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User's Guide to the Contract Laboratory Program

FOREWORD

This document has been prepared by the CLP Sample Management Office specifically for the guidance and direction of program clients.

The organic and inorganic analytical program descriptions herein outline the requirements and analytical procedures of the new CLP protocols developed from technical caucus recommendations. These protocols are being implemented into CLP analysis contracts in 1984. Other analytical programs, procedures and documentation described herein reflect the status of the program as of July 1984.

Updated User's Guide sections containing changes to CLP analytical programs, procedures and documentation will be provided to clients periodically, in the form of User's Guide amendments. For further information on the CLP or to obtain additional copies of the User's Guide, contact the Sample Management Office at 703/557-2490 or FTS 557-2490.

Second Printing
Issued: October 1984

CLP USER'S GUIDE

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CLP USER'S GUIDE
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CHAPTER I

BACKGROUND AND INTRODUCTION

B. CLP Structure

The CLP effort involves numerous Agency, contractor and other groups throughout the country. These organizations are identified and their role in the program described in the following sections. The following table, Interrelationships of Program Principals, graphically illustrates the interaction of these groups in the CLP operation. In addition, Appendix A is a program directory containing addresses and telephone numbers of key program personnel.

1. Program Management

a. National Program Office (NPO)

The CLP is directed by the National Program Office, in EPA Headquarter's Support Services Branch (SSB), Hazardous Response Support Division (HRSD), Office of Emergency and Remedial Response (OERR), in Washington, DC. The NPO is comprised of the National Program Manager, Organic and Inorganic Technical Officers, and a Quality Assurance Officer, who also provides QA support to the OERR.

NPO responsibilities include: overall management of the CLP in terms of program objectives, expansion and interface with clients and other groups; policy and budget formation and implementation; administration of analytical and support contracts; development and technical review of analytical protocols; review of analytical special services subcontracts and CLP-generated laboratory data; development of CLP analytical and support services contracts; monitoring and formal evaluation of analytical and support contractors; and, direction of CLP quality assurance (QA) in coordination with overall OERR QA activities.

CHAPTER I
BACKGROUND AND INTRODUCTION

The purpose of this chapter is to present the basic Contract Laboratory Program (CLP) objective and orientation, and to familiarize the reader with program structure. This background information is provided to facilitate better understanding and more efficient utilization of program services.

A. CLP Objective and Orientation

The CLP supports the Agency's Superfund effort under the 1980 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) by providing a range of state-of-the-art chemical analysis services of known quality on a high-volume, cost-effective basis. The central and overriding assumption governing the structure and function of the CLP is the basic requirement to provide legally-defensible analytical results for use in supporting Agency enforcement actions. Therefore, a high level of quality assurance and documentation has been incorporated in all aspects of program activities.

The ongoing CLP objective is to develop, manage and improve its analytical programs in support of all Superfund requirements. This objective is accomplished by continuously increasing analytical capacity and adjusting analytical program requirements and related support services to better meet Agency needs.

The CLP supplies analytical services in direct response to requests from the EPA Regions, the primary users of the program. The CLP is a service program designed to provide a wide range of enforcement-quality analytical services in response to the changing needs and requirements of the user community. This client orientation is a key factor in the design and application of all CLP services and responses.

The National Program Manager (NPM), in addition to directing program staff, is responsible for the formulation of program policies and direction; communicates with the Regional and Agency communities on a continuing basis, keeping all parties apprised of program activities and receiving input on program effectiveness; administers several program support contracts; and handles financial and contractual aspects of the program.

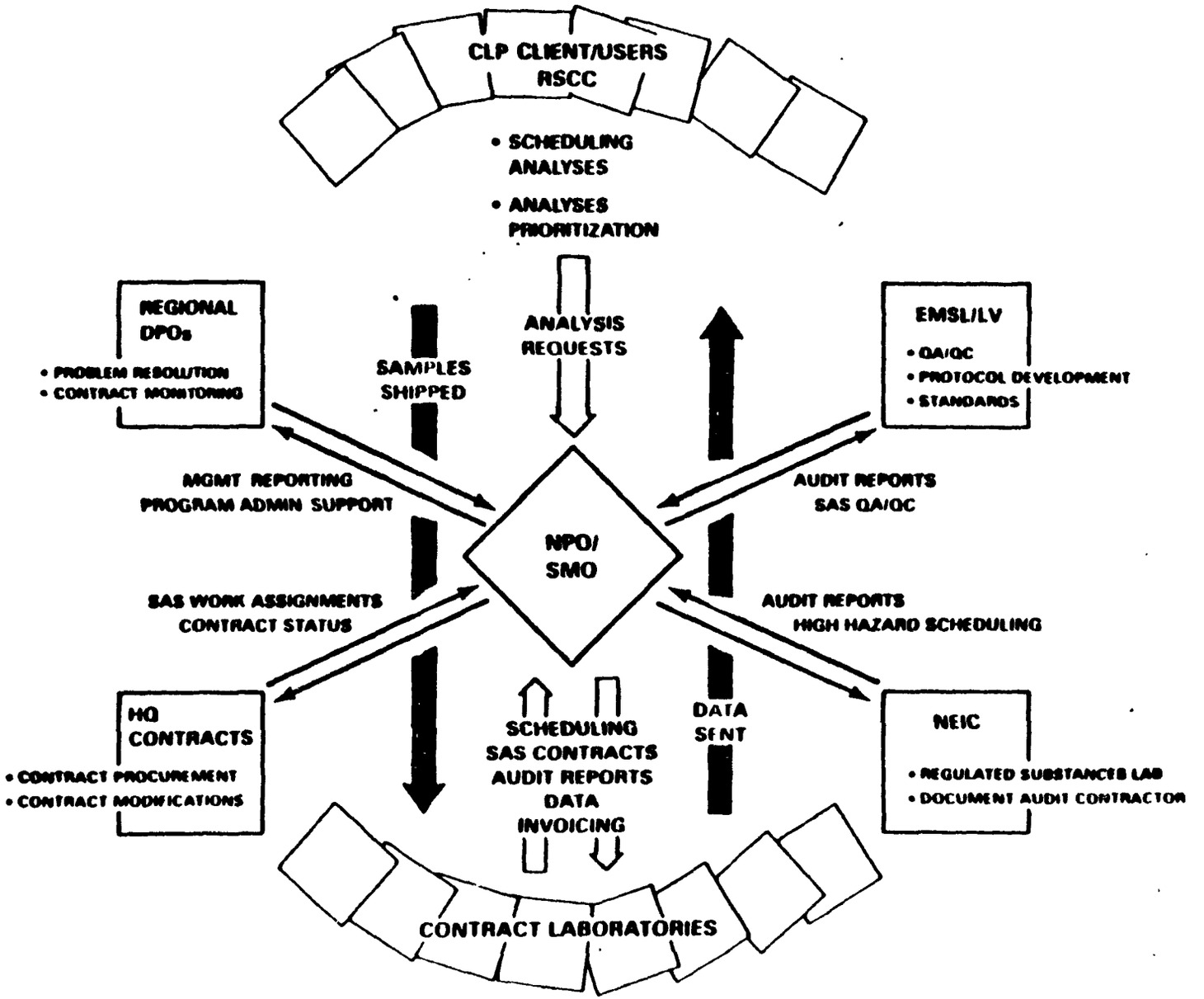
The Organics and Inorganics Technical Officers serve as Project Officers (POs) on laboratory analytical contracts. The POs are responsible for technical program decisions, contract administration and contractor performance evaluation. The POs work closely with the Regional Deputy Project Officers (DPOs) and laboratories on a daily basis in resolving technical issues. The POs direct the ongoing effort to improve contract language and analytical methodologies, and conduct technical caucuses for purposes of CLP data and protocol review.

The Quality Assurance (QA) Officer coordinates all aspects of program application of QA procedures. The QA Officer works closely with EPA Headquarters Office of Research and Development (ORD) and the ORD's Environmental Monitoring Systems Laboratory in Las Vegas (EMSL/LV) which provides QA support to the CLP. The QA Officer also coordinates with the POs and EMSL/LV in refining and updating analytical method QA procedures.

b. Sample Management Office (SMO)

The contractor-operated Sample Management Office functions in direct support of the NPO, providing management, operations and administrative support to the CLP. The primary objective of the SMO operation is to facilitate optimal use of program analytical resources. SMO activities fall into the following areas: (1) sample

INTERRELATIONSHIP OF PROGRAM PRINCIPALS



d. National Enforcement Investigations Center (NEIC)

The NEIC advises the NPO in defining and applying program enforcement requirements. NEIC-developed sample custody procedures, chain-of-custody records, sample tags and custody seals are utilized in the CLP to maintain the validity of sample analyses for supporting Agency enforcement actions. NEIC routinely performs evidence audits of CLP laboratories and generates sample profiles used in Agency enforcement litigation. A description of NEIC's evidence audit process appears in Chapter IV, Section C.

2. Regional Program Support

The Region plays an integral role in program activities, both as the primary CLP user and as a key part of analytical program management. The decentralization of program responsibilities to the Regions has evolved with the expansion of the program, as a means to more effectively direct program operations nationwide. Extended Regional participation in the program has and will continue to increase the program's responsiveness to Superfund requirements.

a. Contract Deputy Project Officers

In January, 1984, Regional Administrators appointed a CLP technical Deputy Project Officer (DPO) for each Regional office. Under direction of the NPO, the Regional DPO assumes a portion of the responsibility for monitoring the laboratory contractors physically located in the Region. The DPO works closely with the NPO Project Officer in responding to identified problems in laboratory operations and performs laboratory site evaluations. Other specific DPO responsibilities will be defined as the system evolves.

scheduling and tracking; (2) Special Analytical Services (SAS) subcontracting; (3) laboratory invoice processing; (4) maintenance of CLP records and management reporting; and (5) NPO management and administrative support.

SMO routinely receives analytical requests from the Regions, coordinates and schedules sample analyses, tracks sample shipment and analyses, receives and checks data for completeness, and maintains a repository of sampling records and program data. In response to client requests for non-routine types of analyses, SMO subcontracts for SAS, performing scheduling and tracking for SAS efforts as outlined above. SMO maintains a comprehensive data base of CLP services, performance and utilization, and generates a variety of management and user reports.

c. USEPA Office of Research and Development (ORD), Environmental Monitoring Systems Laboratory/Las Vegas (EMSL/LV)

Program quality assurance support is provided by EPA ORD through EMSL/LV. EMSL/LV functions as the quality assurance arm of the CLP, providing advice and support to the NPO. Specifically, EMSL/LV assists in performing pre-award and post-award facilities audits of laboratories; prepares performance evaluation (PE) samples for pre-award and post-award evaluations of laboratory performance; evaluates pre-award and post-award PE sample data; and performs QA audits on CLP-generated data. Additionally, EMSL/LV is responsible for: providing analytical standards to program laboratories through the contractor-operated QA Materials Bank; operating the program's QA Database, performing program and laboratory trend analyses used in developing and updating contract QC criteria; directing operation of the Superfund Quality Assurance Support Laboratory (QASL) at the University of Nevada, Las Vegas; and, assisting in evaluation of CLP analytical methods and protocols.

d. Regional/Laboratory Communication System

In January 1983, the NPO established a system of direct communication between the Regions and contract laboratories, as a routine method for Regional data review staff to obtain answers to technical questions concerning program data in the timeliest and most direct manner possible. In this system, designated Regional communication contacts call designated laboratory communication contacts as needed to resolve technical data questions. This communication link also benefits the laboratory by providing direct feedback on its data product.

3. Clients/Users

a. EPA Regions

The ten EPA Regions are the primary clients of the CLP. As described in the previous section, each Region has established a Regional Sample Control Center (RSCC), which schedules all CLP analyses requests for the Region, coordinating Regional sampling to balance with allocated numbers of CLP sample analyses available each month, and prioritizing the Region's analytical workload when conflicts occur. RSCC personnel coordinate closely with SMO throughout Regional sampling events, assisting in tracking sample shipments to the laboratory and resolving any problems which arise. In this role, the RSCC also processes analytical requests from state or other users that are located in the Region's geographical area.

b. States

Under RCRA Section 3012, states undertaking initial site investigations and entering into cooperative agreements with the government for cleanup of local waste sites, can utilize CLP services. States must access CLP analytical services through the RSCC and data packages are distributed to states through the RSCC.

b. Regional Sample Control Centers (RSCC)

In January, 1984, each Region established a Regional Sample Control Center to centralize ordering of CLP sample analyses within the Region. The RSCC is comprised of three or more individuals designated as CLP Authorized Requestors, with one individual named as the Primary Authorized Requestor (AR) directing the RSCC. The RSCC is responsible for coordinating the level of Regional sampling activities to correspond with monthly allocations of CLP analyses. The Primary AR makes final determinations regarding Regional analysis priorities when conflicts occur. RSCC ARs routinely place all Regional requests for CLP analyses, coordinate with SMO during sampling and sample shipment, and resolve any problems which arise concerning the samples. The RSCC serves as the central point of contact for questions concerning Regional sampling efforts.

c. Technical Caucuses

In September 1982, the NPO implemented the concept of Technical Caucus sessions as a means to consistently utilize the scope of available technical resources in updating analytical program methodologies and data reporting requirements. Technical caucuses are held on a regular basis (usually quarterly) and involve participation of the following groups: EPA Regions, EMSL/LV, EMSL/Cincinnati, NEIC, contract laboratories, program support contractors, SMO, NPO and others, as appropriate. These caucuses have been instrumental in improving CLP protocols and orienting deliverables directly to user needs. Revised organics and inorganics protocols developed from caucus recommendations, as presented in Chapter II, Description of Analytical Services, are being incorporated into program analytical contracts in 1984.

concentration liquid and solid samples for subsequent organic and inorganic analysis by CLP or Regional laboratories. A description of the HH sample preparation RAS program appears in Chapter II.

c. Sample Bottle Repository

The Superfund Sample Bottle Repository program was established by the NPO in May 1982, to provide a common source of clean, QC-tested sampling containers for samples processed through the CLP. The objective of the program is to eliminate the potential of bottle contamination that would affect the validity of sample data. The contractor-operated repository serves as a central source for several types of pre-cleaned sampling bottles and is routinely utilized by Regional and contract personnel performing Superfund sampling activities. Repository services are detailed in Chapter IV.

c. Non-Superfund Clients

Program services are available to support non-Superfund clients on a "non-interfering" basis. Non-Superfund analyses are provided by the CLP through use of an accounting system whereby analytical costs are charged back to the requestor. Non-Superfund clients currently include other government agencies and other EPA programs, such as Acid Rain, Solid Waste and the National Dioxin Study.

4. Analytical and Support Contractors

a. Contract Analytical Laboratories

The CLP's analysis contractors come from the nationwide community of chemical analytical laboratory facilities. To become part of the CLP, laboratories must meet stringent requirements and standards for equipment, personnel, laboratory practices, analytical operations, and quality control operations. Firm, fixed-price contracts are awarded competitively to the lowest responsive, responsible bidders through the government's Invitation for Bid (IFB) process. Low-priced bidders must successfully analyze performance samples and pass a pre-award laboratory audit before a contract is awarded. After contract award, laboratories are closely monitored to assure compliance with the terms and conditions of the contract. Details of pre-award and post-award evaluations are addressed in Chapter V.

b. Hazardous Substances Laboratories (HSL)

High hazard (HH) samples are processed by the program's contractor-operated Hazardous Substances Laboratories at NEIC and EMSL/LV. Under direction of the NPO, the HSLs prepare and extract high

CHAPTER II

DESCRIPTION OF ANALYTICAL SERVICES

The two tables which follow outline the menu of services available under the CLP's RAS and SAS programs. The remainder of Chapter II describes each analytical program in terms of:

- o Sample matrices, concentration levels and volumes required.
- o Compounds identified and quantified.
- o Description of analytical protocols and detection limits.
- o Contract quality control requirements.
- o Contract deliverable requirements.

The organics and inorganics RAS sections present the caucus-revised protocols being implemented in 1984.

The client should carefuly consider the provisions of each CLP analytical program during the planning stages of a sampling event to determine the applicability of the analysis to user needs.

In addition to the material included in this Guide, Regional DPOs maintain a Master Copy notebook of each Statement of Work under which CLP RAS laboratory contractors operate. Users are instructed to consult the Region's Master Copy SOWs for detailed analytical information.

CHAPTER II
DESCRIPTION OF ANALYTICAL SERVICES

The Contract Laboratory Program provides standardized and specialized analytical services to support a variety of Superfund sampling activities, from those associated with the smallest preliminary site investigation to those of large-scale, complex remedial, monitoring and enforcement actions. In response to the increasing analytical demands of its client base, the CLP has continually expanded its analytical capacity for standardized analyses through frequent IFB solicitations. Currently the CLP is able to provide over 6,000 sample analyses per month through its routine and specialized analytical services programs. The CLP will continue to adjust analytical capabilities and capacity in response to Regional client needs.

The CLP operates five separate analytical programs:

- Organic Routine Analytical Services (RAS),
- Inorganic RAS,
- Dioxin RAS,
- High Hazard (HH) Sample Preparation RAS, and
- Special Analytical Services (SAS).

Organic, inorganic and dioxin RAS program analyses are performed by a network of laboratories operating under firm, fixed-price contracts with the EPA. The HH sample preparation RAS program provides preparation and extraction of high concentration samples prior to organic and inorganic compound analyses through CLP or Regional laboratories. HH preparation services are provided through the program's contractor-operated Hazardous Substances Laboratories at EPA's NEIC and EMSL/LV facilities. The SAS program provides unique, non-standardized analytical services for organic and inorganic compounds in a variety of matrices, to meet specific analytical requirements which do not fall under RAS programs. SAS services are provided through individual fixed-price subcontracts awarded to qualified laboratories.

Table 3

MENU OF SPECIAL ANALYTICAL SERVICES

RAS Plus SAS Category	All SAS Category
Examples of Services Available:	Examples of Services Available:
o Fast Turnaround Analysis by RAS Organic, Inorganic or Dioxin IFB Protocol.	o Organic Analysis Per Non-RAS Matrices and Protocols.
o RAS Organic Analysis with Additions to IFB Protocols.	o Inorganic Analysis Per Non-RAS Matrices and Protocols.
o RAS Inorganic Analysis with Additions to IFB Protocol.	o Dioxin Analysis Per Non-RAS Matrices and Protocols.
o RAS Dioxin Analysis with Additions to IFB Protocol.	o Organic and Inorganic High Hazard Sample Analysis.
	o Special Topics Analysis (As Requested).

NOTE: The client requestor is responsible for designating IFB method modification in RAS Plus SAS work and for supplying suitable analytical protocols for All SAS work. Additionally, the client must provide QA/QC procedures and criteria, and must specify analysis and data reporting delivery schedules. This information must accompany the client's request for SAS services.

Table 2

MENU OF ROUTINE ANALYTICAL SERVICES

Category	RAS Organic Analysis	RAS Inorganic Analysis	RAS Dioxin Analysis	RAS HH Sample Preparation
Sample Matrices	Low & Medium Concentration Water & Soil/Sediment Samples	Low & Medium Concentration Water & Soil/Sediment Samples	Low & Medium Concentration Soil/Sediment Samples	High Concentration Liquid & Solid Samples
Compounds Identified & Quantified	HSL Compounds & Library Matches of 30 Highest Compounds (in the ppb Range)	Metals & Cyanide (in the ppb Range)	2,3,7,8-TCDD (in the ppb Range)	Organic & Inorganic Waste Characterization Tests, Upon Request
Deliverables	Extraction in 5 Days VOA Analysis in 7 Days Data Delivery in 30 Days	Data Delivery in 30 Days	Data Delivery in 15 or 30 Days Automatic Rerun Data 10 Days Following Initial Data Due Date	Prep Procedure & Documentation Complete & Extracts Ready for Shipment to Analysis Lab in 21 Days
Analytical Procedures	GC/MS Analysis Following Sample Preparation/Extraction	Flame/Flameless & Cold Vapor AA, ICP & Colorimetric Analysis	GC/MS Analysis by FSCC Following Solvent Extraction/Clean-Up	Screen & Dilution As Appropriate to Prepare Sample Extracts For Target Analysis
QA/QC	Matrix Spikes & Duplicate Per 20 Samples or Per Case For Each Matrix & Concentration On Per-Fraction Basis	Duplicate Matrix Spikes Per 20 Samples Or Per Case*	Matrix Spike & Duplicate Per Batch of 20 Samples or Less	Triplicate Matrix Spikes Per 20 Samples or Per Case

*A Case designates a group of samples collected at one site or geographical location during a specific finite period of time.

or four 1-liter amber glass bottles, and two 40-ml glass vials. For RAS organics analysis of a water sample estimated as medium level, a four liter volume is required for extractables and 80 ml for volatiles. The sample should be collected in four 1-liter amber glass bottles or four 32-ounce glass jars, and two 40-ml glass vials. For RAS analysis of a soil/sediment sample estimated as low or medium level, a six ounce volume is required. The sample should be collected in one 8-ounce glass jar for extractables and two 120-ml glass vials for volatiles.

Each sample estimated as medium level (both water and soil) must be enclosed and sealed in a metal paint can for shipment. If it is not certain whether a sample should be categorized as low or medium level, volume should be collected as specified for low level samples, however shipping procedures must be followed as designated for medium level samples. Sample portions for volatile analysis (water and soil) should be collected so that the containers are completely filled, leaving no headspace.

Water samples for duplicate analyses must be collected at double the volume specified for extractables, and triple the volume specified for volatiles. Additionally, for water samples one field blank should be supplied per Case, and one volatile trip blank should be supplied per shipment. No additional volume is required for soil sample duplicate analyses, and no blanks are currently required for soil samples. Soil blanks will be used in the future and will be supplied to Regions by EMSL/LV.

If sufficient sample volume is not provided, complete analysis may not be possible. If this occurs, SMO will contact the RSCC to determine appropriate adjustments in analysis.

Required sample volumes and container types for RAS organic analysis of water and soil samples are illustrated in Appendix C. Pre-cleaned sample bottles are available through the Sample Bottle Repository, as detailed in Chapter IV.

A. Organic Routine Analytical Services (RAS)

1. Sample Matrices, Concentration Levels and Volumes Required

The organic RAS contract methods apply to analysis of water (aqueous) and soil/sediment samples. Samples for analysis should be single-phase, homogeneous samples of a similar matrix. Sample matrices other than water, sediment or soil are processed through the SAS program.

Organic RAS contract methods determine concentrations of organic compounds ranging from low or environmental levels of concentration to medium levels, where a compound may comprise as much as 15 percent of the total sample, at the lowest appropriate detection limits. Low level samples are considered to be those collected off-site, around the perimeter of a waste site, or in areas where hazards are thought to be significantly reduced by normal environmental processes. Medium level samples are most often those collected on-site, in areas of moderate dilution by normal environmental processes. Low and medium level designations are made in the field by the sampler to determine packaging and shipment procedures. Low and medium level analysis designations are performed within the laboratory to determine the appropriate analytical protocol to be used.

Samples collected on-site where high levels of contamination are suspected (i.e., drum samples) are routinely shipped to a Hazardous Substances Laboratory for sample preparation prior to analysis. High hazard sample preparation is discussed in Section D of this chapter. Alternatively, HH sample preparation and analysis can be obtained through SAS as described in Section E.

The sample volume and container types required for RAS organic analysis vary according to the matrix and estimated concentration level of the sample. For RAS organic analysis of a water sample estimated as low level, one gallon sample volume is required for extractables (B/N/A), and 80 ml for volatiles (VOA). The sample should be collected in two 80-ounce

2. Compounds Identified and Quantified

The organic RAS program provides identification and quantification of EPA Hazardous Substances List (HSList) organic compounds in water and soil/sediment samples. These compounds, which include priority pollutant compounds and other organics of interest, are identified on the organic data reporting sheets in Appendix B.

In addition, the laboratory is required to execute a maximum of 30 EPA/NIH Mass Spectral Library searches for compounds not identified on the HSL. The 10 peaks of greatest apparent concentration in the volatile fraction and the 20 peaks in the base/neutral/acid fraction are tentatively identified and the concentration estimated, following a visual comparison of sample spectra with the nearest library matches. The tentative identification of non-HSL organic compounds provides information on potential organic contaminants outside of the analytical parameters of the RAS program.

3. Contract Deliverable Requirements

The organic RAS program specifies contractually-required deliverables for sample extraction, volatile analysis and data reporting. These requirements include: completion of sample extraction within five days of sample receipt by the laboratory, completion of volatile analysis within seven days of sample receipt, and completion of extractable analysis and reporting of data within 30 days of sample receipt. Laboratories are subject to financial penalties for late delivery in meeting these deadlines and incentives for early delivery of the final data package. Illegible data reports are considered unacceptable, and the laboratory is required to resubmit readable versions of any illegible pages.

The organic RAS data package supports independent sample data review by the client user. Through review of data package components, the client can determine the quality of the analytical data.

Each organic RAS data package includes the following components:

- o Narrative report, describing analytical problems encountered and internal decision tree processes applied.
- o Copies of sample Traffic Reports.
- o Quality control summary, containing surrogate, reagent blank and duplicate matrix spike analyses recoveries and instrument tuning and performance information.
- o Sample data, including tabulated results of the organic HSL compounds identified and quantified, and the tentative identification and estimated concentration of up to 30 non-HSL organic compounds in greatest apparent concentration, reported in ug/l or mg/kg.
- o Raw sample analytical data, including sample chromatograms, spectra, quantitation reports, and calculations.
- o Standards data package (for each Case of samples), including chromatograms, spectra and data system printouts.
- o QC data package, documenting instrument tuning and analytical QC criteria.

The organic RAS deliverables index and copies of organic data reporting sheets are contained in Appendix B.

4. Analytical Protocols

The standardized organic analytical methods are based on Federal Register (FR) Methods 625, 608, and 624 modified for CLP use in the analysis of both water and soil samples. Analysis for the organic HSL compounds includes a GC and GC/MS analysis to achieve the lowest appropriate detection limits for each sample fraction.

a. Water Method

Water samples for full organic analysis (base/neutral/acid, volatile and pesticide/PCB compounds) are first prepared and/or solvent extracted, resulting in three individual sample fractions: extractable or semivolatile (B/N/A); volatile (VOA); and pesticide/PCB. Extracts are cleaned up when necessary, using optional column chromatography techniques.

The identification and quantification of the organic HSL compounds in water samples is performed by GC/MS for B/N/A and VOA fractions, and by GC/EC for the pesticide/PCB fractions.

In addition, the 20 highest non-HSL base/neutral/acid compound peaks and the 10 highest non-HSL volatile peaks are tentatively identified and their concentration estimated, using a forward search of the EPA/NIH Mass Spectral Library.

b. Soil Method

Soil samples for full organic analysis (base/neutral/acid, volatile and pesticide/PCB compounds) are prepared by sonification prior to solvent extraction. Extracts are cleaned up using optional column chromatography techniques when necessary.

The identification and quantification of the organic HSL compounds in soil samples is performed by GC/MS for B/N/A and VOA fractions, and by GC/EC for the pesticide/PCB fraction.

In addition, the 20 highest non-HSL base/neutral, acid peaks and the 10 highest non-HSL volatile peaks are tentatively identified and their concentration estimated, using a forward search of the EPA/NIH Mass Spectral Library.

c. Method Detection Limits

Low level analysis method detection limits (MDLs) for water samples are based on MDLs for each organic compound using FR Methods 624, 625, and 608, and are at the part-per-billion (ppb) level. Approximate achievable MDLs for low and medium level water and soil samples can be calculated based on the sample size and on concentration/dilution factors.

MDLs are provided for analytical guidance, as the limits are highly matrix dependent. Matrix interferences vary considerably depending on the nature and homogeneity of the sample, on the interferent contaminants which coextract from the sample, and on the sample volume taken for analysis. The list of contract-specified MDLs for low level water samples is included in Appendix B.

5. Contract Quality Control Requirements

The CLP quality control (QC) program for organic RAS laboratory analysis is structured to provide consistent results of known and documented quality. The program therefore places stringent quality control requirements on all laboratories performing sample analyses. Sample data packages contain documentation of a series of QC operations that allow an experienced chemist to determine the quality of the data and its applicability to each sampling effort. In addition, laboratory contracts contain provisions for sample re-analysis if and when specified QC criteria are not met by the contract laboratory. Each CLP laboratory is also encouraged to develop additional internal QA/QC procedures.

The minimum QC requirements of the organic RAS program consist of both an initial and ongoing demonstration of laboratory capability to generate acceptable precision and accuracy with the contract methods in the

analysis of water and soil samples. CLP contracts define extensive QC procedures that must be performed and documented, and criteria that must be met. These include, but are not limited to, the following:

- o GC/MS instrument tunes for both volatile and semi-volatile compound analyses.
- o Initial multi-level calibration for each HSL compound.
- o Continuing calibration for each HSL compound.
- o Addition of surrogate compounds to each sample and blank for determining percent recovery information.
- o Duplicate matrix spike analyses.
- o Reagent blank analyses.

Certain of the above-listed QC procedures demonstrate that the instrument is operating within contract specifications. These include: a demonstration that the two tuning compounds (DFTPP for extractables and BFB for volatiles) meet the defined ion abundance criteria; determination of an average response factor ($\overline{RF}$) based on a calibration using several concentrations of each HSL compound that must meet a defined relative standard deviation (RSD) and minimum RF; and, a continuing calibration at a single concentration for each HSL compound for which specified compounds are flagged as controls which must meet defined percent difference (%D) from the initial RF or a new initial calibration must be performed.

Other QC procedures are required to demonstrate the quality of the analytical data generated. These include: addition of surrogate spikes to all samples and blanks to monitor sample preparation and analysis and to provide percent recovery information for each sample, so that the suitability of the method for each sample (regardless of matrix) may be established; analysis of duplicate matrix spiked samples to display the

precision of the method for the particular Case and also to provide percent recovery information for defined HSL compounds (specified matrix spikes) as for surrogates; analysis of reagent blanks for each Case or each set of 20 samples (whichever is less) and for each matrix within a Case, to assure that laboratory contaminants are not reflected in data results.

It is the responsibility of the contractor laboratory to document, in each data package submitted, that both initial and ongoing instrument and analytical QC criteria have been met. The laboratory must demonstrate that instrument tuning and calibration criteria have been met, that interferences from the analytical system are under control, and that surrogate spike, matrix spike and matrix spike duplicate recoveries falling outside contract acceptance windows are attributable to sample matrix interferences and not to laboratory analytical errors. Any samples analyzed when contract QC criteria have not been met are re-analyzed by the laboratory when sufficient sample volume is available.

B. Inorganic Routine Analytical Services (RAS)

1. Sample Matrices, Concentration Levels, Volumes Required and Preservation Techniques

The inorganic RAS contract methods apply to analysis of water and soil/sediment samples. Samples for analysis should be single-phase, homogeneous samples of a similar matrix. Sample matrices other than water, sediment or soil are processed through the SAS program.

Inorganic RAS contract methods determine concentrations of inorganic priority pollutant (PP) constituents ranging from low or background levels of concentration to medium levels, where a compound may comprise up to 15 percent of the total sample. Low level samples are generally those collected off-site, around the perimeters of a waste site, or in areas where hazards are thought to be significantly reduced by normal environmental processes. Low level samples are estimated to contain less than 10 ppm of the inorganic PP contaminants. Medium level samples are most often those collected on-site, in areas of moderate dilution by normal environmental processes. Medium level samples are estimated to contain concentrations of inorganic PP contaminants up to 15 percent. Low and medium level designations are made for sample collection volume and shipment purposes, and for determination of appropriate analytical methods and QA/QC requirements. Samples estimated to contain concentrations of inorganic contaminants higher than 15 percent of the sample must be sent to a Hazardous Substances Laboratory for sample preparation prior to analysis. High hazard sample preparation is discussed in section D of this chapter.

The sample volume and container types required for inorganic analysis vary according to the matrix and estimated concentration level of the sample. For RAS inorganic analysis of a water sample estimated as low level, one

liter volume is required for metals analysis and one liter volume for cyanide analysis. The sample should be collected in two 1-liter polyethylene bottles. For RAS inorganic analysis of a water sample estimated as medium level, sixteen ounce volume is required for metals and sixteen ounce volume for cyanide. The sample should be collected in two 16-ounce glass jars. For RAS inorganic analysis of a soil sample estimated as low or medium level, six ounce sample volume is required for both metals and cyanide analyses. The sample should be collected in one 8-ounce glass jar.

For the inorganics RAS program only, it is recommended that a Case of samples be collected over no more than a three-day period and samples shipped collectively when the Case is completed.

When collecting low level water samples, a sample aliquot for cyanide analysis must be collected separately, and different preservation techniques applied to the metals and cyanide portions, as follows. For the metals analysis aliquot, the sample should be filtered, then acidified to pH ≤ 2 with HNO_3. (If filtration is not possible, the sample should not be acidified.) For the cyanide aliquot, the preservation techniques specified in Methods for Chemical Analysis of Water and Waste should be applied. (Consult Appendix E for complete reference.) No preservation is required for medium level water samples or low or medium level soil samples.

Each medium level sample (water and soil) must be enclosed and sealed in a metal paint can for shipment. If it is not certain whether a sample should be categorized as low or medium concentration, volume should be collected and the sample preserved as specified for low level samples, however shipping procedures must be followed as designated for medium level samples. For water samples, one field blank should be supplied for each Case. No blanks are currently required for soil samples. No additional volume is required for duplicate analyses of either water or soil samples.

If sufficient sample volume is not provided, analysis of all required parameters and/or complete QA/QC determination may not be possible. If this occurs, SMO will contact the RSCC to determine appropriate adjustments in analysis.

Required sample volume and container types for inorganic RAS analysis of water and soil samples are illustrated in Appendix C. Pre-cleaned sample bottles are available through the Sample Bottle Repository, as detailed in Chapter IV.

2. Constituents Identified and Quantified

The inorganic RAS program provides identification and quantification of metals and cyanide in water and soil/sediment samples. These compounds are listed on the inorganic data reporting form included in Appendix B.

3. Contract Deliverable Requirements

The inorganic RAS program specifies contractually-required deliverables for completion of metals and cyanide analysis and submission of the final data package within 30 days of sample receipt at the laboratory. Laboratories are subject to financial penalties for late delivery and incentives for early delivery of the final data package. Illegible data reports are considered unacceptable and the laboratory is required to resubmit readable versions of any illegible pages.

The inorganic RAS data package supports independent sample data review by the client user. Through review of data package components, the client can determine the quality of the analytical data.

Each inorganic RAS data package includes the following components:

- Cover sheet, listing the samples included in the report and narrative comments describing problems encountered in analysis.
- Tabulated results of inorganic compounds identified and quantified, reported in ug/l or mg/kg.

- o Analytical results for QC spikes, duplicates, standards, preparation blanks calibration verification and interference checks.
- o Tabulation of instrument detection limits determined in pure water solutions.
- o Raw data system printouts, identifying calibration standards, calibration blanks, preparation blanks, samples and any atypical dilution, duplicates, spikes, interference checks and any instrument adjustments or apparent anomalies on the measurement record.

A summary of RAS inorganic contract deliverables and copies of data reporting forms are contained in Appendix B.

4. Analytical Protocols

The standardized inorganic analytical methods are based on Federal Register (FR) methods, EPA Methods for Chemical Analysis of Water and Wastes (MCAWW), and Test Methods for Evaluating Solid Waste (SW-846), for the analysis of water and soil samples. Analysis for specified metals and cyanide is performed by flame, furnace and cold vapor atomic absorption (AA), colorimetric, distillation, and inductively coupled argon plasma (ICP) methods.

a. Water Method

Water samples for metals analysis are prepared, acid digested and the digestate filtered to remove insoluble materials prior to analysis. Samples are analyzed by AA or ICP methods, and dilutions are performed where any analyte concentration exceeds the calibrated range.

For water samples, a quantitative determination for cyanide is made by midi-distillation and automated colorimetric analysis by MCAWW Method 335.2.

b. Soil/Sediment Method

Soil samples for metals analysis are prepared and acid digested and the digestate filtered to remove insoluble materials prior to analysis. Samples are analyzed by AA or ICP methods, and dilutions are performed where any analyte concentration exceeds the calibrated range.

For soil samples, a quantitative determination for cyanide is made by midi-distillation and automated colorimetric analysis by MCAWW Method 335.2.

c. Detection Limits

The detection limits listed on the inorganic data sheets (see Appendix B) are based on analysis of analytes in pure water. Detection limits for the sample analyses will be higher, depending on the sample matrix.

Detection limits for low level water samples can be achieved in the part-per-billion (ppb) to low part-per-million (ppm) range; detection limits for medium water and soil samples can be achieved in the low-ppm to mid-ppm range. Detection limits are significantly affected by matrix interferences and other sample parameters that vary considerably depending on the nature and homogeneity of the sample, interferent contaminants that coextract from the sample, and analytical method. Lowest detection limits are achieved on low level water samples in the ppb range, where sample matrix interferences are minimal.

Exhibit C of the Statement of Work of inorganics IFB contracts contains minimum contract-required instrument detection levels (IDLs) that must be met by all laboratories for each of the metals and cyanide in pure water.

Extrapolations from the "pure water" IDLs must be made to estimate the detection limits for low and medium water and soil samples, since the detection levels achievable for these samples will be highly dependent on the inorganic species and matrix of each sample. Although data is reported down to the "pure water" IDL, results below the contract-required detection levels should be used with caution.

5. Contract Quality Control Requirements

The CLP quality control (QC) program for inorganic RAS laboratory analysis is structured to provide consistent results of known and documented quality. The program therefore places stringent quality control requirements on all laboratories performing sample analysis. Sample data packages contain documentation of a series of QC operations that allow an experienced chemist to determine the quality of the data and its applicability to each investigation. In addition, laboratory contracts contain provisions for sample re-analysis if and when specified QC criteria are not met by the contract laboratory. Each CLP laboratory is also encouraged to develop additional internal QA/QC procedures.

The minimum QC requirements of the inorganic RAS program consist of both an initial and ongoing demonstration of laboratory capability to generate acceptable precision and accuracy with the contract methods in the analysis of water and soil samples. CLP contracts define extensive QA

procedures that must be performed and documented, and criteria that must be met. These include, but are not limited to, the following:

- Initial calibration and calibration verification.
- Continuing calibration verification.
- ICP interference check sample analysis.
- Preparation blank analysis.
- Matrix spike analysis.
- Duplicate sample analysis.
- Laboratory control sample analysis.

The instrument QC operations include initial and continuing calibration checks, which are performed daily and/or every ten samples. These checks determine that the analytical system is meeting contract-required criteria.

Analytical QC operations include: ICP interference check sample, preparation blank, spiked sample, and duplicate sample analyses. ICP interference check sample analyses are performed at least twice per eight-hour shift, to verify interelement and background correction factors. Preparation blank analyses are performed for each batch of samples or for each set of 20 samples, to ascertain whether sample concentrations reflect contamination. Spiked sample analyses and duplicate sample analyses are performed for each matrix within a Case of samples or for each set of 20 samples of a similar matrix within a Case, to provide information concerning sample homogeneity, analytical precision and accuracy, the effect of the sample matrix on the analytical methodology, and to enable the Agency to evaluate the long-term precision of the method. The laboratory control sample is a standard carried through sample preparation and analysis procedures to document the performance of the entire sample process.

It is the responsibility of the contractor laboratory to document, in each data package submitted, that both initial and ongoing instrument and analytical QC criteria have been met. The laboratory must demonstrate that instrument calibration criteria have been met, that interferences from the analytical system are under control, and that spike recoveries falling outside contract acceptance windows are attributable to sample matrix interferences and not to laboratory analytical errors. Any samples analyzed when contract QC criteria have not been met are re-analyzed by the laboratory.

C. Dioxin Routine Analytical Services (RAS)

1. Sample Matrix and Volume Required

The dioxin RAS contract method applies to analysis of soil/sediment samples only. Samples for analysis should be single-phase, homogeneous soil/sediment samples of a similar matrix. Sample matrices other than soil or sediment are processed through the SAS program.

The dioxin RAS contract method determines the presence of the 2,3,7,8-tetrachlorodibenzo-p-dioxin isomer in soil/sediment samples. No concentration levels are designated in the dioxin program. All samples suspected to contain dioxin are considered hazardous and handled accordingly.

The sample volume required to perform RAS dioxin analysis is four ounces of soil or sediment. Each sample should be collected in one 4-ounce glass jar or one 8-ounce glass jar filled one-half full. The collection of more than four ounces of sample volume is strongly discouraged due to the hazardous nature and difficulty of disposing of dioxin-contaminated waste. Each dioxin sample must be enclosed and sealed in a metal paint can for shipment.

One or more field blanks should be included with each sample batch (24 or less samples). The sampler must designate one field blank for matrix spike analysis and one field sample for duplicate analysis. A rinsate sample, consisting of organic solvent used in rinsing sampling equipment, may be included in a batch. (Rinsates are the only liquid samples analyzed in the dioxin RAS program.) The four ounce sample volume indicated is sufficient for duplicate analysis; no additional volume should be collected.

Per program procedures, a QA sample should be included in each sample batch. Prepared Performance Evaluation (PE) samples are available to Regions through EMSL/LV for this purpose. PE samples should be included as part of the sample batch.

Required sample volume and container types for dioxin RAS analysis of soil/sediment samples are illustrated in Appendix C. Pre-cleaned sample bottles are available through the Sample Bottle Repository, as detailed in Chapter IV.

2. Isomer Identified and Quantified

The dioxin RAS program identifies and quantifies the 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) isomer of dioxin in soil/sediment samples.

3. Contract Deliverable Requirements

The dioxin RAS program specifies: completion of sample extraction, analysis, and data reporting within 15 or 30 days (as specified by the client) following sample receipt at the laboratory; and automatic re-extraction and/or additional cleanup and re-analysis of samples where certain criteria are not met in the initial analysis, reported within 10 days of the initial data due date. Laboratories are subject to financial penalties for late delivery and incentives for early delivery of the data package. Illegible data reports are considered unacceptable, and the laboratory is required to resubmit readable versions of the illegible pages.

The dioxin RAS data package supports independent sample data review by the client user. Through review of data package components, the client can determine the quality of the analytical data.

Each dioxin RAS data package includes the following components:

- Completed data reporting sheets with appropriate selected ion current profiles (SICPs) and spectra attached, indicating instrumental (GC/MS) operating parameters during data acquisition and including all rejected sample runs.

- o Results of analyses of multi-level concentration calibration solutions, including SICPs, calculated response factors, plotted concentration calibration curves, and computer-generated quantitation reports.
- o SICPs generated during each performance check solution analysis and each concentration calibration solution analysis.
- o Documentation of acceptable MS calibration for each confirmatory analysis.
- o Chronological list of all analyses performed including labeled peaks for TCDD isomers and partial scan confirmation spectra.

A summary of RAS dioxin data deliverables and copies of data reporting forms are contained in Appendix B.

4. Analytical Protocols

a. Soil/Sediment Method

The standardized dioxin analysis contracts utilize EPA-developed analytical methods for the analysis of 2,3,7,8-TCDD in soil/sediment samples. Analyses are performed on a "batch" basis. A sample batch consists of a shipment of 24 or fewer field samples, and normally includes an equipment rinse solvent (rinsate) sample, one or more field blanks, and a QA or PE sample.

Prior to analysis, samples are prepared, homogenized and centrifuged when necessary. Samples are then solvent extracted with continuous agitation. Column chromatographic and other cleanup procedures are applied as necessary to eliminate sample components that may interfere with detection and quantification of the 2,3,7,8-TCDD isomer.

The concentrated extract is analyzed by GC/MS using fused silica capillary column (FSCC) techniques. The identification and quantification of 2,3,7,8-TCDD is performed using selected ion monitoring (SIM) GC/MS instrumentation and data systems with the capability to acquire, store and retrieve SIM data for six ions.

b. Method Detection Limits

The RAS contract method provides procedures for the detection and measurement of 2,3,7,8-TCDD in soil/sediment samples at concentrations as low as 1 ug/kg (equivalent to 1 ppb). Column chromatography and other cleanup procedures are used to eliminate coextracted sample components, such as PCBs, which may interfere with the detection of very low levels of TCDD. Matrix interferences can also occur, depending on the nature and homogeneity of the sample, and the lowest MDL may not always be achieved.

5. Contract Quality Control Requirements

The CLP quality control (QC) program for dioxin RAS analysis is structured to provide consistent, accurate and dependable results of known and documented quality. The program therefore places stringent quality control requirements on all laboratories performing sample analysis. Sample data packages contain documentation of a series of QC operations that allow an experienced chemist to determine the quality of the data and its applicability to each investigation. Each CLP laboratory is also encouraged to develop additional internal QA/QC procedures.

The minimum QC requirements of the dioxin RAS program consist of both initial and ongoing demonstration of laboratory capability to generate acceptable precision and accuracy within the contract methods for the analysis of soil/sediment samples for 2,3,7,8-TCDD. CLP contracts define

extensive QC procedures that must be performed and documented, and criteria that must be met. These include, but are not limited to, the following:

- o Initial and continuing calibration and instrument performance checks.
- o Reagent blank analysis.
- o Field blank analysis.
- o Native matrix spike analysis (spiked field blank).
- o Rinsate (equipment solvent) sample analysis.
- o Duplicate sample analysis.
- o Confirmatory partial scan analysis.
- o Re-analyses, including re-extraction and/or additional cleanup of the sample extract, when QC criteria are not met in the initial analysis.

The instrument QC operations include initial and continual calibration and instrument performance cheks. These checks are performed at least twice during each 8-hour shift to demonstrate continued acceptable GC/MS resolution, sensitivity, response factor reproducability, and mass range calibration, and to validate sample data.

Analytical QC operations include: reagent blank, field blank, spiked field blank, rinsate, duplicate sample and confirmatory partial scan analyses. Reagent blank analyses are performed by the laboratory prior to and during analysis of each batch, to demonstrate that identified compound concentrations do not reflect laboratory contamination. Field blank analyses are performed on one fortified (native matrix spike) and other unfortified samples of uncontaminated soil/sediment included in each batch of samples, to provide information on false-positive results, on the matrix effect of the sample on the analytical methodology, and on the accuracy of the method. Rinsate sample analysis is routinely performed for each batch of samples to assure that samples have not been contaminated by sampling equipment. Duplicate sample analysis is performed on one sample of each batch to determine precision of the method. Confirmatory partial scan

analysis is performed on the sample extract from each batch containing the highest concentration of unlabeled 2,3,7,8-TCDD, to confirm identification of the 2,3,7,8-TCDD isomer.

When certain conditions are not met in the initial sample analysis, the laboratory is required by contract to re-extract the sample and/or perform additional sample cleanup, and re-analyze the sample. Specific requirements for automatic sample reruns are delineated in Exhibit C of the IFB Statement of Work.

It is the responsibility of the contractor laboratory to document, in each data package submitted, that both initial and ongoing instrument and analytical QC criteria have been met. The laboratory must demonstrate that instrument tuning and calibration criteria have been met, that interferences from the analytical system are under control, and that spike and duplicate recoveries falling outside contract acceptance windows are attributable to sample matrix interferences and not to laboratory analytical errors. Samples analyzed when contract QC criteria have not been met are re-analyzed by the laboratory. (Consult the dioxin IFB Statement of Work, Exhibit C, for detailed re-analysis requirements.)

D. High Hazard Sample Preparation (RAS)

The high hazard (HH) sample preparation RAS program processes high concentration liquid and solid samples for analysis by CLP organic and inorganic laboratories or EPA Regional laboratories. In this program, samples are shipped directly to one of the program's Hazardous Substances Laboratories (HSLs), either the Regulated Substances Laboratory (RSL) at NEIC or the Containment Facility (CF) at EMSL/LV, for preparation. The client must specify the analysis to be performed at the time HH sample preparation is scheduled to ensure that the sample extracts are prepared in a manner to be compatible with the analytical procedures available through the CLP or the methods to be used by the Regional laboratory. HH sample analysis and HH sample preparation services can be obtained through Special Analytical Services, as described in Section E, following.

1. Sample Matrix, Concentration Level and Volume Required

High hazard (HH) sample preparation RAS methods prepare high concentration liquid and solid samples for analysis of organic and inorganic compounds, and may include performance of specified characterization tests as requested by the client. High concentration samples include samples collected from drums, surface impoundments, direct discharges and chemical spills, where there is little or no evidence of environmental dilution. HH samples are suspected to contain greater than 15 percent concentration of any individual chemical contaminant.

The sample volume required for HH organic and inorganic preparation for analysis is six ounces for either a liquid or solid sample. Each sample should be collected in one 8-ounce clear glass jar, filled one-half to three-fourths full. Each HH sample must be enclosed and sealed in a metal paint can for shipment. The six ounce volume of sample is sufficient for all

organic and inorganic preparations and characterization tests. Collection of additional volume is strongly discouraged due to the hazardous nature and difficulty of disposing of HH waste.

Required sample volume and container types for high concentration samples are illustrated in Appendix C. Pre-cleaned sample bottles are available through the Sample Bottle Repository, as detailed in Chapter IV.

2. Preparation Procedures

a. Organic Preparation

Liquid organic samples are solvent extracted and solid organic samples are extracted with deionized, distilled water prior to screening by GC/FID and dilution where necessary. Samples are prepared for organic analysis of RAS Hazardous Substances List compounds. Upon request, samples may be characterized by testing for pH, acidity/alkalinity, conductivity, ignitability/flash point, oxidants, percent moisture, and percent insoluble residue. The HSL creates reagent blank, spike, and replicate spike QC samples for each Case to accompany the organic extracts to the analytical laboratory.

b. Inorganic Preparation

Liquid and solid inorganic samples are prepared by KOH fusion, extraction, or acid digestion procedures, prior to screening by X-ray/infrared techniques and dilution when necessary. Samples are prepared for analysis of priority pollutant metals (including total mercury). Upon request, samples may be tested for pH, conductivity, ignitability/flash point, percent moisture, percent insoluble residue, strong acid anions, and EP Toxicity. The HSL creates reagent blank, spike, replicate spike and control QC samples for each Case to accompany the inorganic extracts to the analytical laboratory.

E. Special Analytical Services (SAS)

In addition to the standardized analyses provided under the Routine Analytical Services (RAS) program, the CLP's Special Analytical Services (SAS) program provides limited customized or specialized analyses, different from or beyond the scope of the RAS IFB contract protocols but consistent with program objectives. Services provided through SAS include: quick turnaround analyses, verification analyses, analyses requiring lower detection limits than RAS methods provide, identification and quantification of non-priority pollutant and non-HSL constituents, general waste characterizations, analysis of non-standard matrices, and other specific analyses.

SAS functions as an extension of the RAS program, matching unique client needs with individual laboratory resources to accommodate varied analytical requests, often in a short or emergency timeframe. Individual SAS subcontracts are solicited, awarded and administered by Viar and Company, as part of the company's contract with the EPA for operation of the Sample Management Office (SMO). The SAS mechanism, by utilizing the subcontracting process, allows the CLP to procure specialized services in a timely manner, on an as-needed basis. The flexibility of the SAS program expands the CLP's capabilities from standardized RAS organic, inorganic and dioxin contract analyses, to include a wide variety of additional, non-routine analytical services.

SMO procures SAS services by subcontracting with CLP RAS laboratories or with other laboratories which have demonstrated the ability to meet program performance requirements, when RAS laboratories cannot meet the analytical requirement of the SAS. RAS contract laboratories are evaluated for current performance before they are considered for SAS solicitations, and are not solicited for SAS work if deficient in this area. SAS organic, inorganic and dioxin analysis requests are solicited to CLP laboratories with IFB contracts in the appropriate analytical program, and that are performing in accordance with all contractual requirements. Other laboratories qualify to perform certain types of SAS work by successful completion of performance evaluation sample analyses or by justification of unique analytical capability (e.g., Ames testing).

3. Sample Preparation Deliverables

The HSLs routinely perform sample preparation and designated waste characterization tests within 21 days of sample receipt, and ship sample extracts to designated analysis laboratories. Turnaround time for preparation may be shortened or lengthened depending on the size of the project, the complexity of the parameters requested, and current HSL sample loading and instrument conditions. Sample preparation documentation prepared by the HSL accompanies the sample extracts to the designated analysis laboratory and is included as part of the final organic or inorganic analytical data package.

4. Potential Follow-Up Analyses

Following organic and inorganic sample preparation, sample extracts are shipped by the HSL to a previously designated CLP, Regional or other analysis laboratory. Shipments of extracts are accompanied by chain-of-custody forms, sample tracking documentation, sample preparation and screening documentation, and HSL-prepared QC samples.

Potential follow-up analyses include organic analysis of HSL compounds, inorganic analysis of PP metals and cyanide, EP Toxicity testing, and other specified parameters. CLP analysis of HH organic and inorganic samples is provided through the SAS program, as described in Section E, following.

1. SAS Services

a. RAS Plus SAS

(1) Fast Turnaround

A fast turnaround request is defined as a request for routine (RAS) analyses with analysis or data delivery requirements which call for performance or delivery in a shorter timeframe than the RAS contracts provide. Fast turnaround requests require application of existing RAS analytical parameters, methodologies and detection limits, altering only the time required for performance of analysis and/or delivery of data. For information on performance/delivery requirements for RAS organics, inorganics and dioxin IFBs, reference Part 3 of Sections A - C of this chapter.

In responding to fast turnaround requests, SAS procurement is limited by and dependent upon program sample load, laboratory capacities and laboratory operating conditions at the time of the request. Because of constant fluctuations in these factors, it is not possible to obtain fast turnaround service on an unlimited basis. Therefore, fast turnaround contracts are solicited only in situations of demonstrated need, and are used primarily to support EPA emergency actions and to meet impending litigation deadlines.

Once the laboratory universe is determined, SMO initiates solicitation via telephone, contacting a minimum of three laboratories (contingent upon availability of a particular analytical service) and describing the requirement. Laboratories are asked to bid firm, fixed price(s) for the performance of specific types of analyses on a defined number of samples. Laboratory bids are evaluated by SMO in terms of bid price and responsiveness to the specified task. The SAS award is made to the lowest bidding laboratory which responds to the program's analytical requirement. A written, individual SAS subcontract agreement is then made between the laboratory and Viar and Company, the SMO contractor, for laboratory performance of specified analytical work.

A laboratory's ability to bid for SAS work and bid prices vary depending on: the size or scope of the analytical request; data turnaround requirements and analytical parameters of a particular task; weekly RAS sample loading; and, laboratory operating conditions at the time of solicitation. Due to the fluctuation of these factors on a weekly, and often daily basis, the CLP cannot accommodate all SAS requests received. Currently, SAS services are provided on a first-come basis; however, Agency requirements can necessitate that certain work be given priority. In this event, SMO notifies the involved RSCC Primary Authorized Requestors, who determine Regional sampling priorities.

An analysis request can be processed through SAS only if the types of samples to be analyzed or the analysis requirements are different than those of the RAS program. (Consult earlier sections of this chapter for RAS sample types and analysis requirements.) SAS requests are separated into two basic categories: "RAS Plus SAS" and "All SAS". These categories are utilized in defining client requests and pursuant SAS solicitation and award. Analytical services available through the SAS program are described in the following sections.

Pre-cleaned sample bottles are available through the Sample Bottle Repository, as detailed in Chapter IV. In this program, bottles are prepared specifically for RAS analytical work. However, bottles may be utilized in SAS projects as appropriate.

(4) Dioxin – Special Requirements in Addition to RAS

A client may need to access the standardized dioxin RAS program and add to the contract requirements. Any addition to the standard dioxin analysis requirements constitutes this type of SAS request. The following examples illustrate "RAS Plus SAS" dioxin requests, with the SAS portion shown underlined:

- o 2,3,7,8-TCDD analysis of soil/sediment samples with a detection limit lower than 1 ppb.
- o 2,3,7,8-TCDD analysis plus analysis of other dioxin isomers or furans.

b. All SAS

CLP clients frequently request types of analyses that are outside the scope of or not directly applicable to the RAS program. This occurs most often with samples of difficult or unusual matrices and requests to measure analytical parameters not provided through the RAS program. In these situations, requests are met through a second SAS contracting process referred to as "All SAS." Five categories of "All SAS" requests are described in the following sections.

(1) Organic – Special Requirements Not Provided by RAS

- o Seven HSList PCB arochlors analysis only (with or without method substitutions).
- o Specific pesticides/herbicides analysis only.
- o Organic analysis on non-aqueous and non-soil/sediment samples (e.g., oil, tar or biological tissue).
- o Organic analysis by non-RAS methods.

(2) Organic – Special Requirements in Addition to RAS

A common client request is to access the standardized or RAS organic program and add to the contract requirements. Any addition to the standard RAS Hazardous Substances List (HSList) organic analysis requirements constitutes this type of SAS request. The following examples illustrate common "RAS Plus SAS" organic requests, with the SAS portion shown underlined:

- o HSList B/N/A compound analysis at low detection limits.
- o HSList full organic analysis with additional non-HSList pesticide/herbicide compounds.
- o HSList pesticide compound analyses with additional cleanup.

(3) Inorganic – Special Requirements in Addition to RAS

As with organics, it is common for a client to request the standardized inorganic RAS program and add to the contract requirements. Any addition to the standard RAS inorganic analysis requirements constitutes this type of SAS request. The following examples illustrate common "RAS Plus SAS" inorganic requests, with the SAS portion shown underlined.

- o Metals and cyanide analyses plus nitrate, sulfate, ammonia, sulfide, total organic carbon and chloride.
- o Metals and cyanide analyses with sample filtration and preservation.
- o Metals and cyanide analyses with sample homogenization.
- o Metals analysis at low detection limits.

(5) Special Topics Analysis

The SAS program can also accommodate unusual analytical requests on an "All SAS" basis, when sufficient lead time is allowed and complete methodology accompanies the request. These types of analyses include, but are not limited to:

- o Biological samples (e.g., fish, turtle tissue) for specific organic, inorganic or dioxin analyses.
- o Air samples (e.g., tenax, charcoal and flurosil tubes) for specific organic analyses.
- o Wipe samples for specific organic or inorganic analyses.
- o Methods comparison studies.
- o Asbestos analysis.
- o Non-Superfund analytical services of any type.
- o Acid deposition parameters.

2. Contract Deliverable Requirements

SAS contracts specify required delivery schedules for sample extraction, analysis and data reporting, as defined by the client requestor. Deliverable requirements for "RAS Plus SAS" and "All SAS" requests are per RAS contract deliverable requirements, as applicable, unless otherwise specified by the client at the time of request.

3. Contract Quality Control Requirements

SAS contracts require laboratory performance of QC procedures and reporting of QC parameters, as defined by the client requestor. QC requirements are as specified in RAS program contracts, as applicable, unless otherwise specified by the client at the time of request. Clients are encouraged to maintain a high level of QC in all analysis requests, unless there is substantial reason for deleting certain QC requirements.

(2) Inorganic – Special Requirements Not Provided by RAS

- o Specified elements from the RAS program metals (e.g., cadmium, mercury and selenium only).
- o Total organic carbon (TOC) analysis only (on water or soil/sediment samples).
- o EP Toxicity tests (metals, pesticides or herbicides).
- o Any inorganic analysis on non-aqueous and non-soil/sediment samples (e.g., oil, tar or biological tissue).
- o Metals analysis by non-RAS methods.

(3) Dioxin – Special Requirements Not Provided by RAS

- o 2,3,7,8-TCDD in water or fish tissue.
- o 2,3,7,8-TCDF (furan) in any matrix.
- o Total tetra through octa dioxin and/or furan classes in varied matrices.
- o Analysis by HRGC/HRMS or GC/MS/MS.

(4) High Hazard Sample Analysis – Organic and Inorganic

The SAS program provides for analysis of High Hazard (HH) sample extracts prepared by the Hazardous Substances Laboratories. HH analysis services are described below.

- o Organic analysis for HSList compounds by GC/MS and GC/ECD with tentative identification of 30 non-HSList compounds of greatest concentration.
- o Inorganic analysis for KOH fusion total metals and total mercury.

CHAPTER III

UTILIZATION OF ANALYTICAL SERVICES

A. Regional Allocation System

An allocation system has been established to equitably apportion available laboratory space to the Regions during periods of heavy sampling activity when analysis capacity for all requests may not be available. When in effect, all organics RAS and RAS plus SAS Cases are scheduled under the allocation system.

By the first day of each month, the NPO provides the RSCC with the Region's monthly allocation of organic sample analyses. The RSCC is responsible for planning the month's sampling activities in accordance with the NPO allocation.

Up to the second Thursday in the month, the RSCC requests sample analyses for all planned Regional sampling activities for that month, assigning a priority to each activity requested. (Analysis request procedures are delineated in the following sections of this chapter.) In follow-up, the RSCC submits to SMO confirmation of verbal requests for sample analyses for the month, using the form entitled, "Planned Sampling Activity Requiring CLP Analyses." An example of this form is included in Appendix C. Copies are available from SMO.

Upon receiving the Region's sampling requests, SMO makes laboratory assignments for the month, scheduling requests received up to each Region's allocation limit. Requests for space in excess of the monthly allocation will not be processed by SMO until requests from all Regions which fall within allocations have been placed at a laboratory. At this time, any "excess" laboratory capacity for the month is determined. The NPO then prioritizes Regional sampling requests which exceed allocations, on a national basis. Following NPO prioritization, SMO makes laboratory assignments for sampling activities as prioritized by the NPO, utilizing available laboratory capacity.

For additional information concerning the allocation system, contact SMO's Group Leader for Analytical Services (see Appendix A).

CHAPTER III
UTILIZATION OF ANALYTICAL SERVICES

The CLP provides clients with prompt access to laboratory services through a documented system of sample scheduling and coordination in which the client plays a key role. The purpose of this chapter is to familiarize clients with the proper use of program services. Specific procedures and required documentation are reviewed for each program, providing complete step-by-step information on how to properly access the program's analytical resources.

CLP procedures are based on two fundamental requirements: (1) the maintenance of ongoing communication among Regional Sample Control Center (RSCC), field sampler, SMO and laboratory personnel; and, (2) the correct use of sample scheduling and tracking documents by RSCC, field sampler and laboratory personnel. The Sample Management Office (SMO) provides centralized direction and coordination in scheduling sample analyses through the CLP, and tracks the progress of samples from the point of collection through final data production. To effectively match the analytical needs of program clients with the capabilities of appropriate contractor laboratories, SMO maintains ongoing records which document for each program: current utilization, availability of resources, and laboratory performance limitations.

SMO is authorized to accept analytical requests only through the RSCC, centered in the Region's Environmental Services Division. The RSCC, established by the EPA Regional Administrator, is responsible for defining the Region's analytical priorities and placing analytical requests for CLP services through SMO. The RSCC consists of three or more identified Authorized Requestors (AR), who routinely place analytical requests through SMO and coordinate with SMO throughout sample shipment and analysis. The RSCC is responsible for ensuring Regional compliance with the CLP's allocation system, as described in the following section. The Primary AR determines analytical priorities for the Region when conflicts occur.

Individuals interested in obtaining CLP analytical support are instructed to contact their Regional EPA office's Regional Sample Control Center (see Appendix A).

B. Analysis Initiation/Request Procedures

1. RAS Initiation Process

a. User Information Required

To initiate a RAS request, the RSCC Authorized Requestor contacts the appropriate SMO Controller by telephone and provides a complete description of the analytical requirement. (SMO personnel are identified in the CLP Directory, Appendix A.)

SMO requires the following information to initiate a RAS request:

- Name of RSCC Authorized Requestor
- Name(s), association, and telephone number(s) of sampling personnel.
- Name and location of the site to be sampled.
- Number and matrix of samples to be collected.
- Type of analyses required; i.e., organics, inorganics, dioxin.
- Cyanide analysis requirement (inorganics only).
- Scheduled sample collection and shipment dates.
- Nature of sampling event (i.e., investigation, monitoring, enforcement, remedial, drilling project).
- Other pertinent information which may effect sample scheduling or shipment (i.e., anticipated delays due to site access, weather conditions, sampling equipment).
- Name(s) of Regional or contractor contacts for immediate problem resolution.

The Authorized Requestor is responsible for applying professional judgment in accurately estimating the numbers and types of samples and the sample shipment dates of the analytical request.

Overestimation of the number of samples to be collected and/or miscalculation of shipment dates unnecessarily ties up available laboratory capacity, preventing the efficient management of CLP analytical resources and rendering the program less than maximally responsive to all clients. Underestimation of the numbers and types of samples to be collected may mean that adequate services will not be available for any additional analyses needed.

b. Lead Time Requirement

When planning for a sampling activity has been completed and at least one week prior to the scheduled start of sampling, the AR telephones SMO and places the specific request for RAS services. A minimum of one week lead time is essential to facilitate laboratory scheduling and resolution of questions concerning sampling and analysis procedures, and to allow the sampler adequate time to prepare the required sample documentation. Advance scheduling is available through the Regional Allocation System and should be utilized whenever possible.

c. Case Number Assignment and Laboratory Scheduling

At the time of request, SMO assigns a sequential Case number to each individual RAS sampling activity. The RSCC records the Case number and uses it in referencing that request throughout sampling and analysis. A Case number designates a single group of samples collected at one site or geographical location during a predetermined and finite time period and is used to identify a particular RAS sampling event throughout sample tracking and data production.

SMO then schedules the requested analyses through an appropriate RAS laboratory. This selection is determined by the types of analyses, number of samples, program contract capacity, sample

balance among the various laboratories, and laboratory loading and instrument conditions. When possible, the nearest available laboratory is assigned to minimize sample shipping costs.

Once RAS laboratory assignments are made, SMO contacts the AR to confirm the field investigation plans, identify the laboratories to be used for the Case, and answer any further questions the sampler may have regarding program procedures or documentation. At that point, the AR must indicate all known or anticipated sample scheduling changes. Any other changes occurring after this time should be communicated to SMO immediately upon identification to ensure the timely resolution of conflicts and the optimal allocation of program resources.

After the initial placement of the RAS request, the RSCC may choose to assign a logistical contact, such as the team leader in the sampling effort, to follow up with SMO in finalizing sampling requirements, initiating changes, and coordinating sample shipment.

d. User Knowledge of Analytical Protocols

It is the responsibility of each RSCC Authorized Requestor to acquire and maintain a working knowledge of current RAS protocols and analytical services. SMO provides each Region with Master Copy notebooks of each RAS program IFB Statement of Work (SOW), which are periodically updated to reflect program protocol changes. The SOW represents the standardized requirements which each individual RAS laboratory is contractually bound to follow. Regional DPOs (see Appendix A) maintain the Region's Master Copy SOW notebooks.

The analytical SOWs contain specific information on sample types suited to RAS analysis, compounds identified and quantified, analytical methods, protocols, detection limits, deliverable requirements,

and quality control requirements. In addition to the summary information contained in this User's Guide, the RAS Statement of Work should be consulted by program users to confirm that the RAS program is suited to an analytical request. Analytical requirements differing from RAS parameters are processed through the SAS program, as described in Section E, Chapter II.

2. SAS Initiation Process

a. User Information Required

To initiate a SAS request, the RSCC Authorized Requestor contacts the appropriate SMO Controller by telephone and provides a complete description of the analytical requirement. (SMO personnel are identified in the CLP Directory, Appendix A.)

SMO requires the following information to initiate a SAS request:

- Name of RSCC Authorized Requestor
- Name(s), association, and telephone number(s) of sampling personnel.
- Name and location of the site to be sampled.
- Number and matrix of samples to be collected.
- Specific analyses required and appropriate protocols.
- Required detection limits.
- Matrix spike and duplicate frequency.
- Justification for fast turnaround request, if appropriate.
- Scheduled sample collection and shipment dates.
- Nature of sampling event (i.e., investigation, monitoring, enforcement, remedial, drilling project).
- Other pertinent information which may affect sample scheduling or shipment (i.e., anticipated delays due to site access, weather condition, sampling equipment).
- Name(s) of Regional or contractor contacts for immediate problem resolution.

In follow-up to the verbal request, the AR must submit a completed SAS Client Request form to SMO. This form serves as the written record to clarify and confirm the client's requirement for specialized analysis work. A copy of the SAS Client Request form is included in Appendix C.

The Authorized Requestor is responsible for applying professional judgment in accurately estimating the numbers and types of samples and the sample shipment dates of the SAS request. Overestimation of the number of samples to be collected and/or miscalculation of shipment dates unnecessarily ties up available laboratory capacity, preventing the efficient management of CLP analytical resources and rendering the program less than maximally responsive to all clients. Underestimation of the numbers and types of samples to be collected may mean that adequate services will not be available for any additional analyses needed. Depending on the scope of the miscalculation, it may require that the entire request be resolicited, and sampling plans postponed accordingly.

b. Lead Time Requirements

When planning for a sampling activity has been completed, the AR telephones SMO and places the specific request for SAS services. Because SAS services are individually procured on a competitive basis, a minimum lead time of one week is required to process a SAS request. A two-week lead time is strongly recommended whenever possible.

Certain types of SAS requests require a longer lead time, as follows. A minimum lead time of two weeks is required for SAS requests which involve distribution of protocols (reference item d., this section). A minimum lead time of three to four weeks is required for large-scale, analytically complex and/or non-Superfund SAS requests.

The AR should consider the above-outlined criteria in determining the lead time required to schedule a particular SAS effort. As a general rule, due to protocol diversity and laboratory procurement procedures, accessing SAS demands greater advance planning and more lead time than that required for the standardized RAS programs. The AR should contact SMO several weeks in advance, if there is a question regarding the advance time needed to schedule a particular SAS.

c. SAS Number Assignment and Laboratory Scheduling

At the time of request, SMO assigns a sequential SAS number for each individual SAS sampling activity. If SAS services are being provided in association with RAS services, SMO also designates the assigned Case number. The AR records the SAS number and Case number (if applicable) and uses these numbers in referencing the request throughout sampling and analysis. Like the Case identification, the SAS number designates a single group of samples collected at one site or geographical location during a predetermined and finite time period, and is used to identify a particular SAS sampling event throughout sample tracking and data production.

SAS laboratory selection is based on a telephone solicitation process for each individual request, which results in a written SAS award to the lowest qualified bidder. Once SAS laboratory assignments are made, SMO notifies the AR of the laboratories that will be performing the analyses.

As indicated, the nature of the SAS laboratory solicitation process requires the Authorized Requestor to be as exact as possible with all elements of a request at the time of request. It is understood that

actual site conditions can vary considerably from expected conditions and necessitate changes in the sampling plan. However, the AR has the responsibility to notify SMO immediately of any changes to allow sufficient time to amend the SAS contract(s) to meet the changed needs. If an original request is changed significantly, the original SAS contract will be voided and the entire analysis effort will be resolicited, requiring an additional week of time before sample shipment can take place.

d. User-Provided Analytical Protocol

It is the responsibility of the RSCC Authorized Requestor to provide the applicable analytical protocol and associated QC procedures to be utilized for each SAS request. The analytical methodology and QC requirements to be applied under a particular SAS must be provided or referenced at the time of request.

For SAS requests that are based on the use of amended RAS protocols the AR must specify modifications or additions to these protocols at the time of request. If such changes are extensive, the AR must submit changes in written form two weeks in advance of scheduled sample shipment under the SAS. This additional lead time is required for protocol distribution and review by solicited laboratories.

For SAS requests which require use of a non-RAS method that is not commonly available, the AR must submit the method to SMO two weeks in advance of sample shipment, to allow time for protocol distribution and review by solicited laboratories.

SAS requests which cite the application of well-known analytical publications do not require additional lead time for distribution, since laboratories have immediate access to this information. Examples of such frequently-utilized method manuals are listed below. Additional analytical references are supplied in Appendix E.

- o Methods for Chemical Analysis of Water and Waste, USEPA, 1983.
- o Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, USEPA Office of Water and Waste Management, 1983.
- o Standard Methods for the Examination of Water and Waste Water, APHA, AWWA, WPCF, Current Edition.

The RSCC should contact SMO several weeks in advance if there is a question as to whether a particular method will require additional lead time for distribution.

3. Initiation of RAS High Hazard Sample Preparation

a. User Information Required

To initiate a request for routine High Hazard (HH) sample preparation, the RSCC Authorized Requestor contacts the appropriate SMO Controller by telephone and provides a complete description of the requirement. (SMO personnel are identified in the CLP Directory, Appendix A.)

SMO requires the following information to initiate a High Hazard RAS request:

- o Name of RSCC Authorized Requestor
- o Name(s), association, and telephone number(s) of sampling personnel.
- o Name and location of the site to be sampled.
- o Number and matrix of samples to be collected.
- o Type of preparation and analyses required.
- o Scheduled sample collection and shipment dates.
- o Nature of sampling event (i.e., investigation, monitoring, enforcement, remedial, drilling project).
- o Suspected hazards associated with the site.
- o Other pertinent information which may affect sample scheduling or shipment (i.e., anticipated delays due to site access, weather conditions, sampling equipment).
- o Name(s) of Regional or contractor contacts for immediate problem resolution.

It is the responsibility of the RSCC Authorized Requestor to provide information concerning the target analyses for which the samples are being prepared and to designate the analytical facility (CLP or Regional) that will be performing the follow-up analyses at the time of request. Specific HH sample preparation procedures are then employed by the Hazardous Substances Laboratory (HSL) to render sample extracts compatible with the specific analytical protocols to be used by the analysis laboratory.

If the analysis will be performed through the CLP, the AR should schedule the HH SAS analyses when placing the RAS HH preparation request. (Consult part 2., preceding for applicable SAS request procedures.) If the analysis will be performed by a non-CLP laboratory, it is the client's responsibility to make the necessary analytical arrangements with the selected laboratory.

b. Lead Time Requirement

A minimum lead time of one week is required to schedule RAS HH sample preparation. Longer lead time is required for a request involving large numbers of samples or a long-term request.

c. SAS Number Assignment and Laboratory Scheduling

At the time of request, SMO assigns a SAS number to the individual sampling event and designates the HSL that will perform the sample preparation, either the Regulated Substances Laboratory at NEIC or the Containment Facility at EMSL/LV. (It should be noted that HH sample preparation involves assignment of a SAS number to identify the sampling event, rather than using a Case number as in other RAS programs.) The AR records the assigned SAS number, and uses this number in identifying the HH preparation request throughout sample tracking and HSL preparation.

d. Sample Preparation and Shipment to Analysis Laboratory

Samples are sent directly to the designated HSL for sample preparation and characterization tests, if requested. Following the completion of sample preparation, the HH extracts are shipped by the HSL to the assigned CLP or non-CLP analysis laboratory. If the analysis is being performed by a non-CLP laboratory, the client must make arrangements directly with the HSL for shipment of the extracts to the appropriate analysis facility.

4. Procedures for Making Changes to Analytical Requests

The RSCC Authorized Requestor is responsible for immediately notifying the appropriate SMO Controller of all changes in sampling plans as they are identified. This includes any changes in sample matrices, numbers of samples, analyses requested, detection limits, shipping dates, postponements or cancellations. The RSCC Authorized Requestor must maintain this communication at all stages of the request – before, during and after shipment of samples to the laboratories. Likewise, the AR-designated logistical contact must notify the appropriate SMO Controller of any changes in sampling before and during the on-site sampling event and after shipment of samples to laboratories.

Failure to notify SMO of such changes can result in: delay in sampling to accommodate scheduling changes, delay in start of analysis due to conflicts, unsuitability of a particular sample to an analytical program, and/or analysis data inappropriate for client purposes.

C. Sample Documentation

Each sample processed by the CLP must be properly documented to ensure timely, correct and complete analysis for all parameters requested, and most importantly, to support use of sample data in potential enforcement actions concerning a site. The CLP documentation system provides the means to individually identify, track, and monitor each sample from the point of collection through final data reporting. As used herein, a sample is defined as a representative specimen collected at a specific location of a waste site at a particular point in time for a specific analysis, and may reference field samples, duplicates, replicates, splits, spikes, or blanks, that are shipped from the field to a laboratory. Specific CLP sample documentation requirements are described in the following sections.

Whenever questions arise, samplers should contact SMO for direction and clarification concerning the proper completion and distribution of Case and/or SAS paperwork for a sampling effort.

1. Sample Traffic Report (TR)

The sample documentation system for the RAS organic, inorganic and HH sample preparation programs is based on the use of the sample Traffic Report, a four-part carbonless form printed with a unique sample identification number. One Traffic Report and its preprinted identification number is assigned by the sampler to each sample collected. The three types of TRs currently in use include: Organic, Inorganic and High Hazard Traffic Reports. Copies of the three types of TRs are included in Appendix B, along with examples of properly completed TR forms.

To provide a permanent record for each sample collected, the sampler completes the appropriate TR, recording the Case Number, site name or code and location, analysis laboratory, sampling office, dates of sample

collection and shipment, and sample concentration and matrix. Numbers of sample containers and volumes are entered by the sampler beside the analytical parameter(s) requested for particular sample portions.

After completing the TR, the sampler includes the bottom two copies in the sample shipment to the laboratory. Following sample shipment, the sampler returns the top copy of the completed TR to SMO. The second copy is the sampler's file copy. Upon receipt of samples, the analysis laboratory documents sample condition and signs the TR, returning the signed copy to SMO and keeping a laboratory file copy. In the Organics RAS program, copies of the laboratory-signed TRs are provided to the RSCC as part of the data package. In the Inorganics and High Hazard RAS programs, SMO provides copies of the TRs to the RSCC separately.

A strip of adhesive sample labels each printed with the TR sample number come attached to the TR, for the sampler's use in labeling sample bottles. The sampler affixes one of these numbered labels to each container making up the sample. In order to protect the label from water and solvent attack, each label must be covered with clear waterproof tape. The sample labels, which bear the TR identification number, permanently identify each sample collected and link each sample component throughout the analytical process.

Where a RAS request is associated with an additional SAS request (described in Chapter II as "RAS Plus SAS" request), TR forms are used for both RAS and SAS samples. Both the RAS Case number and the SAS number must be entered on the TR line requesting "Case Number." Both numbers are required in order to clearly identify and track the sampling event. Additionally, the sampler must document a brief description of the SAS requirement on each TR. For example, "VOA - 1 ppb detection limit".

Traffic Report forms are provided by SMO to each Region through the RSCC. One of the RSCC ARs should contact SMO two or more weeks in advance to order additional TRs for the Region.

2. Dioxin Shipment Record (DSR)

Sample documentation for the RAS dioxin program utilizes the CLP Dioxin Shipment Record, a four-part carbonless form. The DSR provides a record for one shipment batch of dioxin samples (up to 24 samples). Samples are individually numbered using the pre-printed labels provided by SMO with the supply of DSRs, and each sample number is entered on the DSR by the sampler. A copy of the DSR is included in Appendix C, along with an example of a properly completed DSR form.

To provide a permanent record of each sample collected, the sampler completes the DSR, first recording the appropriate CLP Case number and Batch/Shipment number. Header information pertinent to all samples is then entered, including: site name/code, tier designation, data turnaround (15 or 30 days), sampling office, sampling contact, sampling date, date of shipment, and analysis laboratory. Sample matrix and description information (e.g., soil/sediment field sample, solvent rinsate) is recorded for each sample by checking the appropriate box following each sample number.

After completion of the DSR, the sampler includes the bottom two copies with the sample shipment to the laboratory. Following sample shipment, the sampler returns the top copy of the DSR to SMO. The second copy is the sampler's file copy. Upon receipt of the sample shipment, the laboratory documents sample condition and signs the DSR, returning a copy to SMO and keeping a file copy. Copies of the laboratory-signed DSRs are provided to the RSCC as part of the data package.

As indicated, two strips of adhesive sample labels pre-printed with unique sample numbers are provided with the DSR for the sampler's use in labeling both the sample bottle and the outside of the paint can in which the sample is packed. In order to protect the labels from water and solvent attack,

labels on both the sample container and the paint can are covered with clear, waterproof tape. The sample labels permanently identify each sample collected throughout the analytical process.

Dioxin Shipment Record forms are provided by SMO to each Region through the RSCC. One of the RSCC ARs should contact SMO two or more weeks in advance to order additional DSRs.

3. SAS Packing List (PL)

For an "All SAS" type of request (as described in Chapter II), samplers utilize the SAS Packing List, a four-part carbonless form. The PL provides space to list up to 20 samples on one form. SAS samples are numbered using the SAS number followed by a hyphen and progressive numerical designation, starting with 1 (e.g., 800E-1, 800E-2, 800E-3, etc.) If the sampling activity extends over several days and more than one PL is used, care must be taken not to repeat sample numbers. A copy of the SAS Packing List is included in Appendix C, along with an example of a properly completed PL form.

To provide a permanent record of each sample collected, the sampler completes the PL, recording the SAS number, site name and location, sampling date, shipment date, analysis laboratory, sampling office, sampler name and telephone number, individual SAS sample numbers, sample description and analytical parameters requested.

After completing the PL, the sampler includes the bottom two copies with the sample shipment to the analysis laboratory. Following sample shipment, the sampler sends the top copy to SMO. The second copy is the sampler's file copy. Upon receipt of samples, the analysis laboratory documents sample condition and signs the PL, returning a copy to SMO and keeping a laboratory file copy. Copies of the laboratory-signed PLs are provided to the RSCC as part of the SAS data package.

Adhesive sample labels must be provided by the sampler and marked with the appropriate SAS sample numbers using indelible ink. Labels are secured to each sample container, and covered with clear waterproof tape to protect the label from water and solvent attack. The sample label permanently identifies each sample collected and links each sample component throughout the analytical process.

SAS Packing Lists are provided by SMO to each Region through the RSCC. One of the RSCC ARs should contact SMO two or more weeks in advance to order additional SAS PLs.

4. Sample Tag

To render sample data valid for Agency enforcement uses, individual samples must be traceable continuously from the time of collection until the time of introduction as evidence during litigation. One mechanism utilized in the CLP to comply with this enforcement requirement is the use of the "sample tag". Each sample removed from a wastesite and transferred to a laboratory for analysis is identified by a sample tag containing specific information regarding the sample, as defined by the EPA National Enforcement Investigations Center (NEIC). Following sample analysis, sample tags are retained by the laboratory as physical evidence of sample receipt and analysis, and may later be introduced as evidence in Agency litigation proceedings. Sample tags can be obtained through the Regional office.

The information recorded on an EPA sample tag includes:

- o CLP Case/SAS No(s). — The unique number(s) assigned by SMO to identify the sampling event. (Entered under "Remarks" heading.)
- o CLP Sample No. — The unique identification number (from the TR, DSR or PL) used to document that sample. (Entered under "Remarks" heading.)
- o Project Code — The number assigned by EPA to the sampling project.
- o Station No. — A two-digit number assigned by the sampling team coordinator.
- o Date — A six-digit number indicating the month, day and year of collection.
- o Time — A four-digit number indicating the military time of collection.
- o Station Location — The sampling station description as specified in the project plan.
- o Samplers — Signatures of samplers on the project team.
- o Remarks — Case/SAS and sample numbers are entered here, and any pertinent comments indicated.
- o Tag No. — A unique serial number pre-printed or stamped on the tag.
- o Lab Sample No. — Reserved for laboratory use.

Additionally, the sample tag contains appropriate spaces for noting that the sample has been preserved and indicating the analytical parameter(s) for which the sample will be analyzed. An example of a properly completed sample tag is included in Appendix C.

Each sample tag is completed and securely attached to the sample container. Samples are then shipped under chain-of-custody procedures as described in the following section.

4. Chain-of-Custody Record

Official custody of samples must be maintained and documented from the time of sample collection up to introduction as evidence in court, in accordance with Agency enforcement requirements. The following custody documentation procedure was developed by NEIC and is used in conjunction with CLP sample documentation (i.e., Traffic Report, Dioxin Shipment Record and SAS Packing List) for all samples processed through the CLP.

A sample is considered to be in an individual's custody if the following criteria are met: it is in your possession or it is in your view after being in your possession; it was in your possession and then locked up or transferred to a designated secure area. Under this definition, the team member actually performing the sampling is personally responsible for the care and custody of the samples collected until they are transferred or dispatched properly. In follow-up, the sampling team leader reviews all field activities to confirm that proper custody procedures were followed during the field work.

The Chain-of-Custody Record is employed as physical evidence of sample custody. Chain-of-Custody Record forms can be obtained through the Regional office. The sampler completes a Chain-of-Custody Record to accompany each sample shipment from the field to the laboratory.

Similar information to that entered on the sample tag is recorded on the Chain-of-Custody Record. Header information includes the project number and name, samplers' signatures and the CLP Case/SAS number (entered on the upper right of the form). For each station number, the sampler

indicates: date, time, whether the sample is a composite or grab, station location, number of containers, analytical parameters, CLP sample number(s) (from TR, DSR or PL), and sample tag number(s). When relinquishing the samples for shipment, the sampler signs in the space indicated at the bottom of the form, entering the date and time the samples are relinquished. The sampler enters shipper name and airbill number under the "Remarks" section on the bottom right of the form. An example of a properly completed Chain-of-Custody Record is included in Appendix C.

The custody record is completed using waterproof ink. Any corrections are made by drawing a line through and initialing the error, then entering the correct information. Erasures are not permissable.

The top, original signature copy of the Chain-of-Custody Record is enclosed in plastic (with CLP sample documentation) and secured to the inside of the cooler lid. A copy of the custody record is retained for the sampler's files.

Shipping coolers are secured and custody seals are placed across cooler openings (see Section C., following). As long as custody forms are sealed inside the sample cooler and custody seals remain intact, commercial carriers are not required to sign off on the custody form.

Whenever samples are split with a source or government agency, a separate Chain-of-Custody Record should be prepared for those samples, indicating with whom the samples are being split and sample tag serial numbers from splits.

The laboratory representative who accepts the incoming sample shipment signs and dates the Chain-of-Custody Record to acknowledge receipt of the samples, completing the sample transfer process. It is then the laboratory's responsibility to maintain internal log books and records that provide a custody record throughout sample preparation and analysis.

D. Sample Packaging and Shipment

1. Packaging Requirements

Samples processed through the CLP must be packaged for shipment in compliance with current U.S. Department of Transportation (DOT) and commercial carrier regulations. All required government and commercial carrier shipping papers must be filled out and shipment classifications made according to current DOT regulations. (Consult Appendix E for shipping references.)

Traffic Reports, Dioxin Shipment Records, SAS Packing Lists, Chain-of-Custody Records, and any other shipping/sample documentation accompanying the shipment, must be enclosed in a waterproof plastic bag and taped to the underside of the cooler lid.

Coolers must be sealed with custody seals in such a manner that the custody seal would be broken if the cooler were opened.

Shipping coolers should have clearly visible return address labels on the outside. Shipping coolers that are labeled in this manner will be returned to the sampler by the laboratory within 14 days following laboratory sample receipt.

Inside the cooler, sample containers must be enclosed in clear plastic bags through which sample tags and labels are visible. For dioxin samples and water and soil samples suspected to be of medium or high concentration, each sample must be enclosed in a metal can with a clipped or sealable lid (paint cans are normally used for this purpose) and surrounded by packing material such as vermiculite. The outer metal can must be labeled with the number of the sample contained inside.

Low level water samples for organics analysis must be shipped cooled to 4°C with ice. No ice should be used in shipping: dioxin samples; inorganic low level water samples; or, organic/inorganic medium/high level water or soil samples. Ice is not required in shipping low level soil samples, but may be utilized at the option of the sampler.

Low and medium level water samples for inorganic analysis require chemical preservation (reference Chapter II, Section B, for preservation techniques).

Waterproof, metal ice chests or coolers are the only acceptable type of sample shipping container. Shipping containers should be packed with non-combustible, absorbent packing material (vermiculite is recommended) surrounding the plastic-enclosed sample bottles (or metal cans containing samples) to avoid sample breakage in transport. Sufficient packing material should be used so that sample containers will not make contact during shipment. Earth or ice should never be used to pack samples. Earth is a contaminant, and ice melts resulting in container breakage.

Unless the sampler requests otherwise through SMO in advance, the laboratory disposes of unused sample volume, sample bottles and packing materials 90 days following sample receipt.

A summary of correct sample packaging is illustrated in Appendix C.

2. Shipping Instructions

Samples for organics analysis must be shipped "Priority One/Overnight." If shipment requires more than a 24-hour period, sample holding times can be exceeded compromising the integrity of the sample analyses.

Samples for inorganics analysis should be held until sampling for the Case is complete and shipped "Standard Air" for two-day delivery. In the RAS inorganic program, three days is the recommended period for collection of a Case of samples.

All samples should be shipped through a reliable commercial carrier, such as Federal Express, Emory, Purolator, or equivalent. Sampling offices are responsible for sample shipping charges.

The NEIC/Denver and the ERT/Cincinnati hazardous waste site manuals (references provided in Appendix E), provide extensive information on EPA-approved sample packaging and shipment techniques. In addition, questions concerning sample packaging and shipment may be directed to SMO.

3. Shipment Coordination

To enable SMO to track the shipment of samples from the field to the laboratory and ensure timely laboratory receipt of samples, the sampler must notify SMO immediately following all sample shipments. At that time, the sampler should provide the following information:

- o Sampler name
- o Case Number and/or SAS Number of the project.
- o Batch numbers (dioxin only)
- o Exact number(s) and type(s) of samples shipped.
- o Laboratory(s) samples were shipped to.
- o Carrier and airbill number(s) for the shipment.
- o Method of shipment (e.g., overnight, two-day)
- o Date of shipment.
- o Any irregularities or anticipated problems with the samples, including special handling instructions, or deviations from established sampling procedures.
- o Status of the sampling project (e.g., final shipment, update of future shipping schedule).

Sample shipments made after 5:00 PM EST should be called in to SMO at the start of business the next day (8:00 AM EST). SMO must be notified by 3:00 PM EST Friday concerning information on sample shipments going out Friday intended for Saturday delivery/pickup. CLP laboratories remain open to receive or pick-up Saturday shipments only upon advance notification by SMO and only when shipment airbill numbers have been provided to SMO by the sampler.

The success of sample shipment coordination depends on the proper use and handling of the sample tracking forms and on timely and complete communication among the RSCC, samplers, SMO, and laboratories. Any postponements or cancellations, changes in the number or type of samples to be collected or shipping dates must be communicated to SMO as soon as this information is known, to facilitate this process. Appendix C contains a checklist for coordinating sample shipment.

D. Procedures for Problem Resolution

1. Resolving Problems Concerning Sample Shipment and Analysis

Program laboratories routinely notify SMO upon encountering problems with sample receipt or during sample analysis. (Examples of these types of problems are listed in Appendix C.) In response, SMO immediately contacts the RSCC to relay the problem and to assist in formulating a solution. SMO then contacts the laboratory involved to communicate the recommended action and to authorize processing of the sample(s) in question. The key to this type of problem resolution is timeliness, since delays impact sample holding times, contractual time requirements for sample extraction and analysis, and if extreme, could invalidate the analyses.

General questions a user may have regarding sample shipment, sample analyses, laboratory contracts, or the status of data deliverables on a particular Case or SAS should be referred to the appropriate SMO personnel. Questions of a technical nature regarding contract analytical procedures should be referred to the appropriate NPO official or to the appropriate Regional Deputy Project Officer through the NPO. (Reference Appendix A, CLP Directory.)

2. Resolving Problems Concerning Analytical Data

In the CLP's Regional/Laboratory Communication System, authorized Regional personnel can contact specified laboratory personnel, after laboratory data submission only, to resolve questions regarding the final data package. This system may never be used to initiate additional analytical work to resolve data questions. All communications between laboratories and Regional contacts are recorded by each party on a Telephone Record Log, indicating the number of the Case and/or SAS

concerned, the individuals making contact, the subject of the discussion and its resolution. In follow-up, copies of completed telephone logs are sent to SMO by both the Regional and laboratory parties and become a permanent part of the Case/SAS file. An example of the Telephone Record Log is included in Appendix C. Copies are available from SMO.

Prior to the laboratory's submission of the final data package, client queries regarding those analyses or data are handled through SMO. Depending on the nature of the question, SMO will respond or will direct the client to the appropriate NPO official for resolution. Comments regarding laboratory performance, whether positive or negative, should be directed in writing to the appropriate Regional DPO, with a copy provided to the NPO.

CHAPTER IV

AUXILIARY SUPPORT SERVICES

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In addition to its analytical programs, the CLP provides several supplementary services. These activities have developed as a natural adjunct to the program's analytical services. The purpose of this chapter is to provide the user with a description of each auxiliary program service and how the service may be accessed.

A. Sample Bottle Repository Program

1. Types and Quantities of Bottles Available

Under the Sample Bottle Repository operation, nine types of sample containers are available to CLP clients for use in hazardous waste sampling activities of the Superfund Program. Bottles provided through this program are precleaned and QC-tested according to prescribed procedures to ensure that no contamination exists that might affect sample data results.

Clean, empty bottles and closures are shipped to users in protective cardboard cartons. (Sample coolers and sample preserving agents are not supplied through the Repository program.)

The following chart lists the types of bottles provided through this program, the case sizes in which bottles are shipped, and the type(s) of samples appropriate for collection in each bottle type. Each bottle type is cleaned and QC tested by procedures directly related to the specific analyses that may be performed on samples collected in the bottle. Therefore, to ensure appropriate quality control, users are instructed to utilize bottles only to collect sample types as listed on the following chart.

SAMPLE BOTTLE REPOSITORY SERVICES

Container Type	Description	No. Per Case	Used for RAS Sample Type*
1	80 ounce amber glass bottle with teflon-lined black phenolic cap	6	Extractable Organics Low Concentration Water Samples
2	40-ml glass vial with teflon-backed silicon septum cap	72	Volatile Organics Low & Medium Concentration Water Samples
3	1-liter high-density polyethylene bottle with poly cap	42	Metals, Cyanide Low Concentration Water Samples
4	120-ml wide-mouth glass vial with poly cap (white)	72	Volatile Organics Low & Medium Concentration Soil Samples
5	16-oz wide-mouth glass jar with teflon-lined black phenolic cap	48	Metals, Cyanide Medium Concentration Water Samples
6	8-oz wide-mouth glass jar with teflon-lined black phenolic cap	96	Extractable Organics Low & Medium Concentration Soil Samples -and- Metals, Cyanide Low & Medium Concentration Soil Samples -and- Dioxin Soil Samples -and- Organics & Inorganics High Concentration Liquid & Solid Samples

*This column specifies the only type(s) of samples that should be collected in each container.

(continued)

SAMPLE BOTTLE REPOSITORY SERVICES (continued)

Container Type	Description	No. Per Case	Used for Sample Type*
7	4-oz wide-mouth glass jar with teflon-lined black phenolic cap	120	Extractable Organics Low & Medium Concentration Soil Samples -and- Metals, Cyanide Low & Medium Concentration Soil Samples -and- Dioxin Soil Samples -and- Organic & Inorganic High Concentration Liquid & Solid Samples
8	1-liter amber glass bottle with teflon-lined black phenolic cap	30	Extractable Organics Low Concentration Water Samples
9	32-oz wide-mouth glass jar with teflon-lined black phenolic cap	36	Extractable Organics Medium Concentration Water Samples

*This column specifies the only type(s) of samples that should be collected in each container.

2. Ordering Procedures

The Sample Bottle Repository program may be used by any organization scheduling samples through the CLP, and is commonly accessed by Regional and remedial contractor clients. Two individuals from each organization are designated by SMO as Repository Authorized Requestors (RARs) and only these individuals may place bottle orders through the program. State personnel should access the bottle program through their EPA Regional office.

Users should contact SMO initially to become authorized to order from the Repository and to obtain a supply of Delivery Order forms. Thereafter, the RAR orders bottles directly from the Repository. Since the Repository can respond only to orders submitted by a SMO-designated RAR, users must notify SMO of any change in RAR designations.

There are three types of bottle orders, defined by the amount of time between the date the order is placed and the requested delivery date:

- o Routine Order — Ten or more working days lead time for delivery.
- o Fast-Turnaround Order — More than three days, but less than ten days lead time for delivery.
- o Emergency Order — Less than three days lead time for delivery.

Routine orders are mailed to the Repository utilizing the Delivery Order (DO), a four-part carbonless form. The DO must be signed by an RAR. The first two copies of the completed DO are sent to the Repository at the address indicated on the form, the third copy is sent to SMO, and the fourth copy is retained for the user's file.

Fast-turnaround and emergency orders should be called in to the Repository, at the telephone number provided on the form, and the written Delivery Order distributed as outlined above, to confirm the order. When placing a telephone order, the RAR must give the Repository the DO number for the order and provide the corresponding written DO in followup.

Users should submit orders a minimum of two weeks in advance of the required delivery date, whenever possible, to ensure timely and complete delivery of bottles. Emergency and fast-turnaround orders are filled on an "as available" basis from the Repository's emergency inventory stock. It may not be possible to respond to all emergency and fast-turnaround orders, as response depends on Repository inventory and in-process orders.

In the event that an order is cancelled, the user must immediately contact the Repository to verbally cancel the order, and follow up with a cancellation memo to the Repository, sending a copy of the memo to SMO. Cancellation memos, as well as all other project-related correspondence, should cite the appropriate DO number.

3. Shipment Information

Upon receipt of the Delivery Order, Repository personnel schedule shipment and begin preparing the order. Repository personnel immediately notify the RAR if for any reason the order cannot be met in full by the requested delivery date. Often, partial shipments can be arranged over several days to meet the client's requirement. If concurrent orders are received at the Repository that cannot be filled in a timely manner and if partial shipments cannot be satisfactorily arranged, the Repository immediately notifies SMO, which coordinates with the involved Regional Sample Control Center(s) in determining the priority of bottle orders based on the Region's sampling needs.

Each carton in a Repository shipment is marked "Box ___ of ___," and a Repository Packing List (PL) is included in Box 1 of each shipment, so that the designee can verify that the entire shipment has been received. In addition, the Repository sends two copies of the shipping PL to the RAR at the time of shipment. The RAR confirms with the designee that the entire shipment was received in good condition, then enters the date of receipt and signs the packing list in the space indicated to confirm receipt. The RAR must return a copy of the signed packing list to SMO within seven days of shipment receipt.

4. Procedures for Problem Resolution

a. Resolving Problems Concerning Bottle Shipment

If there are problems relating to shipment (i.e., shipment does not arrive by scheduled date, shipment is incomplete or contents are damaged), the shipment designee or RAR (as appropriate to the situation) should contact the Repository immediately to resolve the problem. If the problem is not satisfactorily handled in this manner, the RAR should then contact SMO for resolution.

b. Resolving Problems Concerning Bottle Contamination

If a user has definitive cause to suspect that container contamination may have affected sample analysis results, the concerned RSCC should notify SMO by telephone and follow up with an explanatory memorandum directed to the appropriate NPO Project Officer (PO). The memorandum should include the following information: description of the problem, rationale for suspecting bottle contamination, supporting documentation (if available), and lot number(s) for all bottles concerned. Bottle lot numbers must be provided before any corrective action can be taken. Prior to

requesting corrective action, the user should verify to the extent possible that the contamination encountered is not a result of either improper field procedures (e.g., use of contaminated water for field blanks) or poor laboratory practice (e.g., background contamination) and include this information as part of the rationale in the memorandum submitted to the NPO.

After review of submitted information, the PO notifies SMO to initiate appropriate follow-up action. Upon notification by SMO, the Repository will first check the QC analysis record for the concerned lot(s) of containers and verify that contract procedures were correctly followed and that the lot passed the QC analysis. Should an error be identified in this process, the Repository will notify SMO immediately.

As a second step, following PO authorization the Repository will pull the QC storage container for the bottle lot(s) and analyze the container(s) for suspected contaminants. SMO will notify the RSCC concerning the analysis results, so that if there is a contamination problem, analysis data from samples collected in other containers in that lot can be appropriately flagged. Should contamination be confirmed by analysis of the QC storage container, the Repository will immediately identify the problem and correct procedures as necessary to resolve it. Should a wide-spread problem be identified at any time, RARs would be notified in a timely manner so that bottles could be pulled before use in the field.

5. Summary of Bottle Cleaning and Quality Control Procedures

Containers provided under this program are prepared in batches or lots of approximately 100 containers. (Exact lot sizes for each bottle type are determined, so that a bottle lot is not split between cases.) Bottles are cleaned in lot groups, utilizing procedures specifically designed to remove any possible contaminants. Different cleaning procedures are employed according to the container material and the type(s) of samples that will be collected in the container.

Each bottle lot is assigned a unique identifying number. This lot number is permanently affixed to each bottle in the lot, recorded in the Repository logbook, and entered on the shipment Packing List when bottles from that lot are shipped. For QA purposes, it is vital that each container's lot number be permanently associated with the sample collected in that particular container. Therefore, it is recommended that samplers record each container lot number and associated CLP sample numbers in their field records at the time that samples are collected.

The Repository routinely performs QC analyses on one percent of the number of containers per lot. No lot is released for shipment until acceptable QC results are verified. QC analyses are performed by equivalent methods to those utilized in CLP RAS programs, and are specific to the types of samples that may be collected in the container. If a container fails to pass the QC check, the associated lot of bottles is pulled and reprocessed through the system.

A QC release number is assigned to each lot of bottles that passes QC analysis, and is marked on both the analysis and storage QC containers for each lot. The QC release number is cross-referenced with the lot number in Repository records, so that all QC records can be accessed based on the lot number identification.

In addition to the QC analysis check, an additional bottle is removed from each lot and stored for QC purposes. QC storage containers are kept in a contaminant-free area of the Repository which is monitored for volatile compounds. The QC storage containers are retained as a backup to recheck for cleanliness, should possible contamination of a lot of bottles come into questions at a later date.

B. Information Services

1. Regional Sample List Report

On a monthly basis, SMO distributes a Regional Sample List Report to each Regional Sample Control Center (RSCC). This computerized report provides a summary of the Region's use of CLP resources during the previous month. The following information is included in the Sample List Report:

- o Case number
- o Sample number
- o Laboratory name and contract number
- o Laboratory sample receipt date
- o Sample weight and components analyzed
- o Sample type
- o Data due date
- o Days late/early calculations for contractually required deliverables (i.e., extraction, VOA analysis and sample data package).

This report is provided to the Region for use as a management and resource planning tool, as well as for verification of monthly sample receipts and analyses performed. While client activity is reported on a monthly basis, information covering other time periods can be provided upon RSCC request to SMO. An example of the Regional Sample List is contained in Appendix D.

2. Sample Status Information

In its sample management role, SMO schedules sample analysis and tracks samples from shipment through data reporting, maintaining manual and computerized tracking systems. SMO maintains ongoing communication with the RSCC regarding sample status, and responds to inquiries from concerned parties as appropriate.

3. General Program Information

Under the direction of CLP management, SMO serves as the program's information center for both incoming calls, correspondence and dissemination of information. Upon request, SMO provides program participants and interested parties with information and material on program services and procedures, and refers callers to the proper sources for additional information as appropriate.

C. Enforcement Support

1. Generation of Enforcement Quality Data

One major objective of Superfund is to recover from responsible parties costs incurred in the investigation and cleanup of hazardous waste sites. The process by which these parties are identified and determined to be responsible often involves litigation, and frequently the Agency's case is based upon CLP analytical data generated from samples collected at a given site. The CLP supports these and other enforcement requirements of Superfund by ensuring that CLP-generated analytical data is admissable and defensible in court. The CLP, in cooperation with the EPA National Enforcement Investigations Center (NEIC), has established detailed procedures and documentation to ensure that CLP sample data meets Agency enforcement standards.

a. Chain-of-Custody and Document Control

Each CLP analysis contract requires the laboratory contractor to implement a comprehensive document control system and to employ strict chain-of-custody procedures in the receipt and handling of samples throughout the analysis and data reporting process. The laboratory must have written Standard Operating Procedures (SOPs) for: receipt and log-in of samples, maintenance of sample security after log-in, tracking the sample through all steps of preparation and analysis, and organization and assembly of all sample-related documentation on a Case-specific basis. Required document control and chain-of-custody records include, at a minimum: sample tags, custody records, sample tracking records, analyst logbook pages, bench sheets, chromatographic charts, computer printouts, raw data summaries, instrument logbook pages, correspondence and the document inventory.

Before a laboratory is awarded a CLP contract and continuing periodically throughout the life of the contract, each laboratory facility is audited by NEIC to ensure compliance with these requirements. In addition to facility audits, laboratory data and evidence documentation are reviewed by NEIC on a regular basis, as described below.

b. NEIC Evidence Audits

Laboratories are contractually required to purge their files of all evidence and other documentation relating to sample analysis, and to submit a complete Case file purge package (as detailed in the previous section) to NEIC six months after submission of analysis data. The Contractor Evidence Audit Team (CEAT) reviews all document control packages to verify that the documentation is complete and conforms to contractual requirements, and routinely audits a selected number of packages for document accuracy and suitability for enforcement uses. A list of Case file purge materials is included in Appendix D.

NEIC evidence audits involve production of sample profiles. A sample profile traces the path and handling of specific samples from the point of collection through shipping, laboratory receipt, chemical analysis and data reporting. This process identifies any gaps or lapses in the chain-of-custody so that measures may be taken before enforcement case preparation either to correct the problem or eliminate the data from consideration in enforcement action. Examples of NEIC sample profiles for organic and inorganic Cases are incuded in Appendix D.

Following review and/or audit, NEIC returns laboratory Case file purge packages to the originating Region, where the packages are filed with the analysis data and may be subject to additional Regional review. In addition to the routine generation of sample profiles in evidence audits, authorized Regional personnel and enforcement attorneys may request NEIC to prepare sample profiles for Cases to support enforcement activities.

2. Additional CLP Enforcement Support

Enforcement activities frequently require direct CLP support. Court appearances and other mandated deadlines often do not allow sufficient time for completion of the normal Case file purge package submission, review and audit process. In this event, CLP assistance may be required. Also, data package evaluation and/or testimony from laboratory or CLP personnel may be needed.

The CLP has established procedures to meet these short-term requirements through SMO, which coordinates and responds to enforcement-related requests. This process is described in the following sections.

a. Request Procedures

Requests are originated by a Regional counsel, NEIC or other appropriately designated EPA personnel, and are submitted in a memorandum to the NPO Program Manager (PM). The PM reviews the memorandum, determines necessary CLP action and forwards the request along with his directions for action to SMO. If a request requires immediate response, the requestor should contact SMO directly by telephone and relay the request, following up with the written request memorandum to the PM.

b. Requestor Information Required

The following information must be provided by the requestor to initiate CLP action:

- Name and telephone number of Regional contact coordinating the enforcement activity
- Case number(s) of specific site sampling(s)

- o Sample number(s)
- o Date(s) of sample collection
- o Laboratory(ies) that performed the analysis
- o Type of support needed

Most requests can be met quickly, however a two-week lead time is strongly recommended.

c. Documentaton/Support Provided by CLP

In responding to enforcement support requests, SMO provides the following support:

- o Arranges for the timely delivery of all laboratory and evidence documentation relating to specific sample analyses (within a minimum of seven days of request, if designated).
- o Obtains information relating to sample analysis or handling not specifically required under laboratory contracts.
- o Arranges for expert testimony by laboratory or CLP personnel.
- o Augments Regional resources for analytical data review.
- o Supplies replacement copies of analytical data.

D. Cost Recovery Substantiation

The CLP provides documentation concerning program analytical costs to the EPA's Office of Waste Programs Enforcement (OWPE) in support of Superfund cost recovery efforts. Formal procedures have been developed to respond to Agency requests for this information. Site-specific cost data, the information required to initiate this process, and cost documentation provided by CLP are described in the following sections.

1. Request Procedures

Requests for cost recovery (CR) documentation on a site must be made through OWPE, using the Cost Recovery Checklist. This checklist is designed to provide basic site information needed to compile cost documentation from the CLP and other sources. A copy of the OWPE Cost Recovery Checklist is included in Appendix D. Each requesting office must complete the CR Checklist, providing all information requested, and mail the completed checklist to OWPE.

In response to requests, OWPE collects and organizes cost-related documentation from the CLP and several other sources, such as the EPA Financial Management Division, the EPA Office of Emergency and Remedial Response, and REM/FIT, TAT and other Agency contractors. In case of conflicts, OWPE is responsible for prioritizing incoming requests.

A minimum lead time of four to six weeks is required to complete this process and provide the requestor with a full site cost recovery report.

2. Requestor Information Required

Requestors are asked to supply the following information items on the CR Checklist to enable the CLP to prepare its cost documentation package. (Complete checklist information is required to obtain a full OWPE cost report, which contains information from other sources in addition to the CLP.)

- Identification number

  The appropriate CLP Case or SAS number must be entered here. If the Case or SAS number refers to more than one site, the specific sample numbers (from the Case Traffic Reports or SAS Packing List) related to the sites in question must be provided.

- Name and location of site
- Date the cost report is needed

  A minimum of four weeks from the date of request must be given. Six week lead time is recommended whenever possible.

3. Documentation Provided by CLP

The CLP provides an information package to OWPE which is part of OWPE's full cost recovery report to the requestor. The CLP provides the following information to OWPE:

- Financial Summary for Cost Analysis

  This summary lists analytical and sample management costs on a Case and/or SAS basis, showing total expenses for a particular site. Information on how sample management costs are computed is included.

- Summary of Invoices, Vouchers, and Cancelled Checks

  This report lists all SAS laboratory invoice numbers and includes SAS cancelled check numbers. The summary is organized by SAS number and laboratory name.

- Routine Analytical Services (RAS) Cost Report

  This computerized report is organized by Case number and laboratory contract. It includes laboratory invoice numbers, net analysis costs, total of adjustments for late/early deliverables, and sample management costs; and lists total costs on a sample-by-sample, laboratory contract, and Case basis.

- Special Analytical Services (SAS) Cost Report

  This computerized report provides a brief description of the service provided, including the number of samples analyzed, data turnaround time, contract start date, laboratory receipt date, unit costs, sample management costs, and contract status; and lists total contract costs on SAS and laboratory bases.

- Copies of all SAS-Related Cancelled Checks and Laboratory Invoices

  CLP documentation, as described above, is assembled by SMO and submitted to OWPE. OWPE provides this CLP information, along with documentation gathered from other sources, to the Regional case development team in the full cost recovery package.

E. Data Review Services

In its program support role, SMO has developed systems of quality assurance and quality control evaluation, working under the guidance of EPA personnel most directly concerned with hazardous waste site data quality assessment. These systems can be applied to CLP data generated from IFB laboratory analysis contracts, upon client request.

The objectives of the data review program are:

- o To provide systematic and standardized data quality assessment at the Case, sample and sample fraction levels.
- o To increase the amount of useable data by resolving or proposing solutions to analytical or quality control problems.
- o To determine the useability and limitations of the data given particular field or policy assessment questions.

The purpose of the CLP's data review service program is to assist, supplement and/or extend Regional capabilities in evaluating the quality and applicability of data for intended uses. The program's application of standardized data evaluation techniques and procedures to given Cases and samples of interest ensures the Regional client a degree of confidence when using the data for enforcement or remedial action planning. Several different types of data review may be conducted depending upon Regional needs and service availability.

1. Types of Review Provided

Four basic types of data review are provided in this program. One or more types of review may be requested for a given Case, and review may be requested for more than one Case. As indicated, these data review services are intended to supplement or extend, but not to replace, Regional data review.

The four types of data review currently provided through this program are summarized below:

- o QA/QC Compliance Review

  A technical and administrative review of each Case, sample, and sample fraction for compliance with contractually-required ranges on measures of precision and accuracy.

- o Problem Case Review

  A technical evaluation of a Case which has failed a Regional or SMO QA/QC Compliance Review in order to resolve or propose solutions to analytical or quality assurance problems.

- o Applications Review

  A technical evaluation of the validity and limitations of the data given particular field or policy assessment questions requiring actual measures of precision and accuracy.

- o Consulting Review

  A technical second opinion of the data from a previous review. Serves an appeal function in determining data useability.

Each type of review is further characterized below.

In the QA/QC Compliance Review, the following areas are examined: data completeness, spectra matching quality, surrogate spike results, matrix spike results, duplicate sample analysis results, blank analysis results, instrument tuning and performance results, chromatography checks, and calibration results. Criteria from each area of performance are applied in the evaluation of each fraction. Acceptability or unacceptability is determined separately for volatiles, semi-volatiles, pesticides and dioxins, using contract ranges as guidance.

The purpose of the Problem Case Review is to increase the amount of useable data by resolving or proposing solutions to analytical or quality assurance problems. Data which have failed the QA/QC Compliance Review may be adequate for the intended purpose, even when laboratory problems cannot be resolved.

The Applications Review attempts to determine the actual quality of the data and relate this assessment to particular field or policy assessment questions. The confidence limits set by compliance to the contractually-determined basic data quality measures are further examined. Additional statistical measures are calculated and reported, and the new confidence levels are related to the Regional client's intended use (e.g., enforcement, site screening, remedial design, site monitoring).

The Consulting Review allows the user to obtain a second opinion of the data quality in problematic situations where the assessment of data quality is either complex, critical or very dependent upon field conditions.

2. Request Procedures

Requests for Data Review Services should be directed to the Regional Deputy Project Officer (DPO), with a copy submitted to SMO, Attention: Data Review Team, and a copy provided to the Regional Sample Control Center. In follow-up, the DPO must notify SMO that the request is authorized, or the DPO may choose to initiate all requests for the Region.

Upon authorization by the DPO, SMO schedules the review and notifies the requestor of the date the review is scheduled for completion. It should be noted that review cannot be initiated until all deliverables for the subject Case(s) have been received from the laboratory.

All requests should be placed using the SMO Data Review Request memorandum. An example of the request memorandum is provided in Appendix D. Copies are available from SMO on request.

3. Requestor Information Required

In completing the Data Review Request form, the client must provide the following information for each Case for which review is requested:

- o SMO Case number
- o Site name
- o Analytical laboratory name(s)
- o Number of samples
- o Sample list
- o Type(s) of review requested
- o Requested date for review completion
- o User name and contact
- o Intended use of data

A minimum lead time of two weeks is required for data review. However, review time is variable depending upon the number of samples involved and the nature of the review. If conflicts occur, the appropriate DPO(s) will be notified and asked to prioritize requests.

4. Documentation Provided by CLP

An evaluation report, including supporting statistics and documentation, is produced with each type of review.

The QA/QC Compliance Review report indicates for each sample fraction whether the data are considered: acceptable, acceptable given qualifications noted, or unacceptable. Reasons for the designation are

discussed and completed data review forms for each of the areas of performance are included in the report to the client. Examples of data review forms used in the QA/QC Compliance Report are included in Appendix D.

The contents and format of reports for Problem Case, Applications and Consulting Reviews are determined by the nature of the data problem(s) being examined and/or the purpose for which the data will be used. Any statistical measures used to define data quality and the raw data supporting conclusions are appended to these reports.

CHAPTER V

PROGRAM QUALITY ASSURANCE

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The purpose of this chapter is to present a summary of the different aspects of quality assurance (QA) and to show their interrelationship within the overall structure of the program. This information is included to familiarize users with the program's basic QA principles and their application, and to facilitate a more complete understanding of the quality of CLP analytical data in terms of potential utilization.

A. Interface with Agency Quality Assurance

The primary role of the CLP is to support the Agency's Superfund investigation and cleanup efforts by producing analytical data of known and documented quality useable for Agency enforcement actions keyed to identification of pollutant sources and recovery of cleanup costs. Therefore, a comprehensive quality assurance program that reflects Agency QA objectives has been incorporated into all aspects of CLP operations. The CLP links two primary aspects of quality assurance (QA): field QA, which includes field sampling operations and QA project planning; and laboratory QA, which is comprised of analytical method QC and external or program QA.

Field operations include sampling activities performed by the EPA Regions and National Remedial Action/Field Investigation Team (REM/FIT) and Technical Assistance Team (TAT) contractors, which result in samples being processed through the CLP for analysis. The CLP NPO coordinates closely with these and other Agency sampling groups and Agency QA teams, in the development and application of quality-controlled Program Plans and site-specific Project Plans. These plans include the consistent use of Agency-specified containers, sampling techniques, sample preservation, sample tags and chain-of-custody documents, and adherence to DOT regulations in sample shipment. The CLP strongly supports the use of consistent field sampling, and sample packaging and shipment

techniques, and specifies types of sample containers and required sample volumes for appropriate target analyses. Through its Sample Bottle Repository system, the CLP provides Superfund samplers with the precleaned sampling bottles for use in the field.

The CLP is directly involved in all aspects of laboratory QA. Analytical methods require extensive Agency-specified quality control (QC) procedures and documentation to ensure a complete data product that will withstand legal scrutiny. The CLP operates an extensive external QA program, which includes: pre-award and post-award laboratory performance evaluation sample analyses and laboratory facility evaluations, required submission of laboratory Standard Operating Procedures (SOPs) for analytical operations and documentation, continuous monitoring of lab performance by Headquarters contract POs and Regional DPOs, and a multi-level data review process to evaluate the validity of the data product.

The CLP, through a variety of mechanisms, continuously strives to improve the quality of program data by maintaining state-of-the-art analytical methods, refining the structure and requirements of analytical contracts, and strengthening lab operations. CLP QA activities are coordinated through the NPO QA Officer, to ensure that the CLP is operating in accordance with overall Agency QA mandates.

The application of field QA is addressed in Chapters II and III, where sample volume, container, preservation, packaging, shipment and documentation requirements are discussed. Analysis or method QC is addressed for each analytical program in Chapter II, which contains a description of contract analytical methods and QC requirements for each program. The following sections of this chapter describe the program's external laboratory QA activities.

B. Laboratory Selection Process

1. Bid Price

The first criterion for laboratory selection is bid price. Following bid opening, bid abstracts are reviewed and evaluated by NPO and EPA contract officials. The lowest competitive bidders are selected to participate in pre-award bid confirmation, the process through which bidder responsiveness and responsibility for award are demonstrated and evaluated.

2. Pre-Award Bid Confirmation

Pre-award bid confirmation may include three activities: (1) bidder analysis of performance evaluation (PE) samples; (2) bidder submission of Standard Operating Procedures (SOPs); and (3) site evaluation of the bidder's facility, performed by EPA program management and contracts personnel.

a. Performance Evaluation Sample Analysis

Laboratories chosen to participate in the pre-award process are sent a set of PE samples for analysis. The PE samples are prepared by EMSL/LV and are representative of the types of field samples that the contractor would routinely be analyzing under the subject procurement. The laboratory is required to analyze PE samples according to contract procedures set forth in the IFB, and to report PE sample data according to IFB requirements, within a time period of 21 days. Bidders' PE sample data are evaluated by NPO and EMSL/LV personnel, in terms of compliance with contract requirements and accuracy of determination of compounds at the levels

known to be in the PE samples. Analysis results are rated by a scoresheet developed by EMSL/LV. The PE sample score is a primary consideration in determining bidder responsiveness/responsibility for contract award.

b. Standard Operating Procedures

Bidders are required to submit copies of all laboratory Standard Operating Procedures (SOPs) at the time of submission of PE sample data. SOPs are not required to coincide with each specific detail of the contract requirement, but must be representative of good laboratory practices and must demonstrate that the laboratory has a facility-wide quality assurance program in place and operating. Bidder SOPs are reviewed by NPO and EMSL/LV personnel and are utilized by EPA in performance of the site evaluation.

c. Laboratory Evaluation

EPA NPO and EMSL/LV personnel participate in site evaluations of laboratory facilities of bidders which scored acceptably on the PE sample analyses. EPA personnel perform a walk-through of the facility and complete a site evaluation questionnaire. The results of the site evaluation are considered in final determination of bidder responsiveness/responsibility for contract award.

C. Laboratory Start-Up Process

Laboratories entering the program undergo a learning curve process during which they become fully familiarized and obtain expertise in application of program methodologies and quality control procedures. To reduce the learning curve period and bring laboratories "up to speed" in a timely manner, CLP management employs a series of laboratory start-up procedures which are utilized during the laboratory's initial contract operations and whenever laboratory problems are identified during contract performance.

1. Provision of Standards to Laboratory

Immediately following contract award, EMSL/LV arranges for the provision of standard materials (SMs) to the contractor, through the Agency's contractor-operated QA Materials Bank. These SMs are utilized by the laboratory in performing initial instrument calibrations and as reference standards throughout contract performance.

2. PO Review of First Data Packages

Initial data packages are targeted for immediate review and evaluation by the NPO Project Officer (PO), EMSL/LV and the Region. This review is intensive and focuses on any problems the laboratory has, either in applying methodologies or in reporting the data. The PO then supplies feedback to the laboratory concerning the status of the data and works with the laboratory in identifying and remedying problems.

3. PO/DPO Laboratory Visits

Depending on the extent of the problems found during the review of an initial data package, the PO may visit the laboratory facility and work on-site with laboratory personnel in rectifying problems. This process also

occurs on an ongoing basis during the life of the contract. Site evaluations are performed yearly by EPA staff, and the PO and/or Deputy Project Officer (DPO) visit the laboratory on an as-needed basis to resolve performance problems.

4. PO/DPO/SMO/Laboratory Communication

Telephone communication is the most widely applied method for problem solving and maintaining efficient laboratory operations, both during the laboratory start-up phase and throughout the performance of the contract. During the start-up period, communication links are established and the laboratory becomes familiarized with the communication process. In general, the laboratory notifies SMO immediately upon identification of any problem regarding the samples (e.g., insufficient sample volume) or any difficulties encountered in analysis. SMO routinely resolves sample-related problems in coordination with the Regional client, and refers technical problems to the contract PO, who contacts the laboratory and resolves the problem. The resolution and any specific actions taken are reported to SMO which records this information as part of the permanent Case record. The laboratory also records the problem and resolution on the sample data report, so that the Region considers this information in association with evaluating and using the data. With the appointment of Regional DPOs to assist in the monitoring of contractor performance, the DPO will play a major role in ongoing laboratory problem resolution in coordination with the PO.

D. Laboratory Performance Evaluation

1. Performance Evaluation Sample Analysis

Performance Evaluation (PE) samples are prepared by ORD EMSL/LV and sent to contractor laboratories for analysis, normally on a quarterly basis. PE samples are typically shipped as "double blind" samples, i.e., the PE samples are not discernable from routine field samples, to ensure that the laboratory processes the samples in a routine manner. Evalution of PE sample data is performed by EMSL/LV and is used by the NPO in formally evaluating laboratory contract performance. Additionally, PE sample QC data are entered by EMSL/LV into the program's QA Data Base, and are utilized, along with other laboratory data, in trend analyses, and evaluation and revision of contract QC criteria.

2. Laboratory Site Evaluation

At least once a year, EPA NPO, Regional and EMSL/LV personnel visit each laboratory facility and evaluate laboratory procedures. The evaluation reports which result from these site visits are utilized by the NPO in identifying and remedying laboratory performance problems. Repeat site visits by EPA NPO, Regional and EMSL/LV personnel are made on an as-needed basis throughout the year, to resolve laboratory problems.

3. Corrective Action

Upon identification of laboratory performance problems, the PO and DPO work closely with the laboratory to effect correction of the problems. Depending on the scope of the problems, the laboratory may be placed on temporary hold, whereby the laboratory does not receive additional samples for analysis until the problem has been corrected.

Should the contractor's non-compliance to contract performance or deliverable requirements continue, the EPA Contracting Officer is requested by the NPO to issue a Show Cause Notice to the contractor. This document requires the contractor, within a ten-day period of time, to present the government with any facts bearing on the issue, to be used in the government's determination regarding whether the contractor's failure to perform arose out of causes beyond the laboratory's control and without fault or negligence on the part of the contractor. The contractor, in response, must submit substantial evidence to demonstrate that the contract should not be terminated for default.

A recovery plan is generally included as part of the contractor's response to the Show Cause Notice. EPA Contracts and NPO officials review the contractor's response and proposed recovery plan, and determine whether the contractor has presented sufficient evidence to demonstrate timely remedy of the noncompliance. Following this review, if the contractor has presented acceptable evidence toward recovery, the government issues a Cure Notice to the contractor which delineates the government-accepted recovery plan that the contractor must follow to avoid contract termination. The government's recovery plan includes actions and time schedules for completion of each step of the recovery process, and specifies an overall time period acceptable for completion of recovery.

Should the contractor not comply with the recovery schedule, the next and final step may be contract termination by the government for default. In addition to terminating the laboratory's contract, this action impacts on evaluation of the contractor's responsiveness/responsibility for award under future CLP solicitations.

E. Sample Data Evaluation

1. Intercomparison Check Sample Studies

Intercomparison check sample studies are initiated by the EPA Regions on a periodic basis and involve simultaneous shipment of known samples to two or more CLP and/or Regional laboratories for analysis. Check samples are routinely shipped as "single blind" sample, i.e., the laboratory is aware samples are check samples but does not know sample composition. Analytical data from study participants are compiled by the Region and used in comparative data evaluation. The Region provides intercomparison sample study results to the NPO and EMSL/LV for use in programmatic applications. These studies differ from the PE sample program in that check sample data do not result in contractual evaluation of individual laboratory performance.

2. Regional Sample Split/Spike Programs

This Regionally-directed program involves simultaneous sample analysis by two or more CLP and/or Regional laboratory facilities, and provides the Region with comparative data utilized in evaluating application of methods. In the sample split program, the Regions arrange to have field samples split and sent to different contractor and Regional laboratories for analysis. In the sample spike program, a known sample volume is prepared and divided into two or more equivalent portions. Each sample portion is then spiked with known levels of contaminants, and sent to different contractor and/or Regional laboratories for analysis. Results of split/spike sample analyses performed by CLP laboratories are provided to the NPO and EMSL/LV by the Region.

F. Analytical Data Review

Upon completion of analysis and data reporting, the laboratory simultaneously sends a copy of the complete data package to the CLP SMO, EMSL/LV and the Regional client. Each of these groups performs complementary aspects of data review.

1. EMSL/LV Data Review

On a routine basis, EMSL/LV performs a comprehensive QA audit on CLP sample data packages using Mil. Standard 105D. Based on this review, EMSL/LV prepares a detailed report on the data packages, which is provided to the NPO and to Regional clients by SMO. This review package is valuable to both program management and users in evaluating the suitability of the contract methods to the types of samples analyzed, the quality of the analytical data, and the performance of the contractor laboratories.

In addition, EMSL/LV enters surrogate and spike recovery information into the program's QA Data Base. These data are then statistically evaluated and utilized to determine and revise contract QC acceptance windows for CLP-generated data and to characterize laboratory performance.

2. Regional Data Review

The Regional client reviews all data packages resulting from Regional sampling efforts. It is the responsibility of the Region, as the data user, to determine the applicability of each data package to its intended use, e.g., site investigation support, cleanup activities and/or enforcement actions. In this review, the Region applies its standard CLP data review procedures and references the requirements of the contract Statement of Work under which the analyses were performed.

3. SMO Data Check for Completeness

Each CLP-generated data package is checked for completeness by SMO upon receipt. SMO reviews the data package verifying that all contractually-required forms are included and that forms are completed according to contract specifications. Should SMO identify any missing information, incomplete forms or other problems with the data package, SMO immediately notifies the NPO PO, EMSL/LV and the Regional client. At this time, the laboratory is contacted and instructed to submit the missing or incorrect portions of the data package.

4. SMO Data Review Services

Under direction of CLP management, SMO may perform additional data review, checking the data for compliance to contract QC procedures and parameters and for applicability to its intended uses. This review is provided on a limited basis in response to specific Regional request. Consult Chapter IV, Section E, for a complete description of the data review services provided and appropriate request procedures.

G. Analytical Methodology Improvement/Development

1. Protocol Standardization and Improvement

Refining and improving analytical protocols to maintain state-of-the-art status and to reflect newly-defined or changed requirements of the Superfund effort, is an ongoing activity for all CLP participants. This effort is accomplished through an established system of information transfer coordinated through the NPO. All program participants submit comments or recommendations to the NPO on an ongoing basis. The NPO reviews all submitted information and considers recommendations for program application, on a periodic basis.

Since 1982, input on protocol improvements has come primarily through the CLP Technical Caucuses which involve NPO, EMSL/LV, EMSL/Cincinnati, EPA Region, SMO, laboratory and other program support contractor personnel. Analytical methods and data reporting formats are reviewed and discussed in detail at the caucus sessions. EPA personnel then review caucus discussions and compile concensus recommendations for protocol changes. Following NPO approval of recommended changes, laboratory contracts are modified by the Contracting Officer to include recommended revisions, through contract change order actions. All laboratory contracts within an analytical program are changed concurrently to maintain consistency across the program.

2. Method Development

Development of new analytical methods may be initiated by a newly identified or redefined Agency analysis requirement, such as dioxin analysis. Analytical methods utilized in the CLP are based on EPA-developed and approved methodologies. The NPO, EMSL/LV, EMSL/Cincinnati, and/or EPA Regions have historically contributed to development of new program analytical methodologies. Regardless of the group responsible for method development, methods are reviewed by several sources and are tested prior to implementation, to the extent possible to meet program requirements.

APPENDICES TO

CLP USER'S GUIDE

APPENDIX A

CLP DIRECTORY

EPA HEADQUARTERS AND NATIONAL LABORATORIES

CLP National Program Office (NPO)

USEPA Office of Emergency and Remedial Response
Hazardous Response Support Division (Mail Code: WH-548A)
Support Services Branch
401 M Street, S.W. (Mail - Room S213)
Washington, DC 20460

Stanley Kovell, National Program Manager
Mary Mahsetky, NPO Secretary
202/382-7906 FTS 382-7906

Duane Geuder, QA Officer
202/382-7943 FTS 382-7943

Fred Haeberer, Organic Technical Officer
202/382-7942 FTS 382-7942

Joan Fisk, Organic Technical Officer
202/382-3115 FTS 382-3115

Gary Ward, Inorganic Technical Officer
202/382-4619 FTS 382-4619

USEPA Office of Administration
Procurement and Contracts Management Division
(Mail Code: PM-214)
401 M Street, S.W.
Washington, DC 20460

Street Address:
499 South Capitol Street
Fairchild Building, 3rd Floor
Washington, DC

Marian Bernd
Contracting Officer
202/382-3195 FTS 382-3195

Dave Stutz
Contract Specialist
202/382-2357 FTS 382-2357

USEPA Office of Research and Development
Environmental Monitoring Systems Laboratory (EMSL/LV)
P.O. Box 15027
Las Vegas, Nevada 89114

Street Address:
944 East Harmon Avenue
Las Vegas, Nevada 89109

Ross Robeson, Acting Director
QA Division
702/798-2103 FTS 545-2103

Gareth Pearson, Chief
Toxics & Hazardous Waste Branch
702/798-2383 FTS 545-2383

Gene Meier
Special Assistant to the Director
702/798-2534 FTS 545-2534

USEPA National Enforcement Investigations Center (NEIC)
Denver Federal Center
Building 53, Entrance E-2
Box 25227
Denver, Colorado 80225

Ted Meiggs, Assistant Director
Laboratory Services
303/234-4661 FTS 234-4661

Robert Laidlaw
Evidence Audit Unit
303/234-4706 FTS 234-4706

REGIONAL DEPUTY PROJECT OFFICERS

Region I	Edward Taylor 617/861-6700 FTS 828-6700
Region II	William Coakley 201/321-6702 FTS 340-6702
Region III	Patricia Krantz 301/224-2740 FTS 922-3752
Region IV	Tom Bennett, Jr. 404/546-3112 FTS 250-3112
Region V	Charles Elly 312/353-8370 FTS 353-8370
Region VI	William Langley 713/954-1766 FTS 526-1766
Region VII	Robert Kleopfer 913/236-3881 FTS 926-3881
Region VIII	John Tilstra 303/234-3263 FTS 234-3263
Region IX	Harold Takenaka 415/974-7484 FTS 454-7484
Region X	Arnold Gahler 206/442-0370 FTS 399-0370

REGIONAL SAMPLE CONTROL CENTERS

Authorized Requestors

Region I

Edward Fitzpatrick, ESD Director
FTS 828-6700

Thomas Spittler, Chief
Technical Support Branch
FTS 828-6700

*Edward Taylor, CLP DPO
FTS 828-6700

Region II

*Richard Spear, Chief
Surveillance & Monitoring Branch
FTS 340-6685

Doug Stout
FTS 340-6717

Carol Price
FTS 340-6714

Region III

*Daniel Donnelly, Laboratory Chemist
Annapolis Field Office
FTS 922-3752

Ramona Trovato, Chemist
FTS 922-3752

John Austin, Chemist
FTS 922-3752

Region IV

*Tom Bennett, Chief
Chemistry Section
FTS 250-3112

Myron Stephenson
Chemistry Section
FTS 250-3165

Bobby Carol, Chief
Analytical Support Branch
FTS 250-3111

* Primary Authorized Requestor

RSCCs (cont.)

Region V

Curtis Ross, CRL Director
FTS 353-8370

*Charles Elly, CLP DPO
FTS 353-8370

(RAS only)

E&E:

Kathy Getty
Cindy Bacunas
312/663-9415

CH_2M Hill:

Jerry Bills
Lin Klann
414/272-2426

Roy F. Weston:

Kurt Stimpson
Geoff Watkins
Tom DeFouw
312/498-9090

Region VI

*Keith Bradley
FTS 729-9770

Minnie Rojo
FTS 727-9990

Dave Peters, Chief
Hazardous Waste Section
FTS 729-9783

(RAS only)

E&E:

John Totin, Asst. FITL
David Anderson
Jairo Guevara
Hunt Chapman
Doug Collins
214/742-4521

* Primary Authorized Requestor

RSCCs (cont.)

Region VII

*Charles Hensley, Chief
Laboratory Branch
FTS 926-3881

Joyce Woods
FTS 926-3881

Bob Kleopfer, CLP DPO
FTS 926-3881

Region VIII

*Keith Schwab, Assc. ESD Director
FTS 327-4935

Tom Staible
FTS 234-3678

Region IX

*Harold Takenaka, CLP DPO
FTS 454-7484

Laura Tom
FTS 454-8379

Frank Day
FTS 454-8200

Region X

*Gary O'Neal, ESD Director
FTS 399-1295

John Osborn, Regional PO
FTS 399-0837

Joyce Crosson
FTS 399-8562

* Primary Authorized Requestor

SAMPLE MANAGEMENT OFFICE

CLP Sample Management Office (SMO)
P.O. Box 818
Alexandria, Virginia 22313

Street Address:
300 N. Lee Street
Alexandria, Virginia 22314

703/557-2490 FTS 557-2490

David Stewart,
Project Manager

Dick Thacker,
Deputy Project Manager

Tina DeYoung, Group Leader
Management Information Systems, Invoice Processing
and Cost Recovery

Linda Haas, Group Leader
Analytical Services

Leslie Braun, RAS Sampling Controller
EPA Regions I - IV, Zones 1 and 2

Eileen O'Connor, RAS Sampling Controller
EPA Regions V - X

Maka Grogard, SAS Sampling Controller
Dioxin and EPA Region V

Roch Mongeon, SAS Sampling Controller
EPA Regions I - IV, Zone 1

Paula Ausserer, SAS Sampling Controller
EPA Regions VI - X, Zone 2

Deborah Miller, Group Leader, Special Projects
IFB Development, User's Guide and Communication System

Steve Manzo, Special Projects Coordinator
Bottle Repository Services and Meeting Planning

Rob Pritchard, Head
Enforcement Support

Don Trees, Head
Data Review and QA Support

Paul Friedman,
QA Chemist

Bill Eckel,
QA Support

APPENDIX B

RAS DELIVERABLES AND DATA REPORTING FORMS

RAS ORGANIC
DELIVERABLES INDEX

I. Case Narrative

The Case narrative must contain: Case number, Contract number, summary of any QC, sample, shipment and analytical problems, and documentation of all internal decision tree processes used. Outline problems encountered and final solutions. Be as specific and detailed as necessary.

II. QC Summary

A. Surrogate Percent Recovery Summary (Form II)

B. Matrix Spike/Matrix Spike Duplicate Summary (Form III)

C. Reagent Blank Summary (Form IV)
(If more than a single form is necessary, it must be arranged in chronological order.)

D. GC/MS Tuning and Calibration Standard (Form V)

1. DFTPP in chronological order; by instrument.

2. BFB in chronological order; by instrument.

III. Sample Data Package

A. Sample data in increasing SMO Number order:

1. HSL Results - Organic Analysis Data Sheet (Form I)

2. GC/MS tentative ID (Form I, Part B) - Must be included even if no compounds are found; if so, indicate on form: "no volatile compounds found" and/or "no semi-volatile compounds found."

3. Raw data - in order: VOA, BNA, Pesticide

a. Reconstructed ion chromatogram(s) (GC/MS), chromatogram(s) (GC)

b. Data System Printout

- Quantitation report or legible facsimile (GC/MS)

- Integration report or data system printout (GC)

c. HSL spectra with lab generated standard (Dual Display)

- data systems incapable of dual display shall provide spectra in order:

- raw HSL compound spectra

- enhanced or background subtracted spectra

- laboratory generated HSL standard

d. GC/MS library search spectra for Tentatively Identified Compound(s) (TIC)

e. Quantitation/Calculation of tentative ID concentration(s)

IV. Standards Data Package

A. Current list of laboratory calculated instrument detection limits for all HSL compounds.

B. Initial Calibration Data (Form VI) - in order: VOA, BNA; by instrument if more than one instrument used.

1. When more than one initial calibration is performed, the data must be put in chronological order. All initial calibration data must be included even for a specific Case.

C. Continuing Calibration (Form VII) - in order: VOA, BNA; by instrument if more than one instrument used.

1. When more than one Continuing Calibration is performed, forms must be in chronological order.

D. Pesticide forms in the following order:

1. Form VIII - Pesticide Evaluation Standards Summary

2. Form IX - Pesticide/PCB Standards Summary

3. Form X - Pesticide/PCB Identification (only required for positive results)

E. VOA standard(s) chromatograms and data system printouts (or legible facsimile). Spectra are not required.

F. BNA standard(s) chromatograms and data system printouts (or legible facsimile). Spectra are not required.

G. All pesticide evaluation standard(s) (A, B, and C) chromatograms and data system printouts in chronological order.

H. All pesticide Individual Standard Mix (A or B) chromatograms and data system printouts.

I. Pesticide Quantitation standard(s) chromatograms and data system printouts.

V. Raw QC Data Package

A. DFTPP

1. Bar graph spectrum

2. Mass listing

B. BFB

1. Bar graph spectrum

2. Mass listing

C. Blank Data

1. Tabulated results (Form I)

2. GC/MS tentative ID sheet (Form I, Part B) even if none found

3. Raw Data - in order: VOA, BNA, Pesticide

a. Reconstructed ion chromatogram(s) and quantitation report(s) or legible facsimile (GC/MS)

b. Chromatogram(s) and data system printout(s) (GC)

c. HSL spectra with lab generated standard (dual display)

- data systems which are incapable of dual display shall provide spectra in order:

  - raw HSL compound spectra

  - enhanced or background subtracted spectra

  - laboratory generated HSL standard spectra

d. GC/MS library search spectra for Tentatively Identified Compounds (TIC)

e. Quantitation/Calculation of Tentative ID concentrations

D. Matrix Spike Data

1. Tabulated results (Form I) of non-spiked compounds

2. Raw Data - in order: VOA, BNA, Pesticide

a. Reconstructed ion chromatogram(s) and quantitation report(s) or legible facsimile (GC/MS)

- spectra <u>not</u> required

b. Chromatogram(s) and data system printout(s) (GC)

E. Matrix Spike Duplicate Data

1. Tabulated results (Form I) of non-spiked compounds

2. Raw Data - in order: VOA, BNA, Pesticide

a. Reconstructed ion chromatogram(s) and quantitation report(s) or legible facsimile (GC/MS)

- spectra <u>not</u> required

b. Chromatogram(s) and data system printout(s) (GC)

RAS ORGANIC DATA REPORTING FORMS

Environmental Protection Agency CLP Sample Management Office
P O Box 818, Alexandria, Virginia 22313 703/557-2490

Sample Number

Organics Analysis Data Sheet
(Page 1)

Laboratory Name _____ Case No _____

Lab Sample ID No _____ QC Report No. _____

Sample Matrix _____ Contract No _____

Data Release Authorized By _____ Date Sample Received _____

Volatile Compounds

Concentration: Low Medium (Circle One)

Date Extracted/Prepared _____

Date Analyzed _____

Conc/Dil Factor _____ pH _____

Percent Moisture _____

Percent Moisture (Decanted) _____

CAS Number		ug/l or ug/Kg (Circle One)
74-87-3	Chloromethane	
74-83-9	Bromomethane	
75-01-4	Vinyl Chloride	
75-00-3	Chloroethane	
75-09-2	Methylene Chloride	
67-64-1	Acetone	
75-15-0	Carbon Disulfide	
75-35-4	1,1-Dichloroethene	
75-34-3	1,1-Dichloroethane	
156-60-5	Trans-1,2-Dichloroethene	
67-66-3	Chloroform	
107-06-2	1,2-Dichloroethane	
78-93-3	2-Butanone	
71-55-6	1,1,1-Trichloroethane	
56-23-5	Carbon Tetrachloride	
108-05-4	Vinyl Acetate	
75-27-4	Bromodichloromethane	

CAS Number		ug/l or ug/Kg (Circle One)
79-34-5	1,1,2,2-Tetrachloroethane	
78-87-5	1,2-Dichloropropane	
10061-02-6	Trans-1,3-Dichloropropene	
79-01-6	Trichloroethene	
124-48-1	Dibromochloromethane	
79-00-5	1,1,2-Trichloroethane	
71-43-2	Benzene	
10061-01-5	cis-1,3-Dichloropropene	
110-75-8	2-Chloroethylvinylether	
75-25-2	Bromoform	
591-78-6	2-Hexanone	
108-10-1	4-Methyl-2-Pentanone	
127-18-4	Tetrachloroethene	
108-88-3	Toluene	
108-90-7	Chlorobenzene	
100-41-4	Ethylbenzene	
100-42-5	Styrene	
	Total Xylenes	

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explained.

Value: If the result is a value greater than or equal to the detection limit, report the value.

U: Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U flag. 10U based on necessary concentration/dilution actions. (This is not necessarily the instrument detection limit.) The number should read U. Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

J: Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds, where a 1:1 response is assumed, or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).

C: This flag applies to pesticide determinations where the identification has been confirmed by GC/MS. Single component pesticides >10 ng/ml in the final extract should be confirmed by GC/MS.

B: This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

Other: Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

Form I 4/84

Form I. Organics Analysis Data Sheet.

Environmental Protection Agency, CLP Sample Management Office,
P O Box 818, Alexandria, Virginia 22313 703/557-2480

Sample Number

Organics Analysis Data Sheet
(Page 2)

Semivolatile Compounds

Concentration: Low Medium (Circle One)

Date Extracted/Prepared: _____

Date Analyzed: _____

Conc/Dil Factor: _____

CAS Number		ug/l or ug/Kg (Circle One)
62 75-9	N-Nitrosodimethylamine	
108-95-2	Phenol	
62-53-3	Aniline	
111-44-4	bis(2-Chloroethyl)Ether	
95 57-8	2-Chlorophenol	
541-73-1	1 3 Dichlorobenzene	
106-46-7	1 4-Dichlorobenzene	
100 51-6	Benzyl Alcohol	
95 50-1	1 2-Dichlorobenzene	
95-48-7	2 Methylphenol	
39638-32-9	bis(2-chloroisopropyl)Ether	
106-44 5	4 Methylphenol	
621-64-7	N Nitroso-Di-n-Propylamine	
67-72-1	Hexachloroethane	
98 95-3	Nitrobenzene	
78 59-1	Isophorone	
88 75-5	2-Nitrophenol	
105-67-9	2 4-Dimethylphenol	
65-85-0	Benzoic Acid	
111-91-1	bis(2 Chloroethoxy)Methane	
120 83 2	2 4-Dichlorophenol	
120-82-1	1 2 4-Trichlorobenzene	
91 20-3	Naphthalene	
106-47 8	4-Chloroaniline	
87-68-3	Hexachlorobutadiene	
59 50-7	4-Chloro-3-Methylphenol	
91 57-6	2 Methylnaphthalene	
77-47-4	Hexachlorocyclopentadiene	
88 06-2	2 4 6 Trichlorophenol	
95 95-4	2 4 5 Trichlorophenol	
91 58-7	2 Chloronaphthalene	
88 74-4	2 Nitroaniline	
131 11 3	Dimethyl Phthalate	
208 96 8	Acenaphthylene	
99 09 2	3 Nitroaniline	

CAS Number		ug/l or ug/Kg (Circle One)
83-32-9	Acenaphthene	
51-28-5	2 4-Dinitrophenol	
100-02-7	4-Nitrophenol	
132-64-9	Dibenzofuran	
121-14-2	2 4-Dinitrotoluene	
606-20-2	2 6-Dinitrotoluene	
84-66-2	Diethylphthalate	
7005-72-3	4-Chlorophenyl-phenylether	
86-73-7	Fluorene	
100-01-6	4-Nitroaniline	
534-52-1	4 6-Dinitro-2-Methylphenol	
86-30-6	N-Nitrosodiphenylamine (1)	
101-55-3	4-Bromophenyl-phenylether	
118-74-1	Hexachlorobenzene	
87-86-5	Pentachlorophenol	
85-01-8	Phenanthrene	
120-12-7	Anthracene	
84-74-2	Di-n-Butylphthalate	
206-44-0	Fluoranthene	
92 87-5	Benzidine	
129-00-0	Pyrene	
85-68-7	Butylbenzylphthalate	
91-94-1	3 3-Dichlorobenzidine	
56-55-3	Benzo(a)Anthracene	
117-81-7	bis(2-Ethylhexyl)Phthalate	
218-01 9	Chrysene	
117-84-0	Di-n-Octyl Phthalate	
205 99-2	Benzo(b)Fluoranthene	
207 08-9	Benzo(k)Fluoranthene	
50 32 8	Benzo(a)Pyrene	
193 39 5	Indeno(1 2 3-cd)Pyrene	
53 70-3	Dibenz(a h)Anthracene	
191 24 2	Benzo(g h i)Perylene	

(1)-Cannot be separated from diphenylamine

Form I. (continued).

Environmental Protection Agency CLP Sample Management Office,
P. O. Box 818, Alexandria Virginia 22313 703/557-2490

Sample Number

Organics Analysis Data Sheet
(Page 3)

Pesticide/PCBs

Concentration: Low Medium (Circle One)

Date Extracted/Prepared: _____

Date Analyzed: _____

Conc/Dil Factor: _____

CAS Number		ug/l or ug/Kg (Circle One)
319-84-6	Alpha-BHC	
319-85-7	Beta-BHC	
319-86-8	Delta-BHC	
58-89-9	Gamma-BHC (Lindane)	
76-44-8	Heptachlor	
309-00-2	Aldrin	
1024-57-3	Heptachlor Epoxide	
959-98-8	Endosulfan I	
60-57-1	Dieldrin	
72-55-9	4,4'-DDE	
72-20-8	Endrin	
33213-65-9	Endosulfan II	
72-54-8	4,4'-DDD	
7421-93-4	Endrin Aldehyde	
1031-07-8	Endosulfan Sulfate	
50-29-3	4,4'-DDT	
72-43-5	Methoxychlor	
53494-70-5	Endrin Ketone	
57-74-9	Chlordane	
8001-35-2	Toxaphene	
12674-11-2	Aroclor-1016	
11104-28-2	Aroclor-1221	
11141-16-5	Aroclor-1232	
53469-21-9	Aroclor 1242	
12672-29-6	Aroclor-1248	
11097-69-1	Aroclor-1254	
11096-82-5	Aroclor-1260	

V_t = Volume of extract injected (ul)

V_s = Volume of water extracted (ml)

W_s = Weight of sample extracted (g)

V_t = Volume of total extract (ul)

V_s _____ or W_s _____ V_t _____ V_t _____

Form I. (continued).
B-9

Environmental Protection Agency, CLP Sample Management Office,
P O Box 818, Alexandria, Virginia 22313 703/557-2490

Sample Number

Organics Analysis Data Sheet
(Page 4)

Tentatively Identified Compounds

CAS Number	Compound Name	Fraction	RT or Scan Number	Estimated Concentration (ug/l or ug/kg)
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

Form 1, Part B 4 86

Form I. (continued).

DATA REPORTING QUALIFIERS

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of such flags must be explicit.

Value - If the result is a value greater than or equal to the detection limit, report the value.

U - Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g., 10U) based on necessary concentration/dilution actions. (This is not necessarily the instrument detection limit.) The footnote should read: U-Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. (e.g., 10J)

C - This flag applies to pesticide parameters where the identification has been confirmed by GC/MS. Single component pesticides $\geq$10 ng/ul in the final extract should be confirmed by GC/MS.

B - This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

Other - Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

WATER SURROGATE PERCENT RECOVERY SUMMARY

Case No. _____ Contract Laboratory _____ Contract No. _____

	VOLATILE			BASE/NEUTRAL					ACID			PESTICIDE
												♦♦

♦ VALUES ARE OUTSIDE OF CONTRACT REQUIRED QC LIMITS

♦♦ ADVISORY LIMITS ONLY

Volatiles _____ out of _____ ; outside of QC limits
Semi-Volatiles _____ out of _____ ; outside of QC limits
Pesticides _____ out of _____ ; outside of QC limits

Comments: _____

FORM II 4/84

Form II. Surrogate Percent Recovery Summary (water).

SOIL SURROGATE PERCENT RECOVERY SUMMARY

Case No. _____ Contract Laboratory _____ Contract No. _____

Low _____ Medium _____

	VOLATILE				BASE-NEUTRAL				ACID			PESTICIDE
EPA SAMPLE NO.	(1)	(2)	(3)	(4)	(5)	(6)			(7)	(8)	(9)	(10)
	80-120	86-115	74-121	81-117	35-114	43-116			10-94	21-100	10-123	54-120

* VALUES ARE OUTSIDE OF CONTRACT REQUIRED QC LIMITS

** ADVISORY LIMITS ONLY

Volatiles _____ out of _____ ; outside of QC limits

Base-Neutrals _____ out of _____ ; outside of QC limits

Pesticides _____ out of _____ ; outside of QC limits

Comments: _____

FORM II 4/84

Form II. Surrogate Percent Recovery Summary (soil).

WATER MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Case No. _____ Contractor _____ Contract No. _____

FRACTION	COMPOUND	CONC. SPIKE ADDED (ug)	SAMPLE RESULT	CONC. MS	% REC	CONC. MSD	% REC	RPD	QC LIMITS * RPD	QC LIMITS * RECOVERY
VOA SMO SAMPLE NO _____	1,1-Dichloroethene								14	61-145
	Trichloroethene								14	71-120
	Chlorobenzene								13	75-130
	Toluene								13	76-125
	Benzene								11	76-127
B/N SMO SAMPLE NO. _____	1,2,4-Trichlorobenzene								28	39-98
	Acenaphthene								31	46-118
	2,4-Dinitrotoluene								38	24-96
	Di-n-Butylphthalate								40	11-117
	Pyrene								31	26-127
	N-Nitroso-Di-n-Propylamine								38	41-116
	1,4-Dichlorobenzene								28	36-97
ACID SMO SAMPLE NO _____	Pentachlorophenol								50	9-103
	Phenol								42	12-89
	2-Chlorophenol								40	27-123
	4-Chloro-3-Methylphenol								42	23-97
	4-Nitrophenol								50	10-80
PEST SMO SAMPLE NO. _____	Lindane								15	56-123
	Heptachlor								20	40-131
	Aldrin								22	40-120
	Dieldrin								18	52-126
	Endrin								21	56-121
	4,4'-DDT								27	38-127

* ASTERISKED VALUES ARE OUTSIDE QC LIMITS.

RPD: VOAs ____ out of ____: outside QC limits
B/N ____ out of ____: outside QC limits
ACID ____ out of ____: outside QC limits
PEST ____ out of ____: outside QC limits

RECOVERY: VOAs ____ out of ____: outside QC limits
B/N ____ out of ____: outside QC limits
ACID ____ out of ____: outside QC limits
PEST ____ out of ____: outside QC limits

Comments: _____

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FORM III

Form III. MS/MSD Results (water).

SOIL MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Case No. _____ Contractor _____ Contract No. _____

Low Level _____ Medium Level _____

FRACTION	COMPOUND	CONC. SPIKE ADDED (ug)	SAMPLE RESULT	CONC. MS	% REC	CONC. MSD	% REC	RPD	QC LIMITS * RPD	QC LIMITS * RECOVERY
VOA SMO SAMPLE NO. _____	1,1-Dichloroethene								22	59-172
	Trichloroethene								24	62-137
	Chlorobenzene								21	60-133
	Toluene								21	59-139
	Benzene								21	66-142
B/N SMO SAMPLE NO. _____	1,2,4 Trichlorobenzene								23	38-107
	Acenaphthene								19	31-137
	2,4 Dinitrotoluene								47	28-89
	Di-n-Butylphthalate								47	29-136
	Pyrene								36	35-142
	N-Nitrosodi-n-Propylamine								38	41-126
	1,4 Dichlorobenzene								27	28-104
ACID SMO SAMPLE NO. _____	Pentachlorophenol								47	17-109
	Phenol								35	26-90
	2-Chlorophenol								50	25-102
	4-Chloro-3-Methylphenol								33	26-103
	4-Nitrophenol								50	11-114
PEST SMO SAMPLE NO. _____	Lindane								50	46-127
	Heptachlor								31	35-130
	Aldrin								43	34-132
	Dieldrin								38	31-134
	Endrin								45	42-139
	4,4'-DDT								50	23-134

*ASTERISKED VALUES ARE OUTSIDE QC LIMITS.

RPD: VOAs ____ out of ____; outside QC limits
B/N ____ out of ____; outside QC limits
ACID ____ out of ____; outside QC limits
PEST ____ out of ____; outside QC limits

RECOVERY: VOAs ____ out of ____; outside QC limits
B/N ____ out of ____; outside QC limits
ACID ____ out of ____; outside QC limits
PEST ____ out of ____; outside QC limits

Comments: _____

4/84

FORM III

Form III. MS/MSD Results (soil).

REAGENT BLANK SUMMARY

Case No. _____ Contractor _____ Contract No. _____

Comments:

FORM IV 4/84

Reagent Blank Summary

GC/MS TUNING AND MASS CALIBRATION
Decafluorotriphenylphosphine (DFTPP)

Case No. _____ Contractor _____ Contract No. _____

Instrument ID _____ Date _____ Time _____

Lab ID _____ Data Release Authorized By: _____

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	
68	less than 2.0% of mass 69	( )[1]
69	mass 69 relative abundance	
70	less than 2.5% of mass 69	( )[1]
127	40.0 - 60.0% of mass 198	
197	less than 1.0% of mass 198	
198	base peak, 100% relative abundance	
199	5.0 - 9.0% of mass 198	
275	10.0 - 30.0% of mass 198	
365	greater than 1.00% of mass 198	
441	present, but less than mass 443	
442	greater than 40.0% of mass 198	
443	17.0 - 23.0% of mass 442	( )[2]

[1]Value in parentheses is % mass 69.
[2]Value in parentheses is % mass 442.

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS.

SAMPLE ID	LAB ID	DATE OF ANALYSIS	TIME OF ANALYSIS

4/84

FORM V

Form V. DFTPP Tuning and Mass Calibration.

GC/MS TUNING AND MASS CALIBRATION

Bromofluorobenzene (BFB)

Case No. _____ Contractor _____ Contract No. _____

Instrument ID _____ Date _____ Time _____

Lab ID _____ Data Release Authorized By: _____

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
50	15.0 - 40.0% of the base peak	
75	30.0 - 60.0% of the base peak	
95	Base peak, 100% relative abundance	
96	5.0 - 9.0% of the base peak	
173	Less than 1.0% of the base peak	
174	Greater than 50.0% of the base peak	
175	5.0 - 9.0% of mass 174	( )[1]
176	Greater than 95.0%, but less than 101.0% of mass 174	( )[1]
177	5.0 - 9.0% of mass 176	( )[2]

[1]Value in parenthesis is % mass 174.
[2]Value in parenthesis is % mass 176.

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS.

SAMPLE ID	LAB ID	DATE OF ANALYSIS	TIME OF ANALYSIS

4/84

FORM V

Form V. BFB Tuning and Mass Calibration.

Initial Calibration Data
Volatile HSL Compounds

Case No _____ Instrument I.D. _____

Contractor _____ Calibration Date _____

Contract No _____

Minimum $\overline{RF}$ for SPCC is 0.300 Maximum % RSD for CCC is 30%

Laboratory ID								
Compound	RF_{20}	RF_{50}	RF_{100}	RF_{150}	RF_{200}	$\overline{RF}$	% RSD	CCC* SPCC**
Chloromethane								**
Bromomethane								
Vinyl Chloride								*
Chloroethane								
Methylene Chloride								
Acetone								
Carbon Disulfide								
1,1-Dichloroethene								*
1,1-Dichloroethane								**
Trans-1,2-Dichloroethene								
Chloroform								*
1,2-Dichloroethane								
2-Butanone								
1,1,1-Trichloroethane								
Carbon Tetrachloride								
Vinyl Acetate								
Bromodichloromethane								
1,2-Dichloropropane								*
Trans-1,3-Dichloropropene								
Trichloroethene								
Dibromochloromethane								
1,1,2-Trichloroethane								
Benzene								
cis-1,3-Dichloropropene								
2-Chloroethylvinylether								
Bromoform								**
2-Hexanone								
4-Methyl-2-Pentanone								
Tetrachloroethene								
1,1,2,2-Tetrachloroethane								**
Toluene								*
Chlorobenzene								**
Ethylbenzene								*
Styrene								
Total Xylenes								

RF - Response Factor (subscript is the amount of ug/L)
$\overline{RF}$ - Average Response Factor
%RSD - Percent Relative Standard Deviation

CCC - Calibration Check Compounds (*)
SPCC - System Performance Check Compounds (**)

Form VI

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Form VI. Initial Calibration - Volatile HSL Compounds

Initial Calibration Data
Semivolatile HSL Compounds
(Page 1)

Case No: _____ Instrument ID: _____

Contractor: _____ Calibration Date: _____

Contract No: _____

Minimum RF for SPCC is 0.050 Maximum % RSD for CCC is 30%

Laboratory ID								
Compound	RF_{20}	RF_{50}	RF_{80}	RF_{120}	RF_{160}	RF	%RSD	CCC* SPCC**
N-Nitrosodimethylamine								
Phenol								*
Aniline								
bis-2-Chloroethyl Ether								
2-Chlorophenol								
1,3-Dichlorobenzene								
1,4-Dichlorobenzene								*
Benzyl Alcohol								
1,2-Dichlorobenzene								
2-Methylphenol								
bis(2-chloroisopropyl)Ether								
4-Methylphenol								
N-Nitroso-Di-n-Propylamine								* *
Hexachloroethane								
Nitrobenzene								
Isophorone								
2-Nitrophenol								*
2,4-Dimethylphenol								
Benzoic Acid	†							
bis-2-Chloroethoxy)Methane								
2,4-Dichlorophenol								
1,2,4-Trichlorobenzene								
Naphthalene								
4-Chloroaniline								
Hexachlorobutadiene								*
4-Chloro-3-Methylphenol								*
2-Methylnaphthalene								
Hexachlorocyclopentadiene								* *
2,4,6-Trichlorophenol								*
2,4,5-Trichlorophenol	†							
2-Chloronaphthalene								
2-Nitroaniline	†							
Dimethyl Phthalate								
Acenaphthylene								
3-Nitroaniline	†							
Acenaphthene								*
2,4-Dinitrophenol	†							* *
4-Nitrophenol	†							* *
Dibenzofuran								

Response Factor (subscript is the amount of nanograms)
RF Average Response Factor
%RSD Percent Relative Standard Deviation
CCC Calibration Check Compounds (*)
SPCC System Performance Check Compounds (**)
† -not detectable at 20 ng

Form VI

4/84

Form VI. Initial Calibration - Semi-Volatile HSL Compounds

Initial Calibration Data
Semivolatile HSL Compounds
(Page 2)

Case No: _____ Instrument ID: _____

Contractor: _____ Calibration Date: _____

Contract No: _____

Minimum RF for SPCC is 0.050 Maximum % RSD for CCC is 30%

Laboratory ID								
Compound	RF_{20}	RF_{50}	RF_{80}	RF_{120}	RF_{160}	RF	% RSD	CCC* SPCC**
2,4-Dinitrotoluene								
2,6-Dinitrotoluene								
Diethylphthalate								
4-Chlorophenyl-phenylether								
Fluorene								
4-Nitroaniline	†							
4,6-Dinitro-2-Methylphenol	†							
N-Nitrosodiphenylamine (1)								•
4-Bromophenyl-phenylether								
Hexachlorobenzene								•
Pentachlorophenol	†							
Phenanthrene								
Anthracene								
Di-N-Butylphthalate								
Fluoranthene								•
Benzidine	†							• •
Pyrene								
Butylbenzylphthalate								
3,3'-Dichlorobenzidine								
Benzo(a)Anthracene								
Bis(2-Ethylhexyl)Phthalate								
Chrysene								
Di-n-Octyl Phthalate								•
Benzo(b)Fluoranthene								
Benzo(k)Fluoranthene								
Benzo(a)Pyrene								•
Indeno(1,2,3-cd)Pyrene								
Dibenz(a,h)Anthracene								
Benzo(g,h,i)Perylene								

Response Factor (subscript is the amount of nanograms)
RF -Average Response Factor
%RSD -Percent Relative Standard Deviation
CCC -Calibration Check Compounds (•)
SPCC -System Performance Check Compounds (••)
† -not detectable at 20 ng
(1) -Cannot be separated from diphenylamine

Form VI

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Form VI. Initial Calibration - Semi-Volatile HSL Compounds

Continuing Calibration Check
Volatile HSL Compounds

Case No. _____ Calibration Date. _____

Contractor: _____ Time: _____

Contract No: _____ Laboratory ID: _____

Instrument ID: _____ Initial Calibration Date: _____

Minimum RF for SPCC is 0.300 Maximum %D for CCC is 25%

Compound	RF	RF_{50}	% D	CCC	SPCC
Chloromethane					• •
Bromomethane					
Vinyl Chloride				•	
Chloroethane					
Methylene Chloride					
Acetone					
Carbon Disulfide					
1, 1-Dichloroethene				•	
1, 1-Dichloroethane					• •
Trans-1, 2-Dichloroethene					
Chloroform				•	
1, 2-Dichloroethane					
2-Butanone					
1, 1, 1-Trichloroethane					
Carbon Tetrachloride					
Vinyl Acetate					
Bromodichloromethane					
1, 2-Dichloropropane				•	
Trans-1, 3-Dichloropropene					
Trichloroethene					
Dibromochloromethane					
1, 1, 2-Trichloroethane					
Benzene					
cis-1, 3-Dichloropropene					
2-Chloroethylvinylether					
Bromoform					• •
2-Hexanone					
4-Methyl-2-Pentanone					
Tetrachloroethene					
1, 1, 2, 2 Tetrachloroethane					• •
Toluene				•	
Chlorobenzene					• •
Ethylbenzene				•	
Styrene					
Total Xylenes					

RF_{50} - Response Factor from daily standard file at 50 ug/l
RF - Average Response Factor from initial calibration Form VI

%D - Percent Difference
CCC Calibration Check Compounds (•)
SPCC System Performance Check Compounds (••)

Form VII

4/84

Form VII. Continuing Calibration Data - Volatiles

Continuing Calibration Check
Semivolatile HSL Compounds
(Page 1)

Case No _____ Calibration Date: _____

Co actor: _____ Time: _____

Contract No: _____ Laboratory ID: _____

Instrument ID: _____ Initial Calibration Date: _____

Minimum RF for SPCC is 0.060 Maximum %D for CCC is 25%

Compound	RF	RF_{SC}	%D	CCC	SPCC
N-Nitrosodimethylamine					
Phenol				•	
Aniline					
bis(2-Chloroethyl)Ether					
2 Chlorophenol					
1 3-Dichlorobenzene					
1 4-Dichlorobenzene				•	
Benzyl Alcohol					
1 2 Dichlorobenzene					
2 Methylphenol					
bis(2 chloroisopropyl)Ether					
4 Methylphenol					
N-Nitroso-Di-n-Propylamine					• •
Hexachloroethane					
Nitrobenzene					
Isophorone					
2 Nitrophenol				•	
2 4 Dimethylphenol					
Benzoic Acid					
bis 2 Chloroethoxy)Methane					
2 4 Dichlorophenol				•	
1 2 4 Trichlorobenzene					
Naphthalene					
4 Chloroaniline					
Hexachlorobutadiene				•	
4 Chloro 3 Methylphenol				•	
2 Methylnaphthalene					
Hexachlorocyclopentadiene					• •
2 4 6 Trichlorophenol				•	
2 4 5 Trichlorophenol					
2 Chloronaphthalene					
2 Nitroaniline					
Dimethyl Phthalate					
Acenaphthylene					
3 Nitroaniline					
Acenaphthene				•	
2 4 Dinitrophenol					• •
4 Nitrophenol					• •
Dibenzofuran					

RF_{SC} Response Factor from daily standard for all concentration indicated

RF Average Response Factor from initial calibration Form VI

%D Percent Difference

CCC Calibration Check Compounds (...)

SPCC Semivolatile Performance Check Compounds (...)

Form VII 4 84

Form VII. Continuing Calibration Data - Semi-Volatiles

Continuing Calibration Check
Semivolatile HSL Compounds
(Page 2)

Case No: _____ Calibration Date: _____

Contractor: _____ Time: _____

Contract No: _____ Laboratory ID: _____

Instrument ID: _____ Initial Calibration Date: _____

Minimum RF for SPCC is 0.050 Maximum %D for CCC is 25%

Compound	RF	RF_{50}	%D	CCC	SPCC
2,4-Dinitrotoluene					
2,6-Dinitrotoluene					
Diethylphthalate					
4-Chlorophenyl-phenylether					
Fluorene					
4-Nitroaniline					
4,6-Dinitro-2-Methylphenol					
N-Nitrosodiphenylamine (1)				*	
4-Bromophenyl-phenylether					
Hexachlorobenzene					
Pentachlorophenol				*	
Phenanthrene					
Anthracene					
Di-N-Butylphthalate					
Fluoranthene				*	
Benzidine					* *
Pyrene					
Butylbenzylphthalate					
3,3-Dichlorobenzidine					
Benzo(a)Anthracene					
bis(2-Ethylhexyl)Phthalate					
Chrysene					
Di-n-Octyl Phthalate				*	
Benzo(b)Fluoranthene					
Benzo(k)Fluoranthene					
Benzo(a)Pyrene				*	
Indeno(1,2,3-cd)Pyrene					
Dibenz(a,h)Anthracene					
Benzo(g,h,i)Perylene					

RF_{50} Response Factor from daily standard (at 50 ug/ml concentration) calculated

RF Average Response Factor from initial calibration Form VI

%D Percent Difference

CCC Calibration Check Compounds (*)

SPCC System Performance Check Compounds (**)

(1) Cannot be separated from diphenylamine

Form VII

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Form VII. Continuing Calibration Data - Semi-Volatiles

Pesticide Evaluation Standards Summary

Case No. _____ Laboratory _____

Contract No. _____ Column _____

Date of Analysis _____ Instrument ID _____

EVALUATION CHECK FOR LINEARITY

LABORATORY ID				
PESTICIDE	CALIBRATION FACTOR EVAL. MIX A	CALIBRATION FACTOR EVAL. MIX B	CALIBRATION FACTOR EVAL. MIX C	% RSD (≤10%)
ALDRIN				
ENDRIN				
4,4'-DDT				
DIBUTYL CHLORENDATE				

EVALUATION CHECK FOR 4,4'-DDT/ENDRIN BREAKDOWN

	PERCENT BREAKDOWN EXPRESSED AS TOTAL DEGRADATION			
	EVAL. MIX B	EVAL. MIX B	EVAL. MIX B	EVAL. MIX B
ENDRIN				
4,4'-DDT				
LABORATORY ID				
TIME OF ANALYSIS				

EVALUATION OF RETENTION TIME SHIFT FOR DIBUTYLCHLORENDATE

SMO SAMPLE NO.	LAB ID	TIME OF ANALYSIS	PERCENT DIFF. *	SMO SAMPLE NO.	LAB ID	TIME OF ANALYSIS	PERCENT DIFF. *

* ≤2% PACKED, ≤0.3% CAPILLARY 4/84

FORM VIII

Form VIII. Pesticide Evaluation Standards Data.

PESTICIDE/PCB STANDARDS SUMMARY

Case No. _____ Laboratory _____

Contract No. _____ GC Column _____ GC Instrument ID _____

	DATE OF ANALYSIS _____ TIME OF ANALYSIS _____ LABORATORY ID _____				DATE OF ANALYSIS _____ TIME OF ANALYSIS _____ LABORATORY ID _____			
COMPOUND	RT	RETENTION TIME WINDOW	CALIBRATION FACTOR	CONF. OR QUANT.	RT	CALIBRATION FACTOR	CONF. OR QUANT.	PERCENT DIFF. **
alpha-BHC								
beta-BHC								
delta-BHC								
gamma-BHC								
Heptachlor								
Aldrin								
Heptachlor Epoxide								
Endosulfan I								
Dieldrin								
4,4'-DDE								
Endrin								
Endosulfan II								
4,4'-DDD								
Endrin Aldehyde								
Endosulfan Sulfate								
4,4'-DDT								
Methoxychlor								
Endrin Ketone								
Tech. Chlordane								
alpha-Chlordane*								
gamma-Chlordane*								
Toxaphene								
Aroclor - 1016								
Aroclor - 1221								
Aroclor - 1232								
Aroclor - 1242								
Aroclor - 1248								
Aroclor - 1254								
Aroclor - 1260								

* SEE EXHIBIT B, PART 7

** CONF. = CONFIRMATION (<20% DIFFERENCE)
QUANT. = QUANTITATION (<10% DIFFERENCE)

FORM IX

Form IX. Pesticide/PCB Standards Summary.

Pesticide/PCB Identification

Case No. _____ Laboratory _____

Contract No. _____

SAMPLE ID	PRIMARY COLUMN	PESTICIDE/ PCB	RT OF TENTATIVE ID	RT WINDOW OF APPROPRIATE STANDARD	CONFIRMATION COLUMN	RT ON CONFIRMATORY COLUMN	RT WINDOW OF APPROPRIATE STANDARD	GC/MS CONFIRMED (Y or N)

4/84

FORM X

Form X. Pesticide/PCB Identification.

RAS INORGANIC DATA DELIVERABLES SUMMARY

TABULATED RESULTS FOR:

- PRIORITY POLLUTANT METALS AND CYANIDE
- INSTRUMENT DETECTION LIMITS

ANALYTICAL RESULTS FOR:

- MATRIX SPIKE RECOVERIES AND DUPLICATES
- CALIBRATION FREQUENCIES AND VERIFICATIONS
- PREPARATION BLANKS
- ICP INTERFERENCE CHECKS
- STANDARD ADDITION RESULTS
- LABORATORY CONTROL SAMPLES

RAW DATA SYSTEM PRINTOUTS FOR:

- SAMPLES
- CALIBRATION STANDARDS AND BLANKS
- MATRIX SPIKE AND DUPLICATES
- METHOD BLANKS
- INSTRUMENT ADJUSTMENTS

RAS INORGANIC DATA REPORTING FORMS

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

Date _____

COVER PAGE
INORGANIC ANALYSES DATA PACKAGE

Lab Name _____ Case No. _____

SOW No. _____ Q.C. Report No. _____

Sample Numbers

EPA No.	Lab ID No.	EPA No.	Lab ID No.

Comments: _____

ICP Interelement and background corrections applied? Yes ____ No ____.

If yes, corrections applied before _____ or after _____ generation of raw data.

Footnotes:

NR - not required by contract at this time
Form I:
Value - If the result is a value greater than or equal to the instrument detection limit but less than the contract required detection limit, report the value in brackets (i.e., [10]). Indicate the analytical method used with P (for ICP/Flame AA) or F (for furnace).
U - Indicates element was analyzed for but not detected. Report with the detection limit value (e.g., 10U).
E - Indicates a value estimated or not reported due to the presence of interference. Explanatory note included on cover page.
s - Indicates value determined by Method of Standard Addition.
R - Indicates spike sample recovery is not within control limits.
* - Indicates duplicate analysis is not within control limits.
+ - Indicates the correlation coefficient for method of standard addition is less than 0.995

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. _____

Date _____

INORGANIC ANALYSIS DATA SHEET

LAB NAME _____ CASE NO. _____

SOW NO. _____

LAB SAMPLE ID. NO. _____ QC REPORT NO. _____

Elements Identified and Measured

Concentration: Low _____ Medium _____

Matrix: Water _____ Soil _____ Sludge _____ Other _____

ug/L or mg/kg dry weight (Circle One)

1.	Aluminum	13.	Magnesium
2.	Antimony	14.	Manganese
3.	Arsenic	15.	Mercury
4.	Barium	16.	Nickel
5.	Beryllium	17.	Potassium
6.	Cadmium	18.	Selenium
7.	Calcium	19.	Silver
8.	Chromium	20.	Sodium
9.	Cobalt	21.	Thallium
10.	Copper	22.	Tin
11.	Iron	23.	Vanadium
12.	Lead	24.	Zinc
Cyanide	_____	Percent Solids (%)	_____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: _____

_____

_____

_____

Lab Manager _____

Form II

Q. C. Report No. _____

INITIAL AND CONTINUING CALIBRATION VERIFICATION[3]

LAB NAME _____ CASE NO. _____

SOW NO. _____

DATE _____ UNITS _____

Compound	Initial Calib.[1]			Continuing Calibration[2]					
Metals:	True Value	Found	%R	True Value	Found	%R	Found	%R	Method[4]
1. Aluminum									
2. Antimony									
3. Arsenic									
4. Barium									
5. Beryllium									
6. Cadmium									
7. Calcium									
8. Chromium									
9. Cobalt									
10. Copper									
11. Iron									
12. Lead									
13. Magnesium									
14. Manganese									
15. Mercury									
16. Nickel									
17. Potassium									
18. Selenium									
19. Silver									
20. Sodium									
21. Thallium									
22. Tin									
23. Vanadium									
24. Zinc									
Other: _____									
Cyanide									

[1] Initial Calibration Source _____ [2] Continuing Calibration Source _____

[3] Control Limits: Mercury and Tin 80-120; All Other Compounds 90-110

[4] Indicate Analytical Method Used: P - ICP/Flame AA; F - Furnace

Form III

Q. C. Report No. _____

BLANKS

LAB NAME _____ CASE NO. _____

DATE _____ UNITS _____

Matrix _____

Preparation Compound	Initial Calibration Blank Value	Continuing Calibration Blank Value 1	2	3	4	Preparation Blank 1	2
Metals:							
1. Aluminum							
2. Antimony							
3. Arsenic							
4. Barium							
5. Beryllium							
6. Cadmium							
7. Calcium							
8. Chromium							
9. Cobalt							
10. Copper							
11. Iron							
12. Lead							
13. Magnesium							
14. Manganese							
15. Mercury							
16. Nickel							
17. Potassium							
18. Selenium							
19. Silver							
20. Sodium							
21. Thallium							
22. Tin							
23. Vanadium							
24. Zinc							
Other:							
Cyanide							

Form IV

Q. C. Report No. _____

ICP INTERFERENCE CHECK SAMPLE

LAB NAME _____ CASE NO. _____

DATE _____ Check Sample I.D. _____

Check Sample Source _____

Units _____

Compound	Control Limits[1] Mean	Std. Dev.	True[2]	Initial Observed	%R	Final Observed	%R
Metals:							
1. Aluminum							
2. Antimony							
3. Arsenic							
4. Barium							
5. Beryllium							
6. Cadmium							
7. Calcium							
8. Chromium							
9. Cobalt							
10. Copper							
11. Iron							
12. Lead							
13. Magnesium							
14. Manganese							
15. Mercury							
16. Nickel							
17. Potassium							
18. Selenium							
19. Silver							
20. Sodium							
21. Thallium							
22. Tin							
23. Vanadium							
24. Zinc							
Other:							

1 Mean value based on n = _____.

2 True value of EPA ICP Interference Check Sample or contractor standard.

Form V

Q. C. Report No. _____

SPIKE SAMPLE RECOVERY

LAB NAME _____ CASE NO. _____

DATE _____ EPA Sample No. _____

Lab Sample ID No. _____

Units _____

Matrix _____

Compound	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR)	Spiked Added (SA)	%R[1]
Metals:					
1. Aluminum	75-125				
2. Antimony	"				
3. Arsenic	"				
4. Barium	"				
5. Beryllium	"				
6. Cadmium	"				
7. Calcium	"				
8. Chromium	"				
9. Cobalt	"				
10. Copper	"				
11. Iron	"				
12. Lead	"				
13. Magnesium	"				
14. Manganese	"				
15. Mercury	"				
16. Nickel	"				
17. Potassium	"				
18. Selenium	"				
19. Silver	"				
20. Sodium	"				
21. Thallium	"				
22. Tin	"				
23. Vanadium	"				
24. Zinc	"				
Other:					
Cyanide	"				

1 %R = [(SSR - SR)/SA] x 100 "R"- out of control

Comments: _____

Form VI

Q. C. Report No. _____

DUPLICATES

LAB NAME _____ CASE NO. _____

EPA Sample No. _____

DATE _____ Lab Sample ID No. _____

Units _____

Matrix _____

Compound	Control Limit[1]	Sample(S)	Duplicate(D)	RPD[2]
Metals:				
1. Aluminum				
2. Antimony				
3. Arsenic				
4. Barium				
5. Beryllium				
6. Cadmium				
7. Calcium				
8. Chromium				
9. Cobalt				
10. Copper				
11. Iron				
12. Lead				
13. Magnesium				
14. Manganese				
15. Mercury				
16. Nickel				
17. Potassium				
18. Selenium				
19. Silver				
20. Sodium				
21. Thallium				
22. Tin				
23. Vanadium				
24. Zinc				
Other:				
Cyanide				

* Out of Control

[1] To be added at a later date.

[2] RPD = [|S - D|/((S + D)/2)] x 100

NC - Non calculable RPD due to value(s) less than CRDL

Form VII

Q.C. Report No. _____

INSTRUMENT DETECTION LIMITS AND

LABORATORY CONTROL SAMPLE

LAB NAME _____ CASE NO. _____

DATE _____ LCS UNITS ug/L mg/kg

(Circle One)

Compound	Required Detection Limits (CRDL)-ug/l	Instrument Detection Limits (IDL)-ug/l		Lab Control Sample		
Metals:		ICP/AA	Furnace	True	Found	%R
1. Aluminum	200					
2. Antimony	60					
3. Arsenic	10					
4. Barium	200					
5. Beryllium	5					
6. Cadmium	5					
7. Calcium	5000					
8. Chromium	10					
9. Cobalt	50					
10. Copper	25					
11. Iron	100					
12. Lead	5					
13. Magnesium	5000					
14. Manganese	15					
15. Mercury	0.2					
16. Nickel	40					
17. Potassium	5000					
18. Selenium	5					
19. Silver	10					
20. Sodium	5000					
21. Thallium	10					
22. Tin	40					
23. Vanadium	50					
24. Zinc	20					
Other:						
Cyanide	10					

Form VIII

Q.C. Report No. _____

STANDARD ADDITION RESULTS

LAB NAME _____ CASE NO. _____

DATE _____ UNITS _____

Sample #	Element	0 ADD ABS.	1 ADD CON./ABS.[1]	2 ADD CON./ABS.[1]	3 ADD CON./ABS.[1]	FINAL CON.[2]	r*

[1] CON is the concentration added, ABS. is the instrument readout in absorbance or concentration.

[2] Concentration as determined by MSA

*"r" is the correlation coefficient.

+ - correlation coefficient is outside of control window of 0.995.

Form IX (Quarterly)
Instrument Detection Limits

Laboratory Name _____ ICP/Flame AA (Circle One) Model Number _____

Date _____ Furnace AA Number _____

Element	Wavelength (nm)	CRDL (µg/L)	IDL (µg/L)	Element	Wavelength (nm)	CRDL (µg/L)	IDL (µg/L)
1. Aluminum		200		13. Magnesium		5000	
2. Antimony		60		14. Manganese		15	
3. Arsenic		10		15. Mercury		0.2	
4. Barium		200		16. Nickel		40	
5. Beryllium		5		17. Potassium		5000	
6. Cadmium		5		18. Selenium		5	
7. Calcium		5000		19. Silver		10	
8. Chromium		10		20. Sodium		5000	
9. Cobalt		50		21. Thallium		10	
10. Copper		25		22. Tin		40	
11. Iron		100		23. Vanadium		50	
12. Lead		5		24. Zinc		20	

Footnotes:

- Indicate the instrument for which the IDL applies with a P (for ICP/Flame AA) or a F (for Furnace AA) behind the IDL value.
- Indicate elements commonly run with background correction (AA) with a B behind the analytical wavelength.
- If more than one ICP/Flame or Furnace AA is used, submit separate Forms IX-XI for each instrument.

Comments: _____

_____

_____

Lab Manager _____

Form X (Quarterly)
ICP Interelement Correction Factors

Laboratory _____ ICP Model Number _____

Date _____

Analyte	Analyte Wavelength (nm)	Interelement Correction Factors for Al	Ca	Fe	Mg				
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Chromium									
Cobalt									
Copper									
Lead									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Tin									
Vanadium									
Zinc									

Comments: _____

Lab Manager _____

Form X (Quarterly)
ICP Interelement Correction Factors

Laboratory _____ ICP Model Number _____

Date _____

Analyte	Analyte Wavelength (nm)	Interelement Correction Factors for						
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Chromium								
Cobalt								
Copper								
Lead								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Tin								
Vanadium								
Zinc								

Comments: _____

Lab Manager _____

Form XI (Quarterly)
ICP Linear Ranges

Laboratory Name _____ ICP Model Number _____

Date _____

Upper ICP Linearity Limits

Analyte	Integration Time (Seconds)	Concentration (µg/L)	Analyte	Integration Time (Seconds)	Concentration (µg/L)
1. Aluminum			13. Magnesium		
2. Antimony			14. Manganese		
3. Arsenic			15. Mercury		
4. Barium			16. Nickel		
5. Beryllium			17. Potassium		
6. Cadmium			18. Selenium		
7. Calcium			19. Silver		
8. Chromium			20. Sodium		
9. Cobalt			21. Thallium		
10. Copper			22. Tin		
11. Iron			23. Vanadium		
12. Lead			24. Zinc		

Footnotes: ● Indicate elements not analysed by ICP with the notation NA.

Comments: _____

_____

_____

Lab Manager _____

RAS DIOXIN DATA DELIVERABLES SUMMARY

SAMPLE DATA PACKAGE, INCLUDING:

- o TABULATED RESULTS OF 2,3,7,8-TCDD ANALYSES
- o SELECTED ION CURRENT PROFILES (SICP) AND SPECTRA FOR TCDD ANALYSES
- o TABULATED RESULTS OF INITIAL CALIBRATION ANALYSES
- o SICPs, RESPONSE FACTORS, CALIBRATION CURVES, AND QUANTITATION REPORTS FOR INITIAL CALIBRATION ANALYSES
- o SICPs FOR PERFORMANCE CHECK SOLUTION ANALYSES
- o SICPs FOR CONTINUING CALIBRATION SOLUTION ANALYSES
- o MS DOCUMENTATION FOR CONFIRMATORY ANALYSES
- o CHRONOLOGICAL LIST BY INSTRUMENT OF ALL ANALYSES PERFORMED

RAS DIOXIN DATA REPORTING FORMS

FORM B-1. TCDD DATA REPORT FORM

Lab: _____

Case No: _____

Batch/Shipment No. _____

Report Date: _____

Column: _____

Spl. No.	Ext'n Date	Extra Cleanup	Aliquot Wet Wt. (grams)	PPB TCDD Meas.	PPB TCDD DL	GC/MS Analysis Instr. ID	GC/MS Analysis Date	GC/MS Analysis Time	Rel. Ion Abund 320/322	Rel. Ion Abund 322/134	PPB Surrogate Meas.	PPB Surrogate % Acc'y	Integrated Peak Area or Height 320	322	257	328*	332	334	Comments

RB = Reagent Blank
P = Partial Scan/Confirmatory Analysis
N = Native TCDD Spike/Fortified Field Blank
D = Duplicate

FB = Field Blank
ND = Not Detected
DL = Detection Limit

*Corrected for contribution by native TCDD; 0.92 of m/z 322 subtracted.

FORM B-2. INITIAL CALIBRATION SUMMARY

Instr. ID	Date	Time	Sol. ID	Peak Area (or Height) 320	322	323	328	332	334	Meas. RF Native	Mean RF Native	Meas. RF Surr.	Mean RF Surr.	TCDL Isomers Resolut'n

Solution ID Codes:

PC = Performance check solution
CC1 = Concentration calibration solution #1 = 0.2 ng/ml
CC2 = Concentration calibration solution #2 = 1.0 ng/ml
CC3 = Concentration calibration solution #3 = 5.0 ng/ml
CC4 = Concentration calibration solution #4 = 20.0 ng/ml
CC5 = Concentration calibration solution #5 = 40.0 ng/ml

FORM B-3. CONTINUING CALIBRATION SUMMARY

ID	Date	Time	Sol. ID	Peak Area (or Height) 320	322	323	328	332	334	Meas. RF Native	Mean RF Native	Meas. RF Surr.	Mean RF Surr.	TCDD Isomers Resolut'n

Solution ID Codes:

PC = Performance check solution
CC1 = Concentration calibration solution #1 = 0.2 ng/ml
CC2 = Concentration calibration solution #2 = 1.0 ng/ml
CC3 = Concentration calibration solution #3 = 5.0 ng/ml
CC4 = Concentration calibration solution #4 = 20.0 ng/ml
CC5 = Concentration calibration solution #5 = 40.0 ng/ml

FORM B-4. TCDD DATA REPORT - PARTIAL SCAN CONFIRMATION

Spl. No.	Response Ratios					% Relative Abundances (relative to m/e 322)								
	320/322	320/324	257/322	257/259	194/196	160	161	194	196	257	259	320	322	32

QUALITY CONTROL SUMMARY

Mean Accuracy, Surrogate Measurements: _____ No. of Data Points: _____

Accuracy, Fortified/Spike Field Blank: _____ Sample No. _____

Relative Difference(%), Duplicate Analysis: _____ Sample No. _____

APPENDIX C

SAMPLE INFORMATION AND DOCUMENTATION

PLANNED SAMPLING ACTIVITY REQUIRING CLP ANALYSES

Region _____ Site _____ Month/Year of Activity _____ Case _____

Sampling Organization (State, REM, FIT, etc.) _____ Regional Contact _____ Telephone _____ _____

Type of Investigation (RI/FS, Enforcement, etc.) _____ Activity Status (Definite, Conditional or Tentative) _____

Sampling Date(s) _____ Alternate Sampling Date(s) _____

Sample Shipment Date(s) _____ Alternate Shipment Date(s) _____

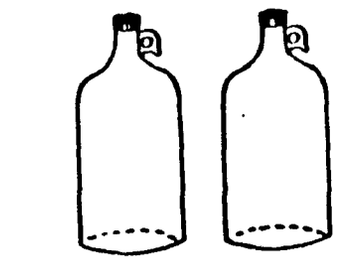
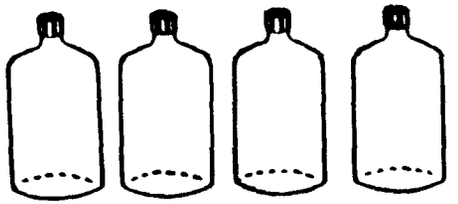
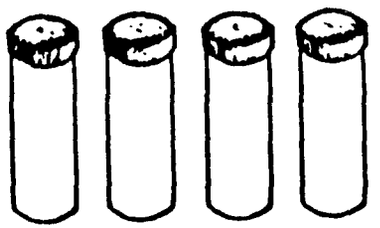
Routine Analytical Services Required	Media/Concentration						Total		
	Liquid or Water			Solid, Soil or Sediment			Other (SAS)					
	Low	Med	High	Low	Med	High	Low	Med	High	Low	Med	High
Full HSL Organics												
VOA Fraction Only												
Semi-VOA Fraction Only												
Pesticide/PCB Fraction Only												
Dioxin Only												
HSL Metals & Cyanide												
HSL Metals Only												

Special Analytical Services Required: Specify (Method, QA, Reporting Requirements to be Provided via SMO Client Request Form)

Submittal Status: (Current, 1, 2 or 3 Month Projection)	Notification Status: (Initial Notification or Resubmittal)	Resubmittal Status: (Resubmittal With or Without Changes)

Submitted By:	Date:	Phone:	Approved By:	Date:
Date Notification Received By SMO:			Date Laboratory(ies) Assigned:	

ORGANIC SAMPLE COLLECTION REQUIREMENTS

WATER SAMPLES	REQUIRED VOLUME		CONTAINER TYPE
EXTRACTABLE ANALYSIS (LOW LEVEL)	1 GALLON		2 X 80-OZ. AMBER GLASS BOTTLES
			OR 4 X 1-LITER AMBER GLASS BOTTLES
EXTRACTABLE ANALYSIS (MEDIUM LEVEL*)	1 GALLON		4 X 32-OZ. WIDE-MOUTH GLASS JARS
VOLATILE ANALYSIS (LOW OR MEDIUM LEVEL*)	80 ML		2 X 40-ML GLASS VIALS

*ALL MEDIUM LEVEL SAMPLES TO BE SEALED IN METAL PAINT CAN FOR SHIPMENT

Rev: 10/84

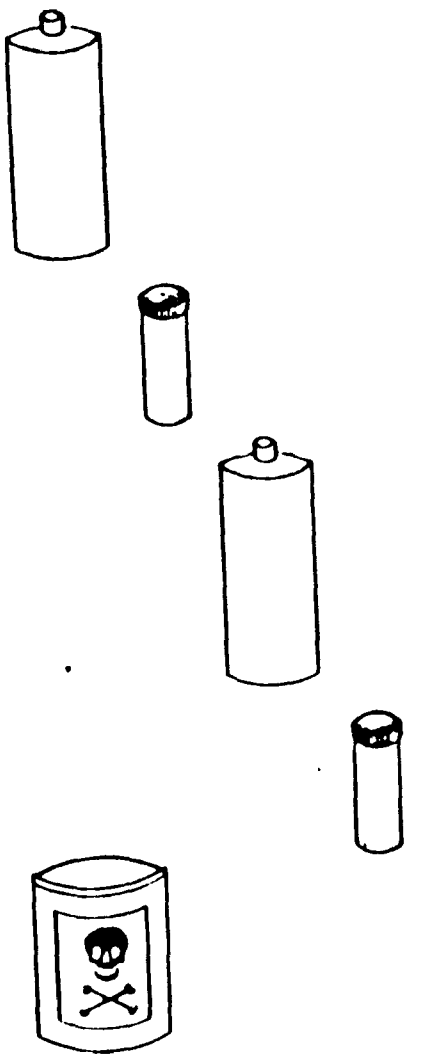
ORGANIC SAMPLE COLLECTION REQUIREMENTS

SOIL/SEDIMENT SAMPLES	REQUIRED VOLUME		CONTAINER TYPE
EXTRACTABLE ANALYSIS (LOW OR MEDIUM LEVEL*)	6 OZ.		1 X 8-OZ. WIDE-MOUTH GLASS JAR
			OR
			2 X 4-OZ. WIDE-MOUTH GLASS JARS
VOLATILE ANALYSIS (LOW OR MEDIUM LEVEL*)	240 ML		2 X 120-ML WIDE-MOUTH GLASS VIALS

*ALL MEDIUM LEVEL SAMPLES TO BE SEALED IN METAL PAINT CAN FOR SHIPMENT

INORGANIC SAMPLE COLLECTION REQUIREMENTS

WATER SAMPLES	REQUIRED VOLUME	CONTAINER TYPE
METALS ANALYSIS (LOW LEVEL)	1 LITER	1 X 1-LITER POLYETHYLENE BOTTLE
METALS ANALYSIS (MEDIUM LEVEL*)	16 OZ.	1 X 16-OZ. WIDE-MOUTH GLASS JAR
CYANIDE (CN^-) ANALYSIS (LOW LEVEL)	1 LITER	1 X 1-LITER POLYETHYLENE BOTTLE
CYANIDE (CN^-) ANALYSIS (MEDIUM LEVEL*)	16 OZ.	1 X 16-OZ. WIDE-MOUTH GLASS JAR



*ALL MEDIUM LEVEL SAMPLES TO BE SEALED IN METAL PAINT CAN FOR SHIPMENT

INORGANIC SAMPLE COLLECTION REQUIREMENTS

SOIL/SEDIMENT SAMPLES	REQUIRED VOLUME		CONTAINER TYPE
METALS AND CYANIDE (CN^-) ANALYSIS (LOW OR MEDIUM LEVEL*)	6 OZ.		1 X 8-OZ. WIDE-MOUTH GLASS JAR
			OR
			2 X 4-OZ. WIDE-MOUTH GLASS JARS

*ALL MEDIUM LEVEL SAMPLES TO BE SEALED IN METAL PAINT CAN FOR SHIPMENT

HIGH HAZARD SAMPLE COLLECTION REQUIREMENTS

	REQUIRED VOLUME		CONTAINER TYPE
LIQUID SAMPLES			
ORGANIC AND INORGANIC ANALYSIS	6 OZ.		1 X 8-OZ. WIDE-MOUTH GLASS JAR
SOLID SAMPLES			
ORGANIC AND INORGANIC ANALYSIS	6 OZ.		1 X 8-OZ. WIDE-MOUTH GLASS JAR

*ALL MEDIUM LEVEL SAMPLES TO BE SEALED IN METAL PAINT CAN FOR SHIPMENT

DIOXIN SAMPLE COLLECTION REQUIREMENTS

SOIL/SEDIMENT SAMPLES	REQUIRED VOLUME		CONTAINER TYPE
2,3,7,8-TCDD (DIOXIN) ANALYSIS	4 OZ.		1 X 4-OZ. WIDE-MOUTH GLASS JAR
			OR
			1 X 8-OZ. WIDE-MOUTH GLASS JAR

*ALL MEDIUM LEVEL SAMPLES TO BE SEALED IN METAL PAINT CAN FOR SHIPMENT

U.S. ENVIRONMENTAL PROTECTION AGENCY
CLP Sample Management Office
P.O. Box 818 - Alexandria, Virginia 22313
Phone: 703/557-2490 - FTS/557-2490

SAS Number

SPECIAL ANALYTICAL SERVICES

Client Request

☐ Regional Transmittal ☐ Telephone Request

A. EPA Region/Client: _____

B. Representative: _____

C. Telephone Number: _____

D. Date of Request: _____

Please provide below description of your request for Special Analytical Services under the Contract Laboratory Program. In order to most efficiently obtain laboratory capability for your request, please address the following considerations, if applicable. Incomplete or erroneous information may result in a delay in the processing of your request. Please continue response on additional sheets, or attach supplementary information as needed.

1. General description of analytical service requested: _____

2. Definition and number of work units involved (specify whether whole samples or fractions; whether organics or inorganics; whether aqueous or soil and sediments; and whether low, medium or high concentration):

3. Purpose of analysis (specify whether enforcement, remedial action, etc.):

4. Estimated date(s) of collection: _____

5. Estimated date(s) and method of shipment: _____

6. Approximate number of days results required after lab receipt of samples: _____

7. Analytical protocol required (attach copy if other than a protocol currently used in this program): _____

8. Special technical instructions (if outside protocol requirements, specify compound names, CAS numbers, detection limits, etc.): _____

9. Analytical results required (if known, specify format for data sheets, QA/QC reports, Chain of Custody documentation, etc.) If not completed, format of results will be left to program discretion. _____

10. Other (use additional sheets or attach supplementary information, as needed): _____

11. Name of sampling/shipping contact: _____
Phone: _____

Please return this request to the Sample Management Office as soon as possible to expedite processing of your request for special analytical services. Should you have any questions or need any assistance, please call us at the Sample Management Office.

SAMPLE DOCUMENTATION

U.S. ENVIRONMENTAL PROTECTION AGENCY HWI Sample Management Office

ORGANICS TRAFFIC REPORT

Sample Number F 1402

① Case Number:

Sample Site Name/Code:

② SAMPLE CONCENTRATION (Check One)

___ Low Concentration
___ Medium Concentration

③ SAMPLE MATRIX (Check One)

___ Water
___ Soil/Sediment

④ Ship To:

Attn

Transfer Ship To

⑤ Regional Office ___ ___

Sampling Personnel

Name

Phone

Sampling Date

Begin End

⑥ For each sample collected specify number of containers used and mark volume level on each bottle.

	Number of Containers	Approximate Total Volume
Water (Extractable)		
Water (VOA)		
Soil/Sediment		
Water (Ext/VOA)		
Other		

⑦ Shipping Information

Name of Carrier

Date Shipped

Airbill Number

⑧ Sample Description

___ Surface Water ___ Mixed Media
___ Ground Water ___ Solids
___ Leachate ___ Other (specify) _____

⑨ Sample Location

⑩ Special Handling Instructions

(e.g. safety precautions, hazardous nature)

U.S. ENVIRONMENTAL PROTECTION AGENCY HWI Sample Management Office

ORGANICS TRAFFIC REPORT

Sample Number: F 1402

① Case Number: 2149

Sample Site Name/Code: DUMP /000

② SAMPLE CONCENTRATION (Check One)

X Low Concentration
___ Medium Concentration

③ SAMPLE MATRIX (Check One)

X Water
___ Soil/Sediment

④ Ship To:
ROY F. WESTON, INC
WESTON WAY
WESTCHESTER, PA
Attn TED THE..

Transfer Ship To.

⑤ Regional Office: CC

Sampling Personnel
David Anderson
(Name)
(214) 742-6601
(Phone)

Sampling Date: 10/12/83
1400 (Begin) 1425 (End)

⑥ For each sample collected specify number of containers used and mark volume level on each bottle.

	Number of Containers	Approximate Total Volume
Water (Extractable)	2	1 GAL.
Water (VOA)	2	80 ML.
Soil/Sediment		
Water (Ext/VOA)		
Other		

⑦ Shipping Information

Federal Express
Name of Carrier

10/12/83
Date Shipped

1302 44321
Airbill Number

⑧ Sample Description

___ Surface Water ___ Mixed Media
X Ground Water ___ Solids
___ Leachate ___ Other (specify) ___

⑨ Sample Location

WELL #1

⑩ Special Handling Instructions (e.g. safety precautions hazardous nature)

½ GAL. Lot # 13232011
40 ML. Lot # 23230071

U.S. ENVIRONMENTAL PROTECTION AGENCY HWI Sample Management Office
P.O. Box 818, Alexandria, VA 22313 703 557-2490 FTS 557-2490

INORGANICS TRAFFIC REPORT

Sample Number
ME 1401

(1) Case Number: _____
Sample Site Name/Code:

(2) SAMPLE CONCENTRATION
(Check One)
_____ Low Concentration
_____ Medium Concentration

(3) SAMPLE MATRIX
(Check One)
_____ Water
_____ Soil Sediment

(4) Ship To:

Attn: _____

Transfer
Ship To:

(5) Sampling Office: _____

Sampling Personnel

(Name) _____

(Phone) _____

Sampling Date

(Begin) _____ (End) _____

(6) Shipping Information:

Name Of Carrier

_____

Date Shipped _____

Airbill Number _____

(7) Sample Description:
(Check One)
_____ Surface Water
_____ Ground Water
_____ Leachate
_____ Mixed Media
_____ Solids
_____ Other: _____
(specify)

MATCHES ORGANIC SAMPLE NO. _____

(8) Mark Volume Level
On Sample Bottle
Check Analysis required

_____ Task 1 & 2
_____ Task 3 Ammonia
Sulfide
Cyanide

U.S. ENVIRONMENTAL PROTECTION AGENCY HWI Sample Management Office
PO Box [illegible] VA 22[illegible] (703) 557-2490 FTS 557-2490

INORGANICS TRAFFIC REPORT

Sample Number: ME 1401

(1) Case Number: 2097
Sample Site Name/Code: DUMP/000

(3) SAMPLE CONCENTRATION (Check One)
X Low Concentration
___ Medium Concentration

(3) SAMPLE MATRIX (Check One)
X Water
___ Soil/Sediment

(4) Ship To:
Rocky Mtn Anal. Lab
5500 Marshall St.
Arvada, CO 80002
Attn: Terry Diorana

Transfer Ship To:

(5) Sampling Office: V
Sampling Personnel
(Name) Roger Jones
(Phone) (517) 372-8147
Sampling Date
(Begin) 9/28/87 (End) 9/28/87

(6) Shipping Information:
Name Of Carrier: Federal Express
Date Shipped: 9/28/87
Airbill Number: 3072329972

(7) Sample Description (Check One)
X Surface Water
___ Ground Water
___ Leachate
___ Mixed Media
___ Solids
___ Other (specify) ME
MATCHES ORGANIC SAMPLE NO 1701

(8) Mark Volume Level On Sample Bottle
Check Analysis required
X Task 1 & 2
X Task 2 Ammonia
Sulfide
Cyanide

QC Lot # 3326002 2

U.S. ENVIRONMENTAL PROTECTION AGENCY CLP Sample Management Office

HIGH HAZARD TRAFFIC REPORT

Sample Number E 1402

FIELD SAMPLE RECORD

1 Case Number: Sample Site Name/Code:	2 Field Sample Description: Drum Aqueous Liquid Sludge Solid Oil Other	3 Ship To: Attn:
4 Sampling Office: Sampling Personnel: (name) (phone) Sampling Date: (begin) (end)	5 Known or Suspected Hazards:	6 Sample Location:
8 Shipping Information: (name of carrier) (date shipped) (airbill number)	7 Preparations Requested: (check below) Sample Volume: Organics Volatile Organics Base/Neutrals, Acid (CLP) Pesticides/PCB Inorganics Total Metals Total Mercury Cyanide	
9 Special Handling Instructions: SMO Copy		

U.S. ENVIRONMENTAL PROTECTION AGENCY CLP Sample Management Office

HIGH HAZARD TRAFFIC REPORT

Sample Number: E 1402

FIELD SAMPLE RECORD

1 Case Number: 167
Sample Site Name/Code: DUMP/OOC

2 Field Sample Description:
X Drum
_ Aqueous Liquid
_ Sludge
_ Solid
_ Oil
_ Other

3 Ship To:
Fred C. Hart Associates
Req'd Lab
Denver Fed Cntr, #53
Denver, CO 80225
Attn. Steve Kunen

4 Sampling Office: V

Sampling Personnel: John Angelo
(name)
312 663-9415
(phone)

Sampling Date: 3/16/83
(begin) (end)

5 Known or Suspected Hazards:
yellow oily
inert liquid

6 Sample Location:
B 7039
S 0008

7 Preparations Requested:
(check below)
Sample Volume: 4 oz.
X Organics
X Volatile Organics
X Base Neutral Acid
TCDD
X Pesticides PCB
X Inorganics
X Total Metals
X Total Mercury
X Strong Acid Anions
X CN Confirmation
X Sulfide Confirmation

8 Shipping Information:
Federal Express
(name of carrier)
7/14/83
(date shipped)
288 419 121
(airbill number)

9 Special Handling Instructions:

SMO Copy

USEPA Contract Laboratory Program
Sample Management Office
P O Box 818 Alexandria Virginia 22313
FTS 8-557-2490 703 557-2490

CASE NO:	BATCH NO:

CLP DIOXIN SHIPMENT RECORD

Site Name	Sampling Office	Ship To	FOR LAB USE ONLY
City & State	City & State		Date Samples Rec'd
EPA Site No	Sampling Contact (name)	Date Shipped	Received By
Latitude / Longitude	Sampling Date	Transfer To	Date Samples Rec'd
Tier 1 2 3 4 5 6 7 (circle one)	Data Turnaround 15-Day ____ 30 Day ____	Date Shipped	Received By

SAMPLE NUMBERS	MATRIX: SOIL/SEDIMENT	MATRIX: OTHER	DESCRIPTION: FIELD SAMPLE	DESCRIPTION: SAMPLE TO DUPLICATE	DESCRIPTION: SAMPLE TO SPIKE	DESCRIPTION: BLANK	DESCRIPTION: EQUIPMENT RINSATE	DESCRIPTION: OTHER (SAS ONLY)	ADD'L ANALYSIS: SPECIFY (SAS ONLY)	FOR LAB USE: SAMPLE CONDITION ON RECEIPT

WHITE [illegible] YELLOW [illegible] PINK [illegible] GOLD [illegible]

USEPA Contract Laboratory Program
Sample Management Office
P O Box 818 Alexandria Virginia 22313
FTS 8-557-2490 703 557-2490

CASE NO: 2000 | BATCH NO. /

CLP DIOXIN SHIPMENT RECORD

Site Name: NAME	Sampling Office: Region VII	Ship To: LAB NAME	FOR LAB USE ONLY
City & State: Cityname, MO	City & State: Kansas City, KS	Attention:	Date Samples Rec'd:
EPA Site No: MOD 123456789	Sampling Contact: NAME (name)	Date Shipped: 6-12-84	Received By:
Latitude: 7 digit number	Sampling Date: 6-12-84	Transfer To:	Date Samples Rec'd:
Longitude: 8 digit number	Data Turnaround: 15-Day ___ 30-Day ✓	Date Shipped:	Received By:
Tier ① 2 3 4 5 6 7 (circle one)			

SAMPLE NUMBERS	MATRIX: SOIL/SEDIMENT	MATRIX: OTHER	DESCRIPTION: FIELD SAMPLE	DESCRIPTION: SAMPLE TO DUPLICATE	DESCRIPTION: SAMPLE TO SPIKE	DESCRIPTION: BLANK	DESCRIPTION: EQUIPMENT RINSATE	DESCRIPTION: OTHER (SAS ONLY)	ADD'L ANALYSIS: SPECIFY (SAS ONLY)	FOR LAB USE: SAMPLE CONDITION ON RECEIPT
DG000101	✓		✓							
DG000102	✓		✓							
DG000103	✓				✓					
DG000104	✓		✓							
DG000105	✓		✓							
DG000106	✓		✓							
DG000107		Solvent ✓					✓			
DG000108	✓		✓							
DG000109	✓		✓							
DG000110	✓		✓							
DG000111	✓		✓							
DG000112	✓		✓							
DG000113	✓		✓							
DG000114	✓		✓							
DG000115	✓		✓							
DG000116	✓		✓							
DG000117	✓		✓							
DG000118	✓			✓						
DG000119	✓		✓							
DG000120	✓		✓							
DG000121	✓		✓							
DG000122	✓		✓							
DG000123	✓		✓							
DG000124	✓		✓							

WHITE—SMO Copy YELLOW—Region Copy PINK—Lab Copy for Return to SMO GOLD—Lab Copy

U.S. ENVIRONMENTAL PROTECTION AGENCY
CLP Sample Management Office
P.O. Box 818 - Alexandria, Virginia 22313
Phone: 703/557-2490 - FTS/557-2490

SAS Number

SPECIAL ANALYTICAL SERVICE
PACKING LIST

Sampling Office:	Sampling Date(s):	Ship To:	For Lab Use Only
Sampling Contact: (name)	Date Shipped:		Date Samples Rec'd:
(phone)	Site Name/Code:	Attn:	Received By:

	Sample Numbers	Sample Description i.e., Analysis, Matrix, Concentration	Sample Condition on Receipt at Lab
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			

For Lab Use Only

White - SMO Copy, Yellow - Region Copy, Pink - Lab Copy for return to SMO, Gold - Lab Copy

U.S. ENVIRONMENTAL PROTECTION AGENCY
CLP Sample Management Office
P.O. Box 818 - Alexandria, Virginia 22313
Phone: 703/557-2490 - FTS/557-2490

SAS Number: 570-F

SPECIAL ANALYTICAL SERVICE
PACKING LIST

Sampling Office: VI Dallas
Sampling Contact: Dave Peters (name)
(214) 767-9763 (phone)
Sampling Date(s): 5/26/83
Date Shipped: 5/26/83
Site Name/Code: DUMP/000
Ship To: RMAL, 5530 Marshall St, Arvada, CO 80002
Attn: Tony Maierana
For Lab Use Only
Date Samples Rec'd:
Received By:

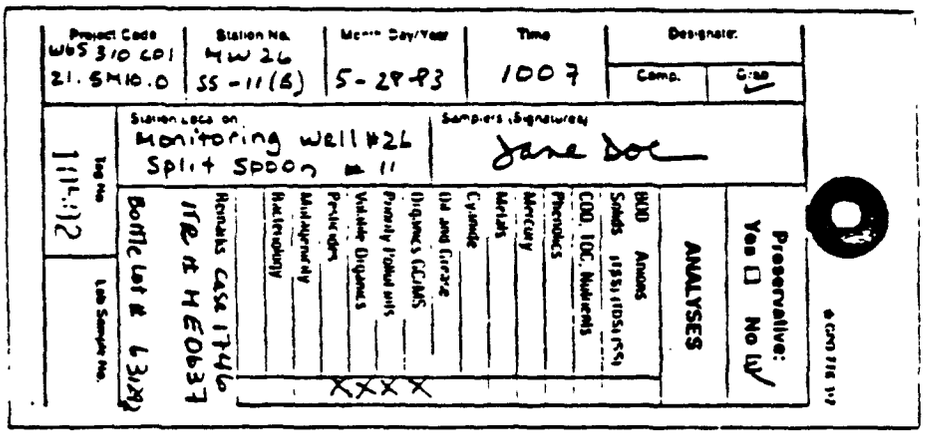
	Sample Numbers	Sample Description Le., Analysis, Matrix, Concentration	Sample Condition on Receipt at Lab
1.	SAS 570F-1	Medium Soil Analysis A, B Tag #6-2450	
2.	" -2	" " " " " #6-2451	
3.	" -3	" " " " " #6-2452	
4.	" -4	" " " " " #6-2453	
5.	" -5	Medium Soil Analysis A " #6-2454	
6.	" -6	" " " " " #6-2455	
7.	" -7	" " " " " #6-2456	
8.	" -8	" " " " " #6-2457	
9.	" -9	Medium Soil Analysis A, B " #6-2458	
10.	" -10	" " " " " #6-2459	
11.	" -11	" " " " " #6-2460	
12.	" -12	Medium Soil Analysis A " #6-2461	
13.	" -13	" " " " " #6-2462	
14.	" -14	" " " " " #6-2463	
15.	" -15	Medium Soil Analysis A, B " #6-2464	
16.	" -16	" " " " " #6-2466	
17.	" -17	Medium Soil Analysis A " #6-6901	
18.	" -18	" " " " " #6-6902	
19.	" -19	" " " " " #6-6903	
20.	" -20	" " " " " #6-6904	

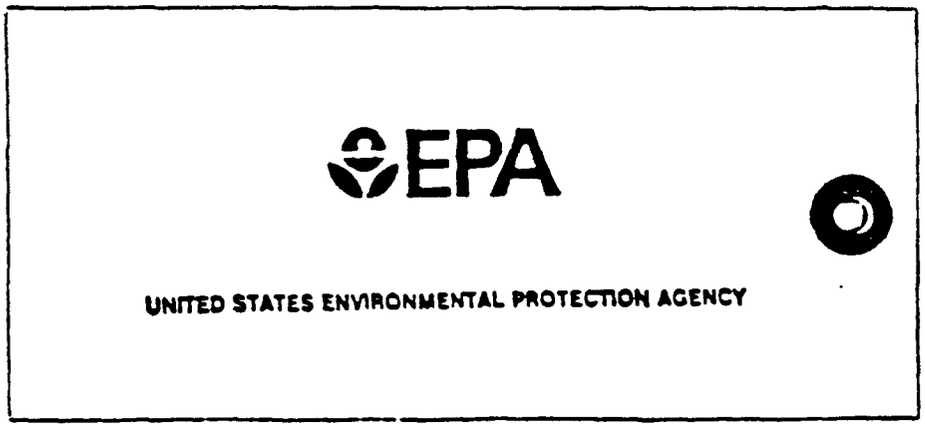
For Lab Use Only

White - SMO Copy, Yellow - Region Copy, Pink - Lab Copy for return to SMO, Gold - Lab Copy
A → Total Lead Analysis B → EP Toxicity

Custody Seal

Sample Tag





ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

CHAIN OF CUSTODY RECORD

PROJ NO	PROJECT NAME					NO OF CONTAINERS							REMARKS
SAMPLERS (Signature)													
STA NO	DATE	TIME	COMP	GRAB	STATION LOCATION								

Relinquished by (Signature)	Date / Time	Received by (Signature)	Relinquished by (Signature)	Date / Time	Received by (Signature)
Relinquished by (Signature)	Date / Time	Received by (Signature)	Relinquished by (Signature)	Date / Time	Received by (Signature)
Relinquished by (Signature)	Date / Time	Received for Laboratory by (Signature)	Date / Time	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

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C23

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

CHAIN OF CUSTODY RECORD

PROJ NO: 2097 | PROJECT NAME: LDI

SAMPLERS (Signature): Roger J. Jones

RMA #-5267
Case 2097

STA NO	DATE	TIME	COMP	GRAB	STATION LOCATION	NO. OF CONTAINERS	Task 1+2	Task 3 CN					REMARKS Tasks 1, 2 + Cn Corresponds To ITR	OTR	TAG #
006	9/28	8:00		X	LDI-SW-006	2	X	X					ME 1701	E4199	5-102501
													"	"	5-102502
007	9/27	16:00		X	LDI-SW-007	2	X	X					ME 1702	E4200	5-102503
													"	"	5-102504
008	9/27	17:00		X	LDI-SW-008	2	X	X					ME 1703	E4201	5-102505
													"	"	5-102506
009	9/27	18:00		X	LDI-SW-009	2	X	X					ME 1703	E4202	5-102507
													"	"	5-102508
010	9/28	9:00		X	LDI-SW-010	2	X	X					ME 1705	E4203	5-102509
													"	"	5-102510

Relinquished by (Signature)	Date / Time	Received by (Signature)	Relinquished by (Signature)	Date / Time	Received by (Signature)
Roger J. Jones	9/28/03 17:00				
Relinquished by (Signature)	Date / Time	Received by (Signature)	Relinquished by (Signature)	Date / Time	Received by (Signature)
Relinquished by (Signature)	Date / Time	Received for Laboratory by (Signature)	Date / Time	Remarks	
		Q. Macorano	9/30/03 10:00	Fed. Express Airbill #33260022 Custody Seals #31511 & #31512	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

C-24

SAMPLE PACKAGING AND SHIPMENT

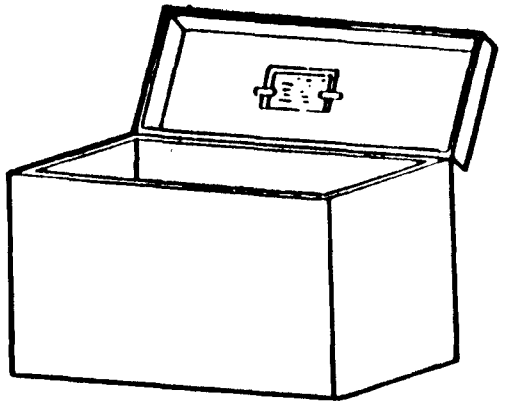
SAMPLE PACKAGING SUMMARY

- ENCLOSE ALL SAMPLE CONTAINERS IN CLEAR PLASTIC BAGS

- COOL ORGANIC LOW WATERS TO 4°C (DO NOT ICE DIOXIN SAMPLES, INORGANIC LOW WATERS, OR MEDIUM/HIGH LEVEL WATERS OR SOILS; ICE IS OPTIONAL FOR LOW LEVEL SOILS)

- PACK ALL MEDIUM AND HIGH LEVEL WATER AND SOIL SAMPLES IN METAL PAINT CANS

- SURROUND CONTENTS OF CAN WITH NON-COMBUSTIBLE, ABSORBENT PACKING MATERIAL



- PACK SEALED PAINT CANS OR PLASTIC-ENCLOSED SAMPLE BOTTLES IN SHIPMENT CONTAINER

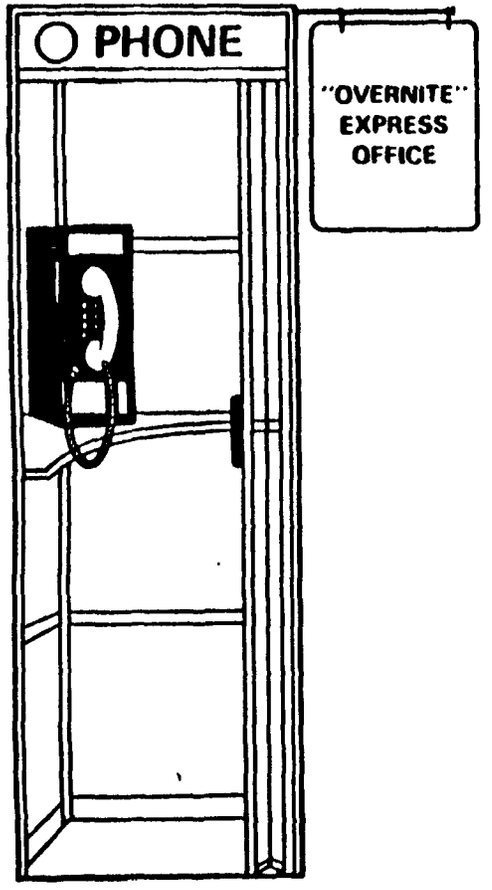
- USE A METAL ICE CHEST FOR SHIPMENT
  (DO NOT USE CARDBOARD OR STYROFOAM CONTAINERS TO SHIP SAMPLES)

- SURROUND CONTENTS WITH NON-COMBUSTIBLE, ABSORBENT PACKING MATERIAL
  (DO NOT USE EARTH OR ICE PACKING MATERIALS)

- TAPE PAPERWORK IN PLASTIC BAGS UNDER COOLER LID

- CLOSE COOLER AND SEAL WITH CUSTODY SEALS

SAMPLE SHIPMENT COORDINATION CHECKLIST



IMMEDIATELY UPON SHIPMENT OF SAMPLES, SAMPLERS CALL SMO WITH THE FOLLOWING INFORMATION:

- CASE OR SAS NUMBER
- NAME OF LABORATORY
- DATE OF SHIPMENT
- CARRIER, AIRBILL (SHIPMENT) NUMBERS AND TYPE OF SERVICE
- NUMBER AND MATRICES OF SAMPLES SHIPPED
- INFORMATION ON CHANGES, DELAYS, CONTINUATIONS, ETC., PERTINENT TO THE CASE
- SMO MUST BE NOTIFIED BY 3:00 PM ON FRIDAY FOR SAMPLES INTENDED FOR SATURDAY DELIVERY/PICKUP

POTENTIAL PROBLEMS
WITH SAMPLE SHIPMENT AND ANALYSIS

- NON-HOMOGENEOUS/MULTI-PHASE WATER OR SOIL SAMPLES
- MATRICES OTHER THAN WATER OR SOIL
  (I.E., ROCKS, LEAVES, STICKS, OIL, ETC.)
- INSUFFICIENT VOLUME FOR ANALYSIS REQUESTED
- BROKEN OR LEAKING SAMPLES
- INCORRECT OR INCOMPLETE PAPERWORK
- LABORATORY RECEIPT OF INCORRECT SAMPLES
- LABORATORY ACCIDENTS INVOLVING SAMPLES
- ANALYTICAL PROBLEMS WITH SAMPLES

IF ANY OF THESE PROBLEMS ARE ENCOUNTERED,
CONTACT SMO IMMEDIATELY.

In Reference to Case No(s):

Contract Laboratory Program
REGIONAL/LABORATORY COMMUNICATION SYSTEM
Telephone Record Log

Date of Call: _____

Laboratory Name: _____
Lab Contact: _____

Region: _____
Regional Contact: _____

Call Initiated By: ____ Laboratory ____ Region

In reference to data for the following sample number(s):

_____
_____
_____

Summary of Questions/Issues Discussed:

_____
_____
_____
_____
_____
_____
_____

Summary of Resolution:

_____
_____
_____
_____
_____
_____
_____
_____

_____ _____
Signature Date

Distribution: (1) Lab Copy, (2) Region Copy, (3) SMO Copy

APPENDIX D

AUXILIARY SUPPORT SERVICES DOCUMENTATION

SUPERFUND SAMPLE BOTTLE REPOSITORY
DELIVERY ORDER

ORDER NO.

Date of Order: _____ Type of Order:

- ☐ Routine
- ☐ Fast Turnaround
- ☐ Emergency

_____
(date/time order called in)

FROM (Name): _____

Affiliation: _____

Telephone: _____

AR Signature: _____

TO: I-CHEM Research Corporation
23787-F Eichler St. - Hayward, CA 94545
Telephone: 415/782-3905

Ship the following items for arrival by: _____ (date)

(If applicable) Ship to arrive no earlier than: _____ (date)

Item No.	Description	No. of Items Per Case	No. of Cases Ordered	REPOSITORY USE ONLY No. of Cases Shipped
1	80 ounce amber glass bottle	6		
2	40-mL glass vial	72		
3	1-L polyethylene bottle	42		
4	120-mL wide-mouth glass vial	72		
5	16-oz wide-mouth glass jar	48		
6	8-oz wide-mouth glass jar	96		
7	4-oz wide-mouth glass jar	120		
8	1-L amber glass bottle	30		
9	32-oz wide-mouth glass jar	36		
—	_____	___		

Ship To: _____
(provide _____
street address) _____
_____
Attention: _____

REPOSITORY USE ONLY

Type of Shipment: Complete Order ☐ Partial Order ☐ Partial/Completes Order ☐

Carrier: _____ A/B, UPS No: _____

Date Shipped: _____ Signature: _____

DISTRIBUTION: White - Repository Copy
Pink - SMO Copy
Yellow - Repository Copy for Return to SMO
Gold - Requestor File Copy

Rev: 10/84

SUPERFUND SAMPLE BOTTLE REPOSITORY
PACKING LIST

REPOSITORY
I-CHEM Research
23787-F Eichler St.
Hayward, CA 94545
Telephone: 415/782-3905

Delivery Order No. _____
Type of Order: _____
Time: _____ (emergency only)

DESTINATION (from Delivery Order)

Name: _____
Address: _____
_____
_____
To be delivered by: _____
Telephone No: _____

The materials listed below have been shipped as requested.
Date Shipped: _____
Mode of Shipment: _____
UPS, BOL, A/B No: _____
Signature: _____

Type of Shipment: ☐ Partial ☐ Complete ☐ Partial/Completes Order

Item No.	Description	No. of Cases Shipped	Lot Number(s)	QC Clearance Number(s)
1	80 oz. glass			
2	40-mL glass			
3	1-L poly			
4	120-mL glass			
5	16-oz glass			
6	8-oz glass			
7	4-oz glass			
8	1-L glass			
9	32-oz glass			

AUTHORIZED REQUESTOR USE ONLY

Sign below and forward the pink copy to SMO within 7 days of shipment receipt. Keep the gold copy for your file.

The above order was received by the designee, inspected, and accepted.

Date of Receipt: _____ Requestor Signature: _____

Send pink PL copy to: USEPA Sample Management Office (SMO)
P.O. Box 818
Alexandria, Virginia 22313

Distribution: White - Repository Copy
Yellow - Designee Copy
Pink - Requestor Copy for Return to SMO
Gold - Requestor File Copy

DATE: 06/20/84

U.S ENVIRONMENTAL PROTECTION AGENCY
HAZARDOUS WASTE INVESTIGATION
SAMPLE MANAGEMENT OFFICE

PAGE: 110

**** REGIONAL SAMPLE LIST ****
SAMPLES RECEIVED FROM REGION V
FROM 04/01/83 TO 12/31/83
LABORATORY: CONTRACT :

PROGRAM : GC SCREEN, GC/MS ANALYSIS

DAY LATE/EARLY CODES: N/A : NOT APPLICABLE N/R: NO CHRONICLE RECEIVED N/D: NOT DUE

CASE NO/ TYPE1 INV	REGION/ TYPE2 INV	SAMPLE NO	LAB RECEIVED	SAMPLE WEIGHT	COMP CODE		SAMPLE TYPE	DATA DUE	DATA RECEIVED	DAYS DATA	LATE/EARLY EXT	VOA
********** 2165 **********	V											
		E3991-X	10/26/83	0.50	E	P	OLS	11/26/83	11/26/83	0	0	N/A
366832		E3992	10/26/83	1.00	FULL		OLS	11/25/83	11/24/83	-1	-5	-5
366832		E3993	10/26/83	1.00	FULL		OLS	11/25/83	11/24/83	-1	2	-5
366832		E3994	10/26/83	1.00	FULL		OLS	11/25/83	11/24/83	-1	-5	-5
366832		E3995	10/26/83	1.00	FULL		OLS	11/25/83	11/24/83	-1	2	-5
366832		E3996	10/26/83	1.00	FULL		OLS	11/25/83	11/24/83	-1	-5	-5
366832		E3997	10/26/83	1.00	FULL		OLS	11/25/83	11/24/83	-1	-5	-5
		E3997-X	10/26/83	0.50	E	S	OLW	11/28/83	11/28/83	0	0	N/A
366832		E3997-M	10/26/83	1.00	FULL		OLS	11/25/83	11/24/83	-1	-5	-5
366832		E3997-D	10/26/83	1.00	FULL		OLS	11/25/83	11/24/83	-1	-5	-5
********** 2174 **********	V											
366832		E3341	10/28/83	1.00	FULL		OLS	11/27/83	11/24/83	-3	-5	-3
366832		E3343	10/28/83	1.00	FULL		OLS	11/27/83	11/24/83	-3	1	-3
366832		E3345	10/28/83	1.00	FULL		OLS	11/27/83	11/24/83	-3	-5	-3
		E3345-X	10/28/83	0.50	E	P	OLS	11/26/83	11/26/83	0	0	N/A
366832		E3347	10/28/83	1.00	FULL		OLS	11/27/83	11/24/83	-3	-5	-3
366832		E3349	10/28/83	1.00	FULL		OLS	11/27/83	11/24/83	-3	-5	-3

D-4

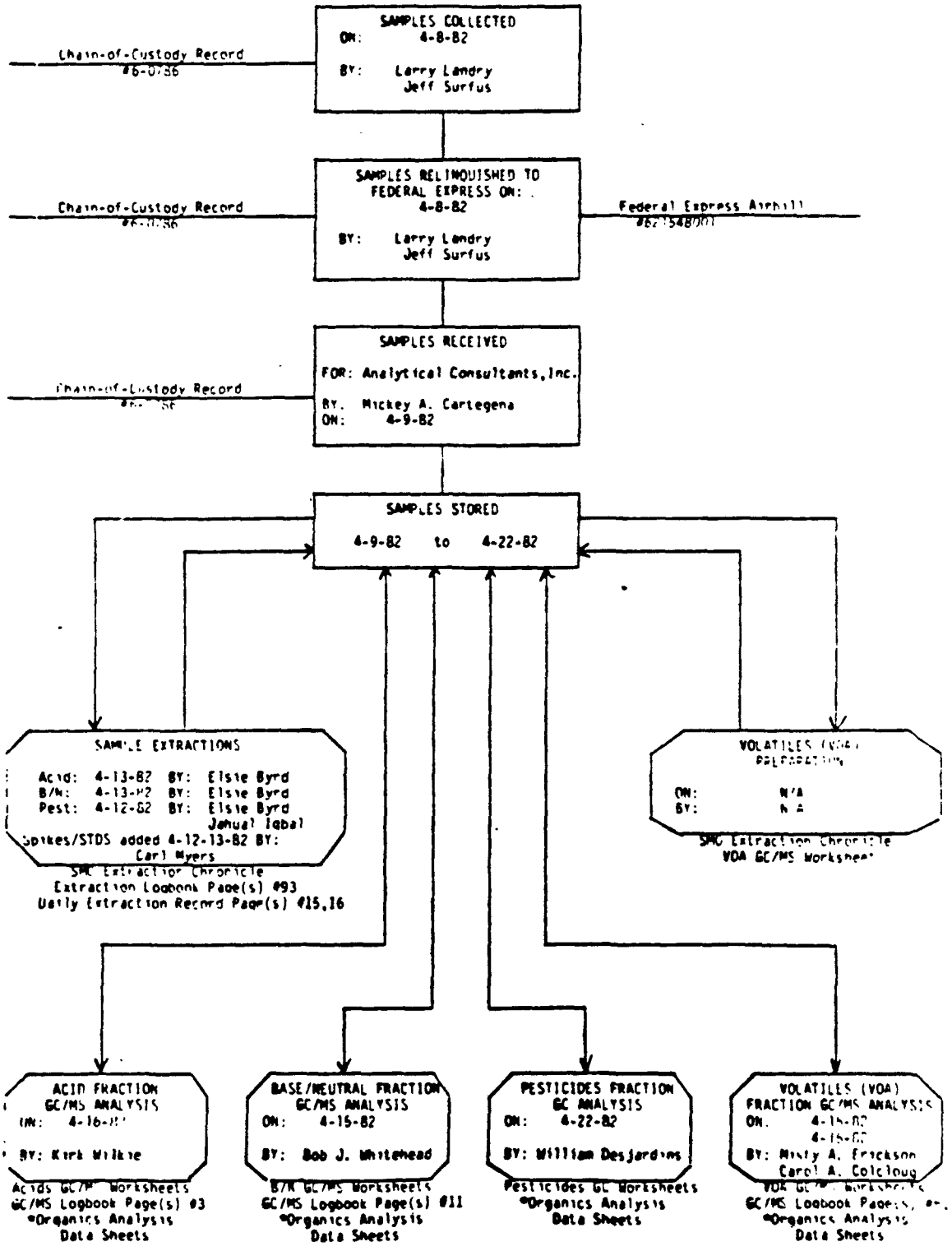
CASE FILE PURGE MATERIALS

Include, but are not limited to:

- Sample Tags
- Chain-of-Custody Records
- Sample Shipment Records
- Sample Receipt Logbook Pages
- Copies of Internal Sample Tracking Records
- Organic/Inorganic/High Hazard Traffic Reports
- Dioxin Shipment Records
- SAS Packing Lists
- Extraction/Preparation Notes
- Analysts' Logbook Pages
- Instrument Logbook Pages
- Bench Sheets
- Organic/Inorganic/Dioxin/SAS Analysis Data Sheets
- Standards Analysis Data
- Calibration Worksheets
- Chromatograms/Spectra
- Inorganic Raw Data Printouts
- Raw Data Summaries
- Correspondence Memos
- Document Inventory

SUMMIT COUNTY LANDFILL

(SMO) CASE #: 1000
NAME OF LABORATORY Analytical Consultants, Inc.
SAMPLE #'s. F1476, F1477



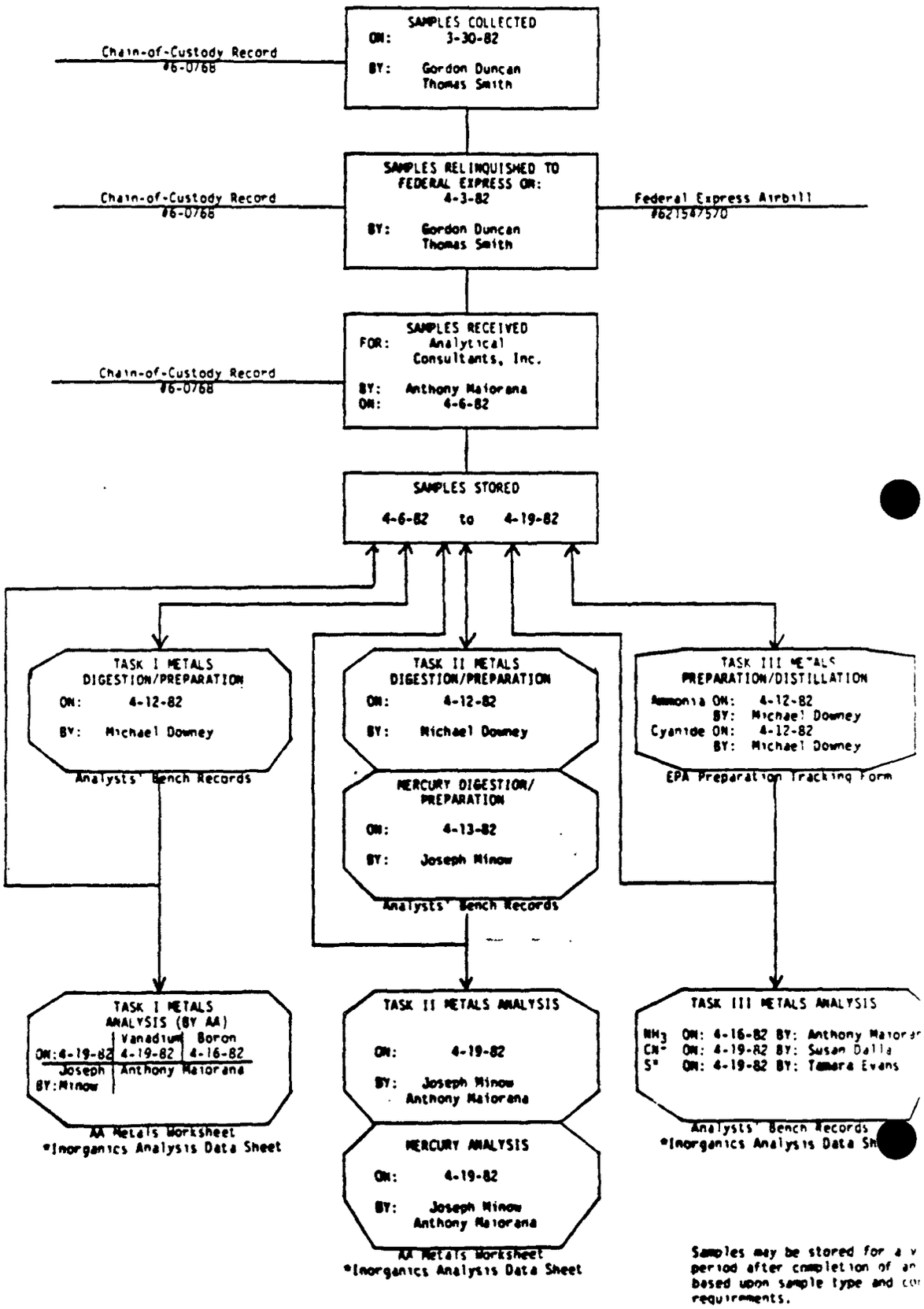
* Results Tabulation Form

VOA fraction does not require extraction

Samples may be stored for a varying period after completion of analysis based upon sample type and contract requirements.

SUMMIT COUNTY LANDFILL

(SMO) CASE #: 1000
NAME OF LABORATORY: Analytical Consultants, Inc.
SAMPLE #'s: MF9043 to MF9053



* Results Tabulation Form

OWPE COST RECOVERY CHECKLIST

1. Site Name: _____ 2. State: _____

3. Site No.: _____

4. Status: (Check One)

___Trial Date Set - If yes, please give date: _____

___Filed

___Referred to DOJ

___Referred to HQ

___In Preparation Stage in Region

___Statute of Limitations Problem

5. Name of OSC or Regional Contact _____

6. Telephone Number of OSC or Regional Contact _____

7. Which, if any, of the following FIT contractors were used?

(Circle One)

a. E&E Yes No Dates E&E worked on site: _____

b. CH_2M Hill Yes No Dates CH_2M Hill worked on site: _____

c. NUS Yes No Dates NUS worked on site: _____

8. Which, if any, of the following TAT contractors were used?

(Circle One)

a. E&E Yes No Dates E&E worked on site: _____

b. Weston Yes No Dates Weston worked on site: _____

9. Were any contract laboratories used for analysis work? (Circle One) Yes No

a. Was work done through the Contract Laboratory Program (CLP)? (Circle One) Yes No

b. If yes, list applicable Case/SAS numbers and/or CLP sample numbers below.

_____

_____

c. If not, who did work? List name of lab(s) and date(s) of work below.

_____

_____

d. Please list any other names or acronyms ever used in identifying this site:

_____

_____

10. Which, if any, of the following REM contractors were used?

		(Circle One)		
a.	Black & Veatch	Yes	No	Dates work was done: _____
b.	CDM	Yes	No	Dates work was done: _____
c.	Weston	Yes	No	Dates work was done: _____
d.	CH_2M Hill	Yes	No	Dates work was done: _____
e.	NUS	Yes	No	Dates work was done: _____

11. Please provide the following information about any contractors let by OSC:

Aa. Contractor: _____ d. Invoice Nos: _____
b. Contract No: _____ e. Invoice Dates: _____
c. Dates work was done: _____ f. Invoice Amounts: _____

Ba. Contractor: _____ d. Invoice Nos: _____
b. Contract No: _____ e. Invoice Dates: _____
c. Dates work was done: _____ f. Invoice Amounts: _____

12. Were any expert witnesses hired? (Circle One) Yes No
    a. If yes, were these witnesses hired through either of the following contracts:

	(Circle One)		
TES	Yes	No	Dates of work: _____
Life Systems	Yes	No	Dates of work: _____

13. Were any overflights done? (Circle One) Yes No
    a. If yes, give approximate dates of overflights: _____
14. Was any work (e.g., evidence audits, sampling) done by NEIC? (Circle One) Yes No
    a. If yes, give approximate dates of work: _____
15. Was any work done by TechLaw, Inc. (Intera)? (Circle One) Yes No
    a. If yes, give approximate dates of work: _____
16. Was any work done by TES? (Circle One) Yes No
    a. If yes, give approximate dates of work: _____
17. Was any work done by IT (emergency response) contract? (Circle One) Yes No
    a. If yes, give approximate dates of work: _____

18. Please provide the following information about any other agencies that may have worked on this site:

	Approximate Dates of Work	IAG Number	Contact Person at Agency	Telephone Number
HHS				
DOI				
USOG				
NOAA				
USGS				
Corps				
FEMA				
DOD				
DOJ				

	Contract Number	Cooperative Agreement No.
State		

MEMORANDUM

DATE: _____

TO: Data Review Team
Sample Management Office

FROM: _____

USEPA Region _____

SUBJECT: Data Review Request

COPIES:

Please review the data from the following SMO Case:

SMO Case No.: _____

Site Name: _____

Lab Name(s): _____

_____

_____

I. Sample Information:

A. Number of Samples in Case: _____

B. Number of Samples to be Reviewed: _____

(List Numbers if Not All)

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

C. Organics to be Reviewed? Yes___ No___

D. Inorganics to be Reviewed? Yes___ No___

II. User Information:

A. User Organization: _____

B. Contact for Questions:

Name: _____ Telephone: _____

C. Type(s) of Review Requested:

	Check All That Apply	Date Needed
QA/QC Compliance	☐	_____
Problem Case	☐	_____
Applications	☐	_____
Consulting	☐	_____
Other	☐	_____

Specify: _____

_____

D. Additional Issues to Address in Review: _____

_____

_____

_____

_____

_____

E. Intended Use of Data:

	Check All That Apply
Enforcement	☐
Preliminary Assessment	☐
Site Investigation	☐
Remedial Action	☐
Site Monitoring	☐
Undetermined	☐
Other	☐

Specify: _____

_____

F. Comments: _____

QA/QC COMPLIANCE REPORT

MEMORANDUM

DATE: _____

TO: _____

USEPA Region _____

FROM: _____

SMO Data Review Team

SUBJECT: QA/QC Compliance Review Summary for a Contract Laboratory Organic Data Package: Case No. _____

COPIES:

As requested, quality control and performance measure for the data packages noted have been examined and compared to EPA standards for compliance.

Measures for the following general areas were evaluated:

I. Data Completeness
II. Spectra Matching Quality
III. Surrogate Spikes
IV. Matrix Spikes
V. Duplicates
VI. Blanks
VII. DFTPP and BFB Tuning
VIII. Chromatography
IX. Holding Times

Any statistical measures used to support the following conclusions are attached so that the review may be reviewed by others.

Correspondence Dates:

A. Review Requested _____
B. Review Authorized _____
C. Results Available _____
D. Review Mailed _____

Action Items:

_____
_____
_____
_____
_____
_____

Data Reviewed

Case Number: _____

Site Name: _____

Laboratory Name(s): _____

_____

_____

Intended Use:

_____

_____

_____

Conclusions

Compared to existing contract standards, each fraction is found to be acceptable, acceptable but qualified as noted, preliminary pending verification or unacceptable.

	Acceptable	Qualified Acceptable	Prelimi-nary	Un-Acceptable
Fractions:				
A. Volatiles	_____	_____	_____	_____
B. Base/Neutrals	_____	_____	_____	_____
C. Acids	_____	_____	_____	_____
D. Pesticides/PCBs	_____	_____	_____	_____
E. TCDD	_____	_____	_____	_____

Comments and Qualifications: See Text.

Data Prepared By: _____ Date: _____

Reviewer's Name: _____ Date: _____

Reviewer's Signature: _____

Telephone No.: _____

FTS Line: _____

Appendices

A. Sample List

B. Summary of Compounds Found

C. Glossary and Data Qualifiers

6/27/84

EXAMPLE

APPENDIX B: SUMMARY OF COMPOUNDS FOUND

Site: Trashy LF

Case: 4000

Lab: ABC Analytical

	T4040	T4041	T4042	T4043	T4044	T4045	T4046	T4047	T4048	T4049	T4050	T4051	T4052
acrolein													
acrylonitrile													
benzene	V		V	V								V	
carbon tetrachloride													
chlorobenzene													
1,2-dichloroethane													
1,1,1-trichloroethane			X							V		X	
1,1-dichloroethane													
1,1,2-trichloroethane													
1,1,2,2-tetrachloroethane													
chloroethane													
2-chloroethylvinyl ether													
chloroform						X	V	V					
1,1-dichloroethene													
trans-1,2-dichloroethene	X		X				V					X	X
1,2-dichloropropane													
trans-1,3-dichloropropene													
cis-1,3-dichloropropene													
ethylbenzene	V		X						X	X	V		
methylene chloride	X		X	X	X	X	X	X	X	X	X	X	X
chloromethane													
bromomethane				X									
bromoform													
bromodichloromethane													
fluorotrichloromethane				X	X	V	V				V	V	X
dichlorodifluoromethane					X	V							
chlorodibromomethane													
tetrachloroethene	X		X	X					V	V	V	X	X
toluene	V		X	X		V	V	V		V			
trichloroethene	X		X	X	X	X		X	X	X	X	X	X
vinyl chloride													
acetone	X		X	X	X							V	
2-butanone			X	X	X			V		V	X		
carbondisulfide	V			X									
2-hexanone													
4-methyl-2-pentanone													
styrene				X				V					
vinyl acetate												V	
total xylenes	X		X	X			V	V	X	X		V	V

II. SPECTRA MATCHING QUALITY

_____ Spectra Were Examined and Found to be of Good Matching Quality

_____ Some Spectra Were Examined and Found to be of Poor Matching Quality

Remarks: _____

III. SURROGATE SPIKES - SOIL SAMPLES

The recoveries of the surrogate spiking compounds were reviewed. The average recovery results, standard deviations, etc., are listed below. Values marked with an asterisk indicate quality control problems.

Fraction	Surrogate Compound	Acceptable Range (Percent)	Average Recovery (Percent)	± Standard Deviation	Range	Number Out of Range	Total No. of Samples
VOA	D_8-Toluene	69 - 127					
VOA	Bromofluorobenzene	61 - 122					
VOA	D_4-1,2-Dichloroethane	64 - 129					
B/N	D_5-Nitrobenzene	24 - 115					
B/N	2-fluorobiphenyl	37 - 120					
B/N	D_{14}-p-Terphenyl	28 - 133					
Acid	D_5-Phenol	20 - 106					
Acid	2-Fluorophenol	24 - 111					
Acid	2,4,6-Tribromophenol	11 - 102					
Pesticide	Dibutylchlorendate	0 - 205**					
TCDD	1,2,3,4-TCDD	18 - 128**					

Remarks: _____

**Advisory Limits

IRROGATE SPIKES - WATER SAMPLES

e recoveries of the surrogate spiking compounds were reviewed. The average recovery results, standard deviations, etc., are ted below. Values marked with an asterisk indicate quality control problems.

Fraction	Surrogate Compound	Acceptable Range (Percent)	Average Recovery (Percent)	± Standard Deviation	Range	Number Out of Range	Total No. of Samples
VOA	D_8-Toluene	86 - 119					
VOA	Bromofluorobenzene	85 - 121					
VOA	D_4-1,2-Dichloroethane	77 - 120					
B/N	D_5-Nitrobenzene	41 - 120					
B/N	2-fluorobiphenyl	44 - 119					
B/N	D_{14}-p-Terphenyl	33 - 128					
Acid	D_5-Phenol	15 - 96					
Acid	2-Fluorophenol	23 - 107					
Acid	2,4,6-Tribromophenol	20 - 105					
Pesticide	Dibutylchlorendate	67 - 114**					
TCDD	1,2,3,4-TCDD	23 - 148					

Remarks: _____

**Advisor imits

V. MATRIX SPIKE RESULTS - SOIL SAMPLES

The matrix spike results (MSR) for each parameter group were evaluated. The parameters that were reported are listed below along with the MSR guidelines and amount of spike added. Values marked with a double asterisk indicates outliers.

Compound	Acceptable Range (Percent)	Average Recovery (Percent)	Number Out of Range	Total Number
Volatiles				
1,1-Dichloroethylene	59 - 177			
Trichloroethylene	62 - 137			
Chlorobenzene	60 - 133			
Toluene	59 - 139			
Benzene	66 - 142			
Base/Neutrals				
1,2,4-trichlorobenzene	38 - 107			
Acenephthene	31 - 137			
2,4-dinitrotoluene	28 - 89			
Di-n-butylphthalate	29 - 135			
Pyrene	35 - 142			
N-nitrosodi-n-propylamine	41 - 126			
1,4-dichlorobenzene	28 - 104			
Acids				
Pentachlorophenol	17 - 109			
Phenol	26 - 90			
2-chlorophenol	25 - 102			
p-chloro-m-cresol	26 - 103			
4-nitrophenol	11 - 114			

MATRIX SPIKE RESULTS - SOIL SAMPLES (continued)

Compound	Acceptable Range (Percent)	Average Recovery (Percent)	Number Out of Range	Total Number
Pesticides				
Heptachlor	35 - 130			
Aldrin	34 - 132			
Dieldrin	31 - 134			
Lindane	46 - 127			
Endrin	42 - 139			
p,p-DDT	23 - 134			

**Not within specified criteria.

Remarks: _____

IV. MATRIX SPIKE RESULTS - WATER SAMPLES

The matrix spike results (MSR) for each parameter group were evaluated. The parameters that were reported are listed below along with the MSR guidelines and amount of spike added. Values marked with a double asterisk indicates outliers.

Compound	Acceptable Range (Percent)	Average Recovery (Percent)	Number Out of Range	Total Number
Volatiles				
1,1-Dichloroethylene	61 - 145			
Trichloroethylene	71 - 120			
Chlorobenzene	75 - 130			
Toluene	76 - 125			
Benzene	76 - 127			
Base/Neutrals				
1,2,4-trichlorobenzene	39 - 98			
Acenephthene	46 - 118			
2,4-dinitrotoluene	24 - 96			
Di-n-butylphthalate	11 - 117			
Pyrene	26 - 127			
N-nitrosodi-n-propylamine	41 - 116			
1,4-dichlorobenzene	36 - 97			
Acids				
Pentachlorophenol	9 - 103			
Phenol	12 - 89			
2-chlorophenol	27 - 123			
p-chloro-m-cresol	23 - 97			
4-nitrophenol	10 - 80			

MATRIX SPIKE RESULTS - WATER SAMPLES (continued)

Compound	Acceptable Range (Percent)	Average Recovery (Percent)	Number Out of Range	Total Number
Pesticides				
Heptachlor	40 - 131			
Aldrin	40 - 120			
Dieldrin	52 - 126			
Lindane	56 - 123			
Endrin	56 - 121			
p,p-DDT	38 - 127			

**Not within specified criteria.

Remarks: _____

V. DUPLICATE ANALYSIS RESULTS

The relative percent difference (RPD) for each parameter group was evaluated. The duplicate analysis RPD acceptance criteria should be:

Fraction	Maximum Acceptable Percent Difference
Volatile	15%
Base/Neutral	50%
Acid	40%
Pesticide	40%

The RPDs exceeding the maximum acceptable percent difference were:

	Compound	Actual RPD	Concentration	
			Sample	Duplicate
Fraction:				
Volatile				
Base/Neutral				
Acid				

Each duplicate analysis was examined in reference to compounds detected in each analysis. Those compounds which were not common to each analysis for the duplicate sample are listed below:

Fraction	Sample Number	Compound	Concentration

Remarks: _____

VI. BLANK ANALYSIS RESULTS

The blank analysis was reviewed. The contaminents in the blank are listed below:

Fraction	Compound	Significant	
_____	_____	Yes ____	No ____
_____	_____	Yes ____	No ____
_____	_____	Yes ____	No ____

Remarks: _____

VII. DFTPP AND BFB TUNING RESULTS

_____ The DFTPP tuning results were reviewed and found to be within the specified criteria.

_____ The BFB tuning results were reveiwed and found to be within the specified criteria.

The (DFTPP/BFB) tuning results were reviewed and the following abundances were found to fall outside the specified criteria:

Compound	m/z	Required Abundance	Actual Abundance

The (DFTPP/BFB) performance results which were found to be outside the contractually-required tuning requirements do not have an adverse technical impact on the data.

_____ No adverse technical impact.

_____ Adverse impact on data.

Remarks: _____

VIII. CHROMATOGRAPHY CHECKS

Resolution and Sensitivity

Type of Column: Packed Column_____ Fused Silica Capillary Column (FSCC)_____

Packed Column Chromatography Check:

Tailing Factors	Acceptance Windows	Actual
Benzidine	Less Than 3	_____
Pentachlorophenol	Less Than 5	_____

FSCC Chromatography Check:

50-ng benzidine detectable? Yes___ No___

Pentachlorophenol response factor? Yes___ No___

General shape of the total ion chromatogram:

	Acids	Base/ Neutrals	Volatiles	Pesticides
Peak Shape	_____	_____	_____	_____
Interferences	_____	_____	_____	_____
Background	_____	_____	_____	_____

Standards

General shape of the total ion chromatography:

	Acids	Base/ Neutrals	Volatiles	Pesticides
Peak Shape	_____	_____	_____	_____
Interferences	_____	_____	_____	_____
Background	_____	_____	_____	_____

Remarks: _____

_____

_____

_____

_____

_____

MEMORANDUM

DATE: _____

TO: _____

USEPA Region _____

FROM: _____

SMO Data Review Team

SUBJECT: QA/QC Compliance Review Summary for a Contract Laboratory Inorganic Data Package: Case No. _____

COPIES:

As requested, quality control and performance measure for the data packages noted have been examined and compared to EPA standards for compliance.

Measures for the following general areas were evaluated:

I.	Data Completeness	IV.	Blanks
II.	Matrix Spikes	V.	ICP Interference Check
III.	Duplicates	VI.	Calibrations

Any statistical measures used to support the following conclusions are attached so that the review may be reviewed by others.

Correspondence Dates:

A. Review Requested _____

B. Review Authorized _____

C. Results Available _____

D. Review Mailed _____

Action Items:

_____

_____

_____

_____

_____

_____

Data Reviewed

Case Number: _____

Site Name: _____

Laboratory Name(s): _____

_____

_____

Intended Use:

_____

_____

_____

Conclusions

Compared to existing contract standards, each fraction is found to be acceptable, acceptable but qualified as noted, preliminary pending verification or unacceptable.

	Acceptable	Qualified Acceptable	Preliminary	Un-Acceptable
Fractions:				
A. Task I (ICP)	_____	_____	_____	_____
B. Task II (AA)	_____	_____	_____	_____
C. Task III (CN)	_____	_____	_____	_____

Comments and Qualifications: See Text.

Data Prepared By: _____ Date: _____

Reviewer's Name: _____ Date: _____

Reviewer's Signature: _____

Telephone No : _____

FTS Line: _____

Appendices

A. Sample List

B. Summary of Elements Found

C. Glossary and Data Qualifiers

6/27/84

APPENDIX B: SUMM...Y OF ELEMENTS FOUND

CASE: 4000
SITE: Trashy LF
LAB: ABC Anal

		MT 0001	MT 0002	MT 0003	MT 0004	MT 0005	MT 0006	MT 0007	MT 0008	MT 0009	MT 0010	MT 0011	MT 0012
Aluminum	Al	X	X	X	X	X	X		X		X	X	X
Chromium	Cr	X	X	X	X			X	X	X			X
Barium	Ba												
Beryllium	Be				X	X	X	X					
Cobalt	Co							X	X	X	X		X
Copper	Cu	X	X		X	X	X		X		X	X	X
Iron	Fe	X	X	X	X	X	X	X	X	X	X	X	X
Nickel	Ni												
Manganese	Mn	X	X	X	X	X	X	X	X	X	X	X	X
Zinc	Zn												
Boron	B												
Vanadium	V	X									X		
Silver	Ag				X		X			X			
Arsenic	As	X	X			X		X		X		X	
Antimony	Sb				X		X		X	X		X	
Selenium	Se												
Thallium	Tl		X					X	X	X			
Mercury	Hg			X	X	X	X	X	X	X	X		
Tin	Sn												
Cadmium	Cd												
Lead	Pb	X	X	X	X	X	X	X			X	X	X
Cyanide	CN^-		X		X			X		X		X	X

APPENDIX E

REFERENCES

NOTE: The references in this Appendix are supplied for general information purposes and do not necessarily represent methods or procedures utilized in the CLP.

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