADS
EXISTING ROADS
THRU- WAY
HOTEL COMPOUNDS
RAS AL-YAMANIAH PROJECT AREA (HOTELS AND QABOOS TOURIST VILLAGE)
EXISTING ROYAL DIVING CENTER
MARINE SCIENCES STATION RESERVE
SWIMMING ZONE - NO BOATING
FRINGING REEF SWIMMING ZONE
FRINGING REEF NO ENTRY ZONE
DIVING ZONE
MULTI-USE ZONE
MARINA AND CHANNEL

MARCH 1995

IMAGING

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