

PD-ABJ-900

usw 91763

**UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT  
(USAID)**

**SMALL-SCALE IRRIGATION MANAGEMENT PROJECT  
(SSIMP)**

**QUARTERLY REPORT NO. 7**

**April - June, 1989**

**HARZA ENGINEERING COMPANY  
in association with**

**Development Alternatives,  
Inc.**

**Global Exchange,  
Inc.**

**P.T. Wiratman  
and Associates**

QUARTERLY REPORT NO.7

Period : April - June 1989

TABLE OF CONTENTS

SECTION	DESCRIPTION	PAGE
I	Background, Description of Project and Harza Services .....	I- 1
II	Activities During Quarter .....	II- 1
	<u>Nusa Tenggara Barat</u>	
	A. General .....	II- 1
	B. Trips .....	II- 2
	C. Meetings .....	II- 3
	D. Reports .....	II- 5
	E. Other Major Activities .....	II- 5
	E.1. Tiu Kulit Dam Project .....	II- 5
	E.2. Kalimantan II Weir Project .....	II- 6
	E.3. Gapit Project .....	II- 7
	E.4. Batujai-Surabaya Project.....	II- 8
	E.5. Training and Technology Transfer .....	II- 9
	E.6. PU-NTB .....	II- 9
	<u>Sulawesi Selatan</u>	
	A. General .....	II-11
	B. Trips .....	II-12
	C. Meetings .....	II-13
	D. Reports .....	II-14
	E. Other Major Activities .....	II-14
	E.1. Awo Project .....	II-14
	E.2. Salomekko Project .....	II-17
	E.3. Ponre-Ponre Project .....	II-20
	E.4. Selli-Coppobulu Project .....	II-21
	E.5. Raja-Telaga Project .....	II-22
	E.6. Environmental Studies .....	II-22
	E.7. Training and Technology Transfer .....	II-23
	E.8. PU-SULSEL .....	II-24
	<u>Groundwater</u>	
	Nusa Tenggara Barat .....	II-26
	Nusa Tenggara Timur .....	II-27
	Sulawesi Selatan .....	II-29

TABLE OF CONTENTS (Cont' d)

SECTION	DESCRIPTION	PAGE
III	Problems Encountered and Recommended Solutions	
	Nusa Tenggara Barat .....	III- 1
	Sulawesi Selatan .....	III- 2
	Groundwater .....	III- 3
IV	Planned Activities for Next Quarter	
	Nusa Tenggara Barat .....	IV- 1
	Sulawesi Selatan .....	IV- 1
	Groundwater .....	IV- 2
	Nusa Tenggara Barat .....	IV- 2
	Sulawesi Selatan .....	IV- 2
	Nusa Tenggara Timur .....	IV- 2
V	Financial Status .....	V- 1
VI	Movement of Employees .....	VI- 1
	Staffing Schedule (original) .....	Fig. 1
	Staffing Schedule (current) .....	Fig. 2
	Time Line Schedule (Tiu Kulit) .....	Fig. 3
	Time Line Schedule (Kalimantong II) .....	Fig. 4
	Tiu Kulit Boring Program (plan) .....	Fig. 5
	Tiu Kulit Boring Program (section) .....	Fig. 6

## SECTION I

### BACKGROUND, DESCRIPTION OF PROJECT AND HARZA SERVICES

#### BACKGROUND AND DESCRIPTION OF PROJECT

The goal of the Small-Scale Irrigation Management Project (SSIMP) is to expand agricultural production by diversifying production, increasing cropping intensity and improving water reliability. Progress in achieving this goal will be measured by increases in cropping intensity, seasonal crop productivity, secondary crop production, and economic returns.

The purpose of SSIMP is to design and apply irrigation technologies and management systems that support diversified cropping patterns in selected eastern islands of Indonesia. Irrigation systems financed under the project will be designed and managed to the maximum extent feasible for diversified cropping. This measure is especially appropriate in the three project provinces where water scarcity may significantly limit the command areas if only rice production is encouraged.

The SSIMP will:

- support the construction of surface irrigation systems in South Sulawesi and Nusa Tenggara Barat provinces to serve an estimated 19,500 ha of rice and secondary crops
- support the further exploration, development, and expansion of small-scale groundwater projects in South Sulawesi, Nusa Tenggara Barat and Nusa Tenggara Timur to serve an estimated 5,200 ha of rice and secondary crops
- strengthen the capacity of the Provincial Public Works staff within the three provinces to utilize new or improved irrigation technologies and management systems appropriate to the needs of the farmers in that agro-climatic zone
- assist in the examination of relevant program issues, and the testing of innovative technologies through collaborative studies and research efforts with the Directorate General of Water Resources Development (DGWRD) of the Ministry of Public Works (PU).

The life of the project for SSIMP is eight years, 1985 through 1993, based on the amount of time required to complete pre-construction surveys and designs, construction of surface systems, expansion of groundwater systems, and post-construction management and monitoring requirements for all of the systems.

It is expected that the project will have two general phases of activities: preparation and planning (first 12 months) and implementation (7 years).

The Small-Scale Irrigation Management Project is a very complex program of activities, by many different agencies, over a wide geographical area. These activities may be divided into the following four subject areas:

1. Improved Irrigation Technologies
2. Strengthening Provincial Public Works (PU) Management
3. Increased Beneficiary Participation
4. Special Studies and Pilot Activities

Each activity is described in the following paragraphs:

#### Improved Irrigation Technologies

- a. Design and Construction. The project will support the development and construction of irrigation systems to provide a reliable water supply to an estimated 23,000 ha of rice and secondary crops in the three provinces of South Sulawesi, Nusa Tenggara Barat (NTB), and Nusa Tenggara Timur (NTT). Four irrigation technologies will be utilized: surface diversion and surface lift systems servicing an estimated 7,200 ha; reservoir systems servicing an estimated 12,300 ha; and groundwater systems servicing an estimated 5,200 ha. All four technologies will be applied in the provinces of South Sulawesi and NTB, while investments in NTT will concentrate on groundwater.
- b. Management of Irrigation Systems. "Management" in this section is defined as the control and rational distribution of limited water supplies in an irrigation command area in order to maximize the area under cultivation. It refers to both the technical and organizational requirements and to the process linking them together.

#### Strengthening Provincial Public Works Management

Substantial decentralization of planning and design of irrigation systems to the Public Works Provincial levels is expected to occur.

To enhance the performance of Public Works (PU) units within the three provinces and the six districts in which activities will be implemented, the project will support the following activities:

1. Introduction of new or improved management tools for both Provincial and Section offices
2. Training and professional development
3. Improved Provincial PU capacity for management of design and construction contracts.

### Increased Beneficiary Participation

The target beneficiaries of this project are the farmers within the command areas. They will participate in four stages of system development under the project:

- a. Site Selection Process. Criteria which ensure farmer participation will be developed for post-project irrigation investments in the three provinces.
- b. Site Profile and Review of Technical Design. The pre-construction activities under the project will include the preparation of a site profile to define agronomic and socio-economic factors. Due to the command area size and the technical nature of the systems, farmers need not be directly involved in the detailed review of the primary and secondary distribution systems, although they will be consulted. Their primary role will be in review and adjustment to the tertiary network design.
- c. Construction. Farmer participation in the construction stage can take several forms including contract labor, farmer-managed construction, or farmer oversight of contractor work. The extent and character of farmer participation will be decided during the development of site profiles and the review of the tertiary system design.
- d. Management and Maintenance. Farmers will be responsible for the management of the tertiary systems. Division of specific responsibilities between the Public Works and water user groups, including an expansion of farmer responsibility, will be defined at the design review and construction stage.

### Special Studies and Pilot Activities

In order to provide sound technical and management plans and recommendations dealing with specific irrigation issues, the project will support a series of special studies and pilot activities to be agreed upon during project implementation. It is anticipated that issues to be addressed may include assessment of private sector role in groundwater, baseline environmental assessment, and policy and management studies especially related to system operation and maintenance.

## Harza Services

Harza consulting services are set forth in Contract AID 497-C-00-7139-00, dated September 1, 1987. The contract describes the scope of services, costs and the duties and responsibilities of the parties.

Three semi-independent teams will be required, one for each of the project provinces. In each province, the Consulting Firm will designate a team leader who will be responsible for the coordination of activities within the province. In addition, there will be a Chief of Party who will be responsible for management and coordination of all Consultant personnel. The Chief of Party will also serve as liaison between his staff and the GOI and USAID.

The contract provides for both local and expatriate specialists. Harza is the prime contractor, and has three subcontractors, with whom subcontracts have been executed. The subcontractors are:

1. Development Alternatives, Inc., Washington, D.C.
2. Global Exchange, Inc., Xenia, Ohio
3. P.T. Wiratman & Associates, Jakarta, Indonesia.

Harza, as prime contractor, retains responsibility for management of the project, and provides the Chief of Party, provincial team leaders, and several key specialists.

The subcontractors provide specialists in agricultural economics, social science, civil engineering and groundwater geology.

Basically, the purpose of the Harza technical assistance team is to provide guidance and direction to the provincial Public Works staff and their local consultants, as they select, evaluate, design and construct small-scale irrigation projects, and to help them in critical technical areas, where they lack experience.

The person-months for each entity as set forth in the Contract are shown on Figure 1, and are summarized below:

<u>Name</u>	<u>Person-months</u>
Harza Engineering Company	140
Development Alternatives, Inc.	63
Global Exchange, Inc.	118
P.T. Wiratman and Associates	<u>148</u>
Total	469

Due to mutually agreed-upon modifications since signing the Contract, the person-months for each entity are now:

<u>Name</u>	<u>Person-months</u>
Harza Engineering Company	140
Development Alternatives, Inc.	50
Global Exchange, Inc.	118
P.T. Wiratman and Associates	122
Total	430

and are shown on Figure 2.

The major changes have been in the DAI Social Scientist position, where a more experienced person has been hired for a shorter term, and in the Wiratman subcontract, where a senior groundwater hydrologist has been retained to replace two driller-trainers. Also, an additional irrigation specialist has been brought on to utilize a Global groundwater position that did not materialize. During this quarter, the TA team has added an agriculturalist for Kupang, to utilize the remainder of the unscheduled Global person-months, and has added the services of a geologist from Wiratman on an as-needed basis, to help monitor the foundation exploration activities in South Sulawesi.

## SECTION II

### ACTIVITIES DURING QUARTER

#### NUSA TENGGARA BARAT

##### A. General

At the start of this quarter, the Technical Assistance staff of the NTB SSIMP office comprised the following long term members:

Jeff Frey, TA Team Leader/ Civil Engineer (Harza)  
Robin Erickson, Agricultural Economist (DAI)  
Terry Haryanto, Irrigation Engineer (Wiratman)  
Pamudji Rahardjo, Hydraulic Structures (Global)  
Soekardi P., Hydrogeologist (Wiratman)  
W. Schoenleber, Irrigation Engineer (Global)

During this report period the following individuals made visits to the NTB office:

Mr. Santosh Banerjee, Harza's Senior Design Engineer from Chicago, visited Mataram during the period 7-20 April to review the tender drawings that P.T. Mettana had designed to that date. He is expected to return again early in the next quarter to determine if all the revisions have been accomplished.

Mr. James Murdoch, Harza's Mechanical Engineer from Kupang, visited Mataram during the period 11-18 April to make an estimate of the repairs necessary to make the newly acquired Hydreg Minor drill rig operational.

Mr. Dennis McCandless, TA Civil Engineer from Ujung Pandang, visited Mataram during the period 13-16 April to review tender drawings that had been designed by Mettana on the Tiu Kulit project.

Ir. Benyamin, Wiratman's Management Staff from Jakarta, arrived in Mataram on 17 April to discuss staffing assignments with Team Leader Frey in order to meet the review schedule of the designs being prepared by Mettana and GeoSurvey consultants.

Mr. Arahata, OECF's representative from Jakarta, arrived in Mataram on 18 April to discuss the Tiu Kulit design schedule and make a site visit to Sumbawa Island.

Dr. Carol Hetler, DAI Social Scientist from Ujung Pandang, assisted in the final preparation of the environmental report during the period 14-29 May. She accompanied the TA team to Gapit Project during the period 29 May to 6 June to conduct Agro-economic surveys for the feasibility study of Gapit Dam.

Mr. Donald Adolphson, Hydrogeologist from Kupang, made an initial visit to Mataram during the period 15-17 May to discuss the ground water program in detail with Ir. Soekardi, and NTB P2AT staff. Mr. Adolphson returned again to Mataram for brief discussions on 28-30 June. He had been in language training so he required an update on the activities in this program by P2AT and SSIMP officials here.

Ir. Ganda, GeoSurvey's Design Engineer from Bandung, visited Mataram during the period 24-25 May to arrange the added technical staff for the preparation of the tender drawings on the Kalimantanong II project.

Mr. Eric Will, Chief of Party in Jakarta, made a visit to Mataram during period 31 May to 9 June to assist in report writing and discuss budget allocations.

Ir. T.Nadjib Mustafa, Wiratman's Senior Design Engineer from Jakarta, arrived in Mataram on 14 June to review tender drawings under preparation by P.T. GeoSurvey for the Kalimantanong II project. He is expected to complete his assignment and return to Jakarta by the second week of July.

Ir. Gunawan and Ir. Irwan from USAID, held discussions with PU, Consultants (Mettana and GeoSurvey) plus TA staff members on the preparation of tender documents for Tiu Kulit and Kalimantanong II projects, respectively during the period 14-16 June. They also made site visits to ascertain the suitability of permanent buildings to be located in Taliwang, Sumbawa Besar and at the Tiu Kulit Dam site.

Ir. Yansen, Wiratman's Geologist from Jakarta, spent the period 8-24 June monitoring the drilling work of P.T. Mettana at Tiu Kulit dam site.

Mr. Robert Styles, Harza's Specification Specialist from Chicago, arrived in Mataram on 20 June to review the draft tender documents that were prepared by P.T. Mettana and P.T. GeoSurvey thus far. He is expected to complete his work by mid-July.

## B. Trips

Project travel by NTB staff members during this period was relatively light with the emphasis being to concentrate on the completion of the preparation of the tender documents for the Tiu Kulit and Kalimantanong II projects.

NTB Team Leader Frey made two trips to Jakarta during the periods; 26 April-1 May for meetings with DOI I, and 11-16 May to write the quarterly report and for a status review meeting on Kalimantanong II project. The review meeting resulted in a suggestion to increase the design and drafting staff for the consultant GeoSurvey in order for them to finish their contract by the 30 June deadline.

Irrigation Engineer Schoenleber traveled to Jakarta during the week of 10- 15 April to obtain medical treatment and briefly discuss tender document preparation status with USAID.

Irrigation Engineer, Ir. Terry H, was requested to return to Jakarta by Wiratman and Associates during the period 25-30 May to attend a special training seminar and for additional technical/ administrative discussions.

TA team members, Messrs. Schoenleber, Terry H., Pamudji R. and Soekardi P., made a site visit to Kalimantanong II project during the period 26-28 April to resolve design problems on the right bank main system alignment. Several GeoSurvey and PU design engineers also participated in these field discussions.

Mr. Robin Erickson, DAI Agro-economist, led a group of PU counterparts on a nine-day (29 May to 6 June) field trip to the Gapit project area to collect agro-socio-economic data to support impending project feasibility studies. Dr. Carol Hetler, TA Social Scientist from Ujung Pandang, accompanied the NTB team during this trip.

Ir. T. Nadjib M, Senior Design Engineer from Wiratman and Associates of Jakarta, made a site visit to Kalimantanong II project during the period 19-20 June to acquaint himself with field conditions in relation to his task of review of the tender drawings presently being prepared by P.T. GeoSurvey.

### C. Meetings

The following meetings were considered important for this reporting period:

On 13 April, Messrs. Banerjee, McCandless and Frey met separately with Mettana (Santoso, etc.) to comment on the necessary revisions to Tiu Kulit drawings.

On 18 April, Messrs. Arahata (OECF), Gunawan (USAID), McCandless and Frey (SSIMP) met briefly to discuss the WUAO's training program.

On 19 April, Mr. Ron Denson, et al. (DIKLAT) Jakarta met with Team Leader Frey to discuss the database training programs being created.

On 19 April, Mettana staff members (Santoso, Rahdi, Pantouw and Diah) met with PU-NTB (Sudanta) and SSIMP (Frey) to discuss the Gapit Projects' TOR in order to review the proposed study plan.

On 22 April, GeoSurvey staff members met with PU-NTB (Danang) and SSIMP (Banerjee, Frey, Pamudji and Terry) to make a review of the current status of tender document preparation on Kalimantanong II project.

On 27 April, Messrs. Giovani, Danang and Sudanta (PU), Irwan (USAID) plus Banerjee, Will and Frey (SSIMP) met to discuss additional drilling on Tiu Kulit with Mettana (Santoso and Pantouw). The permanent buildings, road and construction schedule of Kalimantanong II project was also discussed with GeoSurvey. Both of these meetings were held in the Kemang Hotel Jakarta.

The meeting of 15 May 1989, chaired by Ir. Mashudi at Irrigation I in Jakarta, concerned the current status and proposed work schedule for completion of the Kalimantanong II design and tender documents by P.T. GeoSurvey. Participants at the meeting included Ir. Giovani Wiyarto and Ir. Budi Susilo from DGWRD, Ir. Gunawan and Ir. Irwan from USAID, Jeff Frey from Harza and Mr. Komarudin from GeoSurvey. The initial topic of this meeting was the current status of the Kalimantanong II weir drawings. During late April, the TA Team senior design Engineer Mr. Banerjee completed a review of the weir drawings and marked items for extensive revisions. In order to complete these revisions, Mr. Frey suggested that GeoSurvey assign an additional senior design engineer to the Mataram GeoSurvey team for four to six weeks. This senior design engineer should have adequate experience so that all decisions to complete these drawings could be made in Mataram without resorting to final approval in Bandung. After further discussions, the following schedule was proposed by Ir. Mashudi for P.T. GeoSurvey:

- a. 18 May, GeoSurvey team would return to Mataram from the Idul Fitri recess including two additional engineers (at least one at the senior level) and three additional draftsmen.
- b. 20 May, GeoSurvey team meets with PU Project Manager, his staff plus the Harza TA team to discuss the status of weir and irrigation distribution system work.
- c. 25 May, first weekly work review meeting with GeoSurvey, PU Project Manager and staff plus the Harza TA team.
- d. first, eighth and fifteenth of June would be weekly review meetings at TA office in Mataram.
- e. 22 June, GeoSurvey would complete design and tender drawings (plus documents) for the weir and irrigation distribution system contracts.
- f. 30 June, GeoSurvey would complete their final report.

The above mentioned schedule of weekly meetings between the TA team and P.T. GeoSurvey did in fact take place plus many other additional informal sessions to discuss day-to-day design problems.

On 20 June, a meeting in Jakarta between DOI-II, USAID and SSIMP staff members discussed future groundwater programs in NTB, NTT and SULSEL provinces.

During the period 14-16 June, visiting USAID staff (Ir. Gunawan and Ir. Irwan) held meetings with consultants Mettana and GeoSurvey together with PU-NTB officials and TA team members to determine progress of preparation of tender documents for projects Tiu Kulit and Kalimantanong II, respectively.

On 18 June, Messrs. Frey and Schoenleber met Gunawan and Irwan at the Mataram airport to discuss the results of their trip to Sumbawa Island to view the selected permanent housing sites for the two priority projects there.

On 28 June, Messrs. Masnun, Kartabrata, Danang and Frey met with GeoSurvey design engineers to finalize the proposed siphon crossing the Brang Enek River to provide irrigation water to about 480 hectares of the Kalimantanong I service area (third cropping season only).

#### D. Reports

During this period, the NTB-SSIMP office published the final Environmental Impact Assessment report for Tiu Kulit project. The same report for Kalimantanong II project was finalized at the end of June and will be printed the first week of July.

The other major report effort for this period was the continued preparation of the Tiu Kulit Project Justification report. The draft report should be complete by mid-July.

#### E. Other Major Activities

##### E.1 Tiu Kulit Dam Project

Activity on the Tiu Kulit project in the NTB-SSIMP office was very heavy throughout the month of April. Senior Design Engineer Santosh Banerjee reviewed the complete dam drawing set (about 90 drawings). Dennis McCandless, Ujung Pandang TA Civil Engineer, also came to Mataram to assist in the review. Daily meetings were held with the Mettana team headed by Ir. Santoso. Major design changes were made to the diversion/outlet works tunnel arrangement, i.e. the shaft was removed in favor of an up-stream gate structure at the inlet. The alignment was also angled further east to shorten the tunnel. The headrace canal was moved away from the saddle dam to a low dike just downstream. Many corrections and refinements were suggested for the service and emergency spillway structures, dam foundation treatment, and access road. Mettana spent May and June doing these drawing revisions in anticipation of Mr. Banerjee's return in early July.

Progress on the irrigation system design and drawings has been slow. Although nearly all of the 128 main/secondary drawings and 449 tertiary drawings have been drafted and checked by the TA staff, only 20 drawings have been corrected and re-submitted.

Mettana made a new start on the permanent building drawings since PU-NTB Project Embung confirmed that Cipta Karya would need detailed designs and BOQ's to sign off on the contract. Mettana and Project Embung have proposed a design contract supplement to USAID to perform this work.

One of the two major technical issues reported last period (i.e., additional drilling) was started during June. At the time of this writing, not much progress was reported on the drilling due to failure of equipment and the absence of the surveyor to determine the exact location of bore hole number DH-20. The original locale of this bore hole appears to be situated on a nearly vertical hillside and it would be impossible to set up the boring rig at that site. The problem was resolved only after the surveyor returned from the Gapit site. Field checking also revealed some possible errors in the topo mapping which will be checked by Mettana. See Figures 5 and 6 appended to this report.

## E.2 Kalimantong II Weir Project

During this period, there has been a concentrated effort on the part of P.T. GeoSurvey to finalize the weir and irrigation distribution system design drawings to meet the 30 June deadline. As reported earlier in this report (see paragraph C. Meetings), Irrigation I Jakarta had directed GeoSurvey to increase their Mataram design staff to meet this extended schedule. This has been done, albeit they were somewhat tardy in getting their senior design staff mobilized to Mataram. At the time of this writing, it appears that only the weir drawings will be completed on schedule with the main/secondary and tertiary drawings lagging at least one month behind. The draft tender document preparation schedule suggested by USAID has been largely met, but there is no hope of meeting the final version preparation schedule before the expiration of GeoSurvey's current contract.

The field trip by TA team members on 26-28 April was meant to resolve several alignment problems. In particular, the right bank main canal crossing the Taliwang Lake outlet valley was initially designed to construct a high (6 meter) earthen embankment over 1,300 m in length. Subsequent alternatives could substantially reduce this embankment height, but at a loss of area to be served. In fact, three alternates were studied, but cost-benefit ratios await an engineer's estimate by GeoSurvey.

The cost-benefit and IRR analyses by our Agroeconomist is also dependent upon these final cost computations. At this writing, the proposed Brang Enek River crossing to supply water to the Kalimantan I project is being discussed in terms of whether to construct a siphon under the river or to provide an aqueduct over it. Some of these design alternatives may not be properly addressed given the tendency to beat a deadline. This past month has also taxed the limit of the TA team in trying to review the sudden rush of documents produced by GeoSurvey's expanded design team.

### E.3 Gapit Project

P.T. Mattana officially began work on 1 April as the local consultant for the Gapit project design review and pre-feasibility study. By the 25th of May, they had produced their Inception Report plus two monthly progress reports. They are using the same design computer programs that have been written for the Tiu Kulit Dam and are by now recognized (quasi-approved) by the TA team. The scope of work is listed as follows:

- a. reviewing previous design and project reports.
- b. completing and evaluating the data on geology, hydrology, irrigation area and topographic maps.
- c. determination of the design criteria that will be used for the storage reservoir.
- d. determination of the major features arrangement (i.e. main dam, saddle dam, spillway and outlet works).

The end of this four month review will culminate in a final report that will list the results of all the major analyses and investigations.

During this report period, topographical surveys are being conducted to delineate the volume of the storage area, i.e. mapping the reservoir area at a scale of 1:2,000 and the dam site at 1:500. The coordinates for these new surveys will be based on the previous mapping completed by Fenco in 1981.

Preliminary results of these surveys are as follows:

- a. there are several alternate main and saddle dam axis locations to study to determine which will produce the minimum volume of embankment.
- b. alternate spillway locations include the center rock knob, or at the left abutment of the main dam.
- c. the choice of locating the outlet tunnel through the center rock knob (as in Tiu Kulit); or, with a cut and cover conduit system at the left abutment of the main dam, will depend on least cost computations.
- d. the final access road alignment (3 km) from Gapit village to the dam site is difficult to ascertain with the existing maps - additional study is required before this can be finalized.

Mr. Robin Erickson, TA Agro-economist, sent a four man team (PU counterparts) to the Gapit project area during the latter part of March to:

- a. request submission of secondary data from government agencies
- b. assist in delimiting a sample frame in the field for the Gapit project area

The follow-on trip to Sumbawa and the Gapit project was undertaken from 29 May to 6 June to :

- a. collect requested secondary data from agencies as mentioned above
- b. give notice of the impending project to government officials and discuss potential issues
- c. execute the project farm survey

Field data was catalogued upon return to Mataram for use in analysis later on in the year. A data entry program was written to facilitate transferring data from the farm survey questionnaires to computer data files. The writing of computer program code was also started which will be used to execute analysis of the farm survey data files.

#### E.4 Batujai-Surabaya Project

Now that the studies for the Tiu Kulit and Kalimantan II project are moving into the last stages of completion, there is a sense of urgency to put more emphasis on resolving the problem of a water deficit for the proposed service areas (972 ha in Batujai Kiri and 2,800 ha in Surabaya). Our PU counterpart, Ir. Kusmanadi, has helped develop a reservoir operation program to simulate releases to Batujai Kanan, Batujai Kiri and Surabaya service areas. The preliminary results indicated that there is insufficient inflows into the reservoir to regulate and serve the entire proposed 3,772 ha. A more detailed study is required to determine the optimal selection of areas and cropping patterns for the project.

In our meeting with PU NTB Ir. Gatot Sunaryo on 9 June, he also expressed interest in the Batujai-Surabaya Project. He had some specific ideas on the project, including the possibility of diverting water from the high-level diversion canal to the Surabaya River. This additional inflow would help make up the water deficit for the proposed three irrigation service areas. Another consideration is the need to account for the design inflows for the downstream Pengga Dam which is scheduled for construction under ADB funding.

These additional complications require a careful review to ensure that water availability is properly estimated for the Batujai-Surabaya Project. It has been suggested that the next step of project feasibility review and optimization be handled as a separate special study. We therefore propose to have one of our Harza short term specialists do this 6-8 week special study. Supposedly, this proposal is presently under review by USAID and will be included in the overall listing of additional work to be accomplished during Harza's existing contract.

#### E.5 Training and Technology Transfer

Mr. Erickson, Agroeconomist conducted several training sessions this period in the computer data entry of the farm survey questionnaire for Gapit project. The data entry system features an item entry and subsequent computer response to ascertain that the entry has been properly recorded. Thus, a computer operator plus a questionnaire reader are required to double check each entry. While this entry system requires double manpower, it does eliminate many errors that would normally occur and it is felt to be worth the added effort. Additional training sessions are scheduled as soon as he returns from SULSEL province the latter part of July.

Technology transfer in computer usage is nearly a daily occurrence with the encouragement of computer use during normal and off duty periods by counterpart personnel. The SSIMP has many computer programs available for counterpart use and nearly all tables and graphs for reports are now implemented by computer rather than drafting by hand techniques.

During this period, the office operations have gone much smoother with the installation of the photocopy machine. Communications have vastly improved with the installation of the Faxsimile machine. The purchase of an additional computer printer has also made our report writing and production work more efficient.

A review of our computer usage has revealed some inadequacies in file record keeping and back up copies. A new system of recording file names and ensuring that back up files are updated should alleviate the problems of working with data files that are obsolete or have not been kept current.

#### E.6 PU-NTB

The TA team (particularly, Messrs. Frey and Pamudji) have given their comments on the Terms of Reference document that will be used for the selection of a local consultant to implement the design of the access road and permanent buildings for Kalimantong II project. Since the present contract of consultant P.T. Geo-Survey did not include these duties - it will be necessary to select another.

Mr. Jeff Frey, TA Team leader, has also given his suggestions for the preparation of the Terms of Reference document that will be used for the selection of a consultant to supervise construction for both the Tiu Kulit and Kalimantan II projects.

There has been no word of progress by PU-NTB in the process of selection of a consultant for either the design of the access road or the supervision of construction. It is expected that this will be consummated during the next reporting period.

## SULAWESI SELATAN

### A. General

At the beginning of the quarter, a full complement of five long-term Technical Assistance Team members was assigned to Ujung Pandang. The team members were:

Herb Schoeller, TA Team Leader (Harza)  
Dennis McCandless, Civil Engineer (Harza)  
Carol Hetler, Social Scientist (DAI)  
Heru Sekti, Hydraulic Engineer (Wiratman)  
Salahuddin Gani, Civil Engineer (Wiratman)

Herb Schoeller's assignment as Team Leader ended as of 20 May, and he left Ujung Pandang to return to the United States. Dennis McCandless was named to fill the Team Leader position. His replacement in the Civil/Irrigation Engineer position will be Mr. D. Noel Corcoran. Mr. Corcoran is expected to arrive in-country early in the next quarter. In the meantime, the SULSEL team was operating with reduced staff during the last six weeks of the quarter.

Long-term TA Team staff from other SSIMP offices, Short-term TA Team members, and official visitors who were in the Sulsel office during the quarter included:

Mr. Eric Will, Chief of Party (Harza), from 11 to 12 April, to review progress and effect the change in Team Leader; and from 26 June to 4 July to help prepare sections of the Project Justification Report (PJR) on hydrology and reservoir operation for Awo and Salomekko.

Mr. Robin Erickson, Agricultural Economist (DAI), NTB, from 23 June through the end of the quarter to complete agricultural and economic sections of the Awo PJR; help with a preliminary economic evaluation of Salomekko; and work on the farm survey analyses for Ponre-Ponre, Selli-Coppobulu, and Raja-Talaga.

Ir. Jansen Wongso, Geologist (Wiratman), through 5 April, to review the progress of the drilling program at Salomekko.

Ir. Heru Subana, Geologist (Wiratman), from 28 June, to review geotechnical results on Salomekko and help coordinate startup for Ponre-Ponre and Selli-Coppobulu geotechnical work.

Ir. Gunawan, AID Engineering Staff, on 27 April, to attend the formal review meeting on Geo Ace's Draft Final Report for the Awo project.

Dr. Herb Blank, AID Project Officer, Ms. Suzanne Siskel, AID Personal Services Consultant for Social Sciences, and Ir. Joes Oemarhamzah, AID Engineering Staff, from 5 to 6 June; to coordinate project activities, including the upcoming appraisal,

with the TA team; and to discuss the project organization, progress, future plans, the water user association organizer program, etc., with senior Provincial PU staff, including Ir. Yantahin and Ir. Syamsul Arida.

#### B. Trips

Chief of Party Eric Will traveled to Ujung Pandang 11 to 12 April to effect a change in Team Leader.

Mr. Will returned on 26 June to assist with preparation of Hydrology and reservoir operation study sections of the Awo and Salomekko PJR's. He traveled back to Jakarta on 4 July (in the next quarter).

Sulsel Team Leader Herb Schoeller traveled to Jakarta from 30 April to 3 May to handle paperwork and coordinate his departure from Ujung Pandang. On 26 May, Mr. Schoeller and his wife left Ujung Pandang on his return trip to the United States.

Dennis H. McCandless, Civil Engineer, traveled to Mataram on 12 April to assist in review of Tiu Kulit designs and contract documents. He returned to Ujung Pandang on 19 April.

Mr. McCandless was in Jakarta from 30 April to 3 May, primarily to coordinate his takeover as Sulsel Team Leader.

Geologist Jansen from Wiratman, remained in Sulsel through 5 April to monitor geotechnical investigations on the Salomekko Project.

Heru Subana, a geologist from Wiratman, arrived in Ujung Pandang on 28 June to assist with work on the geotechnical investigations for Salomekko, Selli-Coppobulu, and Ponre-Ponre.

Ir. Salahuddin Gani, Civil Engineer, spent much of his time at the Salomekko site during this quarter. He was primarily involved in field review and evaluation of the surveying and mapping and geotechnical investigation work being done by PT. Airstan Ekawasta and PT. Indec, respectively.

Dr. Carol B. Hetler, Social Scientist, with two PU Counterparts, visited the Salomekko project area from 27 to 29 April to collect information for the PJR and the Socioeconomic section of the Environmental Impact Assessment (EIA) report.

During the period from 14 April to 4 June, Dr. Hetler traveled to NTB to assist in preparing the EIA for Tiu Kulit and Kalimantan II, and to participate in Site Profile activities for Gapit.

From 12 to 14 June, Dr. Hetler and two PU Counterparts visited the Awo site to collect more information for the PJR and the Socioeconomic section of the EIA report.

### C. Meetings

Numerous informal meetings were held among PU staff, local consultants, and TA Team members, as in previous quarters. Substantially more were held this quarter to accomplish final review of the Geo Ace work on the Awo studies and pre-design, and to coordinate the startup of the five new contracts.

Several meetings were held during the quarter to provide formal comments on reports produced by local Consultants. These meetings are listed in the following table:

<u>Project</u>	<u>Contract</u>	<u>Report</u>	<u>Contractor</u>	<u>Date</u>
Awo	Survey, Geotech., Pre-Design	Draft Final	Geo Ace	27 April
Salomekko		-- none --		
Ponre- Ponre	Survey, Geotech.	Inception	Parimac	14 June
Ponre- Ponre	Land Capability Pre-Design	Inception	Indec	1 July
Selli- Coppobulu	Survey, Geotech.	Inception	Seacons	31 May
Selli- Coppobulu	Land Capability, Pre-Design	Inception	Jasa Mitra	29 June

Each of these review meetings was attended by PU staff, TA Team members, and key personnel from the local contractor. Ir. Gunawan from AID attended the 27 April meeting on Awo.

Specific problems with the contractors' work were identified verbally by the PU and TA Team staff members during the meetings, and were later confirmed in writing. The Inception Report review meetings were especially fruitful, since they provided an early opportunity to correct contractor misconceptions about the work required and to point out problems with methods and scheduling before they led to delays in the work.

## D. Reports

The TA Team was active in writing a number of project reports during the quarter, although none of the formal project reports have been completed.

Top priority was placed on completing the Awo EIA report. Some additional information was received from the Hasanuddin University Environmental Study Center. Social Scientist Carol Hetler updated the cultural, demographic, water use, and other sections of the working draft to include data she has collected in the field and through secondary sources. The project description was revised to reflect the preliminary project design presented in Geo Ace's Final Report. Preparation of a draft EIA report that is suitable for review and discussion was underway at the end of the quarter.

Second priority has been assigned to completing the PJR for Awo. Toward the end of the quarter, Project Chief of Party Eric Will was assisting with presentation of the hydrology and crop water requirement studies; Economist Robin Erickson was finalizing the agricultural, economic, and financial analyses of the Awo Project; Team leader Dennis McCandless was preparing written material, in English, to describe the layouts and cost estimates presented in the Geo Ace Report; and Social Scientist Carol Hetler had prepared a description of the existing conditions in the project area.

Third priority was given to completing informal reports to document the so-called "site profile activities". Carol Hetler prepared draft material to describe the results of secondary data gathering, field reconnaissance, and field interviews for the Awo, Salomekko, Ponre-Ponre, and Selli-Coppobulu sites. Although some information has been collected for Raja-Talaga, evaluation of it has not yet begun.

Some work was accomplished on the Salomekko EIA, when time was available. The Salomekko EIA and PJR will be given priority during the next quarter.

A number of local consultant reports were received and reviewed during the quarter, as described under "Meetings", above.

## E. Other Major Activities

### E.1. Awo Project

Consultant Contracts. Services being provided by PT. Geo Ace were essentially completed by the end of the quarter. This work included updating maps of the original service area of 1,700 ha; geotechnical investigations; land capability evaluation; hydrologic and hydraulic studies; preliminary design of the

diversion weir, primary and secondary canals, and related structures; and preparation of a construction plan and cost estimate.

Consultant proposals for final design and tender document preparation were reviewed early in the quarter by the PU Tender Committee. PT. Dacrema was selected as best qualified, and a draft contract was prepared and submitted to USAID for approval. The Dacrema team was mobilized in late May, after receiving notice-to-proceed from PU. The contract completion date is 17 December 1989. Although the final contract had not been approved by the end of the quarter, Dacrema had completed a substantial amount of work by that time.

Surveying and Mapping. Surveying and mapping services included in the PT. Geo Ace contract were completed during the quarter, with the finalization of the left bank secondary canal plan, profile, and section surveys.

Geotechnical Studies. Information from the geotechnical studies, completed during the last quarter, were presented in the Final Report.

Land Evaluation and Land Use. Final maps presenting the results of the land evaluation study and land use investigations for the 1,700 ha irrigation service area were completed during the quarter.

Preliminary Designs. Preliminary design of the project was completed by PT. Geo Ace during the quarter. This work was reviewed by PU Staff and the TA Team to determine that the results were reasonable and adequate for use in the PJR, although a detailed review and check of the work was not possible given PU and TA Team staffing levels.

Water Supply and Demand. Studies of the available water supply from the Awo River and the crop water demands were completed. Adequate water is available for two crops of paddy per year on the extended project area of 2,500 ha. That cropping pattern (paddy, paddy) is preferred by local farmers when adequate water is available, so it has been adopted for use in the project design and economic evaluation.

Pre-Design Drawings. Project maps and pre-design drawings were essentially completed during the quarter, and were under final office review by PU staff at the end of the quarter. A total of 79 map and drawing sheets will be included in the final Geo Ace submittal to PU. A thorough field review of maps and drawings was not undertaken by the TA Team or PU since time and resources were not available. A full review is planned, however, during the early stages of the Final Design contract.

Pre-Design Reports. A revised version of Geo Ace's Interim Report was submitted to PU and accepted during this quarter. A Draft Final Report was prepared and discussed in a meeting held on 27 April 1989. This report was then finalized toward the end of the quarter. It is presented in three volumes:

Volume I - Laporan Utama

Volume II - Data Penunjang dan Analisa

Volume III - Nota Perhitungan

The reports were all prepared in bahasa Indonesia.

Design Surveys and Mapping. PT. Dacrea's principal activity during the quarter was surveying and preparation of 1:5,000 maps of the right bank extension area and surveying existing village roads that are to be upgraded under the project. This work was underway during June.

Land Capability Evaluation. Dacrea's land capability evaluation team was mobilized during the quarter. Several meetings were held in Ujung Pandang to discuss the methods to be used and requirements for presentation of results for the evaluation of lands in the 800 ha extension area.

Final Design. Members of Dacrea's final design team had moved to Ujung Pandang and opened an office near the PU complex by the end of the quarter. They were reviewing pre-design information that had been submitted to PU by Geo Ace, although that information was not complete at the end of June.

Manpower estimates and a schedule for the design effort have been prepared by Dacrea. These generally meet the time limits set by PU in the RFP and have been included in Dacrea's proposal, draft contract, and Inception Report. They show completion of design in November 1989 and completion of tender documents in December. The TA Team does not believe that these schedules are attainable. Two to three additional months will almost certainly be required. In addition, the funds included in the draft contract are substantially less than the amount needed to complete the work that was estimated by the TA Team. Requests from the Consultant for additional time and funds should be anticipated.

Coordination with Regional Government. As a decision has been made to go ahead with the mapping of the "Extension Area" for the Awo site, the Project Social Scientist, accompanied by Bpk. Mardjo, head of PU Pengairan in Kabupaten Wajo, as well as PU counterparts, Ir. Soeprapto and Ir. Karel, visited Kelurahan Bulete, to discuss the inclusion of parts of Bulete into the Awo service area. Previous assessments of the Awo Site have apparently excluded Bulete from inclusion in the service area, so this was the first time Bulete officials were given the opportunity to hear about the plan to include them in the project.

Bulete officials were quite cooperative and provided the field team with a lot of basic data on their area. Little information had ever been available to SSIMP about their downstream use of water from the Awo-Bulete and Siwa Rivers, so the field team interviewed Bulete officials about the local situation. As this was their first contact with SSIMP, and the map of the extension area was not yet complete, the discussion about irrigation was necessarily preliminary.

The Bupati of Kabupaten Wajo, and the Ketua BAPPEDA TK II, continued to give support to irrigation development at Awo. They are both quite interested in making a success of the project and have suggested that a formal meeting be held at the Kantor Daerah, to which the various Kepala Desa, Kepala Dusun, and other leaders of the communities would be invited. This meeting will probably occur after 20 July, when the Bupati can give his formal support to project developments.

Subsequent to this official meeting, it is planned that the SSIMP field team -- consisting of PU Provincial staff, the final design contractor, PU Kabupaten staff, and staff from the extension service -- will begin detailed discussions with farmers and village leaders concerning tertiary layouts. These initial discussions are expected to take about two weeks.

Consultant Personnel. Senior personnel assigned to the project by PT. Geo Ace during this period included:

Team Leader/Geologist	Dodi F. Aryadi
Irrigation Engineer	Sony Intan

Personnel assigned to the project by PT. Dacrea:

Team Leader	Gerrit Ticoalu BE
Hydrologist	Andi Mansur
Geodetic Engineer	Winaryanto
Hydraulic Engineer	Hardi Prabowo
Structural Engineer	Andreas Parabang
Irrigation Engineer 1	Frans Rahmat
Irrigation Engineer 2	Onny Iskandar
Drainage Engineer	Marihot S.
Soil Scientist/Agronomist	Fahran AS.
Chief Surveyor	Trimo Awie

## E.2. Salomekko Project

Surveying and Mapping. PT. Airstan Ekawasta continued to slowly correct the surveying and mapping problems identified during the last quarter.

The 1:5,000 maps of the northern and central parts of the service area were usable by the end of the quarter, and revised irrigation system layouts were proceeding. The 1:5,000 map of the right bank (south) section of the service area had not been

corrected by the end of the quarter. The mapping of the area east of the Sinjai to Watampone road is also suspect. However, much of that area cannot be irrigated by the proposed system, and lower priority is being placed on correcting those maps. Most of the roads, landmark buildings, etc. now seem to be included on the maps.

Work on the 1:2,000 plan and profile sheets along the primary and secondary canal alignments was underway. Data gathered during this effort was being used by Airstan to correct the 1:5,000 maps as work proceeded. None of the plan and profile sheets had been completed by the end of the quarter.

Plan and profile surveys of the Salomekko at the damsite and for several kilometers downstream, at 1:2,000, were completed. These surveys showed additional errors in the 1:5,000 maps, and PU and the TA Team requested further corrections.

Additional surveys were obtained to correct the 1:2,000 dam site map, but the map had not been revised as of the end of the quarter.

The extremely poor progress on surveying and mapping at Salomekko has caused substantial delays in the pre-design work to be completed by Airstan and has delayed completion of the test pit program for structures in the irrigation service area that is being conducted by Indec and Associates (described below). Substantial PU and TA Team resources, including many field visits by TA Team members, including many field visits by TA Team Civil Engineer Salahuddin Gani, were expended during the quarter in an attempt to obtain usable maps in a reasonable period of time,

Geotechnical Studies. The geotechnical studies by Indec and Associates were well advanced by the end of the quarter.

Core drilling at the damsite was complete except for one hole, drilled in the wrong location, that will have to be redrilled. Field permeability testing was conducted during the drilling. Periodic visits to the site to check progress, verify hole locations, etc., were made by TA Team Civil Engineer, Salahuddin Gani and short-term TA Team geologist Jansen and Heru Subana from Wiratman. However, adequate resources were not available to provide continuous monitoring of the investigation program. Also, because of delays in the field program, the Indec geologist was back in their home office during much of the quarter, leaving operations, core logging, and testing in the hands of the drillers only.

Test pits for evaluation of the dam foundation and construction material properties were completed during the quarter, and laboratory testing was underway. Test pits in the irrigation service area were delayed since accurate maps and preliminary system layouts were not available from Airstan.

Land Evaluation. The new land evaluation report for the project service area was reported to be in preparation during the quarter, but no results were received.

Hydrology. The basic hydrologic inputs to the reservoir operation studies, flood routing studies, and cross water computations were determined during April and May. This work was done by Airstan Hydrologist Miranda and TA Team Hydraulic Engineer Heru Sekti under the direction of the (then) TA Team Leader Herb Schoeller. Work continued on the hydrologic studies through the end of the quarter, but the rate of progress and level of TA Team involvement dropped significantly after Mr. Schoeller's departure in late May.

Designs. Dam layout work was stopped during the quarter, pending completion of hydrologic studies and geotechnical investigations. At the end of the quarter, Chief of Party Eric Will assisted in preparing update layout sketches and cost estimates during his trip to Ujung Pandang.

Progress on Airstan's irrigation system layouts and designs was slow, since the maps needed to complete this work were undergoing frequent revisions. Plan-profile surveys and layout work were underway for primary and secondary canal alignments. These were fairly well defined for the left bank and central service areas. In the right bank (south) service area, results of the canal alignment surveys were being used to correct gross errors in the 1:5,000 maps, as described above.

Drawings. Drawing production has been limited to draft 1:5,000 map sheets, the 1:2,000 dam site map, and 1:2,000 plan-profile sheets along the Salomekko River and at the dam site.

Reports. No new reports were prepared by Airstan during this quarter.

A draft Interim Report was presented by Indec and Associates on 20 June 1989. This report included primarily field data and lab test results, with relatively little undertaken, since a more-complete Draft Final Report is expected early in the next quarter.

Contractor Personnel. Senior personnel assigned to the project by PT. Airstan Ekawasta during this quarter included:

Project Manager	A. Salam
Geodetic Engineer	M. Thamrin
Hydrologist	Miranda

Senior personnel assigned to the project by Indec and Associates during this quarter included:

Project Manager	Wael Mansyur
Geologist	Budi Wuryanto
Assistant Geologist	Omar Wuryanto
Soil and Material Engineer	Djoko S.

Data Collection and Government Contacts. Work continued in collecting secondary data to fill in gaps for the various reports being prepared. As the downstream area is being converted to tambak (at a much lesser scale than at Awo), some inquiries were made into tambak development and a quick reconnaissance of the area was made.

The Camat of both Tonra and Salomekko were given the opportunity to see a preliminary layout of the proposed irrigation system. Finally, having a map available has been very useful in focussing attention on details of the project.

An extended conversation was held with the Kepala Desa of Bicoing, and an influential member of his family, regarding local history, general development plans for the area, and details of hamlet administration. In general, people are becoming impatient that no obvious progress, or firm commitment, has been made yet regarding irrigation development at Salomekko.

Similar impatience was expressed by the Kepala Desa of Ujunge. The team also discussed various other possibilities of building a weir across other streams to provide water to downstream Ujunge sawah (not necessarily under SSIMP). The TA Team was unable to contact either the Kepala Desa of Manera nor Ulu Balang due to their absence at the time of the field visit.

### E.3. Ponre-Ponre Project

Local Consultant Contracting. PU gave notice-to-proceed and notice of tentative contract award to the two local consultants for the project:

Contract 1 Parimac & Associates	Topographic Mapping, Geologic Investigations, and Soil Mechanics Studies.
------------------------------------	---

Contract 2 Indec & Associates	Hydrology, Water Quality, and Sediment Studies; Land Capability Evaluation; and Preliminary Design of the Dam and Irrigation System.
----------------------------------	--

Final contract award awaits USAID approval.

Surveying and Mapping. Parimac's field team completed control surveys and began preparation of 1:5,000 maps of the reservoir and irrigation service areas and a 1:2,000 map of the dam sites. PU staff surveyors were working with the consultant in the field and office to keep abreast of the progress and quality of work.

Geologic Investigations. Collection of geologic data and field reconnaissance was initiated during the quarter. Possible explanations for the sources of the large spring near the hamlet of Ponre-Ponre, and possible impacts of dam construction on the spring flow, were given priority.

Pre-Design Studies. Indec's team had begun to mobilize and was collecting data from PU and other sources at the end of the quarter.

Site Profile Activities. No site profile or rural appraisal field visits were made to this site during the quarter. The Project Social Scientist continued to prepare a draft of the Site Profile Activities' report when time was available, based on the information collected in an extended field trip to the site during the first quarter of this year.

Consultant Personnel. Senior personnel assigned to the Ponre-Ponre project by Parimac and Associates, Ltd. during this quarter included:

Team Leader	Jimmi Japri
Geodetic Engineer	Azam Muhammady
Asst. Geodetic Engineer	Bambang Hariyadi BE
Geotechnical Engineer	Rudy Suhendar
Asst. Geotechnical Engineer	Bambang Sugiharto
Chief Surveyor	Achdyjat D.S.

Key personnel assigned to the project by Indec and Associates, Ltd. during this quarter included:

Team Leader	Agus Prijono
Hydrologist	Jumari
Agronomist	A. Hariadi Djoko S.

#### E.4. Selli-Coppobulu Project

Local Consultant Contracting. PU gave notice-to-proceed and notice of tentative contract award to two local consultants for the project:

Contract 1 PT. Seacons	Topographic Mapping, Geologic Investigations, and Soil Mechanics Studies.
Contract 2 PT. Jasa Mitra Manunggal	Hydrology, Water Quality, and Sediment Studies; Land Capability Evaluations; and Preliminary Design of the Dam and Irrigation System.

Final contract award awaits USAID approval.

Surveying and Mapping. Seacons's field teams initially concentrated on control surveys and the 1:2,000 mapping of the two possible (parallel) dam sites. PU staff was working with the surveyors to track progress and quality of work.

Geologic Investigations. Collection of geologic data and a field reconnaissance was initiated during the quarter.

Pre-Design Studies. The Jasa Mitra team has begun mobilization and data collection by the end of the quarter.

Consultant Personnel. Senior personnel assigned to the Selli-Coppobulu project by PT. Seacons during this quarter included:

Team Leader	Abdul Rifai
Geodetic Engineer	Ervien NH.
Asst. Geotechnical Engineer/ Geologist	Ruslan
Soil Technician	Kusman

Senior personnel assigned by PT. Jasa Mitra Manunggal during this quarter included:

Team Leader	Taryoso
Hydrologist	Kiswadi
Dam Engineer	I Nengah S.
Asst. Irrigation Engineer	Haris S.
Asst. Hydrologist	Yudi Hartono
Asst. Dam Engineer	A. Efendi
Agronomist	Bangun

#### E.5. Raja-Telaga Project

There was no activity on the Raja-Telaga Project during this quarter. Discussions regarding deleting this project from SSIMP continued.

#### E.6. Environmental Studies

The SulSel TA Team, led by Social Scientist Carol Hetler, was pushing to gather information needed to complete the Awo EIA. Dr. Hetler made a field trip, described above, to gather additional data. PSL-UNHAS also provided some further information needed to complete the EIA. Rewriting of the draft EIA to include the new data and an up-to-date project description was under way at the end of the quarter.

Additional information will be needed to complete the Salomekko EIA. Work on this has been deferred, with top priority given to completion of the Awo document.

Environmental work has not been started on the Ponre-Ponre and Selli-Coppobulu Projects, although the TA Team intends to complete EIA's for them by March 1990. Scoping and baseline studies must be organized as soon as possible so that data is available when needed.

The TA Team's Senior Environmental Scientist, Dr. Peter Ames is scheduled to return to Indonesia during the next quarter to push this work ahead. The need for additional environmental

staff and further baseline study contracts with PSL-UNHAS have been discussed with USAID. These issues should be resolved by the end of the next quarter.

### E.7. Training and Technology Transfer

Data Collection and Government Relations. Informal training continued during field trips to project sites. In general, PU counterpart staff have been quite receptive to keeping PEMDA and local line agencies up-to-date with project activities. Correspondingly, the various agencies have been cooperative in our request for data, and have willingly answered our inquiries when they have the information available.

Some PU counterpart staff have formal responsibilities for only the technical details of the projects, others have been more involved in the socioeconomic activities related to the Household Survey and Rapid Rural Appraisal process. Overall, there seems to be few, (if any) problems in having all field personnel (whatever their formal duties) participate in discussions with local farmers and officials. Response to this suggested change has been quite positive.

PU counterparts have also improved their ability to explore different lines of inquiry in the project area, as well as in interviews with public officials. They are also improving their ability to record appropriate information in the field. A few have been able to summarize their activities in trip reports, although this continues to be something of a weak area.

PU counterparts have actively participated in developing maps of administrative boundaries, and some land use maps of project sites, including the location of existing irrigation (e.g., at Selli-Coppobulu and Raja-Telaga). These maps that are being made are based on existing maps available in the SSIMP office (from the Japanese, old Dutch maps, and some aerial photos). The field team has interviewed local people at project sites, as well as visiting different places in the area to verify what has been reported. As this is a continuing process, the maps are not yet 'complete', but have proved to be useful way of getting to know about, and record, local conditions.

Language Skills. An experienced, native English speaking, teacher was hired to plan and carry out a formal English language training program for PU staff. Twice-weekly lessons began on 15 June for 12 students, divided into three skill levels:

Basic Level	(1.5 hours/day)
Lower Intermediate	(1.5 hours/day)
Advanced Writing	(0.5 hour/day)

The initial courses will run until the end of August.

Beginners courses continued under the direction of the TA Team's translator, who is being assisted in lesson planning by the teacher of the courses described above.

Computer Skills. Formal computer training for PU staff continued through courses at Oriental Computer and Communication's training center in Ujung Pandang. During the quarter, two more persons were trained in computer basics, and one in computer drafting. During the next quarter, one staff member will attend an introductory course and one will attend a course in Lotus 1-2-3 each month.

TA Team Civil Engineer D.H. McCandless continued with informal counterpart training for users of WordStar, Lotus 1-2-3, technical software such as Eureka and HEC 2.

#### E.8. PU-SULSEL

Perhaps, the most important development on the project in Sulsel during this quarter was the major reorganization of PU staff that resulted from SSIMP's designation as a Bagian Project for the fiscal year that began on 1 April. Highlights of the new organization are:

- Ir. H. Syamsul Arida was appointed Sub-Project Manager, with full-time responsibility for the SSIMP Project. He is assisted by a Treasurer and an Administrator.
- Two Coordinators have been appointed to assist Ir. Arida. Ir. Suwarno HP, who has been in a responsible position on the project for some time, will coordinate pre-design work (including surveys, investigations, planning, hydrology, site profiles, and preliminary design) for all of the five projects. Ir. Soeprapto BS, MSC., who has just returned from a masters' degree program in the United States to rejoin the project during this quarter, will coordinate final design and tender document preparation (which is currently underway for the Awo Project).
- A technical staff of eleven additional full-time counterparts is being shared by the coordinators. The counterparts are generally being assigned work tasks along technical subject lines, not along project lines. Some additional part-time counterparts are provided by P3SA on an as-needed basis.
- The Sub-Project Manager's Treasurer (Mirdaway) and Administrator (Sukirman) are being assisted by Drs. Abdul Wahab, a long-term SSIMP Counterpart, and several full-time support staff members.

Ir. Yantahin retains his responsibility as Project Manager for the South Sulawesi Irrigation Project and, as such, serves as Ir. Arida's supervisor.



## GROUNDWATER

### Nusa Tenggara Barat

During the period 11-18 April, Mr. James Murdoch completed a short term assignment in Mataram as mechanical engineer to:

- a. assess the condition of the Hydreq drilling rig
- b. determine the repairs required
- c. determine spares requirements (including drill bits)
- d. assess workshop support capabilities in Mataram
- e. recommend a source for procurement of spares
- f. estimate repair costs
- g. establish a time schedule for repairs

This work was done with the anticipation of using the newly transferred drill rig to do the proposed well drilling program for Sumbawa. From Mr. Murdoch's report, it would seem that the repair program is quite extensive and he was not sure that the workshops in Mataram were capable of doing the hydraulic repairs necessary to make this machine fully operational. He suggested that P2AT-NTB do the repairs themselves in their workshop near the village of Bengkel and use this opportunity to train the individuals that would be expected to be involved in this program.

The latest decision from Jakarta (USAID, Harza and P2AT) is to prepare a Terms of Reference (TOR) document that would request a tendering process for private contractors to bid on furnishing equipment and drilling the numbers of wells at the given locations within this fiscal year.

It is expected that this TOR document will be completed by TA Hydrogeologist Soekardi early in the next quarter so that the tendering process may begin soon. In order to clarify the current status of the groundwater program of NTB the following table is presented:

GROUNDWATER PROGRAM STATUS FOR NTB

<u>No.</u>	<u>Fiscal Year</u>	<u>Well Program</u>	<u>Description</u>
1.	1987/1988	4 hand dug	designs complete and funds committed.
2.	1988/1989	5 hand dug	designs not started and funds only earmarked.
3.	1989/1990	10 drilled (1000 meters)	preparatory work to earmark funds (PIL).

Item number one is planned to start implementation next quarter. The four shallow hand dug wells are situated as follows:

- a. well with buried pipe system near Kaleo
- b. well with open channel system near Simpasai
- c. well with buried pipe system near Lanta
- d. well with open channel system near Lanta

Item number two will be started next quarter with the designs implemented by Project P2AT staff assisted by TA consultants. This will include 1:2000 scale topographic maps of each site in order to plan the distribution of water from each of the five wells.

Item three has been described previously as the preparation of tender documents for the proposed ten drilled wells for an estimated total depth of 1,000 meters.

### Nusa Tenggara Timur

#### A. General

At the beginning of this quarter, several personnel changes were made at the Kupang post. Mr. Marcel Jolicoeur resigned his position and was replaced by Mr. Don Adolphson. Mr. Martin Wright started work as agriculturalist for Global Exchange, Inc. as of the beginning of this quarter. He took his earned home leave during the period 15 May to 18 June. See section II MOVEMENT OF EMPLOYEES for details.

During a meeting in Jakarta on 20 June between Irrigation II, USAID and the SSIMP Chief of Party, Mr. Eric Will, discussions centered on plans to engage a US firm to map potential groundwater sources of the three provinces. Information was presented that indicated a Geophysical Consultant could prepare a resistivity map of the alluvial plains within all three provinces. This resistivity map combined with a seismographic map could serve as a valuable subsurface scan in determining the groundwater potential of any given area. The proposed survey would cover 392 square kilometers and require three months to implement. Additional information is sought to determine the actual cost of producing a map that would locate at least one resistivity point for each square kilometer.

#### B. Project Activity

The Kupang TA Hydrogeologist gave advice and assistance to P2AT staff members in Jakarta on modifications to the Terms of Reference and Bill of Quantities for the proposed well drilling program. These corrections will be submitted to USAID for approval and adoption.

Additional discussions between the Kupang TA Hydrogeologist consultant and Jakarta P2AT staff members concerned the proposal to establish a network of observation wells and springs in the alluvial plains near Kupang. This observation network would log all existing water points with measurements to be taken at least once monthly and immediately after the occurrence of some significant physical event (heavy rain, earth tremors, etc.). These measurements should include water levels, flows (springs or artesian wells), electrical conductivity and temperatures. These data plotted on hydrographs would correlate fluctuations with predictions of possible future aquifer depletion or saltwater intrusions.

As a repeat of the last quarterly report, the following locations were selected for the proposed drilling campaign for the fiscal year 1988/1989 budget.

Locations and Depths of Wells Proposed for Drilling Program for FY 1988/89

Location	Explor. Well Nos.	Piezometer Nos.	Ave. Depth m	Total Depth m
Nungkurus	1	2	50	150
Pariti	3	1	80	320
Bipolo	1	1	50	100
Patoeme	1	-	20	20
Klapampa	1	-	60	60
Oesao	2	1	40	120
Totals	9	5		770

The survey of existing shallow wells initiated by NTT-P2AT staff during March of this year is still being tabulated and the results of these analyses are not expected to be reported until possibly next quarter. This information will be useful in the selection of future drilling points to be sure that the agro-socio-economic conditions are favorable to the future development of these wells for irrigation.

During this quarter, the TA Agriculturalist assisted P2AT staff to continue the survey to select sites for the development of a further six experimental sites as described in the report for the quarter ending 31 March. The survey of the Nungkurus area has indicated that there is some intrusion of salt water into shallow wells from the adjacent salt flats, especially during the long dry season. This will need to be investigated carefully during further hydrogeological surveys.

The area of cultivated ricefields was also significantly less than that indicated in existing land use maps emphasizing the need for particular caution when using secondary data for project planning in this area. Some areas of ricefields in the Nungkurus area are purely rainfed and others receive some supplementary irrigation from four temporary and one permanent diversion

23

structures on small river tributaries. However, all respondents maintained that supplementary irrigation supplies were erratic and usually insufficient.

In the Oesao, Naibonat and Pukdale areas, short-term pumping tests on a number of shallow wells indicated potential for irrigation purposes but all needed deepening and/or lining before finally assessing suitability for the development of experimental systems. The response of farmers in these cases was very positive. P2AT staff have been providing technical guidance and lending pumps to the groups of farmers who are deepening their wells. One group in Oesao has collected Rp. 400,000 for the construction of concrete lining rings. The enthusiasm of P2AT staff involved in these surveys and their increasing ability to identify both technical and socio-economic key-issues influencing site selection is very encouraging.

At the first two experimental sites (Lukman Barat and Pariti II) some farmers were still harvesting their rainfed season rice crops at the end of this quarter. As these two sites were not fully operational at the beginning of the rainy season, the farmers planted at the usual time for this area, i.e. between January and March. However, at the Pariti II site where the well is still free-flowing at approximately 10 liters per second, 60% of the farmers within the service area have already prepared land and planted seedlings for a second rice crop.

One of the P2AT staff working with SSIMP, Martono Purwanto attended a PUSDIKLAT course in groundwater development with SSIMP funding in January and this training has proven to be of great value in establishing a rational approach to preparing water user's associations for organization and management of the new systems, and the need for the development of line-agency and local government coordination and policies to support the expansion of the groundwater irrigation program in NTT.

The TA Agriculturalist has also assisted P2AT staff in preparing final specifications for project equipment and has attended two meetings in Jakarta with officials of Irrigation II on April 6 and June 20.

#### Sulawesi Selatan

Nothing reported for this period.

## SECTION III

### PROBLEMS ENCOUNTERED AND RECOMMENDED SOLUTIONS

#### Nusa Tenggara Barat

Midway through this period (15 May), DOI I Jakarta took action to direct P.T. GeoSurvey to increase their senior supervisory staff in Mataram in order to follow through with the design revisions suggested by the TA staff earlier. The problem stemmed from inexperienced GeoSurvey Team members relying on constant monitoring by TA staff. As GeoSurvey's existing contract was nearing an end, it was apparent that they would not be able to finish all the drawings that are required to produce adequate documentation for an ICB contract.

In addition to the problem of producing all the required tender drawings by the 30 June deadline - there will be no final versions of the tender documents that have been submitted in draft form only. The viable solution to the above would be to compensate P.T. GeoSurvey for an additional month so that their Mataram staff may complete the preparation of these tender documents.

A similar situation has occurred on the Tiu Kulit project - where P.T. Mettana has utilized their senior supervisory staff members to do the Gapit pre-feasibility study to the detriment of completion of the tender documents. TA had expressed concern (see quarterly report No. 6) that this may happen, although we are pleased that the Gapit pre-feasibility study is being done by a competent firm and therefore may have to accept a later completion date for Tiu Kulit tender drawings as a compromise.

The solution is the acceptance of a later completion date for the Tiu Kulit tender documents. This may preclude the early tendering process startup as proposed by PU-NTB officials.

The rush to beat a deadline by GeoSurvey has overtaxed the ability of the TA team to adequately review all of the design problems that should have been addressed. This may result in change orders or design changes after the construction contract has been awarded.

This should not significantly alter the final cost - it could even result in a saving if the change occurs resulting in lesser quantities or improved methods of implementation. We have no alternative, but to continue our vigilance in terms of being cognizant that changes for betterment are possible although belatedly recognized. In particular, the problem of reducing the embankment height (or aqueduct) at the Taliwang Lake outlet valley crossing has been inadequately addressed. There has been no consideration for making this design plausible by lowering the right bank main canal with a resulting reduction in service area. GeoSurvey design

engineers have stated that no other alternatives have been considered due to insufficient time left in their existing contract.

The obvious solution will be to extend their contract or to engage another firm to do the contract supervision plus the changes necessary in the construction drawings.

As mentioned previously under groundwater activities for NTB province - the prospect of repairing of the newly acquired Hydreg Minor drill rig is certainly not to be recommended. There are no repair shops in Mataram with the capability to do the hydraulic reconditioning plus the lack of spares precludes a timely schedule to get this machine operational. It is far better to go the route of utilizing private contractors to drill the wells on a competitive tender basis.

### Sulawesi Selatan

A number of problems continued to affect progress of work in SULSEL. The most important are:

1. Local Consultant performance (on Salomekko, especially);
2. Too much work/too many consultants with limited experience for TA to monitor, especially after Herb Schoeller left;
3. No water user association organizers to help set up farmer involvement for Awo final design.

### Local Consultant Performance

Problems with the quality and pace of local consultant work continued during this quarter. As before, the problems can largely be attributed to two factors. First, the staff members assigned to the projects have been relatively inexperienced and in some cases too few in number. Second, the work expected of the local consultants continues to be poorly defined in the requests for proposals, contracts, and day-to-day contacts between consultants and PU staff.

Inexperience of local consultant staff members has caused delays and placed unexpectedly large burdens on the TA Team in SULSEL. In addition to working with PU staff, the TA team continues to be actively involved in training consultant staff in hydrology, water resources planning and design, and even mapmaking; and in review of unchecked work submitted as final.

Progress on the projects has continued, but at a slower pace than desired, particularly on Salomekko. In addition, the consultant's managements seem to have underestimated the manpower and time needed to complete the contracted studies.

As in the previous quarter, the TA Team and PU SSIMP Staff continued to implement changes that should reduce these problems on future contracts. Consultants are being directed, by senior PU staff, to closely coordinate their work with PU SSIMP and TA Team members to avoid unnecessary duplication of effort and unacceptable study methods.

#### Amount of Work and Number of Consultants

Problems with local consultant coordination and review of local consultant work products continue, due to the large number of contracts that are under way at the same time. Despite TA Team recommendations to stage the work over a period of time, PU SULSEL has contracted for consulting services on four of the five SSIMP projects, and still plans to begin work on the fifth during this fiscal year.

Given the experience with local consultants on the first four projects in SULSEL and NTB, a great deal of TA Team guidance is needed to obtain quality work. TA Team resources have frequently been strained as there have been seven contractors working on four projects during this quarter. As noted in the previous quarterly report, the quality of work and proposed schedules will necessarily suffer as PU and TA staffs attempt to deal with the resulting administrative and technical review and coordination of workload.

Water User Association Organizers. The failure to appoint the contractor to implement the Water User Association Organizer program is now constraining farmer involvement for the Awo final design. A decision has been made to precede with the final design, and PU and TA staffs, with the final design contractor, are making plans to contact farmers directly.

#### Groundwater

Implementation of the SSIMP training program and the construction of the third experimental site at Lukman Timur are still pending because the official request for the commitment PIL has not yet been sent to USAID.

As reported in the last quarter, the Project Manager sent the designs, specifications and cost estimates to Irrigation II in Denpasar. The main reason for the delay appears to be that two Irrigation II officials who have signatory authority have left their posts and their successors have not yet been delegated to sign these documents.

The limited number of suitably qualified staff and resources available to implement the SSIMP in NTT has been identified as being a potentially critical problem particularly during the projected expansion of activities in the areas. In meetings with USAID and Irrigation II officials, the employment of local consultants has been suggested to overcome the problem. The TA Team has been requested to assist the P2AT Project Manager to draft TOR and cost estimates for these consultants.

## SECTION IV

### PLANNED ACTIVITIES FOR NEXT QUARTER

#### NUSA TENGGARA BARAT

The overall schedules for the Tiu Kulit and Kalimantan II Projects are presented in Figures 3 and 4. For the most part, they remain unchanged from that reported during the last quarter. Since neither Mettana nor GeoSurvey consultants completed their preparation of tender documents and drawings as scheduled - this work will continue during July.

Design Engineer Banerjee is scheduled to return to Mataram early in July to make a final review of both the Tiu Kulit and Kalimantan II project tender drawings. Specification Specialist Styles, will also continue his work on reviewing the draft tender documents for both priority projects during July. The balance of the TA team will review the preparation of the irrigation distribution system drawings as they are being drafted in our SSIMP office in Mataram.

TA Agroeconomist, Robin Erickson, expects to complete his work on Awo Project Justification Report in SULSEL Province by 21 July. He will then return to Mataram to work on the Kalimantan II Project Justification Report economic analysis plus the Gapit project farm survey. He is also expected to initiate secondary data collection on the Batujai-Surabaya project during next period.

Dr. Carol Hetler is expected to return to Mataram again next period to assist with the socio-agronomic survey work on the Gapit project. She is also expected to participate as necessary with LP3ES in commencement of work activities in this province.

#### SULAWESI SELATAN

Continued assistance to PT. Geo Ace and Airstan will essentially end by the TA Team, as they are expected to complete their work during the next quarter. Work will continue on the final design at Awo, and the geotechnical study at Salomekko will probably be completed during the third quarter of 1989. At Ponre-Ponre, contractors are expected to complete topographic mapping and to proceed with the various geologic investigations, soil mechanics studies, and pre-design studies. At Selli-Coppobulu, topographic mapping will commence during the next quarter, as well as the various pre-design studies. No activity is expected to occur at Raja-Telaga during the next quarter.

Work on the draft PJR and EIA reports for Awo and Salomekko will continue.

## GROUNDWATER

The following activities are scheduled under the SSIMP groundwater studies during next quarter:

### Nusa Tenggara Barat

TA Hydrogeologist, Soekardi will continue writing the terms of reference document for the proposed drilling of ten wells on Sumbawa Island as requested by DOI-II Jakarta. He will also assist in the preparation of design work by P2AT staff for the five shallow wells (FY 1988/89). There will also be some coordination work connected with the proposed implementation program for the four hand dug wells located in the Kaleo, Simpasai and Lanta villages.

### Sulawesi Selatan

TA Hydrogeologist Soekardi, will travel to SULSEL province during the period 11-18 July to:

- a. hold discussions with SSIMP team members on the future groundwater program.
- b. hold discussions with Mr. Untung Subagyo, Head of P2AT to determine the work schedule for FY 89/90, groundwater monitoring, geo-electric soundings, procurement of equipment, etc.
- c. make site visits to the projected groundwater development areas in Sidenreng Rappang and Wajo regencies:
  - define the location of the geo-electric surveys.
  - establish the monitoring well site locations.
  - make a short reconnaissance of hydrogeological conditions.

### Nusa Tenggara Timur

TA consultants Adolphson and Wright are expected to work with P2AT staff to initiate work on an inspection of all of the nine exploratory wells and five observation wells in the Oesao, Pariti, Nungkurus and Bipolo alluvial plains. Access roads, hydrologic and geologic conditions will be evaluated to ensure that the proposed drilling program will provide the greatest amount of groundwater potential information. They are also expected to initiate work on an inventory of all existing wells and springs in the vicinity of Kupang. This will eventually lead to monthly measurements of all water points to establish an observation network.

In addition to the above, the following general items will be scheduled :

- a. Monitoring and guidance of water users associations at the two SSIMP experimental sites Lukman Barat and Pariti II.
- b. Continue site selection surveys and give advice to farmer groups on well improvement.
- c. Assist project manager to draft Terms of Reference for employment of local consultants.
- d. Explore the possibilities for coordination with other Government agencies and policies for supporting the expansion of groundwater irrigation.

SECTION V  
FINANCIAL STATUS

Contract expenditures are as shown below. Invoices G-1 through G-23 have been submitted through June, 1989.

Invoice Number -----	Total Amount -----
G-1	\$ 3,640.84
G-2 (REV)	14,527.54
G-3	67,753.28
G-4	97,178.12
G-5	51,739.96
G-6 (Sum.)	61,013.10
G-7 (Sum.)	66,128.64
G-8 (Sum.)	70,944.88
G-9 (Sum.)	148,775.99
G-10(Sum.)	61,097.92
G-11(Sum.)	78,704.54
G-12(Sum.)	211,436.45
G-13(Sum.)	90,667.69
G-14(Sum.)	168,338.49
G-14(Sum.)Adj.	(17.65)
G-15	140,268.31
G-15 Adj.	(1,001.98)
G-15A	10,558.22
G-15A Adj.	(1.97)
G-16(Revised)	128,367.95
G-17(Sum.)	303,153.06
G-17(Sum.)Adj.	(61,771.81)
G-17A	2,793.12
G-18(Sum.)	215,773.58
G-19(Sum.)	170,485.57
G-19(Sum.)	(10,882.20)
G-20(Sum.)	127,786.69
G-20(Disallowed)	(5,540.17)
G-21	201,237.69
G-21(Disallowed)	(6,011.76)
G-22	131,430.80
G-23	171,198.95
 Total	 ----- \$ 2,709,773.84

Expenditures for the quarter amounted to \$ 481,433.31

Expenditures by line item are as follows:

Catagory	Budget Amount	Total to Date
Salaries and Wages	\$ 637,729	\$ 440,896.20
Overhead	809,852	588,781.34
Consultants	55,695	20,234.53
Allowances	290,733	192,197.97
Travel, Transportation and Per Diem	515,877	259,444.18
Nonexpendable Equipment	16,000	18,373.45
Local Support Costs	106,032	83,418.60
Subcontract(s)	2,290,778	824,661.21
Other Direct Costs (includes DBA)	179,683	162,607.40
TOTAL ESTIMATED COST	4,904,778	2,590,614.88
Fixed Fee	225,509	119,158.96
TOTAL ESTIMATED COST PLUS FIXED FEE	\$ 5,127,888 =====	\$ 2,709,773.84 =====

About 21 months, or 70%, of the contract time has elapsed. Only about 51% of the funds have been expended. This is due primarily to startup staffing delays, especially in the groundwater programs, which have been remedied by re-allocation of positions, as described in previous sections of this report.

## SECTION VI

## MOVEMENT OF EMPLOYEES

All SSIMP staff remained at their respective posts as described in Section II, except for the following periods of local or sick leave, arrivals/departures as reported this quarter:

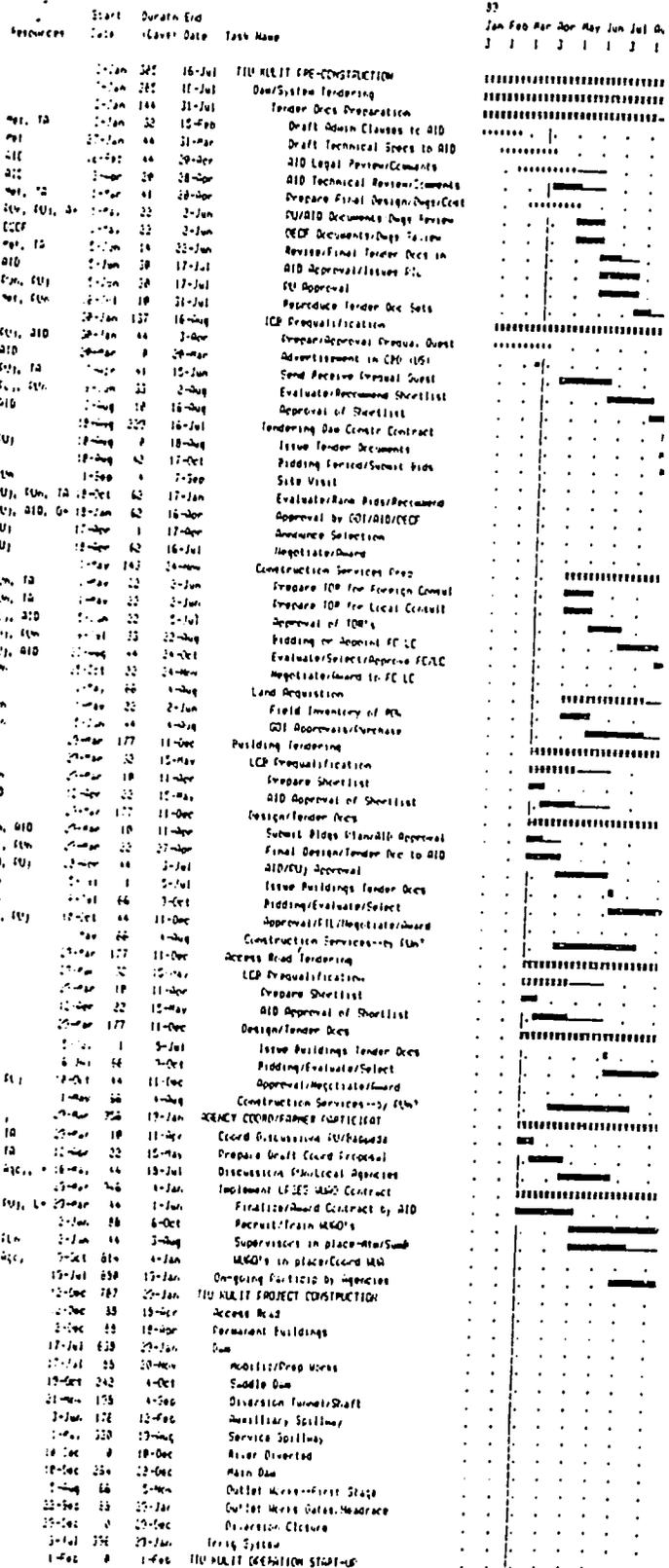
Employee	Location	Dates	Remarks
1. Will, E.	Jakarta	15-18 May	medical leave
2. Schoeller	SULSEL	20 May	departed post
"	"	22-23 May	travel status
"	"	24 May	local leave
"	"	25 May	home leave
3. Schoenleber	NTB	12-13 April	medical leave
4. Soekardi	NTB	9-17 May	local leave
5. Jolicoeur	NTT	29 March	departed post *
6. Adolphson	NTT	8 May	arrived Jakarta
7. Wright	NTT	1 April	started Ag. position
"	"	15 May-18 June	home leave

\* not reported during last quarter.





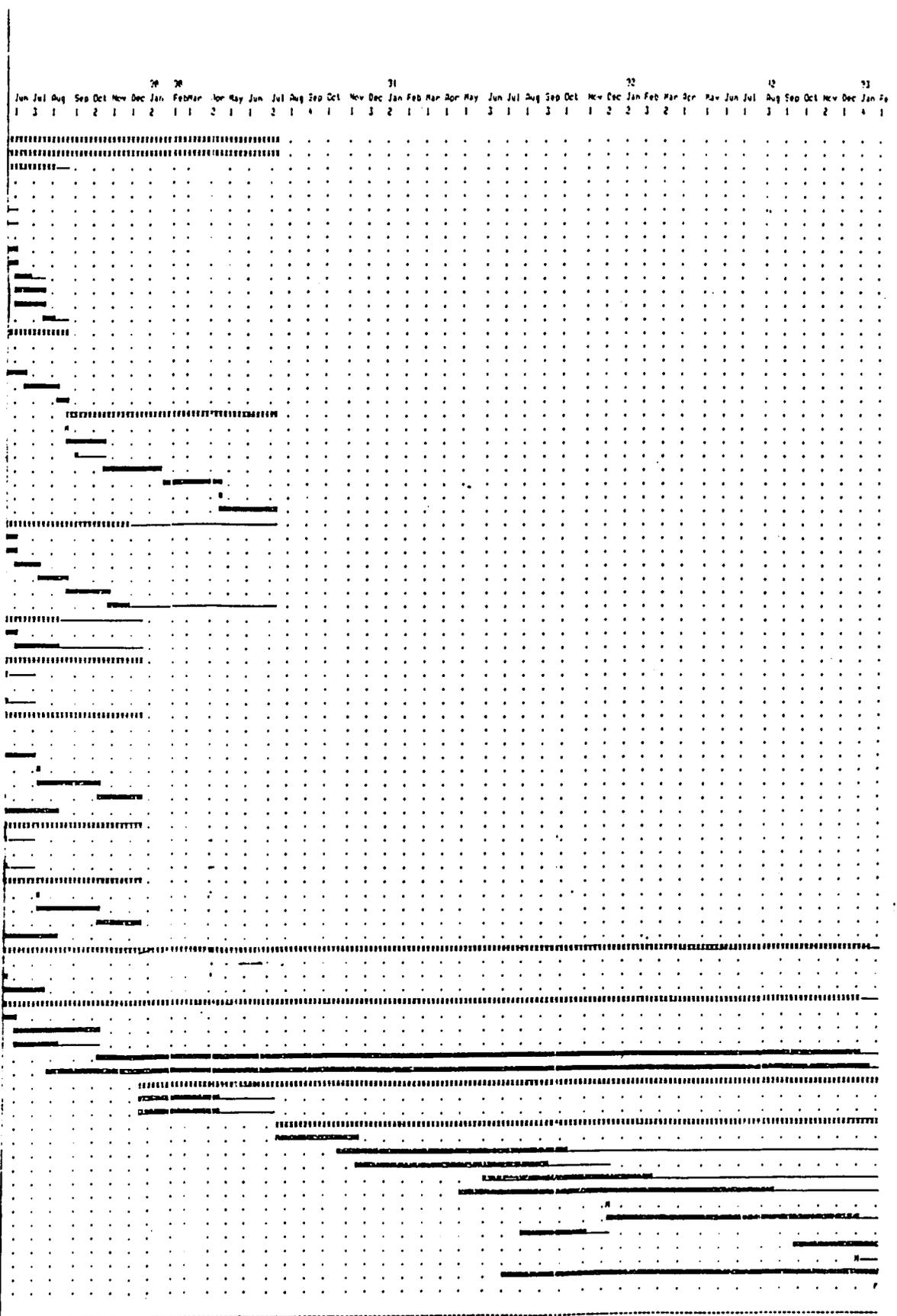
Excluded from previous drafts--for discussion by all parties



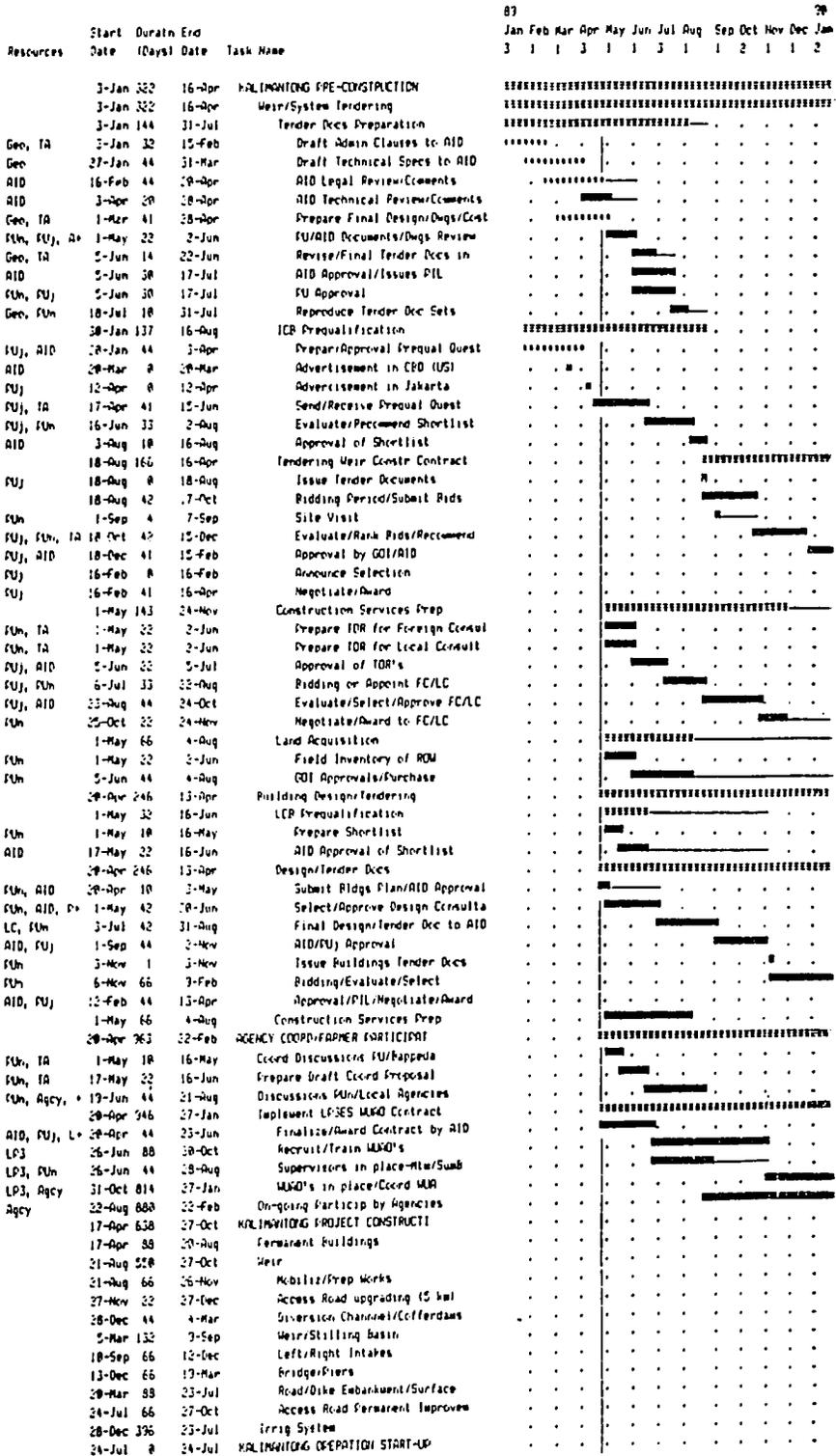
39  
 Jan Feb Mar Apr May Jun Jul Q  
 J J J J J J

BEST AVAILABLE COPY

Legend:  
 ■ Detail Task  
 ■ Start  
 ■ End  
 ■ Milestone  
 ■ Conflict  
 ■ Resource



Compiled from previous drafts--for discussion by all parties

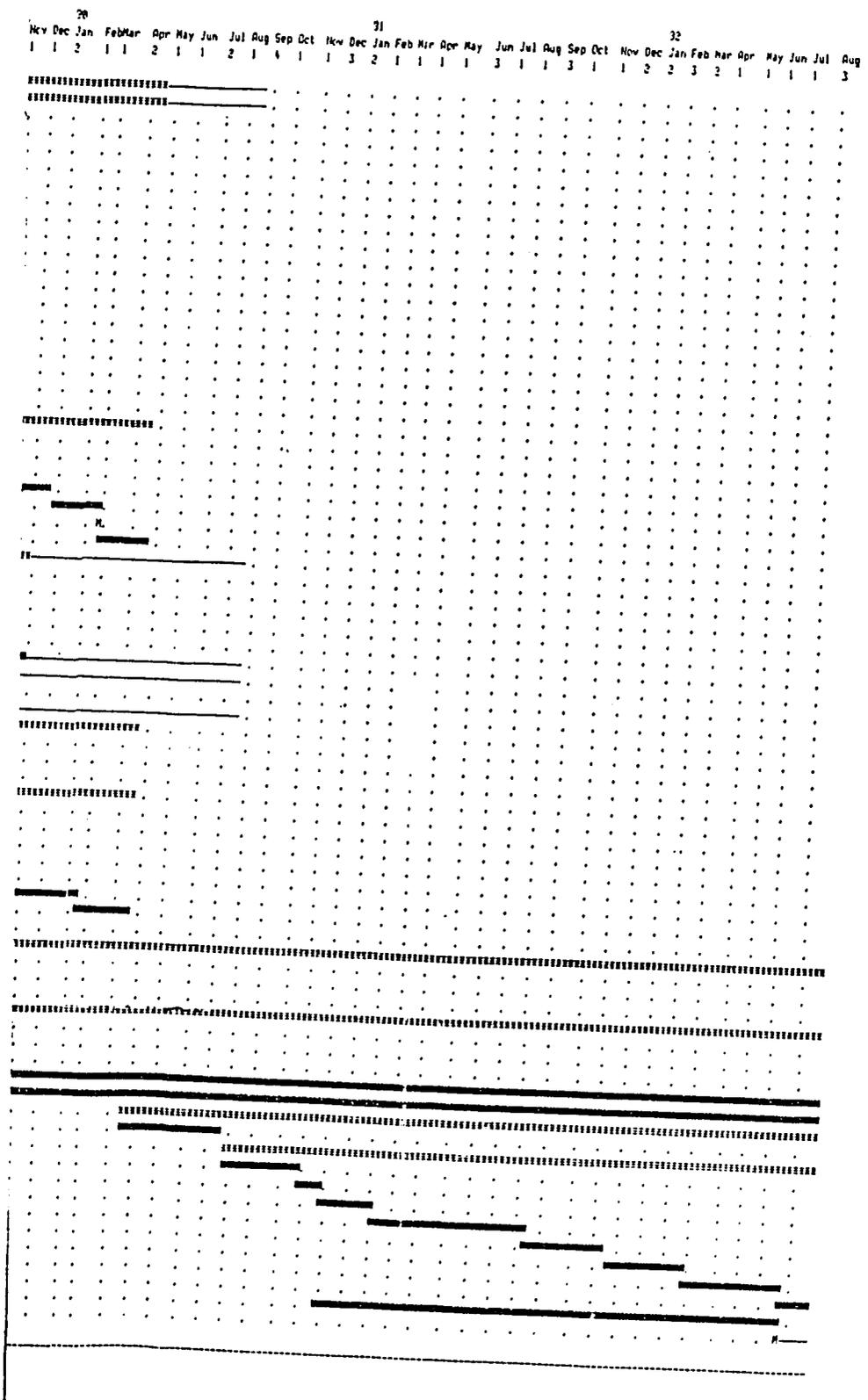


BEST AVAILABLE COPY

■ Detail Task    ■■■ Summary Task    M Milestone  
 ■■ (Started)    ■■■■ (Started)    (C) Conflict  
 ■■ (Slack)      ■■■■ (Slack)      ■■■ Resource delay  
 Scale: 1 week per character

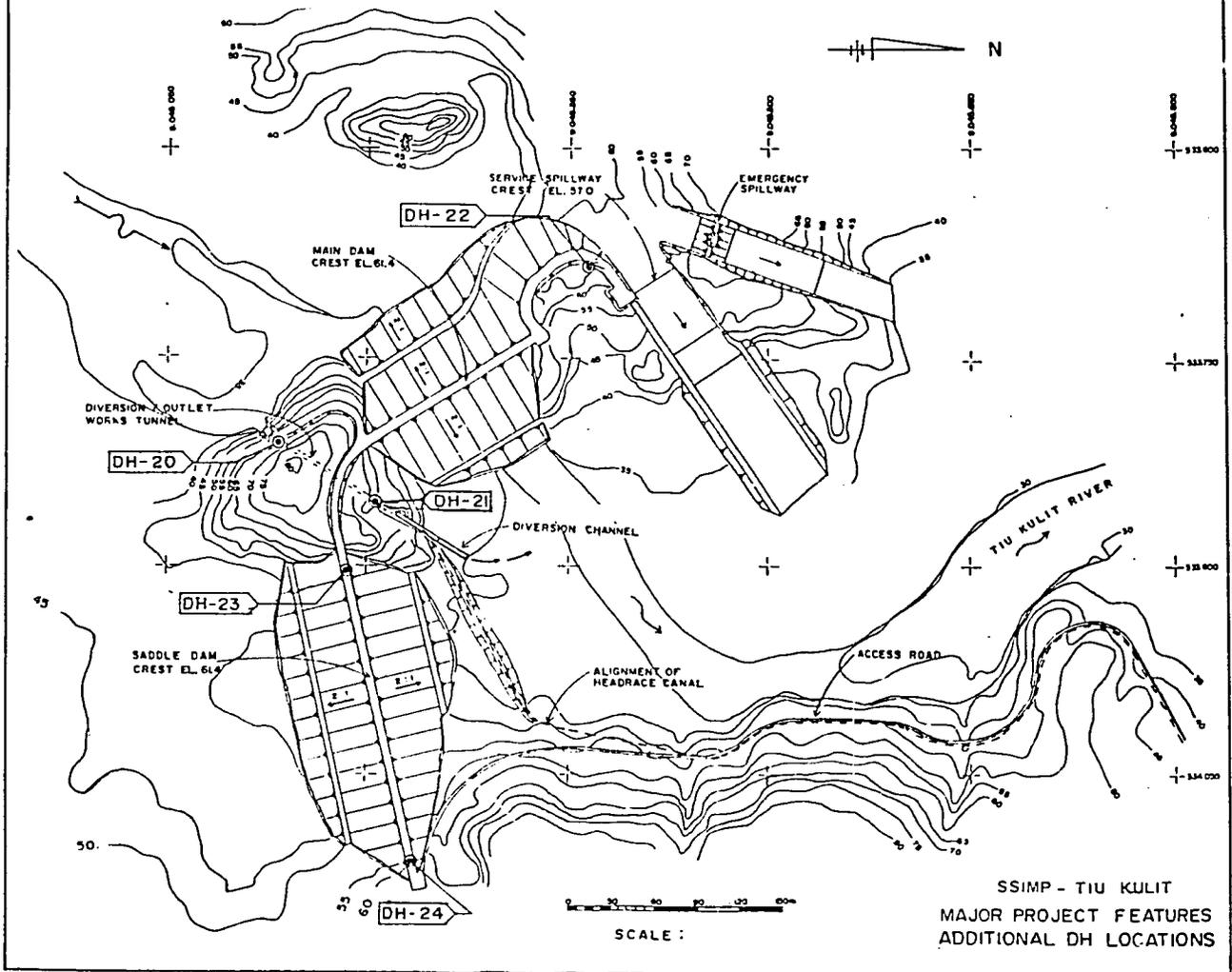
14

41



BEST AVAILABLE COPY

117A

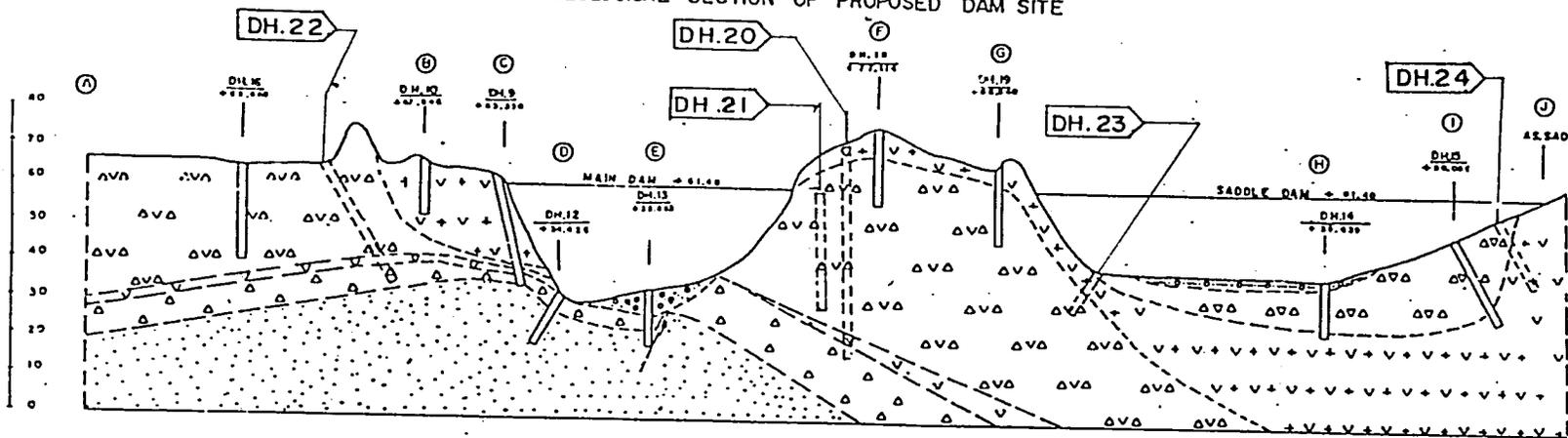


SSIMP - TIU KULIT  
 MAJOR PROJECT FEATURES  
 ADDITIONAL DH LOCATIONS

FIGURE 5

28

PENAMPANG GEOLOGI RENCANA SITE DAM  
 GEOLOGICAL SECTION OF PROPOSED DAM SITE



LEGENDA  
 LEGEND

-  Endapan sungai  
River deposits
-  Endapan tufus  
Tuff deposits
-  Breksi vulkanik atas  
Upper volcanic breccia
-  Tufa andesitik  
Andesite tuff
-  Breksi tufa  
Tuff breccia
-  Tufa  
Tuff
-  Breksi vulkanik bawah  
Lower volcanic breccia
-  Batu pasir tufa  
Tuffaceous sandstone

---Tuffaceous rock

