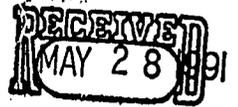


PCS for Oman file 272-0104



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**OMAN WATER RESOURCES DEVELOPMENT**

**PROJECT (272-0104)**

**MIDTERM ASSESSMENT**

**MAY 1991**

**FRED ZOBRIST  
SATISH SHAIH**

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## EXECUTIVE SUMMARY AND RECOMMENDATION

The water resources development project was authorized in September 1986 with 3 broad objectives. These were to assist in the development of Oman's water resources institutions capability to plan, develop and manage Oman's limited water resources and to assist with the development of domestic water supplies and wastewater disposal in the Capital Region and selected towns and villages in Northern Oman. The complexities of these objectives and a shifting focus within the GovOman on the responsibilities for management of the sector delayed the start-up of the project for almost 3 years. By then the needs had changed with Salalah, in the South, emerging as a major subproject component, deleting towns and villages in Northern Oman and a new Ministry of Water Resources being created and becoming another subproject focus. Muscat, originally in the plan, remained but only for support in the Water Sector. A new player, the Ministry of Environment, is receiving support in reviewing and managing coastal zone erosion problems.

At this time, the OAJC considers the project fully funded at approximately \$42.5 million, although the original authorization was for \$75 million. Time and evolution have changed the project scope to where the current funding levels will meet the revised project objectives. Funding currently obligated is a \$10 million grant and the balance as a loan. Of the \$42.5 million, approximately \$18 million remains uncommitted but has been budgeted to subprojects of which most is for Salalah. Final commitment of the balance of these funds will depend primarily on the preliminary results of the three major Master plans started within the last 6 months. Information will be sufficient by late this calendar year to complete this exercise. The project, at this time, is progressing well with excellent U.S. consulting team support. Due to earlier delays, the project completion date (PACD) should be extended, in order to program funds which remain uncommitted. The period will be subject to master plan and training plan results yet to be completed.

At this early stage of implementation, the project appears that it will be most successful in its support of the three master planning activities and support to the MWR. These activities are just underway and final judgment must await further progress. These activities, however, focus directly on the management and planning of Oman's scarce water resources. At this stage of the project, the Omanis have just begun to experience the broad depth and capabilities of U.S. consulting and training institutions. These experiences need to continue for several more years to gain the full impact of the resulting technology transfer. Further, once lasting trusts and relationships are developed between such groups, they should continue without the support of OAJC.

Key recommendation are:

- o The project should continue at the obligated amount with a PACD extension to be determined after preliminary master plan results have been completed (assuming activities are identified either in Salalah or Muscat which can be completed by September 1994) and training needs assessed.
- o A revisiting of this assement with the Bureau on the PACD extension is desirable and best done by obtaining their assistance in programming the remaining \$15 million presently earmarked for Salalah.
- o The project future focus should emphasize its strengths in the areas of technical assistance and training especially when supporting policy and institutional objectives and technology transfer.
- o Construction activities, if continued under the fixed amount reimbursable method, should focus on short term discrete projects, considering U.S. procurement interests where appropriate.
- o The planned PSC Engineer/Project Manager will be required and should be fielded as soon as possible.
- o Several outstanding housekeeping actions need to be addressed, and are noted in this paper's Conclusions and Recommendations section; which, for example, is an amendment to the Project Paper to bring it line with the current project agreement.
- o This assessment should serve as a midterm evaluation, with a final evaluation scheduled prior to the project completion.

## INTRODUCTION

Water in Oman is a National resource and a scarce commodity. With little rainfall and no surface sources the underground water resources must supply the nation. When gone expensive desalination is the only alternative as now being done for most of Muscat. The competitive uses between agriculture and domestic consumption become more acute as the underground water resources dwindle. Understanding the nature of these resources, their extent and quality, is critical to their management. Reuse of water becomes an important factor in this formula.

The water resources project was conceived to be a tool to assist the GovOman in managing this critical resource. The project, authorized in September of 1986, had a goal "To provide a safe, reliable supply of water sufficient to meet the needs of the people and planned development of Oman". This goal remains valid and worthy of continued OAJC support, even though project elements and government water management organization have changed considerably since project inception.

The early years of the project were spent in seeking a proper course for the OAJC commitment. The GovOman and OAJC now believe that such a niche has been found and key activities are well underway. This niche focuses around the comprehensive planning capabilities of the U.S. consulting industry and on the strength of U.S. water resources training and management institutions.

## PROJECT HISTORY

### Background

The Omani-America Joint Commission (OAJC) initiated its work with a water resource project, the Wadi al-Khawd Aquifer Recharge Dam. The U.S. investment was \$7,260,000 and implemented with one Ministry. The project was successful. The concept of a larger follow-on project probably started as early as 1982 when contacts were made with the Public Authority for Water Resources regarding a water project in the Capital. Several senior Omani officials and ministers were briefed on the proposed project in 1983 and a concerted effort was made in 1984 to have such a project included in the Third Five Year Plan. The Commission, in 1983, financed studies to review available data related to recharge needs. As a result of these studies interest was focused on the critical needs of the Capital Region, resulting in a formal assistance request from the Ministry of Electricity and Water in January 1985. This Ministry is responsible for potable water in most of the country with primary work in the Capital Region. Follow-up studies by the Commission resulted in a report entitled "Recommended Water Resources Sector Activities for the Third Five Year Plan" (June 85). This Report resulted in WASH being asked to study water resource related problems and recommend solutions and scopes of work for inclusion in the new project paper. Their report of July 1986 was entitled "Feasibility Studies for Third Five Year Plan Improvements for Capital Area Water Distribution."

The flurry of meetings by the Commission continued in 1985 and early 1986 in an effort to assure that desired project elements were included in the forthcoming Five Year Plan and to gain the interest of potential sponsoring ministries and commissions.

The project was authorized by the ANE Assistant Administrator on September 15, 1986 for a life-of-project funding of 75 million and the PACD of September 30, 1992. The loan agreement was signed at the very end of the FY on September 27, 1986, by the Deputy Prime Minister for Financial and Economic Affairs as what appears to be the GovOman's last minute attempt to save losing the U.S. soft loan.

The project had escalated in scope to where it included several ministries and commissions. An implementing agency or approach had not been determined by the GovOman nor had the Project Paper Plan been fully accepted.

In early 1987 the GovOman was still seeking a common view on how to implement this project. Through its commercial and trade offices, the British Government had made an offer of a grant which duplicated several of the Commission's project elements. To resolve the matter the Government appointed a special committee to develop recommendations on how the work would be divided between the two donors. The resulting outcome was a set of reports much different than envisaged by the Project Paper. The Commission was designated, the following tasks.

- A. Water Supply Improvements for the Capital Region and Salalah City.
- B. Water and Wastewater Masterplans for the Capital Region and Salalah City.

The committees report also named the responsible ministers that were to work with the Commission on carrying out these tasks. The British inturn were tasked with undertaking the National Water Resources Masterplan and to undertake water and wastewater plans for towns and villages in the Sultanate of Oman. Again they were directed to appropriate Ministers with whom they would carry out these tasks. This undated report of about March 1987 was a key step in allowing the OAJC Water Resources Project to finally get started although coordinating donor interests was only a minor concern as compared to the greater problem of who had responsibility for National Water Resouces. Following is a year by year report of activities on the project starting with September 1986, the month of authorization and signing of the loan agreement.

### 1986

The project was authorized as a loan on September 15, 1986 by the ANE Bureau Assistant Administrator with a life-of-project funding of \$75 million for the U.S. and \$201 million for GovOman. The first year obligation was for \$14,556,000 with the loan agreement signed by the GovOman on September 27, 1986. The Project Paper (PP) proposed a highly ambitious program which was divided into three subprojects,

The three subprojects are:

Subproject I - Development of Water Resources Management and Planning Organization;

Subproject II - Capital Region Water supply Improvement and Wastewater Planning; and

Subproject III- Town and Village Water and Wastewater Pilot Activities

An elaborate contracting schedule was proposed to carry these activities out resulting in 16 discrete contract activities (not necessarily number of contracts). A.I.D. funding proposed was \$21.18m for Subproject I; \$20.53m for Subproject II; and \$33.08m for Subproject III. Of this \$73m was planned to be as a loan and \$2m as a grant. The comparative Omani contribution for each subproject was estimated to be \$8.52m, \$170.74m and \$21.45m, respectively.

The loan agreement, Annex 1, proposed the following Phase one loan Activities. (Please note that the figures are reported as stated in the loan agreement, they were not added-up correctly)

Activity	Total	Oman (\$million)	U.S.
Water system Improvements	<u>181.83</u>	<u>169.70</u>	<u>11.82</u>
(- Engineering	13.13	1.31	11.82)
(- Construction	168.70	168.70	0.00)
Water and Wastewater Masterplan and Environmental Study	<u>6.43</u>	<u>0.43</u>	<u>6.00</u>
Grand Total	196.77	178.52	18.25

The implementation time table showed all work to be completed by May 30, 1990. The PACD was Sept. 30, 1992.

The activities noted above represented most of subproject II which focused on the Capital Region only. No subproject I or II activities were included in this start up phase.

#### 1987

Little if any progress was made toward project goals this year as the OAJC lacked agreement with GovOman on contracting agencies and project components. The key activity of the year was the obligation of an additional \$9,935,000 on September 14, 1987. Annex 1, the detailed project description was amended to reflect the addition of Salalah to the Water and Wastewater Masterplans and the specifically identify projects for the Capital Region.

The financial plan was revised as follows

<u>Activity</u>	<u>Total</u>	<u>Oman</u> (\$ million)	<u>U.S.</u>
Water System Improvements	<u>131.60</u>	<u>112.20</u>	<u>19.40</u>
(- Engineering	10.50	9.60	.90)
(- Construction	121.20	102.60	18.50)
Water and Wastewater Masterplan and Environmental Study	<u>9.60</u>	<u>0.60</u>	<u>9.00</u>
Grand Total	141.20	112.80	28.40

The reason for the downward adjustment of the Omani contribution is unclear. The Salalah addition results from the memo dividing the program between the U.S. and British offers. The implementation schedule was adjusted to show all work being completed by December 31, 1990.

## 1988

The major event of 1988 was the awarding of a design contract to ES (Engineering Science of Calif.) to design the following for the Capital Area.

- a. A new water transmission storage tank at the Ghubrah Desalination Plant.
- b. A new transmission line from Ghubrah to Seeb including related modifications to the pump station at Ghubrah a fluoridation system and a water quality laboratory.

Actual contract signing, however, was not until May 1989, well over a year after negotiations had been initiated with ES.

During 1988, it became clear that the OAJC plan of sponsoring a comprehensive and integrated approach was not going to work. The OAJC would have to work with each ministry or council independently. For example using a single contractor to do a master plan for the Capital Region and Salalah was not workable or even combining water and wastewater in a single plan for the Capital Region was not possible because of different organizational jurisdictions. Much time had been lost and the OAJC even entertained the idea of abandoning the project except for Salalah city. Salalah at this time was emerging as an area of great need as well as being cooperative even though not considered in the original project paper. In spite of minimal progress the OAJC continued to add funds to the project with \$8 million added to the loan in FY 88 (Amendment No. 2). This money, however, was totally dedicated to the city of Salalah for technical services for final design and tendering documents for water and wastewater facilities. WASH, using non-project funds, was tasked with doing an evaluation of Alternatives for Interim Treatment and Disposal of Trucked Wastewater in Salalah town. Their report was issued in July 88.

Amendment two to the Project Loan Agreement, signed on September 12, 1988, added Salalah to the project as follows: "The Project is further expanded to include the preparation of final design of water and wastewater facilities for the city of Salalah and the provision of technical and advisory service to prepare documentation suitable for international tendering based on the Masterplan, related studies and final design for these facilities." (Note: The Salalah Masterplan was added in Amendment, No. 1, the previous year, although no work had yet started).

The financial plan was revised as follows:

<u>Activity</u>	<u>Total</u>	<u>Oman</u> (\$ million)	<u>U.S.</u>
Water System Improvements	<u>131.60</u>	<u>112.20</u>	<u>19.40</u>
(- Engineering	10.50	9.60	.90)
(- Construction	121.10	102.60	18.50)
Water and Wastewater Masterplan and Environmental Study	<u>17.60</u>	<u>0.60</u>	<u>17.0</u>
Grand Total	149.20	112.80	36.40

As noted all additional funding was under the Masterplan activity rather than the more appropriate Engineering item. No adjustment was made in the implementation schedule. The year ended with a 100% pipeline and zero expenditures against the loan.

### 1989

This year can probably be credited with the real starting point for this project, even though progress was minimal and the year ended with still no expenditures to date, and a cumulative obligation of \$42,491,000. First, the ES contract for the design of the capital area water storage and transmission facilities was finally signed in May. PIL 272-0104.4 No.1, issued in January to set funding under Fixed amount Reimbussible (FAR) procedures for the Salalah Ponds at \$715,000, was never accepted by Minister of State and Wali of Dhofar. The estimate was based on a preliminary study prepared by WASH consultants. When the final design was prepared by a British firm based in Oman, it recommended approx. 33% increase in the capacity to meet the demand and a 8 kilometer road with bituminous surface leading to the site of the treatment ponds was added. PIL No.2 for \$2,175,000 was issued in December and accepted by the Minister.

Amendment No. 3 to the Project Loan Agreement was signed early in the Annual Budget cycle (1 May 89) and added \$10,000,000 to the project. This addition was as a grant, representing a change from the project loan financing. The entire amount was dedicated to institutional support activities. Annex 1, the Detailed Project Description, was again reissued in its entirety because of the evolving project components. Annex 2 (standard provisions) was also amended to include participant training. The primary changes as detailed in the Annex 1 amendment were the addition of the design and construction of Water and Wastewater Improvements for Salalah and the addition of the Institutional Strengthening Grant. The Salalah addition was not in the basic P.P. plan although the concept of institutional development was included the original Subproject No. I. The institutional strengthening grant represented the first funding of the original PP's Subproject I.

The financial plan was amended as follows:

<u>Activity</u>	<u>Total</u>	<u>Oman</u> (\$ millions)	<u>U.S.</u>
<u>Loan:</u>			
Muscat	131.4	112.0	19.4
(Water System Improvements	127.0	111.6	15.4)
(Masterplan	4.4	0.4	4.0)
Salalah	14.0	1.0	13.0
(Water/Wastewater Improvs	( 10.7	0.7	10.0)
(Masterplan	( 3.3	0.3	3.0)
<u>Grant:</u>			
Institutional Support	10.0	- 0 -	10.0
Total	155.4	113.0	42.4*

\* (Actual is \$42,491,000 but rounded in Annex 1)

This Amendment combined engineering and construction services, however, added a regional designation. Funding programmed for masterplans was greatly reduced to reflect a more accurate view of the needs.

The last action of the year was to again to amend the Detailed Project Description, through PIL 272-0104 No.3 dated December 16, 89. This PIL authorized the use of Project funds to finance a study of the Prevention of Coastal Erosion in the Sultanate of Oman. The PIL states that this study will directly support the project basic objective of strengthening water management and planning. The original project paper did not envisage such a need, however, the case can be argued that such a study is supportive of the project goal of providing a safe and reliable supply of water sufficient to meet the need of people of Oman and the planned development of the country. What happens in the "Coastal Zone" will have an impact on the ground water of the shore line areas, where most of Oman's population resides.

On the institutional side, the Ministry of Water Resources was created in early October. This represented the first time that water resources, as a sector had been elevated to an independent Ministry rank and finally a point of focus for which the Commission could work with on control and regulatory issues.

However, implementation remained with several ministries and no working relationships were changed on the Capital Region and Salalah Projects. The new Ministry of Water Resources appears to still lack clear guidelines on their responsibilities and authorities, especially as related to the Ministry of Agriculture and Fisheries. The Commission, however, was optimistic that the new procedures would now provide the basis for National water resources leadership.

## 1990

The project started to show some momentum, even though only \$143,000 in expenditures were recorded and commitments reached \$1.5 million. Tendering was undertaken for pipe procurement, pipe installation and reservoir construction with 4 contracts expected to be awarded in early 1991, for which over \$15 million had been budgeted.

A \$2.8 million contract was signed with Dames and Moore and CDM (a U.S. Joint Venture Group) on December 25 to undertake the Salalah Water and Wastewater Masterplan. Construction proceeded on the Salalah Ponds (1989 FAR).

The commission proceeded to work out a FAR agreement for \$1,650,000 to finance the Coastal Zone Management Study using a U.S. consultant (James Dobbin Assoc.) under contract to the Ministry of Environment. It should be noted that the OAJC opted for the FAR procedures because of concerns raised by AID/W about host country contracting. (The actual contract was signed in early 1991). The Institutional Support efforts were initiated with WASH undertaking 4 major studies for the Ministry of Water Resources during the year, although three of their reports were completed in early 1991. Resulting reports by Wash were:

- a. A Water Resources Technical Assistance Program for OAJC and the MWR - March 1990
- b. Task 1 - Data Management - January 91
- c. Task 2A - Laboratory Upgrading - February 91
- d. Task 2B - Training - February 91

Again in 1990, on September 30, the OAJC revised the Project Agreement (No 4) only for the purpose of amending Annex 1 to bring the project description up to the current activity level. No funds were added to the project. The project, since its 1986 authorization had now been modified by 4 loan/grant agreement amendments and 1 PIL, although no action had been taken in updating the Project Paper. The project authorization was amended for the first two loan agreement amendments.

The current project as agreed between the OAJC and the GovOman provides for the following:

### Loan funded Components

1. Muscat Water System Improvements
  - a. Design and Construction of Storage Facilities.
  - b. Design and Installation of Pipeline and Related Pumping Facilities.

2. Salalah Water and Wastewater Improvements  
Design and Construction for Water and Wastewater  
Improvements.

Grant Funded Components

1. Water Masterplan for Muscat
2. Water and Wastewater Masterplan for Salalah
3. Coastal Zone Protection/Regulation Study
4. Planning and Management Support
5. Training

Implementation of all Muscat Water activities including the Masterplan is with the Ministry of Electricity and Water. Implementation of all Salalah activities (water, wastewater and the masterplan) is with the office of the Wali of Dhofar.

Implementation of the Coastal Zone Study is with the Ministry of Environment.

The planning and management support activities and training component are directed primarily in support of development of the new Ministry of Water Resources, however, can be used for assisting other relevant ministries and cooperating agencies.

The Amendment 4 (current) agreed financial plan is as follows.

<u>Activity</u>	<u>U.S.</u>	<u>Oman</u> (\$ millions)	<u>Total</u>
<u>Loans:</u>			
Muscat Water Improvements	15.4	111.6	127.0
Salalah Water and Wastewater	<u>17.0</u>	<u>0.7</u>	<u>17.7</u>
Subtotal Loans	32.4	112.3	144.7
<u>Grants:</u>			
Muscat Masterplan	1.0	0.4	1.4
Salalah Masterplan	3.0	0.3	3.3
Coastal zone	1.5	-	1.5
Plan/Management Support	3.0	-	3.0
Training	<u>1.5</u>	<u>-</u>	<u>1.5</u>
Subtotal Grants	10.0	0.7	10.7
TOTAL PROGRAM	42.4	113.0	155.4

Budget totals remain the same as in the 1989 amendment. The primary changes were:

- a. A shift of the two Masterplans from Loan to Grant funding.
- b. Increasing the construction funds available for Salalah.
- c. Programming of the institutional support elements into discrete functions and projects.

As with previous budgets, this change reflected the Commissions continued lag in identifying projects or uses compared with their ability to obligate funds.

### 1991

Project momentum continues and has even accelerated. As of May 1991 the progress has been as follows:

- The pipe contract has been awarded to a U.S. firm and will be totally funded from Omani contributions (approx. \$18 million). It should be noted that GovOman had requested bids for three different sizes (600 mm 800 mm and 1000 mm) and then decided to buy only one size - 1000 mm diameter.
- Three pipe and reservoir construction tenders have been opened and are expected to be awarded soon. OAJC committed \$14,000,000 by a PIL in January toward this construction under a FAR agreement. The total construction is estimated at \$48 million.
- The Water Supply Masterplan contract for Muscat is awaiting final GovOman Ratification; the contractor (ES) however, has started work and already provided a draft conception report.
- The Salalah Water and Wastewater Masterplan Inception report has been completed.
- The Salalah Wastewater Ponds are completed, however, construction of the access road remains an unfinished item.
- WASH has completed four of six tasks in support of the Ministry of Water Resources. Task 3 and 4 completed earlier this year were for surface water Data Collection and Groundwater Data Collection (Draft Report March 91). The remaining tasks are scheduled for completion this Summer.

- The Training activity was initiated in late 1990 with 3 long term assignments of one year each and 7 short term assignments made to a 3 month USGS course.
- The AID Direct hire Engineer left in February. A PSC with considerable experience in Oman, and on this project, has been selected to replace him. A formal start date has not been established, however, nor has a contract been signed.
- Expenditures in the first quarter of 1991 totaled almost \$700,000 compared to a total of about \$100,000 for the previous 4 years. Accruals totaled over \$3.1 million as the quarter ended. Disbursements have lagged because of the Fixed Amount Reimbursement (FAR) procedure is used for several activities.
- Commitments exceed \$24 million.

## STATUS OF PROJECT IMPLEMENTATION

The project is currently divided into seven subprojects. The evolution of how these subprojects were developed and authorized are described in the previous section on project history. This history section also summarizes the current project status under the 1990 Amendment 4 and 1991 discussions.

Table 1 depicts the status of current activities as the project stands today. The expended column includes disbursements plus accruals. The Omani contribution column provides an estimate of funds actually committed, not disbursed, and should be verified at the end of project evaluation as well as routinely being tracked by the OAJC.

As regards funding, the table shows that the project has an uncommitted balance of \$15,293,850 under the loan account. This has been budgeted primarily for Salalah water and wastewater activities. The grant account has an uncommitted balance of \$2,898,164 designated for technical assistance for the MWR and for training. Current foreseeable needs for training and technical assistance would easily use these funds over the next two to three years. However training and support plans will be required to confirm actual needs. The MWR, the primary client, should be especially encouraged to provide a plan of their needs so that a final action plan can be developed for the use of the balance of the grant funds.

A plan to finalize the use of the Salalah Water and Wastewater construction needs must await the completion of an assessment of alternatives by the master plan consultant. This plan is scheduled for June but any action will first be subject to the approval of the Governor of Dhofar, who administers Salalah. The Governor has already requested an expansion of the consultants master plan studies. These are funded under the grant account and will easily use up the small balance of Subproject 6.

The Salalah master plan approval process will confront serious social and political issues over the use of the regions limited water resources. Termination of low productive agricultural uses, relocation to brackish areas, or use of treated wastewater must be considered in order to offset the construction of energy intensive and highly costly desalination plants for potable water. Entrenched farmers will resist and the stigma against use of treated waste is strong.

The Governor and his staff will be fully challenged by these decisions, but they will be necessary for the Master plan team to complete their work in a timely manner. The consultant has wisely already included key government representatives in the planning process and hard questions are being asked by both sides. At this early stage, it appears that the highest priority recommendation will be for a major wastewater treatment plant for Salalah providing a treated waste of sufficient quality for agriculture use or for recharging into the local freshwater aquifer. With such a reuse plan the need for a desalination plant could be put off for many years. The costs of such a wastewater treatment plant would greatly exceed the remaining resources of this project and will probably take at least 5 years to design and construct, after the decision has been made to proceed. Thus, remaining project funds might best be used to finance the design and other follow up studies (using the current contract team) and to seek opportunities for discrete standalone short term projects that could be financed under the FAR method. These may involve several separate collection projects (sewerlines and pump stations) or the purchase of commodities from the U.S. An alternative is to consider a major pipe procurement package for Salalah. A group of FAR projects could best be managed by the existing consultant, especially if in the area doing other work. He may in turn use local firms to do detailed design work. Such an approach would greatly reduce the monitoring requirements on the OAJC staff. Preliminary discussions with the Governor's staff indicates that their first preference may be for continued support from the American contract team to continue with design activities needed to implement the first phase of the Masterplan. This appears to be an excellent use of some of the remaining funds. Assuming a timely decision on the part of the Governor's staff, programming of the balance of the Salalah funds could probably be made in August or September.

However, any final decisions on the programming of both grant and loan funds should also await the completion of the first phases of the other two master plans currently underway. The Muscat water supply masterplan will have completed a "Development of alternatives Plan" by mid September while the Coastal Zone Studies will have completed an initial report by Oct 25. Preliminary conclusions, however, may be available from both of these studies at an earlier date. The OAJC, in these latter two studies should seek ways to meet training and institutional needs especially when the results will help lead to a better or full acceptance of the masterplans and its process, and a continuation of technology transfer.

Based on these dates, the earliest it appears, that the OAJC could consider finalizing an Action Plan would be in the Sep-Oct range and more likely in the Nov-Dec range. At that time collaboration with the Bureau is suggested to finalize outstanding documents including a Project Paper amendment. The Bureau could provide any needed technical or project development assistance to help finalize these actions which should include any planned FAR'S.

The FAR for the Salalah Ponds (Subproject 2) should also be reviewed and revised if appropriate. At this time the ponds have been fully completed but may have included items specifically imported for the project from other than a qualified source and origin. The road portion of this project has not yet been finalized and may deviate from the approved design alternative under the FAR. The current FAR provides for billing once both the road and ponds are complete which will not be, at least, for another 6 months. This is an example of where two FAR's may have been a better approach for management and payment purposes. Accrued expenditures will not be paid, in some cases, for over one year for a project element that is fully acceptable and working. This project may also be credited with a local contribution as the Governor is planning on providing power from the grid to the site in the near future.

Of worthy note is that technology transfer usually occurs as part of the training and consultative processes. The Salalah Master Plan Consultant, as part of his program, is providing on-the-job training for up to 4 government staff at a time. He should leave both a plan and skills behind when his job is done.

The project pipeline (financial) has showed a significant reduction over the past 6 months and will continue to do so. The pipeline should no longer be a major management concern assuming the Salalah subproject can be fully committed later this year.

The project will require full time management from a senior engineer/manager. The Direct Hire engineer assigned to OAJC retired earlier this year leaving a gap at this level. OAJC has selected a PSC replacement, in the absence of an available direct hire candidate, who has considerable experience with both Oman and the project.

### Conclusion

The project, today, with its seven subprojects is well managed and performing at a highly creditable level with a good mix of technical assistance, training and construction. This is now a project for which any Project Development Officer can be proud. The evolution to get here, however, has been a struggle and basically a Project Officers nightmare. In retrospect the earlier experienced delays may not have been bad, and may have been needed to give the GovOman and the OAJC the time to work out the right combination of support as the water resource sector searched for its rightful role in the hierarchy of the Government. At this time the Omanis have just begun to experience the broad depth and capabilities of the American consultants. They have been impressed. The same is true with the training opportunities. These experiences need to run a few more years before the sector is dropped from the OAJC portfolio, if the full impact on the sector is to be gained.

Further, in regard to the delays, no funds are noted to have been wasted, nor have the delays been noted to have caused any hardships on the beneficiaries of the project. An earlier project would have had a different slant and probably would not have been able to clearly bring out the critical water management issues as now being done in Salalah, such as the trade off between agriculture and domestic uses and the critical importance of treated wastewater. These are being addressed in the context of the only other alternative, which is costly desalination. Muscat residents, highly dependent on desalination, pay among the highest rates in the World for water and are still subsidized at about 50%. The issue of the impact of the early project delays might be considered by the projects final evaluation team.

Table 1

WATER RESOURCES DEVELOPMENT PROJECT (272-0104)  
SUMMARY OF PROJECT COMPONENTS, COST ESTIMATES, PROGRESS TO DATE AND  
ESTIMATED COMPLETION DATE

SUBPROJECT	A. I. D. BUDGETED \$ LOAN (L) GRANT (G)	COMPONENT	COMMITTED \$	EXPEND./ ACCRUALS \$	DATE STARTED	DATE COMPLETED	OMAN CONTR. \$
1. MUSCAT WATER IMPR. (.1)	15,400,000 (L)	Design (ES: HC Contract) March 28, 89-PIL No. _	1,022,150	473,000	May 89	Sept 92	-
		Construction Jan 6, 91-PIL No.4, FAR	14,000,000	-	July 91	Sept 92	191,100,000
2. SALALAH WATER & WASTE- WATER CONSTRUCTION (.4)	17,091,000 (L)	Ponds (Design, const.) (incl. access road) Dec 20, 89-PIL No.2, FAR	2,175,000	1,450,000	Jan 90	Dec 91	(powerline)
SUBTOTAL LOAN			17,197,150	1,923,000			-
3. MUSCAT WATER MASTERPLAN (.3)	1,000,000 (G)	ES-HC Contract (amend to 1 above) PIL No 1 - Feb 23, 91	993,307	-	May 91	Jul 92	-
4. TECHNICAL ASSISTANCE TO MWR (.6) (Plan+ Management Support)	3,000,000 (G)	Task 1 - PIO/T	240,625	240,625	Sept 90	Jan 91	-
		Task 2	196,000	196,000	Sept 90	Feb 91	-
		Task 3	245,321	245,321	Feb 91	March 91	-
		Task 4	249,761	249,761	Feb 91	March 91	-
		Task 5	190,000	-	May 91	July 91	-
		Task 6	78,500	-	May 91	July 91	-
		Lab. design & Start up	198,000	-			

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Table 1 - cont

WATER RESOURCES DEVELOPMENT PROJECT (272-0104)  
SUMMARY OF PROJECT COMPONENTS, COST ESTIMATES, PROGRESS TO DATE AND  
ESTIMATED COMPLETION DATE

SUBPROJECT	A. I. D. BUDGETED \$ LOAN (L) GRANT (G)	COMPONENT	COMMITTED	EXPEND./ ACCRUALS	DATE STARTED	DATE COMPLETED	OMAN CONTR. \$
5. COASTAL ZONE EROSION MANAGEMENT (.5)	1,500,000 (G)	Study; (James Dobbins) PIL No. 2-Dec 30, 90, FAR	1,650,000	165,000	Feb 91	June 92	-
6. SALALAH WATER & WASTE- WATER MASTERPLAN (.2)	3,000,000 (G)	Dames & Moore (HC Contr.) PIL No.2-Nov 14, 90	2,786,794	1,182,000	Dec 90	June 92	-
7. TRAINING	1,500,000 (G)	PIO/Ps	50,069 50,069 20,145 20,145 19,469 113,631	- - 18,130 18,130 17,500 -	Sept 91 Sept 91 Sept 89 Sept 89 Sept 90	June 92 June 92 June 91 June 91 June 91	- - - - -
<b>SUBTOTAL GRANT</b>	<b>10,000,000</b>		<b>7,101,836</b>	<b>2,332,467</b>			<b>-</b>
<b>TOTAL</b>	<b>42,491,00</b>		<b>24,298,986</b>	<b>4,255,467</b>			

## INSTITUTION BUILDING

Water resources as a sector is not specifically assigned to any one Ministry of the GovOman, and thus responsibilities tend to often overlap. Specific responsibilities are noted as follows:

<u>Responsibility</u>	<u>Ministry/Government Agency</u>
Assessment & Control	Ministry of Water Resources
Development & Management of Water Use	Ministry of Agriculture & Fisheries - Irrigation Development
	Ministry of Electricity and Water - Potable water supplies for domestic, commercial and Industrial use
	Diwan of Royal Court - Potable water supply to Sohar - Wastewater treatment reuse/disposal in the capital area and Sohar
	Office of the Minister of State and Wali of Dhofar, Directorate General of Water Supply and Transport - Potable water in the Southern Region
	Ministry of Petroleum and Minerals - Water supply to oil and mineral installations
	Ministry of Defence - Water supply to defence establishments
Development Planning	Ministry of Regional Municipalities - Wastewater treatment and reuse
	Development Council, Supreme Committee for Town Planning - Overall strategic and physical planning
	Ministry of Housing - Regional planning
Safeguarding the Environment	Planning Committee for Development and Environment in the Southern Region
	Ministry of Environment - Issue no environment objection certificates

Community Health

Ministry of Health

- Health aspects of water quality

Meteorological Data  
Collection

Ministry of Communications, Directorate  
General of Meteorology

Historically the formal control of water resources in Oman began in 1975 when the responsibility of development and conservation of water resources was assigned to the newly created Water Resources Council (WRC). Its members were the Minister of Agriculture, Fisheries, Petroleum and Minerals, the Minister of the Interior and the Minister of Communication. This group evolved and was enlarged and in 1979 its technical secretariat was replaced by a Public Authority for Water Resources (PAWR). They were at this time charged with undertaking studies and maintaining a center for data and information while WRC was declared the highest authority for drafting a national plan for water resources.

In 1985 the WRC was dissolved and responsibility for water resources transferred to the Ministry of Environment (ME) which was renamed the Ministry of Environment and Water Resources (MEWR). The Council for the conservation of the Environment and Prevention of Pollution, which was created in 1979, became the Council for Conservation of the Environment and Water Resources (CCEWR), and took over the role of the former WRC. The PAWR was subsequently (1986) affiliated with CCEWR. In 1986 the responsibilities for Water Resources were again redefined. The ME was given responsibility for implementing the general plan, issuing well permits and assuming the availability of water for new Agricultural land. This is the first time that this last duty had been assigned to any organization. The CCEWR was to undertake research, studies and data collection, maintain the monitoring network and establish a data base. By Royal Decree, at this time, the Ministry of Agriculture and Fisheries (MAF) was given specific responsibilities for maintenance of traditional irrigation systems and wells, the construction of recharge dams, the protection of agricultural land from erosion and flooding and the collection of survey data from wells, traditional irrigation systems and dams. The MAF regards this decree as still being valid and unchanged by the legislation in 1989 to create the Ministry of Water Resources. Also this period of considerable change occurred at the time the commission was trying to finalize their Water Resource Project Paper. Change again occurred in 1989 when the PAWR was reformed as an autonomous body, taking the role of both the CCEWR and MOEWR in respect to water resources. Later in 1989 the Ministry of Water Resources (MWR) was created taking over the responsibilities of the PAWR, which were basically resource assessment and control. Development and management responsibilities fell elsewhere. The period of 1985 to 1989 was basically a disaster for the Water Resources Sector because of the continual change and the increasing rapidity of the decline in quality of water resources.

The new ministry, even though having similar responsibilities of its predecessor agencies, was perceived by the Commission as a new starting point. Its stature had been raised and its sole focus as a Ministry is on Water Resources. Old interministerial conflicts, however, remain. The new ministry appears to be rapidly expanding its influence in the government and is quickly enlarging its staff and program. It has been highly receptive to the receipt of technical assistance and training as a basis for improving their ability to carry out their Water Resources mandate and in time should be able to take full control and leadership over the development of the GovOmans Water Resources.

### Summary

In summary the Omani water resource institution, continues to evolve. Pieces remain fuzzy but each separate element has the capability to carry out their own precieved tasks. The institution operates most successfully on a task basis and any efforts to shift it to a strategic organization who can focus on broad comprehensive planning and issue is premature. The structure is now in place, however, for this process to evolve at its own pace and it appears to be doing so with a combination of good Omani and expatriate management. Further efforts on institutional change by the OAJC are probably not warranted and would probably continue to be unsuccessful. However, a full commitment to the Ministry's training needs is strongly recommended especially as regards the USGS, Spokane and University of Arizona Programs. Sponsoring of local seminars using U.S. Technicians is also valuable. The budget appears ample for this support however, the PACD would have to be extended to meet Ministry needs. Also training needs of Salalah Municipality should be considered after the Salalah master plan has been prepared.

## TECHNICAL ASSISTANCE

Oman's primary need in the Water Resources sector has been for Technical Assistance ranging from training to engineering and planning. Resources are generally available for development activities such as for construction and the procurement of commodities. However, water resource technical skills are limited primarily to the expatriate advisors who come and go.

The projects technical assistance activities reached their peak at the beginning of 1991 with the start up of three major Master Plans and the continuation of the WASH program. All of these activities are bringing a highly sophisticated level of expertise that is not currently available in the GovOman or the local consulting community. These groups are bringing a vast array of U.S. and International experience to bear on Oman's vital and critical water resource needs and problems.

The WASH support has already had an impact on Water Resources Management in the country. Although not all funded from this project, WASH studies have led to the development of the Salalah Ponds, while work with the MWR has led to the development of a training department and the planning for a major water quality laboratory and associated field program.

One of the most positive results of OAJC's management of this project has been their ability to react quickly by providing assistance to the GovOman when needed. The WASH support program has been an excellent tool in this regard and their continued participation should be encouraged, especially because of their broad background and deep understanding of the water resources sector in Oman.

Future results are yet to come, however, the Master planning efforts will probably be judged as one of the key successes of this project, and when recommendations are carried out the impact will effect all residents of Oman.

The second major project success will probably be in the training support component. This is an activity that is just starting, although the Omani-American Joint Commission (272-0101) grant was used earlier to support this project with 26 trainees taking part. Table 2 summarizes current training activity. As the new Ministry of Water Resources (MWR) takes up its leadership in the sector, new staff are being recruited and developed. The Project offers the MWR the opportunity to take advantage of the extensive U.S. water resource technology and training base. The ambitious plans of the MWR will require a major training effort if its mission is to be successful. For example the Ministry had six staff with degrees approximately one year ago. Last year 15 new graduates were recruited with 30 more planned for each of the next two years. The graduate staff will level at about 80. The Ministry's plan is to have each one of these attend a 3 month USGS

course. About one fourth will be selected for long term training (one year) at an institution such as the University of Arizona. This school, located in Tucson, is in an area with a similar climate to Oman. In addition the Ministry currently has about 150 technicians and will continue to greatly expand this number. Approximately 10% will be selected for long term training such as a year in a technical school specializing in Water Resources Technology in Spokane, Washington. Relationships have already been developed with the Spokane and Tucson schools. The long term training would be supplemented by local seminars using international training teams. This ambitious plan will probably take at least 5 years to accomplish and is not one that could have been initiated earlier in the project as neither the Institution or staff were ready or available.

### Summary

In summary, the projects institutional support components are the real value to the Omani Water Resources Sector. They involve both comprehensive and strategic planning techniques and outputs, critical for the future decisions to be made in the sector. Training will be the transition tool allowing the Omanis to take over full management of the sector. Here the best training available can be afforded and should be provided.. U.S. Institutions can provide this quality. The projects planning mission will soon becoming to an end, however the training needs will continue for the foreseeable future. If the project can not be extended to meet this need, the Commission should consider funding this training from some other program such as the planned FY 92 Human Resources Development Project. Once a strong tie has been made between the MWR and selected U.S. Institutions, such ties will most likely continue long after commission support has ceased.

Table 2

TRAINING  
WATER RESOURCES DEVELOPMENT PROJECT 0104.

LONG TERM TRAINING.

The A.A. degree course offered by Spokane Community College.  
Water Resources Technology.  
Duration : 2 academic years. (approximately 22 person months).

(A). 1988 September - June 1990.

(B). 1989 September - June 1991.

Participants:

- 1) Hamad Al Mahrooqi
- 2) Ahmad Al Barwani

Training Costs:

1990 - 1991 40,290

(C). 1990 September - June 1992.

participant:

- 1) Hamood Al Harassy

Training Costs:

1990 - 1991 19,469

1991 - 1992 20,000

(D). 1991 September - June 1993.

participants:

- 1) Kamal Al Busaidy
- 2) Rasoolbaksh Al Baloushi
- 3) Said Al Manji

Training Costs:

1991 - 1992 (120,000)

SHORT TERM TRAINING PROGRAM:

The "Techniques of Hydrologic Investigations for International Participants" course is offered by The U.S. Geological Survey. This course is equivalent to a post - graduate short term program.

Duration: Approximately 10 weeks, plus an additional 4 weeks of practical training.

1991 - 1991.

participants:

- 1) Ismail Al Bady
- 2) Ali Al Wahaibi
- 3) Suleiman Al Obeidani
- 4) Fahad Al Sadi
- 5) Abdullah Al Kiyumi
- 6) Salim Al Shibli
- 7) Nasser Al Hosni

Training Costs:

June - August 91. U.S.\$ 113,631.

## EVALUATION HISTORY AND PLAN

The project has never had a formal evaluation since its authorization in 1986. Since major activity did not get Underway until 1990, the Commission felt that an external evaluation would not be a wise use of funds and instead relied on its internal monitoring program. With between 2 and 3 full time project managers/engineers assigned to the project the status of all components were always well known and reported fully in the quarterly commission status report which was circulated widely, including A.I.D./W.

The Project Authorizing documents, however fully recognized the need for an evaluation and monitoring plan. To assure that such a plan was implemented the authorizing memorandum included the following covenant.

### "(1) Project Evaluation

The Sultanate of Oman agrees to establish an evaluation program as part of the Project. Except as the Parties otherwise agree in writing, the program will include, during implementation of the project and at one or more points thereafter:

- a. evaluation of progress toward attainment of objectives of the Project;
- b. identification and evaluation of problem areas or constraints which may inhibit such attainment;
- c. assessment of how such information may be used to help overcome such problems;
- d. evaluation, to the degree feasible, of the overall development impact of the Project."

The Project Paper estimated interim evaluation dates of January 88, January 90 and a final evaluation in October 92. No formal evaluation plan was ever established for this project.

The mission did propose the following in a Status Report Cable to A.I.D./W on February 2, 87. "Per PP first evaluation should be timed to coincide with completion of key decision points in life of Project which are in turn tied to completion of specific activities. We therefore propose to issue revised evaluation schedule after we have concluded agreement with GovOman on balance of project".

To date the Project has gone through several key decision points, all which have dealt with the adequacy of original design. Each has led to a new course for the project. Implementation is, however, just starting and the next key decision point will occur

at the completion of the preliminary phases of the three master plans under way and the completion of the WASH studies. From these activities will come the basis for the programming of future activities in these specific areas. As regards timing, the ES Water Supply Master Plan interim report for Muscat is scheduled for September 91 and a draft final by December 91. Dames and Moore will complete Preliminary Report of Master Plan Alternatives and the Priority Engineering Works Report in June 91 and a Draft Final Report by August 91 for the Salalah Master Plan. The WASH Task Work will also be completed by June of 91. The Coastal Zone Masterplan will have a progress report on July 25, with an initial report to be completed by late October 91.

A full scale interim evaluation could best be accomplished about Nov-Dec 91 based on these schedules. However, at this time the Commission has budgeted all funds, leaving decisions dependent on Master plans only for Salalah and WASH studies. For Salalah the option will be simply for construction of high priority projects which Dames and Moore will identify by June 91. The remaining funds (less than \$3 million) are budgeted primarily for training and limited support of the MWR for activities being identified by the WASH work. No further work is planned for the Capital Region or the Coastal Zone under this project, even though the Wastewater Master plan remains as an uncompleted task.

### Summary

In view of the limited budget options available at this time, an interim evaluation later this year is not recommended. At most it would be used as a tool to sanction Masterplan recommendations and, in turn, the need for a PACD extension which is obvious if the Project is to be completed as funded. This assessment should stand as the basis for an interim evaluation. A final evaluation should however, be planned with timing established after the new PACD has been determined. This recommendation assumes that a new PSC engineer will be in place to take leadership over this project and that the quarterly Commission status reports will continue.

The Master plans and WASH studies may be most useful to OAJC in a broader sense as the Commission formulates future grant based programs. These plans will specifically point out institutional needs and environmental and health related problems. The Coastal Zone Plan many offer many environmental opportunities while the WASH studies will tend to high-light institutional support and training needs.

It is recommended that the baseline data for the final evaluation of the project should be identified when the Project Paper amendment is prepared. Most of the information should be available from master plans. The management support and training components would have to be constantly monitored to evaluate their impact on the project purpose.

## ALTERNATIVES FOR FUTURE

Alternative approaches for completing these projects are divided into three general categories as follows.

- A. Terminate and deobligate remaining funds.
- B. Continue the existing program as generally outlined in Amendment 4.
- C. Complete the project at the originally authorized level of \$75 million, of which at this time \$42.5 million has been obligated, leaving a \$32.5 million mortgage.

Alternative A, to terminate and deobligate, would basically mean completing existing ongoing activities, the outstanding FAR's, the masterplans and training activities. This would make available an uncommitted amount of almost \$18 million for deobligation. Outstanding activities, as now scheduled, could be completed by the current PACD of September 1992 assuming a timely start of the Muscat water supply construction FAR's. The primary advantage of this alternative is that a project extension would not be required, which in itself is a relatively simple act.

Disadvantages are as follows:

- The GovOman would lose technical and training resources at a critical stage of the institutional development of the Water Resources Sector.
- Hard won policy gains by the OAJC regarding a comprehensive planning approach for water resources management may be lost or set back.
- Long term opportunities for relationships between U.S. institutions and consultants and Omani institutions will not have the chance to fully develop without the project.
- GovOman expectations will not be met in the Salalah area where most of the remaining funds are budgeted, which may result in the Master plan becoming a shelf item.

Alternate B, which is to continue the existing program as generally outlined in Amendment 4, would focus heavily on institutional and training needs as well as make available some funding for the start-up of the Salalah Plan,

The advantages of this plan are:

- Completes work as currently agreed with the GovOman.
- Provides a basis to continue the greatly needed institutional support and training activities with highly qualified American support.
- Provides an opportunity to improve the creditability of the master planning process by offering follow on Technical Assistance and limited construction start-up.
- Maintains the momentum in the institutional and policy areas which took OAJC many years to gain.

Disadvantages of this plan are:

- The PACD will have to be extended.
- The OAJC will be required to maintain a management staff dedicated to the water resources sector.

Alternate C, provides that the project be completed at the originally authorized levels. In this case additional funds would be dedicated primarily to construction or commodity imports as the absorptive capacity for Technical Assistance and training support will probably be reached with current funding.

An advantage of this plan is:

- Opportunities would be gained for U.S. suppliers and contractors, probably far in excess of the U.S. contribution, because of the high cost sharing ratio between the OAJC and GovOman.

Disadvantages of this alternative are:

- The PACD would have to be extended probably in excess of 5 years if a major construction activity is planned.
- OAJC management resources would have to be extended accordingly.

This alternative does not significantly add to the sectors primary needs of institutional support and training, but rather to capital improvements which are not a current funding problem for the GovOman.

Alternate C, if of interest to OAJC and the GovOman, should best be carried out under a new project authorization in accordance with a new project design effort and the current grant program thinking.

### Summary

Continuance of the existing program, Alternate B, appears to be the most logical choice for the OAJC at this time. These remain viable and desirable objectives for the near future for which U.S. institutions and consultants can play a key role. The OAJC has put too much effort into the sector to terminate the institutional support efforts prematurely as suggested by Alternate A. The third alternative, to undertake a major capital project, may also be a desirable objective, but would not be appropriate under this project because of timing and project design issues.

## CONCLUSIONS AND RECOMMENDATION

1. Policy change was not a goal of this project, although the Commission worked extremely hard for a comprehensive planning and strategic management approach to Oman's scarce water resources. Loosing the battle, the war may have been won as the new Ministry of Water Resources appears to be emerging as the strategic manager for Oman. Future gains in the policy areas will probably come as a result of training and technical assistance currently underway.

- o A priority goal in the use of remaining funds should be to continue to assist the GovOman in developing a highly skilled staff of comprehensive water resource planners, technicians, financial analysts, managers and decision makers.

2. The Omani Institutions generally are strong and effective and have large expatriate staffs. Their capability to plan and implement projects is excellent, and not a barrier to completing the master planning and construction components of this project. The Fixed Amount Reimbursement (FAR) approach, at this point in the project, appears to be working well and a good implementation tool for the OAJC. However, closer management will be required in the future by OAJC staff as regards procurement and construction. Special attention is required for monitoring of items specifically imported for the project to assure that U.S. source and origin rules are met. It should be noted that procedures for the implementation of FAR project assistance as set forth in Handbook 1B, Chapter 20 are "based on the assumption that FAR projects are relatively small..., and that no FAR project or subproject is made up exclusively or largely of commodities..."

- o Future FARs should be developed with assistance of a Project Development Officer or a direct hire engineer and legal advisor experienced in host country contracting and FAR procedures.
- o FARs should be kept as relatively small discrete units that can be completed in one to two years, with payment provisions to minimize the pipeline.
- o Special attention should be directed to monitoring of the source and origin requirements of the FAR program.
- o FAR's should be used to leverage U.S. procurement when practicable.

- o The existing Salalah Ponds FAR should be reviewed and reissued if needed to adjust for possible road design changes and imported commodities.

3. Technical Assistance support to the project is well underway and appears to be the strong element of the project. A major design effort with an U.S. consultant has been completed with construction on the verge of start up. A large pipe procurement contract with a U.S. firm also resulted, funded entirely by the GovOman. The three master plans just underway are yet to be judged but appear to fill the critical gap in helping Oman manage its future water resources. The training element is just starting and could be the project's big winner. The key to the success of the new Ministry of Water Resources (MWR) will be how fast and how well its new staff is trained and developed professionally.

- o The strong focus on U.S. technical assistance and training resources should continue, emphasizing technology transfer.
- o A training plan for the remainder of the project needs to be developed with input from the MWR and considering recommendations of the Coastal Zone, Muscat and Salalah Master Plans.

4. A.I.D. loan (\$32,491,000) and grant (\$10,000,000) funds have been obligated much faster than the decisions on their use. Oman funding support has not been lacking as projects come on line. The final project agreement provides that the Omani commitment will be the equivalent of \$113 million, of which almost \$112 million is for the Muscat Water Improvements. Actually, the Ministry of Electricity and Water has budgeted over \$190 million for construction alone, excluding A.I.D. funds. Although construction is just starting, the Omani funding commitment should far surpass their agreed levels. Omani funding commitments have not been an obstacle on this project to date. The nature of the work will not lead to significant U.S. procurement from the Omani funding sources outside of the pipe contract mentioned above.

- o As construction activities pickup, OAJC should institute a plan to routinely track and update the Omani contribution as well as that portion dedicated to U.S. procurement.

5. The beneficiaries of the project must be tallied in the future, but will include those in Muscat and Salalah who benefit from improved water and wastewater systems. The masterplans could touch almost every resident as their recommendations are carried out. At the micro level, many will gain in the Ministry of Water Resources by receiving vastly upgraded skills which in turn should be passed on through more efficient water resource management.

- o Consider developing a baseline from current data and ongoing master plan studies, to be used for measuring impact at project completion.

6. The three American contract teams plus WASH all appear to be providing a highly professional product. Final results are too early to judge, except partially from the WASH effort, which have been well received. The contract teams are all highly skilled and with extensive developing country experience. They are well qualified for their individual tasks and should provide an excellent end product.

7. OAJC can be complimented for their efforts to make this project work over the past two years. Prior to that time a high level of hope or idealism persisted as well as the failure to fully understand the Omani governmental process. This, in part, may have hindered the start up. Basically three years were lost. The GovOman's indecision on where to place the water resources sector or a competing British offer of support for the sector were not helpful. However an earlier more pragmatic approach may have led to different results and a much different project.

- o The lessons learned here would be helpful in the design of future projects.

8. In hindsight, the Project Paper was not well conceived, presenting an overly optimistic plan, not fully endorsed or understood by the Omani counterpart agencies. While technically sound, the PP had no agreed upon implementation plan. Institutionally, different alternatives needed to be explored as well as better collaboration with the beneficiaries. The PP was almost four years in the design process, a concern in itself, especially when the product has little relevance to the current program.

- o The lesson learned here is to have the GovOman in full agreement before authorization. The OAJC is now well aware of this need, but as staff changes occur must continually keep this in mind.

9. Annual obligations were made primarily for sake of meeting obligation requirements and often, it appears, without the level of technical, financial and economic input and review required by FAA Section 611a, b and e. Also it is not clear whether the original environmental analysis has been revised for the construction components and approved by the Bureau Environmental Officer as required by Regulation 16.

- o An Environmental Analysis of the Muscat construction component should be prepared as soon as possible and submitted to the Bureau Environmental Officer for approval. Also a final project paper amendment should address these concerns, as appropriate.

10. Regarding project management house keeping, OAJC has been most careful to keep the project agreements updated, making annual changes, usually reissuing the detailed Project Description and Financial Plan annually. They have however been remiss in updating the project paper or properly documenting the reasons for major deviations from the paper (i.e.: the usual social, economic, technical, financial analysis), and in the amending of some project authorizations.

- o The PSC Engineer/Project Manager should be brought on-board as soon as possible.
- o Action and Implementation plans for completing the project should be developed as his first action.
- o The Project Paper should be amended incorporating recommendations for the Action, Procurement, Implementation and Evaluation plans as well as pertinent recommendation noted above; possibly using ENE/PD assistance.
- o The Project Paper Amendment should be targeted for completion by the end of Calendar Year 91 along with a decision on A.I.D.'s future participation in the water sector and proposed extension of the Project Assistance Completion Date (PACD).

11. Regarding project monitoring and evaluation, an evaluation plan was basically abandoned and a project covenant ignored. On the other hand the OAJC quarterly reports on the project were forthcoming and generally complete and appear to have been given wide distribution including to A.I.D./W. Also the OAJC did not maintain a current implementation or action plan, an important implementation tool.

- o The OAJC should consider this assessment as adequate for meeting the requirements of a mid term evaluation.
- o A final evaluation should be adequate to meet the balance of the projects external monitoring needs and should be scheduled after the final PACD has been determined.

12. The project will continue to require experienced AID Direct Hire involvement, especially if the remaining \$15 million budget for Salalah is to be implemented through FARs. Consultation with the Bureau will probably be required to support the new PSC manager/engineer planned for the project.

- o ENE/PD input should be used on finalizing future FAR's for the project, especially those that may involve construction or procurement of commodities.
- o Bureau input should also be considered for development of the Action and Implementations Plans and Project Paper Amendment.

13. The project goal to provide a reliable supply of water sufficient to meet the needs of the people and the planned development of Oman remains viable and desirable and fully worthy of continued OAJC support. Obligating the balance of the project mortgage at this time will not significantly add to OAJC's or GovOman's ability to meet this goal.

- o OAJC should continue to implement the project as now generally planned through Amendment 4, subject to recommendations of this assessment.
- o A PACD extension will be required and should be determined only after pertinent Master plan and training information have been collected, and an Action Plan has been completed, including the use of the balance of the funds earmarked for Salalah and Institutional Support.
- o A revisiting of this assessment with the Bureau on the PACD extension is desirable and best done by obtaining their assistance in a decision to program the remaining \$14 million presently earmarked for Salalah.



## ANNEX

### PROJECT COMPONENT EVOLUTION

Table A-1	Base Loan Agreement - September 86
Table A-2	Amendment 1 - September 87
Table A-3	Amendment 2 - September 88
Table A-4	Amendment 3 - May 89
Table A-5	Amendment 4 - September 90

### MISCELLANEOUS TABLES

Table A-6	List of Project PIL's
Table A-7	List of Contracts
Table A-8	List of FAR Agreements

PROJECT COMPONENT EVOLUTION

Table A-1

PROJECT PAPER PROGRAM

Water Resources Development Project  
Projected Expenditure Table  
(U.S. \$ Million)

PROJECT AGREEMENT PROGRAM

Component Activity	Total Cost Estimate U.S.\$	Contribution To Project		Base Loan Agreement - Sep 86			REMARKS
		Oman U.S.	U.S.	U.S. \$	OMAN \$	TOTAL \$	
<b>SUBPROJECT 1</b>							
<b>WATER RESOURCES MANAGEMENT AND PLANNING ORGANIZATION</b>							
1.A. Advisory Services - CCEVR	11.25	1.50	9.75				
1.B. National Water Resources Strategic Plan	2.83	0.25	2.58				
1.C. Engineering - Water Augmentation Facilities	2.61	0.27	2.34				
1.D. Construction - Water Augmentation Facilities	13.00	6.50	6.50				
<b>TOTAL - SUBPROJECT 1</b>	<b>29.70</b>	<b>8.52</b>	<b>21.18</b>				
<b>SUBPROJECT 2</b>							
<b>CAPITAL AREA WATER SYSTEM IMPROVEMENT AND WATER/WASTEWATER PLANNING</b>							
2.A. Engineering - Water System Improvements	13.13	1.31	11.82	11.82	1.31	13.13	
2.B. Construction of Water System Improvements	168.70	168.70	-	-	168.70	168.70	
2.C. Plan for Priority Septage/Wastewater Needs	0.92	0.08	0.84	-	-	-	
2.D. Master Plan for Water/Wastewater Improvements	4.81	0.44	4.37	6.0	0.43	6.43	includes envir. studies in 2E & 2F
2.E. Oceanographic Studies for Wastewater Planning	1.20	0.00	1.20	-	-	-	
2.F. Environmental Impact Statement for Masterplan	0.42	0.00	0.42	-	-	-	
2.G. Institutional Development & Training	2.09	0.21	1.88	-	-	-	
<b>TOTAL - SUBPROJECT 2</b>	<b>191.27</b>	<b>170.74</b>	<b>20.53</b>	<b>18.25</b>	<b>178.52</b>	<b>196.77</b>	
<b>SUBPROJECT 3</b>							
<b>TOWN AND VILLAGE WATER AND WASTEWATER PILOT ACTIVITIES</b>							
3.A. Consulting Services - Towns	6.22	0.62	5.60				
3.B. Consulting Services - Villages	6.22	0.62	5.60				
3.C. Construction Services - Towns	20.00	10.00	10.00				
3.D. Construction Services - Villages	20.00	10.00	10.00				
3.E. Institutional Development and Training	2.09	0.21	1.88				
<b>TOTAL - SUBPROJECT 3</b>	<b>54.53</b>	<b>21.45</b>	<b>33.08</b>				
<b>TOTAL PROJECT COST</b>	<b>275.50</b>	<b>200.71</b>	<b>74.79</b>				

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PROJECT COMPONENT EVOLUTION

Table A - 2

PROJECT PAPER PROGRAM

Water Resources Development Project  
Projected Expenditure Table  
(U.S. \$ Million)

PROJECT AGREEMENT PROGRAM

*Amendment No. 1 - Sep 87*

Component Activity	Total Cost Estimate U.S.\$	Contribution To Project Oms U.S.	PROJECT AGREEMENT PROGRAM			REMARKS
			U.S. \$	OMAN \$	TOTAL \$	
<b>SUBPROJECT 1</b>						
<b>WATER RESOURCES MANAGEMENT AND PLANNING ORGANIZATION</b>						
1.A. Advisory Services - CCEWR	11.26	1.50 9.76				
1.B. National Water Resources Strategic Plan	2.83	0.25 2.58				
1.C. Engineering - Water Augmentation Facilities	2.61	0.27 2.34				
1.D. Construction - Water Augmentation Facilities	13.00	6.50 6.50				
<b>TOTAL - SUBPROJECT 1</b>	<b>29.70</b>	<b>8.52 21.18</b>				
<b>SUBPROJECT 2</b>						
<b>CAPITAL AREA WATER SYSTEM IMPROVEMENT AND WATER/WASTEWATER PLANNING</b>						
2.A. Engineering - Water System Improvements	13.13	1.31 11.82	0.9	9.6	10.5	
2.B. Construction of Water System Improvements	168.70	168.70 -	18.5	102.6	121.2	
2.C. Plan for Priority Septage/Wastewater Needs	0.92	0.08 0.84				
2.D. Master Plan for Water/Wastewater Improvements	4.81	0.44 4.37	9.0	0.6	9.6	
2.E. Oceanographic Studies for Wastewater Planning	1.20	0.00 1.20				
2.F. Environmental Impact Statement for Masterplan	0.42	0.00 0.42				
2.G. Institutional Development & Training	2.09	0.21 1.88				
<b>TOTAL - SUBPROJECT 2</b>	<b>191.27</b>	<b>170.74 20.53</b>	<b>28.4</b>	<b>112.8</b>	<b>141.2</b>	
<b>SUBPROJECT 3</b>						
<b>TOWN AND VILLAGE WATER AND WASTEWATER PILOT ACTIVITIES</b>						
3.A. Consulting Services - Towns	6.22	0.62 5.60				
3.B. Consulting Services - Villages	6.22	0.62 5.60				
3.C. Construction Services - Towns	20.00	10.00 10.00				
3.D. Construction Services - Villages	20.00	10.00 10.00				
3.E. Institutional Development and Training	2.09	0.21 1.88				
<b>TOTAL - SUBPROJECT 3</b>	<b>54.53</b>	<b>21.45 33.08</b>				
<b>TOTAL PROJECT COST</b>	<b>275.50</b>	<b>200.71 74.79</b>				

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PROJECT COMPONENT EVOLUTION

Table A-3

PROJECT PAPER PROGRAM

Water Resources Development Project  
Projected Expenditure Table  
(U.S. \$ Million)

PROJECT AGREEMENT PROGRAM

Component Activity	Total Cost Estimate U.S.\$	Contribution To Project		Amendment No 2 - Sep 88			REMARKS
		U.S.\$	OMAN U.S.	U.S. \$	OMAN \$	TOTAL \$	
<b>SUBPROJECT 1</b>							
<b>WATER RESOURCES MANAGEMENT AND PLANNING ORGANIZATION</b>							
1.A. Advisory Services - CCEWR	11.26	1.50	9.76				
1.B. National Water Resources Strategic Plan	2.83	0.25	2.58				
1.C. Engineering - Water Augmentation Facilities	2.61	0.27	2.34				
1.D. Construction - Water Augmentation Facilities	13.00	6.50	6.50				
<b>TOTAL - SUBPROJECT 1</b>	<b>29.70</b>	<b>8.52</b>	<b>21.18</b>				
<b>SUBPROJECT 2</b>							
<b>CAPITAL AREA WATER SYSTEM IMPROVEMENT AND WATER/WASTEWATER PLANNING</b>							
2.A. Engineering - Water System Improvements	13.13	1.31	11.82	0.9	9.6	10.5	} later amendments combined 2A & 2B.
2.B. Construction of Water System Improvements	168.70	168.70	-	18.5	102.6	121.1	
2.C. Plan for Priority Septage/Wastewater Needs	0.92	0.08	0.84				
2.D. Master Plan for Water/Wastewater Improvements	4.81	0.44	4.37	17.0	0.6	17.6	
2.E. Oceanographic Studies for Wastewater Planning	1.20	0.00	1.20				
2.F. Environmental Impact Statement for Masterplan	0.42	0.00	0.42				
2.G. Institutional Development & Training	2.09	0.21	1.88				
<b>TOTAL - SUBPROJECT 2</b>	<b>191.27</b>	<b>170.74</b>	<b>20.53</b>	<b>36.4</b>	<b>112.8</b>	<b>149.2</b>	
<b>SUBPROJECT 3</b>							
<b>TOWN AND VILLAGE WATER AND WASTEWATER PILOT ACTIVITIES</b>							
3.A. Consulting Services - Towns	6.22	0.62	5.60				
3.B. Consulting Services - Villages	6.22	0.62	5.60				
3.C. Construction Services - Towns	20.00	10.00	10.00				
3.D. Construction Services - Villages	20.00	10.00	10.00				
3.E. Institutional Development and Training	2.09	0.21	1.88				
<b>TOTAL - SUBPROJECT 3</b>	<b>54.53</b>	<b>21.45</b>	<b>33.08</b>				
<b>TOTAL PROJECT COST</b>	<b>275.50</b>	<b>200.71</b>	<b>74.79</b>				

PROJECT COMPONENT EVOLUTION

Table A-4

Water Resources Development Project  
Projected Expenditure Table  
(U.S. \$ Million)

PROJECT AGREEMENT PROGRAM

PROJECT PAPER PROGRAM

Component Activity	Total Cost Estimate U.S.\$	Contribution To Project		Amendment No 3 - May 89			REMARKS
		U.S.\$	Oman U.S.	U.S. \$	OMAN \$	TOTAL \$	
<b>SUBPROJECT 1</b>							
<b>WATER RESOURCES MANAGEMENT AND PLANNING ORGANIZATION</b>							
1.A. Advisory Services - CCEWR	11.26	1.50	9.76				
1.B. National Water Resources Strategic Plan	2.83	0.25	2.58				
1.C. Engineering - Water Augmentation Facilities	2.61	0.27	2.34				
1.D. Construction - Water Augmentation Facilities	13.00	6.50	6.50				
<i>Institutional Support Grant</i>							
<b>TOTAL - SUBPROJECT 1</b>	<b>29.70</b>	<b>8.52</b>	<b>21.18</b>	<b>10.0</b>	<b>—</b>	<b>10.0</b>	<b>Grant</b>
<b>SUBPROJECT 2</b>							
<b>CAPITAL AREA WATER SYSTEM IMPROVEMENT AND WATER/WASTEWATER PLANNING</b>							
2.A. Engineering - Water System Improvements	13.13	1.31	11.82	15.4	111.6	127.0	Engr & Constr. for Muscot
2.B. Construction of Water System Improvements	168.70	168.70	—	10.0	0.7	10.7	" " " " Salalah
2.C. Plan for Priority Septage/Wastewater Needs	0.92	0.08	0.84	—	—	—	
2.D. Master Plan for Water/Wastewater Improvements	4.81	0.44	4.37	7.0	0.7	7.7	
2.E. Oceanographic Studies for Wastewater Planning	1.20	0.00	1.20	—	—	—	
2.F. Environmental Impact Statement for Masterplan	0.42	0.00	0.42	—	—	—	
2.G. Institutional Development & Training	2.09	0.21	1.88	—	—	—	
<b>TOTAL - SUBPROJECT 2</b>	<b>191.27</b>	<b>170.74</b>	<b>20.53</b>	<b>32.4</b>	<b>113.0</b>	<b>145.4</b>	
<b>SUBPROJECT 3</b>							
<b>TOWN AND VILLAGE WATER AND WASTEWATER PILOT ACTIVITIES</b>							
3.A. Consulting Services - Towns	6.22	0.62	5.60				
3.B. Consulting Services - Villages	6.22	0.62	5.60				
3.C. Construction Services - Towns	20.00	10.00	10.00				
3.D. Construction Services - Villages	20.00	10.00	10.00				
3.E. Institutional Development and Training	2.09	0.21	1.88				
<b>TOTAL - SUBPROJECT 3</b>	<b>54.53</b>	<b>21.45</b>	<b>33.08</b>	<b>—</b>	<b>—</b>	<b>—</b>	
<b>TOTAL PROJECT COST</b>	<b>275.50</b>	<b>200.71</b>	<b>74.79</b>	<b>42.4</b>	<b>113.0</b>	<b>155.4</b>	

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PROJECT COMPONENT EVOLUTION

Table A-5

PROJECT PAPER PROGRAM

Water Resources Development Project  
Projected Expenditure Table  
(U.S. \$ Million)

PROJECT AGREEMENT PROGRAM

Component Activity	Total Cost Estimate U.S.\$	Contribution To Project		Amendment No 4 - Sep 90			REMARKS
		Oman U.S.	U.S.	U.S. \$	OMAN \$	TOTAL \$	
<b>SUBPROJECT 1</b>							
<b>WATER RESOURCES MANAGEMENT AND PLANNING ORGANIZATION</b>							
1.A. Advisory Services - CCNR	11.26	1.50	9.76	3.0	—	3.0	Grant Funded by U.K.
1.B. National Water Resources Strategic Plan	2.83	0.25	2.58	—	—	—	
1.C. Engineering - Water Augmentation Facilities	2.61	0.27	2.34	—	—	—	
1.D. Construction - Water Augmentation Facilities	13.00	6.50	6.50	—	—	—	
- Training				1.5	—	1.5	Grant
TOTAL - SUBPROJECT 1	29.70	8.52	21.18	1.5	—	1.5	Grant
<b>SUBPROJECT 2</b>							
<b>CAPITAL AREA WATER SYSTEM IMPROVEMENT AND WATER/WASTEWATER PLANNING</b>							
2.A. Engineering - Water System Improvements	13.13	1.31	11.82	32.4	112.3	144.7	Muscat; U.S. 15.4, Oman 111.6 Salalah; U.S. 17.0, Oman 0.7
2.B. Construction of Water System Improvements	168.70	168.70	—				
2.C. Plan for Priority Septage/Wastewater Needs	0.92	0.08	0.84				
2.D. Master Plan for Water/Wastewater Improvements	4.81	0.44	4.37	4.0	0.7	4.7	Grant
2.E. Oceanographic Studies for Wastewater Planning	1.20	0.00	1.20	—	—	—	Pending Salalah M.P. Conclusions
2.F. Environmental Impact Statement for Masterplan	0.42	0.00	0.42	—	—	—	
2.G. Institutional Development & Training	2.09	0.21	1.88	—	—	—	
TOTAL - SUBPROJECT 2	191.27	170.74	20.53	36.4	113.0	149.4	
<b>SUBPROJECT 3</b>							
<b>TOWN AND VILLAGE WATER AND WASTEWATER PILOT ACTIVITIES</b>							
3.A. Consulting Services - Towns	6.22	0.62	5.60	—	—	—	
3.B. Consulting Services - Villages	6.22	0.62	5.60				
3.C. Construction Services - Towns	20.00	10.00	10.00				
3.D. Construction Services - Villages	20.00	10.00	10.00				
3.E. Institutional Development and Training	2.09	0.21	1.88				
TOTAL - SUBPROJECT 3	54.53	21.45	33.08				
TOTAL PROJECT COST	275.50	200.71	74.79	42.4	113.0	155.4	

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Table A-6

PIL LIST FOR WATER RESOURCES DEVELOPMENT PROJECT 272-1014

WRDP (272-0104)	PIL No. 1	16 May 1987	Procedures
	PIL No. 2	16 May 1987	Implementation
	PIL No. 3	16 Dec 1989	Amendment of Proj. Descript.
WATER SYS. IMP. (272-0104.1)	PIL No. 3	29 Mar 1989	Tech. Serv. Contract Approval
	PIL No. 4	06 Jan 1991	Commitment of Construction funds
	PIL No. 5	25 Feb 1991	Approval of Drgs. & Specs.
SALALAH MP (272-0104.2)	PIL No. 1	23 Jan 1989	Bidding Procedures
	PIL No. 2	14 Nov 1990	Contract Approval
MUSCAT MP (272-0104.3)	PIL No. 1	23 Feb 1991	Approval of Amendment to Engineering Science Contract
SALALAH PONDS (272-0104.4)	PIL No. 1	16 Jan 1989	Funds Commitment
	PIL No. 2	20 Dec 1989	" "
COASTAL ZONE (272-0104.5)	PIL No. 1	04 Feb 1990	" "
	PIL No. 2	30 Dec 1990	" "
MWR TECH. ASST. (272-0104.6)			

Notes:

PIL - 104.4 - No. 2 replaces No. 1 which was never signed by Government of Oman

PIL - 104.1 - No's 1 and 2 were not used.

PIL - 104.5 - No. 1 FAR Amount \$1,500.000  
104.5 - No. 2 Changed from \$1,500.000 to \$1,650.000  
based on draft negotiated contract.

Table A-7

LIST OF CONTRACTS - WRDP

1. Water Supply System Improvements - Design and Supervision

Engineering Science Inc. (HC)

Date Signed: 03 May 1989

Value: \$1,022,150

Completion Date: Complete except for construction supervision

Amendment No. 1 for Consultancy Services for Water Supply

Master Plan for Muscat with ES (HC)

Date Signed: Not signed yet

Value: \$993,307

Completion Date: 13 MO's after signature

2. Water & Wastewater Master Plan for Salalah (HC)

Dames and Moore & CDM

Date signed: 25 December 1990

Value: \$2,786,794

Completion Date: June 1992

Note: Additional work is proposed by the consultants.  
Proposal is being reviewed by OAJC.

3. Coastal Zone Management (FAR)

James Dobbin Associates Inc.

Date Signed: February 1991

Value: \$1,650,000

Completion Date: June 1992

Table A-8  
LIST OF FAR AGREEMENTS FOR CONSTRUCTION

	A C T I V I T Y	MINISTRY	PIL NO.	LATE	AMOUNT \$	COMPLETION DATE PER PIL
1	MUSCAT WATER SUPPLY SYSTEM IMPROVEMENTS					
	Pipe laying (East)	MEW	4	06 Jan 1991		May 1992
	Pipe laying (West)	MEW	4	06 Jan 1991	8,230,000	May 1992
	Ghubra Works	MEW	4	06 Jan 1991	5,770,000	Sept 1992
2	SALALAH PONDS	DHM	2	20 Dec 1989	2,175,000	Jan 1991

Note: Pipelaying costs are combined.

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