SECOND QUARTERLY
TECHNICAL STATUS REPORT

Period of July 1, 1978 through September 30, 1978

Date: October 18, 1978
No: COO-4879-8

CONTRACT TITLE AND NUMBER

Draft Programmatic Environmental Impact Statement of the DOE Solar
Agricultural and Industrial Process Heat Program - ET-78-C-02-4879

CONTRACT START AND COMPLETION DATE

1 May 1978 to 30 June 1979

CONTRACTOR

Energy and Environmental Analysis, Inc.
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WORK ACCOMPLISHED

During the second quarter, work on the solar AIPH environmental statement was concentrated in five areas:

- Initiating and conducting the second coordination meeting
- Finalizing the list of visits to solar AIPH facilities
- Setting up and conducting site visits
- Writing trip reports
- Collecting data on environmental concerns for solar AIPH systems

In preparation for the second coordination meeting, a briefing package was prepared (see Attachment 1) and contacts with interested groups were made. The purposes of the meeting were to establish liaison between Chicago Operations, TO, AIPH, ASCS, and Ames Laboratory; to decide on specific sites to be visited; and to develop a mechanism for setting up site visits.

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The meeting was held on July 23, 1978. Key decisions reached were:

- Most of the industrial sites selected by EEA were approved by DOE. However, many of the proposed agricultural sites were not representative of farm environments. EEA was instructed to locate more suitable sites.
- To ensure EEA access to DOE funded sites, Bill Auer of AIPH agreed to send letters to project managers requesting cooperation. EEA was instructed to draft a letter for DOE use.

A conference record for the meeting subsequently was prepared. This report discussed the decisions reached during the meeting, the directions outlined by the participants, and the actions which the participants recommended. The conference report is included as Attachment 2.

Following the meeting, Dr. Landy Altman of USDA and various agricultural project managers were contacted in order to locate more representative solar applications for agricultural process heat. In addition, D.K. Anand of TPI, Inc. (technical consultant and subcontractor) was consulted about the proposed site visits. Based on comments from Dr. Altman, Bill Auer, D.K. Anand, and field personnel, a list of 26 DOE and private facilities was selected for potential site visits (see Attachment 3). These sites were deemed representative of solar AIPH applications.

Once the list of site visits was approved by DOE, letters were drafted for DOE and USDA signature notifying project managers of upcoming visits and requesting cooperation. The letters specified the purpose of the visit, the type of information being sought, who would be visiting, and the approximate date of the visit. These letters served as a means of introduction for EEA personnel wishing to conduct visits.

EEA contacted project managers and made appointments for site visits. Due to schedule conflicts, the number of sites to be visited was reduced from 26 to 22. During the month of September, EEA personnel visited a total of 17 sites in the South, Southwest, West, and Northeast. At each facility, the solar process heat systems was toured and potential environmental impacts assessed. Project managers and other facility personnel were interviewed on past system installation and operation problems, as well as the applicability of and compliance with local, State, and Federal regulations. Detailed notes and photographs were taken.

Trip reports were prepared for each site visit. The reports specify the date of the visit, the location of the site, the names of persons interviewed at the site, the type of solar energy systems, and environmental data collected. When site visits are completed, all trip reports will be compiled into one document and forwarded to the DOE Project Manager.

Other work efforts during the second quarter included collecting information on environmental concerns associated with solar AIPH systems. The USDA, FDA, and EPA libraries were searched for applicable studies, and the Solar Energy Data Base bibliography was obtained from Oak Ridge National Laboratories. Current developments relevant to solar AIPH, such as the passage of solar access legislation in California, also were investigated, as were the latest status reports on environmental research for solar heating and cooling systems.

WORK FORECAST

During the third quarter, projected work includes:

- Setting up and conducting five visits to solar AIPH facilities in the Midwest. Project managers will be contacted and arrangements will be made for tours and interviews. At the facility, appropriate personnel will be questioned about environmental problems associated with installation and operation of the solar process heat system. Following the visits, trip reports will be written.
- Compiling all trip reports into one document and summarizing the significant points gleaned from the visits. This document will provide current data on the environmental concerns associated with operational solar AIPH systems.
- Formulating a detailed outline for the solar AIPH environmental assessment. The outline will specify the format and content of the EA. It will be derived from the requirements of the 10 CFR 1021 DOE NEPA regulations, the projected DOE program for the FY 79-FY 84 timeframe, and the environmental problems associated with solar process heat systems.
- Continuing data collection on solar AIPH systems and initiating data analyses. Upon DOE approval of the detailed EA outline, all available information will be analyzed to determine its adequacy in assessing the impacts of widespread solar process heat use. Where necessary, existing studies will be expanded and additional analyses performed.

ATTACHMENT 1

SECOND COORDINATION MEETING:

ENVIRONMENTAL STATEMENT FOR THE DOE PROGRAM
FOR SOLAR AGRICULTURAL AND INDUSTRIAL
PROCESS HEAT

JULY 26, 1978

AGENDA

- PURPOSE OF MEETING
- EXPLANATION OF PROJECT
- SITE VISITS

PURPOSE OF MEETING

- To Establish Liaison between Chicago Operations, TO, AIPH, ASCS, and Ames Laboratory
- To Discuss the Purpose and Scope of the Environmental Statement for the DOE Program for Solar Agricultural and Industrial Process Heat
- To Decide on Specific Sites to be Visited and to Develop a Mechanism for Setting Up Site Visits

EXPLANATION OF PROJECT

- Environmental Statement for the DOE Program for Solar Agricultural and Industrial Process Heat
 - A statement which assesses the environmental consequences generic to component solar AIPH subprograms, projects, and actions
 - Covering only the DOE program for solar-derived direct process heat, the programmatic statement will focus on a five-year timeframe (FY 1979 - FY 1984)
 - The content and format of the statement will be consistent with proposed 10 CFR 1021 NEPA compliance regulations
 - DOE will determine the NEPA designation of the statement
- Required by the National Environmental Policy Act of 1969 and DOE NEPA Guidelines
 - An environmental statement will be prepared by DOE to determine whether implementation of a DOE program aimed at development of new energy technologies could significantly affect the quality of the human environment

SOLAR AGRICULTURAL AND INDUSTRIAL PROCESS HEAT
PROPOSED SITE VISITS

Northeast and East

- Commercial Greenhouse
 - Industrial space heating
 - Air/Daystar heat trap and greenhouse
 - Maximum temperature: 150°F
 - S. Arthur Peterson, Inc.
Tewksbury, MA
 - Daystar Corp., D.J. Peck
- Curing Concrete Blocks
 - Industrial hot water
 - Water/flat plate and parabolic tracking
 - Maximum temperature: 180°F
 - York Building Products Co.
Harrisburg, PA
 - AAI Corp., H. Wilkening
- Milking Parlor Heating
 - Livestock shelter heating and hot water
 - Water/flat plate
 - Low temperature
 - USDA Genetics and Management Lab
Beltsville, MD
 - P.D. Thompson

- Chicken Rearing Facility
 - Livestock shelter heating
 - Air/flat plate
 - Low temperature
 - Univ. of Maryland Broiler Environmental Research Facilities,
Salisbury, MD
 - J.L. Cain
- Plant Production
 - Greenhouse heating and cooling
 - Solar pond
 - Low temperature
 - Ohio State University
Wooster, OH
 - T.H. Short

Southeast

- Textile Dyeing
 - Industrial hot water
 - Ethylene glycol-water/evacuated tubes
 - Maximum temperature: 280°F
 - Riegel Textile Corp.
La France, SC
 - General Electric, Co., J. Trice

- Tobacco Curing and Growing
 - Crop drying
 - Greenhouse
 - Low temperature
 - North Carolina State Univ.
Raleigh, NC
 - B.K. Huang
- Hay Drying
 - Crop drying
 - Air/suspended plate and modified roof
 - Low temperature
 - Univ. of Tennessee Agricultural Experiment
Station, Knoxville, TN
 - B.L. Bledsoe

South

- Soybean Drying
 - Industrial hot air
 - Air/flat plate
 - Maximum temperature: 160°F
 - Gold Kist, Inc.
Decatur, AL
 - Teledyne-Brown Engineering, P. Fisher

- Tobacco Curing and Growing
 - Crop drying
 - Greenhouse
 - Low temperature
 - North Carolina State Univ.
Raleigh, NC
 - B.K. Huang
- Hay Drying
 - Crop drying
 - Air/suspended plate and modified roof
 - Low temperature
 - Univ. of Tennessee Agricultural Experiment
Station, Knoxville, TN
 - B.L. Bledsoe

South

- Soybean Drying
 - Industrial hot air
 - Air/flat plate
 - Maximum temperature: 160°F
 - Gold Kist, Inc.
Decatur, AL
 - Teledyne-Brown Engineering, P. Fisher

- Fabric Drying
 - Industrial steam
 - Water/parabolic trough
 - Maximum temperature: 380°F
 - West Point-Pepperell
Fairfax, AL
 - Honeywell, Inc., E. Zoerb

- Kiln Drying Lumber
 - Industrial hot air
 - Water/flat plate
 - Maximum temperature: 160°F
 - J.A. LaCour Kiln Service, Inc.
Canton, MS
 - Lockheed Missiles and Space Co., Inc.
P. McCormick

- Laundromats
 - Industrial hot water
 - Water/flat plate
 - Maximum temperature: 86°F
 - Kwik Wash Corp.
Dallas, TX
 - S. Scott

- Chicken Production House
 - Livestock shelter heating
 - Water/flat plate
 - Low temperature
 - Auburn Univ., Auburn, AL,
R.N. Brewer

Midwest

- Corn, Wheat, Soybean Drying
 - Grain drying
 - Air/modified roof
 - Low temperature
 - Sims' Farms
Liberty, Illinois
 - Randy Sims
- Corn, Wheat, Sorghum Drying
 - Grain drying
 - Air/flat plate and inflated plastic
collectors
 - Low temperature
 - USDA Grain Marketing Research Center
Manhattan, KS
 - H. Converse

- Swine Growing House
 - Livestock shelter heating
 - Air/flat plate
 - Low temperature
 - Univ. of Nebraska
Lincoln, NB
 - H. DeShazer
- Greenhouse-Residence Heating
 - Space heating
 - Air/flat plate and greenhouse
 - Low temperature
 - Colorado State Univ.
Fort Collins, CO
 - C.C. Smith

Southwest

- Car Wash
 - Industrial hot water
 - Water/concentrating collectors
 - Maximum temperature: 200°F
 - Andy's Solar Truck and Car Wash
Mesa, AZ
 - W. Matlock

- Greenhouse-Residence Heating and Cooling

- Space heating and cooling
- Greenhouse
- Low temperature
- Univ. of Arizona
Tuscon, AZ
- C.N. Hodges

West

- Raisin Dehydration

- Industrial hot air
- Air/flat plate
- Maximum temperature: 150°F
- Lamanuzzi and Pantaleo
Fresno, CA
- California Polytechnic State Univ.,
E. Carnegie

- Commercial Laundry

- Industrial hot water
- Water/flat plate
- Maximum temperature: 180°F
- Red Star Industrial Service
Fresno, CA
- Aratex, Inc., E. Burnett

Alternative Sites

- Corn and Hay Drying
 - Grain drying
 - Bin sidewall collectors
 - Low temperature
 - South Dakota State Univ.
Brookings, SD
 - M.A. Hellickson
- Poultry House Heating and Manure Drying
 - Livestock shelter heating
 - Air/modified roof
 - Mississippi State Univ.
Mississippi State, MS
 - W.H. Brown
- Curing Burley Tobacco
 - Crop drying
 - Air/flat plate and modified roof
 - Low temperature
 - Univ. of Kentucky
Lexington, KY
 - L.R. Walton

SOLAR AIPH SITES

■ = INDUSTRIAL

● = AGRICULTURAL

ATTACHMENT 2

CONFERENCE RECORD

Date: July 31, 1978

No: C00-4879-4

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Draft Programmatic Environmental Impact Statement of the DOE Solar
Agricultural and Industrial Process Heat Program - ET-78-C-02-4879

CONTRACTOR NAME

Energy and Environmental Analysis, Inc.
1111 N. 19th Street
Arlington, Virginia 22209

MEETING DATE

July 23, 1978

ATTENDEES

Ted Kurkowski, Chicago Operations, DOE
Laurent Hodges, Ames Laboratory, DOE
Bill Auer, AIPH, DOE
Mike Riches, ASET, DOE
Bob Grossman, NEPA, DOE
Doug Warshauer, ASCS, DOE
Kelly Devine, ASCS, DOE
Phil Mihlmester, EEA, Inc.
Helene Maddux, EEA, Inc.

SUBJECTS DISCUSSED

- Purpose and Scope of Environmental Statement of the DOE Program for Solar AIPH
- Solar AIPH Site Visits
- Alternatives Section of Statement

DECISIONS REACHED

- EEA and/or a DOE representative will visit approximately 25 sites where solar energy is or will be supplying process heat. The majority of these visits will be to industrial sites.
- Most of the industrial sites selected by EEA are approved by DOE. However, many of the proposed agricultural sites are not representative of a farm environment. EEA will attempt to locate more suitable sites.
- Following selection of alternative sites and consultation with TPI, Inc., EEA will finalize the list of sites and submit it for DOE approval.
- Site visits will be conducted during August, September, and October.
- To ensure access to DOE funded sites, Bill Auer will send a letter to the project managers requesting cooperation. EEA will draft the letter which will specify:
 - Who will be visiting
 - The purpose of the visit
 - The type of information being sought
 - The approximate date of the visit
- With respect to the Alternatives section, Ted Kurkowski has suggested that coal and nuclear fuel can be dismissed as alternatives because of the decentralized nature of agricultural and industrial facilities. This view was not completely acceptable to other attendees. Kurkowski will continue consultation with the legal staff at Chicago Operations.

DIRECTION GIVEN

- EEA to contact Jerry Greyerbiehl (AIPH), Gene Shove (Univ. of Illinois), and Conrad Chester (ORNL) concerning more suitable agricultural and industrial sites.
- EEA to finalize list of site visits, their approximate dates, and the people who will conduct the visits.
- EEA to draft letter of introduction from AIPH to project managers concerning site visits.

ATTACHMENT 3

SOLAR AGRICULTURAL AND INDUSTRIAL PROCESS HEAT SITE VISITS

Northeast and East

- Commercial Greenhouse
 - Industrial space heating
 - Air/Daystar heat trap and greenhouse
 - Maximum temperature: 150°F
 - S. Arthur Peterson, Inc.
Tewksbury, MA
- Curing Concrete Blocks
 - Industrial hot water
 - Water/concentrating collector
 - Maximum temperature: 180°F
 - York Building Products Co.
Harrisburg, PA
- Commercial Greenhouse
 - Industrial space heating
 - Water/inflated plastic trickle and greenhouse
 - Maximum temperature: 150°F
 - Kube-Pak Corp.
Allentown, NJ
- Commercial Greenhouse
 - Industrial space heating
 - Water/flat plate and greenhouse
 - Maximum temperature: 150°F
 - Ulery Greenhouses Co.
Springfield, OH

- Drying Grain Beds
 - Grain drying
 - Various air heating systems
 - Low temperature
 - Ohio State University
Wooster, OH

- Plant Production
 - Greenhouse heating and cooling
 - Solar-pond
 - Low temperature
 - Ohio State University
Wooster, OH

- Milking Parlor Heating
 - Livestock shelter heating and hot water
 - Water/flat plate
 - Low temperature
 - USDA Genetics and Management Lab
Beltsville, MD

Southeast

- Textile Dyeing
 - Industrial hot water
 - Ethylene glycol-water/evacuated tubes
 - Maximum temperature: 250°F
 - Riegel Textile Corp.
La France, SC
- Tobacco Curing and Growing
 - Crop drying
 - Greenhouse
 - Low temperature
 - North Carolina State Univ.
Raleigh, NC
- Curing Burley Tobacco
 - Crop drying
 - Air/flat plate and modified roof
 - Low temperature
 - Univ. of Kentucky
Lexington, KY

South

- Poultry House Heating
 - Livestock shelter heating
 - Air/flat plate
 - Low temperature
 - Private farm
Villa Rica, GA
- Poultry House Heating
 - Livestock shelter heating
 - Air/integrated rock collectors and storage
 - Low temperature
 - Private farm
Cumming, GA
- Soybean Drying
 - Industrial hot air
 - Air/flat plate
 - Maximum temperature: 160°F
 - Gold Kist, Inc.
Decatur, AL
- Fabric Drying
 - Industrial steam
 - Water/parabolic trough
 - Maximum temperature: 380°F
 - West Point-Pepperell
Fairfax, AL

- Kiln Drying Lumber

- Industrial hot air
- Water/flat plate
- Maximum temperature: 160°F
- J.A. LaCour Kiln Service, Inc.
Canton, MS

- Commercial Greenhouse

- Industrial space heating
- Water/Sol Pac I collector and greenhouse
- Maximum temperature: 150°F
- Hydro-Gro Enterprises
El Paso, TX

Midwest

- Corn Drying
 - Grain drying
 - Air/bin sidewall collector
 - Low temperature
 - Private farm
Argenta, IL

- Grain Drying
 - Grain drying and space heating
 - Air/modified roof
 - Low temperature
 - Private farm
Pinfield, IL

- Greenhouse-Residence Heating
 - Space heating
 - Air/flat plate and greenhouse
 - Low temperature
 - Colorado State Univ.
Fort Collins, CO

Southwest

- Car Wash
 - Industrial hot water
 - Water/concentrating collectors
 - Maximum temperature: 200°F
 - Andy's Solar Truck and Car Wash
Mesa, AZ

- Greenhouse-Residence Heating and Cooling
 - Space heating and cooling
 - Greenhouse
 - Low temperature
 - Univ. of Arizona
Tuscon, AZ

- Milking Parlor Heating
 - Livestock shelter heating
 - Water/flat plate
 - Low temperature
 - Univ. of Arizona
Tuscon, AZ

West

- Raisin Dehydration
 - Industrial hot air
 - Air/flat plate
 - Maximum temperature: 150°F
 - Lamanuzzi and Pantaleo
Fresno, CA
- Can Washing
 - Industrial hot water
 - Water/flat plate and parabolic tracking
 - Maximum temperature: 195°F
 - Campbell Soup Co.
Sacramento, CA
- Commercial Greenhouse
 - Industrial space heating
 - Modified roof and greenhouse
 - Maximum temperature: 150°F
 - Delta Gardens
Tracy, CA
- Solar Pond Test Facility
 - Industrial hot water
 - Solar ponds
 - Lawrence Livermore Laboratory
Livermore, CA