

# Appendix V

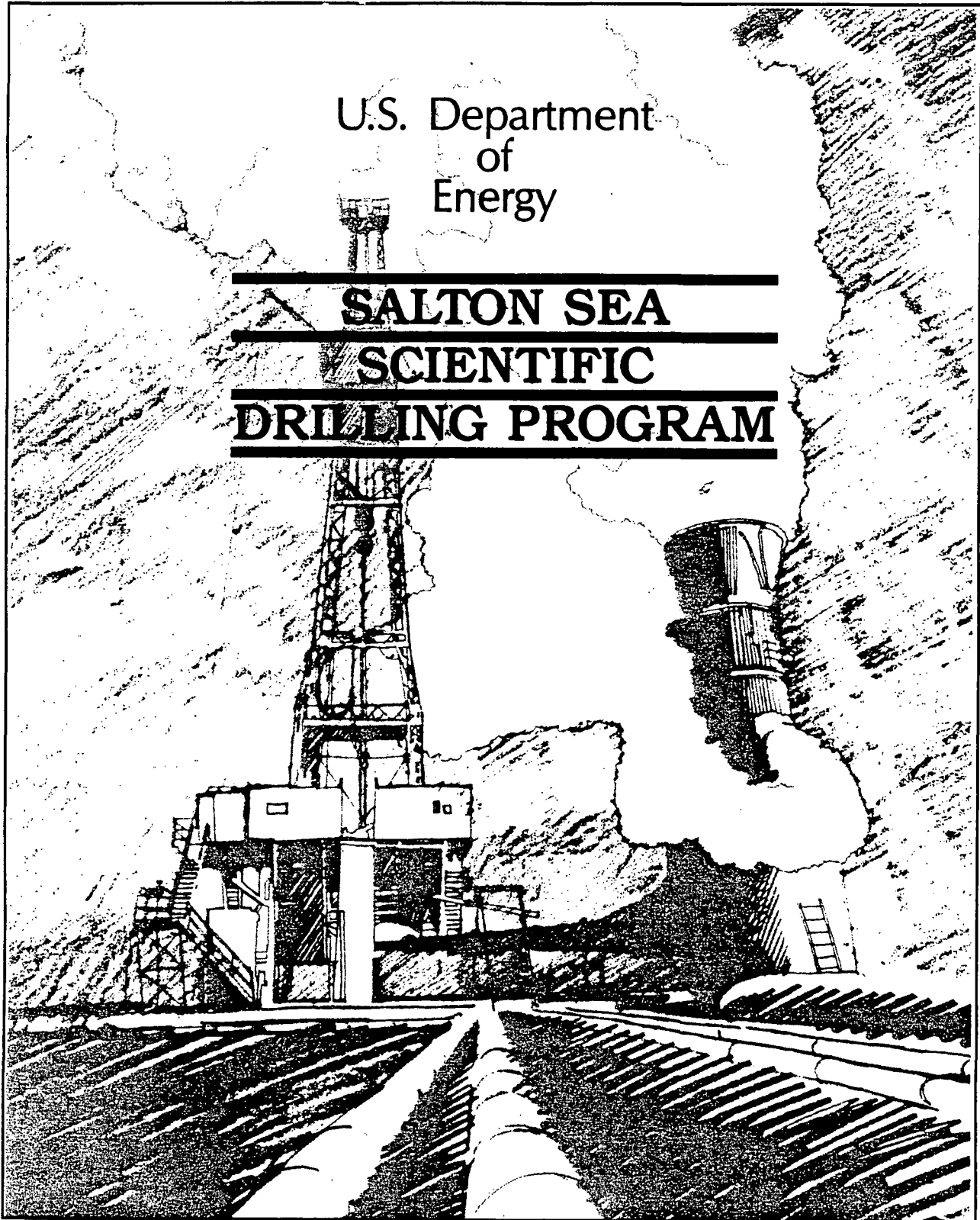


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## Site Procedures Manual

U.S. Department  
of  
Energy

**SALTON SEA  
SCIENTIFIC  
DRILLING PROGRAM**



***On-Site Procedures Manual***

September 1985



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## INTRODUCTION

This document presents an operation plan for the conduct of all on-site activities for the Salton Sea Scientific Drilling Program (SSSDP). It has been developed by DOE/SAN, Bechtel, the On-Site Science Manager, and the Chief Scientist to provide guidelines and requirements that will assure the safe and orderly conduct of site operations.

The plan is organized in the following sections:

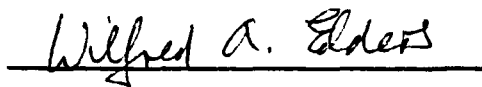
- o The Project Organization - who is who on-site and what are each person's duties and responsibilities.
- o Operating Procedures - methods for keeping things under control and running smoothly and safely during site operations.

It is important that all on-site personnel, whether permanent or transient, gain a full understanding of this plan and follow it in their day-to-day activities.

  
DOE/SAN Program Manager

  
On-Site Science Manager

  
Bechtel Site Manager

  
Chief Scientist

## PART 1

### THE PROJECT ORGANIZATION

#### Introduction

The SSSDP is an interdisciplinary program, under the sponsorship of the U.S. Department of Energy, which is bringing together a management team (Bechtel), commercial subcontractors, and scientific investigators, all working toward a common objective:

"the drilling of an exploratory well for the collection and release to the public domain of scientific data and information, including drilling cuttings, cores and fluid samples, temperature measurements, and a limited suite of wireline logs, from a temperature regime that has not previously been adequately sampled and tested."

Because each member of the project has a unique area of responsibility and relationship to the other members, the success of the project requires a spirit of full cooperation between the engineering and scientific staff while each group works to fulfill its obligations. All participants will operate according to the procedures outlined in this manual.

The basic elements of responsibility break down as follows:

- o Bechtel - As DOE's contracted site manager, Bechtel has the ultimate responsibility and liability for the drilling and

coring activities, production logging, flow tests, a limited resource evaluation, all aspects of site preparation, maintenance, and abandonment. Bechtel's obligations also include personnel safety, operating in conformance with Federal, State, and local regulations and requirements, and minimizing the possibility of loss of well control and loss of the well.

- o Commercial subcontractors - Ranging from the drilling supervisor and drilling contractor to the welder, these service contractors perform the commercial activities normally required in drilling and coring an exploratory well. One product of their efforts will be a well meeting the requirements of the California Division of Oil and Gas and those of the leaseholder - Kennecott - and the State Lands Commission. At the same time, their efforts will be directed to meeting the needs of the science program. They will provide cores, mud logging data, and cuttings samples, and will support the scientists in the collection of downhole data and the conduct of downhole studies.
- o Scientific investigators - Representing the scientific community, this group is responsible for assuring that the agreed scientific objectives are met, to the extent feasible. They will collect geophysical and other data, log and curate core, cuttings, fluid and gas samples taken during drilling, standby, and flow testing for use in scientific studies contracted with various governmental, university, and other researchers. They will be responsible for planning and scheduling the science activities.

### The On-Site Organization

During the drilling and coring phase, there will be an average of about fifteen people "permanently" on site. There will be, in addition, specialty contractors, vendors, science investigators, and other visitors and guests who will be on site intermittently. To facilitate a clear delineation of communication channels, we will operate with the project structure shown in Figure 1.

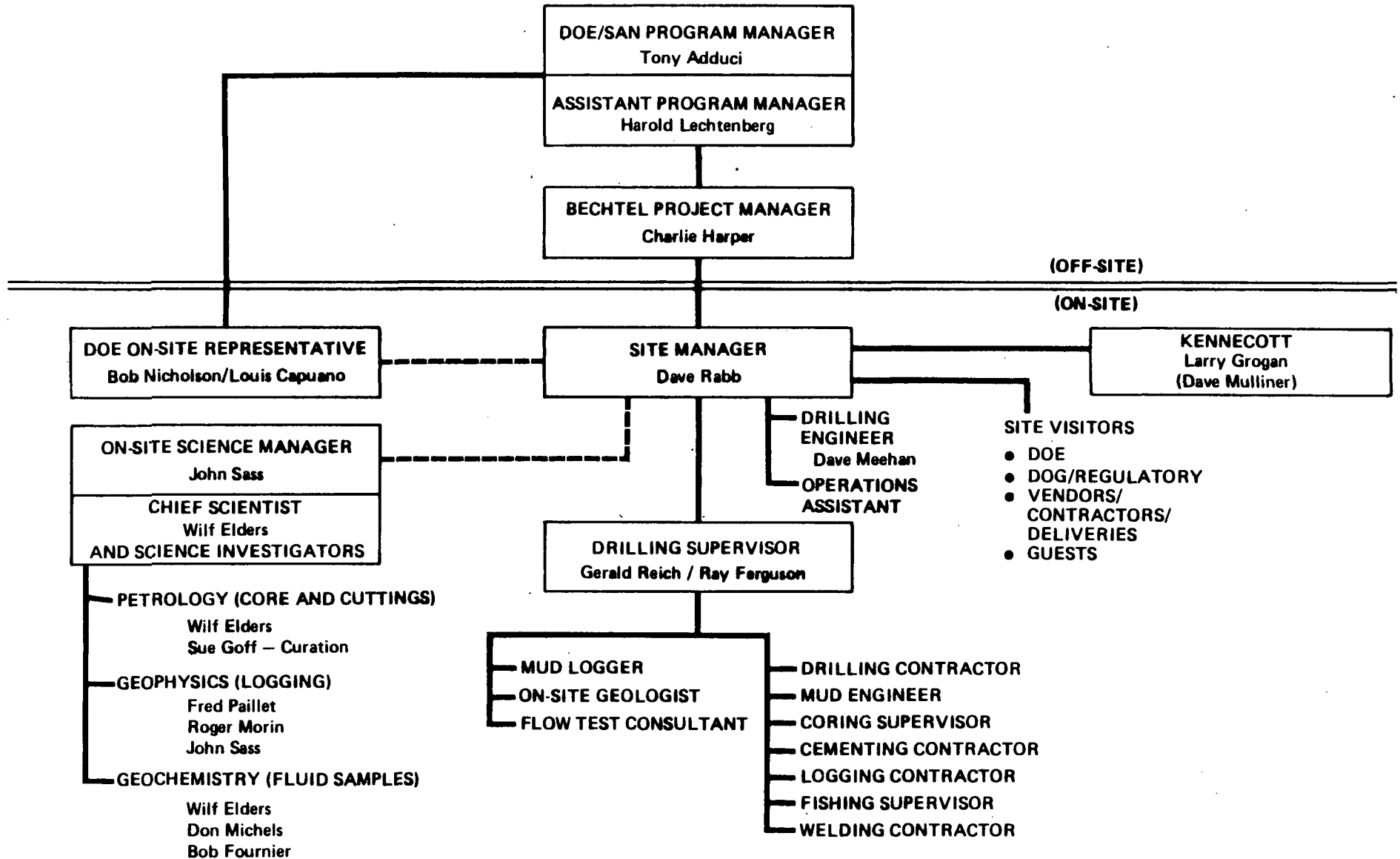


Figure 1 SSSDP ON-SITE OPERATIONS ORGANIZATION



## Roles and Responsibilities

The orderly sharing of responsibility among the Site Manager, On-Site Science Manager, Chief Scientist, and the Drilling Supervisor is the key to a well coordinated operation.

Site Manager - Dave Rabb (Bechtel) is responsible for all aspects of the site operation including:

- o Site safety and emergency situations
- o Security
- o Environmental compliance and all other permits or contractual obligations
- o Provision and maintenance of office space, selected other facilities, and utilities including water, power, and communications
- o Coordination of the drilling and associated activities with the science schedule and activities
- o Chairing the daily Site Coordination Committee meetings
- o Monitoring coring expenditures
- o Coordinating site visitors

When Dave is away from the site he will designate a stand-in until he returns. This will typically be the Drilling Engineer, Dave Meehan, or the Project Manager, Charlie Harper.

Drilling Supervisor - Gerald W. Reich is responsible for all aspects of the drilling operation, including:

- o Supervision of the drilling contractor and all subcontractors, suppliers, or others involved in well drilling, coring, logging, casing, or any other related activity, during normal, fishing, and any emergency operations
- o Drilling safety, downhole and on and around the rig
- o Compliance with environmental regulations and all other permit requirements related to drilling the well
- o Scheduling and coordination of drilling, coring, production logging, and science activities at the well
- o Maintenance of comprehensive drilling records
- o Participation in the Site Coordination Committee

Gerald will report to the Site Manager, providing frequent status reports, alerts on potential problems and methods of avoiding them, and recommendations on casing, coring, and other decisions affecting well integrity, safety, budget, and schedule. He will work with the Mud Logger, On-Site Geologist, Drilling Engineer, and others in arriving at his recommendations.

On-Site Science Manager - John Sass is responsible for managing the on-site portion of the science program developed by the Science Experiments Committee including:

- o Overall supervision of the science personnel, data collection, and science experiments
- o Safe practice by the science group
- o Coordination of requests for coring and other downhole activities with the Site Manager and scientific investigators
- o Reporting of coring costs and use of scheduled time for experiments back to the science group

- o Participation in the Site Coordination Committee
- o Regular and timely reports of the progress of the science program to the Chief Scientist
- o Assisting the Chief Scientist, as necessary, in curation of samples and data

John will coordinate with the Site Manager and the Chief Scientist to accomplish the on-site objectives of the Science Program. He will also direct the measurements of downhole temperatures and pressures and supervise geochemical sampling. In consultation with the Site Manager and Drilling Supervisor during Site Coordination Committee meetings, or as required by circumstances, he will schedule and oversee other on-site science activities. John will be assisted by John Hendricks, Susan Priest, and Lori Robison.

Chief Scientist - Wilfred Elders is the Chairman of the Science Experiments Committee. This committee is responsible for policy and planning of the Science Program before, during, and after drilling. As such, he will be involved in on-site decisions concerning scientific activities, in collaboration with John Sass. In addition, he has the following specific responsibilities on site:

- o Supervision of the science investigators
- o Curation of cores, cuttings, and science data
- o Coordination of fluid and gas sampling for the Science Program
- o Advising the On-Site Science Manager of requests from the science group to make coring attempts or (in consultation with Fred Paillet) to conduct geophysical logging or other scheduled activities

Wilf will be responsible for coordinating and planning the activities of the science investigators. His deputy as Chairman of the Science Committee is Lewis Cohen. As curator of the samples and data, the Chief Scientist will collaborate closely with Sue Goff, the mud logger, coring supervisor, on-site geologist, and those responsible for geophysical logging. His deputy for curatorial activities is James Mehegan.

DOE/SAN On-Site Representative - Bob Nicholson or Louis Capuano will be present to monitor and report to the DOE Project Manager on the status and progress of drilling and science operations. Bob or Lou will participate in the Site Coordination Committee.

On-Site Geologist - John McIntyre, lead field geologist for GeothermEx, will be present to conduct the "commercial" geology. His responsibilities will include:

- o Assisting in the selection of casing points
- o Interpreting electric logs
- o Advising on safety aspects of coring requests
- o Reviewing and, where pertinent, logging and curating core and cuttings splits, mud chemistry, and other samples or data taken for, or available to, DOE
- o Preparing an interpretive report on the "commercial" geology of the well, to fulfill Kennecott's requirements to State and local permitting agencies

John will be spelled, from time to time, by other geologists from the GeothermEx staff.

## PART 2

### OPERATING PROCEDURES

#### Introduction

This section presents a series of procedures established for the benefit of all in the program. No one wants to be injured or cause anyone else to be injured, nor does anyone want to jeopardize the integrity of the well or the successful completion of the project plan. All on-site personnel will be expected to follow these guidelines and to encourage others to do so.

#### Predrilling Phase

- A. Site Surveying and Preparation - DOE/SAN's contractor, Bechtel National, Inc., and its subcontractors are responsible for all on-site activities during this period of time. Subcontractors to Bechtel, under its direction, will be involved in evaluating soil conditions, bringing in fill, leveling and stabilizing the site, establishing pads and foundations, excavating sumps and ponds, installing fencing, extending utilities from existing sources, and associated construction operations that are essential to the drilling and tests and measurements phase of the project to follow. Any other persons with business at the site must clear their presence with the Site Manager or delegated representative and must adhere to health/safety and administrative rules and regulations as presented.

in this On-Site Procedures Manual. Visitors to the site should be limited during the predrilling phase to those with an absolute and demonstrated need to be there.

### Drilling Phase

- A. Rig Mobilization and Surface Facilities Construction - The contractor, Bechtel, will direct the operations of a drilling subcontractor who will transport to the site, and set up, a drill rig and ancillary equipment preparatory to drilling and coring. Other subcontractors will provide services such as supply of drilling materials, to include casing, bits, muds, etc., to be stockpiled on-site. Also, the contractor, with subcontractor assistance, will complete the installation of surface facilities necessary for the drilling and tests and measurements program to include piping to sumps and ponds, with appropriate valves, gauges, etc., as well as office trailers, facility lighting, and similar activities. The On-Site Science Manager will oversee the installation of his facilities and equipment, at this stage, to be ready for use at spudding in. On-site personnel during this period of installation of heavy equipment and stockpiling of supplies should be limited to persons actively engaged in these operations, owing to their hazardous nature. Visitors with a need to be on site must request permission, in writing, in advance of any anticipated approval from Bechtel and check in with the Site Manager upon arrival. All guests must follow all rules and regulations for health/safety and site

administration. Non-essential personnel from any group should be limited.

- B. Drilling, Coring, Tests, and Measurements - During this phase of on-site operations the contractor, Bechtel, is responsible for directing the drilling operations of its subcontractor. However, the on-site Science Program begins with the spudding of the hole, and the On-Site Science Manager and the Chief Scientist will be responsible for directing activities of the various researchers with a need to be present. They will carry out certain experiments in the hole and/or collect, log, and curate samples including core, cuttings, and fluids.

In this phase, scientists may be on-site 24 hours per day, and any on-site housing required for their convenience will be provided by them. During drilling, the contractor will supply the on-site scientists with utilities - that is, electricity, fresh water, sanitation, and a communications link. The scientists may tie into these basic supplies, as appropriate. The Site Manager will retain responsibility for assigning space at the site for unanticipated equipment and facilities, or for reassigning space should conditions require doing so, regardless of their source.

With the influx of personnel that will occur, it will be necessary to implement a series of general visitor guidelines, as follows:

1. On first arriving at the site, each person who will be on the site for more than one day will receive a copy of this Plan and the Health and Safety Plan. (Day visitors will receive a 1-page summary version of the Health and Safety Plan). Each person will be required to sign for his copy, indicating willingness to abide by the safety rules and operating procedures presented.
2. For safety and security reasons, each person entering or leaving the site will sign in and out at the office each day.
3. Posters outlining emergency procedures will be posted at appropriate locations around the site. Hard hats and appropriate work clothes and safety gear will be worn at all times. Work boots (preferably with steel toes), long trousers, and gloves are required as a minimum. All permanent and semipermanent on-site personnel shall provide their own safety gear, including hard hats, as a prerequisite for working on the site.
4. The name and affiliation of each person should be displayed on his or her hard hat.
5. No one will be permitted on the rig floor or the active work areas immediately around the rig without the permission of the Drilling Supervisor and the Rig Supervisor (Tool Pusher).
6. Access to the Mud Logger's trailer and Science Trailers shall be with the permission of the responsible supervisor and limited to those few people having a legitimate need to be there.
7. The living quarters (trailers) of the Site Manager, Drilling Supervisor, and any others are private and are to be entered only with the permission of the assigned occupant.



8. Day visitors to the site will be assigned to an on-site sponsor who will be responsible for familiarizing them with the safety rules and operating procedures. Limited numbers of hard hats and other safety equipment required by guests will be available in the office trailer.

A morning site operations meeting will be held daily at an established time. The attendees, the Site Coordination Committee, will include the Site Manager, DOE On-Site Representative, the On-Site Science Manager, and the Drilling Supervisor. The Site Manager will chair the Committee that as a minimum will:

- o Review the prior day's events including drilling reports, science activities, and costs incurred for site activities
- o Plan the day's events and, as appropriate, long-range requirements
- o Review safety or coordination problems

Copies of the following reports will be distributed at the meeting as they are available:

- o Tour reports
- o Drilling recorder chart
- o Morning report
- o Afternoon report (verbal)
- o Mud logger report
- o Mud log (lithology) as completed
- o Mud engineers report

- o On-Site geologist's report
- o All wireline or slick line logs
- o Flow test reports
- o Coring report (core contractor and preliminary scientist evaluation)
- o Any other special report involving geological or scientific aspects
- o Drill pipe inspection report
- o Casing inspection report
- o Casing talley report
- o Drill pipe talley
- o Deviation survey
- o Final bit record

Additional copies will be delivered to the Chief Scientist, by the On-Site Science Manager, and to DOE/SAN.

A special safety meeting will be held prior to any activity, other than routine drilling, with the Site Coordination Committee and other invited persons who will be taking part in the upcoming activity. This meeting will establish the schedule, duties, and responsibilities of the various participants, material and equipment requirements and availability, and alternative actions based on activity events. The primary objective is to assure that the activity is conducted efficiently and safely. Examples of activities that could trigger a meeting are core runs, casing/cementing, instrument runs, flow tests, or problem situations. The meetings will be chaired by the Site Manager.

The On-Site Science Manager will coordinate closely with the Site Manager, providing written requests with respect to the needs of the researchers, to include coring and cuttings, rig downtime for insertion of downhole instrumentation and samplers, etc. A sample of the Core Request Form, to be filled out for each requested action, is presented in Figure 2. The On-Site Science Manager will give the Site Manager as much lead time as possible relative to requirements so that he may make appropriate arrangements with subcontractors.

The Site Manager will accommodate the requests of the On-Site Science Manager unless such requests endanger health/safety, the environment or well integrity, or do not comply with the terms of the contract between Bechtel and DOE/SAN.

It is emphasized that the Site Manager must respond to the On-Site Science Manager's requests for coring trips in the well unless, as stated above, there are overriding issues of health/safety, environment, and/or well integrity. If the latter situation occurs, the Site Manager must clearly explain the reasoning to the On-Site Science Manager and document it on a Core Request Form. The Drilling Supervisor will countersign for all actions, whether implemented or not. Further, the Site Manager must keep a complete record of costs associated with coring and advise the On-Site Science Manager of these costs as coring advances so that the On-Site Science Manager may optimize coring within the \$1 million agreed to for this purpose. The cost of the core, location, and amount taken will be reported on the request form. The Site Manager and Drilling

Supervisor will sign the transmittal; the On-Site Science Manager will countersign, indicating concurrence and receipt of the information. Requests to run a second core immediately after a first will be expedited by the Site Manager to avoid idle rig time.

In coring, the On-Site Science Manager will supervise the removal of the core from the core barrel and transfer custody to the Chief Scientist. He will see that it is logged, split, crated, and shipped as he deems necessary. For use in preparing his daily report, the On-Site Geologist will have physical access to visually inspect the core, and a split of each core will be made available to him. The splits will be returned to the Chief Scientist as soon as the examination is completed. Any other immediate requests for core sample splits will be submitted in writing to the Chief Scientist for each split. A sample request form is presented in Figure 3.

Also, Bechtel, under terms of the contract with DOE/SAN, must provide the On-Site Science Manager with a minimum of 250 hours of rig time for downhole tests and measurements and provide such assistance as necessary in deploying the equipment. Blocks of rig time will be available upon written request of the On-Site Science Manager to the Site Manager, subject to limitations imposed by health/safety, environment, or well integrity. A separate request form, Figure 4, will be used for logging or other downhole experiments and fluid sampling requests. The procedures for review

and approval of requests and notification and acknowledgement of completion are similar to those to be used on the Coring Request Form.

It is understood that the 250 hours allocated for downhole tests and measurements may be increased if there is sufficient scientific interest and justification. The Site Manager and On-Site Science Manager will determine priorities on a case-by-case basis.

Concurrence from the DOE/SAN Program Manager will be sought prior to initiating any unscheduled activity estimated to last more than 8 hours. The Site Manager may approve new requests obligating less than 8 hours without DOE/SAN explicit consent, but must advise the DOE On-Site Representative of his decision.

The mud logger will log drilling mud returns, take samples of cuttings and fluids, measure temperatures of mud returns, and other such duties as agreed upon. The mud logger will submit daily reports to the Drilling Supervisor; physical samples of cuttings and drill fluids will be given to the On-Site Science Manager at mutually agreed times. Sample splits will be made available to the On-Site Geologist and will be returned after his use. If a nonscheduled sample is desired, a written request (Figure 5) may be made by the On-Site Science Manager and delivered to the Site Manager. In so far as possible, these requests will be implemented. The disposition of the requests will be noted on the request form and signed by the Site Manager, Mud Logger, and On-Site Science Manager.

Copies of all completed request forms will be distributed to the On-Site Science Manager, the Drilling Supervisor, the Bechtel Project Manager, and the DOE Program Manager. The master copy will be filed at the Field Office.

Should disputes arise on any matter which can not be resolved between the On-Site Science Manager and the Site Manager, the Bechtel Program Manager will be contacted. If he cannot resolve the issue to the satisfaction of both parties, he will contact the DOE/SAN Project Manager for final resolution. Every effort will be made to resolve disputes at the job site.

- C. Flow Tests - Attempts will be made to flow the well and obtain at least two uncontaminated fluid samples of the formation fluid before conducting the final flow test of the open hole interval to total depth. The first likely production zone below the 3,000 ft casing point and the first below the 6,000 ft casing point will be tested by flowing to the surface, using whatever stimulation is necessary. Recognition of these likely production zones will be made by applying mutually agreed criteria, under the direction of the Drilling Supervisor. These tests will be limited in volume by the capacity of the holding pond and may take from 3 days to 5 days or more to complete, depending upon the rate of flow and reinjection.

The science group will take samples and measurements during these flow tests under the general supervision of the Chief Scientist and On-Site Science Manager.

The flow tests will be conducted by the contractor, Bechtel, under the general direction of and to the requirements of the science group and Kennecott. Temperatures, pressures, and flow rates of produced brines will be measured for Kennecott and DOE, and fluid samples will be acquired for analysis. Copies of data or analyses from the flow tests will be provided at the daily Site Coordination meeting, as soon as available. Should the On-Site Science Manager wish to take unplanned measurements and samples, he may do so as long as he secures approval from the Site Manager and there are no additional costs to the contractor - in time or services - and as long as it does not cause an increase in flow over and above the 1.1 million gallon capacity of the holding pond, or create a health, safety, or environmental problem.

#### Postdrilling Phase

- A. Standby Period - Following well completion and flow testing, the well will be shut in for a period of 6 months. During this time the contractor will maintain the facility in a standby condition, minimizing expenditures. Full-time, on-site personnel will be limited to a contractor's custodian/guard for site security and basic maintenance.

Any on-site work proposed by the science group, DOE, or any other party(s) during the standby period will be described in detail and submitted to the DOE/SAN Program Manager and the Bechtel Project Manager in writing. Written requests for modification of the

postdrilling science plan, in the light of experience gained during drilling, will be submitted in the same way. After approval, written authorization for site entry will be issued to the lead investigator with copies to the On-Site Science Manager or the corresponding supervisor. Because of the continuing liability held by Bechtel for the well and surface facilities, a representative of Bechtel will be on-site to coordinate and observe any work. This individual will be identified in the authorization letter. The On-Site Science Manager will phone the Bechtel Project Manager at least 2 weeks in advance of the planned activity to confirm or adjust the schedule.

- B. Final Downhole Logging - The On-Site Science Manager and associates will return to the site at the end of the (to be determined) month shut-in period, as will the contractor's Site Manager and such personnel as he needs to reopen and maintain site support facilities. The researchers will conduct downhole logging of the well with equipment provided by their own organizations. The contractor will provide water and sanitation services.
- C. Well Abandonment and Site Cleanup - Upon completion of the final logging, and in the absence of program redirection, the contractor will begin the process of plugging and abandoning the well. This will also involve removing all surface equipment, disposing of all fluids and solids held in ponds and sumps, making such soil analyses as required, and filling and grading the site back to its natural condition. These activities will be conducted to meet all rules and



regulations of Regional Water Quality Control Board, California Division of Oil and Gas, the State Lands Commission, and the County of Imperial.

The contractor's Site Manager or designee will be responsible for conducting all well abandonment and site cleanup work, with the help of suitable subcontractors. During this period, there will be no scientific activities on-site, and entry will be limited to those persons actively engaged in the process of cleanup.

Kennecott and the DOE/SAN Program Manager will inspect the site and assure that it has been left in a condition acceptable to the State and County.