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Workforce Estimates for Environmental Restoration at Pinellas Plant

**J. G. April
E. J. Stahlman**

October 1993

**Prepared for the U.S. Department of Energy
under Contract DE-AC06-76RLO 1830**

**Pacific Northwest Laboratory
Operated for the U.S. Department of Energy
by Battelle Memorial Institute**

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Summary

The purpose of this study was to assist the Pinellas Plant, Largo, Florida, in estimating workforce requirements for the anticipated environmental restoration (ER) mission. Pacific Northwest Laboratory (PNL) has prepared workforce estimates required for ER and the decontamination and decommissioning (D&D) at Pinellas Plant. These estimates are presented in the report and were based on a comparison of several ER projects of similar magnitude, including Elmendorf Air Force Base in Alaska; Hanford in Richland, Washington; and the Radium Chemical D&D project in Queens, New York. The characterization of the Pinellas Plant was based on the RCRA [Resource Conservation and Recovery Act] *Facility Investigation Report: Pinellas Plant*.

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1.0 Introduction

The purpose of this study was to assist the Pinellas Plant, Largo, Florida, in estimating workforce requirements for the anticipated environmental restoration (ER) mission. Pacific Northwest Laboratory (PNL)^(a) has prepared workforce estimates required for ER and the decontamination and decommissioning (D&D) at Pinellas Plant. These estimates are found in the following sections and were based on a comparison of several ER projects of similar magnitude, including Elmendorf Air Force Base (AFB), Hanford, and the Radium Chemical D&D project in Queens, New York. The characterization of the Pinellas Plant was based on the RCRA [Resource Conservation and Recovery Act] *Facility Investigation Report: Pinellas Plant*.^(b)

Section 2.0 discusses the assumptions that were made about the Pinellas Plant prior to proceeding with the workforce estimate. Using comparisons with projects at Elmendorf AFB and the Radium Chemical D&D project, Section 3.0 provides information on the basis for the workforce estimation. Section 4.0 discusses the workforce/classification evaluation, and Section 5.0 describes the schedules for the RCRA ER process. References are found in Section 6.0.

(a) PNL is operated by Battelle Memorial Institute for the U.S. Department of Energy under Contract DE-AC06-76RLO 1830.

(b) *RCRA Facility Investigation Report: Pinellas Plant*. September 1991 (Draft). Draft Report, Los Alamos National Laboratory, Los Alamos, New Mexico.

2.0 Assumptions

The following assumptions were made by PNL prior to beginning the Pinellas workforce estimate.

- The Pinellas Plant will continue with the RCRA process throughout ER. This may revert to the Comprehensive Environmental, Response Compensation, and Liability Act (CERCLA) process, but this should not affect the estimates.
- Sufficient data have been gathered through the RCRA Field Investigation.
- Additional field investigations will support corrective measure studies (CMSs) and designs.
- The workforce estimate will be based on CMS and Corrective Measure Implementation (CMI), as well as monitoring.
- The CMS will include treatability bench/pilot-scale studies.
- Most RCRA cleanup is assumed to be in-house with minimal subcontracting.
- The site will be managed as a single site, not as separate site cleanups.
- Subcontractors will be used for technical support to help onsite staff train, plan, develop, and implement ER and D&D.

3.0 Basis for Estimation

Various areas that helped to provide a basis for the workforce evaluation are outlined in the following.

1. Experience with the Elmendorf AFB CERCLA Program. PNL supported the Federal Facility Agreement Negotiation and Schedule for site cleanup.
2. PNL executed basewide, Operable Unit 4, and Operable Unit 5 remedial investigations. Pinellas Plant is comparable to one operable unit. An operable unit is a designated study area that may have individual sites for investigation and has common sources of contamination. Table 3.1 provides a list of the manhours and other services required for the program during a two-year period:
3. The D&D scope is based upon experience for the Radium Chemical D&D Project in Queens, New York. The Radium Chemical building was used to store radium needles for x-ray machines. A removal action was performed by the U. S. Environmental Protection Agency (EPA) Region 2 to extricate 120 curies of radium needles from the building. A D&D was subsequently performed within a two-year schedule. Total manhours and profession categories were provided by the subcontractor performing the work; this was the basis for position categories and manhour estimates for this evaluation. The position categories and manhours presented in Table 3.2 reflect approximations for this projects.

Consideration needs to be made about this project for use as a model for other D&D work, as this project was an EPA Region 2 lead site. EPA Region 2 was interested in the progress of this project and in meeting a two-year schedule for completion. Therefore, this project was given special attention for streamlining regulatory aspects. Regulations were not circumvented, but there was a priority to get work done.

4. The Radium Chemical D&D Project can be correlated to the Pinellas site. An assumption will be made that RCRA and CERCLA processes are very similar and take approximately the same length of time.
5. U.S. Department of Energy (DOE) sites usually take longer to clean up than U.S. Department of Defense (DoD) sites. DoD cleanups follow the CERCLA process. DOE follows CERCLA, National Environmental Policy Act, and DOE requirements, which increases the complexity and the time necessary to complete the work.
6. The Pinellas Plant estimate was based on the standard CERCLA process. This workforce baseline will be multiplied by a factor of 2.0 to account for the DOE process. This factor is based on experience with both DoD and DOE site cleanup cost estimates. For example, a standard work plan for investigation for a DoD site, on the average, will cost \$200K. A work plan at a DOE site could cost between \$350K and \$800K because of the significant increase in review cycles to the final work plan. A draft work plan for the Corps of Engineers for Hanford 100FR-1 Site Investigation cost approximately \$600K. This included the cost for finishing only the last five sections of the work plan. An average of \$400K had originally been assumed; therefore, a multiplier of 2.0 is used for this estimate.

Table 3.1. Elmendorf AFB Remedial Investigation/Feasibility Study (RI/FS) Program^(a)

<u>Total Subcon- tractor Manhours^(b)</u>	<u>Outside Services</u>	<u>Laboratory</u>
49,100 hr	\$335,000.00 (Approx. 3,500 hr)	\$369,000.00 (Approx. 3,500 hr)

<u>Description</u>	<u>Number</u>
General Manager	1
Project Manager	2
Engineer	4
Geologist	5
Technical Editors	2
Program Administrator	2
Secretary	2
Word Processor	2
Draftsman	2
CAD Operator	1
Computer Specialist	1
Administrative Support	2
Clerk	3

- (a) Assume same effort for remedial design is two years; assume same effort for remedial action is two years (total six-year program).
- (b) Total manhours for CERCLA cleanup from start to finish is $56,100 \times 3 = 168,300$ hr.

Table 3.2. Radium Chemical D&D Project

<u>Description</u>	<u>Number</u>
Onsite Personnel ^(a)	
Site Manager	1
Quality Assurance	1
Health and Safety	1
Site Engineer	1
Secretary	1
Support Lab ^(a)	
Manager	1
Supervisor	2
Technician	8
Offsite Support ^(a)	
Project Manager	1
Deputy Project Manager	1
Project Engineer	1
Staff Engineer	5
Geologist	2
Secretary	3
Technician	3
Accounts Receivable	2
Invoice Clerk	2
Corps of Engineers (COE) and EPA Staff ^(b)	
EPA Project Manager	1
EPA Lawyer	1
EPA Administrative Support	1
EPA Secretary	1
COE PM	1
COE Contract Specialist	1
COE Technical Support	3
COE Secretary	1

(a) Assume a two-year schedule with totally burdened charge-out rate of \$110/hr. This includes per diem expenses for half of the personnel for two years (36 staff x 2,080 working hr/yr = 149,760 manhours; 149,760 manhours x \$110/hr = \$16,473,600).

(b) Assume these staff at one-quarter time for two years. Therefore, 0.25 staff/full time employee (FTE) x 2080 hr x 10 FTE = 5200 hr. Total manhours for project = 149,760 + 5,200 = 154,960 hr, or 74.5 man-yr.

4.0 Workforce/Classification Evaluation

The following are occupation titles that may be needed for the overall RCRA environmental cleanup program at the Pinellas Plant (occupation titles are based on the Common Occupational Classification System (COCS) [Holmes et al. 1992]). The standard RCRA/CERCLA process is presented in Figures 4.1 and 4.2. An estimate was made for janitors, laundry workers, and security workers because these occupation classifications are not usually required on RCRA/CERCLA projects. To obtain the DOE estimate, multiply the quantity in each classification by two and double the amount of time.

<u>Description</u>	<u>Number</u>
General Manager	1
First Line Supervisor	2
Program Manager	1
Project Manager	2
Chemical Engineer	2
Civil Engineer	2
Computer Engineer	2
Environmental Engineer	2
Mechanical Engineer	2
Electrical Engineer	1
Nuclear Engineer	2
Safety Engineer	2
Geologist	2
Social Scientist (Public Affairs Support)	2
Accountant and Auditor	4
Computer Systems Analyst	2
Cost Estimator/Planner/Scheduler	3
Health Physicist	2
Industrial Hygienist	2
Lawyer	2
Personnel and Labor Relations Specialist	2
Technical Writers and Editor	2
Administrative Assistant	6
Office Clerk	6
Office Clerk Specialized	6
Secretary	4
Typist/Word Processor	4
Technician	6
Drafter	4
Health Physics Technician	2
Industrial Safety Technician	2
Instrument and Control Technician	1
Laboratory Technician	5
Driller	4
Laborer	12
Janitor	10
Laundry Worker	10
Security	15
Total Work Force (not including subcontractors)	141

CORRECTIVE ACTION PROCESS

Figure 4.1. Corrective Action Process (adapted from EPA 540 G-89 004 [EPA June 1988])

* The administrative record should be accessible to the public during the entire corrective action process

Figure 4.2. RCRA Corrective Action Process (adapted from EPA 530-SW-88-028 [EPA October 1988])

5.0 Schedules for RCRA Environmental Restoration Process from CMS to Site Closeout

The following table provides the schedules for the RCRA ER process.

Table 5.1. RCRA ER Process Schedules Through Closeout

<u>Item</u>	<u>Time Frame (Conservative)</u>
Corrective Measure Study	
Planning	6 Weeks
Planning Review and Approval	8 Weeks
Work Plan Development ^(a)	12 Weeks
Work Plan Review	6 Weeks
Work Plan Finalization	6 Weeks
Investigation Mobilization	4 Weeks
Field Work	8 Weeks
Laboratory Analysis	16 Weeks
Data Validation	8 Weeks
Laboratory Report	8 Weeks
Bench/Pilot Scale Testing and Evaluation (includes set up, laboratory analysis, and report preparation)	52 Weeks
Evaluation of Data and Remedy Selection	6 Weeks
CMS Report Preparation	12 Weeks
CMS Review and Approval	12 Weeks
Subtotal	164 Weeks
Public Relations Program	
Develop Public Relations Plan	16 Weeks
Public Relations Plan Review and Approval	16 Weeks
Implement and Maintain Public Relations Program	Throughout program

- (a) Work plan will develop and design investigations and bench-/pilot-scale studies that will lead to selection of remedies for environmental restoration. This will involve investigations to gather data to design bench/pilot scale studies and an evaluation of data to recommend selected remedies.

Remedial designs normally take 72 weeks after the Record of Decision or RCRA permit approval and 32 weeks to procure a remedial action contractor. Remedial action should take 144 weeks on large-scale remedial actions, totaling 412 weeks (8 years) for ER, from the start to completion.

6.0 References

Holmes, C. W., R. E. Lewis, S. T. Hunt, and M. G. Finn. 1992. *Environmental Restoration and Waste Management: U.S. Department of Energy Complex*, PNL-8171, Addendum 1, Pacific Northwest Laboratory, Richland, Washington.

U.S. Environmental Protection Agency (EPA). June 1988. *RCRA Corrective Action Plan (Interim Final)*. EPA 530-SW-88-028, OSWER Directive 9902.3.

U.S. Environmental Protection Agency (EPA). October 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (Interim Final)*. EPA 540 G-89 004, OSWER Directive 9655 2-01.

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