

BIBLIOGRAPHIC DATA SHEET

1. CONTROL NUMBER

2. SUBJECT CLASSIFICATION (695)

PN-AAK-233

AP00-0000-0000

3. TITLE AND SUBTITLE (240)

WASH project progress report, July 10, 1981: Non-CDM F
Contract activities, summary of assigned tasks, 11-1-79 to 6-30-81;
~~CDM Five contract activities, summary of orders of technical~~
direction, 8/29/80 - 6/30/81.

4. PERSONAL AUTHORS (100)

Beverly, J.E.

5. CORPORATE AUTHORS (101)

Camp Dresser & McKee, Inc.

6. DOCUMENT DATE (110)

1981

7. NUMBER OF PAGES (120)

37p.

8. ARC NUMBER (170)

9. REFERENCE ORGANIZATION (130)

CDM

10. SUPPLEMENTARY NOTES (500)

(In Water and sanitation for health [WASH] project)

11. ABSTRACT (950)

12. DESCRIPTORS (920)

Water supply and health
Sanitation
Project management
Rural water supply

Project implement-
ation
Technical assistance

13. PROJECT NUMBER (150)

9311176

14. CONTRACT NO. (140)

AID/DSPE-C-0080

15. CONTR. TYPE (1)

16. TYPE OF DOCUMENT (160)

PN-AAK-233

931-1176-~~000000~~
~~000000~~

**WATER AND SANITATION
FOR HEALTH PROJECT**



**COORDINATION AND
INFORMATION CENTER**

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WASH PROJECT PROGRESS REPORT

July 10, 1981

NON-CDM FIVE CONTRACT ACTIVITIES

Summary of Assigned Tasks
November 1, 1979 - June 30, 1981

CDM FIVE CONTRACT ACTIVITIES

Summary of Orders of Technical Direction
August 29, 1980 - June 30, 1981

WASH PROJECT PROGRESS REPORT
July 10, 1981

Non-CDM FIVE Contract Activities
Summary of Assigned Tasks
November 1, 1979 - June 30, 1981

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Summary of Orders of Technical Direction
August 29, 1980 - June 30, 1981

Prepared for WASH Project
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Information Director

Contract No. AID/DSPE-C-0080
Project No. 931-1176

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WASH PROJECT PROGRESS REPORT, JULY 10, 1981
SUMMARIES OF ASSIGNED TASKS AND ORDERS OF TECHNICAL DIRECTION
FROM OFFICE OF HEALTH, DEVELOPMENT SUPPORT BUREAU, AID

November 1, 1979 - June 30, 1981

Introduction

This report is a summary of completed and on-going work done for the Water and Sanitation for Health (WASH) Project for the Agency for International Development (AID).

The WASH Project was initially funded in November 1979 (FY 1980) and is managed by the Division of Community Water Supply and Sanitation, Office of Health, Bureau for Science and Technology (formerly Bureau for Development Support). Its purpose is to provide AID personnel with centrally-funded inter-disciplinary, professional technical assistance services to improve drinking water and sanitation projects and programs with a minimum of administrative effort and delay. WASH is a major contribution of the U.S. Government to the U.N. International Drinking Water Supply and Sanitation Decade 1981-1990. So far WASH has worked for or in 38 countries that are being assisted by AID.

Brief Description of the WASH Project

The areas of support available from WASH are primarily focussed on rural and urban-fringe water supply and sanitation improvement and include: general technical assistance, technology transfer, human resource development and training, and technical and development information.

WASH services are available to AID Missions, Regional Bureaus and central offices through the Office of Health. Missions and Regional Bureaus may request WASH assistance on behalf of:

- Mission programs
- Host government organizations
- Other host country organizations
- Peace Corps
- International/multilateral programs
- Private voluntary organizations

All requests for technical assistance must be approved, requested and sponsored by AID organizations in the field or by AID/Washington.

Requests for information may be sent directly to the WASH Information Director. However, AID Missions and AID supported institutions will receive priority in responding to requests. For details see the WASH Brochure or contact WASH.

Comments on Project Assignments

WASH Project activities have occurred in two phases. The first phase began in November, 1979, and was for the period before the WASH Project contract was awarded to the Camp Dresser & McKee consortium (CDM FIVE). The second, current phase, began on August 29, 1980. The five tasks initiated by the Office of Health before the CDM FIVE contract are summarized in a section below. The scope and general procedural arrangements for the work done by the CDM FIVE group is outlined in the following section.

Aside from routine office administrative activities, there are two major categories of work or tasks performed by the WASH Project Coordination and Information Center (CIC). These are "Orders of Technical Direction" (OTDs), which are formal, written specific statements of work to be done by the WASH Project CIC, CDM-5 units, or other outside contractors or consultants to the WASH CIC. OTD's are issued to the WASH CIC by the AID Office of Health (ST/HEA) Project Manager. As of June 30, 1981, the Office of Health had issued 44 OTD's. They are briefly summarized in the following table and pages.

The other category of work is called a "CIC Task." These are smaller, less formal and usually short-term tasks that may be requested verbally or in writing by the Office of Health, Missions or Bureaus. Other CIC tasks may be initiated by the WASH Project Staff. CIC-type tasks also may be preliminary phases of work that later become Orders of Technical Direction.

The kinds of work done under CIC tasks has included: reproduction of documents for distribution to Missions and Bureaus; literature searches; preparation of bibliographies and assembly of information materials, catalogs, etc. for Missions and Bureaus, e.g., windmill data for Morocco; acquisition of specific sets of information: ASTM Design Standards, EPA materials, American Water Well Association documents, etc.; synthesis of evaluation methods and approaches to community water supply and sanitation: WASH Project planning in specific subjects: training, women's issues in water and sanitation, information priorities, etc.

From September 23, 1980, through June 30, 1981, the WASH Project Coordination and Information Center received 44 Orders of Technical Direction from the the Office of Health. The work content of these OTD's broadly falls into five categories: general technical assistance, training, transfer of appropriate technology, information and international coordination. Each OTD has involved work in two or more categories or sub-categories. General technical assistance has been broken down into four sub-categories: local manufacturing, water supply and sanitation (WS&S) engineering, health and community participation, and planning and procedures.

The number of OTD's having work done in the various categories follows:

General Technical Assistance	37
Local manufacturing	13
WS&S engineering	31
Health and community participation	19
Planning and procedures	29
Training	23
Transfer of Appropriate Technology	26
Information	31
International Coordination	10

The geographic breakdown of OTD's is:

<u>Latin America</u>	<u>Near East</u>	<u>Africa</u>	<u>Asia</u>
Barbados	Jordan	Burundi	Bangladesh
Dominican Republic - 2	Lebanon	Mauritania	India
Ecuador - 2	Tunisia	Niger	Indonesia - 2
El Salvador	Yemen	Tanzania	Philippines - 3
Guatemala			Thailand
Haiti			
Honduras			
Peru			

In addition, CIC-type work has been done in Africa for Benin, Cameroon, Gambia, Ghana, Liberia, Mali, Malawi, Somalia, Sudan, Swaziland, Togo, Upper Volta, and Zambia; in Asia for Sri Lanka; in Latin America for Chile; and in the Near East for Egypt and Morocco.

Thus far the WASH Project has worked for or in 38 of some 70 AID Missions or Offices. Requests for information have been received from an additional nine AID assisted countries.

The table which follows indicates the work content of Orders of Technical Direction by categories and indicates the complex and multi-disciplinary aspects of WASH activities.

WORK CONTENT OF ORDERS OF TECHNICAL DIRECTION
FROM THE OFFICE OF HEALTH-A.I.D. TO THE WASH PROJECT
AUGUST 29, 1980- JUNE 30, 1981

OTD No.	Title	Work Status	Requesting Agent	General Technical Assistance				Training	Transfer of Appropriate Technology	Information	International Coordination
				Local Manufacturing	WS&S Engineering	Health & Comm. Part.	Policy & Procedure				
T1	Hand Pump Manufacturing	C	USAID/Dominican Republic	X					X		
T2	American Public Health Association Meeting - Exhibition of AID Appropriate Technology WS&S Devices	C	DS/HEA						X	X	X
T3	Project Design Manual References Development	C	NE/TECH/HN				X			X	
T4	Competency Based Training/ Planning for Agency	O	DS/HEA AID/W					X		X	
T5	UNICEF/Pan American Health Organization WS&S Workshop and Discussion of WASH Services	C	PAHO DS/HEA							X	X
T6	Social Science Analysis for WS&S AID Administrator Bennett Project Evaluation	C	PPC/E			X				X	
T7	Oral Rehydration Therapy Review Discussion of Need for Using Potable Water in ORT Solutions	C	DS/HEA DS/POP			X			X	X	
T8	Pan American Health Organization/Caribbean Community WS&S Planning Meeting in Barbados	C	PAHO DS/HEA						X	X	X

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Work Status Key - C = completed O = on-going * = cancelled

WORK CONTENT OF ORDERS OF TECHNICAL DIRECTION
FROM THE OFFICE OF HEALTH-A.I.D. TO THE WASH PROJECT
AUGUST 29, 1980- JUNE 30, 1981

OTU No.	Title	Work Status	Requesting Agent	General Technical Assistance				Training	Transfer of Appropriate Technology	Information	International Coordination
				Local Manufacturing	WS&S Engineering	Health & Comm. Part.	Policy & Procedure				
T9	Rural Water Supply Systems Review	C	USAID/Haiti		X		X	X			
T10	Regional Health Officers Conference Participation for West Africa	*	REDSO/WA AFR/DR			X				X	
T11	Local Manufacture of WS&S Devices	C	USAID/Philippines	X	X		X		X		
T12	R&D - Prototype WS&S Devices	C	Inter-Regional DS/HEA	X	X				X		
T13	Italian Earthquake Relief Assistance	C	U.S. Consulate/Naples AID/OFDA		X	X			X	X	
T14	Peri-Urban and Rural WS&S Program Review and Project Development	C	USAID/Ecuador	X	X		X	X	X		
T15	Well Drilling Equipment Specifications and Procedures	C	USAID/Tunisia NE/TECH		X		X	X	X	X	
T16	Water Supplies from Rural Land Reclamation	C	USAID/Mauritania		X	X	X		X	X	
T17	Review of Appropriate Water Supply Technologies, Implementation Planning, Local Manufacturing & Training	O	USAID/El Salvador	X	X		X	X	X	X	

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**WORK STATUS OF ORDERS OF TECHNICAL DIRECTION
FROM THE OFFICE OF HEALTH-A.I.D. TO THE WASH PROJECT
AUGUST 29, 1980- JUNE 30, 1981**

OTD No.	Title	Work Status	Requesting Agent	General Technical Assistance					Transfer of Appropriate Technology	Information	International Coordination
				Local Manufacturing	WS&S Engineering	Health & Comm. Part.	Policy & Procedure	Training			
T18	WS&S Implementation Plan Design for Rural Water Project	C	USAID/Peru	X	X		X	X	X	X	
T19	Food Wastage Project Expert Panel Review	O	PPC/E DS/HEA			X				X	
T20	Small Wastewater Stabilization Pond Design and Analysis	C	USAID/Lebanon NE/TECH		X		X	X	X	X	
T21	Water-seal Latrine and Water Storage/Treatment Design Analysis	O	USAID/Dominican Republic	X	X		X	X	X	X	
T22	Review of Testing Prediction Sanitation Model Project	■	DS/HEA				X				
T23	Preparation of Guidelines for WS&S Project Design and Implementation-Interregional	O	DS/HEA	X	X	X	X	X	X	X	
T24	Rural WS&S System Design for AID Project Paper	C	USAID/Ecuador		X	X	X	X	X	X	
T25	Rural Sanitation Manpower Development (RSMD): Workshop and Program Assistance	C	USAID/Indonesia		X		X	X	X	X	

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WORK CONTENT OF ORDERS OF TECHNICAL DIRECTION
FROM THE OFFICE OF HEALTH-A.I.D. TO THE WASH PROJECT
AUGUST 29, 1980- JUNE 30, 1981

OTD No.	Title	Work Status	Requesting Agent	General Technical Assistance				Training	Transfer of Appropriate Technology	Information	International Coordination
				Local Manufacturing	WS&S Engineering	Health & Comm. Part.	Policy & Procedure				
T26	Project Design Assistance for Health and Environmental Monitoring Project (HEMP) and Water Supply and Sanitation Manpower Training	O	USAID/Tanzania		X	X	X	X	X	X	
T27	Evaluation of Rural Health Project	O	USAID/Niger		X	X	X	X			
T28	Representative of DS/HEA and WASH at Conference of World Federation of Public Health Associations, Calcutta, India, 23-26 February 1981	C	DS/HEA		X	X			X	X	
T29	Development of Local Capability to Fabricate Hand Pumps and Well Screens	O	USAID/Honduras	X	X		X	X	X	X	
T30	Participation in XII Central American Congress of Sanitary Engineering Meeting, 16-20 March 1981	C	USAID/Guatemala, ROCAP		X	X				X	
T31	Wastewater Treatment Design Review and Guideline Preparation	C	USAID/Jordan		X		X		X	X	
T32	Coordination of WASH Information Activities and Exchange with International Information Centers	O	DS/HEA							X	

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**WORK CONTENT OF ORDERS OF TECHNICAL DIRECTION
FROM THE OFFICE OF HEALTH-A.I.D. TO THE WASH PROJECT
AUGUST 29, 1980- JUNE 30, 1981**

OTD No.	Title	Work Status	Requesting Agent	General Technical Assistance					Training	Transfer of Appropriate Technology	Information	International Coordination
				Local Manufacturing	WS&S Engineering	Health & Comm. Part.	Policy & Procedure					
T33	Development of Testing Protocol for Mobile Water Treatment and Disinfection Units in Disaster Situations	O	DS/HEA;OFDA		X	X	X					
T34	Coordination and Facilitation of Use of WASH Technical Assistance Services in Africa	O	AFR/DR; DS/HEA	X	X	X	X	X	X	X		
T35	Participation in the AWWA meeting, St. Louis, 8-12 June, 1981	C	DS/ENGR; DS/HEA			X		X	X	X	X	
T36	Evaluation of Rural Water Supply Project	O	USAID/Burundi		X	X	X	X				
T37	Participation in Session on Water, Sanitation and Health Education, UNICEF New York 22-23 April, 1981	C	DS/HEA		X	X	X	X			X	
T38	Further Development of Rural Water and Sanitation Project	C	USAID/Thailand		X	X	X					
T39	Evaluation of the Water Supply Systems Management Project for the National Water and Sewage Authority (NWSA)	O	USAID/Yemen		X		X	X				
T40	AID Handpump Manufacture	O	USAID/Philippines	X	X		X	X	X	X		

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WORK CONTENT OF ORDERS OF TECHNICAL DIRECTION
FROM THE OFFICE OF HEALTH-A.I.D. TO THE WASH PROJECT
AUGUST 29, 1980- JUNE 30, 1981

OTD No.	Title	Work Status	Requesting Agent	General Technical Assistance					Transfer of Appropriate Technology	Information	International Coordination
				Local Manufacturing	WS&S Engineering	Health & Comm. Part.	Policy & Procedure	Training			
T41	Technical Assistance of Cultural Anthropologist in Peace Corps Training Program in Areas Community Development and Participation in Water Supply and Sanitation	0	DS/HEA; Peace Corps		X	X	X	X	X	X	
T42	Technical Assistance to AID Office of Foreign Disaster Assistance (OFDA)	0	OFDA; DS/HEA		X	X	X				
T43	Technical Assistance for the Barangay Water Program	0	USAID/Indonesia	X	X		X	X	X		
T44	Training and Technical Assistance for Technical Development and Dissemination in Water and Sanitation for Rural Sanitation Manpower Project	0	USAID/Indonesia	X	X		X	X	X		

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Work Status Key - C = completed 0 = on-going * = cancelled

SUMMARIES OF PRE-CDM FIVE WASH PROJECT ASSIGNMENTS

November 2, 1979

WATER SUPPLY AND SANITATION PLANNING - THAILAND

This task was assigned to the American Public Health Association (APHA) by the Office of Health. It had four major objectives:

1. Assessment of AID experience in water supply and sanitation in poorer villages with populations of less than 1,000 in the 200 provinces included in the Primary Health Care Project in Thailand.
2. Assessment of the basic levels of social and economic development affected by improvements in water supply and sanitation.
3. Development of rural water supply and sanitation strategy by identifying positive changes effected in the past and by making recommendations for future programs in those fields.
4. Identification of targets of opportunity for projects that can be considered for funding with special emphasis on USAID participation in the International Drinking Water Supply and Sanitation Decade.

February 28, 1980

ASSISTANCE IN DEVELOPMENT OF NATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE PLAN - SRI LANKA

In February 1980 USAID/Colombo requested, through the Office of Health, the expert services of an individual well versed in national planning of drinking water and sanitation programs to identify the number of individuals and disciplines needed to formulate a detailed Decade Water Supply and Sanitation Plan for the country, including annual investment programs.

These services were provided through an AID agreement with APHA. The assignment resulted in a report: Scope of Work for Assistance in Preparation of a Comprehensive Plan for the International Decade for Drinking Water and Sanitation in Sri Lanka, March 1980. The report recommended a seven man team for a total of 40 person weeks to assist the Government of Sri Lanka in developing the Decade Plan.

A unique methodology was used in developing the Decade Plan. The APHA team worked exclusively with and under the guidance of the designated representative of the Government of Sri Lanka. Findings were based on extensive meetings and consultations with him and others of the GSL.

Team members visited 74 villages to observe on-the-ground conditions and needs with the villagers as background for developing the Decade Plan. The Plan was reviewed with appropriate authorities and representatives of USAID/Sri Lanka as work progressed, and the Final Decade Plan was issued in September.

The National Water Decade Plan of the Ministry of Local Government, Housing and Construction included the following topics:

1. Definition of the overall problems.
2. Statement of the Government of Sri Lanka policy.
3. Definition of Decade Plan goals, objectives and priorities.
4. Socio-economic analysis.

5. Selection criteria.
6. Statement of strategy
 - a. Determination of input requirements
 - b. Technology selection including development of in-country manufacture of equipment required for the Plan
 - c. Methods of approach
 - d. Institutional framework
 - e. Resource analysis
 - f. Constraints analysis.
7. Two year investment projections.
8. Projection of levels of activity and financing required for subsequent years to achieve Decade goal.

The Executive Summary of the Decade Plan was presented, by the two Sri Lankan officials with whom the team had worked in Sri Lanka, to the United Nations General Assembly in New York on November 10, 1980 as part of the official launching of the International Drinking Water Supply and Sanitation Decade.

April 11, 1980

RURAL WATER SUPPLY AND SANITATION PROGRAM PLANNING - ECUADOR

Technical support for this task was supplied by the APHA. The Work included three tasks:

1. To conceptualize a program of rural water supply and sanitation appropriate to Ecuador's resources and needs.
2. To strategize how that program might be developed to identify targets of opportunity for the Ministry of Health and USAID/ Ecuador to consider.
3. To develop a Project Identification Document for the Mission in rural water supply and sanitation.

August 26, 1980

LOCAL MANUFACTURE OF AID HANDPUMPS AND ROBO-DEVICES - TUNISIA

Prior to this contract, Georgia Tech had conducted a feasibility study for the local manufacture of AID hand pumps and Robo-devices in Tunisia. Based on this study and with authorization to USAID/Tunisia from DS/HEA to obligate funds, a contract was signed by USAID with Georgia Tech for technical assistance for local manufacture and testing of this equipment.

The objectives of the contract are for Georgia Tech to provide technical assistance to the Government of Tunisia and USAID/Tunisia in: locally manufacturing hand pumps and the larger Robovalves, in developing no less than ten sanitary wells and upper structures, installing hand pumps, disinfecting the well water and performing chemical analysis on well water for chlorine residual and other tests as necessary, as well as monitoring and evaluating the performance of the hand pumps.

In the spring of 1981, 40 AID pumps, produced under contract with Les Fonderies Reunies, were installed in the field after pre-selected open wells had been capped. Installation was a joint effort of Georgia Tech, CAIZE and the Ministry of Agriculture.

Arrangements were also made with the Societe des Applications Plastiques to produce 200 of the public hydrant Robovalves. These will be installed, monitored and evaluated by Georgia Tech.

September 12, 1980

LOCAL MANUFACTURE OF AID HAND PUMPS AND ROBO-DEVICES - ECUADOR

Under an earlier contract with Georgia Tech, a determination was made that it was feasible to manufacture the AID hand pump and Robo-devices in Ecuador. Subsequently a contract was signed with Georgia Tech and USAID/Ecuador under funding authorization from DS/HEA. The contract provides for technical assistance in local manufacturing of 110 AID hand pumps, 2,000 Robovalves and 1,000 feet of Roboscreen as well as to assure their appropriateness for introduction into bilateral projects which include water supply components. The project will also train the recipient private and public organizations in proper sanitary preparation of wells, installation of hand pumps and Robo-devices, disinfection of water where necessary, bacteriological analysis of water, and maintenance and repair of AID hand pumps.

Georgia Tech later signed a contract with the Escuela Politecnica Nacional for the manufacture of 110 AID hand pumps and with industries IEPESA (Ecuadorian plastics manufacturer) for 2,000 Robovalves and 1,000 feet of Roboscreens with two inch inside diameter.

In late Spring 1981 AID hand pumps and the Robo-devices were installed in rural areas of Ecuador by CAIZE, Peace Corps, the Vozandes, the Ecuadorian Institute of Sanitary Works (IEOS) of the Ministry of Health, and the Center for Rehabilitation of Manah, with appropriate training by Georgia Tech personnel.

**SUMMARIES OF ORDERS OF TECHNICAL DIRECTIONS TO CDM FIVE
Numbers 1 - 44**

OTD #1 - September 23, 1980

HAND PUMP MANUFACTURING: DOMINICAN REPUBLIC

The AID Health Sector Loan Project for manufacturing AID hand pumps in the Dominican Republic was having trouble with quality control, materials processing and testing in the foundry operation, in-shop techniques of assembly, and in the organization of larger scale production activities, and the Mission requested WASH Project assistance.

A consultant from the University of Maryland well-versed in AID hand pumps and manufacturing was sent to the Dominican Republic in October and November 1980 to assess the situation. The consultant identified casting, design and dimensional errors in several materials which would make pump assembly and maintenance difficult, if not impossible. These problems have been solved and the possible use of locally manufactured PVC deep well cylinders is being considered. A summary of work on this OTD may be found in WASH Field Report No. 20.

For further information, contact Dr. D. Warner, Acting WASH Project Director.

OTD #2 - September 30, 1980

**AMERICAN PUBLIC HEALTH ASSOCIATION MEETING - EXHIBIT OF AID
APPROPRIATE TECHNOLOGY WS&S DEVICES - DETROIT, MICHIGAN**

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 hand pump; 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 (a low-cost PVC slotted pipe to screen out small particles and sand in well pipes). The booth was manned by two consultants who had participated in the design and field testing of the equipment--one from Georgia Tech and the other from the University of Maryland.

The AID booth was of special interest to health professionals concerned with developing countries and improving their water supplies. While an exact count was not kept of visitors who stopped at the booth over the four day period, the number exceeded two hundred. This is considered worthwhile inasmuch as the APHA Meeting is primarily U.S. oriented. Numerous inquiries have been followed up with technical information.

OTD #3 - October 6, 1980

PROJECT DESIGN MANUAL REFERENCES DEVELOPMENT - NEAR EAST BUREAU

The Near East Bureau is developing a manual to assist USAID staff in identifying and describing water supply and sanitation projects in the field. An important component of the WS&S PID Manual is its "reference library" consisting

of seventeen texts, papers and reports, some of which are unpublished. Similar "library sets" and bibliographies on relevant water supply and sanitation themes will be developed on request from Missions and Bureaus.

For further information, contact Mr. J. Beverly, Information Director.

OTD #4 - October 16, 1980

COMPETENCY-BASED TRAINING/PLANNING FOR AGENCY

The purpose of this OTD is to collect and analyze information about training in past and present AID projects involving water and sanitation components. The results of this analysis will be used by WASH in responding to training assistance requests from Missions and Bureaus and in planning training conferences, workshops and seminars. This process is 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.

For further information, contact Mr. C. Hafner.

OTD #5 - October 16, 1980

**UNICEF/PAN AMERICAN HEALTH ORGANIZATION WS&S WORKSHOP AND DISCUSSION
OF WASH SERVICES - LIMA, PERU**

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 the others, and 3) to meet LDC people active in water supply and sanitation.

Sixty people participated in the Workshop from twelve countries. The program included "position papers" by UNICEF and PAHO, papers on health education and development of human resources(training), case studies from Paraguay and Peru, and discussions of possible financial patterns for water supply and low-cost sanitation in slums and rural areas.

The International Reference Center for Community Water Supply of the Hague presented a description of its POETRI-Program on Exchange and Transfer of Information--which involved some sixteen countries as of June 1980 and is expected to include more in the near future. PAHO also described its Latin American Information and Documentation Network in Sanitary Engineering and Environmental Sciences. The WASH Project will work closely with these networks on information generation and exchange. Mr. Chanlett, the WASH consultant, made a flip-chart presentation of the WASH Project objectives and procedures.

These presentations were followed by workshops to design check-lists for use in developing water supply and sanitation projects in slum and rural areas.

The workshop achieved its objectives and highlighted two pressing needs for water supplies in Latin America--training of water supply workers and maintenance of water supply systems. Participants learned about the WASH Project and the AID mission in Peru became especially well informed about WASH through Mr. Chanlett's several visits.

For further information, contact Dr. R. Isely.

OTD #6 - October 27, 1980

**SOCIAL SCIENCE ANALYSIS FOR WS&S: AID ADMINISTRATOR BENNETT
PROJECT EVALUATION-PERU**

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 qualified social scientist was needed to do 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 needed describing the broader characteristics of the sierra region and the nation.

The consultant would review documents made available by PPC and prepare summary briefs, tables, charts and graphs relating directly to the geographic and topical areas noted above. The information will be submitted in draft form to PPC to be used as background information by the impact evaluation team.

An anthropologist with field experience in Peru, Dr. Charlotte Miller, was engaged for this OTD. For a summary of the work see WASH Field Report No. 1.

For further information, contact Dr. R. Isely.

OTD #7 - November 3, 1980

**ORAL REHYDRATION THERAPY: REVIEW DISCUSSION OF NEED FOR USING
POTABLE WATER IN ORT SOLUTIONS**

The purpose of this OTD was to obtain the professional counsel of Dr. Lincoln Chen of the Harvard University School of Public Health for a meeting held in AID on November 13, 1980. 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 major conclusion, given what is now known, was that there did not seem to be much support for including a disinfectant in oral rehydration solution packets, although a shift in this opinion might be warranted when further research has been done. It was suggested that further studies be conducted for the provision of safe household water supplies and for "rethinking" the whole water supply and health model.

A report on this meeting, which includes the results of a limited literature search on oral rehydration fluids and disinfection, is being prepared.

For further information, contact Dr. R. Isely

OTD #8 - November 4, 1980

**PAN AMERICAN HEALTH ORGANIZATION/CARIBBEAN COMMUNITY WS&S
PLANNING MEETING IN BARBADOS**

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.

The wide-ranging discussions covered most of the water supply and sanitation spectrum of the Caribbean area with emphasis on accelerating implementation of funded projects being held up by paper work, on the need for technical training, sanitation education for the population, improved water quality control, and up-dated environmental legislation from its 1932 and prior year bases. A significant concern was for the necessity of national commitment for Water Decade goals by the entire cabinet of each country in addition to the Ministry of Health.

A major recommendation was that the concepts, manuals, guidelines and personnel of the Caribbean Basin Water Management Project be replicated with appropriate modifications elsewhere in the world as a proven methodology to train the personnel so urgently needed for the success of Water Decade Programs.

The presentation of the WASH Project was made by consultant Mr. Charles Pineo, who emphasized that the principles, policies and programs of both the Water Decade and the WASH project must be explained and emphasized by extensive person-to-person contact if their collective goals are to be reached.

For further information, contact Dr. R. Isely.

OTD #9 - November 7, 1980

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. The services of the WASH Project Director, James Arbuthnot, were made available to the AID Mission for two weeks to review the existing situation and make suggestions for improvements in WS&S planning, operations, maintenance and training.

Fourteen rural water systems were visited. Significant problems observed included use of PVC pipe in exposed, above ground placements with risk of damage and unauthorized diversion of water (metal pipe would minimize these hazards); lack of proper attention to the drainage requirements of new water fountains with consequent mosquito breeding; and absence of formal provision for system maintenance including training. Equipment, such as portable kits for field testing of water for coliforms, and for laboratories is also needed.

Since a dozen or more PVO's are active in Haiti's water supply and sanitation development, a major recommendation is that WASH support a practical workshop for all local PVO's and others concerned with water supply and sanitation in Haiti. The workshop could be built around case histories of local PVO successes and failures and would provide a basis for better planning, control and training. See WASH Field Report No. 2.

For further information, contact Dr. D. Warner.

OTD #10 - November 21, 1980

PROVISION OF EXPERT PUBLIC HEALTH OFFICER AND TECHNICAL ASSISTANCE TO DS/HEA WEST AFRICA

After the WASH Project staff had spent several days organizing a presentation and starting 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.

For further information, contact Mr. J. Beverly.

OTD #11 - November 21, 1980

**LOCAL MANUFACTURING FOR WATER SUPPLY AND SANITATION
DEVICES - PHILIPPINES**

The AID offices of Capital Development and Engineering in Manila have programmed the local manufacture of AID hand pumps 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.

A WASH consultant from Georgia Institute of Technology spent a week in the Philippines with the AID Mission, inspected local manufacturing facilities, and drafted a proposed scope of work for a local manufacturing program to produce 250 shallow-well hand pumps, 250 deep-well hand pumps, and spare parts over a 24 month period. The draft program also includes four pilot projects of communal water systems/facilities powered by wind energy to be designed, procured, installed and operated during an 18 month period.

The draft scope of work was reviewed by the Mission and has resulted in OTD #40. See below and WASH Field Report No. 3.

For further information, contact Dr. D. Warner.

OTD #12 - November 21, 1980

RESEARCH AND DEVELOPMENT - PROTOTYPE WS&S DEVICES

The purpose of this OTD is 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. Subcontractor should have a well fitted mechanical shop with equipment capable of working with a wide variety of metals and plastics. A suitable testing laboratory should also be available.

The selected subcontractor may be working on a variety of non-proprietary devices ranging from water meters to windmills over the next several years. Work on these devices would be initiated by OTD's.

Subcontractor can have more than one facility, but at least one facility in the Washington, D.C. area is necessary so that international donor personnel and WASH staff can participate in product development and trouble shooting/design of devices. Georgia Tech Research Institute was selected to provide these R&D services. Georgia Tech in turn has 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.

For further information, contact Dr. D. Warner.

OTD #13 - December 1, 1980

ITALIAN EARTHQUAKE RELIEF 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.

In a four day period WASH staff, by telephone and cable, identified some 19 sources of commercial excreta disposal facilities, individual home water supply treatment equipment and chemicals, individual laundry and shower facilities and chlorine residual comparator test kits for public water supplies. A variety of alternative construction, installation and operational modes for communal facilities were described and rough cost estimates prepared. These ranged from locally constructed latrines and showers to the use of field-erected and prefabricated sanitary and laundry units from foreign suppliers.

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 for use by the local U.S. Disaster Relief Team.

For further information, contact Dr. D. Warner.

OTD #14 - December 11, 1980

PERI-URBAN AND RURAL WATER SUPPLY AND SANITATION PROGRAM REVIEW AND PROJECT DEVELOPMENT - ECUADOR

This task for USAID/Ecuador has two distinct parts--peri-urban and rural. The peri-urban review and assessment involves working with an Ecuadorian private volunteer organization (Fundacion Natura) and local municipal sewerage companies in Quito, Guayaquil and other cities. The work includes analyzing environmental sanitation and sewerage problems, plans and constraints, suggesting alternative strategies, identifying high priority projects, and making over-all recommendations. Constraints of concern are high-cost inappropriate technologies, lack of trained manpower and funding, and absence of policy direction.

The technical analysis in selected rural towns is of integrated approaches that include low-cost housing, water, sewerage and related infrastructure, social services and employment generation/training activities. This task has provided AID with a unique opportunity for on-the-job training. Under the experienced guidance of Mr. Charles Pineo, a young U.S.-educated sanitary engineer will gain hands-on exposure to developing country situations by assisting in data collection, interviewing and drafting reports. While developing countries have shortages of trained water supply and sanitation personnel, developed countries like the United States have a shortage of professionals who are qualified by field experience to be effective in developing countries. The WASH Project is an effective mechanism for the United States and AID to increase the supply of water supply and sanitation professionals experienced in developing country work. See WASH Field Report No. 12.

For further information, contact Dr. D. Warner.

OTD #15 - December 12, 1980

WELL DRILLING EQUIPMENT SPECIFICATIONS AND PROCEDURES - TUNISIA

As part of its rural potable water subproject, the AID Mission in Tunisia is examining the use of low-cost technology for drilling relatively shallow wells (maximum 200 meters) having low to moderate yields. The government of Tunisia is experienced in drilling larger and deeper wells for irrigation water and needed assistance in preparing a suitable invitation for bidders for the purchase of a smaller, less expensive drilling rig. The Mission is also interested in the use of PVC in well casing and screens.

An experienced well driller visited Tunisia in December 1980, conferred with AID and Tunisian officials, and drafted bid specifications and the personnel specifications for a well drilling adviser to train Tunisians in the use of top head drive rotary drills.

The consultant provided technical information and guidance on the use of PVC well casing and screens, but recommended that steel casing and screening be used initially. Later on PVC could be used in areas where drilling is relatively uncomplicated and straightforward and the crews are more experienced with the new drilling rig.

There are two Tunisian government agencies interested in using the proposed technology. One has had considerable experience with operating and maintaining heavy equipment. If the other agency is assigned the technology, an intensive training program will be required. See WASH Field Report No. 4.

For further information, contact Dr. D. Warner.

OTD #16 - December 15, 1980

WATER SUPPLIES FOR RURAL LAND RECLAMATION - MAURITANIA

The AID Mission in Mauritania is preparing a Project Paper for rural land reclamation intended to improve the traditional construction of "barrages" (dams). The dams retain rainwater runoff for recessional 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.

The centuries old practice of recessional agriculture commonly induces water related diseases - schistosomiasis, malaria and parasitic infections - especially when the communities around the temporary ponds use them for drinking water, watering livestock and bathing. Shallow wells dug nearby also become contaminated by human and animal wastes.

The Mission requested short-term technical assistance in sanitary engineering and tropical disease control to better identify key issues in this complex environment and to suggest alternative courses of action to deal with them. 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. See WASH Field Report No. 11.

For further information, contact Dr. R. Isely.

OTD #17 - December 23, 1980

REVIEW OF APPROPRIATE WATER SUPPLY TECHNOLOGIES, IMPLEMENTATION PLANNING, LOCAL MANUFACTURING AND TRAINING - EL SALVADOR

This OTD is to provide support for one component of a larger potable water supply and sanitation project in El Salvador. WASH consulting services were requested to provide guidance in: 1) field investigations to select sites; 2) review and selection of appropriate technologies; 3) development of manuals describing installation, operation, and maintenance of the technologies; and 4) training in same.

Technologies to be considered for use in five to ten localities include: solar, wind, or hydraulic energized pumps; storage tanks; homemade filters; utilization of rain water through dams or cisterns; and disinfecting systems. The

technologies should be easily operated and maintained, low cost, durable and appropriate to the locality.

The WASH Project Manager in the Office of Health realized that it was difficult, if not impossible, to find one person having the necessary knowledge and skills and suggested that two people be used. One would be an internationally experienced rural water supply and sanitation engineer and the other would be well versed in the practices of appropriate technology adaptation, implantation, manufacturing and marketing. The mission concurred and the WASH project was prepared to send qualified people to El Salvador when the political situation shifted. The Mission requested that technical assistance support be temporarily postponed.

For further information, contact Dr. D. Warner.

OTD #18 - December 24, 1980

WS&S IMPLEMENTATION PLAN DESIGN FOR RURAL WATER PROJECT - PERU

The purpose of this AID Project in Peru is 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) will integrate these activities into the primary health programs of those communities and simultaneously strengthen the administrative and technical capacity of the Peruvian Regional Health Offices involved in the project.

As the Directorate of Sanitary Engineering of the Peruvian Ministry of Health was experiencing difficulties in getting the Project moving, the AID Mission requested the WASH Project to provide a highly qualified professional, Mr. Harold Shipman, to expedite matters and give general guidance for the Project.

After discussion and review of the Project with AID and Peruvian officials, the WASH consultant left a list of suggestions and recommended revision of the implementation plan, procedures and schedules. His review included observations that the price of locally produced PVC (polyvinyl chloride) plastic pipe and fittings might be higher than imported pipe, and that the foundry industry in Peru could probably manufacture hand pumps, an AID supported activity underway in several other developing countries.

Follow-up support by the WASH consultant and other specialists will continue after the Directorate of Sanitary Engineering has carried out the first round of implementation recommendations. See WASH Field Report No. 6.

For further information, contact Dr. D. Warner.

OTD #19 - January 14, 1981

FOOD WASTAGE PROJECT: EXPERT PANEL REVIEW

The purpose of this OTD is to coordinate the development of a comprehensive, in-depth review of the Food Wastage/Sanitation Cost-Benefit Methodology Project carried on from 1972-1976 by the University of North Carolina at Chapel Hill and the Institute of Nutrition of Central America and Panama (INCAP). Many questions have been raised about the validity of the conclusions drawn from this project. Apparently the conclusions have been used by the detractors of U.S. investments in water and sanitation to argue for less budget. At base the hypothetical underpinnings, the research design, and the statistical inferences, as well as other methodological aspects of the project, may be faulty.

The method of assessment will be to assemble a blue-ribbon review panel composed of outstanding persons in relevant disciplines and to oversee the work of this panel towards a resolution of the question of just what this project says for policy, if anything.

Panel review meetings were in February and May at the WASH Coordination and Information Center. The final report is now under review.

For further information, contact Dr. R. Isely.

OTD #20 - January 16, 1981

**SMALL WASTEWATER STABILIZATION POND
DESIGN AND ANALYSIS - LEBANON**

Under a current Environmental Sub-project, AID is 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.

For further information, contact Dr. D. Warner.

OTD #21 - January 26, 1981

**WATER-SEAL LATRINE AND WATER STORAGE/TREATMENT
DESIGN ANALYSIS - DOMINICAN REPUBLIC**

Under Health Sector Loan II, AID is investigating supplying 26,500 homes with water-seal latrines and household water storage and filtering equipment. The Mission requested technical assistance in: 1) designing and carrying out evaluation plans for Health Sector Loan II; 2) providing information on water-seal latrines; 3) preparing specifications for household water containers and water treatment; and 4) designing health education materials for potable water and sewage disposal activities.

As a result of an on-site visit and discussions with AID, government officials and several manufacturing firms, WASH Staff will begin work on evaluation plans and educational materials and preparation of alternative specifications for plastic container manufacture in Santo Domingo.

Two recommendations were made by the Mission: 1) Mission follow-up with local ceramic manufacturers on feasibility of water-seal toilet production and investigate further community acceptance of actual use of water-seal latrines; and 2) Mission conduct a two month pilot test program on the use and acceptability of plastic household water storage containers and ceramic filters with Triocide disinfectant. See WASH Field Report No. 5.

For further information, contact Dr. D. Warner.

OTD #22 - January 26, 1981

TRAVEL FOR CONSULTANT TO ASSIST ON WATER SUPPLY AND SANITATION PROJECT

Cancelled due to conflict of schedule of consultant.

OTD #23 - January 26, 1981

**PREPARATION OF GUIDELINES FOR WATER SUPPLY AND SANITATION PROJECT
DESIGN AND IMPLEMENTATION - INTER-REGIONAL**

Many missions and several AID Bureaus have expressed a need for guidelines of this kind. The WASH staff will review relevant AID work and reports on this subject and develop realistic and useful guidelines for water supply and sanitation project design and implementation for use in developing countries.

For further information, contact Dr. D. Warner.

OTD #24 - January 30, 1981

RURAL WS&S 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) needs 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 re-structuring. Consultant's report should also include specific policy and field level recommendations for effective community participation in water supply and sanitation projects.

The engineering analysis will be of preliminary water system designs for a dozen communities of 200-2,000 inhabitants. It will include review of cost estimates and technical design appropriateness, hand pump quantities, need for additional small systems and assessment of appropriate excreta disposal systems. Recommendations should contain suggestions for community involvement in planning, design, operation and maintenance of water systems. See WASH Field Report No. 12.

For further information, contact Dr. D. Warner.

OTD #25 - February 12, 1981

**RURAL SANITATION MANPOWER DEVELOPMENT (RSMD):
WORKSHOP AND PROGRAM ASSISTANCE--INDONESIA**

The Government of Indonesia, with AID support, is in final planning stages of its Rural Sanitation Manpower Development (RSMD) Project, and requested WASH guidance on the project and for a training workshop starting February 24, 1981.

The initial scope of work for this OTD included:

1. Presentation at workshop of latest water supply and sanitation appropriate technology (AT) alternatives. This will include the development and adaptation of simple, low-cost effective WS&S technologies. Content of workshop will guide AT development programs in ten Indonesian regional training centers.
2. Formulation and servicing of plans for technological research and development.
3. Consultation with groups or individuals engaged in work related to development of systems and practices for effective wide-scale application of appropriate techniques and methods.
4. Consultation on incorporating recent techniques and methods into the training of sanitation personnel, specifically for the training of trainers.

5. Consultation on curriculum development for in-service training and/or retraining of existing sanitation personnel.
6. Review and comment on approximately 12 proposals for research already submitted by RSMD staff in Regional Centers.
7. Input on planning and conduct of future workshops, conferences and seminars on water supply and sanitation.
8. Consultation and advice on integration of elements of the University of Hawaii curricula and educational materials, as requested by the Government of Indonesia staff.

For further information, contact Dr. R. Isely.

OTD #26 - February 13, 1981

**PROJECT DESIGN ASSISTANCE FOR HEALTH AND ENVIRONMENTAL MONITORING
PROJECT (HEMP) AND WATER SUPPLY AND SANITATION MANPOWER TRAINING--TANZANIA**

USAID Mission Dar es Salaam 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 concerns development of a sanitation education master plan and the possible creation of new facilities. This will involve public health engineering curricula at the University, technician training at the ARDHI 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).

A PID has been completed for the HEMP Project but specific assistance is needed to prepare the scope of work and identify design team composition for the HEMP Project Paper. As now envisaged, HEMP has four phases spread over a five year period: planning, baseline and environmental assessment (including sanitation education and construction of appropriate sanitation devices), follow-up monitoring and assessment of sanitation interventions, and final analysis of data and publication of results.

For further information, contact Dr. D. Warner.

OTD #27 - February 13, 1981

EVALUATION OF RURAL HEALTH PROJECT - NIGER

USAID Mission Niamey requested two French speaking consultants to participate in a four-man evaluation team and visit Niger 14 March or earlier. Desired skills which were provided were in development economics and rural water supply and sanitation. The evaluation team was headed by Dr. Donald Ferguson, DS/HEA.

Components of the project to be evaluated include: 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.

For further information, contact Dr. R. Isely.

OTD #28 - February 19, 1981

REPRESENTATION OF DS/HEA AND WASH AT CONFERENCE OF WORLD FEDERATION OF PUBLIC HEALTH ASSOCIATIONS, CALCUTTA, INDIA, 23-26 FEBRUARY 1981

Dr. Isely's purpose in Calcutta was to set-up and man an AID/WASH display, participate in the conference as an international health expert, as appropriate and requested, and explain the WASH Project to all concerned. A folding graphic and photographic display of WASH functions was prepared and sample AID Robo-valves and Roboscreens were taken for exhibition, along with relevant descriptive information for distribution. Dr. Isely was able to schedule a visit to the environmental research Institute at Nagpur, India, to discuss the WASH Project and possible modes of collaboration. See WASH Field Report No. 14.

For further information, contact Dr. R. Isely.

OTD #29 - February 19, 1981

DEVELOPMENT OF LOCAL CAPABILITY TO FABRICATE HAND PUMPS AND WELL SCREENS--HONDURAS

USAID Mission/Honduras requested WASH assistance in local manufacture of the AID Hand Pump and Roboscreen. WASH consultant/contractor/sub-contractor will, in consultation with USAID/Honduras, select suitable manufacturers of AID Hand Pumps and Roboscreen and award contracts to the selected foundries.

During this manufacturing stage, the contractor will be responsible to: a) order from local foundries and machine shops, 150 AID Hand Pumps, 50 Sanpar Hand Pumps, and 100 feet of Roboscreen; b) provide working drawings, prototypes and technical assistance including dies, jigs, patterns, etc. for production of above to foundries and machine shops; c) inspect, test and accept finished products prior to release by manufacturers for installation in the field; and d) assist the Government of Honduras to identify specific locations for installation of test pumps and screens. A later Order of Technical Direction will be concerned with field installation and testing of this equipment in Stage II.

WASH will use technical assistance personnel familiar with Honduras mission personnel, local manufacturing conditions and organizations and with local manufacturing quality control aspects of AID Hand Pump and Roboscreen (broached).

For further information, contact Dr. D. Warner

OTD #30 - March 2, 1981

PARTICIPATION IN XIII CENTRAL AMERICAN CONGRESS OF SANITARY ENGINEERING MEETING, 16-20 MARCH 1981, GUATEMALA CITY, GUATEMALA

USAID/Guatemala and ROCAP indicated that this meeting would be a good opportunity to present the WASH Project and its capabilities to Latin American engineers who are assembling to discuss Central American cooperation during the U.N. International Drinking Water Supply and Sanitation Decade.

The WASH consultant, Mr. Charles Pineo, briefed the AID Mission and ROCAP on WASH, and became part of the program of the Congress. See WASH Field Report No. 15.

For further information, contact Dr. D. Warner.

OTD #31 - March 11, 1981

WASTEWATER TREATMENT DESIGN REVIEW AND GUIDELINE PREPARATION -- JORDAN

USAID/Amman and the National Planning Commission have been discussing 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 number of projects and feasibility studies underway and planned (over a dozen) merit the development of a set of wastewater treatment guidelines for the use of all concerned, hence this Order of Technical Direction.

The WASH consultant a) analyzed and evaluated the feasibility studies and designs for all wastewater treatment plants and processes under review in Jordan, including plant visits with consideration of "appropriateness and of effluent quality, standards, and self-purification of receiving waters as a function of treatment; b) participated in a round-table conference on design review and discussion of guideline scope and contents with Jordanian and AID officials and consultants; and c) prepared an outline of guidelines and recommendations for the National Planning Commission. See WASH Field Report No. 17.

For further information, contact Dr. D. Warner.

OTD #32 - March 16, 1981

COORDINATION OF WASH INFORMATION ACTIVITIES AND EXCHANGE WITH INTERNATIONAL INFORMATION CENTERS

The purpose of the WASH Project Information Center is to provide information gathering synthesis, reproduction, dissemination and follow-up services, including WS&S guideline development, to AID field Missions, Regional Geographic Bureaus and other offices of AID. The Information Center will be a clearinghouse information retrieval facility appropriate to store and disseminate WS&S information on request.

To further the development of WASH Project international information capabilities, the WASH Information Director is 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, The Hague, and its Program on Exchange and Transfer of Information (POETRI) under UNDP and WHO auspices for the UN Water Decade.

These visits are intended to establish 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 will be explored.

For further information, contact Mr. J. Beverly.

OTD #33 - April 6, 1981

DEVELOPMENT OF TESTING PROTOCOL FOR MOBILE WATER TREATMENT AND DISINFECTION UNITS IN DISASTER SITUATIONS

A sanitary engineer with background in development and coordination of testing experimental design and protocols for water treatment and disinfection devices is being 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 Medi-

cal Research and Development Laboratory (Ft. Dietrick, MD) in development of chemical, biological and virological testing protocols for mobile water treatment and disinfection units. Mr. Jack Slusser is contact person in OFDA and will provide guidance for technical assistance.

For further information, contact Dr. D. Warner.

OTD #34 - April 6, 1981

COORDINATION AND FACILITATON OF USE OF WASH
TECHNICAL ASSISTANCE SERVICES IN AFRICA

The Africa Bureau has 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. Mr. Craig Hafner, WASH Senior Project Officer, acting in this capacity, is coordinating directly with DS/HEA and AFR/DR officials, desk officers and various personnel as necessary. Periodic coordination reports and assessments will be issued during the period of the OTD.

For further information, contact Mr. C. Hafner.

OTD #35 - April 6, 1981

PARTICIPATION IN THE AWWA MEETING, ST. LOUIS, 8-12 JUNE, 1981

The American Waterworks Association International Affairs Committee extended an invitation to Dr. Mary Elmendorf, WASH Consultant, to address that Conference on the general subject of "Acceptance of Public Water supply in Developing Countries." This was also an opportunity to describe the WASH Project to that body. Coordination was made through Mr. F. Montanari, DS/ENGR, the conference panel chairman. Copies of her paper were prepared for dissemination to interested parties and are available from WASH as Technical Report No. 6, "Women, Water and the Decade."

For further information, contact Dr. R. Isely.

OTD #36 - April 6, 1981

EVALUATION OF RURAL WATER SUPPLY PROJECT - BURUNDI

WASH assistance has been sought through the AID Representative to evaluate an on-going rural water supply project in Burundi. A WASH team will assess the impact of this UNICEF project, investigate other opportunities to increase the accessibility of rural populations to safe water and suggest further means of fostering community health/sanitation education.

The request is for a rural water specialist with technical public health/sanitation background and a cultural anthropologist with background in rural water supply and sanitation. The team is to develop criteria for evaluating spring captation; conduct a brief evaluation by visting representative cross sections of the communes; and review other donor gravity fed water projects to assist in obtaining the most cost-effective systems.

For further information, contact Dr. D. Warner.

OTD #37 - April 6, 1981

**PARTICIPATION IN SESSION ON WATER, SANITATION AND HEALTH
EDUCATION, UNICEF, NEW YORK, 22-23 APRIL, 1981**

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. Dr. R. Isely and Mr. C. Pineo were invited by UNICEF to attend the meeting.

For further information, contact Dr. R. Isely.

OTD #38 - April 8 & 21, 1981

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 population 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 above and related matters were also prepared. One WASH consultant is a specialist in rural water supply technology and operation and maintenance; the other is a specialist in infrastructure organization, financing, economics and feasibility studies. The Field Report will be completed in July 1981.

For further information, contact Dr. D. Warner.

OTD #39 - May 5, 1981

**EVALUATION OF THE WATER SUPPLY SYSTEMS MANAGEMENT PROJECT
FOR THE NATIONAL WATER AND SEWAGE AUTHORITY (NWSA) - YEMEN**

WASH assistance has been sought to evaluate the on-going Water Supply Systems Management Project in the Yemen Arab Republic. The project evaluation will include:

- A. Evaluation of progress towards attainment of project objectives and goals.
- B. Recommended revision of project objectives and goals as appropriate and recommended project modifications/reductions if appropriate.
- C. Identification and evaluation of problems or conditions which may impede progress towards those objectives.
- D. Assessment of steps that can be taken to overcome or minimize those problems.

The request is for a two-person team consisting of a senior expert in water and sewerage operations and administration in developing countries, and a training/personnel advisor with water and sewage experience. The team will, among other tasks, review all relevant projects, contracts and contractor documents; examine status, capabilities and effectiveness of NWSA's plans, policies, organization, procedures and operations; and make appropriate recommendations towards achievement of project objectives and its goal.

For further information, contact Dr. D. Warner.

OTD #40 - May 14, 1981

AID HANDPUMP MANUFACTURE-PHILIPPINES

As part of the Barangay Water Program, AID/Philippines has requested technical assistance for local reproduction of the AID handpump. The scope of the work includes: selection of manufacturers of handpumps and deep well cylinders; technical assistance to the selected manufacturers; preparation of a handpump operations manual and a well design and construction manual; and participation in training activities.

One or more persons with extensive experience in handpump manufacturing, well drilling and training in developing countries will be required.

For further information, contact Dr. D. Warner.

OTD #41 - June 1, 1981

TECHNICAL ASSISTANCE OF CULTURAL ANTHROPOLOGIST IN PEACE CORPS TRAINING PROGRAM IN AREAS OF COMMUNITY DEVELOPMENT AND PARTICIPATION IN WATER SUPPLY AND SANITATION

The Peace Corps Water and Sanitation Sector has organized an intensive "training for trainers" program to be conducted in New Mexico for 30 "trainers-to-be" May 31 to July 3, 1981 in conjunction with the U.S. Indian Health Service. The trainers are to work in Kenya, Guatemala, Togo, Yemen, Lesotho and Tonga.

The purpose of the training program is 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. In the training program, an emphasis will be placed on the relationship of water and sanitation technologies to community development activities.

WASH has been asked to provide a cultural anthropologist who could provide specific expertise and training capabilities in the following areas: 1) the role of the family (with an in-depth look at women's, men's, children's and old person's roles) in community based water/sanitation projects; 2) community dynamics, that is, what is a community, how are decisions made, what are the leadership patterns, what constitutes group involvement in village projects, etc.; 3) present water/sanitation patterns and habits in the community; 4) individual attitudes, and taboos regarding water supply and waste disposal; and 5) the organization of operations and maintenance activities to support water/sanitation facilities.

For further information, contact Mr. C. Hafner

OTD #42 - June 12, 1981

TECHNICAL ASSISTANCE TO AID OFFICE OF FOREIGN DISASTER ASSISTANCE (OFDA)

The WASH Project has been requested by DS/HEA and OFDA to develop, and to maintain on a standby-basis, a team of qualified disaster assistance personnel. The team will include 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 will be selected and trained in advance and will be available for short-term overseas assignments on short notice.

For further information, contact Dr. D. Warner.

OTD #43 - June 17, 1981

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 small 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 is desired in refining designs, revising the post-completion manual, and improving local manufacture of BWP system components. The consultant will also inspect each operational BWP "Level III-A" system, make appropriate recommendations, and produce a set of 35mm color slides of these systems for training, orientation and de-briefing purposes.

For further information, contact Dr. D. Warner

OTD #44 - June 26, 1981

**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 is needed to refine the proposed design and to identify required program inputs. This work is a follow-on to OTD #25, in which WASH consultants participated in a planning workshop in Batu-Malang, East Java, in March, 1981, on the Rural Sanitation and Manpower Development Project (RMSD).

For further information, contact Dr. R. Isely.

SUMMARIES OF SELECTED CIC TASKS

CIC #2 - September 29, 1980

A BRIEF REVIEW OF ORAL REHYDRATION THERAPY

The purpose of this task was to review the literature on the use of water disinfection in the preparation of oral rehydration solutions. This review was then to be incorporated into a discussion of this and related issues and subsequently into a report emanating from that discussion.

This review was performed by Glenn Whaley, a graduate student at UNC under the supervision of Dr. Isely. The discussion was led by Drs. Richard Cashan and Lincoln Chen on November 13, 1980.

Several research issues have resulted from the literature search and discussions. Among these are:

What is the effect of adding a disinfectant to ORS (oral rehydration solutions) from different water sources, e.g. with different degrees of contamination?

What is the effect of introducing new innocula of various organisms in individuals already infected?

What can be done to assure safe water in domestic containers and what is the effect on the safety of ORS?

These research issues should be pursued, some under WASH, others through separated funding. See WASH Technical Report No. 2.

For further information, contact Dr. R. Isely.

CIC #3 - October 2, 1980

TRIOCIDES QUESTIONS AND ANSWERS - EXECUTIVE SUMMARY

This document reports the results of an investigation into the suitability of a potable water disinfectant called Triocide for use by the U.S. Agency for International Development in its overseas programs. The investigation was performed during the month of October 1980 by a WASH consultant. The work focussed upon the safety and effectiveness of the disinfectant itself, but did not examine or field-test entire water treatment systems incorporating Triocide. The investigation involved interviews and correspondence with knowledgeable individuals and organizations as well as a literature review, but did not include additional laboratory field testing beyond that reported by others.

The major conclusions of this investigation are:

1. Triocide disinfection providing a significant iodine residual in treated water appears a safe, simple and effective short-term emergency disinfection technology, with distinct operational advantages over other technologies currently available.
2. The operational advantages of Triocide also make the possibility of medium and long-term use attractive, but the presence of significant iodine residual in the treated water raises questions of possible iodine toxicity. These concerns can be reduced with a reduction in iodine residual, but only with a corresponding increase in the risk of pathogen survival in treated water from subsequent recontamination.
3. The question of medium and long-term iodine toxicity is a controversial one with conflicting evidence and opinions as to the existence and mag-

nitude of the risk. Continuous use of water with iodine residual for periods up to three weeks involves no significant hazard by any account, and continuous use for years appears unwise in the face of existing evidence and uncertainty. No exact dividing line currently exists between the above "short-term" and "long-term" periods, and decisions about "medium-term" use should reflect local conditions and the feasibility of alternative means of disinfection.

See WASH Technical Report No. 1. For further information, contact Dr. R. Isely.

CIC #47 - December 10, 1980

SYNTHESIS OF EVALUATION METHODS AND APPROACHES TO THE EVALUATION OF COMMUNITY WATER SUPPLY PROGRAMS

The AID Mission in Malawi is assisting the Government in the design of an evaluation plan for community water supply programs. The Mission requested descriptive material on relevant evaluation work done on developing countries that could be applied in Malawi. This information would also provide useful background for the Government in its selection of its own evaluation specialist.

A consultant from the Research Triangle Institute was contracted to review the literature, discuss the state-of-the-art with evaluation specialists in North Carolina and Washington, DC, write a synthesis, and prepare a bibliography. See WASH Technical Report No. 4.

For further information, contact Dr. R. Isley.

**LIST OF WASH PUBLICATIONS: TECHNICAL REPORTS,
WORKING PAPERS AND FIELD REPORTS**

Technical Reports

1. WASH Technical Report 1. Triocide Questions and Answers. November, 1980.
2. WASH Technical Report 2. Possible Disinfection of Oral Rehydration Solutions:
Notes from November 13, 1980 meeting with Drs. Richard Chen and Lincoln Chen.
3. WASH Technical Report 3. Training of Rural Community Development Workers in Health Education, with Special Reference to Water Supply Protection and Use/Maintenance of Sanitation Facilities, March, 1981. Prepared for Mandara Mountains Water Resource Project, USAID Mission, Yaounde Cameroon by Guy Steuart and Carla Rull.
4. WASH Technical Report 4. Evaluation Methods for Community Rural Water Supply and Sanitation Projects in Developing Countries: A Synthesis of Available Information, March 31, 1981. Prepared for the USAID Mission to Malawi by Dr. Robert Struba.
5. WASH Technical Report 5. The Choice of Health Status Indicators to Evaluate Water and Sanitation Projects in North Cameroon: A Synthesis of Available Information, April 9, 1981. Prepared for Mandara Mountains Water Resource Project, USAID Mission to the United Republic of Cameroon.
6. WASH Technical Report 6. Women, Water and the Decade. Presented at the International Affairs Session of the American Water Works Association, St. Louis, Missouri, June 9, 1981 by Dr. Mary Elmendorf.

Working Papers

1. WASH Working Paper 1. UNICEF/PAHO Joint Workshop on Drinking Water and Sanitation in Rural and Urban Slum Areas - Lima, Peru, November 17-22, 1980. Report of Professor Emil T. Chanlett. OTD #5.
2. WASH Working Paper 2. Water and Sanitation Alternatives for Southern Italy Disaster Relief, December 1980. Prepared by David R. Goff and Michael A. Kostur. OTD #13.
3. WASH Working Paper 3. Technology Transfer. Report by Peter Kolsky. December, 1980.
4. WASH Working Paper 4. Resume of Assignments Financed Through the WASH Project Pre-CDM Contract, April 16, 1981. Prepared by Charles S. Pineo.
5. WASH Working Paper 5. Intensive Session on Water Sanitation and Health Education: A Workshop Held at UNICEF Headquarters, New York, April 22-23, 1981. Prepared by Dr. Raymond B. Isely. OTD #37.

Field Reports

1. WASH Field Report 1. Socio-Cultural and Economic Characteristics of Conditions in Ancash and La Libertad, Peru with Special Emphasis on the Callejones de Huaylas and Conchucos: Questions to be Considered in an Evaluation of CARE-Sponsored Water, Sewage and Health Projects by Charlotte D. Miller, Ph.D., November, 1980. OTD #6.
2. WASH Field Report 2. Review of AID Rural Potable Water Programs - Haiti, November 16-29, 1980. OTD #9.
3. WASH Field Report 3. Feasibility of Local Manufacture of the AID Hand-Operated Water Pump, and other Technology Appropriate for Rural Water Supply Programs in the Phipippines. Prepared for USAID by Phillip W. Potts, Robert Knight and Dr. Yaron M. Sternberg. April 1979. OTD #11.
4. WASH Field Report 4. Tunisia, Aspects of Well Drilling Rural Potable Water Project - Report on a Field Trip, December 20-27, 1980. Prepared for USAID by Michael Glaze. OTD #15.
5. WASH Field Report 5. Dominican Republic Consultations on the Health Sector Loan II. Report of a Field Trip January 26-30, 1980. OTD #21.
6. WASH Field Report 6. Report on the Peru Rural Water Systems and Environmental Sanitation Project, January 31, 1981. Prepared for USAID by Harold Shipman. OTD #18.
7. WASH Field Report 7. Tanzania - A National Environmental Sanitation Education Master Plan, A Preliminary Review, February 22-March 13, 1981. Prepared for USAID by Dennis B. Warner and Kenneth Woolf. OTD #26.
8. WASH Field Report 8. Tanzania - Health and Environmental Monitoring Project (HEMP): Recommendations for Project Paper Design Team, February 22-March 13, 1981. Prepared for USAID by Dennis B. Warner and Kenneth Woolf. OTD #26.
9. WASH Field Report 9. WASH/CDM Five - Quito, Ecuador (T-14). Prepared for USAID and the Fundacion Natura by Paul C. Dreyer. OTD #14.
10. WASH Field Report 10. Lebanon - Technical Recommendations for Wastewater Treatment Demonstration (Pilot) Plants for Lebanon, March, 1981. Prepared for USAID's Lebanon Mission by A.A. Kalinske. OTD #20.
11. WASH Field Report 11. Mauritania - Public Health Assessment of Proposed Dams, Water-Related Diseases and Community Water Supplies, March, 1981. Prepared for USAID by Dr. Emile Malek and David Goff. OTD #16.
12. WASH Field Report 12. Ecuador - Institutional Development for IEOS: Instituto Ecuatoriano de Obras Sanitarias, March, 1981. Prepared for USAID by Dr. Charles S. Pineo, Henry Van and Guillermo Orozco. OTD #14.
13. WASH Field Report 13. Proyecto de Sistema de Entrega de Salud Rural Integrado - Saneamiento Rural, March, 1981. Prepared for USAID Mission in Quito, Ecuador by Gonzalo Medina. OTD #24.

14. WASH Field Report 14. Targets of Opportunity for WASH: Report of A Reconnaissance Visit to India and Bangladesh, February 20-March 7, 1981. Prepared for USAID by Dr. Raymond B. Isely. OTD #28.
15. WASH Field Report 15. Guatemala - XIII Central American Congress of AIDIS, Guatemala City, March 15-20, 1981. Prepared for USAID by Dr. Charles S. Pineo, March 28, 1981. OTD #30.
16. WASH Field Report 16. Indonesia - Rural Sanitation and Manpower Development Project (RSMD). The Development of Appropriate Technology and the Improvement of Curricula for Training of Sanitarians, March 6, 1981. Prepared for the USAID Mission, Indonesia by Dr. Clarence E. Calbert and Dr. Robert A. Gearheart. OTD #25.
17. WASH Field Report 17. Jordan - Recommended Wastewater Treatment Guidelines for the Hashemite Kingdom of Jordan, April 6, 1981. Prepared for the USAID Mission, Jordan by Harris F. Seidel. OTD #31.
18. WASH Field Report 18. Coordination of WASH Information Activities and Exchange with International Information Centers, Holland and England, April 5-17, 1981. Prepared for USAID by James E. Beverly. OTD #32.
19. WASH Field Report 19. To be designated.
20. WASH Field Report 20. Technical Assistance in the Manufacture and Quality Control of the AID/Battelle Handpump in the Dominican Republic, June, 1981. Prepared for the USAID Mission Santo Domingo by Robert Knight. OTD #1.