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Date: September 6, 1996  
Refer to: EM/ER:96-452

FILE LANA HSWJA  
GREN/MHC/6

Mr. Benito Garcia  
NMED-HRMB  
P.O. Box 26110  
Santa Fe, NM 87502

**SUBJECT: MOBILE ANALYTICAL LABORATORIES**

Dear Mr. Garcia:

The Los Alamos National Laboratory's Environmental Restoration (ER) Project has responded to the same concerns that you expressed in your July 10, 1996, letter to Mr. G. Thomas Todd, Department of Energy/Los Alamos Area Office, concerning the use of mobile analytical laboratories. Concern was based on the shortcomings found when the ER Project performed assessments of the mobile laboratories in use. Your two cited concerns have been dealt with, as follows.

1. In June, the ER Project Management Team decided to discontinue use of the Laboratory's Chemical Science and Technology Division mobile laboratories, with the exception of the radiochemistry mobile laboratory. The radiochemistry mobile laboratory is used for Department of Transportation screening purposes. We are planning to use field screening methods or a commercially supplied mobile facility to conduct radiological screening after October 1, 1996.
2. For future work, the ER Project's Chemistry Team has developed two documents designed to ensure the adequacy and appropriateness of analytical services provided by any mobile laboratory (or any on-site measurements). First, the document entitled "Requirements for Chemistry and Radiochemistry Mobile Laboratories" identifies the minimum plans, systems, and standard operating procedures that a mobile laboratory must have in place and demonstrated prior to work being performed for ER.

Second, the document entitled "Statement of Work Elements Required for Use of On-site Measurements" provides specific items that a field unit must include in a statement of work (SOW) for mobile laboratory work (required prior to use of mobile laboratories). This document serves to (1) demonstrate that the field unit has performed proper planning to identify on-site measurements (either in a mobile laboratory or not) as an adequate and appropriate tool (as documented by an SOW flowing from determined data quality needs) and (2) provide a clear description of the work to be performed and the product that is to be delivered, along with acceptance criteria.

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These two documents are enclosed for your information.

Mobile laboratory work will not be initiated without implementation of these documents. Mobile facilities will be assessed for compliance with the requirements, and work will not begin until procedures have been reviewed for completeness and adequacy.

At this time, the Chemistry Team is completing a "standard" SOW for x-ray fluorescence (XRF), an application commonly-used by mobile laboratories. This will be available for each field unit in the near future.

In addition, the new manager of the ER Field Support Facility interviewed 25 mobile van users. It was clear that the mobile vans were designed for screening purposes, but with the redirection of ER activities over the last year from assessment to remediation, the ER Field Project Leaders decided to use the van data for decision purposes. To accomplish this redirection, the field units review the data provided by the vans to determine if the data can meet their needs. In some instances the data can be used and in some instances it cannot. These decisions are made by statisticians, field team chemists, and other field personnel.

Concerning your mention of the Quality Assurance Program Plan (QAPP), this document entitled "Quality Assurance Project Plan Requirements for Sampling and Analysis" was provided to the Environmental Protection Agency and the New Mexico Environment Department for review on March 4, 1996. This QAPP contains appropriate and adequate guidance for planning analytical services, regardless of the source of analyses, and will prevent further problems like those identified in last year's assessment of mobile laboratories.

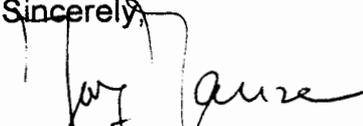
Your recommendation to send 20% of the samples to fixed analytical laboratories as a check for any quality problem may not be appropriate for the manner in which ER currently uses on-site measurements. ER typically uses on-site measurements to provide an indication that remediation has been successfully completed or to provide a focused area for characterization samples. Verification samples are then collected and submitted to fixed analytical laboratories for a final decision on the cleanliness level achieved or for final characterization information needed. If on-site measurement processes are contracted or developed using the criteria identified in the submitted QAPP and the enclosed requirements document, there may be no need for verification samples to be sent to fixed analytical laboratories because the quality checks are already built into the processes.

Lastly, your request for a list of all sites where mobile laboratories were used, especially using XRF, needs some clarification. What is the time frame for which you are requesting this information? Are we to provide this information only for mobile laboratory results that were used in decision-making? We will do our best to provide the information you need once the scope has been clarified. We do not want to provide stacks of print-outs or information that would make it impossible for you to meet your needs.

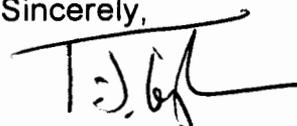
I hope this response assures you of our continuing interest in carrying out our ER Project responsibilities with integrity and ensuring confidence while being cost effective.

If you have any questions, please call Larry Souza at (505) 665-0470.

Sincerely,

  
Jorg Jansen, Program Manager  
LANL/ER Project

Sincerely,

  
Theodore J. Taylor, Program Manager  
DOE/LAAO

JJ/TT/rfr

- Enclosures: (1) Requirements for Chemistry and Radiochemistry Mobile Laboratories  
(2) Statement of Work Elements Required for Use of On-site Measurements

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## REQUIREMENTS FOR CHEMISTRY AND RADIOCHEMISTRY MOBILE LABORATORIES

### Purpose of this Requirements Document:

This is not a statement of work (SOW). It is, instead, a set of requirements for the systems that must be in place in order for chemistry (chem) or radiochemistry (rad) mobile laboratories (also referred to as "vans" herein) to be considered acceptable for consideration for use by the Environmental Restoration (ER) Project. **These requirements apply to mobile laboratories operated commercially or by Los Alamos National Laboratory (the Laboratory), as well as other sources of on-site measurements.** The SOW for on-site measurements (mobile laboratory or other) will depend upon what the particular data use is at the time of mobilization and **must be provided by the client**, along with performance specifications, deliverables requirements, analytical methods to use, and needed turnaround times. See "Statement of Work Elements Required for Use of On-Site Measurements." Definition of these elements should result from the application of the data quality objective (DQO) (or other) planning process and be part of the site-specific Sampling and Analysis Plan (SAP). Participation of Decision Support Council Chemistry Team personnel (e.g., the field unit chemist and other chemistry assistance as appropriate) during the planning process is recommended if mobile laboratories or other sources of on-site measurements are likely to play a role in the data collection process, since they are prepared to define the limitations of the technologies appropriate for deployment in the field and can provide knowledgeable input into methods selection and quality control procedures and criteria.

Some "standard" SOWs will be generated by the Decision Support Council Chemistry Team for common uses of radiochemistry on-site measurements, such as for screening for the following purposes: (1) to provide data to ensure that Department of Transportation and the International Air Transport Association regulations are met for the packaging and transportation of radioactive samples and (2) to provide data to ensure that radiological licenses of laboratories receiving ER samples are not exceeded or jeopardized. Another potential "standard" SOW for generation is for data collection for health and safety purposes.

SOWs for common uses of the chemistry on-site measurements will also be developed by the Chemistry Team. These common uses include the determination of limited suites of volatiles and polychlorinated biphenyls by abbreviated methods, as well as analyses used for health and safety purposes.

**No analytical work will be performed by the mobile vans without an SOW developed by the Chemistry Team or by the ER client according to the required SOW elements.**

The following plans, systems, and standard operating procedures (SOPs) must be in place and demonstrable prior to use of on-site measurements:

- Security system controlling ingress and egress of the mobile laboratory (or area for analysis).

- Chain-of-custody procedures that require complete documentation of sample custody from receipt to final disposition (return to client for disposal).
- Sample log-in and storage procedures, including a description of the locations for storage that will meet temperature, ventilation, or light constraints for common analyses. These procedures must address the potential for sample/reagent contamination or degradation, as well as the potential health and safety issues related to sample/reagent handling storage.
- Systems that ensure there are no significant fluctuations in power supply voltages, when appropriate.
- Temperature control, as needed, that meets manufacturer's requirements for instrument operation.
- A waste management plan or policy that meets all applicable requirements.
- A health and safety plan that has been approved by the Laboratory.
- Procedures for checking and verifying the acceptability of chemical reagents for their intended use.
- Training records for personnel. These are expected to be available for review during an audit.
- Recordkeeping/document control procedures. This includes all instrument logs, sample preparation logs, analytical results (hard copy and electronic), control charts for laboratory quality control purposes, records of laboratory control-sample analysis results, corrective action records, and documentation of deviations from established procedures or plans (such as a project SAP that is being implemented).
- Electronic data delivery capability that is compatible with the Facility for Information Management, Analysis, and Display, and currently, according to the Enforcement Decision Document (EDD) specified for the routine analytical services, and in the future, according to the Department of Energy EM EDD Master Specification (DEEMS) mandated by DOE EM-76, when this EDD is implemented for ER data.
- Quality Assurance Plan (QAP) for the on-site measurement operations. This includes a clear definition of the roles and responsibilities of all van personnel, the reporting hierarchy, the communication links, and the decision authorities.

The QAP must include the procedures for ensuring that the data generated and reported are complete, correct, and compliant with specified requirements. SOPs must exist that clearly define what is done at the bench level to ensure problems are identified and corrected at the earliest possible time; what is done by the supervisor to ensure that procedures are followed; and what review is performed by a quality assurance (QA) officer or other independent review function. The

electronic systems must meet the requirements of Environmental Protection Agency's "Good Automated Laboratory Practices" guidance.

The QAP must clearly describe how standards are prepared, how they are checked for adequacy for use, and the frequency of the checks.

The QAP must clearly define how initial calibrations are performed for the commonly used equipment and how they are checked for viability for continued use. Calibration is an instrument-specific process and the QAP is expected to contain only procedures for the commonly used equipment. Other calibration procedures (e.g., for emerging technologies) must be defined on an as-needed basis and documented in such a way as to be available to personnel (e.g., as an SOP) for use as needed.

The QAP must clearly define the internal quality control (QC) program that is under the authority of the QA officer. Examples include blind QC samples inserted into the analytical sample stream, periodic analysis of laboratory control samples, use of site-specific performance evaluation samples, and use of field audits to ensure that SOPs are being followed.

The QAP must provide the names and titles of the following key personnel:

- QA officer responsible for the quality aspects of the vans and the generated data.
- Supervisor who assigns, evaluates, and approves work.
- Any personnel that will be considered as responsible — that is, oversee the work of technicians who are performing analyses in the van.

## STATEMENT OF WORK ELEMENTS REQUIRED FOR USE OF ON-SITE MEASUREMENTS

The purpose of this document is to identify all of the elements that must be included in a statement of work (SOW) for use of on-site measurements, whether performed in a mobile laboratory or in the field, in order to meet the minimum needs of the Environmental Restoration (ER) Project as delineated in the "Environmental Restoration Quality Assurance Requirements for Sampling and Analysis Plans." **These requirements are for mobile laboratories operated commercially or by Los Alamos National Laboratory (the Laboratory) and for field deployable analytical instruments.**

### **A. Background**

#### A.1 Overview/Problem Definition

Provide a succinct description of the problem for which environmental data are needed, and include it in the project Sampling and Analysis Plan (SAP). If the SAP problem definition is relevant to the problem to be solved or questions to be answered using the data from the mobile laboratory(ies), incorporate it here. The "standard" SOWs that are being developed for common mobile laboratory uses will contain general problem definitions (such as those in the routine analytical contracts) and may need supplementary information specific to a project.

#### A.2 Purpose

Include the rationale for using the mobile laboratory(ies) (or other sources of on-site measurements) for the work to be performed. Some of the justifications for the use of the mobile laboratory are as follows:

- The data quality objective (DQO), or other planning process, has identified methods that are appropriate and most cost effectively performed in the field. (Note: field analyses do not always have to be performed in a mobile laboratory.) Costs include establishing electric power, equipping the mobile laboratory to satisfy the applicable SAP, and transporting it to the needed location. To justify the investment to deploy a mobile lab, there must be, at a minimum, a need for equipment that cannot be used in an outside field environment, a sufficient number of samples to warrant the deployment, and methods available that meet data quality needs.
- A need to make decisions in real, or close to real, time using on-site measurement data that must be generated in a laboratory environment instead of measurements generated *in situ* or by hand-held instruments. Examples include (1) following a contaminant plume, and thus directing the work, and (2) radiological or high-explosives (HE) screening for Department of Transportation (DOT) shipping purposes and to protect laboratory licenses (making sure that ER clients are aware of the potential limitations of screening methods for this purpose).

- Constraints requiring real time on-site analysis — e.g., degradation or change in the sample with short time elapse or temporal constraints related to representativeness of the sample.
- Analysis of samples that should not be shipped because of hazardous or radioactive levels.
- Health and safety screening to determine if protective clothing is needed. Again, any limitation of methods used for this purpose must be fully understood by the ER client.

## **B. General Requirements**

### **B.1 Sample Scheduling, Handling, Chain-of-Custody, and Receipt Procedures**

Provide the information needed by the mobile laboratory on how samples will be scheduled, the amount of lead time before sample delivery that can be expected, the mode of sample delivery, the required procedures/schedule for acknowledging sample receipt, any requirement to return samples to the client, expected or field-measured level of radioactivity or hazardous constituent, and any pertinent information about samples that will help the mobile laboratory support the ER Project in an efficient and cost-effective manner.

#### **B.1.1 Sample Delivery Group Description**

Include a discussion of how samples will arrive at the mobile laboratory, how they are to be grouped for quality control purposes (batching and batch numbering), and how the reporting will be done. An example is that up to 20 samples can be accumulated from the same matrix, analyzed as a batch with batch quality control (QC), and reported as a unit. It makes most sense to have the samples that are reported together related in some way so that relevant data set trends can be detected during data assessment.

#### **B.1.2 Holding Time and Handling Instructions**

Define any holding time constraints for the samples and special storage and/or preservation needed. Relevant tables of holding times can be cited or attached.

#### **B.1.3 Chain-of-Custody Requirements**

State any unusual chain-of-custody procedures/documentation that are not addressed by the mobile laboratory's standard operating procedures (SOPs) for chain-of-custody. Relevant Laboratory ER SOPs must be cited when appropriate.

### **B.2 Deliverables Requirements**

Provide a clear description of the deliverables that are required, with any required hard-copy forms attached. This is critical for managing and interpreting analytical data and to price the work appropriately. The preferred deliverable is electronic, using a deliverable that is compatible with the Facility for Information Management, Analysis, and Display (FIMAD) and can be electronically uploaded directly into FIMAD. The

Enforcement Decision Document (EDD) that is currently in use for the routine analytical services is required for all mobile laboratory analyses that can be incorporated into its structure (filling in the relevant data elements) and should be cited.

The Department of Energy EM EDD Master Specification (DEEMS) will be the FIMAD-compatible format in the near future, thus directing a DEEMS-compatible EDD for the mobile laboratories when implemented.

If the requirement for the mobile laboratory is so small as to not warrant development of a FIMAD-compatible EDD for the application, then define the hard-copy reporting forms, in coordination with the mobile laboratory personnel.

Describe any needed supplementary hard-copy data (e.g., chromatograms, spectra, sample prep logs, etc.), as well as any requirement for maintaining data for a specified amount of time prior to delivering it to the Sample Management Office (and ultimate delivery to the ER Records Processing Facility). Also specify any reports required in addition to the data package.

#### B.2.1 Reporting Turnaround Time

Stipulate the reporting turnaround time. For mobile laboratory work, when turnaround time is the primary constraint, preliminary results might be required immediately (e.g., less than 8 hours), in which case verbal reporting is acceptable, with follow-up reporting of raw and quality control data. All turnaround requirements must be defined, including verbal, electronic deliverables, hard-copy deliverables, and reports, as discussed in Section B.2.

#### B.2.2 Reporting Units

Reporting units depend upon the parameters to be measured and the methods of measurement. Any forms that have been provided for hard copy or formats for electronic deliverables must indicate what reporting units are required (e.g.,  $\mu\text{g/g}$  versus  $\text{mg/kg}$  for metals in soil) as well as wet/dry weight basis (or % moisture).

Generally, a dry weight basis is preferred (unless there is a hazard potential to drying the sample). However, when using a mobile laboratory with time as the primary driver, the delay for drying may not be acceptable. In this case, % moisture (to be performed after analyses and reported later) may be needed in order to relate sample results to a baseline.

#### B.3 Location of Mobile Laboratory(ies) for Performing the Work

Provide notification to the mobile laboratory personnel, well in advance, of restrictions governing where the mobile laboratory(ies) must be placed for performing the work. For example, the location of utility connections, the lay of terrain at the desired location, or the ability to receive samples from other clients might limit where the mobile laboratory can be located.

## **Attachments**

### **Attachment 1 – Proposal/Bid Form**

If this work is to be solicited, then provide a form that clearly states how the proposal/bid is to be made, e.g., price of 1 sample analysis based on X number of samples per week for X weeks for X method with X deliverable (price per sample, based on 50 volatile analyses according to SOW requirements, per week, for 10 weeks, with an electronic data deliverable into FIMAD and raw data deliverables within 7 days of analysis). There may be different prices for different turnaround times, which should be considered. Another example is to propose an hourly rate for use or a daily rate for up to X number of samples for specified analyses.

### **Other Attachments**

Attach any required hard-copy forms. In addition, the methods/QCs that are cited may be attached, as well as other SOPs/documents described herein. Any other information considered useful for implementing the requirements can be added.