

WASH

WATER AND SANITATION
FOR HEALTH PROJECT

Sponsored by the U.S. Agency
for International Development

PROGRESS REPORT

No. 11

OCTOBER 1987

Operated by CDM and Associates

Camp Dresser & McKee International Inc.
Associates in Rural Development, Inc.

International Science and Technology Institute
Research Triangle Institute

Training Resources Group
University of North Carolina at Chapel Hill

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151-54279

WATER AND SANITATION FOR HEALTH PROJECT

Progress Report No. 11

October 1987

Summary of CDM Contract Activities August 29, 1980, to September 30, 1987

Water and Sanitation for Health Project
Contract No. 5942-C-00-4085-00, Project No. 936-5942
Sponsored by the Office of Health, Bureau for Science and Technology
U.S. Agency for International Development
Washington, D.C. 20523

Glossary of Abbreviations and Acronyms

ACT—Activity—the name given to specific work or task assignments (from the Office of Health to CDM/WASH under the WASH II Contract)	HRD—Human Resource Development	PRITECH—Technology for Primary Health Care
AFR/DP—Africa Bureau, Office of Project Development	IRC—International Reference Center for Community Water Supply and Sanitation (The Hague)	PVO—Private Voluntary Organization
AFR/DR/HPN—Africa Bureau, Office of Technical Resources, Division of Health, Population, and Nutrition	ISTI—International Science and Technology Institute	REACH—Resources for Child Health
AID—Agency for International Development	LAC/DR—Bureau for Latin America and the Caribbean/Office of Development Resources	REDSO/EA—Regional Economic Development Service Offices/ East Africa
AID/AFR—AID Bureau of Africa	LDC—Less or least developed country	REDSO/WA—Regional Economic Development Service Office/ West Africa
AID/ANE—AID Bureau for Asia and Near East	NE/PD/ENV—Near East Bureau, Office of Project Development, Environmental Protection	RHUDO—Regional Housing Development Office
AID/ASIA—AID Bureau for Asia (now in ANE)	NE/TECH—Near East Bureau, Office of Technical Support	ROCAP—Regional Office for Central American Programs
AID/LAC—AID Bureau for Latin America and the Caribbean	NE/TECH/HPN—Near East Bureau, Office of Technical Support, Health Population and Nutrition Development Division	RM—Request Memorandum
AID/NE—AID Bureau for Near East (now in ANE)	NGO—Non-governmental Organization	RTI—Research Triangle Institute
AIDIS—Inter American Association of Sanitary Engineers	O&M—Operations and Maintenance	RWS&S—Rural Water Supply and Sanitation
ARD—Associates in Rural Development	OFDA—Office of Foreign Disaster Assistance	S&T/H—Bureau for Science and Technology, Office of Health
AWWA—American Water Works Association	ORT—Oral rehydration therapy	S&T/HEA—Bureau for Science and Technology, Office of Health
CARE—Cooperative for American Relief Everywhere	OTD—Order of Technical Direction - the name given to specific work or task assignments (from the Office of Health to CDM/WASH under the WASH I Contract)	S&T/H/WS—Bureau for Science and Technology, Office of Health, Division of Community Water Supply and Sanitation
CDM—Camp Dresser & McKee International, Inc.	PAHO—Pan American Health Organization	TOT—Training-of-Trainers
CEP—Community Education and Participation	PCV—Peace Corps Volunteer	TR—WASH Technical Report
CSAP—Child Survival Action Plan	PID—Project Identification Document	TRG—Training Resources Group
DS/ENGR—Development Support Bureau, Office of Engineering	PP—Project Paper	UNC—University of North Carolina
DS/HEA—Development Support Bureau, Office of Health	PPC/E—Bureau for Program and Policy Coordination, Office of Evaluation	UNDP—United Nations Development Programme
DS/POP—Development Support Bureau, Office of Population	PPC/EI—Bureau for Program and Policy Coordination, Office of Evaluation and Information	UNEP—United Nations Environment Programme
FR—WASH Field Report	PRE—Bureau for Private Enterprise	UNICEF—United Nations Children's Fund
FVA/PVC—Bureau for Food for Peace and Voluntary Assistance, Office of Private and Voluntary Assistance	PRICOR—Primary Health Care Operations Research	USAID—United States Agency for International Development
FY—Fiscal Year		VBC—Vector Biology and Control Project
HEALTHCOM—Communications for Child Survival		WASH—Water and Sanitation for Health Project
		WHO—World Health Organization
		WID—Women in Development
		WS&S—Water Supply and Sanitation

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Left: Children operating an India Mark II handpump installed over an open well in North Kordofan Province, Sudan.

Below: Construction of a headwall during a well improvement workshop in Honduras.



1. THE WASH EXPERIENCE

Background

The Water and Sanitation for Health Project (WASH) was created to amplify the efforts of the United States government to assist developing countries to meet the goals of the United Nations International Drinking Water Supply and Sanitation Decade (1981-1990). The Decade was conceptualized at a U.N. Water Conference at Mar del Plata, Argentina, in 1977. The action plan developed at this conference called on all countries to vigorously address the water and sanitation needs of over two billion people on Earth. The goal of the Decade is safe drinking water and sanitation for all by 1990.

Now completing its seventh year, the WASH Project has built up a significant body of knowledge and experience about what makes for success in water supply and sanitation projects. This accumulation of knowledge and experience is the end product of WASH's work in fifty countries on 360-plus activities, most of them in response to requests for assistance from the overseas missions of the United States Agency for International Development.

As part of its activities WASH has produced a large number of field and technical reports: field reports describe how a specific water and sanitation problem was dealt with by WASH consultants working overseas; technical reports describe research carried out by WASH and/or contain stand-alone generic guidelines that can be used in many countries and under diverse circumstances to solve various water- and sanitation-related problems.

This progress report presents summaries of the activities carried out by WASH to date and lists all of WASH's technical and field reports. To make it easy for others to access this body of material, WASH has organized it by category. WASH activities and reports are cross-referenced by geographical region, by country and by subject matter.

For this progress report, WASH would also like to emphasize certain activities that are relevant to current issues in the Water Decade. Accordingly the following sections of this text highlight WASH activities in the following areas.

- Decade Planning
- Institutional and Human Resources Development
- Finance and Cost Recovery
- Operations and Maintenance

- Community Participation and Hygiene Education
- Improving Programming in Water Supply and Sanitation

These categories closely parallel the "global concepts" discussed at a conference of bilateral, multilateral, and United Nations agency representatives who met in October 1987 in Interlaken, Switzerland, to take stock of the progress that has been made and constraints that still exist in meeting the goals of the Water Decade.

The categories that were discussed at the Interlaken Conference and that will be highlighted in the following sections all concern "software" problems; that is to say, they do not focus as much on the pumps and pipes and latrines as they do on human institutional problems: how can water and sanitation agencies be organized and managed for maximum effectiveness, how can water and sanitation workers be trained to take on new roles, how can a village group learn to maintain its handpump, or what is needed at the planning stages if water projects are to be sustainable? This emphasis on "software" does not mean, of course, that the hardware is not important or that WASH does not concern itself with solving hardware problems. Far from it—"hardware" and "software" issues cannot be divorced.

In the following pages, some illustrations are given of WASH "products" (technical and field reports) that fall into each category. Note that almost none of these products fits neatly into any one category because WASH uses an interdisciplinary approach in carrying out its assignments and because the categories clearly overlap.

Decade Planning

At the inception of the Water Decade, it was envisaged that developing countries would establish national water and sanitation coverage targets and prepare country-level Decade plans. By early 1981, only nine countries had developed plans. By 1983, this number had grown to 59 countries, with another 31 working on their plans. Through the WASH Project, A.I.D. has been actively helping countries in Africa (where Decade planning lagged) to develop their plans. To date, WASH has provided planning assistance to the Central African Republic, Zaire, and Swaziland and is currently collaborating with the World Health Organization to strengthen the national planning process in Djibouti.

WASH uses a highly collaborative approach to Decade planning whereby the pace of planning

activities and the nature of the planning products are directly determined by the capabilities and efforts of host country officials. One of the most salient features of this approach is its emphasis on planning as a process, rather than an event resulting in a document. The planning process should occur over the ten-year period of the Decade and should result in a progressive strengthening of the planning capabilities of government agencies. WASH, taking a non-directive, advisory role, supports and encourages host country efforts and decisions.

Although "Decade planning" is a discrete activity, everything WASH has accomplished is aimed at giving developing countries the know-how and tools they need to strengthen their institutions, improve their personnel, and find economical and efficient ways to attain the Decade goals they have set.

HIGHLIGHTS

Institutional & Human Resources Development

Guidelines for Institutional Assessment: Water and Wastewater Institutions, *Technical Report 37*.

Facilitator Guide for Conducting a Project Start-up Workshop, *Technical Report 41*.

Facilitator Guide for Conducting a Team Planning Meeting, *Technical Report 32*.

Guide for Conducting a Debriefing, *Technical Report 32, Supplement (draft)*.

Technical Training Guides: Latrine Construction (*Technical Report 25*); Handpump Installation and Maintenance (*Technical Report 26*); Rainwater and Roof Catchment (*Technical Report 27*); Spring Capping (*Technical Report 28*); and Well Improvement (*Technical Report 34*).

Managing Institutional Development Projects, *Technical Report 49 (draft)*.

Guidelines for Human Resources Development Planning in the Water Supply and Sanitation Sector, *Technical Report 20*.

Institutional and Human Resources Development

In developing countries the institutions responsible for water supply and sanitation activities are frequently ineffective. For example, Decade strategy stresses providing water and sanitation services to populations now under-served or not served at all. But the centralized approach of most institutions is not suited to reaching rural and peri-urban or urban fringe areas where the

under-served live. Institutional structures and modes of operation need to be strengthened and decentralized, management must be improved, and personnel need to be given new skills so that they can improve their performance.

For WASH, institutional and human resources development has been a major activity. One focus of these activities has been to create a number of generic products that can be used by institutions and by donor and lending agencies—both those that work directly with WASH as well as others in the wider international community that deals with water and sanitation.

One of these generic products is *Guidelines for Institutional Assessment: Water and Wastewater Institutions*. This document is intended to identify the strengths and weaknesses of an institution. The assessment can be used as the basis for designing an institutional strengthening activity or as part of an evaluation of an on-going project. Preparation of these guidelines was in response to the many requests WASH received to assist missions to unravel institutional problems.

Another of these generic products, *The Facilitator Guide for Conducting a Project Start-up Workshop*, should increase the chances for a project to get off the ground without a year or more of lost time while project personnel sort out their roles and responsibilities. Since the beginning of the WASH Project, WASH staff and consultants have interacted with a great many development projects in a variety of settings. They have noticed that the first few months of a project are critical because it is then that patterns and understandings are established about the project's purpose and goals, roles of project staff, expectations of the various actors, and agreements about how the project will be managed. *The Facilitator Guide for Conducting a Project Start-up Workshop* presents plans for a three- to four- day event bringing together the government implementing agencies, donors, and long-term advisory team to get the project up and running and to forestall typical implementation problems. WASH has also used a similar design in conducting annual project monitoring workshops, and has prepared guidelines for conducting a team planning meeting for use by consultants before they undertake an activity and for conducting debriefings following a field activity.

Early in the project, WASH developed guides for conducting workshops in such areas as latrine construction, rainwater harvesting, etc. These guides can be used as the basis for a comprehensive rural water and sanitation training curriculum. The guides contain all the information a trainer needs to plan and conduct the workshop. Two other guides are currently under development. One is on well improvement and

the other is on community participation.

In addition to preparing these and other generic products, WASH has supported many institutional and human resources projects in the field. In Zaire WASH has been involved since 1985 helping the USAID/Zaire Mission develop a national training team for rural water supply and sanitation. This effort has established a national resource team of twelve persons which is available to water and sanitation projects throughout Zaire. In Sri Lanka WASH designed and delivered a three-phase management development program for the top twenty-five managers of the National Water Supply and Drainage Board. The program has consisted of three workshops focusing on management skills such as work monitoring, conflict resolution, running effective meetings, etc. Between the workshops, the participants have worked on specific action plans to apply the new skills they have learned. WASH plans to document this activity by creating a generic management development program which can be used in other countries.

WASH has been providing technical assistance to the Africa Water Program of the World Vision Relief Organization. The specific purpose of the assistance is to help the Africa Water Program establish a foundation for sound program management in the water and sanitation sector. In October 1987 Africa Water Program project

managers from Senegal, Ghana, Kenya, Ethiopia, and Malawi, along with staff members of the program's Regional Technical Team, attended a workshop in Nairobi. WASH consultants designed and facilitated the workshop, which aimed to assess current problems and develop action plans to address them.

In all its institutional and human resources development activities, WASH follows several basic principles. The first is to practice what it preaches. WASH must manage itself using some of the principles that it suggests to developing country agencies. The second is that activities such as training workshops or management planning can be effective only when they are directly tied to the larger institutional setting. For example, training will not be effective if personnel do not have adequate incentives, the necessary tools and equipment, adequate working conditions, and good supervision. If training is not directly related to the overall goals of the institution, it will not be relevant. But perhaps the most important principle is that many human resources development approaches can greatly benefit the water and sanitation sector. The field of human resources development offers the most current thinking in such areas as management, career development, incentives, and instructional development. WASH has attempted to use these approaches in its work.



Hand- and animal-drawn water at a traditional open well in North Kordofan Province, Sudan.



Developing health education materials in a training workshop in Belize.

HIGHLIGHTS

Finance & Cost Recovery

Willingness to Pay for Water in Rural Areas: Methodological Approaches and an Application in Haiti, *Field Report 213*.

Water Vending Activities in Developing Countries, *Technical Report 45 (draft)*.

A Simplified Costing Format for Primary Health Care Activities, Conference Paper.

Guidelines for Financial Management Assessment, *Activity in progress*.

Cost Management: Comparative Performance in Water Supply and Sanitation Systems, *Activity in progress*.

Finance and Cost Recovery

At any level—a national water authority, a regional operations and maintenance support agency, or in a small rural community—funds are needed from the community or the government to cover the costs of maintaining water and sanitation services. In many instances, ministry and agency budgets are inadequate to maintain the services that have been installed—not to speak of planned-for increases in services to meet Decade goals. In many rural areas, government funds for the operation and maintenance of water and sanitation services are not available at all. As a result, in both urban and rural areas, some or all

of the costs must be recovered from the users. While this need is well understood, in reality cost recovery practices are too often ineffective.

Cost recovery schemes cannot be designed in a vacuum. The magnitude of the costs to be recovered depends on the particular system design and the level of service provided. The success of cost recovery relies, in turn, on the appropriateness of the design, the participation of the community in the project—particularly in rural areas—and the willingness of individuals to pay for water and sanitation services. Cost recovery systems that are designed after systems are constructed may not succeed because the level of service was not what the community wanted, or the cost of the service may be too high for many of the community members to afford. If adequate cost recovery practices can be instituted, it will go a long way to assure the financial viability and autonomy of water supply and sanitation agencies and thus will make it more likely that the work of the Decade can be accomplished.

The WASH Project has carried out a number of activities that address common problems of cost recovery schemes. For example, WASH is collaborating with the World Bank to develop and field test a methodology for finding out how willing individuals are to pay for a water supply. This methodology, which is intended to help systems designers to plan for a level of service which matches the financial resources of a community, has been tested in two rural communities in Haiti. Another WASH activity that sheds light on the

willingness to pay problem is a study of water vending activities in two developing countries, Honduras and Kenya.

Data on water vending can be used to improve water supply planning and to provide estimates of potential cash flow. The study showed that prices charged for vended water are generally much higher than for water from other sources. In Tegucigalpa, Honduras, vended water is thirty-five times the cost of water from the distribution system. In addition to the two completed activities described above, WASH is collaborating with the World Bank on the study of water vending in two areas of Nigeria. The study should provide an assessment of the willingness of consumers to pay for improved water supplies. WASH is also collaborating with the World Bank on other willingness to pay studies in Nigeria, Tanzania, and Pakistan.

WASH is looking at ways to improve the financial management of institutions with responsibilities for implementing or maintaining water supply and sanitation projects. Obviously, improvements in institutional management and efficiency have many advantages—one being the reduction of the costs that have to be recovered from users. Two WASH activities in this area are on-going. The first activity is the development of management performance standards for institutions which have responsibility for water supply and sanitation projects. The final report of this activity will include recommendations for performance measures and standards and a description of the purposes of performance monitoring. The second activity involves devising and field-testing guidelines to assess the strengths and weakness of financial management systems for water sector institutions.

Finally, in the broader finance area, WASH has devised a simplified format for reporting project costs—both start-up and recurrent. The formats are intended as a starting point for the costing of a wide variety of primary health care activities, such as oral rehydration therapy, immunizations, water supply and sanitation. Although the specific elements of any given program may vary, the standardized groupings serve as a reminder of the types of costs that are to be included and to ensure that the inputs from all sources have been considered.

Operations and Maintenance

In recent years bilateral and multilateral agencies, along with the national governments of many developing countries, have constructed a very large number of water supply and sanitation systems. Unfortunately, a significant percentage of these systems are not working as they should or have broken down completely. One of the

HIGHLIGHTS

Operations & Maintenance

Assessment of the Operations and Maintenance Component of Water Supply Projects, *Technical Report 35*.

Privatization of the Operations and Maintenance Component of Rural Water Supply Systems, *Technical Report 39*.

Estimating Operations and Maintenance Costs for Water Supply Systems in Developing Countries, *Technical Report 48*.

Development of an O&M Supervisors Training Guide, *Activity in progress*.

Development of an Operation and Maintenance System for Shaba Refugee Water Supply Project—Zaire, *Field Report 170*.

primary reasons for this situation is a serious deficiency in operations and maintenance programs—a deficiency aggravated by the application of inappropriate or too sophisticated technologies. The poor performance of existing water supply and sanitation systems sets back progress towards Decade goals and represents wasted investment.

During the early years of the WASH Project, A.I.D. recognized the imbalance between efforts to construct water supply and sanitation systems and efforts to sustain them. In particular, WASH participated in a number of project evaluations during its first four years, and, in most cases, poor system maintenance was determined to be a major problem.

With respect to operations and maintenance, WASH activities have been directed primarily towards two areas. The first is the development of guidelines to show project planners how to give proper consideration to the operations and maintenance needs of a project from the very earliest stages of planning. The second is assisting A.I.D. missions with specific problems in operations and maintenance.

WASH's guidelines for the *Assessment of the Operations and Maintenance Component of Water Supply Projects* covers four types of systems commonly found in developing countries: hand-pumps, piped systems fed by gravity from springs, or streams, groundwater pumped by electric or diesel units, and surface waters processed through a treatment works. The guidelines use a question-answer format to cover the key elements of an operations and maintenance program—including such matters as logistics, recordkeeping, staff training, and finance. Another guide is being prepared to give planners a systematic way to estimate operations and maintenance costs during

the planning phases of a project.

One of the major concerns of both external agencies and national governments is that the governments do not have the resources to properly operate and maintain rural water supply systems; hence, the possibility of turning to the private sector is being considered. In this regard, WASH is currently developing a set of guidelines to assess the feasibility of privatizing the maintenance (and perhaps also the operations) of rural water supply systems. Looking at the private sector alternative also involves questions of cost recovery and the ability and willingness of communities to pay.

In the category of mission assistance, WASH evaluated an on-going rural water supply program in Papua New Guinea. One of the major findings of the WASH evaluators was that lack of maintenance threatened the accomplishments of the entire program. At the request of the Government of Papua New Guinea, WASH developed an "action plan" to follow up on the evaluation and to deal with the problems noted. The action plan, based on community ownership, lays out the sequence of steps that must be taken to develop a water project. In Zaire WASH was called upon to develop a maintenance program for a USAID-supported handpump installation project. The WASH team proposed a program utilizing local caretakers and artisans, as well as church missions, to provide handpump maintenance. In Sri Lanka WASH carried out an analysis of the staffing needs of the water systems operated by the National Water Supply and Drainage Board. The board wished to know how the water system staff could be reduced without affecting the operation of the systems. The WASH team proposed a plan for a gradual staff reduction, with a pilot program being tested in one region of the country.

Many development agencies and national governments are addressing the problem of systems failure due to poor operations and maintenance. One tack many are taking is to emphasize community responsibility for maintenance in rural areas and effective training for operations and maintenance personnel. WASH is working on a training manual for operations and maintenance supervisors. Much work remains to be done if the sustainability of a water and sanitation system is the norm rather than the exception.

Community Participation and Hygiene Education

Early in the Water Decade it became clear that past approaches to water supply and sanitation, which relied on high-tech solutions, were incapable of meeting the goal of safe and adequate drinking water and sanitation for all people. In the first place, many of the systems designed were

HIGHLIGHTS

Community Participation & Hygiene Education

Water Supply as a Stimulus to Primary Health Care, *Technical Report 44*.

A Workshop Design for Community Participation, *Technical Report 33 (draft)*.

Guidelines for Designing a Hygiene Education Program in Water Supply and Sanitation for Regional/District Level Personnel, *Field Report 218*.

New Participatory Frameworks for the Design and Management of Sustainable Water Supply and Sanitation Projects, *Field Report 220*.

The Role of Women as Participants and Beneficiaries in Water Supply and Sanitation Programs, *Technical Report 11 (see also, Technical Reports 6, 17, 19, and 21)*.

A Workshop Design for Hygiene Education, *Activity in progress*.

inappropriate for developing country conditions, but more important, user communities were often ignored or given only token involvement in and responsibility for a new system. Their participation, if considered at all, usually meant that they contributed some of the labor to reduce costs. The community simply took orders from the agency or ministry officials carrying out the water project. That approach has now been rejected and in its place is an approach that starts with the user. Experience has shown that, as a general rule, the participation of the benefitting community in all stages of a water supply and sanitation project is a prerequisite for success.

Closely linked to community involvement in water and sanitation projects is hygiene education. The most important aspect of arriving at the behavioral changes that will eventually bring about the anticipated health benefits is hygiene education. Hygiene education provides not only public health education but also the awareness that is needed for continued use and care of the facilities. Both community participation and hygiene education are intricately linked with community participation.

Involving women in hygiene education and community groups responsible for new or improved water and sanitation systems is essential. Women are the prime users and beneficiaries of such services and have continually proved to be the most diligent in ensuring that those services are properly maintained.

Guidelines for Designing a Hygiene Education

Program in Water Supply and Sanitation for Regional District Level Personnel is one of the field tools WASH has developed to promote community participation and hygiene education. This tool is for use in district or regional situations where projects to up-grade water and sanitation facilities have been carried out but have not brought the desired changes in behavior or health. The guidelines offer a solution to this problem by showing how to identify target groups and design effective educational/behavioral messages for them. Another tool, *New Participatory Frameworks for the Design and Management of Sustainable Water Supply and Sanitation Projects*, is intended for engineers and technicians in the field. Using this report, project staff review the approach they have been using for promoting community participation and develop a plan for a more effective process. The report also includes suggestions for conducting a workshop on community participation.

One of the most important sets of guidelines prepared by WASH aims to improve the skills of field workers who are responsible for promoting the active participation of communities in development projects. The guidelines, which consist of comprehensive plans for a three-week workshop, have been field tested and will be published in final form after one more field testing. WASH views *The Workshop Design for Community Participation* as part of a long-term effort to find ways to plan and implement development projects that reflect a community's views and resources and provide them with the skills and experience to act on their own behalf.

WASH has also prepared concept papers on

community participation and hygiene education. Five technical reports on the role of women in water supply and sanitation programs have been published. These reports point out that women have traditionally been the managers of water for household use. They decide, from the alternatives available to them, which source they will use and for what, as well as how the water will be stored and how wastewater will be discarded. Women are also responsible for instructing their children in water and health-related behavior and knowledge. For these reasons, water and sanitation programs cannot leave women out, as they often have in the past.

Another concept paper, *Water Supply as a Stimulus to Primary Health Care*, was developed to investigate the influence of community participation in water supply projects in Indonesia and Togo on other primary health care outcomes. It was found that when a community got organized to carry out a rural water supply project, the process of organization itself led to the community's making better use of other primary health care facilities and resources already available. Also, in situations where a water supply substantially reduces the amount of time women spend fetching water, more time is freed up for participation in other primary health care activities. Significantly, the researchers discovered that effective community participation cannot be assured overnight. It requires a minimum of four months and often up to two years of preparation with the community.

In addition to the field tools and concept papers, WASH has responded to many mission



One of the water vendors described in WASH's study of water vending and willingness to pay in a Kenyan community.

requests for assistance in community participation and hygiene education. In Thailand, WASH developed hygiene education plans for the Ministry of Health. CARE/Sierra Leone asked WASH to help come up with a strategy to get away from focusing exclusively on the installation of wells and instead to pay attention to promoting behavioral change through community participation. The field report on this effort should assist other projects in other countries in refocusing their activities.

Development professionals are generally aware of the importance of community participation and hygiene education approaches and willing to implement them, but still many of the projects being launched give second place or no place at all to these matters. For this reason WASH will continue to provide tools that can be used to integrate community participation and hygiene education into water and sanitation projects and to fill the gaps in knowledge on this important subject.

Improving Programming in Water Supply and Sanitation

The overall goal of the WASH Project is to help organizations improve the water and sanitation projects they launch. One of WASH's recently completed activities can be viewed to some extent as a summary statement on the various approaches used to meet that overall goal. *Framework and Guidelines for CARE Water Supply and Sanitation Projects* is unique among WASH products in that it brings together in one place a great deal of technical, social, and project management information about water and sanitation projects. The guidelines are comprehensive in scope, covering such key issues as

HIGHLIGHTS

Improving Programming in Water Supply & Sanitation

Framework and Guidelines for CARE Water Supply and Sanitation Projects, *Technical Report 40*.

The Value of Water Supply and Sanitation in Development: An Assessment of Health Related Interventions, *Technical Report 43*.

- Who should decide on the purpose and approach of a project?
- How can resource needs be determined?
- What principles are involved in optimizing the participation of communities in project design, implementation, and evaluation?
- What factors influence the choice of technology?
- How can long-term sustainability of a project be assured?
- What elements of a water and sanitation project should be evaluated and when?

While the guidelines were prepared specifically for CARE, many organizations will find them useful. More than anything else, they demonstrate that for water and sanitation projects to be successful, a great deal of planning must take place and the requirements and constraints of a host of people and organizations must be considered.

2. WASH TASK ASSIGNMENTS 1980-1987

This chapter contains summaries and indices of all major task assignments given to WASH by the Office of Health. The first section contains summaries of tasks for WASH I (September 1980 to September 1984) and WASH II (October 1984 to September 1987). The second section is a subject index of task assignments, such as community education and participation, evaluation, geology, latrines, training, etc. Each task is numbered with a letter prefix. During WASH I, all tasks had the prefix "O", standing for Order of Technical Direction from the Office of Health. WASH II tasks have a prefix letter of either "R", for Request Memorandum from the Office of Health, or an "A" for an Activity authorized by the Office of Health. The third section is an index of tasks by country.

Each summary includes a task assignment number; the month and year the task was begun; its status, whether completed, cancelled or on-going; the title of the task; and the country or AID Bureau or Office that initiated the task. If a WASH Report was prepared as part of the task, the number of the Technical or Field Report will be noted, as well as references to related Reports or tasks. All WASH Reports are listed and indexed by subject, country, AID Office, and author in Chapter 3.

WASH I Task Assignments (September 1980 to September 1984)

OTD #1 September 1980: Completed Warner

Handpump Manufacturing-Dominican Republic

The AID Health Sector Loan Project for manufacturing AID handpumps in the Dominican Republic was having trouble with quality control, material processing and testing in the foundry operation, in-shop techniques of assembly, and in the organization of larger scale production activities. The WASH consultant identified casting, design and dimensional errors in several materials which would make pump assembly and maintenance difficult, if not impossible. These problems were solved and the possible use of locally manufactured PVC deep well cylinders was considered. See WASH Field Report No. 20.

OTD #2 September 1980: Completed Beverly

American Public Health Association Meeting-Exhibit of AID Appropriate Technology Water Supply and Sanitation Devices-Detroit, Michigan-DS/HEA

The purpose of this exhibit, held 17-23 October 1980 in Detroit, was to show interested health professionals from the United States and foreign countries appropriate water supply technologies developed under AID auspices. The devices shown were: 1) the AID handpump; 2) the Robometer (a low-cost, household, user activated, CO2 cartridge powered device to release measured volumes of water); 3) the Robovalve (a PVC heavy duty, essentially leak proof, faucet/valve for use on public and private water hydrants); and 4) the Roboscreen

(low-cost PVC slotted pipe to screen out gravel and sand in well pipes).

OTD #3 October 1980: Completed Beverly

Project Design Manual References Development-Near East Bureau

The Near East Bureau developed a manual to assist USAID staff in identifying and describing water supply and sanitation projects in the field. An important component of the water supply and sanitation manual is its "reference library" consisting of seventeen texts, papers and reports, some unpublished, which was supplied by WASH under this OTD. Similar "library sets" and bibliographies on relevant water supply and sanitation themes can be developed on request from Missions and Bureaus.

OTD #4 October 1980: Completed Hafner

Competency-Based Training/Planning for Agency-DS/HEA; AID/W

The purpose of this OTD was to collect and analyze information about training in past and present AID projects involving water and sanitation components. The results of this analysis are used by WASH in responding to training assistance requests from Missions and Bureaus and in planning training conferences, workshops and seminars. This process was aimed at developing appropriate strategies and guidelines for the training aspects of water supply and sanitation project design, implementation, and evaluation at all levels in developing countries.

OTD #5 October 1980: Completed Isely

UNICEF/Pan American Health Organization Water Supply and Sanitation Workshop and Discussion of WASH Services, Lima, Peru-PAHO; DS/HEA

This meeting was one of six held by UNICEF in its several regions for the purpose of defining UNICEF's activities during the International Drinking Water Supply and Sanitation Decade, 1981-1990. It was held in Lima, Peru 17-22 November 1980. The purposes of having a representative of the WASH Project present were: 1) to learn more about UNICEF's and PAHO's plans and programs for the Water Decade; 2) to explain the WASH Project and how its work could be coordinated with other organizations; and 3) meet LDC people active in water supply and sanitation. See WASH Field Report No. 30.

OTD #6 October 1980: Completed Isely

Social Science Analysis for Water Supply and Sanitation: AID Administrator Bennet Project Evaluation-PPC/EI

As part of its program of impact evaluation of rural projects, the Bureau for Program and Policy Coordination (PPC) requested social science expertise on Peru from the WASH Project. A social scientist did a document search and data analysis on health, socio-economic, institutional and demographic indicators for the provinces of Ancash and Libertad, Peru. Corresponding information was also developed describing the broader characteristics of the sierra region and the nation. See WASH Field Report No. 1.

OTD #7 November 1980: Completed Isely

Oral Rehydration Therapy (ORT): Review Discussion of Need for Using Potable Water in ORT Solution-DS/HEA; DS/POP

Major issues discussed were the effects of oral rehydration solutions made with contaminated water and how the provision of potable drinking water might improve health and have a desirable effect on morbidity, mortality and fertility rates, and on nutrition. The results of this meeting, which includes a limited literature search on oral rehydration fluids and disinfection, may be found in WASH Technical Report No. 2.

OTD #8 November 1980: Completed Isely

Pan American Health Organization Caribbean Community Water Supply and Sanitation Planning Meeting in Barbados-PAHO; DS/HEA

The purpose of this international meeting, sponsored by the Pan American Health Organization and the Caribbean community, was to discuss: 1) proposed national environmental health activities

in the Caribbean to improve programming 2) the International Drinking Water Supply and Sanitation Decade; and 3) the new AID Water and Sanitation for Health Project (WASH) which began operating in September, 1980. Twenty senior environmental, health project and engineering officers from Caribbean countries and international agencies attended the meeting.

OTD #9 November 1980: Completed Warner

Rural Water Supply Review-Haiti AID has supported the CARE and other PVO rural water supply projects in Haiti for several years with good results but with much room for improvement and expansion. Fourteen rural water systems were visited and appropriate recommendations made. Since a dozen or more PVOs are active in Haiti's water supply and sanitation development, a major recommendation was that WASH support a practical workshop for all local PVO's and others concerned with water supply and sanitation in Haiti. A workshop was held in February 1983. See WASH Field Report No. 2. See also WASH Field Reports Nos. 77 and 96, and OTDs Nos. 129, 140 and 162.

OTD #10 November 1980: Cancelled Beverly

Regional Health Officers Conference Participation for West Africa-REDSO/WA;AFR/DR

After the WASH Project staff had spent several days organizing a presentation and procuring documents for distribution at this Conference, scheduled for 7-13 December 1980 at Abidjan, Ivory Coast, a decision was made by the Africa Bureau to delete the subject of water and sanitation from the agenda. However, the documents on water supply and sanitation that were to have been distributed at the Conference were mailed to the participants at their missions.

OTD #11 November 1980: Completed Warner

Local Manufacturing for Water Supply and Sanitation Devices-Philippines

The AID Offices of Capital Development and Engineering in Manila had programmed the local manufacture of AID handpumps and Roboscreens, which are used in wells and infiltration galleries to screen out sand. They requested WASH Project assistance in laying out the scope of work for the procurement, supervision and production of this equipment and of complete wind-powered water pumping system/facilities. The draft scope of work was reviewed by the Mission and led to OTD #40 below. See WASH Field Report No. 3. See also WASH Field Report No. 54.

OTD #12 November 1980: Completed Warner

Research and Development Proto-Type Water Supply and Sanitation Devices—DS/HEA The purpose of this OTD was to review options, prepare recommendations to DS/HEA for discussion, and develop a subcontract with an organization having highly innovative, inventive industrial and mechanical engineering professionals with demonstrated expertise in going from concept to operational prototype in short periods of time. Georgia Tech Research Institute was selected to provide these R&D services during WASH I. Georgia Tech in turn let a subcontract with the University of Maryland for joint use of the latter's International Rural Water Resources Development Laboratory at College Park, Maryland in addition to its own R&D facilities in Atlanta, Georgia.

OTD #13 December 1980: Completed Warner

Italian Earthquake Relief Assistance—OFDA (Office of Foreign Disaster Assistance) Following a visit to the disaster areas near Naples by an AID representative in early December 1980, the WASH Project Staff was requested to identify and contact United States and European sources of suitable sanitation equipment that was available for shipment to the disaster area. Estimates of the homeless population ranged from 50,000 to over 150,000 people. A twenty-five page report (plus technical appendices) outlining twelve alternative solutions to the community water supply and sanitation situation was dispatched by courier to Naples on December 13, 1980 for use by the local U.S. Disaster Relief Team. See WASH Field Report No. 25.

OTD #14 December 1980: Completed Warner

Peri-Urban and Rural Water Supply and Sanitation Program Review and Project Development—Ecuador This task for USAID/Ecuador had two distinct parts: peri-urban and rural. The peri-urban review and assessment involved working with an Ecuadorian private volunteer organization (Fundacion Natura) and local municipal sewerage companies in Quito, Guayaquil and other cities. The work included analyzing environmental sanitation and sewerage problems, plans and constraints, suggesting alternative strategies, identifying high priority projects, and making overall recommendations. Constraints of concern were high-cost inappropriate technologies, lack of trained manpower and funding, and absence of policy direction. The technical analysis in selected rural towns was of integrated approaches that included low-cost housing, water, sewerage and

related infrastructure, social services and employment generation/training activities. See WASH Field Reports Nos. 9 and 12.

OTD #15 December 1980: Completed Warner

Well Drilling Equipment Specifications and Procedures—Tunisia As part of its rural potable water subproject, the AID Mission in Tunisia was examining the use of low-cost technology for drilling relatively shallow wells (maximum 200 meters) having low to moderate yields. The government of Tunisia was experienced in drilling larger and deeper wells for irrigation water but needed assistance in preparing a suitable invitation for bidders for the purchase of a smaller, less expensive drilling rig. The Mission was also interested in the use of PVC in well casing and self-purification of receiving waters as a function of treatment; 2) participated in a round-table conference on design review and discussion of guideline scope and contents with Jordanian and AID officials and consultants; and 3) prepared an outline of guidelines and recommendations for the National Planning Commission. See WASH Field Report No. 4.

OTD #16 December 1980: Completed Isely

Water Supplies for Rural Land Reclamation—Mauritania The AID Mission in Mauritania needed assistance with a Project Paper for rural land reclamation intended to improve the traditional construction of "barrages" (dams). The dams retain rainwater runoff for recession agriculture in the dry-land interior of the country, e.g., earth/rock dams are broken in October and the moist soil behind the dam (70-150 hectares) is used for agriculture. The dams are later patched up for the next rainy season. Ideas suggested to the Mission included establishing schistosomiasis surveillance and control teams; a pilot project in one dam area to chemically control urinary schistosomiasis; to disturb snail growth and kill mosquito larvae by fluctuating the water level behind the dams; and to provide better wells for human and animal use as well as the organization of populations around these tasks. See WASH Field Report No. 11.

OTD #17 December 1980: Completed Warner

Review of Appropriate Water Supply Technologies, Implementation Planning, Local Manufacturing and Training—El Salvador Field work on this task was cancelled, but a brief review and bibliography of appropriate technology for rural water supply and sanitation suitable for El Salvador was prepared as WASH Field Report No. 26.

OTD #18 December 1980: Completed Warner

Water Supply and Sanitation Implementation

Plan Design for Rural Water Project—Peru The purpose of this AID Project in Peru was to provide potable water systems, latrines and health education to 420 communities of about 500 inhabitants each in selected regions of the sierra and high jungle over a five year period. The eight million dollar project (five million from AID) integrated these activities into the primary health programs of those communities and simultaneously strengthened the administrative and technical capacity of the Peruvian Regional Health Office involved in the project. The WASH consultant provided a list of suggestions and recommended revisions of the implementation plan, procedures and schedule. See WASH Field Report No. 6. Also see OTD #74 below and WASH Field Report No. 38.

OTD #19 January 1981: Completed Isely

Food Wastage Project: Expert Panel Review—PPC/E; DS/HEA The purpose of this OTD was to coordinate the development of a comprehensive, in-depth review of the Food Wastage/Sanitation Cost-Benefit Methodology Project carried on from 1971-1976 by the University of North Carolina at Chapel Hill and the Institute of Nutrition of Central America and Panama (INCAP). See WASH Technical Report No. 12.

OTD #20 January 1981: Completed Warner

Small Wastewater Stabilization Pond Design and Analysis—Lebanon Under an Environmental Sub-project, AID was supporting the American University in Beirut, Lebanon, and the Ministry of Public Health, in the design, construction and testing of small wastewater stabilization ponds to treat sewage from small towns. The Mission requested technical advice on design alternatives to minimize construction costs. After reviewing the situation, plans, sites, operation, budgets and schedules with AID and Lebanese officials, the WASH consultant developed recommendations on the most appropriate and acceptable approaches to small wastewater stabilization pond utilization. See WASH Field Report No. 10.

OTD #21 January 1981: Completed Donaldson

Latrine and Water Container Design Analysis, and Planning of Evaluations and of Health Materials—Dominican Republic Under Health Sector Loan II, AID was assisting the Secretariat of Health in the Dominican Republic to provide water supply, latrines and health education in 500 rural villages having 26,500 homes. The Mission requested technical assistance in: 1) designing and

carrying out evaluation plans for Health Sector Loan II; 2) providing information on waterseal latrines; 3) preparing specifications for household water containers and water treatment; and 4) designing health education materials for potable water and sewage disposal activities. See WASH Field Report Nos. 5, 21 and 23.

OTD #22 January 1981: Cancelled

Review of Testing Prediction Sanitation Model Project—DS/HEA

OTD #23 January 1981: Completed Warner

Preparation of Guidelines for Water Supply and Sanitation Project Design and Implementation, Inter-Regional—DS/HEA Many missions and several AID Bureaus have expressed a need for guidelines of this kind. The WASH staff reviewed relevant AID work and reports on this subject and developed realistic and useful guidelines for water supply and sanitation project design and implementation to be used for and in developing countries. Draft guidelines are under review.

OTD #24 January 1981: Completed Warner

Rural Water Supply and Sanitation System Design for AID Project Paper—Ecuador Mission required technical assistance in two areas: rural sanitation delivery systems, and engineering analysis of proposed water supply systems. The IEOS (Ecuadorian Institute of Sanitation Work) needed guidance in determining specific numbers of persons to be trained, person-months and types of technical assistance to be provided, vehicle requirements, and inter-governmental agency organizational restructuring. See WASH Field Report No. 13.

OTD #25 February 1981: Completed Isely

Rural Sanitation Manpower Development (RSMD): Workshop and Program Assistance—Indonesia The Government of Indonesia, with AID support, was in final planning stages of its Rural Sanitation Manpower Development (RSMD) Project, and requested WASH guidance on the project and for a training workshop. Topics included water supply and sanitation appropriate technology (AT) alternatives, planning for technological research and development, development of systems and practices for effective wide-scale application of appropriate techniques and methods, curriculum development for inservice training and/or retraining of existing sanitation personnel, and review and comment on approximately 12 proposals for research already submitted by RSMD staff in Regional Centers. See WASH Field Report No. 16.

OTD #26 February 1981: Completed Warner

Project Design Assistance for Health and Environmental Monitoring Project (HEMP) and Water Supply and Sanitation Manpower Training—Tanzania

USAID Tanzania requested project design support for work with the Ministry of Lands, Housing and Urban Development (ARHDI) on training, and with the Muhimbili Medical Center (MMC) in the Department of Community Medicine, University of Dar es Salaam, on the Health and Environmental Monitoring Project (HEMP). The work in training with ARHDI concerned development of a sanitation education master plan and the possible creation of new facilities. Facilitation will involve public health engineering curricula at the University, technician training at the ARHDI Institute, health officer training at three regional centers, health educator training at Muhimbili Hospital, and health assistant training. This work will provide background information for a Project Identification Document (PID). See WASH Field Reports Nos. 7 and 8.

OTD #27 February 1981: Completed Isely

Evaluation of Rural Health Project—Niger

USAID/Niger requested two French speaking consultants to participate in a four-man evaluation team. Components of the project to be evaluated included: public health administration (epidemiology, logistics, supplies distribution, cold chain, construction of dispensaries); training (curriculum development at the certified and state level nursing schools); supervision and management of rural health teams, rural sanitation and water supply; and cost control.

OTD #28 February 1981: Completed Isely

Representation of DS/HEA and WASH at Conference of World Federation of Public Health Associations, Calcutta, India, 23-26 February 1981—DS/HEA

The WASH consultant set up and manned an AID/WASH display, participated in the conference as an international health expert, and explained the WASH Project to all concerned. A folding graphic and photographic display of WASH functions was prepared and sample AID Robovalves and Roboscreens were taken for exhibition, along with relevant descriptive information for distribution. The consultant also visited the National Environmental Engineering Research Institute (NEERI) at Nagpur, India, to discuss the WASH Project and possible modes of collaboration. See WASH Field Report No. 14.

OTD #29 February 1981: Completed Donaldson

Development of Local Capability to Fabricate Handpumps and Well Screens—Honduras

USAID/Honduras requested WASH assistance in local manufacture of the AID Handpump and Roboscreen. Sites were selected for installing 30 AID handpumps as well as 10 Dempster pumps, 10 Moyno pumps and 10 locally-manufactured SANDPAR pumps in order to compare their performance. Installation of the handpumps and assistance in developing a program and manuals for their operation and maintenance was conducted under WASH OTD No. 85. See WASH Field Report No. 85. See also WASH Field Report No. 103.

OTD #30 March 1981: Completed Warner

Participation in XIII Central American Congress of Sanitary Engineering Meeting, 16-20 March 1981, Guatemala City—Guatemala

USAID/Guatemala and ROCAP requested WASH to present the WASH Project and its capabilities to Latin American engineers who were assembling to discuss Central American cooperation during the U.N. International Drinking Water Supply and Sanitation Decade. See WASH Field Report No. 15.

OTD #31 March 1981: Completed Warner

Wastewater Treatment Design Review and Guidelines Preparation—Jordan

USAID/Amman and the National Planning Commission had reviewed the need and value of the "standardization" of design, construction, operation and maintenance of wastewater treatment processes and plants in the cities and rural towns of Jordan. The WASH consultant 1) analyzed and evaluated the feasibility studies and designs for all wastewater treatment plants and processes under review in Jordan, including plant visits for consideration of appropriateness and of effluent quality, standards, and self-purification of receiving waters as a function of treatment; 2) participated in a round-table conference on design review and discussion of guideline scope and contents with Jordanian and AID officials and consultants; and 3) prepared an outline of guidelines and recommendations for the National Planning Commission. See WASH Field Report No. 17.

OTD #32 March 1981: Completed Beverly

Coordination of WASH Information on Activities and Exchange with International Information Centers—DS/HEA

The purpose of the WASH Project Information Center is to provide information gathering synthesis, reproduction, dissemination and follow-up services, including

water supply and sanitation (WS&S) guideline development to AID Missions, Geographic Bureaus and other offices of AID. The Information Center is a clearinghouse information retrieval facility which stores and disseminates WS&S information on request. To further the development of WASH Project international information capabilities, the WASH Information Director was authorized to visit specified information organizations and centers in Europe, Asia, and Latin America. These organizations are cooperating with the International Reference Center for Community Water Supply and Sanitation (IRC), The Hague, and its Program on Exchange and Transfer of Information (POETRI) under WHO auspices for the UN Water Decade. These visits established sound, long-term working relationships on WS&S matters concerning information exchange and various modes of collaboration on information development, acquisition, analysis and dissemination. In addition, possible cooperative interactions on WS&S training, technical assistance, and technology transfer/adaptation were explored. Coordinating visits were made to the IRC, the Intermediate Technology Development Group (London), the Water Research Center (Stevenage, U.K.), the TOOL Foundation (Amsterdam), the Pan American Center for Sanitary Engineering and Environmental Science-CEPIS (Lima, Peru), the Asian Institute of Technology and its Environmental Sanitation Information Center (AIT-ENSIX) in Bangkok, and the World Health Organization (WHO) in Geneva. See WASH Field Reports Nos. 18, 48 and 64.

OTD #33 April 1981: Completed Warner

Development of Testing Protocol for Mobile Water Treatment and Disinfection Units in Disaster Situations-DS/HEA; OFDA A sanitary engineer with background in development and coordination of testing experimental design and protocols for water treatment and disinfection devices was supplied by WASH to act as facilitator between AID/Office of Disaster Assistance, the U.S. EPA (Office of Registration) and the U.S. Army Medical Research and Development Laboratory (Ft. Detrick, MD) in development of chemical, biological and virological testing protocols for mobile water treatment and disinfection units.

OTD #34 April 1981: Completed Hafner

Coordination and Facilitation of Use of WASH Technical Assistance Service in Africa-AFR/DR; DS/HEA The Africa Bureau requested the services of a Technical Assistance coordinator to work with the AFR Bureau and the field missions for increased utilization and awareness of WASH

technical services in water and sanitation. The WASH Senior Project Officer coordinated directly with DS/HEA and AFR/TR officials, desk officers and other personnel as necessary. He made three trips to Africa and visited Botswana, Cameroon, Ivory Coast, Kenya, Lesotho, Malawi, Sierra Leone, Swaziland and Zaire. Fifteen OTDs resulted from these trips.

OTD #35 April 1981: Completed Isely

Participation in the AWWA Meeting, St. Louis, 8-12 June, 1981 DS/ENGR; DS/HEA The American Waterworks Association International Affairs Committee (AWWA) extended an invitation to WASH to address the Conference on the general subject of "Acceptance of Public Water Supply in Developing Countries". See WASH Technical Report No. 6, "Women, Water and the Decade."

OTD #36 April 1981: Completed Warner

Evaluation of Rural Water Supply Project-Burundi WASH assistance was sought through the AID Representative to evaluate an ongoing rural water supply project in Burundi. The WASH team assessed the impact of this UNICEF project, investigated other opportunities to increase the accessibility of rural populations to safe water and suggested further means of fostering community health/sanitation education. The team developed criteria for evaluating spring captation, conducted a brief evaluation by visiting representative cross sections of the communes, and reviewed other donor gravity fed water projects to assist in obtaining the most cost-effective systems. See WASH Field Report No. 24.

OTD #37 April 1981: Completed Isely

Participation in Session on Water, Sanitation and Health Education, UNICEF, New York, 22-23 April 1981-DS/HEA A session involving UNICEF headquarters and field staff plus invited experts from other institutions addressed the complexities of water supply and sanitation, its impact upon health, and the critical mix of interventions which might assure or increase such benefits. Also on the agenda was a discussion of the role of sanitation/health education in water programs. Two WASH consultants participated. See WASH Field Report No. 31.

OTD #38 April 1981: Completed Warner

Further Development of Rural Water and Sanitation Project-Thailand WASH pre-project design work assistance was provided for preliminary assessment of technical and economic feasibility of providing clean water to small

communities or rural population concentrations of 2,000 or less using piped water systems. Appropriate non-piped alternative supply systems were identified and assessed for certain areas of northeast Thailand. Scopes of work for design and feasibility studies of the above and related matters were also prepared. See WASH Field Report No. 19.

OTD #39 May 1981: Completed Warner

Evaluation of the Water Supply Systems Management Project for the National Water and Sewage Authority (NWSA)—Yemen WASH assistance was sought to evaluate the ongoing Water Supply Systems Management project in the Yemen Arab Republic. The project evaluation included: 1. Evaluation of progress towards attainment of project objectives and goals. 2. Recommended revision of project objectives and goals as appropriate and recommended project modification/reductions as appropriate. 3. Identification and evaluation of problems or conditions which may impede progress towards those objectives. 4. Assessment of steps that can be taken to overcome or minimize those problems. See WASH Field Report No. 22. Also see OTD #161.

OTD #40 May 1981: Completed Donaldson

AID Handpump Manufacture—Philippines As part of the Barangay Water Program (BWP), AID/Philippines requested technical assistance for local manufacture and installation of the AID handpump and training BWP engineers and technicians in well siting, construction and pump installation, operation and maintenance. The WASH subcontractor assisted a local foundry in manufacturing the AID handpump and conducted final acceptance inspection of the pumps in March 1982. An extensive manual was prepared for use by the BWP engineers in well construction and pump installation, operation and maintenance. A week-long seminar was held in April 1982 to train BWP engineers and technicians in the content of and use of the manual. See WASH Field Report No. 54.

OTD #41 June 1981: Completed Hafner

Technical Assistance of Cultural Anthropologist in Peace Corps Training Program—Peace Corps; DS/HEA The Peace Corps Water and Sanitation Sector requested WASH assistance in providing a cultural anthropologist to train thirty Peace Corps trainers in New Mexico May 31 to July 3, 1981, in conjunction with the U.S. Indian Health

Service. The trainees were preparing for work in Kenya, Guatemala, Togo, Yemen, Lesotho and Tonga. The purpose of the training program was to prepare the trainees with basic skills and knowledge in the following areas: the role of the volunteer in development, construction skills, water systems (springs, wells, pumps, hydrology, surveying, system design, etc.), waste disposal, health education and group participation training techniques. The WASH consultant provided guidance on the relationship of water and sanitation technologies to community acceptance and development activities.

OTD #42 June 1981: Completed Warner

Technical Assistance to AID Office of Foreign Disaster Assistance (OFDA)—DS/HEA WASH was requested by DS/HEA and OFDA to develop, and to maintain on a stand-by basis, a team of qualified disaster assistance personnel. The team includes experienced water supply and sanitation engineers to provide disaster assessment and coordination services plus technical personnel to operate emergency water purification plants in or near disaster areas. Team members have been selected and trained in advance and are available for short-term overseas assignments on short notice. WASH disaster teams were deployed for emergency water supply duties in flooded areas of Tunisia in November, 1982, and in Ecuador in January, 1983. See WASH Field Report No. 74. See also Field Reports Nos. 25, 41, 79 and 112.

OTD #43 June 1981: Completed Warner

Technical Assistance for the Barangay Water Program—Philippines The Barangay Water Program (BWP) is designed to provide potable water via small systems of public faucets or individual house connections, including household storage facilities, to small rural farming and fishing communities. AID/Manila requested technical assistance from WASH for the start-up, delivery, performance testing and post-completion training, as well as recommendations for improving the SAPANAG BATO water system. Other assistance was desired in refining designs, revising the post-completion manual, and improving local manufacture of BWP system components. The consultant also inspected each operational BWP "Level II-A" system, made appropriate recommendations, and produced a set of 35mm color slides of these systems for training, orientation and debriefing purposes. See WASH Field Report No. 57.

OTD #44 June 1981: Completed Isely

Training and Technical Assistance for Technology Development and Dissemination in Water and Sanitation for Rural Sanitation Manpower Project—Indonesia The Center for Education and Training (PUSDIKLAT) of the Indonesian Ministry of Health is the implementing agency for the Rural Sanitation Manpower Development Project. It requested support from USAID/Jakarta in the design of a program of training and technical assistance in the development and dissemination of appropriate technology in water and sanitation. Specific assistance was needed to refine the proposed design and to identify required program inputs. This work was a follow-on to OTD #25. See WASH Field Report No. 28.

OTD #45 July 1981: Completed Hafner

Village Health Education and Training: Program Planning, Implementation and Evaluation—Benin and Togo AID Missions in Benin and Togo requested WASH assistance in village health education and training for program planning, implementation and evaluation. Work included developing the overall training strategy and sequencing of events; determining who needs to be trained to do what; designing and implementing training of trainer workshops; developing job aids; and developing management, evaluation and performance analysis procedures and instruments. In addition, the WASH consultant developed procedures for coordination among groups in Togo and groups outside of Togo, assisted in the training of Togo Peace Corps Volunteers and their co-workers; supported the Peace Corps Associate Director in various planning tasks; and assisted the Benin Peace Corps Director in designing health education training materials. See WASH Field Reports Nos. 27 and 51 and OTD No. 91 below.

OTD #46 July 1981: Completed Donaldson

Handpump Installation Operation, Maintenance and Training Project—Haiti AID/Port-au-Prince requested WASH technical assistance in securing and installing AID and other handpumps and in training suitable public or private agencies, including PVOs, in installation, operation and maintenance of the pumps. The WASH consultants obtained AID handpumps from the Dominican Republic, selected sites and installed the handpumps at Camp Perrin and La Gonave. They also developed an operation and maintenance plan for the pumps being installed. In addition to the Dominican Republic/AID handpumps, some Moyno deep well handpumps and a prototype AID Handpump manufactured at Fonderie Nationale in Haiti were installed.

Observation of the performance of the latter pumps provided useful information concerning the feasibility of manufacturing the AID handpump in Haiti. See WASH Field Report No. 128.

OTD #47 July 1981: Completed Isely

Technical Assistance in Review of Rural Primary Health Care Project Paper—Zaire AID/Zaire requested the services of WASH to review the Rural Primary Health Care Project Paper with the Mission and Ministry of Health officials. Preventative health measures were emphasized in the review.

OTD #48 July 1981: Completed Donaldson

Technical Assistance in Handpump Maintenance and Plastic Valve and Faucet Manufacture—Dominican Republic AID/Santo Domingo requested WASH technical assistance in support of its Health Sector Loan II Project in two areas: handpump quality control and maintenance and local manufacture of a plastic foot valve and water container faucets. The WASH consultant made recommendations for a quality control program at the local foundry; the content and format of handpump service manuals being prepared by the Ministry of Health; planning and organizing handpump maintenance programs at regional and community levels; logistical planning for spare parts, and preventive maintenance guidelines and schedules. He also worked with a local firm on the manufacture of the plastic valves and faucets. See WASH Field Report No. 101.

OTD #49 August 1981: Completed Hafner

Survey of Potential Subcontractors for Human Resources Development Support—S&T/HEA The Office of Health requested WASH to survey potential human resources development (HRD) subcontractors with demonstrated effectiveness and proficiency in innovative approaches to the analysis of human resource needs, training system development and implementation, and training system evaluation to support HRD activities. Relevant selection criteria included knowledge of subject matter in key areas, e.g., operation and maintenance of small water supply systems; language capability; LDC experience; availability; experience in use of performance based systems in solving problems in knowledge, skill and attitudinal areas of performance; demonstrated capability to work in human resource needs assessment and evaluation, task analysis, performance problem solving, training material development, training of trainers, training system development, implementation of training and development of job aids.

OTD #50 September 1981: Completed Beverly

Technical Assistance in Technology Transfer Including Development and Testing (Lab and Field) of Low Cost Technology for Developing Countries—S&T/HEA

WASH was requested to provide technical assistance and information to S&T/HEA in the development, adaptation and testing of certain low cost technologies in water supply and sanitation for developing countries. The scope of this work included six related sub-tasks: 1. Collection and analysis of technical information on flow limiters, family water purification units, hydraulic rams, "package" water treatment plants, sewerless excreta disposal units, and alternatives to reciprocating handpumps. 2. Activation and preparation of product development, testing and demonstration facilities under contracts with Georgia Tech and the University of Maryland. 3. Establishment of a steering committee of experts inside and outside AID, and the planning, organizing and conducting of a seminar on WS&S technology appropriate for manufacture in LDCs. 4. Review and analysis of simple, low cost appropriate well drilling technologies. 5. Review, analysis and conceptual modification or replacement of Moyno type deep well handpump design to substantially reduce costs and render suitable for LDC manufacture. 6. Provision of professional services of additional consultants as required to perform above sub-tasks. A Technology Transfer Workshop was held April 12-20, 1983. Twenty-six consultants, WASH staff and AID personnel participated in the Workshop.

OTD #51 August 1981: Completed Hafner

Implementation of Workshop on Excreta Disposal in Non-Sewered Areas—NE/TECH

The Near East Bureau requested WASH assistance in developing and implementing the above workshop. This included: 1. Contacting speakers and participants in consultation with NE/TECH. 2. Preparing workshop agenda. 3. Arranging for workshop site. 4. Arranging for instructional materials. 5. Taping workshop. 6. Preparing workshop proceedings. The workshop was attended by twenty-five participants and was held on September 10, 1981, in the Conference room of the International Science and Technology Institute (ISTI), one of the CDM Associates.

OTD #52 August 1981: Completed Isely

Participation in Workshop on Primary Health Care, 31 August to 3 September, 1981 in Sousse, Tunisia—NE/TECH/HPN

WASH was requested to provide consultant services to NE/TECH/HPN for

the above workshop. The purpose of this workshop was to bring together key health representatives of Near East nations, A.I.D. and other institutions to share their experience with primary health care programs and to discuss the technical, institutional and operational aspects of primary health care programs and their components parts. Special attention was focussed on the need for water supply and sanitation facilities to serve as models in all health facilities, especially in peri-urban and rural areas. See WASH Technical Report No. 8 and Field Report No. 29.

OTD #53 August 1981: Completed Isely

Participation in AID Health Officers Workshop in Lome, Togo, 15-20 November, 1981—AFR/H

WASH design and implementation assistance for the above workshop was requested by the Africa Bureau. WASH prepared the agenda and educational materials for that portion of the workshop dealing with water supply and sanitation in relation to the proper planning and implementation of primary health care programs. See WASH Technical Report No. 13.

OTD #54 August 1981: Completed Isely

Participation in AID Health Officers Workshop in Chiang Mai, Thailand, 8-14 November 1981—ASIA/TR

WASH participation in the above workshop was requested by the Asia Bureau in order to plan and facilitate discussions of Bureau policy on water supply and sanitation. WASH had earlier provided a draft policy paper. The WASH consultant served as a resource person during workshop sessions and was available to participants for consultation. The American Public Health Association was responsible for the overall organization of the workshop.

OTD #55 September 1981: Completed Hafner

Analysis of Human Resources Development Needs for the Hashemite Kingdom of Jordan

The AID Mission in Amman, Jordan, requested assistance in developing a national water resources training program. Following intensive preparation in the U.S., the field work included review of human resources development (HRD) in Jordan with AID and relevant agencies, visiting agencies and facilities, reviewing documentation and preparing a preliminary HRD plan, program and schedule. These were discussed with Mission staff and government officials and modified appropriately before formal presentation to the concerned institutions. See WASH Field Report No. 34.

OTD #56 September 1981: Completed Isely

WASH Participation in International Reference Center (IRC) Advisory Group on Community Education and Participation (CEP)-IRC; S&T/HEA

The International Reference Center for community Water Supply and Sanitation, the Hague, requested, through AID's Office of Health, that WASH provide a working member to serve on the above Advisory Group and to participate in the first meeting of the Group. The terms of reference of the Advisory Group were:

1. To provide overall guidance to the CEP Programme and coordination with other relevant international activities.
2. To review and evaluate, from a scientific and technical standpoint, the content, scope and dimension of the programme.
3. To recommend priorities for technical cooperation activities, studies and services of the CEP Programme.
4. To provide the Steering Committee for Cooperation Action, donor organizations, bank, and Governments with a continuous independent assessment of the CEP Programme and related activities.
5. To recommend joint plans and actions for the further development of the CEP Programme and other relevant international activities. See OTD #65 below.

OTD #57 September 1981: Completed Isely

Technical Assistance to the National Council for International Health for Development and Implementation of Water and Sanitation: A Workshop for PVOs

WASH was requested to supply technical assistance to the Office of Health in the development of a workshop on implementation, preparation and evaluation of water supply and sanitation for PVOs in collaboration with the National Council for International Health (NCIH). The activities included: 1. Designing and formatting the workshop, incorporating results of survey of PVOs, 2. Identifying and selecting speakers with survey input from the planning committee, 3. Compiling bibliography and supplying selected materials for workshop participants, 4. Supervising the dress rehearsal of sessions that needed to be rehearsed, 5. Identifying possibly exhibitors for poster sessions, commodity or equipment displays, 6. Preparing background papers for the workshop, 7. Assisting with workshop implementation the first week of December 1981, and 8. Providing technical editing of the proceedings. See WASH Technical Report No. 14 and OTD No. 70 below.

OTD #58 October 1981: Completed Donaldson

Technical Assistance to Develop Scope of Work for Impact Evaluation of Health Sector-Dominican Republic WASH was requested to assist USAID/Dominican Republic in preparing a cost

estimate and scope of work for implementing the evaluation plan for Health Sector Loan II. The loan is to provide water, latrines and health education in 500 rural communities. Mortality and anthropometric data for the evaluation were to be gathered by local health promoters in 100 communities. The evaluation plan included sections on sample design; data collection, monitoring, processing and analysis; personnel requirements and qualifications; and a contract schedule with estimated costs by task. See WASH Field Report No. 35.

OTD #59 October 1981: Completed Isely

Technical Assistance for Water Conservation Seminar-Jordan

WASH was requested to support USAID/Jordan in planning and conducting a day-and-a-half water conservation seminar for Jordan's water supply institutions. The work for this task included consultant preparation in the U.S.; discussions with relevant officials in Jordan; orientation visits to water supply/conservation areas in Jordan; planning and implementing the seminar; and preparing a report on the seminar and recommendations to improve water conservation practices in Jordan. See WASH Field Report No. 36.

OTD #60 October 1981: Completed Isely

Technical Assistance in Water Supply and Sanitation Planning and Training-Sudan WASH was requested to supply technical assistance in assessing and making recommendations in relation to USAID/Sudan planning efforts in water supply and sanitation in six project areas. These were: 1. Northern Primary Health Care Project—a regional project to construct new health centers in North and South Kordofan Provinces, 2. Rural Health Support—a national dispensary and school construction project contracted to the African Medical Research Foundation of Nairobi, 3. Reforestation Program—provision of potable water to farmers in this program in conjunction with CARE, 4. Refugee camps on three borders of Sudan—WS&S requirements, 5. Port Sudan Refugee Water Supply Project—in conjunction with CARE, and 6. Darfor Region—study of allocation of water for domestic, livestock and agricultural uses. See WASH Field Report No. 37.

OTD #61 October 1981: Completed Donaldson

Technical Assistance in Operation and Maintenance of Water Pumping Systems-Morocco

WASH was requested to provide training for fifteen Peace Corps volunteers in Morocco in the installation, maintenance and repair of selected water pumping systems. The scope of work included collection and preparation of training

materials; briefings with Peace Corps staff in the U.S. and Morocco; detailed planning of a four-week training course; conducting training; and preparing a final report. See WASH Field Report No. 43.

OTD #62 October 1981: Completed Warner

Technical Assistance for Health Sector Assessment—Egypt WASH was requested to provide technical assistance for the health sector assessment in Egypt and preparation of an environmental health working paper. The scope of work included preparation and briefing of WASH consultants at AID/W; in-country travel and review and analysis of relevant available documents and data; and preparation of a final report. The report reviewed and summarized existing data on environmental determinants of health status in Egypt; identified important gaps in existing data; discussed priority problems, changes and trends; identified institutions and interrelationships between health status and AID's assistance to the water, sewage, housing industrial and agricultural sectors; and concluded with a set of recommendations for AID action. See WASH Field Report No. 33.

OTD #63 October 1981: Completed Donaldson

Technical Assistance in Local Handpump Manufacture and Maintenance—TUNISIA AID/Tunisia requested WASH technical assistance in local manufacture, field monitoring and adaptation of the AID Handpump in support of an on-going program. The scope of work included improving quality control of pump manufacturing at the foundry, assuring that pump designs were properly adapted to conditions in rural Tunisia, and planning and managing an integrated field installation, re-installation, repair, maintenance, monitoring and training program. The WASH consultants coordinated activities with AID/Tunis, government officials, manufacturing companies and suppliers, and the Ecole Nationale d'Ingenieurs de Tunis (ENIT) which installed the pumps. See WASH Field Report No. 100.

OTD #64 October 1981: Completed Isely

Technical Assistance for Well Siting—Mali USAID/Mali requested technical assistance for recommending siting of twenty-nine wells in twenty-five villages of the First Region of Mali (Yalimane Circle). The WASH consultant was a hydrogeologist with experience in siting hand-dug and borehole wells using aerial photography, soil resistivity tests and investigative drilling. This work included reviewing aerial photographs in Bamako, working closely with regional and local government officials and technicians, visiting all well site

areas, and consulting with the local water committee in Yelimané. See WASH Field Report No. 32.

OTD #65 November 1981: Completed Isely

Collaboration with the International Reference Center on Directory of Resources—IRC; S&T/HEA The Office of Health requested WASH technical support in jointly developing, printing and disseminating a "Directory of Resources for Community Participation in Water Supply and Sanitation for Developing Countries." The Directory was based on existing descriptions of institutions in WASH and IRC files supplemented by information from a questionnaire sent to European and American NGOs, PVOs, bilateral agencies, and other organizations and researchers in community education and participation, and relevant LDC organizations. The Directory provides an essential tool for everyone involved in the Water Decade to facilitate the exchange and transfer of information and guidance on community education and participation. The Directory is not part of the WASH Technical and Field Report series. See OTD No. 56 above.

OTD #66 November 1981: Completed Donaldson

Technical Assistance in Well Drilling for Private Voluntary Organization (PVO) Fundacao Esperanca in Amazon Basin—Brazil USAID/Brazil requested WASH technical assistance in preparing a proposal for the AID supported PVO Fundacao Esperanca, in Santarem, Para, Brazil. The Foundation needed technical advice in deep well drilling in the highland villages it serves. See WASH Field Report No. 40.

OTD #67 November 1981: Completed Rosensweig

Preparation of Manual on the Installation, Operation and Maintenance of Portable Packaged Water Treatment and Disinfection System—S&T/HEA; OFDA WASH assistance was requested by S&T/HEA and the Office of Foreign Disaster Assistance (OFDA) to prepare a manual on the installation, operation and maintenance of a portable packaged water treatment and disinfection system. An instructional manual was prepared to accompany the equipment for use anywhere in the world where it is sent to disaster areas. The manual was designed for ease of comprehension and use by people of diverse cultural backgrounds who may have little formal education or mechanical training. Simple graphics and photos that are culturally neutral were used where appropriate.

OTD #68 November 1981: Completed Donaldson

Analysis, Design, Prototype Development, and Demonstration System Construction and Operation of PAHO "Pumpless Pump"—S&T/HEA

WASH was requested to provide technical assistance to S&T/HEA in the design, testing and demonstration of the PAHO "pumpless pump" system. The scope of work included engineering analysis and mathematical modeling of the system, design and construction of a system capable of serving a community of 5,000 persons, and the preparation of a user application manual suitable for use in developing countries. Also required was the planning of an information dissemination and demonstration program to alert development officials throughout the world of the operational feasibility of this technology.

OTD #69 November 1981: Completed Donaldson

Design and Implementation for AID Handpump Testing Program—Dominican Republic, Ecuador, Honduras, Philippines and Tunisia—S&T/HEA

WASH was requested by S&T/HEA to design and implement a testing program for the AID Handpump being manufactured in the Dominican Republic, Ecuador, Honduras, Philippines and Tunisia. The scope of work includes shipment of pumps from the countries to the Georgia Institute of Technology, design and execution of a time-stress component testing program, procurement of test equipment and material, documentation of test procedures and results, redesign and testing of components and systems as appropriate, and preparation of test reports and recommendations. See WASH Field Report No. 131.

OTD #70 November 1981: Completed Hafner

Technical Assistance for Seminar on Handpumps for Community Water Supply in Developing Countries—S&T/HEA

WASH was requested to supply technical support and information materials for a half-day seminar on handpumps sponsored by S&T/HEA. The seminar was conducted on December 1, 1981, in conjunction with the National Council for International Health (NCIH) Workshop for Private Volunteer Organizations held December 2-4, 1981 and attended by forty-five participants. (OTD 57).

OTD #71 November 1981: Completed Donaldson

Design and Implementation of Robo-Valve Testing Program—Ecuador—S&T/HEA

WASH was requested to design and implement a testing program for the Robovalves being manufactured in Ecuador. The scope of work included acquisition and time-stress testing of seventy Ecuadorian-made Robovalves for a continuous

day-in and day-out period of three months to determine design, material and fabrication flaws. The work was done at the International Rural Water Resources Development Laboratory of the University of Maryland. See WASH Field Report No. 102.

OTD #72 December 1981: Completed Donaldson

Laboratory Assessment and Testing of AID Handpump—S&T/HEA

WASH was requested by S&T/HEA to provide it with results of a laboratory assessment and testing of the AID Handpump. The results are based on the World Bank/UNDP approved testing protocol which was applied by the Consumers Association (CA) of the United Kingdom to some thirty different pumps from all over the world. WASH supplied two AID deep-well handpumps manufactured in a developing country to the CA Harpenden Rise Laboratory in Hertfordshire, England, for testing over a twenty month period. See WASH Field Report No. 130.

OTD #73 December 1981: Completed Isely

Technical Assistance in Revision of CARE Water Supply and Sanitation Project—Indonesia USAID/

Indonesia requested WASH technical assistance in reviewing and refining the scope of work of an AID-funded CARE water and sanitation project. Specific assistance was desired to integrate a health education component into the project including the assessment. Plans were formulated for training CARE field staff in health education methods including the use of supportive materials with an emphasis on community participation. See WASH Field Report No. 39.

OTD #74 December 1981: Completed Donaldson

Evaluation, Planning and Training Assistance to Rural Water Supply and Sanitation Project (RWSS)—Peru USAID/Peru

requested WASH technical assistance for the Peru Rural Water Supply and Sanitation Project (RWSS) in several areas. The work included a technical evaluation of the plans for thirty gravity water systems, the design of a training seminar, and assistance to the National Directorate of Sanitary Engineering in analyzing future technical assistance and procurement needs. See WASH Field Report No. 38.

OTD #75 December 1981: Completed Hafner

Development of the National Sanitation Environmental Education Master Plan—Tanzania AID/

Tanzania requested WASH technical assistance to develop the plan recommended in WASH Field Report No. 7 of March 9, 1981. "Tanzania—A National Environmental Sanitation Education Mas-

ter Plan—A Preliminary Review.” The scope of work included collection of relevant information on training and on the status of sanitation programs and projects in Tanzania and the development of the Master Plan based on the Field Trip Report. The Plan outlined educational and training objectives, operational strategies, roles of participating institutions, implementation requirements and schedules, evaluation procedures and estimated financial needs. See WASH Field Report No. 58.

OTD #76 December 1981: Completed Donaldson

Small Water Supply Systems: Training Program Design and Implementation with Agua del Pueblo—Guatemala USAID/Guatemala and Agua del Pueblo, a PVO, requested technical assistance in the design and implementation of a comprehensive workshop on small scale pumped water supply systems. The resulting workshop program included training in technology and design selection; training in the planning, design, construction, operation and maintenance of small scale pumped water supply systems; and the development of organizational capacities to transfer technical knowledge from the engineer level to the professional level. The workshop took place July 5-30, 1982, with ten Guatemalan engineers participating. See WASH Field Report No. 56.

OTD #77 January 1982: Completed Warner

Planning for Improved Excreta and Wastewater Pilot Demonstrations—Egypt USAID/Egypt requested a WASH Advance Team to prepare an implementation plan for pilot demonstration projects for improved excreta and wastewater disposal methods in selected unsewered areas of Greater Cairo in Giza Governorate. For an immediate solution, the WASH team recommended field tests into the improvement of equipment, including pumper trucks, tractor drawn trailers, and animal drawn carts, for the collection and transport of sanitary wastes from sewage vaults. For long term solutions, the team recommended three types of field tests: community-financed sewers, small diameter sewers connected to existing sewage vaults, and septic tanks. Overall recommendations included sites, personnel, support requirements, and costs. See WASH Field Report No. 52.

OTD #78 January 1982: Completed Isely

Training of Sanitarians—Senegal AID/Senegal requested WASH assistance in improving the sanitation training school which furnishes personnel to the Sine Saloum Rural Health project. The work included collecting relevant training materials

in French and English; assisting in task analysis and performance objective development; suggesting training activities and appropriate evaluation techniques; designing and assisting delivery of a two week program emphasizing hands-on skills; making recommendations for improving the supervision and continuing education of sanitarians; and preparing a final report. The WASH consultant also assisted in preparation and supervision of the construction of latrines, composting sites, and well protection and deepening activities, which are part of the two week practical training program. See WASH Field Report No. 44. Also see OTD #147 and WASH Field Report No. 91.

OTD #79 January 1982: Completed Isely

Technical Assistance in Planning Diarrheal Disease Control Subproject—Indonesia USAID/Indonesia requested WASH to assist ACEH Province officials in planning a diarrheal disease control subproject that includes a water supply and sanitation component. The work included assessing water supply and sanitation facilities in Kabupaten Pidie, reviewing existing training and supervision activities in water supply and sanitation and the community participation situation, and developing recommendations and appropriate interventions which might be used in the subproject. The team contributed to a work plan for the subproject which integrates water supply and sanitation activities with diarrheal disease control, surveillance, treatment, training, and community participation. See WASH Field Report No. 42.

OTD #80 February 1982: Completed Rosensweig

Training-of-Trainers Workshop for AID Hand-pump Technology Transfer Personnel—S&T/HEA The Office of Health requested WASH to provide consultant and consultant support services for management and analysis of AID water supply and sanitation data from 1973 to the present. The principal consultant collected relevant AID programmatic and historic project data base materials and then entered, stored, processed and readout data in desired formats using standard and self-developed computer programs. This data is continuously up-dated under a separate ISTI contract with the Office of Health.

OTD #82 February 1982: Completed Rosensweig

Local Manufacture of AID Handpumps—Ecuador WASH provided technical assistance to two local manufacturers for the production of 30 AID handpumps, which were to be used in a USAID funded rural water project. The OTD included

the preparation of job aids for quality control of the production process and for the installation and maintenance of the handpump. WASH also trained twenty Peace Corps Volunteer and PVO personnel in installation and maintenance. See WASH Field Reports Nos. 110, 123, 124 and 125.

OTD #83 February 1982: Completed Donaldson

Testing of Portable Water Purification Units for Use in Disaster Assistance—OFDA; S&T/HEA

The AID Office of Foreign Disaster Assistance requested an evaluation of the quality of water produced by portable water purification and disinfection units which were developed for use in disaster assistance operations. A total of 30 samples of heavily polluted water were tested at a certified laboratory. After running through the disinfection units, 29 of the samples showed no coliform organisms. The effluent quality, therefore, was within USEPA drinking water standards. See WASH Field Report No. 41.

OTD #84 February 1982: Completed Donaldson

Technical Assistance in Project Identification for Water Supply, Sewage and Health Sector Loan Project—Dominican Republic

USAID/Santo Domingo requested WASH technical assistance in the development of data for a Project Identification Document for the water/sewage/health education element under Health Sector Loan III. The work included reviewing status of past and current projects, resource availabilities and existing plans, assisting in identifying the problem and in the determination of project purpose, scope, size, constraints, desired inputs and outputs, relationships with the government and local organizations, and estimated impacts on beneficiaries and the environment.

OTD #85 February 1982: Completed Donaldson

Technical Assistance in Field Installation, Training, Testing and Evaluation of Handpumps—Honduras

USAID/Honduras requested WASH assistance in implementing Stage II of the Honduras Handpump Project. WASH was asked to install several types of handpumps in up to fifty sites selected under Stage I (WASH OTD No. 29) and to test and evaluate the performance of a handpump manufacturer's quality control training manual and a handpump installation, operation and maintenance manual. Government health promoters were also trained in pump installation, operation and maintenance and in water quality testing and well disinfection. See WASH Field Report No. 103.

OTD #86 March 1982: Completed Rosensweig

Attendance of WASH Training Officer at Meeting of Interagency Task Force on Human Resource Development—UN Water Decade, Geneva—S&T/HEA

The Office of Health requested that the WASH Training Officer participate in the March 11-12, 1982, Geneva meeting of the U.N. Interagency Task Force on Human Resources Development. This was part of WHO coordination efforts for the International Drinking Water Supply and Sanitation Decade. The agenda of the meeting included a review of U.N. agency and donor countries' development plans, programs and proposals, a discussion of means to achieve a cooperative approach to Decade HRD, and development of a short- and medium-term plan of action. The Training Officer also stopped in London in order to establish linkages with the Industrial Training Service.

OTD #87 March 1982: Completed Isely

Participation in AIDIS/PAHO Regional Symposia on Human Resources for the Water Decade, Panama July 26–August 3, 1982—S&T/HEA

The Office of Health requested WASH to participate in and prepare a workshop for two meetings in Panama City, Panama. The first meeting on human resource development aspects of water supply and sanitation was sponsored by PAHO. WASH worked with PAHO and the Office of Health in planning and implementing a session of "Training of Trainers" and in designing and coordinating the working group. The second meeting was the XVIII Congress of AIDIS—Interamerican Association of Sanitary Engineers. Its theme was also human resource development aspects of the International Drinking Water Supply and Sanitation Decade.

OTD #88 April 1982: Completed Hafner

Feasibility Analysis and Design Study of Effluent Reuse and Night Soil Disposal for Maseru—Lesotho

USAID/Lesotho requested WASH technical assistance for feasibility analysis and preliminary design work on utilization and disposition of human wastes from the city of Maseru. The scope of work for the first task, effluent re-use from the sewage treatment plant for crop irrigation, included a feasibility analysis; determination of rough design parameters, cost/benefits, and a preliminary pilot plant design; evaluation of health hazards and control requirements; and preparation of a report. The scope of work of the second task, night soil disposal, included investigation of alternatives, their feasibility and costs, and recommendations for the most appropriate method of disposal. See WASH Field Report No. 55.

OTD #89 April 1982: Completed Donaldson

Preparation of a Manual on "Practical Water Treatment for Communities in Developing Countries"—S&T/HEA The AID Office of Health requested WASH to prepare a manual on "Practical Water Treatment for Communities in Developing Countries." The resulting manual contains information on the technical, managerial, and human resource aspects of operating and maintaining community water treatment systems. See WASH Technical Report No. 29. A revised version of this report was published in 1984 by John Wiley & Sons with the same title.

OTD #90 April 1982: Completed Rosensweig

Second Training-of-Trainers Workshop for AID Handpump Technology Transfer Personnel, September 15-17, 1982—S&T/HEA The Office of Health requested WASH to plan and conduct the second "Trainer-of-Trainers Workshop for AID Handpump Technology Transfer Personnel," September 15-17, 1982. This workshop reinforced and expanded on the material covered in the February 1982 Workshop (OTD #80). Among other topics, it reviewed progress, identified training problems, reinforced training design and delivery skills, and provided practice in using training techniques and writing training materials. There were eight participants from the Georgia Institute of Technology and staff from the WASH CIC who are involved in technology transfer operations. See WASH Field Report No. 60.

OTD #91 May 1982: Completed Isely

Planning Assistance for Rural and Village Health Activities—Togo USAID/Togo requested WASH technical assistance for planning rural and village level health activities in Plateaux and Savane regions. The scope of work included review and revision of baseline medical, hygiene and water usage surveys and procedures; assisting in the planning of management and implementation strategies to integrate current Affaires Sociales activities into the proposed water project health program; and exploration of technical possibilities for alternative water resource development strategies in villages where drilled wells have proven unfeasible. The consultant also worked with government officials to outline ways of increasing community participation in village health activities.

OTD #92 May 1982: Completed Isely

Technical Assistance for Workshop on Water Supply and Sanitation for Rural Dispersed Populations—Tunisia USAID/Tunisia requested WASH planning and implementation support for

a Tunisian Workshop on Water Supply and Sanitation for Rural Dispersed Populations in Arid Countries. The purpose of the workshop was to exchange information and experience on rural water services, on technologies for disinfection at water points and in homes, on equipment and fittings for use at water points, including handpumps, and on related activities. Workshop outputs included recommendations for action and training in the format of an execution plan and the creation of a network of professionals in Tunisia and Francophone Africa. The workshop was held in November 1982 in Kasserine. See WASH Field Report No. 67.

OTD #93 May 1982: Completed Donaldson

Technical Assistance in Administration of Rural Sanitation Project—Bolivia USAID/Bolivia requested WASH assistance in improving the administration of the Bolivia Rural Sanitation Project. The purpose of the project was to create an institutional capability within the Ministry of Social Welfare and Public Health and its Division of Environmental Sanitation to provide potable water and sanitation facilities to small Bolivian rural villages of 800 persons or less. The WASH consultant assisted the Mission and the Division of Environmental Sanitation in establishing a simplified information and accounting system, among other things. See WASH Field Report No. 47.

OTD #94 May 1982: Completed Donaldson

Review of Design Standards, Specification and Costs for Water Supply and Sanitation Systems for Low Income Housing—Honduras The USAID Regional Housing and Urban Development Office in Honduras requested WASH technical assistance to develop mechanisms for accelerating the current process of project implementation, to review current design standards of WS&S infrastructure systems for low income housing, and to participate in a seminar on appropriate design standards for water and waste disposal in low income shelter projects in Latin America. The WASH consultant worked closely with the two Honduran water authorities and other public and private sector organizations in the course of review and evaluation activities. See WASH Field Report No. 46, available in English and Spanish.

OTD #95 May 1982: Completed Donaldson

Kanye Village Sewerage and Sanitation Feasibility Study—Botswana USAID/Botswana requested WASH assistance to conduct a feasibility study for sanitation in Kanye Village, which has a population of about 22,000 people. WASH consultants carried out a need assessment,

developed sanitation options, and recommended an integrated approach involving ventilated improved pit (VIP) latrines, sanitation seminars, and broad based community participation. See WASH Field Report No. 95.

OTD #96 May 1982: Completed Rosensweig

Monitoring and Evaluation of Community Health Promoter Training Course—Ecuador AID/Ecuador requested WASH assistance to observe and review a three week classroom and field demonstration training course being held for community health promoters from eighteen provinces in Ecuador. The course was given by the Ecuadorian Institute of Sanitary Works (IEOS) in conjunction with AID. The purpose of the review was to develop insights and recommendations to strengthen future training courses and the IEOS program in rural water supply, sanitation and community participation. See WASH Field Report No. 49.

OTD #97 May 1982: Completed Donaldson

Technical Assistance in Well Siting and Drilling—Dominican Republic USAID/Dominican Republic requested WASH assistance in the well siting aspects of Health Sector Loan II. The original well drilling program had resulted in a high incidence of dry holes which required review. The WASH consultant made recommendations to improve the productivity of local well drilling companies and assisted in revising the well drilling contracting program to minimize the problem of reduced drilling capacity. See WASH Field Report No. 50.

OTD #98 June 1982: Cancelled

Training Assistance on Groundwater Contamination and Quality—Costa Rica Cancelled at request of Mission.

OTD #99 June 1982: Completed Beverly

Health Information System Development: Microcomputer Demonstration—Dominican Republic USAID/Dominican Republic requested WASH technical assistance to design and present a demonstration of how information generated by the Secretariat of Health (SESPAS) could be processed, analyzed and displayed using a microcomputer system. Some 6,000 SESPAS primary health care workers, or promoters, were each collecting basic health and household data on 100–300 families. Methods of efficiently using this information for analytical, planning and management purposes were under consideration and the

microcomputer may provide a cost effective method of processing and analysis. The scope of work included meeting with Mission and SESPAS personnel to determine the characteristics of the data and the data collection system and to determine appropriate uses of processed data. Based on these findings, a preliminary set of file structures, record formats and displays was established for demonstration to SESPAS and Mission officials. Suggestions were also made as to possible hardware/software combinations that might be appropriate for later assessment in a feasibility study (see OTD #103). The demonstration was given in September 1982. See WASH Field Report No. 111.

OTD #100 June 1982: Completed Hafner

Technical Assistance in Training-of-Trainers for Public Health Nurse Supervisors and in Training for Spring Cappers—Zaire USAID/Zaire requested technical assistance in two training tasks: training-of-trainers (TOT) for fifteen public health nurse supervisors who would work with village health committees, and training of 20 Peace Corps Volunteers (PCVs) in spring capping techniques. The two week training-of-trainers course conducted in July and August 1982 emphasized adult learning processes, preparation of training objectives, planning of training sessions, and innovative health education approaches. In the Peace Corps spring capping course, held in October, the sanitary engineering training consultant assisted the Peace Corps on-site trainer and emphasized practical site assessment, flow measurement, and physical design. This consultant also advised PCVs and Zairians of possible solutions to water flow, drainage and design problems of existing spring boxes in specific areas and prepared a draft spring capping instructional manual. See WASH Field Report Nos. 62 and 73. Also see WASH Technical Report No. 28.

OTD #101 June 1982: Completed Donaldson

Evaluation Assistance for Rural Water and Sanitation Project—Honduras USAID/Honduras requested WASH assistance in evaluating the status of the Honduras rural water supply and sanitation project, which was intended to provide 247,000 families with access to safe water and to adequate human waste disposal facilities but was experiencing serious delays in implementation. WASH consultants recommended changes in project organization, management, and financial procedures as well as in technical design, construction, and operations and maintenance. See WASH Field Report No. 69.

OTD #102 June 1982: Completed Rosensweig

Technical Assistance on Appropriate Well Drilling Equipment—Ecuador USAID/Ecuador requested WASH assistance to provide Meals for Millions/Freedom from Hunger Foundation, a U.S. private voluntary organization operating in Ecuador, with technical advice on well drilling equipment appropriate for local use. Meals for Millions has a project to provide water for improvement of the nutritional and health status of the population of the Santa Elena peninsula in Southern Ecuador. The WASH consultant assessed the situation and capabilities of local organizations to procure, and/or manufacture, operate, and maintain various types of well drilling equipment and recommended the appropriate drilling rig. See WASH Field Report No. 59.

OTD #103 June 1982: Completed Beverly

Health Information System Development: Assessment and System Design Study—Dominican Republic USAID/Dominican Republic requested WASH technical assistance to make an assessment and system design study of the data collection activities of the Secretariat of Health (SESPAS) under Health Sector Loan II. The scope of work included review of forms and of data collection procedures, definition of information requirements, information system design, and preparation of manual and computerized system specifications, as appropriate. Two specific areas of information system design were selected for detailed analysis: inventory control and field operations management. Recommendations identified design assumptions and addressed trade-offs of manual vs. computerized systems with specific attention being given to accuracy, availability, accessibility, flexibility and possible external applications of data and analyses. See WASH Field Report No. 111 and OTD #99.

OTD #104 July 1982: Completed Warner

Investigation of Appropriate Water and Sanitation Systems for Low Cost Housing—Kenya The USAID Regional Office of Housing and Urban Development in Nairobi requested WASH technical assistance in investigating appropriate water supply and sanitation systems for low cost housing in the Umoja II housing project in Nairobi. Working with a technical committee of the Nairobi City Council, WASH consultants developed four alternatives for water and sanitation systems, including (1) temporary community sanitary facility, (2) Kayole I project standards, (3) courtyard standpipe with pourflush toilet, septic tank and small diameter sewer, and (4) minimum cost conventional system. Interim reports are available.

OTD #105 July 1982: Completed Donaldson

Technical Assistance in Lecture Workshop on Sanitary Engineering Design for Developing Countries—Ecuador USAID/Ecuador requested a WASH consultant to participate in a week-long training seminar on cost efficiency in the design and implementation of sanitary engineering facilities in developing countries. The consultant demonstrated the use of a computerized planning model on a minicomputer and conducted seminars on efficient sanitary engineering design and appropriate technology. See WASH Field Report No. 63.

OTD #106 July 1982: Completed Hafner

Technical Assistance in Developing a National Drinking Water Supply and Sanitation Plan—Central African Republic USAID/Central African Republic (CAR) requested WASH assistance in developing a national drinking water supply and sanitation plan similar to that prepared for Sri Lanka. The WASH consultant provided preliminary coordination for plan formulation which included discussions with AID and CAR officials of the water supply and sanitation situation, needs and implementation capabilities; review of resources required to design a national plan; and an initial schedule of plan development activities. A National Action Committee for the Water Decade has been established and a Technical Coordinator has been appointed. Follow-up WASH assignments included assisting in the formulation of a water supply and sanitation policy document; a national seminar to review and approve the policy; and the development of a short-term action plan. See WASH Field Reports Nos. 53, 72, and 97.

OTD #107 July 1982: Completed Isely

Technical Assistance in Development of Intersectoral Water Supply and Sanitation Strategy Paper for the Africa Bureau—AFR/TR/HNP The Africa Bureau Health/Nutrition/Population Division requested WASH assistance to develop an intersectoral water supply and sanitation (WS&S) strategy statement. WASH consultants had been drafting an Africa WS&S strategy paper primarily from the health sector viewpoint and with an emphasis on human and institutional resource development. In reviewing this paper, the Africa Bureau recognized the need for a broader, more comprehensive inter-sectoral perspective and requested an appropriate revision of the paper. The revision emphasized rural and peri-urban water supply and sanitation in sub-Saharan Africa. See WASH Technical Report No. 19.

OTD #108 August 1982: Cancelled

Training Assistance to the Assistant Sanitary Technician Schools—Cameroon Cancelled at request of Mission.

OTD #109 August 1982: Completed Isely

Technical Assistance to Peace Corps Water Supply and Sanitation Sector—S&T/H/WS WASH was requested to assist the Peace Corps in a review of its water supply and sanitation activities to serve as a basis for planning and implementing future operations in the water supply and sanitation sector. The scope of work included interviewing key Peace Corps staff, collecting and analyzing relevant documentation and data, identifying strategic opportunities, resource requirements, and possible deployments, and preparing a final report. In addition, the consultants updated the 1980-1981 Peace Corps Project Summary of Water and Sanitation Projects for 1982-1983. See WASH Field Report No. 86.

OTD #110 August 1982: Completed Donaldson

Coordination/Collaboration on LDC Training with the International Water Supply Association (IWSA)—S&T/H/WS WASH was requested to participate in a planning meeting of the Committee on Waterworks Personnel of the IWSA in Zurich, Switzerland, on September 6, 1982. The agenda of the Committee included: reviewing the minutes of earlier Working Group meetings as well as reports of Regional Conference (1981-India, 1982-Africa); considering papers for the 1984 Tunis Congress; examining arrangements for Post Congress Seminars in developing countries; and discussing a proposal for a training workshop to be held for developing countries in 1983.

OTD #111 August 1982: Completed Rosensweig

In-Service Training for Peace Corps Volunteers in Rural Potable Water Supply Project—Morocco USAID/Morocco requested WASH to provide in-service training to 11 Peace Corps Volunteers (PCVs) in the operation and maintenance of water pumping systems for the rural potable water supply project and to review the status of the project. Since completing initial training under OTD No. 61 in February 1982, PCVs had identified unresolved problems and had expressed a need for further training. The assignment included reviewing the situation with PCVs, preparing a work plan and material requirements for in-service training of PCVs, conducting in-service training at selected field sites, and

providing assistance in the design of a diesel repair trouble shooting course to be given by others. See WASH Field Report No. 61.

OTD #112 September 1982: Completed Rosensweig

Participation in Practice of Management Seminar—S&T/H/WS The Office of Health authorized the WASH Senior Training Officer to participate in a seminar on "The Practice of Management Principles," October 25-29, 1982, in Rosslyn, Virginia. The seminar was conducted by the Coverdale Organization, an internationally recognized consulting firm specializing in increasing awareness and skills in the human, non-technical "process" areas of management. Understanding and proficiency in these areas is vital to the achievement of quality organizational results and the personal satisfaction of those involved. The approaches and techniques demonstrated in the seminar are being applied to WASH activities in the area of management training.

OTD #113 September 1982: Completed Donaldson

Technical/Managerial Review of the AID Handpump Technology Transfer Program in Sri Lanka, Philippines, Indonesia, Honduras, and Dominican Republic—S&T/H/WS The AID Office of Health requested that WASH participate in a technical/managerial review of the AID Handpump Technology Transfer Program in Sri Lanka, Philippines, Indonesia, Honduras and Dominican Republic. During the field visits, WASH consultants reviewed the current and anticipated future status of handpump manufacturing, handpump marketing, pricing, and distribution, and the supply and delivery of spare parts; field installation effectiveness; and training and community participation effectiveness. The consultants also ascertained current and future USAID handpump technology transfer activities. See WASH Field Report No. 76.

OTD #114 September 1982: Completed Donaldson

Assessment and Evaluation of the Feasibility of Local Manufacturing of the AID Handpump—Peru USAID/Peru requested WASH to conduct an evaluation of the feasibility of local manufacturing and marketing of the AID Handpump and Robodevices in Peru. WASH consultants carried out a needs assessment, marketing study, and a review of manufacturing and maintenance capabilities. They concluded that low manufacture of the AID handpump was feasible in Peru but that further cost analyses were required to decide on future handpump production. See WASH Field Report No. 89.

OTD #115 September 1982: Completed Donaldson

Technical Assistance in Design of Well Drilling Program—Honduras USAID/Honduras requested WASH assistance in designing a well construction program for western Honduras that would encompass an estimated 3,000 drilled and hand dug wells. A WASH consultant reviewed the hydrogeological and well construction practices of the area. He recommended increased emphasis on cable tool drilling methods, private sector contractors, and gravity flow water systems. See WASH Field Report No. 65.

OTD #116 September 1982: Completed Isely

Technical Assistance in Training Social Promotional Agents in Spring Capping and Rainwater Harvesting—Togo USAID/Togo requested WASH assistance in the training of social promotion agents in village level water supply and sanitation system design and construction as part of ongoing AID funded projects. The technical and training instruction given to these agents was to prepare them to assist village populations in developing local springs and rainwater harvesting systems. The training-of-trainers training plan addressed preparation, coordination, training sequence, agenda, and types of performance demonstrations in the field. It also identified controls to insure that the training materials/methodology used for these efforts with the Togo trainees resulted in a package of field tested materials and methodology that can be translated and applied in other country/geographic situations. See WASH Field Report No. 87. Also see Technical Reports Nos. 27 and 28.

OTD #117 September 1982: Completed Isely

Technical Assistance in Evaluation of Foster Parents Plan Water Projects—Indonesia USAID/Indonesia requested WASH assistance with the technical aspects of evaluating the 2,000 site water supply program of the private volunteer organization Foster Parents Plan. The social and health aspects were evaluated by the staff of Foster Parents Plan. The scope of work included review of relevant project documents; interviews with staff of AID, Foster Parents Plan, and ministries and with village committees; inspection of existing and planned water source sites; and preparation of an evaluation report. The report considered suitability of location and effectiveness of existing wells and gravity systems, appropriateness of planned sites, construction program, technology selection and training, and the strengths and weaknesses of the overall program. See WASH Field Report No. 71.

OTD #118 September 1982: Completed Hafner

Technical Assistance in Assessing and Planning CARE Water Supply and Sanitation Projects—Cameroon USAID/Cameroon requested WASH assistance in assessing CARE water supply and sanitation programs and in preparing the CARE 1983-1987 Development Plan. The scope of work had two major tasks. The first was to assess the current status of CARE-managed water supply and sanitation (WS&S) programs in the Northern and Eastern Regions. The second task was to assist CARE in making reasonable and feasible projections of WS&S activities for the next five years. Sub-tasks included the development of practical targets and reasonable "indicators" against which to measure progress and to prepare a draft of relevant sections of CARE's multi-year plan. See WASH Field Report No. 75.

OTD #119 September 1982: Cancelled

Technical Assistance in Planning the Evaluation of Water Supply, Sanitation and Health Projects—Philippines Cancelled at request of the Mission.

OTD #120 September 1982: Completed Isely

Technical Assistance in Evaluation of Water Supply, Sanitation and Health Aspects of Spring-Fed Irrigation Project—Tunisia USAID/Tunisia requested WASH assistance in conducting an interim evaluation of the water supply, sanitation and health aspects of a spring-fed irrigation project. The evaluation was undertaken jointly with the Central Tunisia Development Authority and AID. The scope of work included reviewing relevant documentation, interviewing AID and government officials, visiting sites and preparing an evaluation report and recommendations. See WASH Field Report No. 84.

OTD #121 September 1982: Completed Rosensweig

Technical Assistance for Training-of-Trainers Workshop for Peace Corps—S&T/H/WS The Peace Corps requested WASH assistance in the design and delivery of a training-of-trainers (TOT) workshop December 6-9, 1982 for the Indian Health Service in Alaska. Eighteen Indian Health Service engineers and sanitarians who participated in the workshop were trained to serve as technical trainers in the continental U.S. for Peace Corps Volunteers assigned to water supply and sanitation projects. The scope of work encompassed the design and delivery of a four day TOT workshop and the preparation of a final report which included an evaluation and recommendations. See WASH Field Report No. 70.

OTD #122 September 1982: Completed Rosensweig

Development of Trainers' Guides on Handpump Installation and Maintenance, and Latrine Construction—S&T/H/WS WASH developed two training guides on handpump installation and maintenance and latrine construction. Both training guides contain all the information a trainer needs to plan and conduct a comprehensive workshop, including training designs, trainer guidelines, and participant handouts. The guides were developed for trainers to use in training field workers. The training guides can be adapted with minor changes for use in a wide variety of situations. See WASH Technical Reports Nos. 25 and 26.

OTD #123 October 1982: Completed Rosensweig

Technical Assistance in Design and Delivery of a Training Workshop on Management Team Building—Thailand USAID/Thailand requested WASH training assistance in designing and delivering a workshop on management team building for the Provincial Waterwork Authority (PWA) of Thailand. The workshop was held for the 30 top managers of PWA from November 1-5, 1982. The workshop was a first step in future PWA activities to strengthen its management and its training capability. Most of the workshop was conducted in Thai. See WASH Field Report No. 68.

OTD #124 October 1982: Completed Donaldson

Technical Assistance to Assess Solid Waste, Wastewater and Water Supply Situation and Requirements—Lebanon USAID/Lebanon requested WASH assistance to assess the solid waste, wastewater and water supply situation and requirements in Metropolitan Beirut. The scope of work included contacting public, private and foreign organizations active in these subsectors; reviewing their activities and plans; estimating the effectiveness of their individual and collective efforts; and determining areas of need and future resource requirements for the subsectors. From this data the WASH consultants prepared a suggested action plan, schedule and estimates of resource requirements, and other recommendations considered appropriate. See WASH Field Report No. 66.

OTD #125 October 1982: Completed Donaldson

Technical Assistance in Staffing AID/WASH Exhibition Booth at APHA Annual Meeting, Montreal, November 13-19, 1982—S&T/H/WS The AID Office of Health requested WASH to provide professional staff for the AID/WASH exhibition booth at the annual meeting of the

American Public Health Association in Montreal, Canada, November 13-19, 1982. The WASH portion of the booth contained display panels with photographs, an operational AID Handpump, and a variety of WASH reports and publications for discussion and distribution to visitors to the booth.

OTD #126 November 1982: Completed Donaldson

Review of Water-Seal Latrine Field Acceptance and Possible Local Manufacture—Honduras USAID/Honduras requested WASH assistance in reviewing the acceptance of water-seal latrines and the feasibility of manufacturing them in Honduras. At the time, Honduras had programmed the installation of 18,000 pit latrines and 14,000 water-seal latrines. A WASH consultant then in Honduras on another task made a preliminary survey to determine what steps should be taken next.

OTD #127 November 1982: Completed Rosensweig

Reconnaissance Visit in Preparation for Sanitation Workshop—Senegal USAID/Senegal requested WASH services to plan a workshop on latrine construction and solid waste disposal for nurses working in the Bakel Health Component of the Irrigated Perimeters Project. The planning visit took place in December 1982. The purposes of the planning visit were to review workshop planning to date, assess the proposed workshop site, and investigate the participation of other Senegalese institutions. As a result of the planning visit the workshop was scheduled for April 1983. See OTD No. 147.

OTD #128 December 1982: Completed Donaldson

Coordination/Collaboration on Water and Sanitation in Asia—S&T/H/WS At the request of the AID Office of Health, WASH partially financed the travel costs of a keynote speaker at the International Seminar on Human Waste Management for Low-Income Settlements, in Bangkok, Thailand, January 16-22, 1983, sponsored by the Asian Institute of Technology and others.

OTD #129 January 1983: Completed Donaldson

PVO Seminar on Rural Potable Water and Sanitation Systems—Haiti USAID/Haiti requested WASH technical services in the design and implementation of a seminar on rural potable water and sanitation systems for private volunteer organizations (PVOs). WASH consultants provided these services and the seminar was held in February 1983. A seminar of this kind was recommended by WASH under OTD #9 in November 1981 in WASH Field Report No. 2. See WASH Field Report No. 77.

OTD #130 January 1983: Completed Donaldson

Comparative Life Cycle Cost Analysis of AID and Moyno Design Handpumps—LAC/DR; S&T/H/WS WASH was requested by the AID Latin America Bureau, the Dominican Republic Mission, and the Office of Health to make a comparative life cycle cost analysis of the AID and Moyno design handpumps that are used in the Dominican Republic. The AID handpumps were manufactured in the Dominican Republic while the Moyno pumps were imported from the U.S. The cost analysis included annual operational and maintenance cost estimates, sensitivity analyses, and the use of several interest rates. Although the analysis was sensitive to the interest rate employed, it was found that the Moyno pumps were slightly more expensive on an annual or life cycle basis than the locally manufactured pumps. See WASH Field Report No. 80.

OTD #131 January 1983: Completed Rosensweig

Technical Assistance to Improve Management Structure and Systems of Public Health Inspectorate—Swaziland USAID/Swaziland requested WASH assistance to strengthen the management structure and systems of the Public Health Inspectorate in the Ministry of Health. The Inspectorate is responsible for latrine construction, spring protection, food inspection and the control of pest and communicable diseases. The scope of work included evaluation of present level of management skills, identification of key management skills to perform job duties, review of proposed organization structure of the Inspectorate, preparation and delivery of an in-service management training program for health inspectors, and development of a management information system and of other recommendations as appropriate. See WASH Field Report No. 108.

OTD #132 February 1983: Completed Rosensweig

Planning of Latrine Construction Workshop and Determination of Training Needs in Water Supply and Sanitation—Dominican Republic USAID/Dominican Republic requested WASH technical assistance in planning a latrine construction workshop for Peace Corps Volunteers and Dominican field personnel working under Health Sector Loan II. The scope of work included establishing the workshop objectives, collecting information on participants and planning for all logistical arrangements. Additional assistance was provided to review and discuss short and long term training needs in water supply and sanitation within the scope of Health Sector Loan II. As a result of the planning, two workshops were scheduled in April-May 1983 under OTD #143 below.

OTD #133 February 1983: Completed Isely

Feasibility Study and Planning of Water Supply and Sanitation Systems for Private Volunteer Organizations—Indonesia USAID/Indonesia requested WASH to provide assistance to several private volunteer organizations (PVOs) operating in Irian Jaya, Indonesia. WASH assisted the Mission in making a feasibility study and plan for a PVO Operating Grant project involving 70-80 small scale water systems and the World Relief Corporation in the Minyambou area of Irian Jaya. WASH also assisted the PVO Development Information Service in planning a water supply and sanitation project in the Jaya Paura of Irian Jaya. See WASH Field Report No. 90.

OTD #134 February 1983: Completed Donaldson

Development of Solid Waste Disposal Plan for Beirut and Other Areas in Lebanon—Lebanon USAID/Lebanon requested WASH technical assistance in developing, with Mission, Near East Bureau and Lebanon Government staff, an environmentally sound "Plan of Action" to stop the continuing pollution of the Mediterranean from improper solid waste dumping. The plan prepared by a WASH consultant included potential institutional participants, recommendations for future dump site operations, and estimated costs of plan implementation. See WASH Field Report No. 79.

OTD #135 February 1983: Completed Donaldson

Revision of Plan for Rural Water Supply and Sanitation Project—Honduras USAID/Honduras requested WASH technical assistance to revise the work content and financial plan of the ongoing Rural Water Supply and Sanitation Project, which was experiencing serious delays in implementation. Working with the Programa de Saneamiento y Agua Rural (PRASAR), the WASH consultant recommended installing 950 handpumps out of the 3,000 originally planned and constructing 600 new wells. In addition, recommendations were made regarding scheduling, project siting, and equipment acquisition. See WASH Field Report No. 81.

OTD #136 February 1983: Completed Isely

Preparation of Scope of Work for Evaluation of CARE Rural Water Project—Indonesia USAID/Indonesia requested WASH technical assistance in preparing the scope of work for the evaluation of the ongoing CARE Rural Water Project. Since 1980 CARE has constructed 70 small scale rural water supply systems of 500 wells and numerous gravity flow systems in over 100 villages at a cost of about \$2,500,000. The evaluation of progress

to date enhanced future programming by assessing the cost-effectiveness and impact of completed works. The WASH consultant also assisted the Mission in considering a strategy for CARE to leverage its resources for greater impact on government water programs. See WASH Field Report No. 85 and OTD No. 155 below.

OTD #137 February 1983: Completed Isely

Development of Comprehensive Training Plan for Rural Spring Capping Project—Burundi

USAID/Burundi requested WASH technical assistance to develop a comprehensive training plan for rural workers involved in the installation and maintenance of capped springs and in the promotion of domestic hygiene and sanitation. The scope of work included reviewing current health and sanitation programs of the Ministries of Health and Social Affairs and of UNICEF's spring capping project and assessing the training resources of each Ministry and of the Ministry of Development, which is in charge of the Project. It also included developing a comprehensive training program aimed at maximizing the health and sanitation benefits of spring capping, providing a list of required equipment and materials, and furnishing guidelines for the Ministries to institutionalize this program in their long-term plans of operation. See WASH Field Report No. 78.

OTD #138 February 1983: Completed Hafner

Technical Training and Management Assistance to the National Water Supply and Drainage Board—Sri Lanka

USAID/Sri Lanka requested that WASH provide technical, training and management assistance to the National Water Supply and Drainage Board (NWSDB) and also to the Ministry of Local Government, Housing and Construction (MLGHCL). Areas needing improvement included training, operations and maintenance, rehabilitation, water quality monitoring, planning, technology evaluation, organizational development and community financing of water supply and sanitation systems. The specific tasks of the WASH consultants were to prepare and conduct a workshop for 20 NWSDB staff on the management of operations and maintenance activities and to develop procedures and methods for the maintenance of water supply and sanitation activities. See WASH Field Reports Nos. 94 and 122.

OTD #139 February 1983: Completed Donaldson

Technical Assistance with Design of a Rural Water Supply Project—Thailand

USAID/Thailand requested WASH assistance in preparing materials for a project paper for a rural water supply

project. The Provincial Water Authority (PWA), which operates some 700 rural piped water systems, sought to improve its capacity to design, install, manage and maintain these systems. The proposed project was intended to up-grade PWA's technical and management skills and identify measures to reduce capital and operating costs. The WASH consultants, working as members of the project design team, specifically addressed requirements for manpower training needs assessments, and the planning and implementation of training delivery systems.

OTD #140 March 1983: Completed Isely

Engineering Evaluation of Foster Parents Plan Water Projects—Haiti

USAID/Haiti requested that WASH provide technical assistance for an engineering evaluation of the private volunteer organization Foster Parents Plan (FPP) water projects. The scope of work included assessing existing water supply sources, distribution networks, and maintenance activities; examining the unused filter system and reservoirs near Croix-des-Bouquets to determine costs and feasibility of future use; designing simple drains for public fountain areas and a storage tank for spring water; and making recommendations as appropriate, e.g., rainwater catchments, etc. See WASH Field Report No. 96.

OTD #141 March 1985: Completed Hafner

Rural Health Zone Directors Workshop—Zaire

USAID/Zaire requested WASH participation in a health zone directors workshop, which is part of the Annual Conference of the AID Basic Rural Health Project in Zaire. The scope of work included identifying and discussing needs for spring capping, rain water harvesting and well construction, development of training strategies to meet the needs, planning regional water-related seminars for 1983-84, and specific seminar planning on rainwater harvesting for two rural health zones seminars for 1983. See WASH Field Report No. 88 and OTD No. 167 below.

OTD #142 March 1983: Completed Hafner

Public Health Education for Low-Cost Sanitation—Tanzania

USAID/Tanzania requested WASH to provide a public health educator to assist the Ministry of Lands, Housing and Urban Development (ARDHI) in preparing strategy outlines for health education and promotion in low-cost sanitation for peri-urban areas of Dar es Salaam. The consultant worked with the low-cost sanitation unit, the Institute of Adult Education, the City Council, and other organizations. The scope of work for the strategy outline included defining

objectives; determining personnel and logistic requirements and methods of operation and promotion; identifying teaching/promotion aids needed; designing the monitoring and evaluation process; and estimating program costs. See WASH Field Report No. 92.

OTD #143 March 1983: Completed Rosensweig

Design and Delivery of Two Workshops on Latrine Construction—Dominican Republic As a follow-up to OTD #132 USAID/Dominican Republic requested WASH to design and deliver two workshops on latrine construction as part of AID Health Sector Loan II activities. The participants were Peace Corps Volunteers and Dominican Health Promoters, the latter being responsible for the latrine component and health education activity of Health Sector Loan II. The scope of work included preparing training materials, organizing the workshops, which included solid waste disposal and potable water handling in addition to latrine construction, conducting the workshops, and preparing an evaluation and final report. The first workshop was conducted from April 4–15, 1983 for twenty-five participants and the second from April 25–May 6, 1983 for twenty-two participants. The workshop also served as a field test for the WASH Training Guide on Latrine Construction. See WASH Field Report No. 93. The Training Guide is Technical Report No. 25.

OTD #144 March 1983: Completed Hafner

Design and Delivery of Three Training-of-Trainers Workshops on Community Participation in Water Supply Projects—Malawi USAID/Malawi requested WASH technical assistance in the design and delivery of a training-of-trainers workshop for six Malawian trainers and two three-week-long workshops on community participation in relation to the AID piped water project. Sixty-five Ministry of Health field staff were trained in health education and sanitation improvements in rural piped water supply areas. Workshop topics included the communication process, adult learning theory, community motivation methods, shared approaches to developing problem-oriented learning programs, community education techniques and materials, and village health committee formation, function, administration and supervision. See WASH Field Report No. 99.

OTD #145 March 1983: Completed Isely

Assistance in Evaluation of Rural Supply Project—Togo USAID/Togo requested WASH assistance as member of a team to evaluate the Rural Water Supply Project. The overall evaluation assessed the effectiveness of the establishment

and functioning of wells, village health committees, AID and Togo government project staff, and of pump maintenance systems; and the effectiveness of training village pump mechanics and of micro-project planning in the plateau region. The WASH consultant specifically addressed training effectiveness and relationships between villagers and field agents, identified problems encountered in carrying out project activities at the village level, and suggested possible solutions. See WASH Field Report No. 82.

OTD #146 March 1983: Completed Isely

Design of Research/Action Demonstration Study on Community Participation—Tunisia USAID/Tunisia requested WASH planning assistance for the Central Tunisia Development Authority (CTDA). The WASH consultant assisted CTDA in the detailed planning and budgeting of a study designed to demonstrate the impact of community participation on the attainment of water supply, sanitation, and primary health care program objectives. The initial study concept is to take three different groups of communities with varying degrees of historical community participation and assess relative costs, resource utilizations, effectiveness, and impact of community participation activities on program objectives.

OTD #147 March 1983: Completed Rosensweig

Design and Delivery of Workshop on Latrine Construction, Solid Waste Disposal, and Wastewater Disposal for Rural Areas—Senegal USAID/Senegal requested WASH assistance to design and deliver a sanitation workshop and to provide additional follow-up technical assistance with participants from the Bakel Project. The workshop covered latrine construction, solid waste disposal and wastewater disposal for rural areas. The activity included planning the workshop for sixteen participants, developing the training materials, arranging logistic requirements, conducting the workshop, evaluating the workshop and preparing a final report and recommendations. The workshop was held in Bakel from April 20–May 3, 1983. This follows up OTD No. 127 above. See WASH Field Report No. 91.

OTD #148 May 1983: Completed Donaldson

Technical Assistance in Development of a Water Supply and Sanitation Project—El Salvador USAID/El Salvador requested WASH assistance to support a health systems project development team in El Salvador. The WASH consultant identified targets of opportunity to be incorporated into the project paper related to improving the on-going Ministry of Health latrine program

(design and construction) and assessed needs for the development of appropriate technology in household water systems.

OTD #149 July 1983: Completed Hafner

Rural Water Supply Evaluation—Malawi USAID/Malawi requested WASH assistance in designing and conducting a mid-project evaluation of the Self-Help Rural Water Supply Project. The purposes of this formative evaluation were to establish a baseline of evaluation data for the final evaluation and to measure current progress towards achieving project outputs, purposes, goals and end-of-project status. Five areas were investigated by the WASH evaluation team: project inputs by AID and the Government of Malawi; strengthening of the institutions involved in the project; project outputs; the construction and operational status of community water systems; the performance of the community water systems; and the economic, social and health impacts of the project. See WASH Field Report No. 105.

OTD #150 July 1983: Completed Donaldson

Evaluation of Construction Aspects of Integrated Rural Health Project—Guatemala USAID/Guatemala requested WASH assistance in evaluating the construction aspects of the Community-based Integrated Health and Nutrition System Project for rural health delivery. The project included construction of 114 small gravity fed potable water systems, 7,000 latrines, 1,500 housing improvements, 13 health posts, one regional service center and the renovation of 44 health posts. The WASH consultant reviewed Ministry of Health implementation plans and its logistic and administrative capabilities to monitor and meet project objectives, and made recommendations relevant to the timely and satisfactory completion of the project. See WASH Field Report No. 104.

OTD #151 July 1983: Completed Donaldson

Technical Assistance for Private Sector Water Program—Bolivia USAID/Bolivia requested WASH assistance in preparing a proposal for a private sector potable water and rural sanitation project. The WASH consultant assessed the technical feasibility of the proposed private sector initiative which involved Bolivian savings and loan institutional financing. A representative of the AID Bureau of Private Enterprise developed the institutional financing aspects of the proposal.

OTD #152 July 1983: Completed Rosensweig

Preparation of Scopes of Work for Human Resource Development Programs—Peru USAID/Peru requested WASH assistance in designing

scopes of work for regional level rural water supply training programs for the Ministry of Health. The three training program subjects were 1) design and supervision of construction of rural water systems, 2) operation and maintenance of rural water systems, and 3) health education programs which integrate primary health care with the construction of rural water systems and latrines.

OTD #153 August 1983: Completed Hafner

Development and Testing of Rainwater Harvesting Training Materials—Inter-Regional; S&T/H/WS The Office of Health requested that WASH continue development and testing of rainwater harvesting training materials on a more extensive basis than previously authorized. The scope of work included a technical review of existing materials; review and revision following field pilot test which was conducted under OTD No. 167; development of a dissemination strategy for the final products to reach key people with operational program interests; and distribution of the training materials to these individuals. See WASH Technical Report No. 27 and Field Report No. 115.

OTD #154 August 1983: Completed Rosensweig

Development and Testing of Spring-Capping Trainers Guide—Interregional; S&T/H/WS The Office of Health requested that WASH develop and test the spring-capping training guide. The scope of work included the development of the first draft, revisions based on a field test, and final production. The training guide contains all the information a trainer needs to plan and conduct a comprehensive two-week workshop, including training designs, trainer guidelines, and participant handouts. The guide was developed for trainers to use in training field workers with responsibility for rural water supply and sanitation. See WASH Technical Report No. 28.

OTD #155 August 1983: Completed Donaldson

Technical Assistance in Evaluation of CARE Water Program—Indonesia USAID/Indonesia requested WASH assistance in conducting the second part of an evaluation of the CARE Water Project. The scope of work included evaluation of CARE's field staff, of CARE's community involvement approach, and the involvement of the Government of Indonesia in CARE water project activities. Recommendations addressed how the CARE approach and training program might be incorporated into Government operations, how it might be used by other development organizations

and PVOs, and how alternative financing methods may be applicable to CARE water projects. See WASH Field Report No. 107.

OTD #156 August 1983: Completed Hafner

Technical Assistance in Evaluation of National Institute of Health Science Project—Sri Lanka USAID/Sri Lanka requested WASH assistance in the mid-project evaluation of the National Institute of Health Science Project in the Ministry of Health, Sri Lanka. The WASH consultant was a member of the evaluation team and provided expertise in public health, water supply, sanitation and institutional training of community workers at the paraprofessional level in developing countries.

OTD #157 August 1983: Completed Hafner

Technical Assistance in Evaluation of CARE/Kenya Rural Water Projects—Kenya USAID/Kenya requested WASH assistance in the design and execution of an evaluation of several rural water supply projects that CARE had worked on over the past three years. The scope of work included determining what has worked well, the reasons therefor and the impact on recipient communities; recommending viable community-based maintenance systems for future CARE projects in Kenya; reviewing and recommending realistic project goals and an appropriate goal accomplishment indicator system; developing a practical evaluation methodology for future CARE projects; and informally training CARE staff in evaluation approaches and methodologies. See WASH Field Report No. 106.

OTD #158 September 1983: Completed Rosensweig

Technical Assistance in Assessment of Sanitation Sector and Strategy Design—Tunisia/RHUDO USAID/Tunisia, the AID Regional Housing Office (RHUDO) in Tunisia, and the AID Office of Housing and Urban Programs in the Bureau for Private Enterprise (PRE/H), requested WASH assistance in undertaking an assessment of the sanitation sector in Tunisia and in developing a strategy for meeting urban and periurban sanitation needs. The scope of work included reviewing selected current and planned sewerage and drainage projects of other donors; assessing dimensions of sanitation sector needs, constraints, programs, policies and institution, managerial, and financial capabilities; reviewing projects submitted for funding and identifying those eligible for AID/Housing financing; and assisting in an initial development of a strategy and options for undertaking AID financing of future programs and projects in the sanitation sector. See WASH Field Report No. 109.

OTD #159 September 1983: Completed Rosensweig

Technical Assistance in Institution Building—Near East Bureau AID/NE requested WASH assistance in assessing the institution-building needs and plans of the water sector in the Near East region. WASH assisted the Near East Bureau Water Resources Subcommittee on Institutional Development in assessing the capabilities of Near East institutions in Yemen, Egypt, Tunisia, and Jordan based on literature reviews and interviews with experts. The Report provides a description of the institutional setting, discusses sector trends in terms of programs and investments, identifies problems and constraints affecting the sector, and provides a framework for examining the status and institutions in each country. See WASH Field Report No. 119.

OTD #160 September 1983: Completed Rosensweig

Technical Assistance in Human Resource Development—Near East Bureau At the request of the Water Resources Committee of the Near East Bureau, WASH was asked to identify and assess the organizations and institutions that offer high quality training and educational programs in the water and wastewater sector. A handbook was developed which catalogues programs by length of the course, type of training offered and relation to key job functions in the sector. A companion document identifies sources of training materials for operations and maintenance. See WASH Field Reports Nos. 117 and 118.

OTD #161 September 1983: Completed Donaldson

Technical Assistance in Evaluation of Small Rural Water Systems—Yemen USAID/Yemen requested WASH assistance in evaluation of the small rural water systems project and preparing the terms of reference for the water sector assessment planned for early 1984. The general scope of work included assessing activities and plans of the organization; staffing of the contractor and the rural water department; project replicability; the role and impact of Peace Corps and of women in the project; and the long range requirements for similar water supply projects in Yemen. See OTD No. 39 and WASH Field Report No. 22.

OTD #162 September 1983: Completed Isely

Technical Assistance on Project Paper for Community Water Systems Development—Haiti USAID/Haiti requested WASH assistance in preparing a Project Paper for Community Water Systems Development. The WASH consulting team focused on site and water supply technical

alternatives, options for institutional arrangements with PVOs, baseline data acquisition for socio-economic and health impact evaluation, technology transfer opportunities and resources, and utilization of local experience in project design and development of financing schemes.

OTD #163 September 1983: Completed Beverly

Technical Assistance in Staffing AID/WASH Exhibition Booth at APHA Annual Meeting, Dallas, Texas, November 1983-S&T/H/WS

WASH was requested by the Office of Health to provide professional staff for the AID/WASH exhibition booth at the annual meeting of the American Public Health Association. WASH display panels with photographs were part of the AID exhibit. The WASH section also included an operational AID Handpump and a variety of WASH reports and publications for discussion and distribution to visitors to the booth.

OTD #164 October 1983: Completed Donaldson

Technical Assistance in Reviewing Low-Cost Alternative Water Supply and Sanitation Concepts and Designs-Ivory Coast

The USAID Regional Housing and Urban Development Office in Abidjan requested WASH assistance in reviewing low-cost alternative water supply and sanitation concepts and designs. The WASH team worked with the Housing Office in the Ivory Coast to identify and evaluate alternatives that were within the social, financial, and technical resources of the Ivory Coast for its low-cost housing projects. Key issues addressed included the social, technical, and financial range of affordable solutions; capital costs per user; environmental impacts; local availability of materials and equipment; possible financing schemes, such as a revolving fund; and feasible changes in current technical standards. See WASH Field Report No. 113.

OTD #165 October 1983: Completed Isely

Collection and Presentation of Water and Sanitation Related Health Education Materials-S&T/H/WS

The Office of Health requested that WASH prepare a collection of water and sanitation related health education materials produced in developing countries and especially descriptions of how they were developed and used. The materials and associated descriptions will be used as examples and as guidance and inspiration for the creation of new indigenously prepared materials by health educators and trainers in developing countries and by consultants. The scope of work included obtaining copies and/or descriptions of materials and of their development and use; reviewing, cataloging

and abstracting the materials; and preparing a health education resource bibliography. See WASH Technical Report No. 30.

OTD #166 October 1983: Completed Rosensweig

Technical Assistance for Workshop on Sanitation and Latrine Construction-Sierra Leone

USAID/Sierra Leone and the Peace Corps requested WASH assistance to design and deliver a two week sanitation and latrine construction workshop for twenty-four Peace Corps Volunteers and staff from the Ministry of Energy and Power and the Ministry of Health. The workshop included hands-on experience in latrine construction and maintenance, as well as consideration of community participation, local practices, health education strategies, and project development and planning skills. The WASH training guide on latrine construction was piloted during this workshop. See WASH Field Report No. 114. Also see Technical Report No. 25.

OTD #167 October 1983: Completed Hafner

Technical Assistance for Rainwater Harvesting Workshop-Zaire

USAID/Zaire requested WASH assistance to design and deliver a two-week workshop on rainwater harvesting for twenty-five national rural health workers, missionary health staff and Peace Corps Volunteers. The workshop concentrated on the technical skills and practices applied in the construction, operation, and maintenance of gutters and above-and-below-ground cistern systems used for household, institutional and community water supply. Previously developed WASH training materials on rainwater harvesting were adapted to Zaire and translated into French for use in the workshop. See WASH Field Report No. 115. Also see WASH Technical Report No. 27.

OTD #168 October 1983: Completed Hafner

Technical Assistance in Evaluation of Rural Water-Borne Disease Control Project-Swaziland

USAID/Swaziland requested WASH assistance in conducting a mid-project evaluation of the Rural Waterborne Disease Control Project. The project has three major inter-related components-health education, environmental sanitation and public health engineering, and a survey of schistosomiasis and water-related diseases-aimed at expanding the capacity of the government to deliver effective preventive health services. In addition to assessing progress on eighteen specific aspects of the project, the WASH evaluation team reviewed the scope and content of the project, work plan priorities and time requirements and the appro-

priateness of the implementation strategy and of support received by the contracting team. The team also assessed the need for a post-project knowledge, attitudes and practices survey, and made appropriate recommendations. See WASH Field Report No. 120.

OTD #169 October 1983: Completed Isely

Participation in International Workshop on Measuring the Health Impacts of Water Supply and Sanitation Projects, November 21-25, 1983 Dhaka-Bangladesh The Office of Health authorized WASH participation in the International Workshop on Measuring the Health Impacts of Water Supply and Sanitation Projects. The workshop was organized by the International Centre for Diarrheal Disease Research, Bangladesh, and the London School of Hygiene and Tropical Medicine, and had some thirty invited participants plus observers. The WASH consultant presented a paper entitled "Opportunities, Problems and Pitfalls in Using Health Status Measures to Evaluate Water Supply and Sanitation Projects in Togo, Malawi and Tunisia."

OTD #170 October 1983: Cancelled

Technical Assistance for Development of Project Paper Amendment for Rural Water Supply and Sanitation Project-Togo Cancelled at request of Mission.

OTD #171 November 1983: Completed Donaldson

Disaster Assistance Following Earthquake-Turkey The AID Office of Health and the Office of Foreign Disaster Assistance requested WASH technical assistance in evaluating the earthquake situation and its requirements in eastern Turkey. A WASH consultant and the AID WASH Project Manager analyzed water supply and sanitation conditions, requirements and opportunities resulting from the earthquake and coordinated water purification and planning activities in consort with U.S. and Turkish government officials.

OTD #172 November 1983: Completed Donaldson

Drought Emergency Assistance-Mauritania The AID Office of Foreign Disaster Assistance and the Mauritania Mission requested WASH services in planning relief measures for the drought situation in Mauritania. The WASH team recommended short term technical assistance activities as well as long-term water supply improvements involving equipment replacement, well drilling, well maintenance, operator training programs, and drilling rig repairs. See WASH Field Report No. 112.

OTD #173 January 1984: Completed Donaldson

Technical Assistance in Well Drilling and Community Participation-Bolivia USAID/Bolivia requested WASH assistance in the well drilling and community participation aspects of the Bolivia Rural Water Supply and Sanitation Project, which had been suspended in 1980 and reactivated in 1983. WASH consultants developed recommendations on drilling rigs, well siting, pumps, and generators as well as on the community participation aspects of staff deployment, transportation, recruitment, equipment, technical assistance, and community promotion. See WASH Field Reports Nos. 116 and 121.

OTD #174 January 1984: Completed Isely

Technical Assistance in Evaluation of Rural Water Supply Project-Upper Volta USAID/Upper Volta requested WASH assistance in conducting a benchmark assessment of the ongoing rural water supply project. The assessment report reviewed the overall management of the project and its major components; choice of technology, well construction, and pump installation; pump and well maintenance organization and financing; host country management capability to continue well site identification and future well drilling; training of health assistants and village health workers; content of the health education component; and coordination of the component with well construction and use.

OTD #175 January 1984: Completed Rosensweig

Technical Assistance in Organizing a Training Unit in the Directorate of Rural Sanitation (DISAR)-Peru USAID/Peru requested WASH assistance in organizing and planning the initial operations of the central training unit recently established in the Directorate of Rural Sanitation (DISAR). The WASH consultants assisted DISAR in organizing the training unit; establishing objectives, functions, positions and procedures; in developing a model for courses that DISAR will conduct; and in coordinating DISAR's training delivery system with other AID projects, other donors, and other national agencies. See WASH Field Report No. 126.

OTD #176 February 1984: Completed Hafner

Technical Assistance on Project Paper for Urban Development-Jamaica USAID/Jamaica and the Regional Housing Office/Caribbean requested WASH assistance in reviewing and refining a scope of work for the preparation of the project

paper for an urban development project. The WASH consultant was involved with the water supply, sanitation, solid waste disposal and environmental health components of the paper.

OTD #177 February 1984: Completed Donaldson

Evaluation of Basic Village Services Project—Egypt USAID/Egypt requested WASH to provide an experienced rural public works engineer to assist in the third mid-project evaluation of the Basic Village Services Project. The purpose of this Project was to improve and expand the capacity of villages and governates to plan, manage, finance, implement and maintain selected infrastructure projects. At the time of the evaluation, there were 3,560 sub-projects encompassing 1,425 villages in 20 rural governates. Over 3,000 people had been given technical and managerial training, with 3,000 more in the training pipeline. The contribution of the rural public works engineer to the evaluation included assessment of the quality, quantity and effectiveness of sub-project engineering and of technical assistance and training, and the preparation of recommendations in these areas for successful project completion.

OTD #178 February 1984: Completed Rosensweig

Evaluation of the Integrated Health Delivery Project—Ecuador USAID/Ecuador requested WASH assistance in evaluating the water supply and sanitation component of the ongoing integrated Health Delivery Project which was being implemented by the Ecuadorian Institute of Sanitary Works (IEOS). The WASH evaluation team assessed IEOS' overall management capabilities and structure, cost/effectiveness in appropriate technology utilization, and its training programs, especially for paraprofessionals. The team also determined the status, quantitative results and effectiveness of IEOS' vehicle and equipment procurement, operations and maintenance program; the gravity water supply system construction program; the handpump and latrine installation program; and the community health education and participation program. Inter-institutional arrangements and the role of AID's sanitary engineer were considered and appropriate recommendations made to improve over-all project performance. See WASH Field Report No. 127.

OTD #179 February 1984: Completed Donaldson

Assessment of Water and Sanitation Emergency Situation—Mozambique The AID Office of Foreign Disaster Assistance and the U.S. Embassy in Mozambique requested WASH technical assistance to assess the damage caused by Typhoon Domitia in February 1984. Torrential rains caused the

worst flooding in recorded history. A WASH consultant reviewed the overall water supply and sanitation condition in the capital of Maputa and surrounding areas and recommended replacements of needed irrigation, water supply, and sanitation equipment.

OTD #180 February 1984: Completed Donaldson

Technical Assistance in Evaluation of Provincial Cities Project—Egypt USAID/Egypt requested WASH assistance as part of a team to evaluate the on-going Provincial Cities Project. Principal issues addressed by the evaluation were whether inputs were being achieved in a timely and effective manner, had they resulted to date in the outputs envisaged in the project paper, and had the inputs/outputs contributed to the timely accomplishment of the project goal and purpose. Other topics considered were the role of the Egyptian private sector in project implementation; the effectiveness of coordinated action by the Egyptian government, AID and the AID contractor; the role of Provincial Cities in decentralization and Egyptian development; and the extent to which capacity building ("institutionalization") is occurring as a result of the project.

OTD #181 February 1984: Completed Rosensweig

Technical Assistance on Project Paper for Housing/Sanitation Program—Tunisia The USAID Regional Housing Office (RHUDO) in Tunisia requested WASH technical assistance in preparing the project paper for a combined Housing/Sanitation Program. This assistance was a follow-up to OTD #158 WASH provided a sanitary engineer and an economist who, as part of a five person team, prepared the sanitation/sewage component. Their contribution included criteria for beneficiary identification, technical project descriptions, review of standards, a program financing plan, and a cost/benefit analysis. The team also assisted in coordinating efforts with existing sanitation projects funded by the World Bank, Kuwait Fund, and Tunisian government agencies, and in identifying specific sanitation/sewage projects to be funded.

OTD #182 May 1984: Completed Rosensweig

Follow-up Technical Assistance for Private Water Sector Water Program—Bolivia USAID/Bolivia requested WASH technical assistance for the private sector water program. This was a follow-up to work done under OTD #151 for the Bolivian Savings and Loan System (CACEN) and AID's Bureau for Private Enterprise. The scope of work included development of site selection criteria, advice on appropriate design and con-

struction of water, wastewater and excreta disposal systems, counsel on community participation, promotion, operation and maintenance of systems, and a review of CACEN's proposed general project plan. Guidelines for project evaluation were also considered.

OTD #183 May 1984: Completed Donaldson

Review of Wastewater Treatment Facilities—Jordan and NE/PD/ENV USAID/Jordan requested WASH technical assistance in conducting a comparative review of two operational wastewater treatment facilities. Aspects covered included the methods being used to recover the wastewater for further economically productive use; design operation, and maintenance problems and procedures; the monitoring plan being used to protect public health and the environment; and the procedures undertaken to insure that there are no adverse public health or environmental impacts.

OTD #184 May 1984: Completed Rosensweig

Participation in Human Resource Development Core Group Meeting—S&T/H/WS In February, 1984, the World Health Organization invited WASH to participate in the work of a Core Group on Human Resources Development (HRD) for the UN Water Decade. Other members of the Core Group are AID, WHO, PAHO, ILO and the World Bank. The Core Group is an advisory group to the Task Force on HRD. Agenda topics included exchange of information on training activities; assessment of training needs in support of the Decade; the need to develop presentations illustrating the benefits of an integrated and systematic approach to HRD; the difficulty of mounting effective HRD programs where existing water and sanitation programs are weak and rarely coordinate their programs; and preparation and publication of a series of guidance articles focusing on organizational development and HRD. The meeting was held May 29 - June 1, 1984 in Washington, D.C.

OTD #185 June 1984: Completed Donaldson

Technical Assistance in Evaluating and Planning Rural Water and Sanitation Maintenance Systems—Honduras USAID/Honduras requested WASH technical assistance to evaluate alternative maintenance arrangements and to recommend appropriate maintenance systems for the on-going rural water supply and sanitation project. A WASH consultant assisted SANAA and the Ministry of Health to develop a self-financing operations and maintenance plan which made maximum use of existing human and technical resources. The consultant also recommended that

there be a plan director, that an information system be developed, that in-service training be established, and that implementation begin in a pilot area. See WASH Field Report No. 129.

OTD #186 June 1984: Completed Hafner

Technical Assistance in Evaluation of the Upgrading Component of the Housing and Community Services Project—Egypt USAID/Egypt requested that WASH provide an experienced civil engineer as part of a team that will evaluate the upgrading component of the housing and community service project for low-income areas in Egypt. The WASH consultant was concerned primarily with the community planning and water supply and sanitation infrastructure design standards aspects of the project. Since community upgrading programs should minimize the costs of physical improvements so that cost recovery can be maximized through affordable special assessments, particular attention was paid to service level trade-offs with appropriate infrastructure/facility designs and costs. See WASH Field Report No. 133.

OTD #187 June 1984: Completed Rosensweig

Technical Assistance in Planning the Rural Water Supply and Sanitation Component of a Health Sector Project—Belize USAID/Belize requested WASH technical assistance in preparing project documentation for the improvement and expansion of rural water supply and sanitation (WS&S) facilities and the strengthening of institutional back-up as part of a proposed health sector project. As a member of a three-person planning team, the WASH consultant first assessed the current situation in terms of goals, plans, resource capabilities and availability, and potential locations of WS&S projects. Then, following discussion with local officials as to potential service areas, coverages, types of services, resource allocations, payment systems and schedules, the consultant prepared a preliminary WS&S project design. The physical design emphasized low costs, local materials, local operation and maintenance, and suitability for wide-spread replication. The project design also included institutional and human resource development activities to strengthen administrative and WS&S service delivery capabilities locally and nationally.

OTD #188 July 1984: Completed Hafner

Development of Rural Water Supply National Plan—Zaire USAID/Zaire requested WASH assistance in the development of a rural water supply (RWS) national plan. The government, private volunteer agencies and other donors in Zaire are

committed to uniting efforts and developing a national plan. The scope of work for this initial effort included reviewing the situation, existing plans, projects, and proposals; contacting agencies, PVO's and institutions concerned with RWS; devising a strategy for developing the plan, including information requirements, the role of organizations participating in the planning process, financing requirements, schedules and an outline of the plan; and preparing scopes of work for planning actions by participants and follow-up WASH consultants. See WASH Field Report No. 135.

OTD #189 July 1984: Completed Isely

Technical Assistance in Searching for Alternative Water Supplies—Ghana/OFDA USAID/Ghana and the Office of Disaster Assistance requested WASH services to design a plan to search for and develop alternative water supplies. The drought in Ghana has reached disaster proportions and required expert appraisal of the situation and recommendations for appropriate action. The WASH consultant, an experienced geologist and water supply engineer, reviewed the water supply situation, visited critical sites, and identified emergency and short-term actions and programs, as well as longer term development options, actions and programs, that could be useful in alleviating potable water shortages. See WASH Field Report No. 132.

OTD #190 July 1984: Completed Rosensweig

Progress Evaluation of Rural Water Systems and Environmental Sanitation Project—Peru USAID/Peru requested WASH assistance in conducting a progress evaluation of the on-going rural water systems and environmental sanitation project. The project is intended to provide water supply and sanitation facilities and services to 660 villages having populations under 500 people. The evaluation covered the following aspects of the project: operational status of recently organized regional environmental health offices; progress in construction of community water supply and sanitation systems in the 660 villages; state of development of operations and maintenance procedures for village water systems; level of training and effectiveness of community organiza-

tion and participation activities; progress in decentralization; and management and administration of the project. See WASH Field Report No. 134.

OTD #191 September 1984: Completed Rosensweig

Planning Basic Village Services Overseas Training—Egypt USAID/Egypt requested WASH assistance in planning a five week component (three week workshop and two week field trip) of a ten week course for approximately fourteen Egyptian engineers responsible for design and maintenance of Basic Village Services projects. The WASH component of the course focused on the design of water supply systems, selection of sources and treatment, environmental problems related to water supply and sewerage, appropriate sewerage systems, groundwater pollution, and establishment of maintenance systems. The training program took place in Washington, DC from October 1–December 7, 1984 with the USDA Graduate School coordinating the program.

OTD #192 September 1984: Completed Hafner

Technical Assistance in Designing Water Supply and Sanitation Workshops—Sudan USAID/Sudan requested WASH to develop a plan for WASH assistance to the Juba Water and Sanitation Programme (JWASP) in the Equatoria Region. WASH developed a scope of work for WASH assistance, particularly in the area of training, and discussed with the AID Mission potential WASH assistance for fiscal year 1985. The training subjects include latrine design, installation and maintenance, health education, bore-well rehabilitation and shallow well construction.

OTD #193 September 1984: Completed Donaldson

Technical Assistance in the Engineering Applications of Microcomputer Techniques—Ecuador USAID/Ecuador requested WASH technical assistance to develop the capability of Ecuadorian engineers to use a microcomputer to evaluate design alternatives for water and sanitation projects. A WASH consultant adapted an existing program to the available computer, conducted a workshop in computer use, and made recommendations regarding future computer operations. See WASH Field Report No. 136.

WASH II Task Assignments (October 1984 to September 1987)

RM #101 October 1984: Completed St. Michel

Prepare 1st Annual Work Plan for WASH II-S&T/H

This was an administrative Activity requested by the Office of Health to prepare, in close collaboration with the Office of Health and other AID offices, a WASH II Project Annual Work Plan covering the period October 22, 1984, through September 30, 1985. A pre-planning workshop for AID and CDM Associates' Staff was conducted as a basic part of this Activity.

RM #102 October 1984: Completed St. Michel

Administrative Start-Up of WASH II-S&T/H

This was an administrative Activity requested by the Office of Health to develop, install and operate a management information system (MIS) for WASH II. It also included the performance of other necessary initial administrative, financial, contracting, leasing, hiring, and organizational tasks to start-up the WASH II Project.

RM #103 October 1984: Completed St. Michel

Technical Start-Up of WASH II-S&T/H This was an administrative Activity requested by the Office of Health to start-up WASH II technical assistance activities in support of AID Missions, Bureaus, offices and other AID clients and collaborators.

RM #104 October 1984: Completed Warner

Bolivia: Simple Low-Cost Water and Sanitation Measures for Rural Programs

An evaluation of development projects in the San Julian colonization area indicated major problems in the water supply and sanitation (WS&S) sector and the need for WASH technical assistance services. The scope of work for this activity included review of WS&S data on water supply in San Julian area, evaluation of needs and possible WS&S solutions, and preparation of design recommendations appropriate to the income and lifestyle of colonists. See WASH Field Report No. 140 (in Spanish only).

RM #105 October 1984: Completed Rosensweig

Visit to UNICEF and International Development Research Centre (IDRC)-S&T/H

Associate Director/HRD visited IDRC in Canada to discuss the development of support materials for the film "Prescriptions for Health," interviewed appropriate people at CIDA to assess to what extent HRD is an integral part of projects, and discuss collaboration with UNICEF in New York City.

RM #106 November 1984: Completed Jordan

Dominican Republic: Evaluation of Modified AID Type Handpump

The USAID supported handpump manufacturing program, which had been underway for several years in the Dominican Republic, was considering making a handpump from steel pipe rather than cast iron and requested WASH technical assistance. The scope of work included reviewing the AID handpump situation, the ongoing manufacturing/test activities, and the protocol developed by the Georgia Institute of Technology for the modified AID handpump being tested in the Dominican Republic. Recommendations for appropriate next steps to assure quality production were made. See WASH Field Report No. 139.

RM #107 November 1984: Completed Rosensweig

Chile: Coordinating Working Groups with Pan American Health Organizations (PAHO) Symposium

The Associate Director for Human Resource Development conducted a two-day training session in Santiago, Chile to prepare working group leaders for symposium responsibilities, acted as coordinator for working group leaders during symposium, and wrote a brief report summarizing WASH involvement in the symposium.

RM #108 October 1984: Completed Rosensweig

U.S. Training for Egyptian Basic Village Service Engineers-S&T/H

The USAID/Egypt Basic Village Services (BVS) Project had arranged a training program in the United States for fourteen BVS engineers and requested WASH training assistance in the areas of water supply, sewerage, groundwater and maintenance. The scope of work included designing and conducting a three-week workshop on the topics above, coordinating the workshop with the United States Department of Agriculture Graduate School, which gave related training, and preparing a summary report and recommendations. See WASH Field Report No. 141.

RM #109 October 1984: Completed Rosensweig

Develop Scope of Work and Prepare Guidelines for Assessing Institutional Effectiveness-S&T/H

Institutional development is a major concern of AID and the Office of Health recognizes specific institutional needs in the water and sanitation sector in developing countries. As an initial step in this area, the Office of Health requested WASH to prepare a scope of work to later develop guidelines for assessing institutional effectiveness. The work under this activity included reviewing available documents on assessment of institutional effectiveness, interviewing appropriate

individuals to determine overall focus of guidelines and writing a scope of work that included the purpose of the document, steps needed to develop it and resources required. Activity #146 below is implementing and developing the guidelines.

RM #110 November 1984: Completed Rosensweig

Tunisia: Site Selection for Housing Projects The USAID Regional Housing Office (RHUDO) in Tunis has a project with the Tunisian National Sewerage Authority (ONAS) for financing the up-grading of sewerage and drainage systems in low-income neighborhoods and towns. The World Bank and the Kuwait Development Fund are also involved in this project. RHUDO requested WASH assistance in selection of appropriate housing sites. The scope of work included visiting proposed sites to determine eligibility for AID financing, reviewing and evaluating construction costs, assisting ONAS in preparing information for the program delivery plan, and preparing the final report. See WASH Field Report No. 143.

RM #111 December 1984: Completed Hafner

Sudan: Training of Trainers—Latrine Construction Workshop To support the JUBA area water and sanitation program, USAID/Sudan asked WASH for training assistance in latrine construction. The scope of work included preparing and conducting a two-week training-of-trainers workshop using WASH trainer's guide on latrine construction (WASH Technical Report No. 25) and providing technical and training assistance for two Sudanese trainers who will later conduct latrine construction workshops. This assignment was cancelled due to political problems in southern Sudan.

RM #112 December 1984: Completed Warner

Ethiopia: Technical Assistance to Office of Foreign Disaster Assistance (OFDA) Drought Relief Efforts—Phase I The Office of Foreign Disaster Assistance of AID requested WASH technical support for water supply in the drought areas of Ethiopia. The scope of work included 1) assessment of current well-drilling equipment capability and hydrogeological potential for water supply to drought stricken areas and 2) assessing equipment rehabilitation requirements and assessment of costs and possible additional equipment needs. See WASH Field Report No. 138.

RM #113 November 1984: Completed Jordan

Belize: Preparation of Project Paper—Water Supply and Sanitation Component USAID/Belize was preparing a Project Paper for the Increased Productivity Through Health Project and requested WASH technical assistance. The WASH consultant provided necessary inputs on tubewells, handpumps, simple water systems, latrines, and maintenance requirements.

RM #114 November 1984: Completed Hafner

Zaire: National Rural Water and Sanitation Planning The planning work on this task was a continuation of OTD #188 of July 1984 in WASH I (See WASH Field Report No. 135). Its scope of work included the review of prior WS&S efforts, identification of existing policies, plans and programs, determination of possible future WS&S directions, and formulation of recommended WS&S strategies. A seminar on National Planning was designed and conducted in May 1985. See WASH Field Reports Nos. 142 and 150.

ACT #115 December 1984: Completed Rosensweig

Development of Team Planning Model for WASH Consultants-S&T/H To improve the performance of WASH consultants, the Office of Health requested that a more comprehensive orientation of consultants be provided prior to their field work. The scope of work included development and implementation of a strategy for the institutionalization of the team planning model within WASH and training WASH activity managers to use the model. See WASH Technical Report No. 32.

ACT #116 January 1985: On-going Rosensweig

Development of Training Guide on Well Improvement-S&T/H This Activity continues the series of WASH workshop designs in water supply and sanitation. Earlier guides were on latrine construction, handpump installation and maintenance, rainwater roof catchment systems and spring capping (see WASH Technical Reports Nos. 25, 26, 27 and 28 and Activity 124 below). The scope of work includes review of the use of existing well improvement materials and future training needs, identification of potential trainees, required tasks and workshop elements, design of the training guide, and planning of field tests. See WASH Technical Report No. 34.

ACT #117 December 1984: Completed Jordan

Belize: Baseline Survey for CARE USAID/Belize requested WASH to assist CARE in its AID supported Village Health Sanitation Project. The scope of work included the development and execution of a baseline survey to gather information on water usage and excreta disposal in villages in the Orange Walk and Corozal Districts of Belize. See WASH Field Report No. 147.

ACT #118 December 1984: Completed St. Michel

Egypt: Water/Wastewater Program Assessment USAID and the Government of Egypt have made substantial water and wastewater investments having a significant effect on the rehabilitation, upgrading, and expanding of physical facilities throughout Egypt. USAID/Egypt requested a selective review and assess-

ment of these projects and the agencies and organizations responsible for implementation and operation. A WASH team assisted the Mission in preparing a report presenting findings and recommendations in the areas of management capability and institutional development; training and human resources development; financing project completion and sustainability; system design, construction, and operation; estimating beneficiaries served; assessing ability to pay; and systems impact.

ACT #119 December 1984: Completed St. Michel

General Administration-S&T/H This is the basic administrative Activity for WASH II operations as requested by the Office of Health. It will be continued in FY 1987 as Activity #301.

ACT #120 January 1985: Completed St. Michel

General Technical Management-S&T/H This is the basic technical management Activity for WASH II as requested by the Office of Health. It will be continued in FY 1987 as Activity #302.

ACT #121 January 1985: Completed Warner

Ethiopia: Assistance to Office of Foreign Disaster Assistance (OFDA) Drought Relief Efforts-Phase II This Activity was a continuation of related work done under RM 112 above. The scope of work included assisting OFDA and the Africa Task Force to develop a scope of work to implement recommendations in WASH consultants report (WASH Field Report No. 138) and those approved by USAID for funding. It also required the identification of other sources of support and provision of requested technical services.

ACT #122 February 1985: Completed Isely

Cameroon: Development of An Evaluation Plan for CARE Northern Wells Project USAID/Cameroon requested WASH assistance in preparing an evaluation plan for the on-going CARE well installation and health education project in Northern Cameroon. The scope of work included review of the wells project and its health education component, identification of process and outcome evaluation variables, and development of prototype evaluation protocols for use by CARE in the health education component. See WASH Field Report No. 165.

ACT #123 January 1985: Completed St. Michel

Preliminary Activity Development-S&T/H This is a basic administrative Activity that will continue for the duration of WASH II. Under it, WASH Operations Center staff, subcontractor staff and consultants will prepare Activity Sheets, draft Activity Implementation Plans and develop scopes of work for future WASH Activities. It will continue in FY 1987 as Activity #303.

ACT #124 January 1985: On-going Rosensweig

Development of a Training Guide on Community Participation-S&T/H This is another Activity continuing the WASH workshop design series as mentioned under Activity #116 above. The scope of work includes the review of existing materials on community participation, clarification of purposes of guide, identification of its user and trainee characteristics, and design of the training guide. See WASH Technical Report No. 33 (draft).

ACT #125 January 1985: Completed Halner

Africa Bureau: WASH Initiatives This was a coordinating Activity to develop and reinforce existing contacts between WASH and the Africa Bureau and Missions, to develop new contacts between WASH and the Africa Bureau and Missions, and to target high priority Missions where WASH has not provided assistance. This Activity was continued in WASH Fiscal Year 1986 as Activity #201.

ACT #126 January 1985: Completed Isely

Asia Bureau: WASH Initiatives This was a coordinating Activity to develop and reinforce existing contacts between WASH and the Asia Bureau and Missions, to develop new contacts between WASH and the Asia Bureau and Missions, and to target high priority Missions where WASH has not provided assistance. This activity was continued in WASH Fiscal Year 1986 as Activity #202. Note that the Asia Bureau has been combined by AID with the Near East Bureau as ANE.

ACT #127 January 1985: Completed LSM/Warner

LAC Bureau: WASH Initiatives This was a coordinating activity to develop and reinforce existing contacts between WASH and the Latin America and Caribbean Bureau (LAC) and Missions, to develop new contacts between WASH and the LAC Bureau and Missions, and to target high priority missions where WASH has not provided assistance. This Activity was continued in WASH Fiscal Year 1986 as Activity #203.

ACT #128 January 1985: Completed Rosensweig

Near East Bureau: WASH Initiatives This was a coordinating Activity to develop and reinforce existing contacts between WASH and the Near East Bureau and Missions, to develop new contacts between WASH and the Near East Bureau and Missions, and to target high priority missions where WASH has not provided assistance. This Activity was continued in WASH Fiscal Year 1986 as Activity #202. Note that the Near East Bureau has been combined with the Asia Bureau as ANE.

ACT #129 January 1985: Completed Beverly

Provision of Information Services to AID and AID-Related Organizations-S&T/H This is a basic Activity required by the WASH II contract and will continue for the duration of WASH II. Its purpose is to provide AID and AID-assisted organizations with relevant information on all aspects of the water supply, sanitation and environmental health sector, WASH project activities, and other topics as requested by AID. It also provides for the operation and maintenance of the WASH library and information center and collaboration and information exchange with the international WS&S community. It will be continued in FY 1987 as Activity #304.

ACT #130 January 1985: Completed Rosensweig

Near East Water/Wastewater Workshop The Near East Bureau Water Resources Committee (WRC) requested WASH assistance in planning and supervising a workshop for USAID staff in its Near East Missions. The scope of work included a reconnaissance trip to Near East Missions and planning a workshop on water supply and sanitation project design, implementation and evaluation. The workshop was held in Tunis, April 15-18, 1985. See WASH Field Report No. 149.

ACT #131 January 1985: Completed Warner

Ethiopia: Technical Assistance to Office of Foreign Disaster Assistance (OFDA) Drought Relief Efforts-Phase III This activity followed work under Activity 121 above. Its scope of work included assisting the mission in coordinating activities in water sector relief efforts, identifying current and future activities/problems at relief camps, reviewing OFDA efforts to provide water and developing recommendations for future strategies/actions for USAID relief efforts. See WASH Field Reports Nos. 145 and 146.

ACT #132 January 1985: Completed Jordan

Oman: Capital Region Water Resources Project USAID/Oman requested WASH assistance in developing part of the Third Five Year Plan in conjunction with the Omani-American Joint Commission. The scope of work included developing an action plan for preparation of master plans, preparing a five-year water/wastewater investment program, evaluating the Brown and Root report on water resources, and developing an implementation plan that identifies top priority projects.

ACT #133 January 1985: Completed Hafner

CARE Africa Field Staff Training Workshop-S&T/H The Office of Health requested that WASH continue its collaboration with CARE by assisting in a training workshop for CARE Africa staff. The scope of work included conducting a needs assessment of CARE

staff on water supply and sanitation project design, implementation and management, and designing and implementing a training workshop on WS&S to satisfy CARE management requirements. The workshop was held in Sierra Leone, July 1-8, 1985. See WASH Field Report No. 159.

ACT #134 January 1985: Completed Hafner

Chad: Emergency Health Assessment As part of its efforts in the drought areas of Africa, the Office of Foreign Disaster Assistance requested support from the Communicable Disease Centers (CDC) in Atlanta. CDC in turn asked WASH to provide a water and sanitation consultant to carry out an emergency health needs assessment as part of a CDC-led health reconnaissance team.

ACT #135 January 1985: Completed Beverly

Prepare New WASH Brochure-S&T/H Since the WASH Brochure had not been revised since 1980 and did not reflect the WASH II contract nor include the new WASH Associates, a new brochure describing WASH services and how to obtain them was prepared and distributed to AID and to WASH related organizations throughout the world.

ACT #136 January 1985: Completed Jordan

Dominican Republic: Development of Steel Hand-pump for Rural Water Supply Program This Activity is a follow-on to ACT #106 and included building a model of the pump that had been tested in the Dominican Republic. Upon approval of the model by the Office of Health, four prototype models were built for delivery to USAID/DR with bidding documents. Gage kits and quality assurance recommendations for local manufacturing were also included.

ACT #137 January 1985: Completed Warner

Honduras: Technical Assistance in Well Drilling for Non-Governmental Organization Program The Rotary Club of San Pedro Sula, Honduras, was working on a well drilling project in cooperation with the Rotary Club of Columbus, Ohio, and requested assistance from USAID/Honduras. WASH sent a consultant to Honduras in October to work with a Honduran well driller and provide on-site practical training in well/groundwater hydraulics and hydrology, locating wells, well drilling techniques and handpump installation.

ACT #138 January 1985: Completed Isely

Sanitary Survey Manual for Village Workers-S&T/H Under WASH I, WASH consultants had been developing the content of a sanitary survey manual. The Office of Health requested WASH to continue the work and develop a draft sanitary survey manual for village workers.

ACT #139 February 1985: Completed Isely

Assistance to CARE in Developing Guidelines for Water Supply and Sanitation Projects-S&T/H To assist CARE's ongoing activities in the water supply and sanitation sector, the Office of Health requested WASH to collaborate with CARE in developing guidelines for project preparation. The work included reviewing existing documentation, interviewing key CARE personnel and preparing draft guidelines for the design, implementation and evaluation of domestic water supply and environmental sanitation projects in developing countries. See WASH Technical Report No. 40.

ACT #140 February 1985: Completed Yacoub

Targeting Rural Water Supply and Sanitation Programs in Guinea Worm Endemic Areas-S&T/H This Activity followed up work done in WASH I in collaboration with the Communicable Disease Centers in Atlanta. This task included reviewing results from WASH I on intervention modalities, developing cost estimates, combining interventions into programmatically meaningful packages, and selecting trial countries for field work. See WASH Technical Report No. 38.

ACT #141 February 1985: Completed Isely

Assistance in Developing Rationale for Including Water Supply and Sanitation in Primary Health Care for Asia/Near East Bureau The Asia/Near East Bureau was exploring the role of water supply and sanitation (WS&S) in primary health care (PHC) and requested WASH assistance in reviewing relevant strategies. The work included summarizing known relationships between water supply and sanitation and primary health care, identifying cost-effective WS&S strategies for reducing morbidity and mortality, comparing these with PHC strategies, reviewing findings with an expert panel and determining the role of WS&S in primary health care for the Bureau.

ACT #142 February 1985: Completed Isely

Issues Paper on Water Supply and Sanitation in Relation to Oral Rehydration Therapy-S&T/H This activity expanded on material prepared in WASH I. The work consisted of revising the earlier draft and preparing a full issues paper aimed at health and WS&S program administrators in AID and the host countries. It also included preparing an executive summary of the paper for the "educated" general public. See WASH Technical Report No. 31.

ACT #143 February 1985: Completed Warner

Burkina Faso: Emergency Assistance to Water Supply Sector in Ouagadougou The impact of the African drought situation in Burkina Faso led the

USAID Mission to request WASH technical services in the capital city area. The work consisted of assisting the government to develop short-term measures for more effective use of water/sanitation resources in Ouagadougou and nearby urban areas caused by the drought and by high internal migration rates. A pre-PID survey of the Ziga damsite was also conducted. See WASH Field Report No. 144.

ACT #144 February 1985: Completed Jordan

Botswana: Economic Comparison of Latrine vs. Waterborne Sewer Systems USAID/Botswana requested WASH to assist the Ministry of Local Lands and Government in the evaluation of alternative sanitation systems for current and proposed housing projects. The work included reviewing documentation, interviewing AID and government officials, coordinating the task with the health engineer, and documenting per capita costs of on-site latrine systems and waterborne sewerage collection systems. See WASH Field Report No. 148.

ACT #145 February 1985: Completed Jordan

Lesotho: Rural Water Supply and Sanitation Project Evaluation Mission cancelled request.

ACT #146 February 1985: On-going Rosensweig

Development of Guidelines for Assessing Institutional Effectiveness in Water Supply and Sanitation Sector-S&T/H As part of AID's general policy to encourage institutional development, the Office of Health asked WASH to prepare a set of sector specific guidelines for institutional assessment. The work includes reviewing existing literature on institutional development, conducting a field survey of two successful institutions to develop a profile, and developing draft guidelines. Field testing for the guidelines is being planned. See WASH Technical Report No. 37.

ACT #147 February 1985: Completed Warner

Developing Water Supply Strategy for Drought Affected Areas in Africa-OFDA This Activity is in support of the Office of Foreign Disaster Assistance's on-going program in Africa. The work had two major tasks: 1) to summarize knowledge on populations at risk to drought and water supply scarcity in Mauritania, Mali, Niger, Burkina Faso, Chad, Ghana, Sudan, Somalia, Kenya, Mozambique, and 2) to develop a short-term action plan plus projections for each country.

ACT #148 March 1985: Completed Beverly

Collaboration with Non-AID Water Supply and Sanitation Related Organizations in the U.S. and Overseas-S&T/H This is a basic activity required by the WASH II contract to supply coordination and in-

formation services to interface with the U.N. and bilateral donor systems. The task includes establishing and maintaining working relationships, collaborative efforts and information exchange with non-AID organizations in the WS&S sector, private voluntary organizations, multi-lateral and bilateral organizations, international organizations, LDC agencies, private sector organizations, etc. This work was continued during WASH Fiscal Year 1986 as Activity #204, and will continue in FY 1987 as Activity #309.

ACT #149 March 1985: Completed Jordan

Project Assessment for Operations and Maintenance-S&T/H Many water supply and sanitation projects in developing countries have failed due to inadequate provisions for operating and maintaining the system after construction or installation. This Activity developed guidelines that will enable project designers and managers to assess the merit of the operations and maintenance component of projects prior to and during the project planning cycle. See Activity #223 and WASH Technical Report No. 35.

ACT #150 February 1985: Completed Jordan

Benin: Rural Water Project Redesign The Benin Rural Water Supply Project, which had been suspended in 1981, was re-authorized in October 1984 and required revision in view of the delay. The WASH consultant provided water supply and sanitation inputs to the project re-design.

ACT #151 March 1985: Completed Rosensweig

Sri Lanka: Project Pre-Implementation Workshop USAID/Sri Lanka requested WASH assistance during the start-up of a new water supply and sanitation (WS&S) project. WASH consultants planned and conducted a pre-implementation workshop for key contractor, AID and government staff who are involved in the new WS&S project. The workshop emphasized team-building and approaches to problem solving. See WASH Field Report No. 151.

ACT #152 January 1985: Completed Rosensweig

Planning for Community Water Supply in Developing Countries-S&T/H WASH was requested by the Office of Health to plan and conduct a workshop in conjunction with the American Water Works Association (AWWA) conference for U.S. consulting engineers and consultants who are interested in learning more about current practices and approaches in the water sector of the developing countries. The workshop was held June 28-29, 1985 in Arlington, Virginia, with fifty-six participants. See WASH Field Report No. 155.

ACT #153 April 1985: Completed Isely

Tunisia: Design Team for Rural Potable Water Project Cancelled by Mission.

ACT #154 March 1985: Completed Jordan

Reducing Water Losses in Small Urban and Rural Water Systems-S&T/H Water losses in water supply systems is a continuing problem. The purpose of this Activity was to develop guidelines that will assist managers of small urban and rural water systems to establish priorities for measures aimed at reducing water losses.

ACT #155 January 1985: Completed Beverly

WASH Staff Conference Participation-S&T/H This is a basic communications Activity of the WASH professional staff. WASH staff attends selected conferences, seminars and briefings as presenters or participants in order to foster understanding, collaboration and information exchange in the water supply and sanitation sector for AID and WASH. This Activity was continued in WASH Fiscal Year 1986 as Activity #205, and will be continued in FY 1987 as Activity #310.

ACT #156 April 1985: Completed Hafner

Central African Republic: Water Decade Planning This Activity is a continuation of work begun under OTD #106 above and documented in WASH Field Reports Nos. 53, 72, 97, 137, and 158. The scope of work consisted of assisting the CAR Government agencies to prepare a water supply and sanitation sectoral plan and proposals for an international donors meeting.

ACT #157 April 1985: Completed Beverly

Evaluation of WASH Information Services-S&T/H The purpose of this Activity was to review and assess the appropriateness, effectiveness, and costs of information products and services provided by WASH to serve as a basis for improving WASH information center operations. The consultants interviewed selected AID staff, WASH personnel, and users of WASH information, reviewed relevant records and reports, and prepared an evaluation report and recommendations for the Office of Health.

ACT #158 June 1985: Completed Jordan

Egypt: Assessment of Operations and Maintenance Training of Basic Village Services This Activity was a follow-up field visit on the training received by Egyptian engineers in the U.S. under RM #108 above. The work included determining usage of operations and maintenance techniques learned at the U.S. workshop, and assessing current and future O&M improvement strategies for the new USAID decentralization program. See WASH Field Report No. 152.

ACT #159 May 1985: Completed Jordan

Oman: Water Distribution System Computer Model

This Activity is an extension of work done under Activity #132 above. The work included four tasks: 1) collecting data on the water supply system of the capital area of Oman, 2) developing a computer program to analyze the existing system and project future needs, 3) providing planning, design and operation information, and 4) training MEW personnel to use the program.

ACT #160 July 1985: Completed Isely

Thailand: Assessment of Current Status of Rural Water Supply and Sanitation Project

USAID/Thailand requested WASH assistance for the Ministry of Health on possible future courses of action. The work consisted of assessing the current status of rural water supply and sanitation programs managed by the Ministry of Public Health; reviewing similar projects by other agencies; assisting the Ministry in formulating its next five year WS&S program; and advising on program coordination with other agencies and AID. See WASH Field Report No. 153.

ACT #161 May 1985: Completed Hafner

Zaire: SANRU II (Rural Health) Project Paper

USAID/Zaire requested WASH assistance to provide technical inputs to the SANRU II (Rural Health) Project Paper. The work consisted of preparing cost estimates for well drilling equipment and reviewing plans for other water technologies— spring capping, gravity flow systems, etc.

ACT #162 May 1985: Completed Hafner

Sierra Leone: CARE Water Program Evaluation Design

CARE/Sierra Leone requested WASH, through the USAID Mission, to assist in developing an evaluation plan for its water and sanitation program. The work included three tasks: 1) to assist CARE and the Ministry of Energy and Power in designing a water program evaluation and developing program indicators and goals; 2) to train U.S. and local staff in evaluation methods; and 3) to make recommendations on a health education and community based maintenance system. See WASH Field Report No. 156.

ACT #163 June 1985: Completed Isely

Nepal: Assessment of Save the Children Rural Water Supply Systems and Training Field Staff

The on-going water supply project of the Save the Children Foundation (SCF) has been having technical problems which led USAID/Kathmandu to request WASH assistance. The basic task was to assess the design, construction, maintenance, cost-effectiveness, and long-term viability of the gravity systems constructed by Save the Children. The consultants' report will be

the basis for training-of-trainers, and training of SCF construction and maintenance personnel. See WASH Activity #226 and Field Report No. 157.

ACT #164 June 1985: Completed Isely

Philippines: Review Baranguay Water Supply Project

USAID/Philippines requested WASH assistance to assess the feasibility and mode of continuing its Baranguay rural water program. The scope of work was divided into three phases: Phase I: assess feasibility of continuing project. Phase II: design continuation project if recommended or design close-out strategy. Phase III: finalize design as necessary.

ACT #165 July 1985: Completed Isely

Haiti: Design of Evaluation for CARE Community Water Supply Project

USAID/Haiti requested WASH assistance in designing an evaluation plan for CARE's on-going water supply project that would specifically include indicators of change of health status. The work consisted of designing a realistic scheme for evaluating health and related behavioral outcomes for presentation and review with CARE staff, assisting in developing baseline indicators, and suggesting appropriate project changes to enhance project impact on health status and health related behavior. See WASH Field Report No. 154.

ACT #166 July 1985: Completed Warner

Investigation of Willingness to Pay for Water Supply-S&T/H

The shortage of resources to finance water supply systems has placed renewed emphasis on suitable methods of cost-recovery. The Office of Health asked WASH to investigate the determinates of willingness to pay for water. The scope of work included identifying the factors which determine the willingness to pay for water by householders, including their sensitivity; developing guidelines based on these factors for use by planners; and locating projects where the guidelines could be tested. See WASH Field Report No. 213.

ACT #167 July 1985: Completed Roark

Burkina Faso: Emergency Dam and Spillway Project

This Activity was a follow-on to Activity 14 above which included a survey of Dam No. 2 near Ouagadougou (see WASH Field Report No. 144). The AID Mission requested WASH assistance to support rehabilitation of the dam. This work involved reviewing emergency repair plans, assisting in refining the repair proposal, and assisting the Government of Burkina Faso and USAID in reviewing final design and construction plans, approval of construction bids, and construction supervision. The dam was completed in July 1986, and was inaugurated as the Martin Luther King, Jr. Memorial Dam on August 5, 1986. See WASH Field Report No. 192.

ACT #168 August 1985: Completed Rosensweig

Bolivia: Evaluation of CARE Potable Water Project USAID/Bolivia requested WASH assistance in evaluating the CARE Potable Water/Irrigation Project. The work consisted of designing and conducting the final evaluation of the technical, institutional and social aspects of the project, as well as assessing the operational strategy used in the project. See WASH Field Report No. 162.

ACT #169 August 1985: Completed Rosensweig

Swaziland: Manpower Development Strategy Cancelled by Mission.

ACT #170 July 1985: Completed Hafner

Swaziland: National Decade Planning The Government of Swaziland has established a National Action Group in support of the UN International Drinking Water Supply and Sanitation Decade and requested the USAID Mission to supply technical assistance in planning for the Decade. The first phase of work included reviewing the status of water supply and sanitation projects and of the national planning process, outlining a process for developing water decade objectives, and assisting the National Action Committee in determining objectives and steps necessary to achieve them.

ACT #171 August 1985: Completed Isely

Burkina Faso: Preparation of Field Handbook on Community Participation in Health Education Cancelled by Mission.

ACT #172 June 1985: Completed Jordan

Dominican Republic: Rural Water Supply and Sanitation Project Evaluation USAID/Dominican Republic requested WASH technical assistance in planning the evaluation of the Health Sector II Project. The task included reviewing, modifying, and simplifying the evaluation plan, and assisting USAID, SEPAS (the Secretariat of Health) and a local firm in collecting and analyzing evaluation data. See WASH Field Report No. 166.

ACT #173 August 1985: Completed Beverly

Prepare WASH Progress Report No. 9-S&T/H Periodic Progress Reports distributed to AID and others involved in water supply and sanitation in developing countries are a primary means of informing others of WASH accomplishments in specific subject areas and countries. The summaries of work done by WASH are also useful for identifying WASH-type tasks and defining proposed scopes of work. This task involved reviewing the scope, content and design of the Progress Report with WASH staff and the Office of Health, and writing, editing, printing, and distributing

the report. The Progress Report also included an updated WASH Publications List cross-referenced by country, subject, Activity Number and author.

ACT #174 August 1985: Completed Jordan

Zaire: Village Based Maintenance System for Shaba Refugee Water Supply Project USAID/Zaire requested WASH technical services to design a maintenance system for the water supply systems in refugee/returnee communities. The work included the review of project documents, performance of a technical needs assessment, development of a maintenance system design, and preparation of a training needs assessment and of an initial training plan. See WASH Field Report No. 170.

ACT #175 August 1985: Completed St. Michel

Yemen: Sana'a Basin Water Resources Project USAID/Yemen requested WASH services in recognition of the severity of the water resources situation in the Sana'a basin. The objectives of this Activity were to provide a better understanding of the water resources situation, identify critical issues which must be resolved and present viable options for projects and/or programs related to these issues, present recommended interventions, and review previous planning efforts and ongoing sector projects. Several important constraints to effective planning and management were identified and considered in developing recommended interventions. See WASH Field Report No. 164.

ACT #176 August 1985: Completed Hafner

Togo: Training in Rainwater Harvesting USAID/Togo desired to expand the scope of its Rural Water Supply Project and requested WASH assistance in the use of rainwater harvesting techniques. The WASH consultant reviewed the WASH rainwater harvesting training guide, modified it in Togo as appropriate, conducted two two-week training sessions with Togolese co-trainers, and evaluated the training program and the trainers' performance. See WASH Field Report No. 172 in two volumes.

ACT #177 August 1985: Completed Warner

Technical Assistance to Drought Stricken African Countries-OFDA This Activity extends the work done under Activity 147. A member of the WASH Operations Center Staff provided technical advisory services to the Office of Foreign Disaster Assistance primarily in the development of a water and sanitation strategy for dealing with the African drought. He will also serve as liaison between OFDA and WASH.

ACT #178 September 1985: Completed Rosensweig

Bolivia: Rainwater Catchment Development This work is a follow-on to Activity RM #104 above which

recommended development of rainwater catchments (See WASH Field Report No. 140). This activity was conducted in two phases. In the first phase a scope of work was prepared for WASH to assist a local PVO (FIDES) in planning and implementing rainwater catchment systems, including training. The second phase executed the scope of work. See WASH Field Report No. 163. Spanish only.

ACT #179 September 1985: Completed Rosensweig

Togo: Training of Trainers USAID/Togo requested WASH assistance in furthering the training skills of the social/sanitation agents working in the Rural Water Supply Project. The WASH consultants 1) upgraded skills of project and non-project trainers in designing and conducting training-of-trainers workshops (TOT); 2) reviewed and modified existing project TOT materials; and 3) conducted two one-week TOT workshops. See WASH Field Report No. 168 in two volumes. Also available in French.

ACT #180 September 1985: Completed Yacoob

Water Supply Development as a Stimulus to Primary Health Care-S&T/H While potable water supply projects have a direct effect on health, other impacts may be as important. For example, if water supply projects are based on a community participation approach, they may also affect other health outcomes by stimulating the local population to make better use of other primary health care services, such as immunizations for tetanus, measles and diphtheria. The purpose of this Activity was to develop and apply a methodology for determining whether or not water supply projects based on community participation can have a positive effect on the use of other primary health care interventions such as immunizations. See WASH Technical Report No. 41.

ACT #181 September 1985: Completed Jordan

Lesotho: Rural Sanitation Project—Financial/Economic Analysis The Ministry of Health requested USAID/Lesotho to supply planning assistance for the Rural Sanitation Project. The WASH consultant reviewed and analyzed financial and economic information to prepare recommendations for national policy on low cost sanitation in rural areas. He also considered possible financial and resource commitments of the Government, donors and the private sector to subsidization programs. See WASH Field Report No. 167.

ACT #182 September 1985: Completed Jordan

Oman: Assist in Preparation of Water Resources Project Paper As an extension of Activity 132 above, USAID/Oman and the Omani-Joint Commission requested WASH assistance in preparing a Project Paper for the Water Resources Development Project.

WASH provided technical support for the water/wastewater engineering, institutional development and economic components of the paper.

ACT #183 September 1985: Completed Beverly

WASH Audio-Visual Briefing Package-S&T/H This Activity did not progress beyond a preliminary design stage and is under further development by the Office of Health.

ACT #184 September 1985: Completed Beverly

Prepare WASH Communication Strategy Document-S&T/H This Activity did not progress beyond a preliminary design stage. It is being developed further under Activity #266—Social Marketing Applied to Water Supply and Sanitation.

ACT #185 September 1985: On-going Turner

Distribution of Water by Vending-S&T/H Water vending is a common method of water supply and distribution in many developing countries yet has received very little formal study and evaluation. The purpose of this Activity was to: 1) design, test and apply an evaluation survey to existing water vending systems in urban and village settings; and 2) develop guidelines for governments to improve water quality and quantity at low costs to users. See WASH Technical Report No. 45 (draft).

ACT #186 September 1985: Completed St. Michel

Advisory Panel on AID Strategies for Water and Sanitation in the Child Survival Program-S&T/H This Activity provided inputs for revision of the AID water supply and sanitation strategy. The Advisory Panel reviewed relevant literature and formulated and discussed strategic options for supporting child survival efforts with appropriate water and sanitation interventions.

ACT #187 September 1985: Completed Rosensweig

Zaire: SANRU (Rural Health) Training Plan USAID/Zaire requested WASH assistance for the Rural Water Supply and Sanitation Project. The WASH consultant designed a national training strategy for rural water supply and sanitation for the SANRU Project. He also developed a plan for WASH to assist in implementing the strategy. See WASH Field Report No. 160.

ACT #188 September 1985: Completed Warner

Kenya/RHUDO: Review of Alternatives to Conventional Sewerage for Small Towns The USAID Regional Housing Office in Kenya and the National Housing Corporation of Kenya requested WASH assistance. WASH developed comparative costs of alternative methods for handling sewerage for facilities being constructed under the Kenya Small Towns Shelter Project.

ACT #189 September 1985: On-going Jordan

Botswana: Comparison of Energy Sources for Water Pumping USAID/Botswana requested WASH assistance in evaluating water lifting/pumping technologies being tested as part of the BRET Project (Botswana Renewable Energy Technology). WASH will design and implement a comparative test program for the techno-economic evaluation of alternative energy sources for water pumping—wind, solar and diesel.

ACT #201 October 1985: Completed Hafner

Africa Bureau: WASH Initiatives This was a coordinating Activity to develop and reinforce existing contacts between WASH and the Africa Bureau and Missions, to develop new contacts between WASH and the Africa Bureau and Missions, and to target high priority Missions where WASH has not provided assistance. This Activity will be continued in FY 1987 as Activity #305.

ACT #202 October 1985: Completed Rosensweig

Asia/Near East Bureau: WASH Initiatives This was a coordinating Activity to develop and reinforce existing contacts between WASH and the Asia/Near East Bureau and Missions, to develop new contacts between WASH and the Asia/Near East Bureau and Missions, and to target high priority Missions where WASH has not provided assistance. This Activity will be continued in FY 1987 as Activity #306.

ACT #203 October 1985: Completed Turner

LAC Bureau: WASH Initiatives This was a coordinating Activity to develop and reinforce existing contacts between WASH and the LAC Bureau and Missions to develop new contacts between WASH and the LAC Bureau and Missions, and to target high priority Missions where WASH has not provided assistance. This Activity will be continued in FY 1987 as Activity #307.

ACT #204 October 1985: Completed Beverly

Collaboration with Non-AID Water Supply and Sanitation Related Organizations in US & Overseas-S&T/H This was a basic activity required by the WASH II contract to supply coordination and information services to interface with the U.N. and bilateral donor systems. The task included establishing and maintaining working relationships, collaborative efforts and information exchange with non-AID organizations in the water supply and sanitation sector, private voluntary organizations, multi-lateral and bilateral organizations, international organizations, LDC agencies, private sector organizations, etc. This work will be continued in FY 1987 as Activity #309.

ACT #205 October 1985: Completed Beverly

WASH Staff Conference Participation-S&T/H This was a basic communications Activity of the WASH professional staff. WASH staff attended selected conferences, seminars and briefings as presenters or participants in order to foster understanding, collaboration and information exchange in the water supply and sanitation sector for AID and WASH. This work will be continued in FY 1987 as Activity #310.

ACT #206 October 1985: Completed Rosensweig

Development of Water Supply and Sanitation Management Training Course-S&T/H This Activity, requested by the Office of Health, was to develop a 4-5 week course for improving the management skills of mid-and upper level managers, and strengthen water and sanitation institutions through management development. The focus of the activity was changed and was completed under Activities 253 and 345.

ACT #207 October 1985: Completed Hafner

Sudan: Training-of-Trainers/Sanitation Workshop USAID/Sudan requested WASH assistance to design and implement a two week training-of-trainers workshop on latrine construction in the Sudan using WASH Technical Report #25, "A Workshop Guide for Latrine Construction: A Training Guide." See WASH Field Report Nos. 173 and 180.

ACT #208 October 1985: On-going Roark

Domestic Water Supply and Sanitation in Irrigation Projects-S&T/H The Office of Health requested that WASH review literature, interview key AID, World Bank, and WHO personnel, and prepare a report on the current state-of-the-art in this subject. WASH will prepare a manual on designing irrigation projects to optimize use of water for household and sanitation purposes.

ACT #209 October 1985: Completed Hafner

Malawi: Training-of-Trainers for Health Education USAID/Malawi requested WASH assistance to design and implement two training-of-trainers workshops in community motivation and health education for staff of the Ministries of Health and Work. See WASH Field Report Nos. 174 and 185.

ACT #210 October 1985: Completed Jordan

Honduras: Water Supply and Sanitation Project Evaluation USAID/Honduras requested WASH to assist the mission and PRASAR (the governmental unit created to manage the project) to evaluate the engineering, project administration, financing and health education aspects of the on-going rural water supply

and sanitation project. See WASH Field Report No. 169, available only in Spanish. A summary version of the report (FR 169-s) is available in English.

ACT #211 November 1985: Completed Jordan

Papua New Guinea: Evaluation of Rural Water Supply and Sanitation Project WASH was requested to assist USAID/Fiji and the Government of Papua New Guinea to evaluate the effectiveness of the ADB I (Asian Development Bank) water project and assist with the design of the new ADB II project water component. Specific attention was given to project administration, financing and community participation in water system operations and maintenance. See WASH Field Report No. 182.

ACT #212 November 1985: Completed Roark

Brazil: Disaster Mitigation Assessment-OFDA The Office of Foreign Disaster Assistance requested a WASH hydrogeologist to participate in a team that reviewed the drought and flood situation in six areas of Brazil, assessed disaster response efforts, and made recommendations for future disaster and ground-water control operations.

ACT #213 November 1985: Completed Jordan

Solomon Islands: Rural Water Supply and Sanitation Project Planning Assistance USAID/Fiji requested WASH assistance in the Solomon Islands. WASH assisted in planning community participation, rural water supply and sanitation system maintenance and information systems, and in identifying types of training programs needed. See WASH Field Report No. 179.

ACT #214 December 1985: Completed Yacoub

Managing Childhood Defecation in Developing Countries-S&T/H The Office of Health requested WASH to conduct a two-phase study on the management of childhood defecation. The first phase of the Activity was intended to design a survey and protocol to determine attitudes and practices concerning childhood defecation in developing countries. The second phase implemented the survey and developed and tested appropriate defecation management interventions in the field.

ACT #215 December 1985: Completed Turner

Tunisia: Regional Housing and Development Office Sanitation Upgrading Project Review ONAS, the National Sewerage Authority of Tunisia, prepared a \$32 million upgrading project for which the Regional Housing Office requested WASH assistance to review. The WASH consultant reviewed the plans and monitored construction progress in the field.

ACT #216 December 1985: Completed Rosensweig

Swaziland: Workshop on Community Participation USAID/Swaziland requested that WASH design and implement a workshop on community participation for 25 people from the Ministry of Health and the Rural Water Supply Board in January 1986. See WASH Field Report No. 176.

ACT #217 November 1985: Completed Warner

Liberia: Water Supply for Cuttington University College USAID/Liberia requested WASH to review the wells and water system of the college in relation to future supply and demand, make recommendations for improving operations and equipment and developing new water sources if needed.

ACT #218 December 1985: On-going Jordan

Privatization and Operations and Maintenance-S&T/H The Office of Health requested that WASH explore relationships and opportunities in the private sector for operations and maintenance. The WASH team completed Phase I of this activity and made one field trip to the Dominican Republic to test their initial conclusions. A second field trip will be made in late 1987. See WASH Technical Report No. 39.

ACT #219 December 1985: Completed Hafner

Zaire: National Rural Water and Sanitation Planning USAID/Zaire requested that WASH assist the Zairean design team in determining data requirements, identifying analytic variables, developing a planning model applicable to Zaire, and implementing the planning process to produce a national rural water and sanitation plan. See WASH Field Report Nos. 171 and 184. Also available in French.

ACT #220 October 1985: On-going Roark

OFDA Liaison: Emergency Disaster Assistance-OFDA This is a continuing Activity to assist the Office of Foreign Disaster Assistance in evaluating emergency requests related to water supply and sanitation and in locating appropriate personnel, equipment, and commodities for use in disaster situations.

ACT #221 January 1986: Completed Rosensweig

Zaire: Training-of-Trainers-Workshop I USAID/Zaire requested training assistance from WASH for the SANRU II Project (Rural Water Supply and Sanitation). WASH designed and delivered a two week training-of-trainers workshop for fifteen Zairean trainers, and assisted Zaireans in curriculum development. See WASH Field Report No. 177. Also available in French. Also see Activity #245.

ACT #222 January 1986: Completed Turner

Financing Methods and Cost Recovery Strategies for Water Supply and Sanitation Programs-S&T/H The Office of Health requested that WASH conduct a literature search and interviews to serve as a basis for developing financing/cost recovery strategies and preparing guidelines for field use. This activity has been changed to ACT #380 and broadened to include both strategies for cost recovery and tariff design.

ACT #223 December 1985: Completed Jordan

Development of Additional Operations and Maintenance Assessment Guides-S&T/H This Activity for the Office of Health continued the work done under ACT #149. Operations and maintenance assessment guides have now been developed for four types of water systems found in developing countries—handpumps, surface water treatment, groundwater pumping, and gravity systems from springs. See WASH Technical Report No. 35.

ACT #224 January 1986: Completed Jordan

Zaire: Training of Community Development Workers-SHABA Water Project USAID/Zaire requested that WASH conduct a three-week community development workshop. The workshop prepared community development workers to introduce villages to the advantages and responsibilities of a new water system. See WASH Field Report No. 178.

ACT #225 January 1986: Completed Hafner

Peru: CARE Water/Sanitation Project Management Workshop USAID/Peru requested that WASH plan and conduct a workshop for CARE Latin America field staff. The workshop was conducted in Trujillo, Peru, April 3-10, on community participation, health education and the management of water supply and sanitation projects. See WASH Field Report No. 193.

ACT #226 January 1986: Completed Rosensweig

Nepal: Assistance to Save the Children Foundation Project (Phase II) This is a continuation of Activity #163. WASH designed and delivered a three week training program for 10 Save the Children Foundation staff, and 15 Rapti area overseers on village water supply design, management and training-of-trainers. The workshop was completed in May 1986. See WASH Field Report No. 190.

ACT #227 February 1986: Completed Turner

El Salvador: Assessment of Handpump Program USAID/El Salvador requested that WASH assess the feasibility of a handpump program or other water supply alternatives. The WASH consultant identified training and organizational needs of the project and

outlined a recommended water supply development program. See WASH Field Report No. 187.

ACT #228 February 1986: Completed Rosensweig

Bolivia: Operations and Maintenance Training USAID/Bolivia requested that WASH implement two workshops on operations and maintenance of rural potable water systems. The first was the design and delivery of a three week workshop on operations and maintenance for twenty-five supervisors, the second was a three week workshop on pump maintenance for the same supervisors. See WASH Field Report No. 194 on the Operations and Maintenance Workshop and Field Report No. 195 on the pump maintenance workshop. See Activity #260 for two other follow-on training activities.

ACT #229 February 1986: On-going Rosensweig

Planning for Pan American Health Organization Symposium on Integrating Water Supply and Sanitation into Primary Health Care-S&T/H The Office of Health requested WASH to assist PAHO in planning the PAHO symposium on the integration of water supply and sanitation into primary health care. WASH assistance consisted of the design of working group sessions, writing a case study, furnishing a symposium presenter, and training working group leaders. The Symposium took place in Guatemala in November 1986.

ACT #230 February 1986: Completed Turner

Rwanda: Ruhengeri Water Resource Study USAID/Rwanda requested WASH assistance in assessing impacts of watershed development on Ruhengeri water supplies. The consulting team prepared a plan for orderly water supply development, and developed concepts for a quantitative computer model to simulate Ruhengeri River System conditions. See WASH Field Report No. 181.

ACT #231 February 1986: Completed Turner

Mexico: Water Supply and Technical Assistance to Juarez USAID/Mexico requested that WASH review the water supply situation in marginal areas of Juarez in support of project Verdad (PVD) and the local government. The consulting team provided assistance in locating groundwater and developed a water supply plan for the areas not served. See WASH Field Report No. 188.

ACT #232 March 1986: Completed Rosensweig

Asia/Near East Bureau Water/Wastewater Workshop The Asia/Near East Bureau requested that WASH assist the water/wastewater committee of the Bureau in the initial planning of workshops for AID mission staff.

ACT #233 March 1986: Completed Warner

Technical Assistance to Atlanta University African Water Supply and Sanitation Symposium-S&T/H WASH assisted Atlanta University in planning the Symposium on Water and Sanitation in Africa, held May 3-8, 1987 in Atlanta, Georgia. WASH personnel made presentations and acted as facilitators of the Symposium.

ACT #234 March 1986: Completed Turner

Asia/Near East Bureau Water/Wastewater Committee Technical Seminars The Asia/Near East Bureau requested WASH assistance to develop plans for seminars, select speakers, and prepare seminars for the water/wastewater committee March-June 1986.

ACT #235 March 1986: Completed Hafner

Malawi: Piped Water Project Evaluation WASH provided a team of specialists to the USAID/Malawi Rural Water Program. They reviewed the progress made in implementing the 1983 evaluation recommendations, conducted the final evaluation, and assisted in formulating plans for future water supply. See WASH Field Report No. 186.

ACT #236 February 1986: Completed Turner

Technology Transfer for Water and Sanitation Projects-S&T/H The Office of Health requested that WASH conduct a study of technology transfer for water and sanitation projects. The consultant reviewed literature, defined critical elements of the technology transfer process, and prepared a report which established the need for, and included an outline of, a technology transfer handbook.

ACT #237 March 1986: Completed Rosensweig

Sri Lanka: First Monitoring/Evaluation of Water Supply and Sanitation Project USAID/Sri Lanka requested WASH assistance in planning and conducting biannual evaluations of the Water Supply and Sanitation Sector Project. The WASH team assessed the current status of the water supply and sanitation project, particularly in the management/commercial area, and planned and conducted a workshop for contractor government and AID mission staff to discuss problems, issues and possible solutions.

ACT #238 March 1986: Completed Rosensweig

Burkina Faso: Preparation of Scope of Work for Evaluation of Rural Water Supply and Sanitation Project USAID/Burkina Faso requested WASH to assist the mission in drafting an evaluation outline and terms of reference for the health component of the USAID-funded Rural Water Supply project.

ACT #239 March 1986: On-going Campbell

Sri Lanka: Provision of Information Services to the National Water Supply and Drainage Board USAID/Sri Lanka requested that WASH purchase and deliver selected information materials to strengthen the information base of the National Water Supply and Drainage Board (NWSDB). WASH will also provide relevant current awareness bulletins of recent literature and information on topics selected by the NWSDB.

ACT #240 April 1986: On-going Turner

Cost Management: Comparative Performance in Water Supply and Sanitation Systems-S&T/H The Office of Health requested that WASH review the literature and current practice and develop performance indicators applicable to a variety of water supply and sanitation systems. The consultant will review appropriateness of indicators with donor agency personnel, synthesize standards and develop procedures for implementing performance assessment.

ACT #241 May 1986: On-going St. Michel

Jordan: Program Review of Groundwater Monitoring USAID/Jordan requested that WASH review the proposed groundwater monitoring program for the Aqaba wastewater treatment facility and assist in further development of the program including training in monitoring procedures and procurement.

ACT #242 April 1986: Completed Jordan

Honduras: Evaluation of Development Project for the Bay Islands USAID/Honduras requested that WASH assist the Pan-American Development Fund in an end-of-project evaluation of the integrated development project for the Bay Islands. WASH provided a water systems engineer as part of the two-person evaluation team.

ACT #243 June 1986: Completed Rosensweig

Burkina Faso: Final Evaluation of Rural Water Supply Project USAID/Burkina Faso requested that WASH assist the mission in evaluating a rural water supply project for 550 villages and formulating recommendations for future projects. WASH provided two consultants for the six person evaluation team. See WASH Field Report No. 191.

ACT #244 May 1986: Completed Roark

Uganda: Emergency Water Supply Assessment-OFDA USAID/Uganda and the Office of Foreign Disaster Assistance requested WASH to assess the current rural water supply situation and the need for rehabilitation and for other water sources. The consultants ascertained interests and capabilities of private voluntary organizations, UNICEF, and the govern-

ment to undertake water sector rehabilitation, and prepared appropriate recommendations.

ACT #245 July 1986: Completed Rosensweig

Zaire: Training of Trainers Workshop II This Activity is a continuation of Activity #221 above. WASH designed and delivered a two-week intermediate training-of-trainers (TOT) workshop for 15 trainers. See WASH Field Report No. 198.

ACT #246 June 1986: Completed Jordan

Sri Lanka: Operations and Maintenance Efficiency Assessments This Activity is part of the on-going WASH program for USAID/Sri Lanka. The assessment of the operations and maintenance capabilities and performance of the National Water Supply and Drainage Board focused on the efficiency and effectiveness of plant and workshop staff. The WASH team recommended criteria for establishing staff size for the different types of water supply systems found in Sri Lanka.

ACT #247 June 1986: Completed Jordan

Oman: Capital Region Septage Study The Oman Ministry of Environment and Water Resources, through the Joint Omani-American Commission, requested that WASH determine the feasibility of replacing the proposed septage treatment plant with lagoon-type treatment.

ACT #248 June 1986: Completed Jordan

Oman: Preparation of Revised Feasibility Study of Water Supply Sector USAID/Oman requested further assistance on water supply planning from WASH. Since less funding will be available for construction, the Ministry of Electricity and Water asked WASH to modify the scope, scale and content of proposed projects in line with new funding levels.

ACT #249 June 1986: Completed Campbell

Zaire: Design of Information Systems for SANRU II and Societe Nationale D'Hydraulique Rural USAID/Zaire requested that WASH determine the information requirements of the SANRU II Project (Rural Water Supply and Sanitation), of the Societe Nationale D'Hydraulique Rural, and of the Ministry of Health. The WASH consultant assisted in designing appropriate information systems and training programs for the respective organizations. See WASH Field Report No. 199.

ACT #250 June 1986: Completed Rosensweig

Philippines: Project Paper for Rural Water Supply and Sanitation Project USAID/Philippines requested WASH to assist the mission in preparing a project pa-

per for a rural water supply and sanitation project. The project will serve 370,000 people in 168 rural communities and attempt to correct institutional problems of the Barangay Water Project Phase II. The assignment was carried out in July 1986.

ACT #251 July 1986: Completed Rosensweig

Nepal: Project Start-up Workshop for Irrigation Management Project USAID/Nepal requested that WASH assist in the start-up phase of an irrigation management project. The WASH consultant designed and facilitated a four-day workshop using the WASH team planning model and related techniques. The workshop took place in September 1986. See WASH Field Report No. 196.

ACT #252 July 1986: Completed Beverly

Solomon Islands: Hurricane Disaster Assistance-OFDA USAID/Fiji and the Office of Foreign Disaster Assistance requested WASH technical support following Cyclone Namu. The WASH consultant assessed the extent of cyclone damage to water supply systems, reviewed proposed housing rehabilitation programs for adequacy of water supply, and made appropriate recommendations.

ACT #253 July 1986: On-going Rosensweig

Sri Lanka: National Water Supply and Drainage Board Management Training Program USAID/Sri Lanka requested that WASH design and deliver a three phase management training program for the top management of the National Water Supply and Drainage Board. The program concentrated on actual work-place needs of managers and included (but was not limited to) such areas as delegation skills, collaborative work planning, meeting effectiveness, employee accountability, time management, monitoring work plans, setting priorities, and decision-making.

ACT #254 August 1986: Completed Warner

Uganda: Emergency Water Supply Projects-OFDA USAID/Uganda and the Office of Foreign Disaster Assistance requested WASH assistance in preparing required documentation for rural and urban water supply rehabilitation. This work included developing contractual arrangements with private voluntary organizations, in monitoring implementation start-up, and advising on modalities for follow-up monitoring.

ACT #255 August 1986: Completed Warner

Jordan: Regional Conference on Wastewater Reuse USAID/Jordan requested WASH assistance in a regional conference on wastewater reuse. WASH provided an expert to participate in the conference who provided relevant information on wastewater applications to agriculture as practiced in Arizona and California.

ACT #256 August 1986: Completed Jordan

Yemen: Evaluation of Small Rural Water Systems

Project USAID/Yemen requested WASH assistance in the evaluation of the Small Rural Wastewater Systems Project. The WASH team evaluated the project and recommended appropriate future actions for the project. See WASH Field Report No. 197.

ACT #257 September 1986: Completed Hafner

Malawi: Engineering Assessment of Gravity Water Supply Systems

WASH assisted the Government of Malawi's Water Department of the Ministry of Works and Supplies in determining the potential for future rural piped gravity water supply systems. Nineteen catchment areas were identified as possible sites. The consultant reviewed available information, assisted in the formulation of procedures for preliminary engineering assessment of systems, carried out one or two assessments to train government staff, and returned later to review assessments conducted by government personnel.

ACT #258 September 1986: On-going Roark

Drilled Water Well Rehabilitation Guidelines-

S&T/H The Office of Health requested WASH to produce a set of guidelines for procedures for the rehabilitation of drilled wells. The work consists of a literature review, including data from a UNICEF project in Uganda, analysis of existing approaches, estimation of rehabilitation costs and schedules vs. new well construction, and preparation of the guidelines.

ACT #259 September 1986: On-going Roark

Water Well Drilling Rig Selection Guidelines-

S&T/H The Office of Health requested that WASH develop a set of guidelines for selecting drilling rigs and related equipment for construction of village water wells. The task consists of a literature review, contacting manufacturers, establishing appropriate specifications, and preparing the guidelines.

ACT #260 October 1986: Completed Rosensweig

Bolivia: Operations and Maintenance Training: II

This task is a continuation of work done under Activity #228. It consisted of development of a three-week community operator training course, design and delivery of a training-of-trainers workshop for 15 rural water supply technicians who received the earlier training, and pilot testing and revision of the Community operator course, which will be used by Bolivians to train at least 125 operators. See WASH Field Report Nos. 202 and 204.

ACT #261 September 1986: Completed Beverly

Prepare WASH Progress Report No.10-S&T/H This edition of the WASH Progress Report updated No. 9

and included summaries of the 70 activities initiated by WASH in FY 1986. The WASH Progress Reports distributed to AID and others involved in water supply and sanitation in developing countries are a primary means of informing others of WASH accomplishments in specific subject areas and countries. The summaries of work done by WASH are also useful for identifying WASH-type tasks and defining proposed scopes of work. Progress Reports also update the WASH Publications List which is cross-referenced by subject, country, Activity Number and author. This task involved reviewing the scope, content and design of the Progress Report with WASH staff and the Office of Health, and writing, editing, printing, and distributing the report.

ACT #262 September 1986: Completed Turner

Latin America: Evaluation of Catholic Relief Services/AID Matching Grant-FVA/PVC

The Office of Private and Voluntary Cooperation of the Bureau for Food for Peace and Voluntary Assistance (FVA/PVC) requested that WASH assist in the evaluation of its matching grant to the Catholic Relief Services (CRS). WASH provided two teams, each having an engineer and a community participation specialist, to assess the quality of the CRS water supply projects. Technical, social and organizational aspects were assessed and successful programming thrusts were identified for possible replication elsewhere. Projects were reviewed in the Dominican Republic, Ecuador, Guatemala, Honduras, and Peru. See WASH Field Report No. 201.

ACT #263 September 1986: On-going Jordan

Handbook for Estimating Operations and Maintenance Costs for Water Supply Projects-S&T/H

WASH has completed the final draft of a manual to assist project planners estimate the recurring cost of operating and maintaining a water system prior to its construction. The manual, which will be available for distribution by December 1987, focuses on cost estimating techniques for labor, supplies, spare parts, utilities and transportation. See WASH Technical Report No. 48.

ACT #264 October 1986: Completed Warner

Djibouti: Planning Water Supply and Sanitation Upgrading in Peri-Urban Refugee Resettlement Areas

USAID/Djibouti requested WASH to investigate possible WASH technical assistance in the area of training in upgrading the water supply and sanitation infrastructure of Djibouti. Two WASH consultants visited Djibouti in October 1986 and made recommendations regarding an initial planning workshop for GROD officials followed by a series of training-related activities. See WASH Field Report No. 260.

ACT #265 November 1986: On-going Yacoub

Guidelines for Planning Water Supply and Sanitation Hygiene Education-S&T/H The Office of Health requested that WASH develop guidelines that will assist district/regional level personnel in planning and implementing hygiene education programs in water supply and sanitation. See WASH Field Report No. 218.

ACT #266 October 1986: On-going Yacoub

Social Marketing Applied to Water Supply and Sanitation Projects-S&T/H The Office of Health requested that WASH examine how social marketing techniques might be applied to water supply and sanitation projects. A number of AID health projects have been using social marketing techniques to introduce new behaviors, to change old ones, and to emphasize the continuation of on-going sound health behaviors. Since the linkage between disease and appropriate water and sanitation behavior is not widely understood or applied, this Activity will study how hygiene education and the proper use of water and sanitation facilities can be encouraged and accomplished more effectively and widely through social marketing.

ACT #267 September 1986: On-going Turner

Guidelines for Financial Management Assessment of Water Supply and Sanitation Institutions-S&T/H The Office of Health requested that WASH prepare a set of guidelines for making financial management assessments of water supply and sanitation institutions. This Activity is part of the WASH program for institutional development. It will identify the key financial management issues relevant to assessing the capability of a water supply and sanitation institution to manage the finances of water supply and sanitation projects. Assessment protocols will be developed and incorporated into a set of guidelines for future field testing.

ACT #268 September 1986: On-going Rosensweig

Development of a Model for Project Start-up Workshops-S&T/H The Office of Health requested that WASH develop a model for project start-up workshops. The purpose of this Activity is to improve the start-up efficiency and effectiveness of long-term projects by ensuring clarity of roles and responsibilities of all parties involved and developing a project start-up action plan. A guide for conducting a project start-up workshop was developed and pilot tested in Benin. See WASH Technical Report No. 41.

ACT #269 September 1986: Completed Turner

Guidelines to Improve Planning, Implementation, and Evaluation of Water Supply and Sanitation Projects-S&T/H The Office of Health requested that WASH develop guidelines to improve the planning,

implementation, and evaluation of water supply and sanitation projects. Under this activity WASH produced a paper "WASH Activities to Improve the Sustainability of Water Supply and Sanitation Projects." The paper was given at the Bi-Annual Meeting of AIDIS, the inter-American Sanitary Engineering Association, in March 1987 in Mexico City. Subsequent activities to synthesize WASH materials and products are being carried out under ACT 385.

ACT #270 September 1986: Completed Beverly

Egypt Wastewater Treatment Plant Site Visits in the District of Columbia Area: I USAID/Cairo requested that WASH arrange for wastewater treatment plant site visits in the vicinity of Washington for its technical staff. The purpose of these visits was to orient the visiting engineers on the state-of-the-art of plant designs, operations and maintenance equipment, policies, procedures and practices.

ACT #301 October 1986: Completed St. Michel

General Administration-S&T/H The Administrative operation of WASH II, as requested by the Office of Health, was carried out under this activity. It continues in FY 1988 as Activity #401.

ACT #302 October 1986: Completed St. Michel

General Technical Assistance-S&T/H This activity covered all technical management activities for WASH II as requested by the Office of Health. It continues in FY 1988 as Activity #402.

ACT #303 October 1986: Completed St. Michel

Preliminary Activity Development-S&T/H All technical support activity for WASH II, as requested by the Office of Health, was authorized under this activity. WASH staff, subcontractor staff, and consultants developed and prepared activity sheets, activity implementation plans (AIP), and scopes of work for the start-up of FY 1987 WASH activities. This work will continue in FY 1988 as Activity #403.

ACT #304 October 1986: Completed St. Michel

Provision of Information Services to AID-S&T/H Under this activity, WASH provided AID and AID-assisted organizations with relevant information on all aspects of the water supply, sanitation, and environmental health sector, WASH Project activities, and other topics as requested by AID. It also provided for the operation and maintenance of the WASH library and information center and collaboration and information exchange with the international WS&S community. This activity continues in FY 1988 as Activity #404.

ACT #305 October 1986: Completed Hafner

Africa Bureau: WASH Initiatives This was a coordinating activity to provide assistance and reinforce existing contacts (as well as develop new contacts) between WASH and the Africa Bureau and missions. Under this activity, high priority missions were targeted, where WASH had not yet provided assistance. This work continues in FY 1988 as Activity #405.

ACT #306 October 1986: Completed Rosensweig

Asia/Near East Bureau: WASH Initiatives This was a coordinating activity to provide assistance and reinforce existing contacts (as well as develop new contacts) between WASH and the ANE Bureau and missions. Under this activity, high priority missions were targeted, where WASH had not yet provided assistance. This work continues in FY 1988 as Activity #406.

ACT #307 October 1986: Completed Turner

LAC Bureau: WASH Initiatives This is a coordinating activity to provide assistance and reinforce existing contacts (as well as develop new contacts) between WASH and the LAC Bureau and missions. Under this activity, high priority missions were targeted, where WASH had not yet provided assistance. This work continues in FY 1988 as Activity #407.

ACT #308 October 1986: Completed Warner

WASH Liaison with Non-regional AID Bureaus WASH will continue to develop and reinforce contacts with AID bureaus such as PPC, PRE, and FVA/PVC to keep them informed of WASH operations, to foster WASH involvement at early stages of bureau project development, and to assist in formulating requests for WASH assistance. This work will continue in FY 1988 as Activity #408.

ACT #309 October 1986: Completed Campbell

Collaboration with Non-AID WS&S-Related Organizations in the U.S. and Overseas-S&T/H This was a basic activity required by S&T/H to supply coordination and information services to interface with the U.N. and bilateral donor systems. This work will continue in FY 1988 as Activity #409.

ACT #310 October 1986: Completed St. Michel

WASH Staff Conference Participation-S&T/H This activity represents a basic communications function of the WASH professional staff. Under this activity, WASH staff attended selected conferences, seminars, and briefings as presenters or participants to foster understanding, collaboration, and information exchange in the WS&S sector for AID and WASH. This work will continue in FY 1988 as Activity #410.

ACT #311 November 1986: Completed Yacoub

Cameroon: Team Planning Meeting for Health CDSS WASH was requested by the Africa Bureau to conduct a two-day team planning meeting for two consultants going to Cameroon to prepare the country development strategy statement (CDSS). WASH Technical Report No. 32 was used as a guide.

ACT #312 December 1986: On-going Roark

Cost Effectiveness of WS&S Interventions-S&T/H The Office of Health requested WASH to compare WS&S with other health interventions. It was found that WS&S provides many benefits beyond reductions in morbidity or mortality and comparisons with ORT or immunization programs are sometimes misleading. WS&S is a long-term investment in preventive health and the costs are not high when all potential benefits are included in the assessment. See WASH Technical Report No. 43.

ACT #313 November 1986: On-going St. Michel

ANE: Orientation Visits to U.S. WS&S Facilities and Organizations The purpose of this activity was to arrange meetings and site visits to U.S. water supply and sanitation facilities for personnel from Asia and the Near East. The visits were intended to provide information on current O&M practices and administrative procedures at these facilities.

ACT #314 November 1986: Completed Hafner

Peace Corps: Program Design Assistance WASH assisted the Office of Training and Program Support (OTAPS) of the Peace Corps to strengthen WS&S program guidelines and develop a strategy for improving the programming skills of field staff in designing WS&S projects.

ACT #315 November 1986: On-going Hafner

Africa: World Vision Staff Workshop on WS&S WASH is providing technical assistance to World Vision to improve its capabilities in WS&S program planning and management.

ACT #316 December 1986: On-going Roark

Pump Selection: A Field Guide for Developing Countries-S&T/H At the request of the Office of Health, WASH is preparing a Pump Selection Manual designed to provide a step-by-step analysis of pumping advantages and disadvantages. Four energy sources are being considered—solar, wind, diesel, and hand power. The manual is designed for field technicians to choose water pumping systems based on local water needs, site characteristics, local resources, comparative cost, and local operation and maintenance constraints.

ACT #317 January 1987: Completed Hafner

Togo Water Film WASH provided a technical production assistant to a film maker and USAID/Togo in planning and producing a film on the USAID-supported Rural Water Project in Togo. See WASH Field Report No. 212.

ACT #318 January 1987: Completed Roark

Somalia: Kismayo Water Supply USAID/Somalia requested that WASH review the Kismayo water supply system and make recommendations regarding its adequacy and technical alternatives. Preliminary designs were developed which build upon the existing system and minimize sophisticated operation and maintenance procedures. See WASH Field Report No. 211.

ACT #319 December 1986: Completed Hafner

Kenya: World Vision Planning Workshop WASH provided a facilitator to design and implement two World Vision planning workshops in the Maasai and Kara Poket regions of Kenya.

ACT #320 January 1987: Completed Rosensweig

Djibouti: Urban Sanitation Workshop WASH designed and implemented a workshop for agencies of the Government of Djibouti (GROD). The workshop, which took place in February 1987, was to assist the agencies in defining issues of urban sanitation at the household level and in identifying possible solutions.

ACT #321 January 1987: On-going Hafner

Rainwater Harvesting Technology-S&T/H WASH has established a rainwater information network to increase awareness of rainwater roof catchment technology and to promote it as a viable component of rural water supply projects.

ACT #322 January 1987: Completed Jordan

Papua New Guinea: Project Planning Assistance Under an earlier activity, a WASH team evaluated the water supply and sanitation component of the Asia Development Bank I Project and reported some deficiencies. Under this activity, WASH consultants assisted the Department of Health of the Government of Papua New Guinea in developing an action plan to address these deficiencies. The action plan focused on effective community development techniques particularly as they relate to village responsibilities for water system maintenance. See WASH Field Report No. 208.

ACT #323 January 1987: Completed Yacoub

Planning and Coordination of Continued Guinea Worm Control Activity-S&T/H WASH is to continue functioning as the coordinating and public education

organization on the subject of guinea worm. Countries suitable for the testing of methodology derived under Phase I of this work were identified.

ACT #324 January 1987: Completed Turner

Mexico: WFFHA Fifth International Congress WASH and REACH assisted the Office of Health in planning and delivering a workshop on health costs and financing. The activity included selection of panelists, preparation of a paper, and delivery of the paper at the Workshop. The Congress was held in March 1987 in Mexico City.

ACT #325 January 1987: Completed Turner

Haiti: CARE Rural Water Supply Mid-term Project Evaluation WASH provided a team of French-speaking professionals to perform a mid-term evaluation of the USAID-funded CARE Rural Water Supply Project in Haiti. The final report was delivered to the USAID mission in Haiti and the CARE office. See WASH Field Report No. 205.

ACT #326 February 1987: On-going Rosensweig

Managing Institutional Development Projects-S&T/H Based on past experience WASH is developing a practical tool to assist both headquarters and field staff in implementing institutional development projects. The first draft has been developed and will be finalized by January 1988. See WASH Technical Report No. 49 (draft).

ACT #327 February 1987: Completed Rosensweig

Egypt: Design of Local Development II Water Supply Assessment WASH designed a study to provide specific operational guidance to improve the performance of USAID-funded rural water supply projects. The WASH team recommended a 4-month assessment conducted by a joint expatriate-Egyptian team. See Activity No. 367.

ACT #328 March 1987: On-going St. Michel

Botswana: Renewable Energy Project (Extended Economic Analysis with Engineering Support) WASH performed a comparative economic analysis of pumping systems installed under the Comparative Water Pumping Project (CWPP). Financial and economic analyses of several small-scale water pumping stations were carried out. The results of these studies are being incorporated into the final reports being prepared under the CWPP. These reports will be available in December 1987.

ACT #329 February 1987: Completed Warner

Malawi: Piped Water Project Design A WASH consultant worked with a USAID team in Malawi in February and March 1987 in preparing the background documentation for a health sector grant. This grant, termed MASH (Multiple Assistance Schemes in Health), will contain provision for the continuation of USAID support to the Malawi Rural Piped Water Program.

ACT #330 March 1987: Completed Rosensweig

Benin: Project Start-up Workshop WASH designed and delivered a project start-up workshop for the Benin Rural Water Supply Project. The workshop was based on the "Facilitator Guide for Conducting a Project Start-up Workshop" (WASH Technical Report No. 41). The workshop took place in May 1987. See WASH Field Report No. 207.

ACT #331 February 1987: Completed Warner

Egypt: WS&S Inputs to Schistosomiasis PID WASH assisted the Vector Biology and Control (VBC) Project by facilitating a team planning meeting for a consultant group preparing a Project Identification Document (PID) for a schistosomiasis research control project in Egypt.

ACT #332 March 1987: On-going Rosensweig

Development of O&M Supervisors Training Guide-S&T/H WASH will revise an O&M supervisors training guide which was an end product of a workshop conducted for USAID/Bolivia (see Activity #268). The draft was translated into English from Spanish and is being revised to make it appropriate for use in other countries. A revised draft should be available in early 1988.

ACT #333 March 1987: Completed Turner

Belize: Mid-term Evaluation of CARE WS&S Project WASH provided a two-person team to do a mid-term evaluation of the CARE Village-Level Water and Sanitation Project. WASH assessed the effectiveness of this project in meeting the goal of providing increased access to safe water and sanitation. The final report was delivered to the Belize mission and CARE. See WASH Field Report No. 206.

ACT #334 March 1987: On-going Turner

LAC Bureau: Planning for Central America WS&S Programs The LAC Bureau requested that WASH determine the level of funding required from USAID and other donors and national sources to expand water supply and sanitation coverage in Central America to meet the objectives of the Central American Initiative (CAI). See WASH Field Report No. 209.

ACT #335 March 1987: On-going Hafner

Israel: Environmental Assessment in West Bank/Gaza WASH undertook an on-site environmental assessment of the effects of four proposed slaughterhouse operations in the West Bank/Gaza Strip.

ACT #336 March 1987: On-going Yacoob

Integrating WASH into UNDP Training for Women in WS&S Irrigation This activity will promote long-term substantive collaboration between WASH, UNDP, USAID, and WID offices and regional officers. See WASH Field Report No. 220.

ACT #337 March 1987: On-going Yacoob

Thailand: Hygiene Education Strategies and Techniques WASH was asked to assist the Sanitary Division of the Ministry of Public Health in developing new hygiene education approaches by reviewing existing materials and interviewing regional staff. A report was prepared which outlines specific hygiene education approaches for Region 1. See WASH Field Report No. 210.

ACT #338 March 1987: Completed Rosensweig

Somalia: TPM for Mid-term Evaluation WASH was asked to conduct a team planning meeting (TPM) for a mid-term evaluation of the Juba Valley Analytical Studies Project. The intent of the evaluation was to check on the project progress to date and to determine any necessary changes or adjustments. The TPM was conducted in March 1987.

ACT #339 March 1987: On-going Hafner

Guinea Worm Information Network-S&T/H WASH has developed and is maintaining a database of AID and non-AID projects with guinea worm control potential. The purpose is to increase the efficiency in gathering, disseminating, and coordinating this information among USAID missions and other agencies.

ACT #340 March 1987: On-going Warner

Information Support to UNEP-S&T/H WASH will provide information support to UNEP (United Nations Environment Programme) users in the area of water and sanitation. WASH will respond to information requests from UNEP through their database system (INFOTERRA) for appropriate documents or sources of information.

ACT #341 March 1987: On-going Hafner

World Vision: Ghana and Senegal Project Assessments WASH provided a two-person team to assist World Vision in a rural water project assessment in Ghana and Senegal.

ACT #342 April 1987: Completed Rosensweig

Sri Lanka: Second Monitoring Evaluation WASH assessed the current status of the Water and Sanitation Sector Project in Sri Lanka with special focus on the area of personnel management. WASH also planned and conducted an annual monitoring/evaluation workshop for the National Water Supply and Drainage Board, USAID, and contractor staff following the assessment. The assignment took place in May and June 1987.

ACT #343 May 1987: On-going Hafner

Peace Corps: Improving Water and Sanitation Programming-S&T/H WASH is assisting the Peace Corps Office of Training and Program Support (OTAPS) in improving water and sanitation programming. WASH is training OTAPS staff in the team planning meeting process, assessing Peace Corps projects, and assisting OTAPS on consultant briefings and debriefings.

ACT #344 May 1987: On-going Jordan

Lesotho: Privatization Study WASH was asked by the USAID Mission in Lesotho to assess the feasibility of privatizing the construction, operation, and maintenance of rural water supply systems. The WASH team evaluated the options and recommended a suitable course of action to USAID and the Government of Lesotho to test the feasibility of privatization. See WASH Field Report No. 215.

ACT #345 May 1987: On-going Rosensweig

Management Development Program-S&T/H WASH is developing a management development program for WS&S institutions. Guidelines for conducting the program will be available in draft form by January 1988.

ACT #346 May 1987: Completed Roark

Somalia: Drought Needs Assessment USAID/Somalia requested WASH to do a baseline study to assess the emergency drought needs in Somalia. WASH was to determine the water needs and available local water supplies, evaluate capabilities of local organizations, and recommend donor assistance programs. The WASH consultant was part of a six-person team which evaluated various drought problems.

ACT #347 May 1987: On-going Hafner

Swaziland: Water Evaluation Design A WASH evaluation consultant/water specialist assisted the Rural Water Supply Board in developing an on-going evaluation/assessment system as a basis for improving water supply and sanitation sector activities.

ACT #348 May 1987: On-going Jordan

O&M Costs for Water Supply Projects-S&T/H WASH consultants collected and analyzed actual O&M cost data from LDCs and prepared a report giving general conclusions with respect to O&M costs for different types of water systems. One major conclusion from this work is that O&M costs are not consistently collected, and another is that actual recurrent costs of water projects are difficult to determine.

ACT #349 May 1987: On-going Yacoob

Swaziland: Health Education Evaluation USAID/Swaziland asked WASH to assist in strengthening the capability of the Health Education Unit (HEU) of the Ministry of Health. The WASH consultant designed an assessment system to use with all health education materials produced by the HEU, and also designed a KAP study to evaluate the sanitation messages used by the HEU staff.

ACT #350 April 1987: On-going Yacoob

WS&S as a Stimulus to ORT Knowledge in Togo and Indonesia WASH is to test the hypothesis that villages involved with participatory water supply projects will have a higher percentage of mothers who know how to administer ORT than villages involved in non-participatory water supply projects.

ACT #351 May 1987: Completed Turner

Honduras: Project Paper for Health Sector II USAID/Honduras asked WASH to provide a three-person team to assist the mission in writing an interim project paper report for the water supply and sanitation component of the Health Sector II Project.

ACT #352 May 1987: On-going Hafner

Sierra Leone: CARE Community Participation Assessment WASH assisted CARE in identifying why community participation on CARE WS&S projects has not been achieved. WASH developed a strategy for follow-on activities to improve CARE WS&S projects in Sierra Leone. See WASH Field Report No. 217.

ACT #353 June 1987: On-going Warner

Nigeria: Willingness to Pay Field Studies The World Bank is undertaking a major field study of willingness to pay for water supply services in developing countries. In light of WASH experience in conducting such studies, the World Bank has requested WASH collaboration in the Nigerian study. WASH will be working with Nsukka University in the field implementation of the study.

ACT #354 June 1987: On-going Rosensweig

Swaziland: Manpower Assessment WASH carried out an assessment of the availability of manpower at the professional, technical, and craftsman levels in the water and sanitation sector in Swaziland. WASH identified areas of shortages and recommended training methods and programs. The assessment was carried out in September 1987. A final report will be available by December 1987.

ACT #355 June 1987: On-going Rosensweig

Zaire: Training of Trainers—Workshop III WASH designed and implemented a two-week advanced training-of-trainers workshop for 13 Zairian water supply and sanitation trainers. This workshop was a follow-on to Activities 221 and 245. The workshop took place in August 1987. See Field Report No. 216.

ACT #356 June 1987: On-going Yacoob

Domestic Sanitation and Child Survival WASH will synthesize the findings and research conducted under WASH Activity #214 in rural Kenya and produce a document useful to USAID missions for hygiene education programs. The second phase of the activity will delineate behavior changes in water use and sanitation practices which are required for improved health and child survival in urban and peri-urban communities.

ACT #357 June 1987: On-going Rosensweig

Development of Debriefing Model-S&T/H The purpose of this activity is to develop guidelines for conducting a debriefing with WASH consultants that will capture the lessons learned and issues relevant to the work that was conducted. This model will be used by WASH activity managers. See WASH Technical Report No. 32, Supplement (Draft).

ACT #358 June 1987: Completed Turner

Belize: Redesign and Technical Assistance for IPTBH Project WASH provided a two-person team to assist USAID/Belize with the redesign of the Improved Productivity Through Better Health (IPTBH) water and sanitation project and to provide recommendations for the selection of drilling equipment.

ACT #359 July 1987: On-going Jordan

Thailand: Wastes Management Program Design WASH provided expert technical support for the preparation of the program design for the waste management element of the Natural Resources for Sustainable Development Project in Thailand. A two-person team—a WASH consultant and a consultant from the World Environment Center—carried out this assignment. The results of their work will be published in December 1987.

ACT #360 July 1987: On-going Jordan

Thailand: Wastewater Assessment in Coastal Areas WASH assessed the wastewater collection, treatment, and disposal practices and alternatives in the coastal areas of Thailand. WASH identified possible areas of intervention through demonstration projects, institutional development, and training. The report presenting the findings, conclusions, and recommendations will be published in December 1987.

ACT #361 July 1987: On-going Rosensweig

Honduras: Well Improvement Workshop Peace Corps requested that WASH conduct a field test of the Well Improvement Training Guide (Activity #116) for Peace Corps Volunteers and counterparts. Seventeen participants were trained to assist communities in organizing and implementing well improvement projects. See WASH Field Report No. 222.

ACT #362 July 1987: On-going Rosensweig

Thailand: Asia-Pacific Regional Water Supply Conference Thai Waterworks Association (TWWA) has requested WASH assistance in designing and implementing the 6th Asia-Pacific Regional Water Supply Conference and Exhibition to be held in December 1987. WASH's goal is to help make the conference more participatory. A consultant assisted in the planning phase in July 1987 and is scheduled to return for the actual conference in December 1987.

ACT #363 July 1987: On-going Hafner

World Vision: Africa Water Program Workshop-FVA/PVC WASH is assisting World Vision (WV) in planning and conducting a workshop for WV Africa country managers of water projects, their regional technical teams and other World Vision staff to familiarize them with the African Water Program and other RWS&S projects in Africa.

ACT #364 July 1987: On-going Yacoob

Pakistan: Field Test of Cost-Effective Methods of Guinea Worm Control In collaboration with the Centers for Disease Control, WASH was requested to assist the Government of Pakistan in developing a cost-effective strategy for the control of guinea worm. Phase II of the activity will be actual testing of the strategy, and Phase III includes the development of a user's guide for planning a national program for the control of guinea worm.

ACT #365 August 1987: Completed Turner

PPC/CDIE: Sustainability of USAID Investments in Guatemala WASH provided a staff member to assist PPC/CDIE in a study of the sustainability of AID investments in the health sector in Guatemala. The team

identified the characteristics of projects that have resulted in the continuation of project activities and benefits after disbursement of project funds.

ACT #366 September 1987: On-going Warner

Djibouti: Water Decade Planning Workshop USAID/Djibouti and WHO/Djibouti collaborated in the organization and facilitation of a Water Decade planning workshop which was held in Djibouti in October 1987. Two WASH consultants participated in the planning and facilitation of the workshop.

ACT #367 August 1987: On-going Rosensweig

Egypt: LD I Rural Water Supply Assessment USAID/Egypt has requested WASH assistance in conducting an assessment of the Local Development I (LD I) Rural Water Supply Systems to provide improved guidelines for future LD II water supply activities. This assignment is the implementation of the assessment which WASH designed under Activity #327. The work will take place November 1987 to March 1988.

ACT #368 September 1987: On-going Yacoub

Guidelines for Guinea Worm Component in Existing WS&S Projects This activity will develop guidelines for adding a guinea worm component to existing water supply and sanitation projects, using the USAID-funded Togo Rural Water Supply Project as a case study.

ACT #369 September 1987: On-going Yacoub

Components of Successful Water Supply and Hygiene Education Programs This activity will identify the key areas which cause the success or failure of integrating hygiene education programs into water supply and sanitation projects. This activity will outline preliminary guidelines using selected case studies.

ACT #370 August 1987: On-going Turner

Nigeria: Collaboration with World Bank on Water Vending Studies Based on the water vending studies carried out by UNC under Activity #185, the World Bank requested WASH assistance to start water vending studies in the state of Anambra, Nigeria. The studies will recommend improvements to existing water vending operations.

ACT #371 August 1987: On-going Rosensweig

Bolivia: Project Review Workshop USAID/Bolivia requested WASH assistance in designing and conducting a project review workshop for the CARE Water and Sanitation/Child Survival Project. WASH used its project start-up model to conduct the project review. The workshop took place in October 1987.

ACT #372 August 1987: On-going Jordan

Yemen: Demonstration Handpump Project USAID/Yemen has requested WASH to assist in developing a demonstration program to study the use of hand-pumps to provide water needs for Yemeni villages and to assess the feasibility of in-country manufacturing or assembly of the pumps.

ACT #373 September 1987: On-going Rosensweig

Revision of HRD Planning Guidelines-S&T/H Under Activity #354, WASH used the HRD Planning Guidelines in a manpower assessment in Swaziland. WASH will revise the guidelines based on the results of the Swaziland activity. A revised version is expected by January 1988.

ACT #374 September 1987: On-going Warner

Guidelines for the Evaluation of Water Supply and Sanitation Projects-S&T/H This study will review the WASH (and AID) experience in WS&S evaluation, identify useful models for future evaluations, and prepare preliminary guidelines for operational use by WASH, AID, and AID contractors.

ACT #375 March 1987: On-going Yacoub

Nigeria: Training Modules on Guinea Worm Prevention Two training modules will result from this activity. The first is a training module for high school teachers in Nigeria as part of family life education implemented by CEDPA (Center for Development in Population Activities). The second training module which is to be implemented by the University of Ibadan will train community level health workers, teachers, and extension agents in guinea worm prevention.

ACT #376 September 1987: On-going Sarai

Prepare Progress Report No. 11-S&T/H This edition of the WASH Progress Report updates No. 10 and includes summaries of the 86 activities initiated by WASH in FY 1987. This task involves reviewing the scope, content, and design of the Progress Report with WASH staff and the Office of Health and writing, editing, printing, and distributing the report.

ACT #377 September 1987: On-going Warner

Lessons Learned in the WASH Project-S&T/H Under this activity, WASH staff will identify the key findings or lessons learned for water supply and sanitation development during the course of seven years of WASH technical assistance activities. The early

phase of the activity will develop a framework for identifying, classifying, and describing the findings and accumulated experience.

ACT #378 September 1987: On-going Jordan

Solomon Islands: Development of Technical Assistance Needs USAID/Suva requested that WASH provide further assistance to the Government of the Solomon Islands (SIG) in developing an action plan for more effectively executing its rural water supply and sanitation program, resulting in the construction of water and sanitation systems. Under this activity, WASH prepared the terms of reference for a subsequent visit. The purpose of the second visit will be to assist the SIG in preparing a national policy for maintenance of rural water systems and to participate in a national conference on rural water supply systems.

ACT #379 September 1987: On-going Warner

Pakistan: Collaboration with World Bank on Willingness-to-Pay World Bank and WASH will collaborate on a willingness-to-pay study. WASH is assisting with field support expenses for the principal investigators.

ACT #380 September 1987: On-going Turner

Strategies for Cost Recovery and Tariff Design This activity will identify and discuss a wide range of issues involved in cost recovery and tariff design. The study report will present a detailed sample problem to illustrate how the issues can be handled analytically, under varying policy sets.

ACT #381 September 1987: On-going Hafner

WHO Consultation-S&T/H WASH is participating in an international conference sponsored by the Swiss Development Cooperation Agency and World Health Organization which will focus on development concepts related to the provision of support programs.

ACT #382 October 1987: On-going Campbell

Guidelines for Organizing Technical Information Systems of Water/Wastewater Institutions-S&T/H

This activity will provide guidelines to assist organizations in establishing and organizing databases, records and filing systems. Proper organization of records and information will assist in developing an institutional memory.

ACT #383 September 1987: On-going Turner

Developing Community-Oriented WS&S Management Guidelines-S&T/H The purpose of this activity is to develop a set of guidelines that can be used by implementing agencies and PVOs to produce written materials for villages to guide their water supply and sanitation system management.

ACT #384 September 1987: On-going Turner

Application of Water Vending Lessons This activity is designed to help large municipal water companies provide improved and lower-cost water supply services, especially to the urban poor slums and shanty towns, using the lessons learned from the vending study conducted in Kenya and Honduras.

ACT #385 September 1987: On-going Turner

Synthesis and Packaging of Existing WASH Products and Materials-S&T/H WASH staff will synthesize, organize and package existing WASH materials so they can be used more effectively by water supply and sanitation planning and implementing organizations.

ACT #386 September 1987: On-going Warner

IRC/The Hague: Information Exchange for WS&S A working meeting on information exchange for WS&S was held in The Hague under the sponsorship of the International Reference Centre for Water Supply and Sanitation. The meeting was used to develop a framework for organizing and strengthening information services in developing countries.

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