

**CLEAN  
Central Zone**

**Contract No. N62474-88-D-5086**

**Contact Task Order 0007**

**PRC Project Manager: Dan Ashenberg**

**NAVAL AIR STATION  
MOFFETT FIELD, CA**

**WELL CLOSURE OF NINE SUSPECTED WELLS**

**WORK PLAN**

**Prepared By**

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IT Work Plan

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## 1.0 INTRODUCTION

PRC Environmental Management, Inc., (PRC) received Contract Task Order (CTO) 0007 under the Comprehensive Long-Term Environmental Action Navy (CLEAN) contract N62474-88-D-5086. This CTO calls for PRC to plan and oversee well closures at Naval Air Station (NAS) Moffett Field. This work plan presents PRC's approach to performing the work.

### 1.1 BACKGROUND

PRC understands that there are up to nine suspected abandoned wells at the Naval Air Station Moffett Field site. Abandoned wells may have resulted in ground-water contamination at the site, and they potentially act as conduits, resulting in the migration of contaminants between aquifers. On September 16, 1987, the California Regional Water Quality Control Board (RWQCB) issued the Navy a cease and desist order because of water code violations. The closure of the abandoned wells is part of the action required under the order.

### 1.2 PURPOSE

This CTO has two primary purposes: (1) to procure a qualified subcontractor to prepare sites prior to excavation, excavate suspected well locations, seal and close suspected abandoned wells in accordance with Santa Clara Valley Water District specifications, and restore excavated sites to their original condition, and (2) to provide technical oversight during the closure of the suspected abandoned wells.

## 2.0 TECHNICAL APPROACH

PRC proposes a sole source procurement with International Technology Corporation (IT). The rationale for this sole source procurement was presented in our letter dated June 23, 1989. IT's approach to completing this project is presented in the attached IT Work Plan. The proposed technical approach is based on technical data, information, and guidance contained in the following documents:

*Research Report, Potential Conduits Investigation, Naval Air Station, Moffett Field, California. Kennedy/Jenks/Chilton, January 1988.*

*Technical Specifications for Construction Bid Document for Sealing Abandoned Wells, Naval Air Station, Moffett Field, California. IT Corporation, April 1989.*

*Design Specifications, Potential Conduit Excavations, Suspected Well Investigation, Naval Air Station, Moffett Field, California. Kennedy/Jenks/Chilton, March 1988.*

*Plan for Evaluation and Closure of Abandoned Wells, Naval Air Station, Moffett Field, California. IT Corporation, July 1989.*

*Suspected Wells Location Report, Potential Conduits Investigation, Naval Air Station, Moffett Field, California. Kennedy/Jenks/Chilton (K/J/C), April 1989.*

PRC will provide oversight of well closure activities to be conducted by IT. Up to nine suspected abandoned wells at Naval Air Station Moffett Field have been identified for location and closure. Suspected well locations are discussed in further detail in the attached IT Work Plan.

## 2.1 ASSUMPTIONS

PRC cost estimates and schedule are based on several key assumptions. These assumptions include:

1. Total project duration is approximately 17 months. PRC oversight will be required at critical points, including location of suspected abandoned wells, site excavation, well sealing and closure, and site restoration.
2. Well evaluation, removal of blockages, and water quality sampling will be performed under HAZWRAP and will require 4 weeks per well.
3. Site preparation, well sealing and closure, and site restoration will be performed under CLEAN. The number of weeks required to accomplish these activities for each well are presented in Table 1.
4. The work to be performed under this CTO will focus on primary targets only. The Navy Engineer-in-charge will be responsible for making a decision to expand the scope of work to include secondary targets, if a well is not encountered at a primary target.
5. Where practical, work will be performed concurrently at more than one site in an effort to maximize efficiency and minimize total project cost.
6. NAS operations will not interfere with work to be performed under this CTO. Costs for standby time and additional mobilization-demobilization due to interference from normal NAS operations have not been included.

7. The Navy, PRC, and IT agree that certain technical specifications contained in Design Specifications for Construction Bid Document for Sealing Abandoned Wells (KJC, 1988) are not relevant or appropriate. As such, the following assumptions are reflected in PRC's and IT's cost estimates and technical approaches:
  - A security guard will not be necessary.
  - The purchase of mooring eyes will not be required.
  - Standby time will not be required.
  - One hundred (100) feet of temporary fencing will be required at each suspected well site. One suspected well site will require an additional sixty (60) feet of permanent fencing.
  - Temporary water will not be required.
  - Clean backfill will not be required during site restoration.
  - Warning lights for drill rig masts and site identification will not be required.
8. Two drill rigs will be required to coordinate HAZWRAP and CLEAN work tasks. To reduce standby time under the CLEAN well closure activities, nine mobilization/demobilization efforts are scheduled.
9. Estimated sealing and closure costs are based on total depth equal to 1,000 feet and a 14 inch casing diameter. Actual number of wells, well construction details and the potential number of blockages per hole are not known. As such, the proposed time schedule and associated estimated costs could be affected if actual field conditions vary significantly.
10. Water management costs can be significantly reduced by pumping directly to on-site storm sewers at all suspected well locations except site 13D. At site 13D, water samples will be collected and analyzed prior to making a decision regarding disposal.
11. No costs will be incurred related to class III disposal of solid waste.
12. PRC oversight of well sealing and closure will be performed by the project hydrologist. An average of 40 hours per well for each of the 9 suspected wells has been allocated to oversee well sealing and closure.
13. PRC field oversight of site preparation and site restoration will be performed by the project engineer. Field oversight will require up to a maximum of 20 hours for wells 13D, SW-5, SW-2, and SW-10. Wells 14A and 14C will require up to 40 hours. Wells SW-1, SW-7, and SW-11 will not require field oversight of site restoration activities.
14. Costs associated with preparation of this work plan and cost estimate will be charged to the CLEAN PMO account.

TABLE 1

TIME REQUIREMENTS FOR COMPLETION OF SITE PREPARATION,  
WELL SEALING AND CLOSURE, AND SITE RESTORATION  
FOR NINE SUSPECTED WELLS

Well Identification	Site Preparation (weeks)	Sealing & Closure (weeks)	Site Restoration (weeks)	Total (weeks)
SW-1	1	1	1	3
SW-11	1	1	1	3
SW-7	1	1	1	3
13D	1	1	2	4
SW-5	1	1	2	4
SW-2	1	1	2	4
SW-10	1	1	2	4
14A	2	1	2	5
14C	2	1	2	5

## 2.2 TASKS

PRC's proposed approach for project management and oversight activities related to site preparation, excavation, well sealing and closure, and site restoration has been organized into six discrete tasks which include project management, project administration, meeting participation, technical review, field oversight, and quality assurance/quality control (QA/QC).

### Task 1. Project Management

PRC project management responsibilities will include contract negotiations with the Navy and IT, monthly updates on well closure progress, communication with Navy, IT, and Santa Clara Valley Water District (SCVWD) personnel, cost tracking, and document control.

### Task 2. Project Administration

Project administrative time includes clerical hours associated with invoicing and accounts payable.

### Task 3. Meeting participation

PRC personnel will be available to organize and attend strategic meetings during the course of well closure activities. These meetings include a preliminary kick-off meeting, communication with Navy, IT and SCVWD personnel, and internal meetings to coordinate oversight activities.

### Task 4. Technical Review

PRC will review design specifications, technical reports, and appropriate guidance documents applicable to well closure and sealing procedures.

### Task 5. Field Oversight

PRC will prepare a site-specific Health & Safety Plan (HSP) and oversee IT field work. PRC will participate in an initial site inspection for orientation and safety instruction as required by NAS Moffett Field. PRC's oversight will focus on six critical activities, including:

- Coordinating with NAS Moffett Field Public Works Department to prevent interference with base operations
- Locating abandoned wells
- Excavating primary target areas
- Sealing of wells per Santa Clara Valley Water District specifications
- Closing wells
- Restoring the sites

PRC will review procedures followed during field work and will document the review in a field log. In particular, PRC will note changes from the work plan and noncompliance with approved field procedures. PRC will also record drilling equipment and methods, sealing equipment and methods, and closure equipment and methods. Strict attention will be given to procedures used to prevent further contamination or cross-contamination of aquifers. As necessary, PRC will communicate with IT and other subcontractor personnel regarding critical health and safety issues and compliance with approved well sealing and closure methodology.

#### Task 6. Quality Assurance/Quality Control

PRC will implement internal QA/QC in review of all deliverables.

### 2.3 DELIVERABLES

Deliverables include monthly status reports, field logs, and technical memoranda.

## 3.0 SCHEDULE

The total duration of this project is assumed to be 17 months; the schedule of submittals for work to be performed under CTO 0007 is as follows:

<u>Tasks</u>	<u>Schedule</u>
1. Project Management	Duration of project, with monthly progress reports submitted on the 1st of each month.
2. Project Administration	Duration of project, with monthly invoices prepared and submitted at the end of each month.
3. Meeting Participation	Meetings to be via telephone on an as-needed basis.
4. Technical Review	Prior to commencement of field work.
5. Field Oversight	Initial site inspection 14 calendar days following award of CTO. Oversight activities to occur concurrently with IT fieldwork, for duration of project.
6. QA/QC	Status reports to be reviewed on a monthly basis. Field logs and technical memoranda to be reviewed as they are developed.

#### 4.0 PROJECT MANAGEMENT

The project will be managed by PRC staff with hydrological field supervisory experience. The project manager will manage all project activities from initiation to closeout.

Management responsibilities include maintaining budgets, schedules, and technical performance. The project manager will report directly to the Navy's Engineer-in-charge. Potential changes in work scope and project budget will be communicated as soon as the need for these changes become apparent.

## **5.0 STAFFING**

Principal staff selected to oversee and manage this project consist of hydrologists and engineers knowledgeable in field hydrology and familiar with accepted methodologies for well sealing, closure, and abandonment. Resumes for PRC staff members can be provided on request.

## **6.0 HEALTH AND SAFETY**

All work on this project will be performed in accordance with PRC's Navy CLEAN Health and Safety Program dated July 6, 1989. A site-specific health and safety plan (HSP) will be prepared by PRC prior to all field oversight activities. IT will also prepare an HSP for their personnel in the field.

## **7.0 SAMPLING AND ANALYSIS**

IT will prepare a Sampling Plan (SP) and Quality Assurance Project Plan (QAPP), which will be reviewed by PRC prior to beginning work. These plans will detail sampling objectives and procedures, analytical procedures, and quality assurance objectives. The QAPP will include the analytical laboratory's internal quality controls and reporting procedures.

## **8.0 QUALITY ASSURANCE**

All PRC work on this contract will be performed in accordance with PRC's Navy CLEAN Quality Control Management Plan dated July 6, 1989. Activities defined in this work plan may be subject to a system audit conducted by the QA staff to check on adherence to the QA Management Plan. Such audit results will be included in the appropriate monthly progress report.

**Attachment**

**IT CORPORATION WORK PLAN**

DEPARTMENT OF THE NAVY  
WESTERN DIVISION  
SOUTHWESTERN AREA  
NAVAL FACILITIES ENGINEERING COMMAND  
SAN BRUNO, CALIFORNIA

WORK PLAN  
for  
SUSPECT ABANDONED WELL CLOSURES  
(CONTRACT TASK ORDER 0007)  
NAVAL AIR STATION  
MOFFETT FIELD, CALIFORNIA

Submitted By:  
PRC ENVIRONMENTAL MANAGEMENT, INC.

September 20, 1989

Prepared By:  
IT CORPORATION

For The  
CLEAN PROGRAM  
CONTRACT N62474-88-D-5086

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## 1.0 INTRODUCTION

The San Francisco Bay Regional Water Quality Control Board (RWQCB) has requested that the Navy investigate and evaluate potential sources of ground water contamination at the Naval Air Station (NAS) Moffett Field. This request has resulted in studies to identify and evaluate the potential for vertical migration of various chemicals of concern present in the ground water. These requests are outlined in existing orders issued to the Navy by the San Francisco Bay RWQCB in 1985 (Order No. 85-66) and 1987 (Order No. 87-125). Investigations to identify and locate both active and inactive wells that can act as potential conduits between water-bearing zones have been conducted for the Navy.

Suspect well locations must now be excavated in order to locate wells. The next phase of the process involves the re-entry of these abandoned wells to remove known and suspected blockages. After removal of blockages, well bores will be visually assessed and natural gamma logged, and the ground water sampled and evaluated. Following this investigation, which will help define the local hydrogeology, the wells will be sealed and closed to remove them from the list of potential vertical conduits. The final step involves restoration of the site to its previous state.

### 1.1 OBJECTIVE

The objective of this Work Plan is to present the technical approach, procurement methods, estimated costs, and schedule necessary to implement the sealing and closure of the nine suspect abandoned wells after they have been evaluated under separate contract.

This Work Plan for sealing and closure of the suspect abandoned wells at NAS Moffett Field has been prepared by IT Corporation (IT) and PRC Environmental Management, Inc., for the Department of the Navy, Western Division (WESTDIV), Naval Facilities Engineering Command. This work is in response to the scope of work (SOW) for Contract Task Order (CTO) 0007, in compliance with the Comprehensive Long-Term Environmental Action Navy (CLEAN) Program Contract N62474-88-D-5086.

## 1.2 PROJECT SCOPE

The scope of this Work Plan is limited to the following nine suspect abandoned wells at NAS Moffett Field that have been identified in previous studies:

<u>WELL NO.</u>	<u>TARGET NO.</u>	<u>WELL NO.</u>	<u>TARGET NO.</u>
SW-1	1	SW-2	1
SW-11	1	SW-10	1
SW-7	1	14-C	2
13-D	4	14-A	1
SW-5	1		

Furthermore, the scope of the work is dependent on the successful re-entry and blockage removal to be executed in compliance with a contract through the Hazardous Waste Remedial Action Program (HAZWRAP) (Martin Marietta Energy Systems, Inc.). The integration of these two separate contracts is detailed in Section 1.3.

Established standards for the sealing and closure of abandoned wells published by the Santa Clara Valley Water District (SCVWD) will be used as described in the Closure Plan (Ref. D of the SOW). Any variances from the Plan during closure activities will be specified in the well closure permit application for each well submitted to the SCVWD. All information collected during the activities of removing obstructions, video recording, and logging the abandoned wells will be available for use to help define sealing activities, as required.

## 1.3 PROJECT INTEGRATION

This Work Plan, consisting of site preparation, well sealing, and site restoration, will be integrated with HAZWRAP work which is responsible for the evaluation and closure of the known abandoned wells at NAS Moffett Field.

The nine suspect abandoned wells will be reentered, blockages removed, ground water sampled and analyzed, video recorded, geophysically logged, and closed under HAZWRAP.

The information obtained during the evaluation and investigation performed under the HAZWRAP contract will be used in completing the closure permit applications submitted to the SCVWD. The following tasks are identified according to the contract under which they will be executed.

<u>TASK</u>	<u>CONTRACT PROGRAM</u>
Site Preparation	CLEAN
Blockage Removal	HAZWRAP
Well Evaluation	HAZWRAP
Sealing and Closure	CLEAN
Site Restoration	CLEAN
Closure Reports	HAZWRAP

Because of the ongoing work under HAZWRAP and the need to integrate and coordinate all of the various activities, this work will be managed by the IT Corporation's Martinez office. The personnel associated with executing these tasks are addressed in Section 1.4.

#### 1.4 PROJECT ORGANIZATION

The identified personnel for the proposed Work Plan are located in Martinez and San Francisco, California, and at NAS Moffett Field. The Team has identified the project management and key personnel for the implementation of this Work Plan and the associated work outlined in the HAZWRAP well evaluation/investigation program. The Project Manager (Manager of Projects), Dennis Robinson, has been selected specifically for this project to provide the key element of continuity. Dr. Robinson has been involved with the ongoing Remedial Investigation/Feasibility Study (RI/FS) and is familiar with the wide range of considerations relevant to effectively integrating and implementing this plan.

Phil Numoto, CIH, Health and Safety Coordinator, will be responsible for the audit of and adherence to the health and safety plans during the field activities conducted in accordance with this plan and those associated with the HAZWRAP work.

Don Cox, the IT field coordinator located at NAS Moffett Field, will be responsible for coordinating the daily field activities. Members from the other technical support groups will provide support or direct site supervision as needed, e.g., field geologists.

## 2.0 TECHNICAL APPROACH

This section describes the location and technical aspects that will be employed in each step of the destruction and sealing of the nine suspected wells.

### 2.1 SITE PREPARATION

The nine suspect wells have been buried in the past during the construction of NAS Moffett Field runways and support facilities. Through records search and geophysical surveys of previous studies, priority targets have been identified for each suspect well location. Under this Work Plan one target will be excavated to the well head or a depth of ten feet whichever occurs first.

#### 2.1.1 Location and Coordination

Each suspect well location has been marked in a previous study (Reference C of the SOW).

IT's field coordinator will work with Moffett Field operations, security personnel, and public works personnel to minimize potential disruptions during the following activities:

- Site preparation
- Well re-entry
- Well closure
- Site restoration.

The items to be addressed with the Moffett Field personnel include:

- Maintenance of security at those locations where fence removal is required to access the wells
- Potential traffic diversion
- Safety concerns while in the fuel farm area
- Flight operations while work is performed near the end of the runway
- Locating underground or other utilities.

One priority target of each suspect well location will have the following site preparation (investiation) work performed:

- Geophysical survey and records search to locate underground utilities
- Remove existing fencing and/or install temporary fence
- Reroute utilities as appropriate
- Saw cut AC/PCC, if needed, remove and dispose at a Class III facility
- Excavate target site to a depth of five feet
- If well not found, determine if further excavation warranted
- Upon approval to proceed, shoring will be installed and the excavation deepened to ten feet
- If the well is located then the well investigation will proceed under HAZWRAP
- If the well is not located then the excavation will be abandoned (see site restoration section) and the next suspect well location's priority target will be excavated in a similar fashion.

## 2.2 WELL INVESTIGATION AND EVALUATION

The abandoned wells that are located will be investigated and evaluated before sealing activities begin. This investigation and evaluation work will be performed under HAZWRAP.

HAZWRAP will be responsible for TV inspection, blockage removal, geophysical logging and analytical sampling of all wells. This information will be used to finalize the sealing requirements and methods which will be performed under the CLEAN Program.

## 2.3 WELL SEALING AND CLOSURE

This plan is to be used for proper closure of abandoned ground water wells at NAS Moffett Field. During a recent (May 1989) telephone conversation with Tom Iwamura of the SCVWD, it was determined that it will not be necessary to remove well casings. Casings will be perforated through the entire length of a well, if deemed necessary by the on-site engineer/geologist and the representative of the SCVWD. General categories of work to be completed during closure activities are:

- Perforation of well casing
- Placement of sealing material

- Excavation of top six feet of well
- Final sealing and backfill around site.

### 2.3.1 Permit Application

A completed permit application for each well to be closed will be submitted to SCVWD. Any variances from the Closure Plan will be specified in the permit applications.

A report that describes the investigation and closure activities undertaken will be submitted to SCVWD and RWQCB at the end of this well closure project under HAZWRAP. The report will include analytical data, gamma well logs, and copies of the Well Sealing/Abandonment Logs. An evaluation of this information and other pertinent data, such as borehole television logs, will be provided in this report. No well closure reports will be prepared under the CLEAN Program.

### 2.3.2 Site Protection

A work zone will be identified with barricades, rope, or temporary fence. The zone will be large enough to provide access for necessary operating equipment and emergency vehicles. When the work area is left open and unattended, suitable barricades will be provided for public safety. Where well closure activity will occur near structures on site, proper clearance will be maintained to ensure proper egress for building occupants and for emergency vehicles to access the structure.

Plywood sheets shall be placed on the ground to minimize the damage sustained by the grass as equipment is moved in and out of the lawn areas. These sheets will be secured in a manner that will prevent wind or propellor/jet exhaust from moving them off the site. As soon as these sheets are no longer required at the well site, they will be promptly removed.

During periods when no work is being done on the well, the well and surrounding excavation will be covered to prevent the introduction of foreign material into the well and to promote safety. These covers will be anchored to prevent movement by wind or jet exhaust. Temporary steel fabricated covers will be placed over each well where practicable.

A hole will be excavated around the well casing to a minimum of six feet below ground surface, one foot grout seal placed in the bottom of the excavation, and backfilled to complete the closure per SCVWD requirements. The barricades referenced above will be in place to provide protection.

### 2.3.3 Sealing Specifications

The subcontractor chosen to perform the work required for closure will hold a California Water Well Contractor's License.

Appropriate Santa Clara Valley Water District (SCVWD) Well Abandonment Standards general sealing procedures shall be followed.

A Well Sealing/Abandonment Log to show completion of all activities required during work will be maintained. Information to be included is: well depth; casing diameter; casing material; any obstructions present; whether casing has been removed or perforated; a description of the methods used in the destruction of the well; static water levels and depths; amount of sealing material used; and the resulting condition of the well. This information will be collected during the HAZWRAP Investigation and Evaluation.

All wells will be destroyed and "sealed" in such a way that they will not produce water or act as a channel for the interchange of water, when such interchange will result in significant deterioration of the quality of water in any or all water-bearing formations penetrated, or present a hazard to the safety and well being of people and of animals. Destruction of a well shall consist of the complete filling of the well in accordance with the approved procedures.

The objective of the sealing requirements is to restore, as nearly as possible, those subsurface conditions which existed before the well was constructed taking into account changes, if any, which have occurred since the time of construction. It is also necessary to prevent contamination of uncontaminated water and to conserve the yield and hydrostatic head of the aquifer.

## 2.4 WASTE MANAGEMENT

### 2.4.1 Liquids

It is anticipated that a significant amount of water (as much as 60,000 gallons) will be generated during the investigation. This water will be collected and stored in a holding tank at each well location.

Waste water management is expected to be a significant problem at one of the nine suspect well locations. The one suspect well (13-D) is on a portion of NAS Moffett Field where ground water is expected to be at a depth of less than 10 feet and where there is a potential to encounter contaminated water.

Reference C of the SOW requires that the excavation be kept free of standing water. Infiltration rates were estimated to range from 5-50 gpm for an excavation that is 8'x8'x10'. The following assumptions were used to estimate the cost to manage the infiltration:

- Infiltration would be 10 gpm
- The excavation would require water management for a period of six weeks
- CLEAN would manage the water for all six weeks
- No analytical work will be required to manage the water.

With this in mind, the following items will be needed to manage the estimated 15,000 gallons per day or 600,000 gallons from each excavation:

- Four-20,000 gallon portable tanks for two months, and associated plumbing
- Pump and hoses
- Generator or compressor to run pump
- 300 hours of vacuum truck time to empty portable tanks
- Sunnyvale Sanitary District discharge fees
- Part-time technician to manage operation and support the equipment.

As agreed to at the September 19, 1989 negotiation meeting, the water management approach described above will be employed only at Site 13D. Water encountered at any other site will be pumped to an appropriate ditch or storm

drain. With the exception of Site 13-0 water samples will not be collected or analyzed for the purpose of water management.

Any samples collected will be packaged, documented, and shipped per the requirements of the IT NAS Moffett Field Project:

- Quality Assurance Project Plan (IT 1988b)
- Sampling and Analysis Plan (IT 1988c)
- Health and Safety Plan (IT 1988d).

When appropriate, the Sunnyvale Sanitary District (SSD) will be presented with certificates of analysis for the holding tank water samples. After the SSD representative provides written authorization, the nonhazardous water will be discharged to the SSD treatment system. Based on past and current work on NAS Moffett Field, the water displaced from these wells is not expected to contain concentrations of constituents that will preclude its disposal at the SSD.

Disposal of hazardous liquid waste is unanticipated and outside the scope of this Work Plan.

#### 2.4.2 Solid Waste

Uncontaminated concrete, asphalt, rocks, soil (not used for backfill), etc., generated by activities associated with this Work Plan will be transported to an appropriate offsite disposal facility.

No hazardous solid waste is expected to be generated on the project.

#### 2.4.3 Decontamination

Decontamination of drilling tools, equipment, and rig(s) is not believed to be necessary between wells or before leaving the project site. The subcontractor will be required to ensure that all equipment used on the project has been properly cleaned before being brought to NAS Moffett Field.

### 2.5 SITE RESTORATION

Site restoration with materials specified in Reference C of the SOW will be required for each well after closure. The restoration of the area around the closed well will be such that the original site topography will be minimally impacted. This includes:

- Backfilling and compacting with soil from the excavation and aggregate base
- Replacing AC or PCC as required
- Replace fencing removed or relocated
- Return utilities or wiring to prior status
- Sodding, or other material will be placed on the backfill as appropriate to the site.

## 2.6 HEALTH AND SAFETY

It is the policy of the IT Corporation to provide a safe and healthful work environment for all its employees and subcontractors. IT considers no phase of operation or administration to be of greater importance than injury and illness prevention. Safety takes precedence over expediency or shortcuts and every attempt is made to reduce the possibility of injury, illness, or accident occurrence.

All subcontractors will be required to comply with applicable components of the site Health and Safety Plan (IT 1988d). Subcontractors, and other personnel on site will be responsible for understanding and complying with all site requirements. Health and safety requirements will be included in all subcontracts. The written requirements will be copied and distributed to personnel working on site and individuals receiving the written requirements will be required to sign off as having received the document.

Project activities primarily involve locating and sealing of nine suspect abandoned irrigation wells. The chemical contaminants of the ground water are well documented and do not present an occupational exposure hazard.

Therefore, the principal risks of this project are the physical hazards associated with sealing activities. Engineering controls, such as guarding moving parts, shall be used to control such hazards. Protective equipment shall be utilized to minimize these hazards. Level D personal protection will be appropriate for the hazards anticipated on the project.

All potentially exposed field personnel, will attend training sessions (six to eight hours in duration) where potential health and safety hazards on the site

will be communicated and individuals will receive instructions on the requirements of the Health and Safety Plan. This training will be designed to address the appropriate requirements of both the California and Federal Occupational Health and Safety Administration (OSHA) requirements. At this time, it is believed that the training and medical programs described in the OSHA Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120) are not required because experience on-site demonstrates that exposure to chemicals above permissible exposure limits (PELs) has not occurred and is unlikely to occur on this project.

The project Health and Safety Coordinator will provide this one-day-training session and health and safety plan orientation for subcontractor personnel. Additionally, he will make unannounced audits of the field work to ensure compliance with the Health and Safety Plan.

#### 2.7 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

This project will follow the requirements of the NAS Moffett Field Quality Assurance Project Plan.

The QA/QC officer will perform in process surveillance during field activities the field work to ensure compliance with the approved QAPjP. He will also ensure that sealing methods and materials are consistent with established requirements and good work practices.

## 3.0 PROCUREMENT

### 3.1 SUBCONTRACTING PLAN AND EXECUTION

IT Corporation has standard procedures that establish requirements for the procurement of subcontractors. IT maintains a file of prequalified subcontractors that have performed satisfactorily on previous contracts and that maintain acceptable quality assurance/quality control and health and safety programs. Additional subcontractors are added to the pool through a prequalification process.

IT will subcontract the shoring, well sealing, and site restoration components of the activities described in this Work Plan, due to their specialized nature. Other activities that may be subcontracted include fencing, electrical work, landscaping, and excavating. Actual subcontracting strategy will, in part, be dictated by Equal Employment Opportunity objectives established for the program.

The well sealing subcontract will be awarded on a unit-price basis given the uncertainty of the work. Subcontractors will be asked to provide firm prices where practical (i.e., mobilization, demobilization, etc.).

IT's subcontracting strategy will allow for the option of selecting the lowest priced, most qualified bidder for both the sealing work (CLEAN) and the well investigation/blockage removal work (HAZWRAP). This strategy has been chosen for the following reasons:

- It makes one subcontractor responsible for all the work
- It will optimize execution by minimizing interface, delays, etc. which would arise if multiple contractors were utilized
- It will reduce project costs because resources required for each phase (CLEAN vs. HAZWRAP) will be shared rather than duplicated (supervision, facilities, etc.).

The necessary accounting measures to separate CLEAN vs. HAZWRAP charges during project execution will be developed and implemented.

Prospective bidders for the well-sealing work will be asked to provide a quote on the following bases:

- That they only do the well-sealing work
- That they only do the well investigation/blockage removal work
- That they do the well-sealing work and the well investigation/blockage removal work.

This approach will allow IT to establish the price benefits of potentially using one contractor for all the work (CLEAN and HAZWRAP), or keeping the work separate. The bid package development, issuance, and award process will be as follows:

- Technical specifications, referenced in the CTO, have already been developed and will be utilized
- Necessary contractual clauses will be developed/incorporated into the package to meet the requirements of the Navy and IT, including the requirement to perform under the Davis-Bacon Act.
- At least six potential contractors will be requested to submit unit rate bids. If any of these contractors have not been prequalified, they will be sent the necessary paperwork with their bid package and asked to submit the prequalification information with their bid.
- Bidders will be allowed at least two weeks to respond and will be required to attend a prebid meeting.
- At least three bids from qualified contractors will be necessary before analysis, selection, and award will be made. Exceptions may occur where there are a limited number of qualified or responsive contractors. A minimum of two bids from qualified contractors will be needed before selection and award will be made.
- In addition to their bid, perspective contractors will be asked to list three examples of similar work and a reference. References will be contacted and asked about performance against schedule, budget, and other relevant points. The contractor's health and safety record and program, and QA/QC program are reviewed in the prequalification process.

Selection of the contractor will be made based on:

1. Costs
2. Ability to perform work
3. Ability to meet scheduled needs
4. Acceptable health and safety program/record
5. Acceptable QA/QC program
6. Response from references
7. Minority owned/small business status.

For small tasks, e.g., fencing and electrical work, several local providers will be contacted and requested to provide costs. These telephone conversations will be documented on a telephone record log and submitted to the project file. Selection will be based on an assessment of their ability to do the work when needed, costs, as possession of the necessary licenses, insurance, permits, etc. A confirming letter will be requested from the company selected prior to issuance of a purchase order.

#### 4.0 SCHEDULE

One of the requirements of reference C to the SOW is that work on one site must be completed before work on the next site can begin. During the September 19, 1989 negotiations the Navy agreed that work on multiple sites could proceed concurrently. The following is the conceptual progression of events and duration for each site:

<u>PHASE</u>	<u>DESCRIPTION OF ACTIVITIES</u>
Site Preparation	Coordinate with station security, operations and public works. Locate utilities and move if appropriate, saw cut PC/ACC. Remove and dispose of PC/ACC. Excavate site to well head or five foot depth. Determine if further excavation needed. Install shoring. Excavate to ten foot depth. Institute water management procedures.
Well blockage Removal and Well Investigation	Mobilize crew and equipment as needed. Remove up to three blockages in each well (1000 feet deep). Video and natural gamma log, and collect water samples from each well.
Well Sealing	Mobile crew and equipment. Perforate well casing, lower Tremie pipe. Pump grout from bottom to top of well. Excavate to a six foot depth and cut off well. Back fill excavation.
Site Restoration	Mobilize crew and equipment. Remove shoring. Backfilled and compact excavation. Return to grade or replace AC/PCC as required. Remove fencing and replace utilities if required.

The duration of activities at each site may range from seven to nine weeks. The following table identifies sites and estimated duration of activities:

ESTIMATED DURATION OF FIELD ACTIVITIES IN WEEKS

SITE	SITE PREP.	BLOCKAGE REMOVAL/EVAL.	WELL SEALING	SITE RESTORATION
SW-1	1	4	1	1
SW-11	1	4	1	1
SW-7	1	4	1	1
13-D	1	4	1	2
SW-5	1	4	1	2
SW-2	1	4	1	2
SW-10	1	4	1	2
14-C	2	4	1	2
14-A	2	4	1	2

Working each site in series extends the schedule to 71 weeks. As agreed, IT plans to work on multiple sites concurrently in order to achieve over budgetary and schedule goals. Significant delays due to weather are not foreseen and have not been planned or budgeted for. Moreover, significant delays (greater than one hour) due to the needs of flight operations or other organizations may present scheduling problems. As agreed at the negotiations, IT will strive to work with flight operations and other groups to avoid such delays, and work with PRC/Navy to amend the budget and schedule should an unreasonable delay occur.

## 5.0 COST ESTIMATE

### 5.1 MAJOR ASSUMPTIONS AND BASES

Numerous assumptions and bases have been used to develop the estimate of costs for this work. The more significant are as follows:

- Field work will be conducted on a normal work week (eight hours per day, five days per week) and will progress in a routine, orderly fashion.
- All subcontractors must comply with the provisions and requirements of the Davis-Bacon Act.
- Wells to be sealed have been assumed to be 1,000 feet in depth with 14 inch casing. Casing will be perforated the entire length of the well for abandonment purposes. Nine wells will be sealed. No casing will be removed.
- All liquid and solid waste generated during this work have been assumed nonhazardous in nature.

### 5.2 COST TABLES

Cost tables have been generated for each major portion of the work as follows:

#### Phase 1: Negotiate CTO and Meetings

The Phase 1 table represents the cost for one meeting each with the Navy to review the Work Plan, and a meeting with field work subcontractor(s) to discuss schedule, organization, health and safety, and coordination/integration of on-site activities. In addition, the table addresses the cost of the Work Plan development and project reviews with Program Management. IT envisions a conference call/session once a month, and informal transmission of schedule and cost information.

#### Phase 2: Premobilization

The Phase 2 Table shows the costs associated with retaining qualified subcontractor(s) to support the necessary field work. Activities covered by this table include development of bid packages, identification and qualification of potential subcontractors, issuance of bid packages, pre-bid meeting and site walk, issuance of addenda to bid packages (if required) based on questions from bidders, evaluation of bids, and award of contract(s).

### Phase 3: Site Preparation

These tables represent the cost associated with subcontracted activities to prepare the nine well locations for evaluation and subsequent well destruction and sealing. Necessary work will involve planning/coordination with station Security, Public Works, and Flight Operations. Field work may include relocation of fencing and utilities, grading, traffic control/diversion, tree trimming, AP/PCC saw cutting and removal and disposal, installation of shoring to 12-foot depth, excavation to 10-foot depth and management of waste water and soil.

### Phase 4: Well Sealing

The Phase 4 tables address the costs to seal and destroy the nine wells. This work necessarily follows well clearance and evaluation taking place under separate contract. The work involves the perforation of well casing, lowering 1,000 feet of tremie pipe, and filling the hole with grout. Additional work will involve excavation and removal of the last six feet of well casing and filling the hole with cement and soil. Because minimal information is available on the wells, these costs were based on all nine wells being 1,000 feet deep and having a diameter of 14 inches.

### Phase 5: Site Restoration

These tables present the costs to restore the site to its original or an acceptable condition. Activities include replacement of fencing and utilities, grading, landscaping, replacing AC or PCC, and disposal of nonhazardous construction debris. IT has assumed that no hazardous waste will be generated from activities associated with this project. Should hazardous materials be encountered that require their disposal as hazardous waste, it would be considered out of the scope of this Work Plan.

The estimated costs associated with the above phase descriptions are shown on Tables 1B-6D.

The following list indicates how sections of the Work Plan narrative relate to each cost table.

TABLE	DESCRIPTION	SECTIONS
1B	General Requirements	
2	Phase 1 CTO Negotiations and Meetings IT Labor and ODCs	1.1
3	Phase 2 Premobilization IT Labor and ODCs	3.1, 2.3.2
4A & B	Phase 3 Site Preparation IT Labor and ODCs	2.1
4D & C	Phase 3 Site Preparation Subcontractors/Equipment	2.1
5A & B	Phase 4 Well Seal/Closure IT Labor and ODCs	2.3, 2.4
5D & C	Phase 4 Well Seal/Closure Subcontractors/Equipment	2.3, 2.4
6A & B	Phase 5 Site Restoration IT Labor and ODCs	2.5
6C & D	Phase 5 Site Restoration Subcontractors/Equipment	2.5

### 5.3 COST CONTROL

A baseline budget for each major portion of the work will be established as a result of negotiation of the task order. IT will develop a code of accounts for each major segment of the work to allow for proper charging and tracking of costs across major elements (site preparation, sealing activities, etc.) and across major categories (IT labor, subcontractor costs, materials, etc.).

IT will issue a monthly cost report that provides the following information for each code of account:

- Original (and revised, as appropriate) budget
- Actual expenditure to date
- Earned value to date
- Forecast cost at completion
- Forecast variance from budget at completion.

Forecast variances in excess of five percent of approved budget will be addressed in the cost report with a specific corrective action plan.