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FINAL STATEMENT OF WORK FOR EXPANDED HERBICIDE ORANGE MONITORING WITH TRANSMITTAL NCBC GULFPORT MS
6/26/1984
U S AIR FORCE

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE ENGINEERING AND SERVICES CENTER
TYNDALL AIR FORCE BASE, FL 32403

REPLY TO ATTN OF: RDVW

26 Jun 84

SUBJECT: Expanded Herbicide Orange Monitoring Program

TO: Mr. Jim Cluff
Naval Construction Battalion Center (NCBC)
Public Works Department
Planning Division/Environment
Code 470
Gulfport, MS 39501

1. Please find attached a finalized Statement of Work covering the Air Force expanded Herbicide Orange monitoring program. This document outlines the monitoring activities scheduled at NCBC.

2. Request your support for the planned program. Should you have any questions regarding the proposed work, please call my office at AUTOVON 970-2942.

Terry L. Stoddart

TERRY L. STODDART, Capt, USAF, BSC
Toxic Waste R&D Program Scientist

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Statement of Work

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STATEMENT OF WORK
EG&G/SOW-04-84

USAF SAMPLING AND ANALYSIS PROGRAM

VOLUME I

Submitted to the

DEPARTMENT OF DEFENSE
USAF/AFESC TYNDALL AFB

By

IDAHO NATIONAL ENGINEERING LABORATORY (INEL)
EG&G Idaho, Inc., Prime Contractor

May 25, 1984

1.0 EXECUTIVE SUMMARY

1.1 Title

USAF Sampling and Analysis Program

1.2 Summary Statement of Work

The purpose of this proposed investigation is to determine the horizontal and vertical extent of Herbicide Orange-derived 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) contamination in soils at former Air Force (AF) storage sites. The investigation will be conducted at the following three sites:

- Johnston Island (JI) in the Pacific Ocean
- The Naval Construction Battalion Center (NCBC), Gulfport, MS
- Eglin Air Force Base (EAFB), FL

This proposed investigation includes the following tasks:

1. Design a surface and subsurface soil sampling or coring plan (field protocol) for collection and analysis of representative samples using Environmental Protection Agency (EPA) and AF approved procedures. An integrated Quality Assurance (QA) program will be included to determine accuracy and precision of field and laboratory procedures. The protocol will also incorporate EPA, National Institute of Occupational Safety and Health (NIOSH), Occupational Safety and Health Administration (OSHA), and (for JI) Defense Nuclear Agency (DNA) safety and health procedures.

2. Collect surface soil samples at JI and NCBC.

3. Collect subsurface samples at JI, NCBC and EAFB.

4. Evaluate hydrogeologic data at NCBC and EAFB and develop a groundwater monitoring program.

5. Analyze samples for 2,3,7,8-TCDD and audit data quality.

6. Prepare final deliverables

   - maps of 2,3,7,8-TCDD contamination
   - technical report on sampling, analyses and quality assurance
   - technical report on monitoring wells
   - medical report on personnel involved in sampling.

The results of this proposed investigation will provide conclusive data regarding the extent of 2,3,7,8-TCDD contamination at the subject sites, thus allowing the Air Force Engineering and Services Center (AFESC) to evaluate and recommend clean-up activities for the different sites.

1.3 Experiment Duration

The Project is estimated to take 14 months (including a final presentation) after receipt of interagency agreement.

1.4 Work Location

1. The field protocol will be developed at Idaho Falls by EG&G Idaho personnel. EG&G Idaho is the prime contractor to the Department of Energy (DOE) at the Idaho National Engineering Laboratory (INEL).

2. Surface soil samples will be collected at JI and NCBC by subcontractor personnel under the direct supervision of EG&G Idaho and Air Force personnel.

3. Subsurface soil samples will be collected at JI, NCBC and EAFB by subcontractor personnel under the direct supervision of EG&G Idaho and Air Force personnel.

4. Hydrologic data evaluation and development of a groundwater monitoring program will be conducted by EG&G Idaho personnel in Idaho Falls after site visits to NCBC and EAFB.

5. Chemical analyses of all samples will be conducted by an EPA "certified" laboratory(s). The QA program will be supervised by EG&G Idaho personnel in Idaho Falls, based on analytical results and laboratory visits.

6. All deliverables will be prepared by EG&G Idaho personnel in Idaho Falls.

1.5 Milestones

		Time from Receipt of MIPR
1.	Select field sampling contractor	2.0 mo.
2.	Complete and submit field protocol to AFESC. Arrange logistics.	2.5 mo.
3.	Select analytical contractor(s)	3.0 mo.
4.	Final field protocol completed (includes QA procedures)	3.5 mo.
5.	Commence field sampling	3.5 mo.
6.	Submit raw data on JI contamination	8.0 mo.
7.	Complete field sampling and hydrologic data evaluation	8.5 mo.

8.	Complete analyses of samples	9.5 mo.
9.	Submit draft monitoring well report	10.5 mo.
10.	Complete and submit draft 2,3,7,8-TCDD maps and report	11.5 mo.
11.	Submit final monitoring well report	12.0 mo.
12.	Submit final 2,3,7,8-TCDD maps and report	13.0 mo.
13.	Present briefing on results	14.0 mo.

1.6 Labor and Materials

A Senior Scientist or equivalent from EG&G Environmental Sciences Section will be assigned as Principal Investigator for this study and be responsible for technical and day-to-day management. EG&G Idaho Waste Management Programs will be responsible for AF interaction, as well as reporting, budgets, etc. In addition, EG&G Idaho will provide a sampling expert (or the principal investigator) responsible for supervising all field work, a chemist responsible for analytical procedures and QA, and a hydrologist to conduct the groundwater investigation and monitoring system design.

Field sampling will be conducted by subcontractor technicians (probably six to eight) directly supervised by an EG&G Idaho sampling expert.

The estimated costs for this project are itemized in Volume II of this document. Personnel qualifications are presented in Volume III. Materials will be supplied by EG&G Idaho or its subcontractor, unless an agreement is reached with the AFESC for the Air Force to supply some of the needed materials.

2.0 TECHNICAL STATEMENT OF WORK

2.1 Introduction

Six tasks are outlined in the Scope of Work:

1. Design a surface and subsurface soil sampling or coring plan (field protocol) for collection and analysis of representative samples using the best available EPA and AF procedures. An integrated QA program will be included to determine accuracy and precision of field and laboratory procedures. The protocol will also address EPA, OSHA, and NIOSH safety procedures. For JI, DNA safety procedures will also be addressed.
2. Collect surface soil samples at JI and NCBC.
3. Collect subsurface samples at JI, NCBC and EAFB.
4. Evaluate hydrogeologic data at NCBC and EAFB and develop a groundwater monitoring program.
5. Analyze samples for 2,3,7,8-TCDD and audit data quality.
6. Prepare final deliverables

    - maps of 2,3,7,8-TCDD contamination
    - technical report on sampling, analyses and quality assurance
    - technical report on monitoring wells
    - medical report on personnel involved in field sampling.

2.2 Field Protocol

A detailed field protocol (plan) will be prepared following consultation with AF personnel and site visits. The plan will cover field collection: sampling-design, location, procedures; sample-collection equipment, processing, containers, coding, shipping; chemical analytical procedures; quality assurance; EPA, OSHA, and NIOSH (DNA for JI) safety procedures; logistics--schedules, record keeping, maps, personnel; data management; and results reporting.

The sampling methodology(s) will ensure that the areal and vertical distribution of 2,3,7,8-TCDD contamination at JI and the NCBC can be determined with a known level of confidence. The surface and subsurface sampling plans will be designed to permit comprehensive mapping, including contamination isopleths, at the contaminated sites. Two levels of surface soil sampling will be implemented:

- General systematic site sampling to obtain a distribution of contaminants in and adjacent to known contaminated areas.

- Intensive site sampling in areas used for storage and de-drumming.

The sampling protocol will be developed by EG&G Idaho in conjunction with the AFESC, and will include the following items:

- An initial site visit and reconnaissance to identify areas for general and intensive sampling and obtain site maps, hydrogeologic data and land use histories.

- Design sampling plans, including map preparation for locations and number of samples to be taken, (field splits, field replicates, blank samples).

- EPA, OSHA, NIOSH, and (for JI) DNA safety and health guidelines for 2,3,7,8-TCDD sampling will be employed. The protocol will include provisions to monitor for and minimize the possibility of heat exhaustion, including night sampling at JI. (Night lighting at JI, if required, will be provided by the Air Force.) The subcontractor will be responsible for obtaining any necessary medical treatment, from offsite hospitals, or, in the case of JI, from Holmes and Narver.

- Document packaging, shipping, and sampling documentation procedures including field sheets, method of packing and labeling, and management and transmittal of data. No data will be released except to the AFESC, through DOE-ID.

- Reporting requirements (monthly and final reports).

2.3 Field Sampling--Surface and Subsurface

Approximately 1900 surface samples and 325 core samples will be collected from the JI, NCBC and EAFB sites. A summary of the approximate number of samples (including QA samples) is presented in Table 1.

TABLE 1. Sampling Summary

Site	Core Samples	Surface Samples	Total Samples
Johnston Island	75 (15 cores x 5 samples/core)	800	875
Naval Construction Battalion Center	75 (15 cores x 5 samples/core)	1100	1175
Eglin AFB	175 (7 cores x 25 samples/core)	0	175
**QA blanks	10	50	60
**Field splits*	10	50	60
**Field replicates	--	80	80
**Lab QA standard samples	20	100	120
**AFESC qualification samples	--	10	10
**Decontamination Samples	15	85	100
Totals	380	2275	2655

* Additional field splits, beyond those listed here, will be provided to the Air Force, who will fund such analyses separately.
** QA samples.

The surface soil samples will be collected by a team of subcontractor personnel according to procedures documented in the field protocol. An EG&G Idaho supervisor will be present during all field sampling. An EG&G Idaho or Subcontractor safety representative will also be present during the first few days of sampling at the initial site, to verify that the measures to protect personnel from contamination are satisfactory. One of the team members will be medically trained and monitor workers for heat exhaustion.

The current USAF sampling protocol calls for samples to be taken from a 3 x 3 x 3 in. deep soil volume sieved to a standard size. This method and other EPA approved procedures acceptable to the AFESC will be considered. Compositing of several soil aliquots will be used to generate samples which are more representative. The samples will be collected at permanently marked grid points surveyed and labeled by the subcontractor. Sampling equipment will be decontaminated between sampling points. All samples will be stored and shipped in glass jars.

In addition to surface samples, fifteen (15) core samples will be collected at both JI and the NCBC. Samples will be collected at one foot intervals from the surface to a depth of five (5) feet. At EAFB seven (7) core samples will be collected every foot to a depth of twenty-five (25) feet. Each coring location will be determined in conjunction with the AFESC. Any change in this subsurface sampling design must be approved by AFESC.

The methodology for the core sampling will depend on an evaluation of site-specific conditions and be designed to minimize cross contamination of samples. It is anticipated that samples collected at JI will be horizontally cored samples taken from the wall of a backhoe trench. At NCBC and EAFB, split-spoon samples will be taken through the hollow stem of augers driven by

a small drilling rig. To minimize the potential for vertical migration of 2, 3, 7, 8-TCDD, all drilled holes will be grouted in accordance with the following specification: EPA Manual of Water Well Construction Practices (570/9-75-001); ASTM C-150; ASTM C-494. All surface and subsurface samples from JI will be surveyed for alpha-emitting radioactivity.

Decontamination of sampling equipment will be performed in accordance with protocols established by the EPA. These procedures will require all non-expendable sampling equipment to be thoroughly decontaminated after each sample is collected to prevent cross-contamination of samples and contamination of personnel. In addition, vehicle and drill rig decontamination shall be performed if there is potential for transporting contaminated soils off-site. Personnel decontamination will consist of removal of all contaminated clothing, including footwear and respirators, and scrubbing with soap and water.

All samples and equipment will be shipped by commercial carrier to the extent possible. Military cargo aircraft will be provided to transport hazardous materials and samples from Hawaii to JI and from JI to Hawaii.

Considerable amounts of hazardous waste will be generated during field sampling. In costing this proposal, it was assumed that the AF will be responsible for all hazardous waste generated by field sampling. The analytical laboratory will be responsible for the disposal of the samples.

It is assumed that the Air Force will handle all site clearances for contractor and subcontractor personnel. It is also assumed that through this clearance process, access will be made readily available to all portions of the sites where the work will be performed.

2.4 Hydrogeologic Evaluation

Development of the ground water monitoring program for NCBC and EAFB will require an in-depth evaluation of hydrogeologic data. A generalized approach to performing this task is outlined below:

- o Obtain and review all existing and newly collected (during this study) hydrogeologic and stratigraphic data.

- o Interpret data to define and evaluate hydraulic parameters, including direction of ground water flow, velocity, and hydraulic gradient.

- o Based upon this evaluation, provide recommendations as to:

  - Monitor-well locations (one up gradient, and up to four down gradient)
  - Well design (multiple completion wells may be considered) and construction including depth, size, and construction materials.
  - Sample collection procedures and frequency

  If existing data are inadequate to conduct the hydrogeologic evaluation, the Air Force will be consulted for guidance on how to proceed.

2.5 Analysis

All surface and subsurface samples will be analyzed for 2,3,7,8-TCDD using an USEPA approved methodology in a USEPA "certified" laboratory(s). All subsurface samples will be analyzed for 2,4-D and 2,4,5-T. A laboratory(s) will be selected to analyze the samples, using criteria developed in conjunction with the AFESC, including the following:

- Attainable detection limit of 0.1 ppb for surface samples and 0.01 ppb for subsurface samples for 2,3,7,8-TCDD. Detection limit for 2,4-D and 2,4,8-T is 0.1 ppb.

- Sample turn-around time and throughput.

- Laboratory quality assurance and quality control programs.

- Analysis of qualification samples.

- Previous history of the determination of 2,3,7,8-TCDD.

- Cost.

If possible, one laboratory will be contracted to analyze all field samples. In addition, a separate laboratory will be retained to prepare approximately 120 "known" concentration QA samples to be submitted from the field (on a random basis). These samples will be packaged and numbered similar to the field samples. The major components of the quality assurance program will include the following:

- Submission of field splits.

- Submission of field replicates.

- Laboratory "known" concentration samples.

- AFESC qualification samples.

- Periodic laboratory "on-site" audits to address sample analysis logging, and data reporting.

- Periodic laboratory "on-site" evaluation of internal quality assurance to address instrument calibration, etc.

- Agreed-upon level of recovery for laboratory spike samples.

2.6 Deliverables

1. EG&G Idaho will provide AFESC with a map of 2,3,7,8-TCDD contamination including isopleths of surface and subsurface contamination. A map shall be provided that includes specific sample locations; 2,3,7,8-TCDD levels at each location; and depth of soil contamination based on soil cores.

2. EG&G Idaho will prepare a technical report describing all sampling and EPA-approved analytical methods used. The analytical results will be presented in the EPA format, including percent recovery. The report will address laboratory and field quality control/assurance and precautions to prevent cross-contamination of samples.

3. EG&G Idaho will provide AFESC with the recommended monitoring well locations at NCBC and EAFB. A technical report will be prepared addressing existing hydrogeological data, rationale used to determine well locations, groundwater monitoring well design/construction, and sampling methods.

4. Monthly progress reports will be routinely prepared and submitted to the AFESC.

A brief medical report will also be prepared. The results of physical examinations for each in-field employee, both pre-project and post-project, will be reported.

Appropriate review of the above reports will be provided by DOE-ID.

3.0 PRODUCT AND MILESTONE EXPLANATION

This project will result in the preparation of maps and two reports. The maps will show sample locations; 2,3,7,8-TCDD concentrations; and depth of contamination. One report will describe field sampling and quality assurance for 2,3,7,8-TCDD sampling. The second report will describe recommended monitoring well locations, well design, sampling methods, etc.

Key intermediate and final milestones are described in the following section.

	Event	After Start Date
3.1	Select field sampling contractor. A scope of work will be developed, bids will be requested and a contract awarded.	2.0 mo.
3.2	Complete and submit draft field protocol (including field and laboratory QA procedures) to AFESC. Upon review by AFESC, comments will be incorporated.	2.5 mo.
3.3	Select analytical contractor(s). A scope of work will be developed, and bidders evaluated based on criteria identified in Section 2.5.	3.0 mo.
3.4	Complete incorporation of AFESC comments into field protocol.	3.5 mo.
3.5	Commence sampling. Field work will begin at the first of three sites.	3.5 mo.
3.6	Submit raw data on JI contamination	8.0 mo.
3.7	Complete field sampling and hydrologic data evaluation.	8.5 mo.
3.8	Complete analyses of samples for 2,3,7,8-TCDD.	9.5 mo.
3.9	Submit draft monitoring well report to AFESC.	10.5 mo.
3.10	Complete and submit draft TCDD maps and reports	11.5 mo.
3.11	Submit final monitoring well report.	12.0 mo.
3.12	Submit final TCDD maps and report.	13.0 mo.
3.13	Present briefing on final results	14.0 mo.

4.0 LABOR AND MATERIALS BREAKDOWN

Labor hours and non-labor costs for EG&G Idaho and subcontractors are itemized below.

Labor Hours (Senior Scientist or Equivalent)

Prepare field protocol (EG&G)	700
Conduct field work	
(EG&G)	863
(Subcontractor)	4778
Hydrologic investigation (EG&G)	400
Chemical analysis QA (EG&G)	120
Reporting (EG&G)	700
Program management (EG&G)	286
Total	7847
Non-labor costs	
Chemical analyses	915
Field sampling materials and shipping	52
Travel and living expenses	110
Computer	4
Other	14
Total	1095

5.0 REPORTING REQUIREMENTS

5.1 Monthly Report

Monthly letter reports will be provided to the AFESC which will contain a brief description of progress, funds expended, problems and milestone variance (if any).

5.2 Draft and Final Reports

Draft reports will be prepared in accordance with a format to be supplied by the AFESC and submitted for review. Comments and recommendations will be addressed and the final reports submitted to the USAF/AFESC.

STATEMENT OF WORK
EG&G/SOW-04-84

U.S.A.F. SAMPLING AND ANALYSIS PROGRAM

VOLUME II

Submitted to the

DEPARTMENT OF DEFENSE
USAF/AFESC TYNDALL AFB

By

IDAHO NATIONAL ENGINEERING LABORATORY (INEL)
EG&G Idaho, Inc., Prime Contractor

May 26, 1984

The following cost estimates are for completion of the work described in the Statement of Work EG&G/SOW-04-84, Volume I, dated April 26, 1984. These estimates are based on preliminary information from the lowest priced of a number of potential suppliers and from other sources. If these estimates turn out to be significantly lower than actual bids, the number of samples will be proportionaly reduced, after consultation with the Air Force, to hold the total cost to no more than $1.65 million.

Task	Labor Hrs	Labor $K	Materials and Shipping ($K)	Computer ($K)	Travel and Living Expenses ($K)	Total ($K)
Field Protocol	700	39	1		6	46
Surface Sampling						
EG&G*	713	40	--	--	13	53
Sub.*	4330	190	36	--	65	291
Subsurface Sampling						
EG&G*	150	9	--	--	4	13
Sub.*	448	20	16	--	11	47
Hydrological Inves.	400	20	1	1	4	26
Analyses and QA						
EG&G	120	7	--	1	2	10
Sub.	--	--	915	--	-	915
Reporting	700	38	12	2	3	55
Management	286	16	--	--	3	19
Total	7847	379	981	4	111	1475
Contingency						175
GRAND TOTAL						1650

* Includes 10% contingency for additional labor hours and living expenses occasioned by delays due to inclement weather. Approximately 8 working days assumed to be affected.

STATEMENT OF WORK
EG&G/SOW-04-84

U.S.A.F. SAMPLING AND ANALYSIS

VOLUME III

Submitted to the

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By

IDAHO NATIONAL ENGINEERING LABORATORY (INEL)
EG&G Idaho, Inc., Prime Contractor

May 26, 1984

PERSONNEL QUALIFICATIONS

Environmental Scientists

Two environmental scientists from the Environmental Sciences Section of The Earth and Life Sciences Branch. The classification of one person will be Senior Scientist or higher, and the second will be a Scientist or higher.

The Senior Scientist will serve as the principal investigator. This person has over ten years of experience beyond an M.S. in the areas of environmental research and monitoring. The monitoring experience includes design, field experience, and data analyses as the lead scientist for air, soil, water and biota monitoring projects. The person has conducted the monitoring studies for both organic chemicals and trace elements. The research efforts have involved research design, field work, data analyses and publication in peer-reviewed journals. Over a dozen published reports have been completed.

The Scientist has also had experience in field sampling for a variety of media and reported on the results. The Scientist has an M.S. degree in environmental science plus experience. The person's work experience has included design, data analyses and reporting of sampling data.

Geotechnical Personnel

Two support personnel will be provided from the Geosciences Section of the Earth and Life Sciences Branch. The classification for these individuals will be either a Senior Scientist or Scientist.

The subsurface soil sampling or coring operation will be directed by a geologist with extensive experience with coring procedures in or around contaminated areas. In addition, this individual has been responsible for directing several large-scale coring or subsurface investigations at the INEL.

The hydrogeologic evaluation and monitoring network design will be directed by a senior ground-water hydrologist. At the INEL, this individual has been responsible for the evaluation of hydrogeologically controlled contaminant transport mechanisms through the unsaturated and saturated zones of the subsurface environment. In addition, this hydrologist has assisted in the design and construction of many of the INEL monitor wells and system designs.

Analytical Chemist

The Ph.D. chemist supervising quality assurance taught at a University for 14 years, attaining the rank of full professor the last 8 years. He has worked extensively as a consultant to various private and government organizations including the EPA. The person has administered and supervised many environmental monitoring programs. The chemist has authored over 100 publications and written one chemistry textbook.

Program Manager

The Program Manager from Waste Management Programs has over five years experience in program management, as part of over 10 years experience in hazardous and radioactive waste management. He has numerous publications.

In addition, support personnel are available from Health and Safety in industrial hygiene, industrial safety, occupational medicine, etc.