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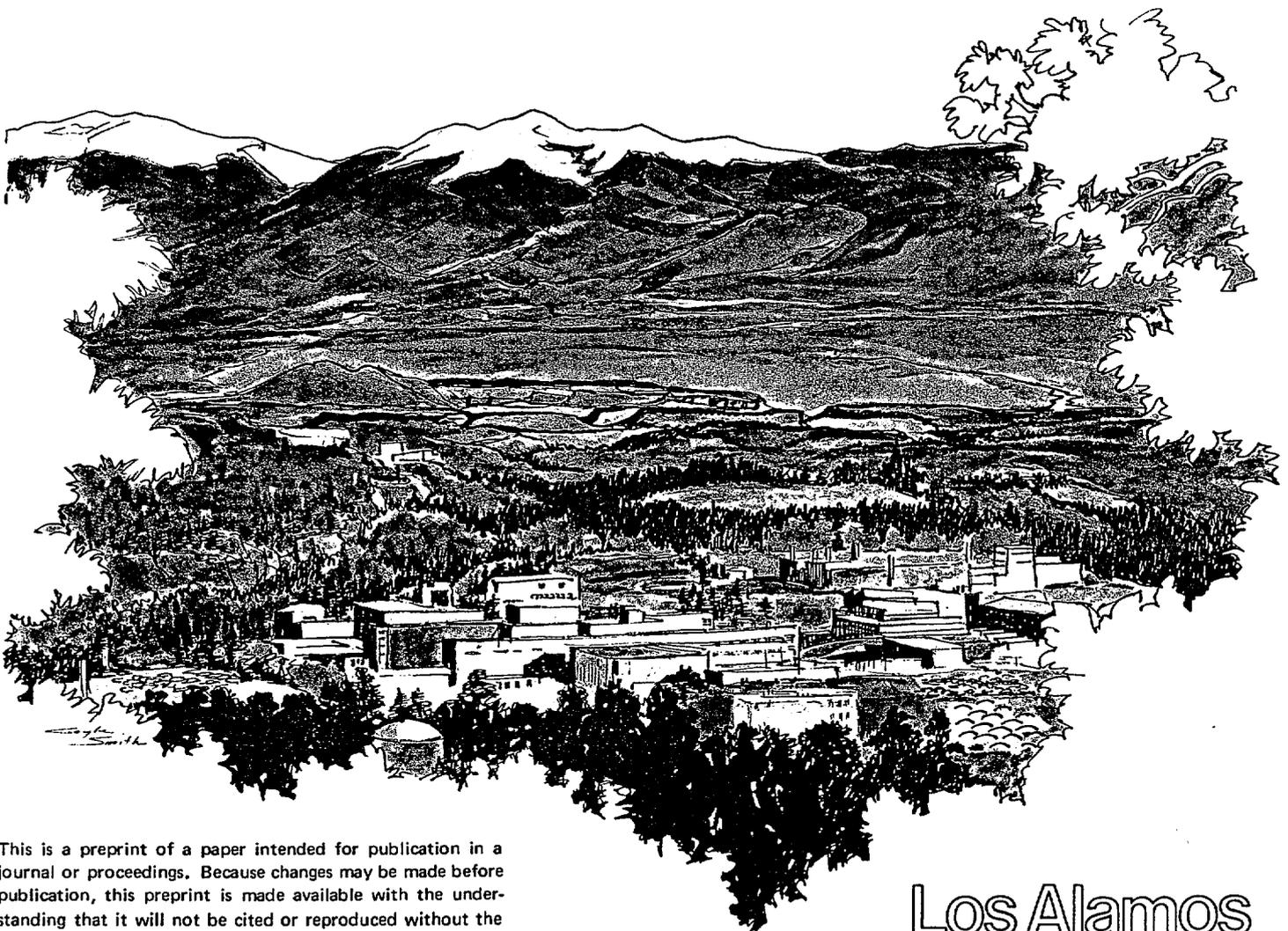
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CENTRAL AMERICAN ENERGY RESOURCES PROJECT

PROJECT PAPER FOR 1986 SUPPLEMENTAL FUNDS

Submitted to the
Regional Office for Central America and Panama

September 1986



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Los Alamos

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I. INTRODUCTION

This document defines the project components for which Los Alamos National Laboratory is requesting a one million dollar supplemental allocation to the Central American Energy Resources Project from FY86 funds. This is primarily new work which is in addition to the work described in the initial project paper, revised March 1985, and in two subsequent addenda, dated August 1985 and April 1986. In those cases where funds are being requested to supplement previously funded work the revisions are clearly identified and justified. The Central American Energy Resources Project is being performed by Los Alamos under a PASA Agreement between the US Agency for International Development (AID) and the US Department of Energy.

These supplemental funds will be used to address specific problems and priorities as defined by our regional counterparts, AID and us. Project performance will be adversely impacted if the funding and related work efforts are delayed until FY87 funds are approved. This document has been prepared under the assumption that FY87 allocations will not be available to us until the end of March 1987.

II. BUDGET SUMMARIES

A. Summary by Component

<u>Component</u>	<u>\$K</u>
Energy Planning Assistance	150.0
Honduras Geothermal Reconnaissance	600.0
Direct Heat Application of Geothermal Energy in Guatemala	150.0
Education Assistance	25.0
Management and Contingency	<u>75.0</u>
Total	1,000.0

B. Summary by Cost Category

	<u>\$K</u>
Staff Member base salary	88.0
Fringe @ 26% of base salary	22.0
Burden @ 82% of base salary	<u>91.0</u> 201.0
Travel	
Air fare (33 R/T, Albuquerque to Central America)	30.0
Air fare (1 R/T, Santa Cruz, CA to Los Alamos)	0.7
Air fare (2 R/T, Costa Rica to Santa Cruz, CA)	2.0
Per diem (total of 545 days at various rates)	31.2
Local and Field Expenses	<u>14.9</u> 78.8
General Materials and Services	
Group and Division Allocation	58.0
Other Administration	<u>27.0</u> 85.0
Contracts	527.0
Consultants (10 days at \$250/day)	2.5
Miscellaneous	
Equipment	27.0
Analysis	<u>3.2</u> 30.2
Management and Contingency	<u>75.0</u>
TOTAL	1000.0

III. PROJECT COMPONENTS

A. Energy Planning Assistance

1. Problem Statement. The heavy reliance on a dwindling fuelwood resource, the economically inefficient pricing policies, and the high debt incurred during recent construction of large hydroelectric projects have led to serious energy problems in the region. The Central American governments closely control the energy sector in all countries, being responsible for centralized energy planning, fixing energy prices, and deciding on significant energy development projects. The governments therefore have the authority to affect the energy situation of their countries. However, while the governments have the authority, some require assistance in improving their abilities to institute sound energy policies. Policies that minimize the future cost and maximize the availability of energy are critical to the development prospects of the Central American countries. Energy planning assistance is therefore warranted.

2. Project Component Description.

a. Activities. This project component will address the needs of the region by focusing on two activities: (1) energy planning assistance; and (2) maintenance and support for a computerized database that was transferred during Phase I of this project.

The long-term goals of this project as specified in the original Project Paper and the April Addendum are: (1) development of sound national energy policies; (2) efficient energy use; and (3) provision of an analytical framework to measure the benefit of indigenous resource development.

b. Task Statement.

1) Energy Planning Assistance. This task will provide technical assistance in one area that all countries can benefit from, such as energy demand estimation. A seminar held at INCAE will be used to discuss common problems encountered by each country. Energy demand issues will be addressed jointly by economists from Los Alamos, counterparts in the region, and consultants. Common methodologies of demand estimation will be adopted from those already in use in the region and from methods that have been applied elsewhere. The methodologies will be transferred to all countries in a framework compatible with the personal computers given to the countries under this project and further training will take place.

2) Sistema de Informacion Centroamericana para Planificacion Energetica (SICAPE). This energy/economic database was transferred during Phase I of this project. We will take the responsibility of updating the database with 1985 data as they become available and will support other organizations' efforts to expand the database.

c. Coordination and Implementation Plan. We will complement the activities of the UNDP, the IDB, and ECLA that have been carried out in the region. The project component will be directed by Dr. Linda Trocki and will be performed by the following personnel as needed: Patricia Aragon, Dr. Steven Booth, Dr. Anthony Burris, Robert Drake, Flavio Gurule,

and Dr. Richard Lotspeich of Los Alamos; Guillermo Selva, Rogelio Sotela, and Milton Fonseca of INCAE. Outside consultants from universities, private firms, and government organizations will be sought when necessary.

The main counterpart organizations are the following: the Belize Energy Board and the Secretary of Energy, Communications and Transport in Belize; the Dirección Sectorial de Energía in Costa Rica; Comisión Ejecutiva Hidroeléctrica del Río Lempa in El Salvador; Ministerio de Energía y Minas in Guatemala; Consejo Superior de Planificación Económica in Honduras; Comisión Nacional de Energía in Panama; SIECA; and ECLA.

Both subtasks are expected to be ongoing activities throughout the life of the project. Significant end products are listed below.

d. Status at completion.

- o SICAPE updated.
- o Expansion of SICAPE carried out in two countries and at regional level for some data.
- o Energy planning capabilities strengthened.
- o Energy planning seminar held.

e. Project Component Budget

\$K

Energy Planning Assistance

Economist base salary (\$53K/FTE/Yr) 0.5 FTE	27	
Fringe @ 26% of base salary	7	
Burden @ 82% of base plus fringe	<u>28</u>	62
INCAE Contract		
Personnel	5	
Seminar	<u>25</u>	30
Travel		
Air fare (4 R/T, Albuquerque to Central American Capital City)	4	
Per diem (average \$75/person-day x 40 person days)	3	
Local and field expense	<u>1</u>	8
Consultants (4 days @ \$250/day)		1
General Materials and Services		
Group and Division Office overhead	15	
Other administrative expenses	<u>4</u>	<u>19</u>
Subtotal		120

SICAPE

Computer scientist base salary (\$53K/FTE/Yr) 0.15 FTE	8	
Fringe @ 26% of base salary	2	
Burden @ 82% of base plus fringe	<u>8</u>	18
 SIECA/INCAE Contract Personnel		 5
 Travel		
Air fare (1 R/T, Albuquerque to Central American Capital City)	1	
Per diem (average \$75/person-day x 14 person days)	<u>1</u>	2
 General Materials and Services		
Group and Division Office overhead	4	
Other administrative expenses	<u>2</u>	<u>5</u>
Subtotal		30
 TOTAL		 <u>150</u>

f. Activity Schedule and Milestones. The schedule for the tasks described is shown on the accompanying milestone chart.

PROJECT COMPONENT TITLE: ENERGY PLANNING ASSISTANCE

FY87 QUARTER

SUBTASK	1	2	3	
Energy Planning Assistance				
Specification of demand in 2 sectors				▽ Work on other sectors
Construction of models		Seminar		→ Work on other sectors
SICAPE				
Update				→ Continued updating
Expansion		Completed for 1 country		→ Continued expansion

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* Division Management Allocation (1005)

An allocation of 5% of the project amount is charged by the Earth and Space Sciences Division for providing support services to the groups and projects. \$30K

* Project Leadership (1010)

Coordinate efforts of Los Alamos geology, geochemistry and geophysics principal investigators. Provide liaison between Los Alamos, ENEE and the Italian UNDP team. Four trips to Honduras for project coordination. Provide technical and financial leadership to the project. \$25K

* Engineering and Logistics (1020)

Design, direct, and execute engineering activities (drilling, logging, and well testing) in coordination with the scientific disciplines. Two trips to Honduras during well drilling. Provide logistical and other support for the technical activities and the project leadership. \$25K

* Gradient Drilling, PL-1 (1100)

An outside contractor (Swissboring of Guatemala) will drill the first intermediate depth geothermal gradient well at Platanares. This well will be cored to 500 m depth, providing stratigraphic, structural, gradient, and hydrologic information. This information is required for the modeling of the geothermal system at Platanares. \$220K of this activity will be covered by existing funds. \$55K

Well Sitting, PL-1 (1105)

Geologists from Los Alamos will remain at the Platanares drill site throughout the drilling period. These geologists will perform the initial logging of core samples, ensure security of cores, provide training to ENEE geologists, and supervise the drilling operations to achieve scientific goals. Two persons will perform this task to ensure that Los Alamos supervision is always available during the round-the-clock drilling operations. This activity will be covered by existing funds.

* Logging, PL-1 (1110)

A commercial geophysical logging company will run appropriate logs in well PL-1 to measure temperature, lithologies, permeability of the reservoir, and other related scientific and technical geothermal characteristics. \$60K

Well Testing, PL-1 (1115)

Appropriate production and injection testing will be performed by Los Alamos personnel and contractors to provide information on effects of the subsurface on hydrology.

Interference testing will be performed (if more than one well is drilled) to evaluate fractures and permeability of subsurface. Considerable equipment will be required for this effort.

* Geochemical Sampling, PL-1 (1120)

In collaboration with ENEE and USGS geologists, Los Alamos will collect samples of all fluids encountered in PL-1 during well drilling. These water and gas samples will provide the basic data for obtaining better estimates of reservoir temperature, composition of the geothermal fluids, reservoir recharge, and the amount of mixing with shallow aquifers. Two Los Alamos personnel (a geochemist and a technician) will perform the water sampling and a USGS geochemist will perform the gas sampling. \$20K

Core Studies, PL-1 (1130)

Thin-sections (approximately 100) will be prepared by Los Alamos personnel from core samples from PL-1. These sections will be studied using the petrographic microscope, x-ray diffraction, and electron microprobe to identify mineral constituents, textures, alteration, and rock genesis. Whole-rock chemical analyses will be used to aid in evaluating permeability and the development of the geothermal system.

* Geochemical Analysis, PL-1 (1140)

Fluid chemical and stable isotopic analyses will be obtained in samples from PL-1 by atomic absorption spectrophotometry and mass spectrometry. This work will be performed by Los Alamos personnel and contractors. Funds from the supplemental request will only cover the outside contracting. \$10K

Interpretation of Geochemical Data, PL-1 (1150)

Los Alamos personnel will use the results of the chemical and isotopic analyses of fluids from PL-1 to estimate reservoir temperatures, recharge, and the amount of mixing between high temperature fluids and shallow groundwater.

* Move Drilling Equipment to PL-2 (1160)

The drilling contractor will break down the drilling rig and related equipment at the PL-1 site and move it by truck to PL-2 site. They will also prepare new drill site and reassemble drill rig. \$25K

* Gradient Drilling, PL-2 (1170)

The drilling contractor will drill the second intermediate depth geothermal gradient well at Platanares. This well will be cored to 500 m depth, providing stratigraphic, structural, gradient, and hydrologic information. This information is required for the modeling of the geothermal system at Platanares. \$200K

* Well Sitting, PL-2 (1175)

Geologists from Los Alamos will remain at the Platanares drill site throughout the drilling period. These geologists will perform the initial logging of core samples, ensure security of cores, provide training to ENEE geologists, and supervise the drilling operations to achieve scientific goals. Two persons will perform this task to ensure that Los Alamos supervision is always available during the round-the-clock drilling operations. \$45K

* Logging, PL-2 (1180)

A commercial geophysical logging company will run appropriate logs in well PL-2 to measure temperature, lithologies, permeability of the hydrothermal system, and other related scientific and technical geothermal characteristics. \$60K

Well Testing, PL-2 (1181)

Appropriate production and injection testing will be performed by Los Alamos personnel and contractors to provide information on effects of the subsurface on hydrology. Interference testing will be performed to evaluate fractures and permeability of subsurface. Considerable equipment will be required for this effort.

* Demobilization of Equipment (1182)

The drilling contractor will breakdown the drilling rig and equipment and move by truck to Guatemala office. \$25K

Core Studies, PL-2 (1190)

Thin-sections (approximately 100) will be prepared by Los Alamos personnel from core samples from PL-2. These sections will be studied using the petrographic microscope, x-ray diffraction, and electron microprobe to identify mineral constituents, textures, alteration, and rock genesis. Whole-rock chemical analyses will be used to aid in evaluating permeability and the development of the geothermal system.

* Geochemical Sampling, PL-2 (1200)

In collaboration with ENEE and USGS geologists, Los Alamos will collect samples of all fluids encountered in PL-2 during well drilling. These water and gas samples will provide the basic data for obtaining better estimates of reservoir temperature, composition of the geothermal fluids, reservoir recharge, and the amount of mixing with shallow aquifers. Two Los Alamos personnel (a geochemist and a technician) will perform the water sampling and a USGS geochemist will perform the gas sampling. \$20K

Geochemical Analysis, PL-2 (1210)

Fluid chemical and stable isotopic analyses will be obtained in samples from PL-2 by atomic absorption spectrophotometry and mass spectrometry. This work will be performed by Los Alamos personnel and contractors.

Interpretation of Geochemical Data, PL-2 (1220)

Los Alamos personnel will use the results of the chemical and isotopic analyses of fluids from PL-2 to estimate reservoir temperatures, recharge, and the amount of mixing between high temperature fluids and shallow groundwater.

c. Coordination and Implementation Plan. We will coordinate with the UNDP funded Italian geothermal team through frequent meetings of a coordinating committee chaired by ENEC. This project component will be directed by Dr. William Laughlin and engineering and logistical support will be provided by Sue Goff. Drs. Mark Ander, Fraser Goff and Grant Heiken are the Principal Investigators for geophysics, geochemistry and geology, respectively. Other technical staff will be provided by Los Alamos as necessary. The United States Geological Survey will provide technical support under contract to Los Alamos.

The counterpart organization in Honduras is the Empresa Nacional de Energia Electrica.

d. Status as of March 31, 1987.

Based only on activities included in the supplemental funds request, the status on March 31, 1987 will be:

- o Thermal gradient wells PL-1 and PL-2 at Platanares will be drilled to approximately 500m depth.
- o Wells PL-1 and PL-2 will be logged.
- o The cores from both wells will be ready for core studies.
- o Geochemical fluid sampling will be complete for both wells.
- o Approximately 25% of the geochemical analysis for samples from well PL-1 will be complete.
- o The drill rig and associated equipment will be demobilized and returned to Guatemala.

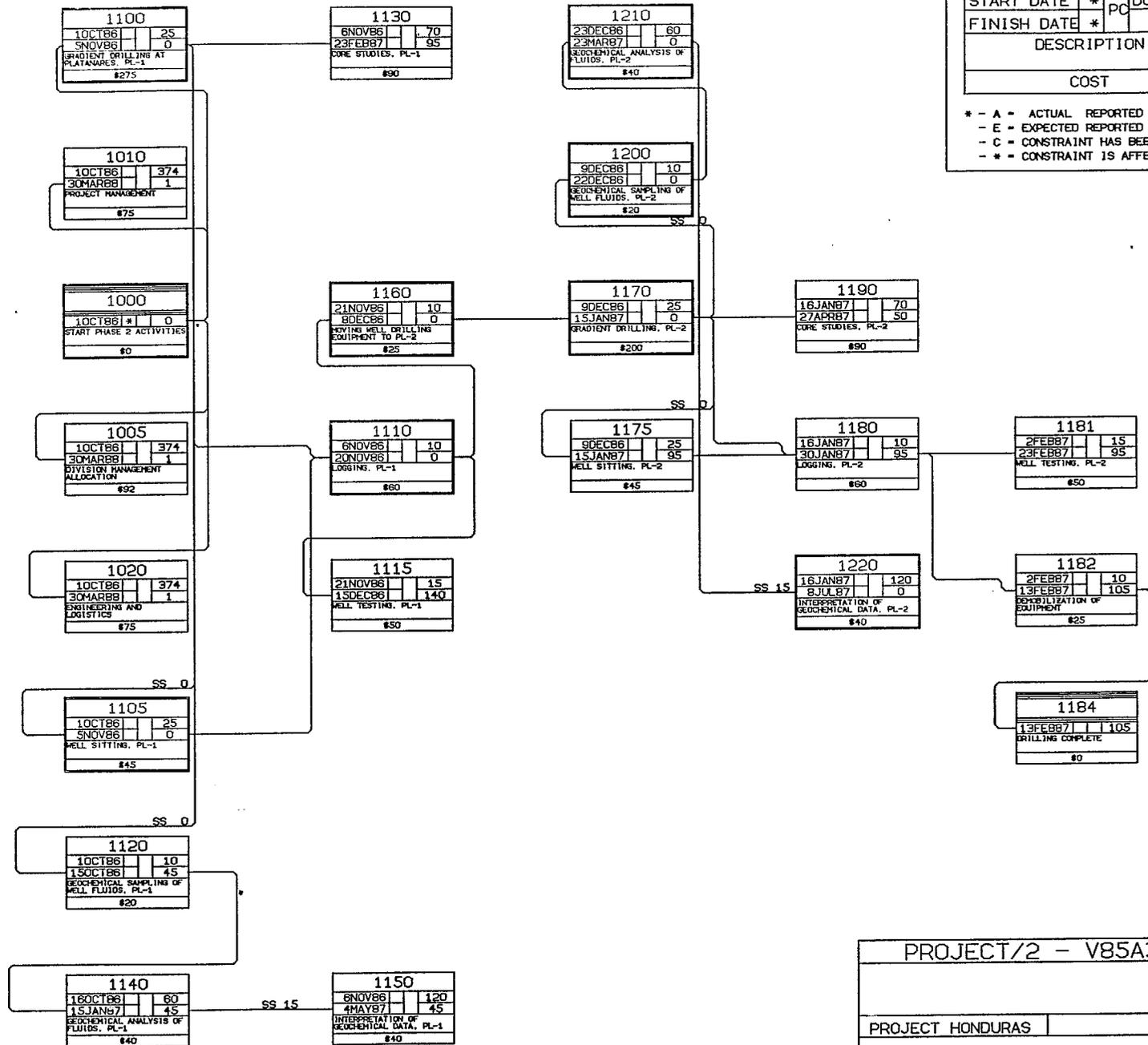
e. Project Component Budget.

	\$K
Geologist base salary (\$50.7/FTE/Yr) 0.7 FTE	36
Fringe @ 26% of base salary	9
Burden @ 82% of base salary	<u>37</u> 82

Travel		
Air fare (15 R/T, Albuquerque to Tegucigalpa)	15	
Per diem (average \$75/person-day x 114 person-days)	9	
Local and Field Expenses	<u>9</u>	33
General Materials and Services		
Division Allocation	30	
Other Administration	<u>20</u>	50
Contracts		
Drilling	305	
Geophysical Logging	120	
Analytical	<u>10</u>	435
TOTAL		600

f. Activity Schedules and Milestones. The first of the following two figures presents the schedule for the work described in the task statement (2.b.). The second figure presents the schedule for all of the new work required to complete the prefeasibility study, including the work shown on the first figure. The costs shown with each activity are total costs in thousands of dollars.

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LEGEND:

ACTIVITY NUMBER			
START DATE	*	PC	DURATION
FINISH DATE	*		TF
DESCRIPTION			
COST			

* - A - ACTUAL REPORTED DATE.
 - E - EXPECTED REPORTED DATE.
 - C - CONSTRAINT HAS BEEN ASSIGNED.
 - ** - CONSTRAINT IS AFFECTING DATE.

PROJECT/2 - V85A3			
PROJECT HONDURAS			
START DATE		COMPLETION	
10OCT86		31MAR8C	
MODE O/FE		RUN SEP 10, 1986	
PLOT 'SUPNET'		PAGE 1 SHEET 1/1	

Fig. 1

LEGEND:

ACTIVITY NUMBER			
START DATE	*	PC	DURATION
FINISH DATE	*		TF
DESCRIPTION			
COST			

- * - A - ACTUAL REPORTED DATE.
- E - EXPECTED REPORTED DATE.
- C - CONSTRAINT HAS BEEN ASSIGNED.
- * - CONSTRAINT IS AFFECTING DATE.

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PHASE 2 COSTS

EXISTING FUNDS: \$ 265K
 FUTURE FUNDS: 1927K
 TOTAL COST: \$2192K

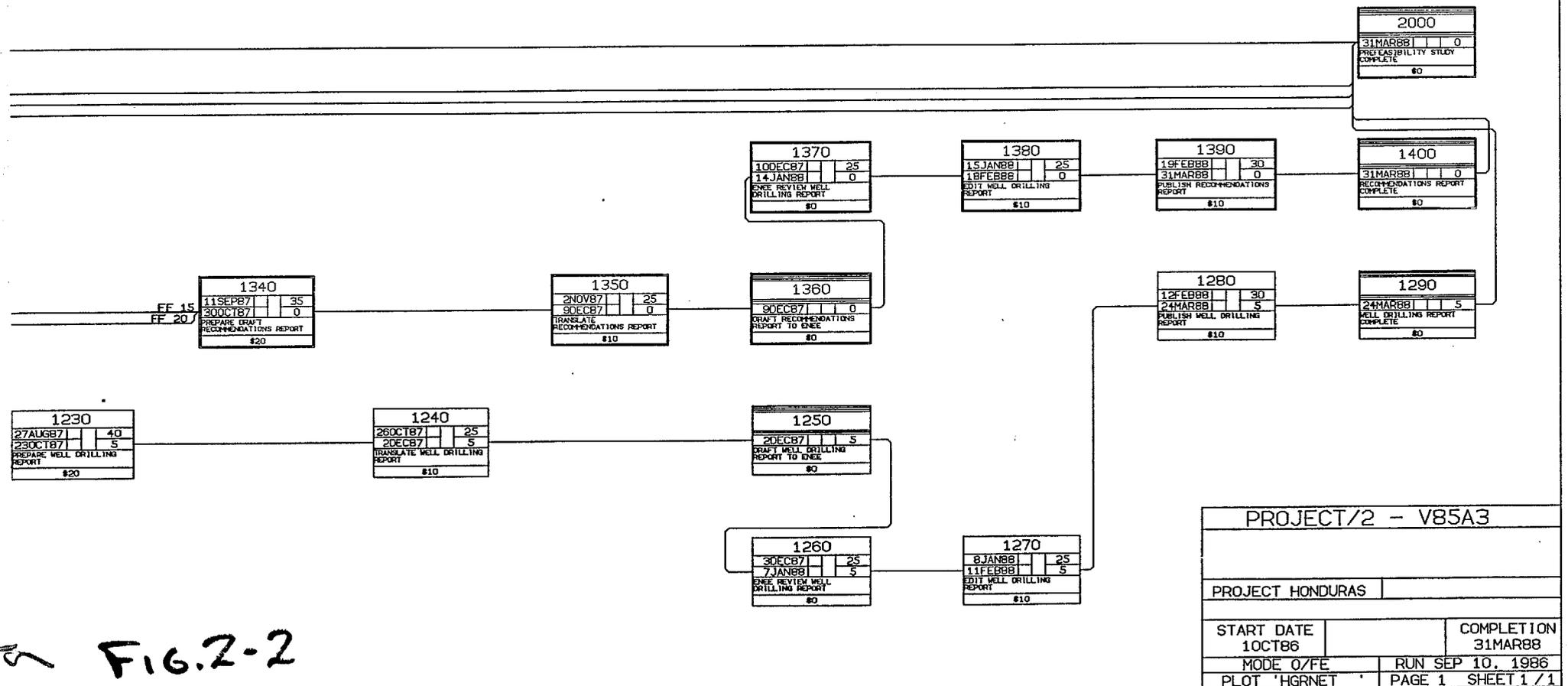


FIG. 2-2

C. Direct Heat Application of Geothermal Energy in Guatemala

1. Problem Statement. The direct application of geothermal energy to provide process heat can provide a comparative advantage for economic development. Also, for favorable use situations, the process heat obtained in this way can be considerably less expensive than conventional alternatives. For these reasons, we are studying the direct-heat application of geothermal energy in Guatemala. To demonstrate the concept, our problem is to match the resource location and availability with worthwhile applications and then demonstrate to the many diverse potential users how this type of energy can be utilized.

2. Project Component Description.

a. Activities. We have identified existing plants in the Amatitlán and Zunil areas having process heat needs compatible with the geothermal resource. The development of an industrial park at Amatitlán is attractive. At Zunil, the local farmers grow many types of fruits and vegetables, and the agricultural processing application should be useful. Because Guatemala has offered the use of existing wells at Zunil, we are concentrating our efforts on establishing a small demonstration facility for agricultural processing at Zunil. Los Alamos, MEM, and INDE are coordinating their efforts to achieve a successful demonstration at the earliest possible date. Initially, we plan to demonstrate the dehydration of fruits and vegetables in a dehydration tunnel using geothermally heated air. The basic elements of the heat-delivery system will be similar to what could be used in a commercial plant. Further, the small demonstration facility can serve as a laboratory for future tests of agricultural processing techniques. The facility is conveniently located near a small lower temperature well for the initial demonstrations and also next to a much larger and higher temperature well that might be used in the future.

The longer term development objective is to use the geothermal energy in a commercial agricultural processing center at Zunil. The processing will be by freezing, cold storage, as well as drying dehydration. The prefeasibility studies of the commercial plant will be initiated in the last quarter of CY 1986 with a marketing study of the most promising products. Emphasis will be on exports to the US or Europe. The market study will be followed by another subcontracted study of the plant design and costs.

The following task statements cover the work planned for the period between September 1986 and March 1987. The additional \$150K added to the funds previously allotted to the 1986 program makes possible additional work that will be beneficial to the overall project.

b. Task Statement. The following activities will be initiated during or are continuing into the period between October 1, 1986 and March 31, 1987, given the availability of funds or the permission to operate on anticipated funds. The activity numbers in parentheses refer to the flow chart presented at the end of this section. An asterisk (*) indicates activities partially or totally funded from the supplemental request. The portion of the cost being funded by supplemental funds is indicated at the end of each activity description.

* Geothermal Well and Surface Equipment (1100)

We will coordinate with INDE the design of the geothermal surface system at Well No. 11, the small well that will be used for the demonstrations. INDE will supply construction labor and as much equipment as is available in Guatemala. In the preliminary stages of the design it was not anticipated that Los Alamos would cover the cost of putting the well on line. Los Alamos agreed to cover these costs at a meeting that took place after the April, 1985 addendum was submitted. We will supply equipment, as necessary, to allow INDE to complete the system and measure flow characteristics. For example, we will supply four primary geothermal control valves, some smaller valves, and flow control and measurement accessories. \$12K.

* Dehydration Facility Design and Construction (1200)

Los Alamos has prepared the basic design of the dehydration demonstration building and is in the process of designing the heat loop between the well and the dehydration building utilizing existing funds. Los Alamos has agreed to supply the materials and equipment and INDE will construct the facility. As the design and the operational plan progressed, the need for more equipment such as temperature and humidity sensors developed and Los Alamos has agreed to supply these before the end of 1986. \$10K.

* Environmental Studies (1300)

Los Alamos will continue to work with INDE on the study of two potential environmental impact problems. One has to do with release into the environment of noncondensable gases from the geothermal fluid. The other relates to the purity of the water used in the processing of the fruits and vegetables. Los Alamos anticipates providing about \$5K of monitoring equipment for use in these studies. \$5K.

Operational Procedures and Crew (1400)

For the demonstration, we will develop preliminary operational procedures and initiate the hiring and training of the operating crew using existing funds. Mr. E. L. Cooper of E-Corporation of Albuquerque, New Mexico, will coordinate the operational procedures and the work of the crew.

Demonstration Plan (1500)

Los Alamos will develop a plan to test techniques and demonstrate the dehydration of selected fruits and vegetables using existing funds.

* Tests and Demonstrations (1600)

After the demonstration facility and the local operating crew is checked out, it is planned to run the facility for a

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six-month time period in CY 1987 measuring operating requirements to achieve good quality products. Los Alamos will hire and pay for an operating crew. Los Alamos will also pay for anticipated additional expenses, for activities such as product hauling and distribution and for additional processing equipment to allow a full processing program. This activity will require approximately \$25K in FY 87 funds in addition to the supplementary funds being requested. \$15K.

Survey Report (1700)

A survey of potential geothermal heat applications has been completed and a report on the study results will be completed using existing funds.

* Prefeasibility Study (1800)

Many of the program activities to date can be considered to be prefeasibility type studies. To complete the prefeasibility analyses and specifically addressing the agricultural processing application, a market survey will be made as soon as an acceptable subcontractor can be arranged. The USAID has already arranged for a similar study by the Guatemalan Exporters Guild to cover all of Guatemala. It is planned to cooperate with the above study to gather data for the Quetzaltenango/Zunil agricultural area. The study results should include an analysis of economically feasible products from the Zunil processing plant and an analysis of the competition or other impediments that such a plant would have to face. \$25K.

Feasibility Study (1860, 1880 and 1900)

The feasibility study results should include preliminary plant designs, capital and equipment costs, as well as production costs of typical products. It is planned to develop the study's scope-of-work and select a study subcontractor by the end of March 1987. Los Alamos' costs will be covered by the supplemental funds being requested as described below in "Technical Assistance."

* Technical Assistance (2300)

Los Alamos, aided by our subcontractor (E-Corporation) and food processing consultants, will provide project direction and technical backup to MEM, INDE, and the private sector people who should become increasingly involved in the project. This activity also includes division and group management allocations. Funds are required to continue work after existing funds run out at the end of 1986. \$83K.

c. Coordination and Implementation. Program management for this component is the responsibility of Mr. Joseph Frank. Dr. Kenneth Williamson is the Project Leader. Mr. John Altseimer is the Principal Investigator, and he is assisted by Dr. Frederick Edeskuty. Mr. David Chávez, the Los Alamos Field Coordinator in Guatemala is providing liaison

to the project. In Guatemala the overall direction is being given by Mr. Mario Funes, Vice Minister, MEM. Other counterpart personnel are Mr. Carlos Avalos, MEM; Mr. Andres Caisedo, INDE and Mr. Rolando Bethancourt, INDE. Mr. Leon Cooper acts as our field liaison engineer and also gives us the benefit of his extensive experience on alternative energy projects in Central America.

d. Status on March 31, 1987.

- o The geothermal heat supply system at Well No. 11 will be operable.
- o The heat delivery loop from Well No. 11 to the demonstration facility will be operable.
- o The dehydration tunnel will be in operation to determine its performance and productivity.
- o The market survey part of the prefeasibility studies of a commercial processing plant at Zunil will be completed.
- o The subcontractor for the plant design and cost estimating part of the prefeasibility studies of a commercial processing plant at Zunil will have been selected.
- o A local operating crew will have gained work experience in a small geothermal processing plant.
- o The private sector industrialists will have gained a valuable insight into the operation of a geothermal processing plant.
- o INDE, who will be in charge of delivering heat to commercial plants in the future will be able to make better estimates of the price to private consumers.
- o MEM and INDE will also be able to better plan how to more fully utilize the geothermal energy available in Guatemala.

e. Project Component Budget

	<u>\$K</u>
Staff Engineer base salary (56K/FTE/yr) 0.3 FTE	17
Fringe @26% of base salary	4
Burden @82% of base plus fringe	18 39
Travel	
Airfare (13 RT, ABQ to Guatemala)	10
Per diem(\$80/pers. day x 29 pers. day plus \$29/pers. day x 18 pers. day)	3
Local expenses	1 14
Consultant (6 days @\$250/day)	2
Additional equipment at demonstration site	27

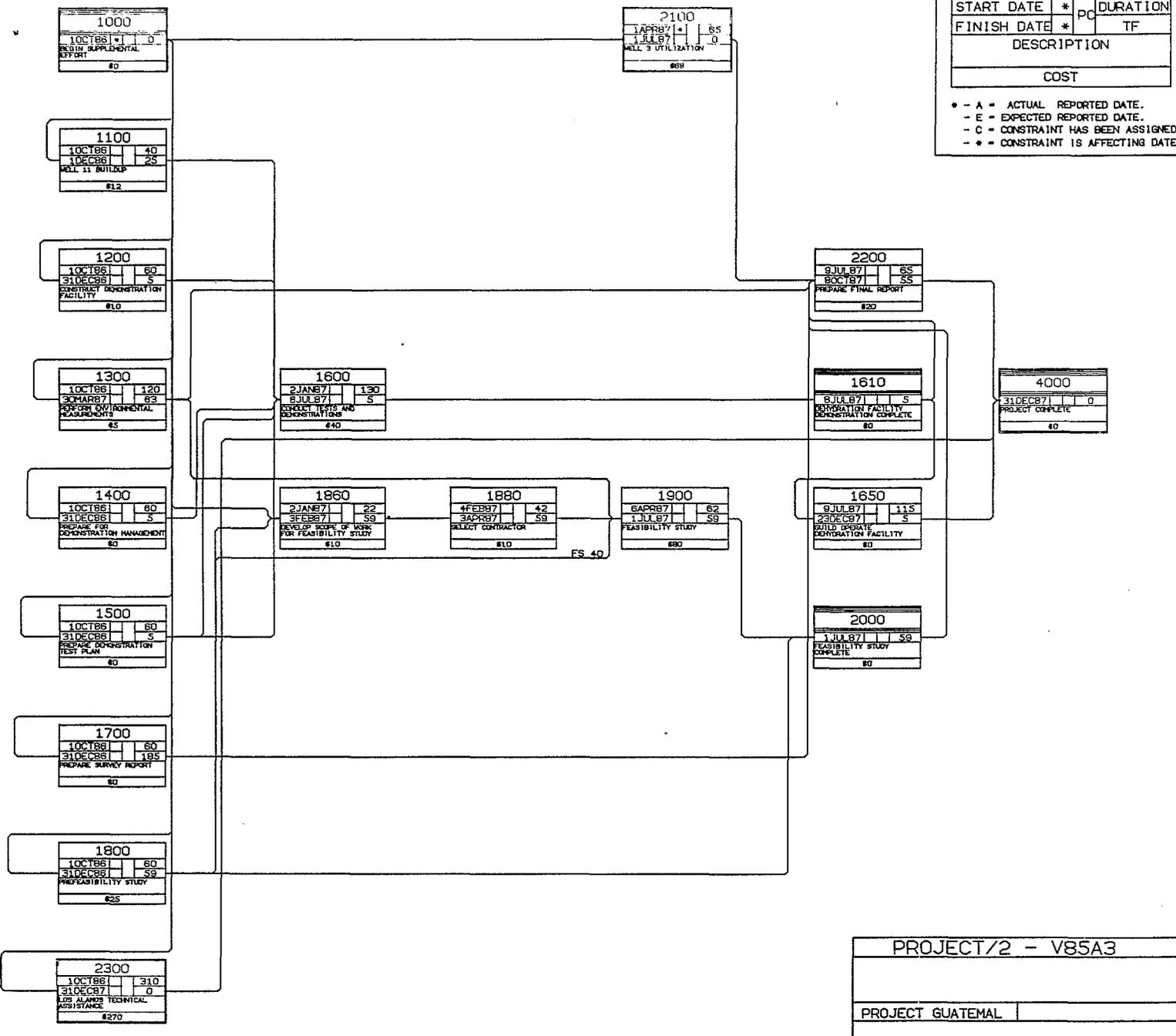
	<u>\$K</u>
Contracts	
E-Corporation	17
Demonstration local salaries and test equipment support	15
Prefeasibility Study of potential products and their competitiveness	25 57
General material and services	
Group & Division Office	9
Other administrative expenses	<u>2 11</u>
	\$150K

f. Activity Schedules and Milestones. The following flow chart presents the schedules and milestones for new work for this component, including the work for which supplemental funding is being requested. The costs shown with each activity are total costs in thousands of dollars.

LEGEND:

ACTIVITY NUMBER			
START DATE	*	PC	DURATION
FINISH DATE	*		TF
DESCRIPTION			
COST			

- A - ACTUAL REPORTED DATE.
- E - EXPECTED REPORTED DATE.
- C - CONSTRAINT HAS BEEN ASSIGNED.
- * - CONSTRAINT IS AFFECTING DATE.



PROJECT/2 - V85A3			
PROJECT GUATEMAL			
START DATE	10C'86	COMPLETION	31DEC87
MODE	O/FE	RUN	SEP 12, 1986
PLOT	'GDHNET	PAGE	1 SHEET 1 / 1

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e. Project Component Budget.

\$K

Travel

Air fare (1 R/T Santa Cruz to Los Alamos)	0.7	
Air fare (2 R/T Costa Rica to Santa Cruz)	2.0	
Per diem in United States (270 days @ \$50/day)	13.5	
Per diem in Costa Rica (60 days @ \$29/day)	1.7	
Field expenses in Costa Rica	<u>3.9</u>	21.8

Analytical Expenses

3.2 3.2

TOTAL

25.0

f. Activity Schedule and Milestones. None.

E. Management and Contingency

We request that \$75K of the supplemental funds not be programmed at this time. These funds would be used to cover unanticipated increases in the component costs. Some of these funds will be required to cover project management expenses after after currently approved funds run out at the end of CY86.