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DOCUMENT CLEARANCE REQUEST

Part 1 – Issuing Manager's Approval

1. Date Cleared Required	2. Document Identification	2B. Previous Document Identification
6/23/89	WHC-MR-0030	

3. Title (Include UC Category)	4. Author's Name(s)	5. Phone	6. MSIN
1100 Area Air Quality Monitoring Protocols and Procedures	C. Sheats, PNL M. R. Adams	6-8361	HV-5

SECTION 1

7. Desired Clearance/Release

Public Clearance ☑ Open Literature ☐ Oral Public

Limited Clearance ☐ Applied Technology ☐ Foreign Exchange

DOE Directed Release ☐ FOIA ☐ Media ☐ O

Document Type

(Choose One) ☐ Speech/Article ☐ Abs. ☐ Sum. (WHC-SA-XXXX) ☐ Full Paper ☐ Speakers Bureau

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Meeting Name, Location, Date NA

10. ☐ To Be Published in Journal ☐ Handouts for Attendees Official Publishing Month: NA

11. WHC Program: Environmental

SECTION 2 Program Office Information

12. Does this document contain Liquid Metal Reactor (LMR) information? ☑ No ☐ Yes
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12A. When was the information generated?

12B. What prior dissemination of the information has been made to LMR contractors? (Cite report number, page, date of issuance, and distribution, and/or meeting handouts, date and distribution.)

13. Does this document or its source document contain applied technology information ☑ No ☐ Yes
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14. Does the document contain Nuclear Waste Policy Act information? (Explain)
NO

SECTION 3 Patent Legal Info.

Does this document contain or disclose any of the following? If "Yes" identify information and location in document.

15. New or novel (patentable) subject matter? ☑ No ☐ Yes
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16. Information received from a foreign country under an exchange agreement? ☑ No ☐ Yes (Identify)

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SECTION 4 Remarks and Approvals

20. Sponsoring Agency (if not U.S. Department of Energy):

21. DOE/HQ Assistant Secretary For: Environment, Safety & Health

22. Remarks: This document is being cleared because it is referenced in DOE/RL 88-23. Prepared by PNL under work order ED 9321

Document is approved as conforming to all applicable requirements. The above information is certified to be correct.

	23. Author	Immediate Manager	Issuing Manager (Level III)	24. Date
Type Name	M. R. Adams	L. C. Brown	L. C. Brown	
Signature	M R Adams	L C Brown	L C Brown	6/19/89

Attach additional sheet if more space is needed.

DOCUMENT CLEARANCE REQUEST
Part 2 – Clearance Reviews and Approvals

Document Identification: WHC-MR-0030

Legends	Remove	Affix	Reviewer
UCNI	☐	☐	
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Applied Technology	☐	☐	
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Patent Status	☐	☐	
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Disclaimers	Remove	Affix	Reviewer
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	☐	☐	

Reviewer	Required (If yes)	Approve Yes	Approve No	Mandatory Changes Yes	Mandatory Changes No	See Remarks (If yes)	Signature	Date
Publications Services 6/21/89	✓						see attached	
WHC Classification/UCNI	✓	✓					R.D. Baird	6/20/89
WHC Patent/Legal	✓	✓		✓		(1)	[illegible]	6/22/89
DOE Patent/Legal	✓	✓		✓		(1)	[illegible]	6/22/89
Westinghouse Corporate								
WHC Public Relations								
References							see attached	
WHC Int. Prog. Coord.	✓	✓			✓		S.M. Wiegle	6/21/89
WHC Prog. Office/or Working Group Rep.								
DOE Program Sponsor	Bob Stewart						R K Stewart	6/26/89
DOE Working Group Chairman								

Working Group Name:

Remarks (1) Trademarked items such as Corbetrope, etc. (page 3) must be so stated the first time mentioned in the document with a footnote "Trademark of "XYZ" Company. [illegible] 6/22/89

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Document Identification: WHC- MR-0030

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Reviewer	Required (If yes)	Approve Yes	Approve No	Mandatory Changes Yes	Mandatory Changes No	See Remarks (If yes)	Signature	Date
Publications Services	✓					✓ (2)	Diane E. Stolp	7/14/89
WHC Classification/UCNI	✓	✓					R.A. Brown	6/20/89
WHC Patent/Legal	✓	✓		✓		(1) (2)	[illegible]	6/22/89
DOE Patent/Legal	✓	✓		✓		(1)	[illegible]	6/22/89
Westinghouse Corporate							N/A	
Public Relations							N/A	
References							Diane E. Stolp	7/14/89
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WHC Prog. Office/or Working Group Rep.							N/A	
DOE Program Sponsor	✓						R.K. Stewart	6/26/89
DOE Working Group Chairman							N/A	

Working Group Name:

Remarks

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(2) Made title page only [illegible] disclaimer and TM disclaimer/ incorporated TM corrects as per Stan Bugin/ no edit

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1100 Area Air Quality Monitoring Protocols and Procedures

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Westinghouse Hanford Company

C. S. Glantz
Pacific Northwest Laboratory

Date Published
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Date: 3/6/89
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ED 9321
Task Order or Work Order #
Impact Level III

To: Project File

From: M. R. Adams

Subject: Approval of Procedures for Field Services Procured by Task/Work Order

The procedures for field services provided by task/work orders are approved by Westinghouse Hanford Company. Specific information regarding the service is indicated below:

1. Work Title Including Operable Unit Designation

   1100-EM-1 OU Air Quality Monitoring

2. Type of Order: ____ Task Order Task # ____

   X Work Order Order # ED 9321

   X Statement of Work (check is present; do not proceed if absent).

3. Performing Organization:

   ____ Golder X PNL ____ Kaiser ____ Other ____

4. Performing Personnel and Title:

   Cliff Glantz - Task Leader

5. Approval Checklist: (Attach list of each document supplied, date of document, ID # if available, and revision indication, if available).

   X Equipment operating manuals, instructions or procedures

   X Calibration instructions or procedures

   X Calibration record during operation

   X Equipment maintenance instructions or procedures

   X Equipment maintenance record during operation

   N/A Purchase records of parts or tools used specifically for operation specified in Statement of Work attached to Work or Task Order

   X Safety precautions peculiar to equipment documented (Site safety precautions covered in Health and Safety Plan)

   X Logbooks and/or notebooks for field data collection

6. Approvals:

RI Project Coordinator (WHC)	3/22/89 Date
Field Team Leader (WHC)	3/22/89 Date
Technical Lead (WHC)	3/6/89 Date
QA Officer (If impact Level I, II or III)	3/22/89 Date

1100 AREA AIR QUALITY MONITORING PROTOCOLS AND PROCEDURES

Impact Level III

Issue Date: March 21, 1989

3/21/89

C. S. Glantz Task Manager

3/21/89

R. R. LaBarge Quality Engineer

1100 AREA AIR QUALITY MONITORING PROTOCOLS AND PROCEDURES

INTRODUCTION

This document presents the protocols and procedures for the air quality monitoring to be conducted as part of the Remedial Investigation (RI) of three waste sites located in the 1100-EM-1 Operable Unit. The three waste sites being examined are the Horn Rapids Landfill (located north of Horn Rapids Road), the 1100-2 and 1100-3 disposal pits (located near the center of the 1100 Area), and the battery acid pit (located southwest of the 1171 Building). The air quality monitoring task calls for sampling at two or three locations near each waste site. There will be three sampling events at each monitoring location; air samples will be collected before, during, and after RI activities are conducted at the site. Air quality data will be used in the planning and implementation of CERCLA remedial actions for the 1100-EM-1 waste sites.

Because there is uncertainty as to the types and quantities of the various waste products buried at the Horn Rapids Landfill and the 1100-2 and 1100-3 disposal pits, a broad spectrum of air quality monitoring will be conducted at these locations. This spectrum of monitoring will include examining for airborne particulates, volatile organic compounds, and semivolatile organic compounds(1). Because more information is available on the wastes disposed of at the battery acid pit, monitoring at this site will concentrate on detecting atmospheric emissions from the wastes that are known to be present.

This document is divided into sections that cover: sampling techniques and instrumentation, sampler locations, criteria for initiating air quality monitoring, experimental procedures (including instrument calibration) and analysis, additional quality control procedures, and report findings.

SAMPLING TECHNIQUES AND INSTRUMENTATION

In this section, information is presented on the sampling techniques and instrumentation that will be employed for the sampling of airborne particulates, volatile organic compounds, and semivolatile organic compounds. A copy of each instruments operating manual will be retained by the task leader. Instrument calibration procedures are reported in a later section of this document.

Particulates and Semivolatile Organic Compounds

A [redacted]*will be used to collect airborne particulates and semivolatile organic compounds. In this sampling system, a battery driven pump draws air through a filter sampler and a polyurethane foam (PUF) plug cartridge. The pump uses a bypass blower motor equipped with an independent cooling fan to sample at rates of up to 280 liters per minute. Power will be provided using two rechargeable 12-volt batteries connected in series to provide a 24-volt power source. In this configuration the instrument can operate at full power for over 4 hours.

In the PS-1 sampler, equipment is housed in an 18.75 x 18.75 x 52.5 inch anodized aluminum shelter. In the upper portion of the shelter, a dual-chambered sampling module contains both the filter and PUF sampling devices. Sampled air first moves through the upper chamber of the sampling module. In this chamber, incoming air passes through a 4-inch diameter teflon filter that collects airborne particulates. The instrument's range of operational flow rates and the geometry of the housing favor the collection of particles with diameters between 0.1 and 100 microns. A collection efficiency of 99% is quoted for particles with a 0.3 micron diameter(2).

After passing through the filter, air enters the lower chamber of the sampling module and passes through a 3-inch long, cylindrical glass cartridge containing a PUF plug. The PUF adsorbs semivolatile organic compounds, organochlorine pesticides, and polychlorinated biphenyls (PCBs); sampling efficiencies are provided in EPA Method 608(3)(4).

*Trademark of General Metal Works, Inc.

Volatile Organic Compounds and Asbestos

A low-volume sampling system will be used to sample volatile organic compounds and asbestos. In this system, a [redacted] Sampler * draws air through an asbestos filter and a Carbon Molecular Sieve (CMS) cartridge. The PAS-3000 operates using a series of eight 1.25-volt rechargeable nickel-cadmium batteries connected in series. The maximum flow rate through the sampler is 500 ml per minute. The sampler can operate for 6 to 10 hours before the unit's batteries need to be replaced or recharged.

The CMS cartridge to be used in the PAS-3000 is a Model 300 Supelco Carbotrap. This stainless steel cartridge is filled with three specialized adsorbents: [redacted]** Glass wool plugs separate the adsorbent materials and are packed into the ends of the cartridge. The CMS cartridge is specifically designed to efficiently adsorb and desorb all hydrocarbons listed in EPA methods TO-1, TO-2, and TO-3(2), whether present individually or in complex mixtures.

Several alternative methods are available for sampling volatile organic compounds. Two commonly used alternatives involve the use of a SUMMA polished canister(5)(6) and a [redacted])**adsorbent cartridge. The SUMMA molectrics process is used to passivate the interior of a stainless steel canister to create an interior surface that is free of active adsorption sites. Samples are collected by drawing air into a treated, evacuated canister. A pump and mass flow controller may be used to slowly fill the canister over an extended period. Tenax GC is an adsorbent that traps volatile organic compounds. A stainless steel tube (similar to the cartridge used in the CMS) is filled with the Tenax material and air is drawn through the tube. A Tenax cartridge can be used in a PAS-3000 air sampling unit.

There are advantages and disadvantages to each method of sampling volatile organic compounds. To determine which type of sampler might be best for future air quality assessment projects at the Hanford Site, several trial samples may be taken using the Tenax and SUMMA polished canisters. These samples would be taken in addition to CMS sampling and will be collected using separate

*Trademark of the Spectrex Company.
**Trademark of Supelco Inc.
***Trademark of Enka N.V.

sampling instruments (so as not to interfere with CMS sampling). Sampling activities with Tenax and the SUMMA polished canisters will be recorded in the field logbook.

Asbestos particles will be collected using a [redacted] filter. The filter is made from mixed cellulose esters and has a pore size of 0.8 microns. The asbestos filter will be set up upstream from the CMS cartridge in the PAS-3000.

SAMPLER LOCATIONS

At each waste site, equipment will be deployed to collect air samples that will be used to monitor ambient air quality and detect pollutants that may be emitted to the atmosphere from the waste site.

Downwind Air Quality Monitoring

In order to estimate the impact of a waste site on air quality, air sampling will be conducted downwind of each waste site (or within the boundaries of a waste site if downwind sampling is not possible). The wind direction sector to be used for downwind sampling will be determined by analyzing data from nearby Hanford wind monitoring stations. Attention will be paid to both the annual and seasonal characteristics of the winds, because the preferred sampling technique is to use the same monitoring locations for each phase of the project (i.e., before, during, and after RI activities). Winds that produce atmospheric transport into the selected downwind sector must occur frequently during each of the three sampling periods. Also, these winds must typically persist for a long enough period of time to allow a multi-hour sampling run to be completed. An analysis of wind data collected near the 1100 Area indicates that southwesterly winds (winds blowing from the southwest to the northeast) should best meet these criteria.

To compensate for the normal meander in wind direction, two downwind air monitoring sites will be used at the Horn Rapids Landfill and at the 1100-2

*Trademark of Gelman Scientific.

and 1100-J disp[illegible] pits. Two [illegible] positions will be located a sufficient dist[illegible] apart so that [illegible] one of the monitoring sites should be able to coll[illegible] a viable sample when there is a slight shift from the optimal wind direction.

At the Horn Rapids Landfill, the downwind sampling locations will be located within 200 m of the site boundaries (Figure 1). At the central 1100 Area waste sites, downwind samplers will be placed in close proximity to each of the two disposal pits (Figure 2). At the battery acid pit, the proximity of the 1171 Building to the waste site makes sampling at any significant distance downwind of the site impossible. Instead of sampling downwind, monitoring at this site will have to be conducted directly over the waste site. All sampling location will be carefully documented in the field logbook. If meteorological or other conditions warrant the redeployment of air sampling equipment outside of the zones outlined in Figures 1 and 2, justification for the moving the monitoring locations will be documented in the project field logbook.

Ambient Air Quality Monitoring

The tentative positions for ambient air quality monitoring are presented in Figures 1, 2, and 3. If meteorological or other conditions warrant the redeployment of air sampling equipment outside of the zones outlined in these figures, justification for the moving the monitoring locations will be documented in the project field logbook.

CRITERIA FOR INITIATING SAMPLING

The decision to initiate air quality sampling will be made by the task leader, after consulting with task field personnel, Hanford meteorologists, and project management. WHO field supervisors and project management will be consulted early in the decision making process to determine if scheduled site activities would conflict with air quality sampling. The final decision to initiate sampling will be made after carefully analyzing meteorological conditions. The meteorological conditions that are required for sampling include:

- winds from a selected direction sector that will produce net transport from the waste site toward the "downwind" air quality monitor(s) and the forecast persistence of these winds.

- atmospheric stabilities that are in the neutral to stable range (moderately unstable conditions would also be acceptable for summertime sampling events)

- no precipitation.

Meteorological data will be obtained from the automated Hanford wind and temperature monitoring stations located in the vicinity of the 1100 Area. Particular attention will be paid to the data from the automated stations located southwest of the 300 Area (between the 300 Area and the Horn Rapids Landfill) and at the Richland airport. In addition, supplementary meteorological data will be obtained near the air sampling locations using a portable anemometer and a battery-powered Climatronics datalogger. The anemometer will be a standard Climatronics cup-type instrument (or its equivalent) and will be mounted at a height of between 1 and 3 meters above ground level. The instrument package used in the field will be obtained from a pool of calibrated Hanford meteorological equipment(8). Collection of meteorological data at a site will begin prior to the initiation of air quality sampling and will cease only after all air quality sampling has been completed. Based on the available meteorological data, air monitoring locations may be adjusted slightly prior to the initiation of sampling to maximize monitoring efficiency. Once sampling is underway, monitoring will continue uninterrupted.

In order to collect a sufficient sample, air quality monitoring will be conducted for a minimum of 2 hours. The exact duration of the sampling will be based on the meteorological conditions and the requirements of the sampling equipment. If meteorological conditions are marginal for the collection of sample material (e.g., a moderate meander in the wind direction, unstable atmospheric conditions, or high wind speeds) the task leader may elect to

continue sampling up to 8 hours. The decision to terminate sampling will be made by the task leader.

After a sampling event, meteorological data from the portable anemometer will be downloaded from the datalogger to a cassette tape. The person downloading the data will immediately label the cassette with the data and name of the waste site. The tape will be hard delivered to the task leader and downloaded to a IBM PC* for preliminary analysis and storage. If the preliminary analysis of the meteorological data indicates that the winds during sampling were not from an acceptable direction sector for a sufficient length of time to produce a viable sample, sampling will need to be repeated at the waste site being studied.

Uncooperative Weather

As in all air quality monitoring studies, it must be recognized that the atmosphere may not cooperate with the field project. Although a detailed meteorological analysis might indicate that winds from the selected direction sector should occur quite often, it is possible to experience an extended period during which atmospheric conditions might not produce winds from the selected sector. It is recognized that such a condition might persist for days or weeks; field personnel must be prepared to wait out the situation or amend the sampling protocols outlined in this document (any change to the sampling protocols will be documented in the field logbook). Any such decision will be made only after fully consulting the PNL project manager, field work supervisors, and WHO project management.

EXPERIMENTAL PROCEDURE AND ANALYSIS

This section details the protocols and procedures for collecting, handling, and analyzing the air quality samples. After the decision to initiate sampling is made, individual samplers will be turned on. A sampling event will last from 2 to 8 hours, with the exact duration depending on meteorological conditions and instrument performance. After sampling has been completed,

*Trademark of International Business Machines Corporation.

the lead field technician will supervise the collection of the filter and cartridge samples. All samples will be placed in clean containers, sealed from contact with outside air, and clearly labeled with their monitoring location and the date and time that sampling was conducted. Sample labeling and chain of custody procedures will be based on the portions of PNL-MA-567 applicable to air quality monitoring. The lead technician will return the samplers to the laboratory for temporary storage until laboratory analysis procedures are begun.

Particulate and Semivolatile Organic Compounds

The General Metal Works PS-1 sampler will be operated using a sampling rate of between 100 to 280 l/minute. Air flow will be measured using a magnehelic gage. Calibration checks on the flow rate will be run before each sampling event. This calibration utilizes a manometer, calibrator, and the manufacturer's published calibration curve. The manufacturer's calibrator attaches directly to the top of the filter holder. The procedures followed during calibration will be according to the manufacturer's written specifications. A copy of the manufacture's calibration specifications will be stored in the project's field notebook.

In the staging laboratory, a teflon filter and PUF plug will be loaded into each dual-chambered sampling module. The clean handling procedures outlined in EPA method TO-4(3)(4) will be followed for all sampling equipment. After all the PS-1's are deployed in the field, and a sampling event is imminent, the sampling modules will be brought to the field by the lead technician and installed in each PS-1. The air sample flow rate through the PS-1 will be calibrated after the first few minutes of sample operation. The calibration will be conducted using the calibrator orifice module according to the manufacturer's written procedure. After calibration is completed, the sampler's identification number, the start date and time for sampling, and all relevant calibration data will be promptly recorded in the field log.

Just prior to the termination of sampling, a check will be made of each instrument's sampling flow rate. After all checks are completed, each sampling

pump will be turned off and the sampling event will be terminated. The end date and time for sampling, and final calibration data will be recorded in the field log.

To remove samples from the field, the lead technician will detach the sampling modules from their sampler housing and prepare the samples for transport (following the procedures outline in EPA method TO-4(3)(4)). All samples will be promptly returned to the staging laboratory for disassembly. The teflon filters will be removed using stainless steel tweezers, placed in clean petri dishes, sealed with white plastic tape, and clearly labeled. The PUF material will be similarly removed, placed in clean glass bottles (amber or foil covered) and clearly labeled.

In the laboratory, PCBs and pesticides are removed from the PUF material via Soxhlet extraction according to EPA method TO-4(3)(4). The extracts will be analyzed using gas chromatograph with electron capture detection (GC-ECD) following the procedures also outlined in EPA method TO-4(3)(4). The teflon* filter will also be analyzed following the procedure outlined for particulates and metals via non-destructive X-ray fluorescence in PNL's X-Ray Florescence Reference Procedure (PNL-SP19). This is an approved ANSI/ASME NQA-1 procedure under U. S. Nuclear Regulatory Commission guidelines.

Volatile Organic Compounds and Asbestos

Before a field experiment, each PAS-3000 sampler will be calibrated in the laboratory using a soap film flow meter and following the manufacturer's written procedures. A copy of the manufacture's calibration specifications and calibration results will be stored in the project's laboratory notebook. After a sampling event is scheduled, the PAS-3000 samplers will be deployed in the field. Each CMS cartridge will be transported to the field in a screwtop glass storage container. Asbestos filters will be transported to the field in sealed ziploc bags. The clean handling procedures outlined in EPA method TO-4(3)(4) will be followed for all sampling equipment.

*Trademark of E.I. du Pont de Nemours & Company, Inc.

[illegible] installed in their PAS-3000 [illegible] sampling event. After the PAS-3000 [illegible] number and the date and time [illegible].

After sample has been collected, each PAS-3000 will be turned off and the end date and time recorded on the field log. The CMS cartridges will then be removed from their samplers, recapped, and placed in screwtop glass storage containers for transport to the laboratory. The asbestos filters will be resealed in ziploc bags for transport to the laboratory. The CMS samples will be analyzed using the procedures outlined in EPA Method TO-2(2) for thermal desorption gas chromatography (GC), using electron capture (ECD) and flame ionization detectors (FID). The asbestos filters will be analyzed using Phase Contrast Microscopy (PCM) according to federal and Washington State Occupational Safety and Health standards for asbestos monitoring. The lead technician will document these standards, and compliance with them, in the laboratory notebook.

Any Tenax trial samples will be collected following the same procedure as CMS and will be analyzed via thermal desorption and GC using ECD and FID according to EPA Method TO-1(2). The polished canister trial samples will be analyzed using GC/ECD and GC/FID according to EPA Method TO-14(5)(6).

ADDITIONAL QUALITY CONTROL PROCEDURES

Before air quality samples are collected, a quality control blank will be collected for each type of sample collected by each instrument (as called for in the RI/FS workplan). This blank sample will serve as an instrument and methods detection limit and contaminant check. Results of blank sampling will be presented in the final report.

All laboratory analysis equipment will meet PNL standards for calibration and quality control purposes. The lead technician will have the responsibility

of documenting in the laboratory notebook these PNL standards and each analysis laboratory's compliance with these standards.

The lead technician will assume responsibility for the safe keeping of each sample. The appropriate chain of custody forms for air quality samples (PNL-MA-567 Procedure AD-2)) will be used to track the location, condition, and custodians for each sample throughout the preparation, sampling, and laboratory analysis phases of the task. Only individuals designated by the task leader will be allowed to assume custody of a sample. Chain of custody forms will be kept in a secure location in the project laboratory, the location of the forms will be clearly denoted in the laboratory notebook.

REPORT FINDINGS

Records of field activities will be kept in a field logbook. This logbook will be maintained by the lead technician and inspected by the task leader prior to, and at the completion of each series of sampling events. The inspection will be documented in the logbook. The lead technician will also keep a laboratory notebook to record information on the status of chain of custody forms, denote formal calibration and analysis procedures, and to store laboratory analysis results and observations. The task leader will inspect and sign this notebook on a quarterly basis.

After each sampling event, and within two weeks of the receipt of all laboratory analysis results, a brief letter report to project management will be issued documenting preliminary air quality findings. WHO project management will be immediately informed by telephone of any unusual findings uncovered in our assessment of the laboratory analyses.

At the conclusion of the project, a summary report will document the methods used to collect the air samples, identify the trials for the alternative methods, include tabular listings of data and interpretive comments, and make recommendations for future sampling programs. Contaminants will be reported

as a total mass (micrograms, micromoles) for a stated air volume per sample.

REFERENCES

(1) Marquardt, G. D. 1987. "Toxic Air Quality Investigation at a Hazardous Waste Site." In *Proceedings of Superfund '87, 8th National Conference*. 284-295, Washington, D.C.

(2) U.S. EPA. 1983. *Quality Assurance Handbook for Air Pollution Measurement Systems*. Volume II of *Ambient Specific Methods*. EPA/600/4-77-027a, Section 2, U.S. Environmental Protection Agency, Washington, D.C.

(3) U.S. EPA. 1984. *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air*. EPA/600/4-84-041, U.S. Environmental Protection Agency, Washington, D.C.

(4) U.S. EPA. 1986. *Supplement to EPA/600/4-84-041: Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air*. EPA/600/4-87-006, U.S. Environmental Protection Agency, Washington, D.C.

(5) U.S. EPA. 1988. *Compendium Method TO-14, The Determination of Volatile Organic Compounds (VOCs) in Ambient Air Using SUMMA Passivated Canister Sampling and Gas Chromatographic Analysis*. Quality Assurance Division, U.S. EPA, Research Triangle Park, North Carolina.

(6) Oliver, K. D., et al. 1986. *Sample Integrity of Trace Level Volatile Organic Compounds in Ambient Air Stored in SUMMA(R) Polished Canisters. Atmos. Environ.* 20:1403-1411.

(7) Alatkis, A., et al. 1973. *Concentration and Analysis of Trace Volatile Organics in Gases and Biological Fluids with New Solid Adsorbent. Chromatographia* 6(2):67-70.

(8) Glantz, C. S., and M. M. Islam. 1988. The Data Collection Component of the Hanford Meteorology Monitoring Program. PNL-6684, Pacific Northwest Laboratory, Richland, Washington.

Date: 1-3-89
OU #: 1100-EM-1
ED 9304
Task Order or Work Order #

To: Proje[illegible] File

From: M. [illegible] Adams

Subject: Approval of Procedures for Field Services Procured by Task/Work Order

The procedures for field services provided by task/work orders are approved by Westinghouse Hanford Company. Specific information regarding the service is indicated below:

1. Work Title Including Operable Unit Designation
   Geophysical Site Surveys, 1100-EM-1 Operable Unit

2. Type of Order:
   ____ Task Order Task # ____
   X Work Order Order # ED 9304
   X Statement of Work (check is present; do not proceed if absent).

3. Performing Organization:

   ____ Golder X PNL ____ Kaiser ____ Other ____

4. Performing Personnel and Title:

   G. A. Sandness, Scientist

5. Approval Checklist: (Attach list of each document supplied, date of document, ID # if available, and revision indication, if available).
   Document supplied is "Procedures for Geophysical Site Surveys," 1100-EM-1 Operable Unit, dated December 19, 1988.
   X Equipment operating manuals, instructions or procedures (Manuals referenced in procedure, kept with equipment operator).
   X Calibration instructions or procedures
   X Calibration record during operation
   X Equipment maintenance instructions or procedures
   X Equipment maintenance record during operation
   N/A Purchase records of parts or tools used specifically for operation specified in Statement of Work attached to Work or Task Order
   X Safety precautions peculiar to equipment documented (Site safety precautions covered in Health and Safety Plan)
   X Logbooks and/or notebooks for field data collection
   X Radiation monitoring activities completed at all sites.

6. Approvals:

RI Project Coordinator (WHC)	11/03/88 Date
Field Team Leader (WHC) FST II	1/9/88 Date
Technical Lead (WHC)	1/3/89 Date
QA Officer (If Impact Level I, II or III)	1-10-89 Date