Attachment L

"Guidance Document for Completing Region I Data Validation Utilizing CADRE Data Review", February 1995

GUIDANCE DOCUMENT FOR COMPLETING REGION I DATA VALIDATION UTILIZING CADRE DATA REVIEW CADRE RELEASE 2.10

CONTRACT LABORATORY PROGRAM ROUTINE ANALYTICAL SERVICES VOLATILE AND SEMIVOLATILE ORGANICS

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TABLE OF CONTENTS

LIST OF ATTACHMENTS

LIST OF ATTACHMENTS (CONT.)

INTRODUCTION **CADRE version 2.10**

CADRE (Computer Aided Data Review and Evaluation) version 2.10 is a software program which is designed to aid in the validation of volatile and semivolatile CLP RAS data packages. CADRE is capable of interpreting the electronic deliverable which the laboratory is required to submit to CLASS under SOWs OLM01.9 and OLM03.1. CADRE performs a review of data quality by comparing the quality control results to a preprogrammed set of criteria. The criteria used for evaluation by CADRE are defined in the National Functional Guidelines for Organic Data Review (Draft, June 1991).

This document is designed to guide the validator in completion of a Region I Tier II data validation utilizing CADRE's findings. For each quality control parameter reviewed, CADRE will generate a worksheet reporting any problems found during the review. CADRE will also provide recommendations for qualification of the data based upon these problems. The recommendations made by CADRE are identical to those suggested in the National Functional Guidelines for Organic Data Review (Draft, June 1991).

In some instances, however, the recommendations of the National Functional Guidelines (and, therefore, the recommendations made by CADRE) may differ from those suggested in the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses, November 1988. The actions recommended by CADRE on the data review worksheets should be followed unless stated otherwise in this guidance document. In the cases where specific actions are not stated by CADRE or included in this guidance document, all guidelines for review and data qualification set forth in the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses, November 1988, are to be followed. Any deviations in the review process or qualifications placed on sample results must be clearly justified in the Data Validation Memorandum as per the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses.

NOTE: If pesticides/PCBs were analyzed along with the volatile and semivolatile organics for a particular SDG, CADRE will attempt to validate the pesticide/PCB fraction. CADRE will display its findings of the pesticide/PCB validation on the CADRE worksheets along with its findings of the validation of the volatile and semivolatile fractions. Currently, CADRE validates many pesticide/PCB parameters different than Region 1. Any pesticide/PCB results reported by CADRE on the CADRE worksheets should be ignored. All Region 1 pesticide/PCB analyses should be manually validated.

However, it should be noted that CADRE pesticide/PCB Data

Summary Tables will be generated during CADRE validation and should be used during validation. These Data Summary Tables will be delivered, along with the CADRE Data Validation Report, to the Field Sampling Contractor.

A completed set of example worksheets (CADRE and manual) is included in Attachment I. A full set of blank Region I data validation worksheets is included in Attachment II. A tabular summary of the manual review necessary to complete a Region I Tier II data validation is included in Attachment III. The differences between the National Functional Guidelines, CADRE, and the Region I Functional Guidelines criteria are summarized in a series of tables included in Attachment IV.

CADRE Data Summary Tables

CADRE will create Data Summary Tables summarizing the results reported by the laboratory on the Form Is. CADRE can generate either unqualified or qualified Data Summary Tables. The CADRE unqualified Data Summary Tables contain the Form 1 results and qualifiers as reported by the laboratory. The CADRE qualified Data Summary Tables contain the CADRE Form 1 results along with any qualifiers resulting from the CADRE validation process.

CADRE, wherever possible, will recalculate sample values. On occasion, CADRE will round values differently than the laboratory. CADRE is programmed to round results according to rules stated in SOWs OLM01.9 and OLM03.1. The differences occur when the laboratory reporting software uses rounding rules which vary from those stated in the SOW. In these cases, the results reported by CADRE (the CADRE Form I results) represent the true CLP values. If, however, the CADRE results and the laboratory Form I results differ due to slight rounding errors, the results reported by the laboratory will be included by the ESAT CADRE chemist on the qualified Data Summary Tables. This will insure consistency of sample result transcription from the hardcopy to electronic deliverables.

The CADRE qualified Data Summary Tables for the volatile and semivolatile fractions will be provided to the Field Sampling Contractor. These Data Summary Tables will contain qualifiers recommended by CADRE on the CADRE worksheets generated during the review of each QC parameter. The Field Sampling Contractor will be required to verify that all qualifiers have been correctly transcribed onto the Data Summary Tables by CADRE. The Field Sampling Contractor will also be required to place any qualifiers onto the Data Summary Tables which result from any required manual validation.

For the pesticide/PCB fractions and in instances where major discrepancies exist between the sample values reported on the CADRE qualified Data Summary Tables and the laboratory Form 1s, the CADRE unqualified Data Summary Tables will be sent to the Field Sampling Contractors along with a notice that the Data Summary Tables are unqualified. The unqualified Data Summary Tables distributed to the Field Sampling Contractors will contain only the Form I results and qualifiers as reported by the laboratory. The Field Sampling Contractors will be required to remove all laboratory qualifiers from the CADRE unqualified Data Summary Tables (such as the "B", "D", and "E" qualifiers), with the exception of the "J" qualifier,

for results detected below the CRQL, and the "U" qualifier, for non-detect results. The Field Sampling Contractor must then add any qualifiers resulting from the completion of the data validation.

Along with the hardcopy Data Summary Tables, a diskette containing the WordPerfect files for the Data Summary Tables will be provided to the Field Sampling Contractors.

Each CADRE Data Summary Table file will be named to identify the SDG, fraction and sample matrix. The CADRE files are created as ASCII files and are then transformed into WordPerfect files by the ESAT CADRE Chemist prior to being distributed to the Field Sampling Contractor. The file naming scheme is as follows: "SDG#XY.TXT".

SDG# = The SDG number for the CLP data package.

X = Fraction
- B for Semivolatiles (BNA)
- V for Volatiles
- P for Pesticides
- M for Metals

Y = Sample Matrix
- A for Aqueous
- S for Soil

The .TXT file extension is assigned by MSDOS, when the CADRE file is created as an ASCII file, to designate that the file is a text file. This extension is retained when the file is converted into WordPerfect format.

For example - SDG AEN06 has 5 soil samples and 4 water sample for volatiles, semivolatiles, and pesticides/PCBs analysis. The files for the Data Summary Tables would be named as follows:

Semivolatiles

AEN06BS.TXT for the semivolatile soil samples
AEN06BA.TXT for the semivolatile water samples

Volatiles

AEN06VS.TXT for the volatile soil samples
AEN06VA.TXT for the volatile water samples

Pesticides/PCBs

AEN06PS.TXT for the pesticide/PCB soil samples
AEN06PA.TXT for the pesticide/PCB water samples

A backup file for each Data Summary Table will also be included on the diskette. The backup file will be named similarly to the original file but the ".TXT" extension is replaced with a ".BKP" extension. This backup file will be included only to serve as a second copy of the Data Summary Tables, if for any reason the original becomes unusable.

The Data Summary Tables will also be submitted electronically in ASCII format. This format will be available for use in site databases if desired. The ASCII files will be named similarly to the original file but the ".TXT" extension will be replaced with a ".DB".

The CADRE Data Summary Tables have been formatted as WordPerfect files. This formatting includes creating a defined structure for the table boundaries.

In order to preserve the table boundaries, all edits to the summary tables **must be performed in the "typeover" mode.** After retrieving the file onto the computer screen, press the <INSERT> key. To verify that you are in typeover mode, the word "typeover" should appear on the bottom left hand corner of the computer screen.

COMPLETING THE CADRE Data Validation Report

Upon completion of the CADRE validation, a CADRE report which consists of the CADRE Worksheets, hardcopy and diskette CADRE Data Summary Tables, and CADRE Data Review Inventory Sheet will be shipped along with the CLP Data Package to the Field Sampling Contractor. Upon receipt of the CADRE report and CLP Data Package, the Field Sampling Contractor should complete the Region I Complete SDG File Receipt/Transfer Form and the Organics Complete SDG File (CSF) Inventory Sheet (Form DC-2) as usual, as well as the CADRE Data Review Inventory Sheet to verify data completeness. (Copies of these forms are included in Attachment V). The completed CADRE Data Review Inventory Sheet should be included with the Data Validation Report.

ROLES OF ESAT IN THE CADRE VALIDATION PROCESS

The following section describes the roles that ESAT personnel play in the procession of the CADRE validation.

1. Receipt of the Data Package From the EPA RSCC at ESD

   The EPA RSCC at ESD will transfer custody of the data package to the ESAT Lexington Data Preparer. The ESAT Lexington Data Preparer will log the data package into the CLP Sample Tracking System (CLPSTS) and will indicate on the Region 1 Complete SDG File (CSF) Receipt/Transfer Form if the data package is for ESD/ESAT, ARCS, or TES validation.

   The ESAT Data Preparer will then transfer custody of the data package to the ESAT CADRE Chemist.

2. Initiation of CADRE SDG Tracking Process

   Upon receipt of the data package, the ESAT CADRE Chemist will begin a CARD/CADRE SDG Tracking Form. (A copy of the CARD/CADRE SDG Tracking Form is included in Attachment VI). The purpose of this tracking form is to provide internal assurance that all of the necessary steps for generating the CADRE report have been completed and are documented. A copy of the CARD/CADRE SDG Tracking Form will be included in the CADRE report file for each SDG, which will be kept in the EPA ESD central files.

3. Downloading of Electronic Deliverable

   Upon receipt of the data package, the ESAT CADRE Chemist will download the SDGs from the CARD database to the CADRE PC.

4. Importing the SDG into CADRE

   ESAT will import the SDG into CADRE. After successfully importing the SDG into CADRE, ESAT will manually enter the sampling dates, sampling preservation for volatiles, laboratory sample numbers, and sampling locations. If any errors are detected by CADRE during the import process, ESAT will generate the CADRE import error reports.

5. Manual Data Entry and CADRE Data Review

The ESAT CADRE Chemist will manually enter any missing or discrepant data. After completion of all manual data entry, the ESAT CADRE Chemist will execute the CADRE review of the data and generate CADRE worksheets.

6. Generating and Formatting the Data Summary Tables

The ESAT CADRE Chemist will format the Data Summary Tables to conform to the current Region I Data Summary Table specifications. The one exception to this format is that currently there is no space on the CADRE Data Summary Tables to include a column for the SOW CRQLs. However, the sample-specific CRQLs will be listed for each compound which is not detected. The Data Summary Tables will be exported in ASCII format and converted into WordPerfect files. The CADRE qualified Data Summary Tables for the volatile and semivolatile fractions will be provided to the Field Sampling Contractor. These Data Summary Tables will contain qualifiers recommended by CADRE on the CADRE worksheets generated during the review of each QC parameter. The Field Sampling Contractor will be required to verify that all qualifiers have been correctly transcribed onto the Data Summary Tables by CADRE. The Field Sampling Contractor will also be required to place any qualifiers onto the Data Summary Tables which result from any required manual validation.

For the pesticide/PCB fractions and in instances where major discrepancies exist between the sample values reported on the CADRE qualified Data Summary Tables and the laboratory Form 1s, the CADRE unqualified Data Summary Tables will be sent to the Field Sampling Contractors along with a notice that the Data Summary Tables are unqualified. The unqualified Data Summary Tables distributed to the Field Sampling Contractors will contain only the Form I results and qualifiers as reported by the laboratory. The Field Sampling Contractors will be required to remove all laboratory qualifiers from the CADRE unqualified Data Summary Tables (such as the "B", "D", and "E" qualifiers), with the exception of the "J" qualifier, for results detected below the CRQL, and the "U" qualifier, for non-detect results. The Field Sampling Contractor must then add any qualifiers resulting from the completion of the data validation.

7. Delivery of CADRE report to Field Sampling Contractors

The ESAT CADRE Chemist will prepare the hardcopy CADRE report, which consists of the CADRE worksheets and CADRE Data Summary Tables. The ESAT CADRE Chemist will also prepare a diskette containing three copies of the file for the Data Summary Tables. One file is to be used as the working file for adding qualifiers to the summary tables. The second copy will be given a .BKP extension. This file is included as a backup file if needed. The third copy will be delivered in ASCII format for use in the site database if desired.

Prior to shipping the CADRE report and CLP Data Package, the ESAT CADRE Chemist will verify the completeness of the CADRE report by initiating the CADRE Data Review Inventory Sheet. This sheet will be delivered with the CADRE report to the Field Sampling Contractor.

The ESAT CADRE Chemist will send the CLP RAS Data Package, CADRE report, and diskette containing the files for the Data Summary Tables simultaneously to the appropriate Field Sampling Contractor.

8. Notification of Required Full Manual Data Validation

On some occasions, the diskette deliverable from the laboratory will not pass the Contract Compliance Screening (CCS), which is performed by the Contract Laboratory Analytical Services Support (CLASS) contractor. Those SDGs which do not pass the CCS screen will not be uploaded into the CARD database, and subsequently, will not be available for CADRE review.

Those SDGs must have a full manual validation performed by the Field Sampling Contractor. The ESAT CADRE Chemist will send those SDGs to the Field Sampling Contractor with a notification that manual validation must be performed.

9. Notification of Required Partial Manual Validation

On some occasions, CADRE will be unable to validate a portion of the SDG due to problems with the electronic deliverable. These affected parameters must be manually validated. The ESAT CADRE Chemist will send the remaining CADRE report and data package to the Field Sampling Contractors with a notice of which parameters must be manually validated.

10. Storage and Archival of CADRE Data

The ESAT Data Preparer will store a copy of all CADRE-generated worksheets, hardcopy and diskette CADRE Data Summary Tables, CADRE Error Reports, and the CARD/CADRE SDG Tracking Form in the EPA ESD central files. A copy of the CARD/CADRE SDG Tracking Form will also be kept by the ESAT CADRE Chemist to generate the weekly CADRE Status Report for EPA.

11. Weekly CADRE Status Reports

The ESAT CADRE Chemist will provide the EPA Data Validation Chemist and the CLP-TPO with a weekly report summarizing the CADRE activities for the previous week.

ROLES OF FIELD SAMPLING CONTRACTORS IN THE CADRE VALIDATION PROCESS

The following section describes the roles that the Field Sampling Contractors play in the validation of CLP RAS data utilizing CADRE.

1. Receipt of Hardcopy Data and CADRE Report

   The Field Sampling Contractors shall receive the hardcopy CLP Data Package and CADRE report, consisting of CADRE worksheets and CADRE Data Summary Tables, simultaneously from the ESAT CADRE Chemist. If no problems are encountered with CADRE, the CLP Data Package and CADRE report will be shipped by the ESAT CADRE Chemist from ESAT/ESD within 3 days of receipt of the CLP Data Package from the EPA RSCC. A diskette containing the WordPerfect file for the Data Summary Tables will accompany the hardcopy CADRE Data Summary Tables and worksheets. A CADRE Data Review Inventory Sheet which has been completed by the ESAT CADRE Chemist will also be shipped with the CADRE report.

2. Data Completeness Check

   Upon receipt of the data package, the Field Sampling Contractor shall complete the Organics Complete SDG File (CSF) Inventory Sheet (Form DC-2) as usual and the CADRE Data Review Inventory Sheet to verify data completeness. The completed CADRE Data Review Inventory Sheet should be included with the Data Validation Report.

   If any CADRE data are missing or discrepancies are detected in the CADRE report, then the Field Sampling Contractor should notify the Region I EPA Data Validation Chemist for correction or clarification.

   If any data are missing from the CLP Data Package, then the Field Sampling Contractor should contact the laboratory to obtain the missing data.

3. Completion of the Tier I Validation

   If only a Tier I validation was required in the QAPjP (Quality Assurance Project Plan) and/or SAP (Sampling and Analysis Plan), then the Field Sampling Contractor should complete the Tier I validation as described in the Region I CSF Completeness Evidence Audit Program, dated 7/3/91. This procedure was referenced in a memorandum titled "Region I CSF Completeness Evidence Audit Program" from the Region I CLP-

TPOs to Region I Contractors, dated 7/7/91.

If a Tier II or Tier III validation was not required in the QAPjP and/or SAP, then the CADRE report and diskette, including the completed CADRE Data Review Inventory Sheet, should be stored with the CLP data package.

4. Completion of the Tier II and Tier III validation

The Field Sampling Contractor shall complete the Tier II and Tier III data validation utilizing the findings of CADRE. The validation should be completed using the Region I Tiered Organic and Inorganic Data Validation Guidelines, dated 7/1/93, the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses (as modified by Region I, 11/88) and the Guidance Document for Completing Region I Data Validation Utilizing CADRE Data Review (February 1995).

If CADRE review of an SDG is not possible, the Field Sampling Contractor will be sent the CLP Data Package with a notification that a manual validation must be performed. Currently, manual validation must also be performed for all CLP RAS Pesticides/PCB data. The Field Sampling Contractor shall perform the Tier II or Tier III data validation using the Region I Tiered Organic and Inorganic Data Validation Guidelines, dated 7/1/93 and the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses (as modified by Region I, 11/88).

5. Writing of the Data Validation Report

The Field Sampling Contractor should complete the Data Validation Memorandum, Data Summary Tables, and worksheets as directed in the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses (as modified by Region I, 11/88) and the Guidance Document for Completing Region I Data Validation Utilizing CADRE Data Review (February 1995).

6. Delivery of Final Validation Report

The final validation report, including Data Validation

Memorandum, CADRE and Region 1 Worksheets, Data Summary Tables, CADRE Data Review Inventory Sheet, etc. should be addressed to the appropriate EPA RSCC representative (currently Christine Clark) at the Environmental Services Division (ESD) in Lexington, MA. The original validation report should be delivered to the RPM for the site at EPA WMD and a copy delivered to Christine Clark, EPA RSCC in Lexington, MA.

ROLES OF EPA IN THE CADRE VALIDATION PROCESS

The following section describes the roles that Region I EPA personnel play in the validation of CLP RAS data utilizing CADRE.

1. Receipt of Hardcopy Data at EPA ESD

   The transfer of the RSCC function from EPA Waste Management Division (WMD) to EPA Environmental Services Division (ESD) occurred in January 1995. All CLP Data Packages are currently supposed to be shipped to EPA ESD by the CLP laboratories.

2. Transfer of the Data Packages From EPA WMD to EPA ESD

   If any CLP Data Packages are mistakenly shipped to EPA WMD, then EPA WMD will transfer the data package to EPA ESD via the EPA internal mailing system.

   Upon receipt of the data package by the EPA RSCC, the EPA RSCC will initiate the custody tracking of the data package by filling out the EPA Region 1 Complete SDG File (CSF) Receipt/Transfer Form and will transfer custody of the data package to the ESAT Lexington Data Preparer.

3. CADRE Support to Field Sampling Contractors

   The EPA Data Validation Chemist shall provide CADRE support to the Field Sampling Contractors. This includes tasking ESAT to provide any CADRE resubmittals if necessary and/or answering CADRE questions raised by the Field Sampling Contractors.

4. Receipt and Review of Data Validation Reports From Field Sampling Contractors

   The EPA RSCC representative (currently Christine Clark) at the Environmental Services Division (ESD) in Lexington, MA shall receive a copy of the Data Validation Report. The EPA RPM for the site (located at EPA WMD) shall receive the original validation report.

   The Data Validation Report shall be reviewed by the EPA Data Validation Chemist for use in data validation oversight and laboratory analysis oversight activities.

REGION I TIERED APPROACH TO DATA VALIDATION

The data validation process can be broken down into three distinct levels: Tier I, Tier II, and Tier III.

Tier I: A Completeness Evidence Audit is performed to ensure that all laboratory data and documentation are present. Completeness Evidence Audits are performed in accordance with procedures contained in the Region I CSF Completeness Evidence Audit Program, dated 7/3/91. (This document is the currently used procedure referenced in the memorandum titled "Region I CSF Evidence Audit Program" from the Region I CLP-TPOs to Region I Contractors, dated 7/7/91.)

The validation procedures contained in this Guidance Document for Completing Region I Data Validation Utilizing CADRE Data Review, dated February 1995, are not applicable for Tier I validation. The validation procedures contained in the Region I Tiered Organic and Inorganic Data Validation Guidelines, dated 7/1/93, should be followed. If only a Tier I validation was required in the QAPjP/SAP, then the CADRE report and diskette should be stored with the CLP Data Package for future use. The CADRE Data Review Inventory Sheet should be completed by the Field Sampling Contractor and supplied with a letter to the EPA RSCC at ESD in Lexington, MA and the site RPM stating that the QAPjP/SAP required only a Tier I validation. The technical justification for performing only a Tier I validation must also be documented in that letter.

Tier II: A Tier I Completeness Evidence Audit is performed, then the results of all Quality Control (QC) checks and procedures are evaluated and used to assess and qualify sample results. Tier II data validation is performed primarily from information contained on the tabulated data reporting forms.

The validation procedures contained in this Guidance Document for Completing Region I Data Validation Utilizing CADRE Data Review, dated February 1995, and the Region I Tiered Organic and Inorganic Data Validation Guidelines, dated 7/1/93, are used in conjunction with the CADRE report to complete a Tier II validation for CLP RAS volatiles and semivolatiles.

Tier III: A full validation is performed. Tier III includes Tier I and Tier II procedures plus an in-depth examination of all raw data to check for technical, calculation, analyte identification/analyte quantitation, and transcription errors.

The validation procedures contained in this Guidance Document for Completing Region I Data Validation Utilizing CADRE Data Review, dated February 1995, and the Region I Tiered Organic and Inorganic Data Validation Guidelines, dated 7/1/93, are used in conjunction with the CADRE report to complete the Tier II portion of the Tier III data validation. The validation procedures contained in the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses, modified 11/88, are used to complete the remainder of the Tier III data validation.

SECTION I DATA COMPLETENESS

I. INTERPRETATION OF THE CADRE WORKSHEET AND FINDINGS

CADRE generates import error reports if it detects errors or identifies that data are missing. All import errors are corrected by the ESAT CADRE Chemist prior to delivery of the CADRE report and CLP Data Package to the Field Sampling Contractor. Therefore, there is no interpretation required for this parameter.

II. FURTHER MANUAL REVIEW REQUIRED

Verifying the Completeness of the CLP Data Package

1) The contents of the CLP Data Package should be reviewed for completeness by completing the Organics Complete SDG File (CSF) Inventory Sheet (Form DC-2) as per the Region I CSF Completeness Evidence Audit Program, dated 7/3/91. This sheet is submitted by the laboratory with the CLP Data Package. This sheet must be signed by the person who performed the completeness check.

2) If any data from the CLP Data Package are missing or incorrect, the validator must request submission of this information from the laboratory.

3) The validator must complete the Region I Data Completeness Worksheet. The worksheet and any Records of Communication with the laboratory must be included with the Data Validation Report. For completing a Tier I validation, refer to the Roles of the Field Sampling Contractor section for guidance.

Verifying the Completeness of the CADRE Report

1) The CADRE report and Data Summary Tables should be reviewed for completeness and accuracy by completing the CADRE Data Review Inventory Sheet. This sheet is included with the CADRE report. The sheet must be signed by the person who performed the completeness check.

2) If any CADRE report data are missing or incorrect, then the validator must contact the Region I EPA Data Validation Chemist for correction and/or submission of the information.

3) The validator must complete the CADRE Data Review Inventory Sheet. The CADRE Data Review Inventory Sheet and any Records of Communication with the Region I EPA Data Validation Chemist must be included with the Data Validation Report. For completing a Tier I validation, refer to the Roles of the Field Sampling Contractor section for guidance.

III. REQUIRED ACTION IF ERRORS ARE DETECTED BY CADRE

No action is required. All errors in electronic data completeness will be detected by CADRE during the import process and will be corrected by the ESAT CADRE Chemist prior to shipping the CADRE report and CLP Data Package to the Field Sampling Contractor.

IV. STEPS REQUIRED TO COMPLETE THE REGION I VALIDATION

1) Complete any manual review as required in Section II.

2) Include the CADRE Data Review Inventory Sheet with the Data Validation Report. The completed photocopy of the DC-2 form shall remain with the CLP Data Package.

3) If resubmittals were required, include any Records of Communication requesting these resubmittals with the Data Validation Report.

4) Include the Region I Data Completeness Worksheet after the Region I Review of Organic Contract Laboratory Data Package cover sheet and the CADRE Sample Listing page in the Data Validation Report.

5) Any CLP Data Package resubmittals shall remain with the CLP Data Package. Any CADRE resubmittals shall be included with the Data Validation Report.

SECTION II QUANTITATION LIMITS

I. INTERPRETATION OF THE CADRE WORKSHEET AND FINDINGS

CADRE produces a Quantitation Limit Report which lists any compounds detected below the CRQL. These results are already qualified (J) by the laboratory on the Form 1s. CADRE automatically transcribes the (J) qualifiers onto the CADRE Data Summary Tables. No further qualification of these results is required.

II. FURTHER MANUAL REVIEW REQUIRED

1) None.

III. REQUIRED ACTION IF ERRORS ARE DETECTED BY CADRE

1) None.

IV. STEPS REQUIRED TO COMPLETE THE REGION I VALIDATION

1) Include the CADRE Quantitation Limit Report after the Region I Data Completeness Worksheet in the Data Validation Report.

2) Sample result qualifiers are already placed on the Data Summary Tables. No further action is required.

SECTION III HOLDING TIMES

I. INTERPRETATION OF THE CADRE WORKSHEET AND FINDINGS

1) Holding Times

The CADRE Holding Times Report for aqueous and soil samples displays the criteria used by CADRE for volatiles and semivolatiles when holding times are slightly or grossly exceeded. The criteria used by CADRE are identical to the criteria used by Region 1. If all holding times criteria are met, CADRE will display the message "No problems found for this qualification."

If holding times are exceeded, CADRE will state which samples exceeded holding times and the appropriate Region I action to be taken. The CADRE qualified Data Summary Tables will contain the correct qualifiers. For unqualified Data Summary Tables, the validator needs only to place the qualifiers suggested by CADRE onto the unqualified Data Summary Tables.

It should be noted that CADRE will list any volatile soil samples exceeding holding times twice on the Holding Times Worksheet. This is due to a difference in soil sample preservation designation between CADRE and Region 1. This does not affect the validation of holding times.

2) Percent Solids

The CADRE Percent Moisture Report displays the criteria used by CADRE for percent moisture (percent solid) determination. If all percent moisture criteria are met, CADRE will display the message "No problems found for this qualification." If the percent moisture exceeds the limits specified by Region 1, CADRE will list the samples affected and whether the percent moisture exceeded the primary or expanded criteria. CADRE will also list the appropriate Region 1 action to be taken. The CADRE qualified Data Summary Tables will contain the correct qualifiers. For unqualified Data Summary Tables, the validator needs only to place the qualifiers suggested by CADRE onto the unqualified Data Summary Tables.

II. FURTHER MANUAL REVIEW REQUIRED

1) If no error messages are reported, then no further manual review is required.

2) Manual review is required if CADRE reports any of the error messages listed in Section III. If an error is detected by CADRE, CADRE will report this error on the CADRE Holding Times Report or the CADRE Percent Moisture Report. The validator should refer to Section III to determine the extent of manual review required. Region 1 Holding Times Worksheets must be utilized to document the manual review.

III. REQUIRED ACTION IF ERRORS ARE DETECTED BY CADRE

CADRE can display two possible error messages for Holding Times and one possible error message for Percent Moisture.

A. Possible Errors

Holding Times

1) Samples Missing Sampling Date.

- If CADRE does not find a sampling date, it will perform the holding times evaluation using the VTSR. CADRE will display an error message on the Holding Times Report stating that no sampling date was found.

2) Missing Holding Time Information.

- If any necessary information are missing (other than the sampling date), CADRE will not perform the review for this parameter. An example of this is when there is no sample preservation designated for volatile water samples.

Percent Moisture

1) Missing Percent Moisture Information

- If CADRE cannot find percent moisture information, CADRE cannot perform the review for this parameter.

B. Required Action

Holding Times

1) If either of the two holding time error messages are reported, manual review of the sampling paperwork and CLP Data Package must be performed to evaluate holding times. The sampler must be contacted to resolve discrepancies, if necessary. Manual review of the associated holding time information that was not reviewed by CADRE must be performed using the criteria and actions outlined in the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses. A Region I Holding Times Worksheet must be completed to document the manual review.

Percent Moisture

1) A manual review of the percent moisture (percent solid) information in the CLP Data Package must be performed. The criteria and actions outlined in the memorandum sent to Region 1 Data Validators by the Region 1 CLP TPOs titled "Qualifying Soil/Sediment Data With Low Percent Solid", dated March 29, 1990 must be used. (A copy of this memorandum is included as Attachment VII.)

IV. STEPS REQUIRED TO COMPLETE THE REGION I VALIDATION

1) Complete any manual review as required in Section II.

2) Include the CADRE Holding Times Report and any required Region I Holding Times Worksheets after the CADRE Quantitation Limit Report in the Data Validation Report. Include the CADRE Percent Moisture Report after the CADRE Holding Times Report (and Region 1 Holding Times Worksheets, if applicable) in the Data Validation Report.
3) Discuss any qualifications placed upon sample results in

the Data Validation Memorandum and provide justification for sample result qualification as per the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses.

4) Include required qualifiers in the Recommendations Summary Table (Table I of the Data Validation Memorandum) as per the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses.

5) Apply qualifiers to sample results on the Data Summary Tables as per the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses.

SECTION IV GC/MS TUNING

I. INTERPRETATION OF THE CADRE WORKSHEET AND FINDINGS

The CADRE Instrument Performance Check Report displays the criteria used by CADRE for review of the BFB and DFTPP instrument performance checks. The criteria used by CADRE are identical to the criteria used by Region I. The CADRE qualified Data Summary Tables will contain the correct qualifiers. For unqualified Data Summary Tables, the validator needs only to place the qualifiers suggested by CADRE onto the unqualified Data Summary Tables. If all criteria are met, CADRE will display the message "No problems found for this qualification".

II. FURTHER MANUAL REVIEW REQUIRED

1) If no error messages are reported, then no further manual review is required.

2) Manual review is required if CADRE reports any of the error messages listed in Section III. If an error is detected by CADRE, CADRE will report this error on the CADRE Instrument Performance Check Report. The validator should refer to Section III to determine the extent of manual review required. Region 1 GC/MS Tuning Worksheets must be utilized to document the manual review.

III. REQUIRED ACTION IF ERRORS ARE DETECTED BY CADRE

A. Possible Errors

CADRE can display three possible error messages for GC/MS Tuning

1) The instrument tune is missing.

- CADRE will display this message if it is expecting to find and evaluate a BFB/DFTPP instrument performance check sample but could not locate one in the electronic deliverable.

2) The incorrect base mass was normalized.

- During the instrument performance check, the laboratory is required to normalize (use as 100% relative abundance) m/z 95 for BFB and m/z 198 for DFTPP. CADRE will display this message if it detects the base mass to be a mass other than m/z 95 for BFB or m/z 198 for DFTPP.

3) The instrument tune did not meet tuning criteria.

- CADRE will display this message if the primary BFB/DFTPP tuning criteria displayed on the Instrument Performance Check Report are not met.

B. **Required Action**

1) If any of these error messages are reported, manual review of the CLP Data Package must be performed to determine if the associated GC/MS Tuning information are present and meet tuning acceptance criteria. If the associated tuning information are missing from the CLP Data Package, then the laboratory must be contacted to submit the information. Manual review of the associated tuning information must be performed using the criteria and actions outlined in the Region 1 Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses. Region 1 GC/MS Tuning Worksheets must be utilized to document the manual review.

IV. STEPS REQUIRED TO COMPLETE THE REGION I VALIDATION

1) Complete any manual review as required in Section II.

2) Include the CADRE Instrument Performance Check Report and any required Region 1 GC/MS Tuning Worksheets after the CADRE Percent Moisture Report in the Data Validation Report.

3) Discuss any qualifications placed upon sample results in the Data Validation Memorandum and provide justification for sample result qualification as per the Region I

Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses.

4) Include required qualifiers in the Recommendations Summary Table (Table I of the Data Validation Memorandum) as per the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses.

5) Apply qualifiers to sample results on the Data Summary Tables as per the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses.

SECTION V CALIBRATIONS

I. INTERPRETATION OF THE CADRE WORKSHEETS AND FINDINGS

CADRE generates three reports to aid in the review of calibration data.

1) **Analytical Sequence**

The report titled Analytical Sequence contains a summary of all analyses associated with the SDG in chronological order by instrument and fraction. This report lists the BFB/DFTPP Instrument Performance Checks (IPCs) and calibrations, as well as all samples which were analyzed within the 12 hour time period following the BFB/DFTPP IPC.

2) **Calibration Listing**

The report titled Calibration Listing includes all the initial and continuing calibrations which are associated with the SDG along with the dates and times of analysis. This report lists all samples which were associated with each continuing calibration, and the calibrations are reported in chronological order by instrument and fraction.

This report also lists all compounds which failed to meet the initial calibration %RSD criteria of less than 30% and/or the continuing calibration %D criteria of less than 25%. The actual non-compliant %RSD and/or %D values are also reported. This report also includes a list of all calibration compounds which failed to meet the relative response factor (RRF) criteria of greater than 0.05. The actual non-compliant RRFs are also reported. If the RRF was out in an individual standard in the initial calibration, CADRE also identifies that individual standard.

3) **Calibration Report**

If all criteria are met, CADRE will display the message "No problems found for this qualification".

The Calibration Report displays the criteria used by CADRE when minimum RRFs and maximum %RSDs/%Ds have been slightly or grossly exceeded. If RRFs and/or %RSD/%D criteria are not

met, CADRE will state which samples and compounds are affected by non-compliant calibrations and the appropriate Region 1 action to be taken.

The CADRE qualified Data Summary Tables will contain the correct qualifiers. For unqualified Data Summary Tables, the validator needs only to place the qualifiers suggested by CADRE onto the unqualified Data Summary Tables.

II. FURTHER MANUAL REVIEW REQUIRED

1) If no error messages are reported on the CADRE Calibration Report, then no further manual review of the data is required.

2) Manual review is required if CADRE reports any of the error messages listed in Section III. If an error is detected by CADRE, CADRE will report this error on the CADRE Calibration Report. The validator should refer to Section III to determine the extent of manual review required. Region 1 Volatile Calibration Verification and/or Semivolatile Calibration Verification Worksheets must be utilized to document the manual review.

III. REQUIRED ACTION IF ERRORS ARE DETECTED BY CADRE

CADRE can display four possible error messages for Calibrations.

A. Possible Errors

1) Samples with no instrument performance check.

- For each sample in the SDG, CADRE will attempt to locate the associated instrument performance check to determine if the instrument performance check passed the tuning criteria. If CADRE cannot locate the instrument performance check, it cannot associate a calibration standard with the instrument performance check standard. Thus, CADRE will not evaluate the calibration standard associated with the missing instrument performance check. Any sample(s) associated with the calibration standard(s) will not be evaluated for this parameter.

2) Samples with no associated calibration.

- If CADRE cannot associate a calibration standard with a sample, it cannot evaluate calibration criteria for that sample.

3) Samples associated with a continuing calibration for which no corresponding initial calibration is found.

- If CADRE cannot associate a continuing calibration with an initial calibration, it cannot calculate a %D. Therefore, it cannot evaluate the calibration criteria for that sample.

4) Missing calibration information.

- If CADRE cannot locate any necessary calibration information, other than the information listed above, it cannot perform an evaluation of that calibration. This may include but is not limited to the following information:

  - Missing a response factor for one or more compounds in the continuing calibration.

  - Missing the response factors for one or more points in the initial calibration.

B. **Required Action**

1) A manual review of the CLP Data Package must be performed to determine if the instrument performance check associated with the calibration(s) for the affected sample is present. If the instrument performance check is missing from the CLP Data Package, then the laboratory must be contacted to submit the information. Manual review of the instrument performance check and the associated calibration that was not reviewed by CADRE must be performed using the criteria and actions outlined in the Region I Laboratory Data Validation Functional Guidelines for Evaluating

Organics Analyses. Region 1 Volatile Calibration Verification and/or Semivolatile Calibration Verification Worksheets must be utilized to document the manual review.

2) For errors 2-4 listed in Section III above, manual review of the CLP Data Package must be performed to determine if the associated calibration information are present and meet calibration acceptance criteria. If the associated calibration information are missing from the CLP Data Package, then the laboratory must be contacted to submit the information. Manual review of the associated calibration information must be performed using the criteria and actions outlined in the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses. Region 1 Volatile Calibration Verification and/or Semivolatile Calibration Worksheets must be utilized to document the manual review.

IV. **STEPS REQUIRED TO COMPLETE THE REGION I VALIDATION**

1) Complete any manual review as required in Section II.

2) Include the CADRE Analytical Sequence, Calibration Listing, Calibration Report, and any required Region 1 Volatile Calibration Verification and/or Semivolatile Calibration Verification Worksheets after the CADRE Instrument Performance Check Reports and any required Region 1 GC/MS Tuning Worksheets in the Data Validation Report.

3) Discuss any qualifications placed upon sample results in the Data Validation Memorandum and provide justification for sample result qualification as per the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses (mod 11/88). Include, in the Data Validation Memorandum, a table of compounds not meeting the calibration criteria along with the samples associated with each calibration.

4) Include required qualifiers in the Recommendations Summary Table (Table I of the Data Validation Memorandum) as per the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses.

5) Apply qualifiers to sample results on the Data Summary Tables as per the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses.

SECTION VI BLANKS

I. INTERPRETATION OF THE CADRE WORKSHEET AND FINDINGS

A. Laboratory Blanks

The CADRE Laboratory Blanks Report specifies the multipliers used for calculating action levels.

If all criteria are met, CADRE will display the message "No problems found for this qualification".

The CADRE Laboratory Blanks Report indicates which samples and compounds have been considered as non-detects due to method blank contamination. The CADRE Laboratory Blanks Report will also note whether the sample result is to be reported qualified as (U) or the sample result is to be raised to the CRQL and qualified as (U). The CADRE qualified Data Summary Tables will contain the correct qualifiers. For unqualified Data Summary Tables, the validator needs only to place the qualifiers suggested by CADRE onto the unqualified Data Summary Tables.

The Laboratory Blanks Report incorrectly qualifies equipment and trip blanks due to laboratory blank contamination. The qualification for these blanks should be ignored as Region I does not qualify equipment or trip blanks for laboratory blank contamination. For qualified Data Summary Tables, the validator needs to remove any qualifiers placed by CADRE on equipment/trip blanks due to laboratory blank contamination.

B. Equipment and Trip Blanks

CADRE distinguishes equipment and trip blanks from regular field samples. CADRE has the capability to evaluate these blank samples for contamination. This function is currently not being used. In many instances, the equipment and trip blank samples are not included in the same SDGs as the field samples. CADRE cannot evaluate these blanks if they are contained in a separate SDG from the associated field samples.

Manual review of the CADRE Data Summary Tables (or Form Is) for these blanks is required to determine the extent of contamination and to document the appropriate qualification of the regular field samples. Region I Blank Analysis Results Worksheets must be completed for these blanks. The review must be performed using the criteria and actions outlined in the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses. Actions should be applied to all samples (except other blanks) in the SDG. Equipment and trip blanks should not be qualified based upon laboratory blank contamination.

II. FURTHER MANUAL REVIEW REQUIRED

A. Laboratory Blanks

If no error messages are reported, then no further manual review of the laboratory blanks data is required.

B. Equipment and Trip Blanks

1) The sampler or sampling paperwork must be consulted to determine which samples, if any, are designated as equipment or trip blanks and to determine which regular field samples are impacted by these equipment/trip blanks.

2) A manual review of the CADRE Data Summary Tables (or Form Is) for these blanks must be performed. The criteria and actions outlined in the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses must be used for evaluation.

3) Sections 2 and 3 of the Region I Blank Analysis Results Worksheets must be completed and included in the Data Validation Report.

C. Manual Review Required Due To Errors Detected by CADRE

1) Manual review is required if CADRE reports any of the error messages listed in Section III. If an error is detected by CADRE, CADRE will report this error on the CADRE Laboratory Blanks Report. The validator should refer to Section III to determine

the extent of manual review required. Sections 2 and 3 of the Region 1 Blanks Analysis Worksheets must be utilized to document the manual review.

III. REQUIRED ACTION IF ERRORS ARE DETECTED BY CADRE

CADRE can display six possible error messages for Laboratory Blanks.

A. Possible Errors

1) No instrument performance check found for sample.

- CADRE will not evaluate laboratory blank contamination for the sample if it does not find an instrument performance check (BFB/DFTPP) for that sample. CADRE will list the affected sample(s).

2) No calibration found for sample.

- CADRE will not evaluate laboratory blank contamination for the sample if it does not find an associated initial and/or continuing calibration for that sample. CADRE will list the affected sample(s).

3) Samples with no associated laboratory blank.

- CADRE will display this message if there was no laboratory blank associated with the specific sample(s) listed.

4) Invalid laboratory blank. Blank qualified (R) during a previous qualification.

- CADRE will not evaluate a laboratory blank if the blank has been considered as unusable for other quality control parameters. For instance, if the blank results have been rejected (R) due to low surrogate recoveries.

5) Missing laboratory blank information.

- CADRE will not evaluate laboratory blank

contamination for a sample if there is information missing which is required to associate laboratory blank contamination with that sample (e.g., if the laboratory does not report the weight of the blank, then CADRE cannot calculate the 5x/10x blank contamination levels).

6) No laboratory blank samples.

- CADRE will display this error message if it does not detect any laboratory blanks in the whole electronic deliverable.

B. **Required Action**

1) A manual review of the CLP Data Package is required to determine if the associated instrument performance check is present. If the instrument performance check is missing from the CLP Data Package, then the laboratory must be contacted to submit the information. Manual review of the associated instrument performance check (IPC) and laboratory blank(s) that were not reviewed by CADRE must be performed using the criteria and actions outlined in the Region 1 Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses (mod 11/88). The Region 1 Blanks Analysis Results Worksheets (all three sections) must be completed to document the manual validation.

2) A manual review of the CLP Data Package is required to determine if the associated calibration is present. If the associated calibration is missing from the CLP Data Package, then the laboratory must be contacted to submit the information. Manual review of the associated calibration and laboratory blank(s) that were not reviewed by CADRE must be performed using the criteria and actions outlined in the Region 1 Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses (mod 11/88). The Region 1 Blanks Analysis Results Worksheets (all three sections) must be completed to document the manual validation.

3) If the laboratory blank has been rejected (R) during the review of other quality control parameters, then professional judgement must be used to determine if qualification of any positive hits in any samples associated with the invalid laboratory blank is necessary. The reviewer must provide justification for sample result qualification as per the Region 1 Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses.

4) For errors 4-6 listed in Section III above, a manual review of the CLP Data Package is required to determine if the associated laboratory blank information are present and meet laboratory blank acceptance criteria. If the associated laboratory blank information are missing from the CLP Data Package, then the laboratory must be contacted to submit the information. Manual review of the associated laboratory blank information that was not reviewed by CADRE must be performed using the criteria and actions outlined in the Region 1 Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses (mod 11/88). The Region 1 Blanks Analysis Results Worksheets (all three sections) must be completed to document the manual validation.

IV. **STEPS REQUIRED TO COMPLETE THE REGION I VALIDATION**

1) Complete any manual review as required in Section II.

2) Include the CADRE Laboratory Blanks Report and any required Region I Blank Analysis Results Worksheets after the CADRE Calibration Report and any required Region 1 Volatile Calibration Verification and/or Semivolatile Calibration Verification Worksheets in the Data Validation Report.

3) Discuss any qualifications placed upon sample results in the Data Validation Memorandum and provide justification for sample result qualification as per the Region 1 Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses. Include, in the memorandum, a table of the maximum concentrations of contaminants found in the laboratory, equipment, and trip

blanks.

4) Include required qualifiers in the Recommendations Summary Table (Table I of the Data Validation Memorandum) as per the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses.

5) Apply qualifiers to sample results on the Data Summary Tables as per the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses. (Raise sample results to the CRQL if necessary).

SECTION VII SMCs/SURROGATES

I. INTERPRETATION OF THE CADRE WORKSHEET AND FINDINGS

The CADRE SMC/Surrogate Report displays the criteria used for surrogate review. The criteria used by CADRE are identical to the criteria used by Region I. CADRE reviews the advisory BNA surrogates but does not qualify data based on advisory recoveries.

If all criteria are met, CADRE will display the message "No problems found for this qualification".

The CADRE SMC/Surrogate Report will indicate any samples which require qualification due to poor surrogate recoveries and will indicate the qualifiers to be placed on the sample results. The CADRE qualified Data Summary Tables will contain the correct qualifiers. For unqualified Data Summary Tables, the validator needs only to place the qualifiers suggested by CADRE onto the unqualified Data Summary Tables.

II. FURTHER MANUAL REVIEW REQUIRED

1) If no error messages are reported, then no further manual review is required.

2) Manual review is required if CADRE reports any of the error messages listed in Section III. If an error is detected by CADRE, CADRE will report this error on the CADRE SMC/Surrogate Report. The validator should refer to Section III to determine the extent of manual review required. Region 1 Surrogate Spike Recoveries Worksheets must be utilized to document the manual review.

III. REQUIRED ACTION IF ERRORS ARE DETECTED BY CADRE

CADRE can display three possible error messages for SMCs/Surrogates.

A. **Possible Errors**

1) Sample dilution factor exceeds criteria.

- This message will appear if the sample is analyzed at greater than a 1:10 dilution. CADRE will only review SMC/surrogate recoveries for samples analyzed at less than or equal to a 1:10 dilution.

2) Missing surrogate (system monitoring compound) data.

- This message will appear if CADRE cannot locate surrogate/SMC recoveries in the electronic deliverable.

3) Surrogate (system monitoring compound) percent recovery in method blank exceeds criteria.

B. **Required Action**

1) A manual review of the Form 2 contained in the CLP Data Package is required for all samples analyzed at greater than a 1:10 dilution to determine if surrogate recoveries are within acceptance limits. Manual review of the associated SMC/surrogate information must be performed using the criteria and actions outlined in the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses. A Region I Surrogate Spike Recoveries Worksheet must be utilized to document the manual review.

2) A manual review of the Form 2 contained in the CLP Data Package must be performed to determine if the associated SMC/surrogate information are present and meet SMC/surrogate acceptance criteria. Manual review of the associated SMC/surrogate information must be performed using the criteria and actions outlined in the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses. A Region I Surrogate Spike Recoveries Worksheet must utilized to document the manual review.

3) A manual review of SMC/surrogate data contained in the CLP Data Package must be performed for all samples associated with a laboratory blank containing outlier surrogate recoveries. Professional judgement should be used to qualify any affected sample data due to outlier laboratory blank surrogate recoveries as the per the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses. The reviewer must provide justification for sample result qualification as per the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses.

IV. **STEPS REQUIRED TO COMPLETE THE REGION I VALIDATION**

1) Complete any manual review as required in Section II.

2) Include the CADRE SMC/Surrogate Report and any required Region I Surrogate Spike Recoveries Worksheets after the CADRE Laboratory Blanks Report and any required Region I Blank Analysis Results Worksheets in the Data Validation Report.

3) Discuss any qualifications placed upon sample results in the Data Validation Memorandum and provide justification for sample result qualification as per the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses. Include, in the memorandum, a table listing any samples and surrogates which failed to meet the acceptance criteria.

4) Include required qualifiers in the Recommendations Summary Table (Table 1 of the Data Validation Memorandum) as per the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses.

5) Apply qualifiers to sample results on the Data Summary Tables as per the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses.

SECTION VIII MATRIX SPIKE/MATRIX SPIKE DUPLICATE

I. INTERPRETATION OF THE CADRE WORKSHEET AND FINDINGS

The CADRE Matrix Spike Report displays the criteria used for matrix spike evaluation. The criteria used for evaluation are identical to the criteria used by Region I.

If all matrix spike criteria are met, CADRE displays the message "No problems were found for this qualification" on the Matrix Spike Report.

If all criteria are not met, CADRE will indicate whether the percent recovery or RPD criteria were not met on the Matrix Spike Report. CADRE will also list the individual compounds which exceeded criteria.

Where possible, CADRE will recommend specific qualifications for MS/MSD deviations. If CADRE cannot recommend specific qualifications, CADRE will alert the reviewer that criteria were not met and list what manual review is necessary.

CADRE does not apply qualifiers to the qualified or unqualified Data Summary Tables for MS/MSD percent recovery or RPD deviations. Where possible, CADRE recommends qualifications. For qualified and unqualified Data Summary Tables, the validator needs to place the qualifiers suggested by CADRE and/or resulting from any required manual validation onto both Data Summary Tables.

II. FURTHER MANUAL REVIEW REQUIRED

1) If CADRE indicates that recovery criteria were not met, then a manual review of Form 3 contained in the CLP Data Package must be performed to determine if any qualification of the data is required. The criteria and actions outlined in the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses must be used. Region I Matrix Spike/Matrix Spike Duplicate Worksheets must be completed and included with the Data Validation Report.

2) CADRE does not evaluate the unspiked compounds in the sample, MS, and MSD. This review must be performed

manually. The criteria and actions outlined in the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses must be used. Region I Matrix Spike/Matrix Spike Duplicate Worksheets for unspiked compounds must be completed and included with the Data Validation Report. A CADRE-generated Data Summary Table which contains the sample results for the sample, MS, and MSD is included in the CADRE report along with the Matrix Spike Report. This Data Summary Table may be used to aid in completing the Region I Matrix Spike/Matrix Spike Duplicate Worksheet for the evaluation of MS/MSD unspiked compounds.

3) Manual review is also required if CADRE detects and reports any of the error messages listed in Section III. If an error is detected by CADRE, CADRE will report this error on the CADRE Matrix Spikes Report. The validator should refer to Section III to determine the extent of manual review required. Region 1 Matrix Spike/Matrix Spike Duplicate Worksheets must be utilized to document the manual review.

III. REQUIRED ACTION IF ERRORS ARE DETECTED BY CADRE

CADRE can display three possible error messages for MS/MSDs.

A. Possible Errors

1) Matrix spike (MS) and matrix spike duplicate (MSD) frequency not sufficient.

- CADRE will display this message on the Matrix Spike Report if an MS/MSD pair was not analyzed at the required frequency of 1 per 20 samples per matrix.

2) Missing matrix spike information.

- CADRE will display this message on the Matrix Spike Report if some (or all) of the information necessary to evaluate this parameter is missing. This may include but is not limited to:

  - True value of matrix spike added.

- Matrix (soil or water).
- QC limits for % recovery and/or RPD.

3) No matrix spike data.

- CADRE will display this error message on the Matrix Spike Report if it cannot find any matrix spike sample(s) in the electronic deliverable.

B. **Required Action**

1) As required in the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses, professional judgement must be used to determine if there is any affect on the data due to the insufficient frequency of MS/MSD analysis. The reviewer must justify, in the Data Validation Memorandum, any action taken.

2) For errors 2 and 3 listed in Section III above, manual review of the CLP Data Package must be performed to determine if the associated matrix spike information are present and meet matrix spike acceptance criteria. If the associated matrix spike information are missing from the CLP Data Package, then the laboratory must be contacted to submit the information. Manual review of the associated matrix spike information must be performed using the criteria and actions outlined in the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses. Region I Matrix Spike/Matrix Spike Duplicate Worksheets must be utilized to document any manual review.

IV. STEPS REQUIRED TO COMPLETE THE REGION I VALIDATION

1) Complete any manual review as required in Section II.

2) Include the CADRE Matrix Spike Report and any required Region I Matrix Spike/Matrix Spike Duplicate Worksheets after the CADRE SMC/Surrogate Report and any required Region I Surrogate Spike Recoveries Worksheets in the Data Validation Report. The CADRE generated sample, MS,

and MSD Data Summary Table must be included along with all other matrix spike worksheets.

3) Discuss any qualifications placed on sample results in the Data Validation Memorandum and provide justification for sample result qualification as per the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses. Include, in the memorandum, a table listing all compounds which did not meet the matrix spike acceptance criteria.

4) Include the required qualifiers in the Recommendations Summary Table (Table 1 of the Data Validation Memorandum) as per the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses.

5) Apply qualifiers to sample results on the Data Summary Table as per the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses.

SECTION IX FIELD DUPLICATES

I. INTERPRETATION OF THE CADRE WORKSHEET AND FINDINGS

CADRE does not evaluate field duplicate samples.

II. FURTHER MANUAL REVIEW REQUIRED

1) The reviewer must check the Organic Traffic Report/Chain-of-Custody Form, consult the sampler, or refer to the CLP Sample Tracking System (CLPSTS) to determine which samples in the SDG are field duplicates and to determine which regular field samples are impacted by these field duplicate samples.

2) A manual review of the CADRE Data Summary Tables (or Form 1s) for the field duplicates must be performed using the criteria and actions outlined in the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses. Region I Field Duplicate Precision Worksheets must be completed and included with the Data Validation Report.

III. REQUIRED ACTION IF ERRORS ARE DETECTED BY CADRE

No action is required as this parameter is not reviewed by CADRE.

IV. STEPS REQUIRED TO COMPLETE THE REGION I VALIDATION

1) Complete any manual review required in Section II.

2) Include the Region I Field Duplicate Precision Worksheet after the CADRE Matrix Spikes Report and any required Region I Matrix Spike/Matrix Spike Duplicate Worksheets in the Data Validation Report.

3) Discuss any qualifications placed on the sample results in the Data Validation Memorandum and provide justification for sample result qualification as per the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses.

4) Include the required qualifiers in the Recommendations Summary Table (Table I of the Data Validation Memorandum) as per the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses.

5) Apply qualifiers to sample results on the Data Summary Tables as per the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses.

SECTION X INTERNAL STANDARDS

I. INTERPRETATION OF THE CADRE WORKSHEET AND FINDINGS

The CADRE Internal Standards Report displays the criteria used by CADRE for evaluation of internal standards. The criteria used by CADRE are identical to the criteria used by Region I.

If all criteria are met, CADRE will display the message "No problems found for this qualification".

CADRE will list, on the Internal Standards Report, the compounds in each sample which have been qualified due to poor internal standard recoveries or retention times which are outside of criteria. CADRE will also list the appropriate Region 1 action to be taken. The CADRE qualified Data Summary Tables will contain the correct qualifiers. For unqualified Data Summary Tables, the validator needs only to place the qualifiers suggested by CADRE onto the unqualified Data Summary Tables.

II. FURTHER MANUAL REVIEW REQUIRED

1) If no error messages are reported, then no further manual review is required.

2) Manual review is required if CADRE detects and reports any of the error messages listed in Section III. If an error is detected by CADRE, CADRE will report this error on the CADRE Internal Standards Report. The validator should refer to Section III to determine the extent of manual review required. Region 1 Internal Standard Performance Worksheets must be utilized to document the manual review.

III. REQUIRED ACTION IF ERRORS ARE DETECTED BY CADRE

CADRE can display three possible error messages for Internal Standards.

A. **Possible Errors**

1) Samples with no internal standard.

- CADRE will display this message on the Internal Standards Report if it cannot locate the internal standards for a sample in the electronic deliverable.

2) Missing internal standards.

- CADRE will display this message on the Internal Standards Report if no internal standards for the SDG were located by CADRE in the electronic deliverable. This may occur if either the laboratory did not include Form 8 in the electronic deliverable or if CADRE failed to import Form 8.

3) Missing internal standard information.

- CADRE will display this message if a portion of the required information for internal standard evaluation is not present. This may include but is not limited to the following reasons:

  - If only the internal standard area information for the sample and/or associated calibration standard is missing.

  - If only the retention time information for the sample and/or associated calibration standard is missing.

  - If CADRE cannot associate the internal standard information for a sample with a calibration standard (i.e. either the calibration standard information are missing or the instrument performance check associated with the sample or calibration standard is missing).

B. **Required Action**

If any of these error messages are reported, manual review of the CLP Data Package must be performed to determine if the associated internal standard(s) information is present in the CLP Data Package. If any of the necessary information is missing from the CLP Data Package, then the laboratory must be contacted to submit the information. Manual review of the associated internal standard information must be performed using the criteria and actions outlined in the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses. Region 1 Internal Standard Performance Worksheets must be utilized to document the manual review.

IV. STEPS REQUIRED TO COMPLETE THE REGION I VALIDATION

1) Complete any manual review as required in Section II.

2) Include the CADRE Internal Standards Report and any required Region I Internal Standard Performance Worksheets after the Field Duplicate Precision Worksheets in the Data Validation Report.

3) Discuss any qualifications placed upon sample results in the Data Validation Memorandum and provide justification for sample result qualification as per the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses.

4) Include required qualifiers in the Recommendations Summary Table (Table I of the Data Validation Memorandum) as per the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses.

SECTION XI TENTATIVELY IDENTIFIED COMPOUNDS (TICs)

I. INTERPRETATION OF THE CADRE WORKSHEET AND FINDINGS

CADRE does not review Tentatively Identified Compound (TIC) results. Review of TIC results is not required for Tier II data validation. It is, however, required for Tier III data validation.

II. FURTHER MANUAL REVIEW REQUIRED

For Tier III data validation, the procedure stated in the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses must be followed to evaluate Tentatively Identified Compounds.

For Tier II data validation, verify that target compounds are not reported as TICs in another fraction. Only a tabular summary of the detected TICs is required.

A tabular TIC summary should be included in the Data Validation Memorandum for both Tier II and Tier III data validations.

III. REQUIRED ACTION IF ERRORS ARE DETECTED BY CADRE

No action is required, as this parameter is not reviewed by CADRE.

IV. STEPS REQUIRED TO COMPLETE THE REGION I VALIDATION

1) Complete any manual review as required in Section II.

2) For Tier II data validation, summarize the TICs found in the TIC Summary Table in the Data Validation Report. Verify that target compounds are not reported as TICs in another fraction. No further review of TICs is to be performed.

3) Provide an explanation of any identifications which were changed by the reviewer or any TICs which were not included in the TIC Summary Table. The reviewer must justify any changes to the TIC results in the Data Validation Memorandum. This step is required only for Tier III data validation.

SECTION XII COMPLETING THE DATA VALIDATION REPORT

1) The Data Validation Memorandum must be completed as stated in the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses (Section 1.5). The completed CADRE Data Review Inventory Sheet must be included in the Data Validation Report.

2) Any manual review of the CLP Data Package which was performed must be documented by completing the Region I Data Validation worksheets. These worksheets should be included in the Data Validation Report along with the CADRE worksheets in the order specified by this guidance document.

3) The CADRE Data Summary Tables must be completed. The CADRE qualified Data Summary Tables for the volatile and semivolatile fractions will be provided to the Field Sampling Contractor. These Data Summary Tables will contain qualifiers recommended by CADRE on the CADRE worksheets generated during the review of each QC parameter. The Field Sampling Contractor will be required to verify that all qualifiers have been correctly transcribed onto the qualified Data Summary Tables by CADRE. The Field Sampling Contractor will also be required to place any qualifiers onto the Data Summary Tables which result from any required manual validation.

   For the pesticide/PCB fractions and in instances where major discrepancies exist between the sample values reported on the CADRE qualified Data Summary Tables and the laboratory Form 1s, the CADRE unqualified Data Summary Tables will be sent to the Field Sampling Contractors along with a notice that the Data Summary Tables are unqualified. The unqualified Data Summary Tables distributed to the Field Sampling Contractors will contain only the Form I results and qualifiers as reported by the laboratory. The Field Sampling Contractors will be required to remove all laboratory qualifiers from the CADRE unqualified Data Summary Tables (such as the "B", "D", and "E" qualifiers), with the exception of the "J" qualifier, for results detected below the CRQL, and the "U" qualifier, for non-detect

results. The Field Sampling Contractor must then add any qualifiers resulting from the completion of the data validation.

ATTACHMENT I

Completed CADRE and Region I Data Validation Worksheets

For a hardcopy of this Attachment contact:

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ATTACHMENT II

Blank Region I Data Validation Worksheets

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ATTACHMENT III

Manual Review Necessary to Complete a Tier II Data Validation

SUMMARY OF CADRE DATA REVIEW - REQUIRED MANUAL REVIEW NECESSARY TO COMPLETE A REGION I TIER II DATA VALIDATION

QC CRITERIA	REVIEW PERFORMED BY CADRE	REQUIRED MANUAL REVIEW
DATA COMPLETENESS	● CADRE lists any errors or omissions which were detected in the electronic deliverable. These errors are corrected prior to data review. ● CADRE does not detect errors or omissions in the raw data.	● The Complete SDG File (CSF) form must be completed and signed by the reviewer. All supporting documentation must be present in the data package. The reviewer must request from the laboratory any data missing from the data package (For example if a hardcopy Form I is missing). The Region I Data Completeness Worksheet must be completed and included in the Data Validation Report along with any records of communication. ● The CADRE Data Review Inventory Sheet must be completed and signed by the reviewer. The reviewer must request from the EPA Data Validation Chemist any information missing from the CADRE report sent by ESAT. The CADRE Data Review Inventory Sheet must be included in the Data Validation Report.
HOLDING TIMES	● CADRE reviews holding times for waters and soils as per Region I guidelines.	● If CADRE detects no errors, no further manual review is required. ● Manual review is required if CADRE reports any errors during data review. Required review is stated in Section III of Guidance Document.
PERCENT SOLID	● CADRE evaluates percent solid content as per Region 1 Guidelines.	● If CADRE detects no errors, no further manual review is required. ● Manual review is required if CADRE reports any errors during data review. Required review is stated in Section III of Guidance Document.
GC/MS TUNING	● CADRE evaluates GC/MS tunes based on current Region I guidelines.	● If CADRE detects no errors, no further manual review is required. ● Manual review is required if CADRE reports any errors during data review. Required review is stated in Section III of Guidance Document.

SUMMARY OF CADRE DATA REVIEW - REQUIRED MANUAL REVIEW NECESSARY TO COMPLETE A REGION I TIER II DATA VALIDATION

QC CRITERIA	REVIEW PERFORMED BY CADRE	REQUIRED MANUAL REVIEW
CALIBRATIONS	● CADRE reviews calibration criteria based on current Region 1 Guidelines.	● If CADRE detects no errors, no further manual review is required. ● Manual review is required if CADRE reports any errors during data review. Required review is stated in Section III of Guidance Document.
BLANKS	● CADRE reviews and qualifies results for laboratory blanks based on current Region I guidelines. ● CADRE capability to review equipment or trip blanks is currently not being used.	● If CADRE detects no errors, no further manual review is required. ● A manual review of all equipment and trip blanks is necessary to assess contamination. ● Manual review is required if CADRE reports any errors during data review. Required review is stated in Section III of Guidance Document.
SURROGATES	● CADRE reviews and qualifies surrogate data based on current Region I guidelines. CADRE reviews the advisory surrogates for BNA but does not qualify data for outlier advisory surrogate recoveries. ● CADRE does not review surrogate recoveries if samples were analyzed at a dilution greater than 1:10.	● If CADRE detects no errors or if samples were analyzed at a dilution less than or equal to 1:10, no further manual review is required. ● A manual review of Form 2 is necessary for all samples analyzed at a dilution greater than 1:10. ● Manual review is required if CADRE reports any errors during data review. Required review is stated in Section III of Guidance Document.

SUMMARY OF CADRE DATA REVIEW - REQUIRED MANUAL REVIEW NECESSARY TO COMPLETE A REGION I TIER II DATA VALIDATION

QC CRITERIA	REVIEW PERFORMED BY CADRE	REQUIRED MANUAL REVIEW
MATRIX SPIKE	● CADRE reviews matrix spike data based on current Region I guidelines. ● CADRE does not qualify data for matrix spikes, but indicates which compounds did not meet matrix spike acceptance criteria.	● If all criteria were met for %R and RPD or if CADRE detects no errors, no further manual review is required for %R and RPD. ● If recovery criteria were exceeded, a manual review of Form 3 is necessary to determine if qualification of the data is required ● Manual review of the CADRE sample, MS, MSD Summary Table is required to assess the %RSD of unspiked compounds. ● Manual review is required if CADRE reports any errors during data review. Required review is stated in Section III of Guidance Document. ● CADRE does not qualify results for MS/MSD deviations on the CADRE qualified Data Summary Tables. The validator needs to apply qualifiers to both the qualified and unqualified Data Summary Tables for any MS/MSD deviations.
FIELD DUPLICATES	● CADRE does not evaluate field duplicates.	● A manual review of the CADRE Data Summary Tables (or Form 1s) for the field duplicates is required to assess precision.
INTERNAL STANDARDS	● CADRE evaluates primary internal standard criteria based on the current Region I guidelines. For the criteria of "extremely low" areas counts, CADRE assigns a defined value of less than 20% of the internal standard area of the associated calibration.	● If CADRE detected no errors, no further manual review is required. ● Manual review is required if CADRE reports any errors during data review. Required review is stated in Section III of Guidance Document.
TENTATIVELY IDENTIFIED COMPOUNDS	● CADRE does not evaluate this criterion.	● No manual review for TICs is required for Tier II. A table summarizing the TICs detected must be completed. The reviewer must verify that target compounds are not reported as TICs in another fraction.

SUMMARY OF CADRE DATA REVIEW - REQUIRED MANUAL REVIEW NECESSARY TO COMPLETE A REGION I TIER II DATA VALIDATION

QC CRITERIA	REVIEW PERFORMED BY CADRE	REQUIRED MANUAL REVIEW
COMPOUND IDENTIFICATION AND QUANTITATION	● CADRE does not check any raw data but where possible does check and verify calculations and rounding procedures. ● If CADRE detects errors in calculations and rounding, CADRE will generate an error form and suggest its correct result. However, for consistency between the hardcopy and electronic data deliverables, the laboratory Form 1 result will be reported by the ESAT CADRE Chemist if the error is due to rounding. ● CADRE produces a worksheet which lists all compounds detected less than the CRQL.	● No manual review is required. Evaluation of compound Identification and Quantitation is not required for Tier II data validation.
OVERALL ASSESSMENT OF DATA FOR A CASE	● CADRE reviews each parameter independent of other parameters.	● No manual review is required. An overall summary of data qualifications should be included at the end of the Data Validation Memorandum as outlined in the Region I Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses.

ATTACHMENT IV

**Criteria Comparison Between CADRE,
National Functional Guidelines and
Region I Functional Guidelines**

CADRE METHOD COMPARISON
SEMI-VOLATILES

	Evaluated by Tier II?	Region I Functional Guidelines modified 11/88	CADRE Version 2.10	National Functional Guidelines Draft, 6/91
HOLDING TIMES	Yes	• Extraction: soil and water samples within 7 days of collection. • Analytical: Both within 40 days of extraction. • Action: (J) positive results and (UJ) non-detects. If holding time is grossly exceeded, may need to (R) non-detects.	• Extraction: **Primary:** water and soil samples within 7 days of collection. **Expanded:** water and soil samples within 14 days of collection. • Analytical: **Primary:** both within 40 days of extraction. **Expanded:** both within 60 days of extraction. • Action: (J) positive results and (UJ) non-detects outside primary criteria. (J) positive results and (R) non-detects outside expanded criteria.	• Extraction: water samples within 7 days of collection. Soil samples recommended within 14 days of collection. • Analytical: Both within 40 days of extraction. • Action: (J) positive results and (UJ) quantitation limits. If HT grossly exceeded, may need to (R) non-detects.
GC/MS TUNING	Yes	DFTPP m/z Ion Abundance Criteria 51 30.0 - 80.0% of m/z 198 68 less than 2.0% of m/z 69 69 present 70 less than 2.0% of m/z 69 127 25.0 - 75.0% of m/z 198 197 less than 1.0% of m/z 198 198 base peak, 100% relative abundance 199 5.0-9.0% of m/z 198 275 10.0-30.0% of m/z 198 365 greater than 0.75% of m/z 198 441 present, but less than 443 442 40.0-110% of m/z 198 443 15.0-24.0% of m/z 442 • 12 hour tune period • Action: (R) all data if mass calibration is in error. • If ion abundance criteria not met, use professional judgement to determine if qualification is necessary. • Ion abundance criteria used should reflect the most current version of the SOW.	DFTPP m/z Ion Abundance Criteria 51 30.0 - 80.0% of m/z 198 68 less than 2.0% of m/z 69 69 present 70 less than 2.0% of m/z 69 127 25.0 - 75.0% of m/z 198 197 less than 1.0% of m/z 198 198 base peak, 100% relative abundance 199 5.0-9.0% of m/z 198 275 10.0-30.0% of m/z 198 365 greater than 0.75% of m/z 198 441 present, but less than 443 442 40.0-110% of m/z 198 443 15.0-24.0% of m/z 442 • 12 hour tune period. • Action: Manual review of data is necessary to determine usability of data if mass calibration is in error, ion abundance criteria are not met, or if m/z 198 is not base peak. • Will alert validator to perform manual review if it cannot associate samples with a tune file.	DFTPP m/z Ion Abundance Criteria 51 30.0 - 80.0% of m/z 198 68 less than 2.0% of m/z 69 69 present 70 less than 2.0% of m/z 69 127 25.0 - 75.0% of m/z 198 197 less than 1.0% of m/z 198 198 base peak, 100% relative abundance 199 5.0-9.0% of m/z 198 275 10.0-30.0% of m/z 198 365 greater than 0.75% of m/z 198 441 present, but less than 443 442 40.0-110% of m/z 198 443 15.0-24.0% of m/z 442 • 12 hour tune period • Action: (R) all data if mass calibration is in error. Use judgement if ion abundance criteria are not met.
INITIAL CALIBRATION	Yes	• All average RRFs must be ≥ 0.05. • All %RSDs must be ≤ 30%. • Action: If RRF < 0.05, (J) all positive results for that compound in samples associated with the initial and subsequent continuing calibrations. (R) non-detects for that compound in samples associated as mentioned. If %RSD > 30%, (J) positive results for that compound in associated samples. If %RSD > 50%, also (UJ) non-detects.	• All average RRFs must be ≥ 0.05. • All %RSDs must be ≤ 30%. • Action: If RRF < 0.05, (J) all positive results for that compound in samples associated with the initial and subsequent continuing calibrations. (R) non-detects for that compound in samples associated as mentioned. If %RSD > 30%, (J) positive results for that compound in associated samples. If %RSD > 50%, also (UJ) non-detects.	• Minimum RRF criteria specified per compound. • %RSDs must be ≤ 20.5%. • 19 selected compounds have no %RSD criteria, but RRFs must be ≥ 0.01. • Action: RRF criteria judged in conjunction with the RSD. Professional judgement used to qualify data when RRF < minimum criteria. Data are qualified due to non-compliant %RSD criteria based on if the high, low or middle part of curve is out.

CADRE METHOD COMPARISON Continued
SEMI-VOLATILES

	Evaluated by Tier II?	Region I Functional Guidelines modified 11/88	CADRE Version 2.10	National Functional Guidelines Draft, 6/91
CONTINUING CALIBRATION	Yes	• RRFs must be ≥ 0.05. • %Ds must be ≤ 25.0%. • Action: If RRF < 0.05, (J) positive results and (R) non-detects for that compound in samples associated with the calibration. If %D > 25, (J) positive results for that compound in associated samples. If %D > 50, also (UJ) non-detects for that compound in associated samples.	• RRFs must be ≥0.05. • %Ds must be ≤25. • Action: If RRF < 0.05, (J) positive results and (R) non-detects for that compound in samples associated with the calibration. If %D > 25, (J) positive results for that compound in associated samples. If %D > 50, also (UJ) non-detects for that compound in associated samples.	• RRF criteria specified per compound. • %Ds must be ≤ 25%. • Selected compounds have no %D criteria but RRFs must be ≥ 0.01. • Action: If RRF is between 0.01 and acceptance criteria, or above 0.01 for the selected compounds, (J) positive results and (UJ) non-detect results. If RRF < 0.01, (R) non-detects and (J) positive results with acceptable mass spectrum. If %D > 50, (J) positive results. Use professional judgement for non-detects.
BLANKS	Yes	• No contaminants should be present. • One blank per matrix, concentration level and extraction batch. • Equipment blanks are treated as method blanks. • Action: If contaminant also detected in sample, qualify data (U) at the CRQL if concentration is < 5x blank level (10x for common lab contaminants (CLCs) and less than CRQL. Qualify (U) at raised detection limit if concentration is < 5x blank level (10x for CLCs) and greater than CRQL. Actions apply to any blank contamination (method or equipment).	• No contaminants should be present. • One blank per matrix, concentration level and extraction batch. • Equipment blanks are not validated by CADRE. • Action: If contaminant also detected in sample, qualify data (U) at the CRQL if concentration is < 5x blank level (10x for common lab contaminants (CLCs) and less than CRQL. Qualify (U) at raised detection limit if concentration is < 5x blank level (10x for CLCs) and greater than CRQL. Actions apply only to samples associated with the contaminated blank (from Form 4).	• No contaminants should be present. • One blank per matrix, concentration level and extraction batch. • Field blanks are treated as method blanks. • Lab Blank Action: If contaminant also detected in sample, qualify data (U) at the CRQL if concentration is < 5x blank level (10x for common lab contaminants (CLCs) and less than CRQL. Qualify (U) at raised detection limit if concentration is < 5x blank level (10x for CLCs) and greater than CRQL. • Field blanks should not contain any TCL above its CRQL and should not contain the common phthalate contaminants at concentrations > 2x CRQL. • Should not contain TICs. • Field Blank Action: Qualify the same as for Region I Functional Guidelines except use only 5x level.

CADRE METHOD COMPARISON Continued
SEMI-VOLATILES

	Eval by Tier II	Region I Functional Guidelines modified 11/88	CADRE Version 2.10	National Functional Guidelines Draft, 6/91
SURRO-GATES	Yes	% Recovery Soil Aqueous Nitrobenzene-d_5 23-120 35-114 2-Fluorobiphenyl 30-115 43-116 Terphenyl-d_{14} 18-137 33-141 Phenol-$_{d6}$ 24-113 10-94 2-Fluorophenol 25-121 21-100 2,4,6-Tribromophenol 19-122 10-123 ● Action: If at least 2 surrogates in a base/neutral or acid fraction are > 10%, but < CRR, (J) positive results and (UJ) quantitation limits in the sample. If < 10%, (J) positive results and (R) non-detect results in the sample. If recoveries are > CRR (J) positive results only.	% Recovery Soil Aqueous Nitrobenzene-d_5 23-120 35-114 2-Fluorobiphenyl 30-115 43-116 Terphenyl-d_{14} 18-137 33-141 Phenol-d_5 24-113 10-110 2-Fluorophenol 25-121 21-110 2,4,6-Tribromophenol 19-122 10-123 2-Chlorophenol-d_4 20-130 33-110 1,2-Dichlorobenzene-d_4 20-130 16-110 ● Action: If at least 2 surrogates in a base/neutral or acid fraction are > 10%, but < CRR, (J) positive results and (UJ) quantitation limits in the sample. If < 10%, (J) positive results and (R) non-detect results in the sample. If recoveries are > CRR (J) positive results only. ● CADRE does not take into consideration advisory surrogate recoveries when qualifying data. (i.e. does not include them as one of the two outlier surrogates required for qualification). ● CADRE will not evaluate surrogate recoveries on a sample if a dilution greater than 1:10 was performed on that sample.	% Recovery Soil Aqueous Nitrobenzene-d_5 23-120 35-114 2-Fluorobiphenyl 30-115 43-116 Terphenyl-d_{14} 18-137 33-141 Phenol-d_5 24-113 10-110 2-Fluorophenol 25-121 21-110 2,4,6-Tribromophenol 19-122 10-123 2-Chlorophenol-d_4 20-130 33-110 1,2-Dichlorobenzene-d_4 20-130 16-110 ● Action: If at least 2 surrogates in a base/neutral or acid fraction are out, but > 10%, (J) positive results for that fraction (B/N, or A) and (UJ) quantitation limits for that fraction. If < 10%, (J) positive results for that fraction and (R) or (J) non-detect results for that fraction.
MS/MSD	Yes	% Recovery Soil RPD Aqueous RPD Phenol 26-90 35 12-89 42 2-Chlorophenol 25-102 50 27-123 40 1,4-Dichlorobenzene 28-104 27 36-97 28 N-Nitroso-di-n-prop. 41-126 38 41-116 38 1,2,4-Trichlorobenzene 38-107 23 39-98 28 4-Chloro-3-methylphenol 26-103 33 23-97 42 Acenaphthene 31-137 19 46-118 31 4-Nitrophenol 11-114 50 10-80 50 2,4-Dinitrotoluene 28-89 47 24-96 38 Pentachlorophenol 17-109 47 9-103 50 Pyrene 35-142 36 26-127 31 ● Action: If recoveries are greater than limits (J) positive results in unspiked sample. If recoveries are less than limits but ≥ 10%, (J) positive results in unspiked sample. If recoveries are < 10%, (J) positive results and (R) non-detect results in unspiked sample. Use professional judgement to qualify results for high RSD between sample, MS, and MSD for non-spike compounds.	% Recovery Soil RPD Aqueous RPD Phenol 26-90 35 12-89 42 2-Chlorophenol 25-102 50 27-123 40 1,4-Dichlorobenzene 28-104 27 36-97 28 N-Nitroso-di-n-prop. 41-126 38 41-116 38 1,2,4-Trichlorobenzene 38-107 23 39-98 28 4-Chloro-3-methylphenol 26-103 33 23-97 42 Acenaphthene 31-137 19 46-118 31 4-Nitrophenol 11-114 50 10-80 50 2,4-Dinitrotoluene 28-89 47 24-96 38 Pentachlorophenol 17-109 47 9-103 50 Pyrene 35-142 36 26-127 31 ● Action: CADRE performs this evaluation but does not qualify sample results which did not meet criteria. CADRE does list which compounds failed criteria.	% Recovery Soil RPD Aqueous RPD Phenol 26-90 35 12-89 42 2-Chlorophenol 25-102 50 27-123 40 1,4-Dichlorobenzene 28-104 27 36-97 28 N-Nitroso-di-n-prop. 41-126 38 41-116 38 1,2,4-Trichlorobenzene 38-107 23 39-98 28 4-Chloro-3-methylphenol 26-103 33 23-97 42 Acenaphthene 31-137 19 46-118 31 4-Nitrophenol 11-114 50 10-80 50 2,4-Dinitrotoluene 28-89 47 24-96 38 Pentachlorophenol 17-109 47 9-103 50 Pyrene 35-142 36 26-127 31 ● Action: Use professional judgement to determine need for qualification of the data.

CADRE METHOD COMPARISON (Continued)
SEMI-VOLATILES

	Evaluated By Tier II?	Region I Functional Guidelines modified 11/88	CADRE Version 2.10	National Functional Guidelines Draft 6/91
FIELD DUPLICATES	Yes	• RPD for aqueous samples must be < 30%. For soils, RPD must be < 50%. • Action: If RPD limits are exceeded, (J) positive results for that compound in both samples. Use professional judgement to qualify all samples of the same matrix.	• Presently, CADRE does not evaluate field duplicates. CADRE does recognize field duplicate pairs but does not have an evaluation parameter. This option is scheduled for implementation in future releases.	• Criteria determined by each Region. • Action: Action must be in accordance with Regional specifications.
INTERNAL STANDARDS	Yes	• Area counts may not vary by more than a factor of 2 from the associated calibration standard. The RTs may not shift more than 30 seconds. • Action: If area counts are out, (J) positive results and (UJ) non-detect results for compounds quantitated using that internal standard. If area counts are extremely low, non-detects should be rejected (R). Use professional judgement if RT shifts by more than 30 seconds.	• **Primary:** Area counts may not vary by more than a factor of 2 from the associated calibration standard. The RTs may not shift more than 30 seconds. **Expanded:** areas counts may not decrease by more than a factor of 5. • Action: If area counts are out of primary criteria low, (J) positive results and (UJ) non-detect results for compounds quantitated using that internal standard. If areas counts are out high, (J) positive results associated with that internal standard. If area counts are outside expanded criteria (J) positive results and (R) non-detects associated with that internal standard. Manual validation is required to qualify data for retention time shifts of more than 30 seconds.	• Area counts may not vary by more than a factor of 2 from the associated calibration standard. The RTs may not shift more than 30 seconds. • Action: If area counts are out, (J) positive results and (UJ) non-detect results for compounds quantitated using that internal standard. If area counts are extremely low, non-detects should be rejected (R). Use professional judgement if RT shifts by more than 30 seconds.
TCL COMPOUND IDENTIFICATION	No	• Compound must be within ± 0.06 RRT units of the standard RRT. • Mass spectra of the sample compound and a current lab generated standard must match according to specific ion criteria. • Action: Use professional judgement.	• CADRE does not evaluate this criterion.	• Compound must be within ± 0.06 RRT units of the standard RRT. • Mass spectra of the sample compound and a current lab generated standard must match according to specific ion criteria. These criteria are the same as those listed in the Region I Functional Guidelines. • Action: Use professional judgement.

CADRE METHOD COMPARISON (Continued)
SEMI-VOLATILES

	Evaluated by Tier II?	Region I Functional Guidelines modified 11/88	CADRE Version 2.10	National Functional Guidelines Draft 6/91
COMPOUND QUANTITATION AND CRQLs	CRQLs Yes Compound Quantitation No	• See attached CRQL list for current soil and water CRQLs for each compound. • RRF must be calculated based on internal standard specified in appropriate SOW. • Quantitation must be based on the specific quantitation ion listed in the SOW. • Quantitation is performed using the RRF obtained from the daily calibration standard. • Action: Professional judgement is used to determine if reported compounds are false positives or if false negatives are reported.	• CADRE prepares a report listing all compounds which were reported below the CRQL and flags all those results as (J). • CADRE does not evaluate raw data, therefore, cannot verify spectra.	• See CRQL list. • RRF must be calculated based on internal standard specified in SOW OLM01. • Quantitation must be based on the specific quantitation ion listed in the SOW. • Quantitation is performed using the RRF obtained from the daily calibration standard. • Action: Professional judgement is used to determine if reported compounds are false positives or if false negatives are reported.
TENTATIVELY IDENTIFIED COMPOUNDS	Yes	• Must report possible identity if the 20 largest non-TCL or surrogate peaks which have area counts > 10% of nearest IS. • Action: Use professional judgement to determine if proper identifications or classifications have been made. TICs summarized in tabular format.	• CADRE does not evaluate nor list a summary of the reported TICs even though they are included on a reporting form.	• Must report possible identity if the 20 largest non-TCL or surrogate peaks which have area counts > 10% of nearest IS. • Action: Use professional judgement to determine if proper identifications or classifications have been made.
SYSTEM PERFORMANCE	No	• Use professional judgement to evaluate effects of poor chromatography, abrupt shifts in baseline peak tailing or splitting, etc.	• CADRE does not evaluate this criterion. CADRE reports the findings of each parameter independent of other QC parameters.	• Use professional judgement to evaluate effects of poor chromatography, abrupt shifts in baseline peak failing or splitting, etc.

CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs)
SEMI-VOLATILES

	Region I		CADRE		National Functional Guidelines	
Analyte	Water µg/L	Soil µg/Kg	Water µg/L	Soil µg/Kg	Water µg/L	Soil µg/Kg
1,2,4-Trichlorobenzene	10	330	10	330	10	330
1,2-Dichlorobenzene	10	330	10	330	10	330
1,3-Dichlorobenzene	10	330	10	330	10	330
1,4-Dichlorobenzene	10	330	10	330	10	330
2,2'-oxybis(1-Chloropropane)	10	330	10	330	10	330
2,4,5-Trichlorophenol	25	800	25	800	25	800
2,4,6-Trichlorophenol	10	330	10	330	10	330
2,4-Dichlorophenol	10	330	10	330	10	330
2,4-Dimethylphenol	10	330	10	330	10	330
2,4-Dinitrophenol	25	800	25	800	25	800
2,4-Dinitrotoluene	10	330	10	330	10	330
2,6-Dinitrotoluene	10	330	10	330	10	330
2-Chloronaphthalene	10	330	10	330	10	330
2-Chlorophenol	10	330	10	330	10	330
2-Methylnaphthalene	10	330	10	330	10	330
2-Methylphenol	10	330	10	330	10	330
2-Nitroaniline	25	800	25	800	25	800
2-Nitrophenol	10	330	10	330	10	330
3,3'-Dichlorobenzidine	10	330	10	330	10	330
3-Nitroaniline	25	800	25	800	25	800
4,6-Dinitro-2-Methylphenol	25	800	25	800	25	800
4-Bromophenyl-Phenylether	10	330	10	330	10	330
4-Chloro-3-Methylphenol	10	330	10	330	10	330
4-Chloroaniline	10	330	10	330	10	330
4-Chlorophenyl-Phenylether	10	330	10	330	10	330
4-Methylphenol	10	330	10	330	10	330
4-Nitroaniline	25	800	25	800	25	800
4-Nitrophenol	25	800	25	800	25	800
Acenaphthene	10	330	10	330	10	330
Acenaphthylene	10	330	10	330	10	330
Anthracene	10	330	10	330	10	330
Benzo(a)anthracene	10	330	10	330	10	330
Benzo(a)pyrene	10	330	10	330	10	330
Benzo(b)fluoranthene	10	330	10	330	10	330
Benzo(g,h,i)perylene	10	330	10	330	10	330
Benzo(k)fluoranthene	10	330	10	330	10	330
bis(2-Chloroethoxy)methane	10	330	10	330	10	330

CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs) Continued
SEMI-VOLATILES

	Region I		CADRE		National Functional Guidelines	
Analyte	Water µg/L	Soil µg/Kg	Water µg/L	Soil µg/Kg	Water µg/L	Soil µg/Kg
bis(2-Chloroethyl)ether	10	330	10	330	10	330
bis(2-ethylhexyl)phthalate	10	330	10	330	10	330
Butylbenzylphthalate	10	330	10	330	10	330
Carbazole	10	330	10	330	10	330
Chrysene	10	330	10	330	10	330
Di-n-butylphthalate	10	330	10	330	10	330
Di-n-octylphthalate	10	330	10	330	10	330
Dibenz(a,h)anthracene	10	330	10	330	10	330
Dibenzofuran	10	330	10	330	10	330
Diethylphthalate	10	330	10	330	10	330
Dimethylphthalate	10	330	10	330	10	330
Fluoranthene	10	330	10	330	10	330
Fluorene	10	330	10	330	10	330
Hexachlorobenzene	10	330	10	330	10	330
Hexachlorobutadiene	10	330	10	330	10	330
Hexachlorocyclopentadiene	10	330	10	330	10	330
Hexachloroethane	10	330	10	330	10	330
Indeno(1,2,3,cd)pyrene	10	330	10	330	10	330
Isophrone	10	330	10	330	10	330
N-Nitroso-di-n-propylamine	10	330	10	330	10	330
N-Nitrosodiphenylamine (1)	10	330	10	330	10	330
Naphthalene	10	330	10	330	10	330
Nitrobenzene	10	330	10	330	10	330
Pentachlorophenol	25	800	25	800	25	800
Phenanthrene	10	330	10	330	10	330
Phenol	10	330	10	330	10	330
Pyrene	10	330	10	330	10	330

CADRE METHOD COMPARISON
VOLATILES

	Evaluated by Tier II?	Region I Functional Guidelines Modified 11/88	CADRE Version 2.10	National Functional Guidelines Draft, 6/91
HOLDING TIMES	Yes	• Unpreserved water: Aromatic within 7 days, non-aromatic within 14 days of sample collection. • Preserved water and soil: both within 14 days of sample collection. • Action: (J) positive results and (UJ) non-detects. Use professional judgement when (R) rejecting data for grossly exceeded holding times.	• Unpreserved waters: **Primary:** within 7 days of collection for aromatics and 14 days of collection for non-aromatics. **Expanded:** within 14 days of collection for aromatics and 28 days of collection for non-aromatics. • Preserved waters and soils: **Primary:** within 14 days of collection for all compounds. **Expanded:** within 28 days of collection for all compounds. • Action: (J) positive results and (UJ) non-detects outside primary criteria. (J) positive results and (R) non-detects outside expanded criteria.	• Unpreserved & Preserved: Both water and soil within 14 days of sample collection. • Action: (J) positive results, (UJ) non-detects. Use professional judgement when (R) rejecting data.
GC/MS TUNING	Yes	Bromofluorobenzene m/z Ion Abundance Criteria 50 8.0-40.0% of base peak 75 30.0-66.0% of base peak 95 base peak, 100% relative abundance 96 5.0-9.0% of base peak 173 < 2.0% of m/z 174 174 50-120% of m/z 95 175 4.0-9.0% of m/z 174 176 > 93.0% but < 101.0% of m/z 174 177 5.0-9.0% of m/z 176 • 12 hour tune period. • Action: (R) all data if mass calibration is in error. • If ion abundance criteria not met, use professional judgement to determine if qualification is necessary. • Ion abundance criteria used should reflect the most current version of the SOW.	Bromofluorobenzene m/z Ion Abundance Criteria 50 8.0-40.0% of m/z 95 75 30.0-66.0% of m/z 95 95 base peak, 100% relative abundance 96 5.0-9.0% of m/z 95 173 < 2.0% of m/z 174 174 > 50.0%-120.0% of m/z 95 175 4.0-9.0% of m/z 174 176 > 93.0%-101.0% of m/z 174 177 5.0-9.0% of m/z 176 • 12 hour tune period. • Action: Manual review of data is necessary to determine usability of data if mass calibration is in error or ion abundance criteria are not met. • Will alert validator to perform manual review of the data if it cannot associate samples with a tune file.	Bromofluorobenzene m/z Ion Abundance Criteria 50 8.0-40.0% of m/z 95 75 30.0-66.0% of m/z 95 95 base peak, 100% relative abundance 96 5.0-9.0% of m/z 95 173 < 2.0% of m/z 174 174 > 50.0%-120.0% of m/z 95 175 4.0-9.0% of m/z 174 176 > 93.0%-101.0% of m/z 174 177 5.0-9.0% of m/z 176 • 12 hour tune period. • Action: (R) all data if mass calibration is in error. Use expanded criteria if necessary.

CADRE METHOD COMPARISON Continued
VOLATILES

	Evaluated by Tier II?	Region I Functional Guidelines Modified 11/88	CADRE Version 2.10	National Functional Guidelines Draft, 6/91
INITIAL CALIBRATION	Yes	• All average RRFs must be ≥ 0.05. • All %RSDs must be ≤ 30%. • Action: If RRF < 0.05, (J) all positive results for that compound in samples associated with the initial and subsequent continuing calibrations. (R) non-detects for that compound in samples associated as mentioned. If %RSD > 30%, (J) positive results for that compound in associated samples. If %RSD > 50%, also (UJ) non-detects.	• All average RRFs must be ≥ 0.05. • All %RSDs must be ≤ 30%. • Action: If RRF < 0.05, (J) all positive results for that compound in samples associated with the initial and subsequent continuing calibrations. (R) non-detects for that compound in samples associated as mentioned. If %RSD > 30%, (J) positive results for that compound in associated samples. If %RSD > 50%, also (UJ) non-detects.	• Minimum RRF criteria specified per compound. • %RSDs must be ≤ 20.5%. • Acetone, 2-Butanone, Carbon Disulfide, Chloroethane, Chloromethane, 1,2-Dichloroethane(total)have no %RSD criteria, but RRFs must be ≥ 0.01. • Action: RRF criteria judged in conjunction with the RSD. Professional judgement used to qualify data when RRF < minimum criteria. Data are qualified due to non-compliant %RSD criteria based on if the high, low or middle part of curve is out.
CONTINUING CALIBRATION	Yes	• RRFs must be ≥ 0.05. • %Ds must be ≤ 25.0%. • Action: If RRF < 0.05, (J) positive results and (R) non-detects for that compound in samples associated with the calibration. If %D > 25, (J) positive results for that compound in associated samples. If %D > 50, also (UJ) non-detects for that compound in associated samples.	• RRFs must be ≥0.05. • %Ds must be ≤25. • Action: If RRF < 0.05, (J) positive results and (R) non-detects for that compound in samples associated with the calibration. If %D > 25, (J) positive results for that compound in associated samples. If %D > 50, also (UJ) non-detects for that compound in associated samples.	• RRF criteria specified per compound. • %Ds must be ≤ 25%. • Selected compounds have no %D criteria but RRFs must be ≥ 0.01. • Action: If RRF is between 0.01 and acceptance criteria, or above 0.01 for the selected compounds, (J) positive results and (UJ) non-detect results. If RRF < 0.01, (R) non-detects and (J) positive results with acceptable mass spectrum. If %D > 50, (J) positive results. Use professional judgement for non-detects.

CADRE METHOD COMPARISON Continued
VOLATILES

	Evaluated by Tier II?	Region I Functional Guidelines Modified 11/88	CADRE Version 2.10	National Functional Guidelines Draft, 6/91
BLANKS	Yes	• No contaminants should be present. • One method blank per matrix per concentration level per 12 hour tune per system. • Equipment and trip blanks are treated as method blanks. • Action: If contaminant also detected in sample, qualify data (U) at the CRQL if concentration is < 5x blank level (10x for common lab contaminants (CLCs) and less than CRQL. Qualify (U) at raised detection limit if concentration is < 5x blank level (10x for CLCs) and greater than CRQL. Actions apply to any blank contamination (method, equipment, or trip).	• No contaminants should be present. • One method blank per matrix per concentration level per 12 hour tune per system. • Equipment and trip blank contamination is not validated by CADRE. • Action: If contaminant also detected in sample, qualify data (U) at the CRQL if concentration is < 5x blank level (10x for common lab contaminants (CLCs) and less than CRQL. Qualify (U) at raised detection limit if concentration is < 5x blank level (10x for CLCs) and greater than CRQL. Actions apply only to samples associated with the contaminated blank.	• No common contaminants should be present. • One method blank per matrix per concentration level per 12 hour tune per system. • Field blanks are treated as method blanks. • No TCL compounds above 5x CRQL. • Non-target compound must not have peak area > 10% of the nearest internal standard. • Action: If contaminant also detected in sample, qualify data (U) at the CRQL if concentration is < 5x blank level (10x for common lab contaminants (CLCs) and less than CRQL. Qualify (U) at raised detection limit if concentration is < 5x blank level (10x for CLCs) and greater than CRQL.
SURROGATES	Yes	Analyte — QC Limits water — QC Limits soil Toluene-d_8 84-138 88-110 Bromofluorobenzene 59-113 86-115 1,2-Dichloroethane,d_4 70-121 76-114 • All blanks and samples must meet surrogate recovery criteria. • Action: If any surrogates are > 10%, but < CRR, (J) positive results and (UJ) quantitation limits in the sample. If < 10%, (J) positive results and (R) non-detect results in the sample. If recoveries are > CRR (J) positive results only.	Analyte — QC Limits soil — QC Limits water Toluene-d_8 84-138 88-110 Bromofluorobenzene 59-113 86-115 1,2-Dichloroethane,d_4 70-121 76-114 • All blanks and samples must meet surrogate recovery criteria. • Action: If any surrogates are > 10%, but < CRR, (J) positive results and (UJ) quantitation limits in the sample. If < 10%, (J) positive results and (R) non-detect results in the sample. If recoveries are > CRR (J) positive results only.	Analyte — QC Limits water — QC Limits soil Toluene-d_8 84-138 88-110 Bromofluorobenzene 59-113 86-115 1,2-Dichloroethane,d_4 70-121 76-114 • All blanks and samples must meet surrogate recovery criteria. • Action: If surrogate recovery is < 10% (R) non-detects and (J) positive results. If recoveries are 10%-CRR (UJ) non-detects and (J) positive results. If recoveries are > CRR (A) non-detects and (J) positive results.
MS/MSD	Yes	% Recovery — Soil — RPD — Water — RPD 1,1-Dichloroethane 59-172 22 61-145 14 Trichloroethene 62-137 24 71-120 14 Benzene 66-142 21 76-127 11 Toluene 59-139 21 76-125 13 Chlorobenzene 60-133 21 75-130 13 • One MS/MSD analyzed per SDG, per matrix. • Action: If recovery is < 10% (R) non-detects and (J) positive results in unspiked sample. If recoveries are 10%-CRR (UJ) non-detects and (J) positive results in the unspiked sample. If recoveries are > CRR (A) non-detects and (J) positive results in the unspiked sample. If RPD > CRR (J) positive results. Use professional judgement to qualify compounds for high RSD between sample, MS, and MSD for non-spike compounds.	% Recovery — Soil — RPD — Water — RPD 1,1-Dichloroethane 59-172 22 61-145 14 Trichloroethene 62-137 24 71-120 14 Benzene 66-142 21 76-127 11 Toluene 59-139 21 76-125 13 Chlorobenzene 60-133 21 75-130 13 • One MS/MSD analyzed per SDG, per matrix. • Action: CADRE performs this evaluation but does not qualify sample results which did not meet criteria. CADRE does list the compounds which failed criteria.	% Recovery — Soil — RPD — Water — RPD 1,1-Dichloroethane 59-172 22 61-145 14 Trichloroethene 62-137 24 71-120 14 Benzene 66-142 21 76-127 11 Toluene 59-139 21 76-125 13 Chlorobenzene 60-133 21 75-130 13 • One MS/MSD analyzed per SDG, per matrix. • Action: If recovery is < 10% (R) non-detects and (J) positive results. If recoveries are 10%-CRR (UJ) non-detects and (J) positive results. If recoveries are > CRR (A) non-detects and (J) positive results. If RPD > CRR (J) positive results. Use professional judgement for RSD in unspiked samples and only for the MS/MSD sample.

CADRE METHOD COMPARISON Continued
VOLATILES

	Evaluated by Tier II?	Region I Functional Guidelines Modified 11/88	CADRE Version 2.10	National Functional Guidelines Draft, 6/91
FIELD DUPLICATES	Yes	• RPD for water is < 30%; RPD for soil is < 50%. • Action: For duplicate samples, if RPD for water is > 30% (J) positive results. Also, if RPD for soil is > 50% (J) positive results. Use professional judgement to qualify all samples of the same matrix.	• Presently, CADRE does not evaluate field duplicates.	• Criteria determined by each Region. • Action: Action must be in accordance with Regional specifications.
INTERNAL STANDARDS	Yes	• Area counts may not vary by more than a factor of 2 from the associated calibration standard. The RTs may not shift more than 30 seconds. • Action: If area counts are out, (J) positive results and (UJ) non-detect results for compounds quantitated using that internal standard. If area counts are extremely low, non-detects should be rejected (R). Use professional judgement if RT shifts by more than 30 seconds.	• **Primary:** Area counts may not vary by more than a factor of 2 from the associated calibration standard. The RTs may not shift more than 30 seconds. **Expanded:** areas counts may not decrease by more than a factor of 5. • Action: If area counts are out of primary criteria low, (J) positive results and (UJ) non-detect results for compounds quantitated using that internal standard. If areas counts are out high, (J) positive results associated with that internal standard. If area counts are outside expanded criteria (J) positive results and (R) non-detects associated with that internal standard. Manual validation is required to qualify data for retention time shifts of more than 30 seconds.	• Area counts may not vary by more than a factor of 2 from the associated calibration standard. The RTs may not shift more than 30 seconds. • Action: If area counts are out, (J) positive results and (UJ) non-detect results for compounds quantitated using that internal standard. If area counts are extremely low, non-detects should be rejected (R). Use professional judgement if RT shifts by more than 30 seconds.
TCL COMPOUND IDENTIFICATION	No	• Compound must be within ± 0.06 (RRT) units of the standard (RRT). • Mass spectra must meet criteria: 1. All ions present in the standard at a relative intensity > 10% must be present in the sample spectrum. 2. Relative intensities of ions specified above must agree ± 20%. 3. Ions > 10% in the sample spectrum but not present in the standard must be accounted for. 4. Technical judgement may be used if all criteria are not met. • Action: Use professional judgement.	• CADRE does not evaluate this criterion.	• Compound must be within ± 0.06 (RRT) units of the standard (RRT). • Mass spectra must meet criteria: 1. All ions present in the standard at a relative intensity > 10% must be present in the sample spectrum. 2. Relative intensities of ions specified above must agree ±20%. 3. Ions > 10% in the sample spectrum but not present in the standard must be accounted for. 4. Technical judgement may be used if all criteria are not met. • Action: Use professional judgement.
COMPOUND QUANTITATION AND CRQLs	CRQLs Yes Quantitation No	• See attached CRQL list for current compound list and CRQLs for water and soil. • RRF must be calculated based on internal standard specified in SOW OLM01. • Quantitation must be based on the specific quantitation ion listed in the SOW. • Quantitation is performed using the RRF obtained from the daily calibration standard. • Action: Professional judgement is used to determine if reported compounds are false positives or if false negatives are reported.	• CADRE prepares a report listing all compounds which were reported below the CRQL and flags all those results as (J). • CADRE does not evaluate raw data, therefore, cannot verify spectra.	• See CRQL list. • RRF must be calculated based on internal standard specified in SOW OLM01. • Quantitation must be based on the specific quantitation ion listed in the SOW. • Quantitation is performed using the RRF obtained from the daily calibration standard. • Action: Professional judgement is used to determine if reported compounds are false positives or if false negatives are reported.

CADRE METHOD COMPARISON Continued
VOLATILES

	Evaluated by Tier II?	Region I Functional Guidelines Modified 11/88	CADRE Version 2.10	National Functional Guidelines Draft, 6/91
TENTATIVELY IDENTIFIED COMPOUNDS	Yes	• The laboratory must conduct a mass spectral search of the NBS library and report the possible identity for the 10 largest VOA fraction peaks. Reported peaks are not surrogate, internal standards or TCL compounds, but have area height > 10% of the size of the nearest IS. • Action: All TICs are flagged (J). TICs are summarized in tabular format	• CADRE does not evaluate nor list a summary of the reported TICs even though they are included on a reporting form.	• The laboratory must conduct a mass spectral search of the NBS library and report the possible identity for the 10 largest VOA fraction peaks. Reported peaks are not surrogate internal standards or TCL compounds, but have area height > 10% of the size of the nearest IS. • Action: All TICs are flagged (J).
SYSTEM PERFORMANCE	No	• Use professional judgement to evaluate effects of poor chromatography, abrupt shifts in baseline peak tailing or splitting, etc.	• CADRE does not evaluate this criterion. CADRE reports the findings of each parameter independent of other QC parameters.	• Use professional judgement to evaluate effects of poor chromatography, abrupt shifts in baseline peak failing or splitting, etc.
OVERALL ASSESSMENT OF DATA	Yes	• Use professional judgement when assessing data.	• CADRE does not evaluate this criterion. CADRE reports the findings of each parameter independent of other QC parameters.	• Use professional judgement when assessing data.

CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs)
VOLATILES

	Region I		CADRE		National Functional Guidelines	
Analyte	Water * µg/L	Soil * µg/Kg	Water µg/L	Soil µg/Kg	Water µg/L	Soil µg/Kg
1,1,1-Trichloroethane	10	10	10	10	10	10
1,1,2,2-Tetrachloroethane	10	10	10	10	10	10
1,1,2-Trichloroethane	10	10	10	10	10	10
1,1-Dichloroethane	10	10	10	10	10	10
1,1-Dichloroethene	10	10	10	10	10	10
1,2-Dichloroethane	10	10	10	10	10	10
1,2-Dichloroethene(Total)	10	10	10	10	10	10
1,2-Dichloropropane	10	10	10	10	10	10
2-Butanone	10	10	10	10	10	10
2-Hexanone	10	10	10	10	10	10
4-Methyl-2-Pentanone	10	10	10	10	10	10
Acetone	10	10	10	10	10	10
Benzene	10	10	10	10	10	10
Bromodichloromethane	10	10	10	10	10	10
Bromoform	10	10	10	10	10	10
Bromomethane	10	10	10	10	10	10
Carbon Disulfide	10	10	10	10	10	10
Carbon Tetrachloride	10	10	10	10	10	10
Chlorobenzene	10	10	10	10	10	10
Chloroethane	10	10	10	10	10	10
Chloroform	10	10	10	10	10	10
Chloromethane	10	10	10	10	10	10
cis-1,3-Dichloropropene	10	10	10	10	10	10
Dibromochloromethane	10	10	10	10	10	10
Ethyl Benzene	10	10	10	10	10	10
Methylene Chloride	10	10	10	10	10	10
Styrene	10	10	10	10	10	10
Tetrachloroethene	10	10	10	10	10	10
Toluene	10	10	10	10	10	10
trans-1,3-Dichloropropene	10	10	10	10	10	10
Trichloroethene	10	10	10	10	10	10
Vinyl Chloride	10	10	10	10	10	10
Xylenes (Total)	10	10	10	10	10	10

* - Indicates that currently Region I uses CRQLs from SOW 3/90.

ATTACHMENT V

Organics Complete SDG File (CSF) Inventory Sheet

For hardcopy of the Organics Complete SDG File (CSF) Inventory Sheet Contact:
Steve Stodola, U.S. EPA Region I
TEL: 617-918-8634
EMAIL: stodola.steve@epamail.epa.gov

CADRE Data Review Inventory Sheet

Region I Complete SDG File Receipt/Transfer Form

CADRE DATA REVIEW
INVENTORY SHEET

The following items are required to be delivered from ESD to the Field Sampling Contractor in the CADRE data review report. Please verify delivery and receipt of each item by checking the appropriate column. This form is to be included with the Data Validation Report.

Case No:_____ SDG No:_____

		ESD	Field Sampling Contractor
1)	Sample Listing	_____	_____
2)	Quantitation Limit Report	_____	_____
3)	Holding Time Report	_____	_____
4)	Percent Moisture	_____	_____
5)	Instrument Performance Check Report	_____	_____
6)	Analytical Sequence	_____	_____
7)	Calibration Listing	_____	_____
8)	Calibration Report	_____	_____
9)	Laboratory Blanks Report	_____	_____
10)	SMC/Surrogate Report	_____	_____
11)	Matrix Spike Report	_____	_____
11)	MS/MSD Non-Spike Compounds Tables	_____	_____
12)	Internal Standards Report	_____	_____
13)	Volatile Data Summary Table	_____	_____
14)	Semivolatile Data Summary Table	_____	_____
15)	Pesticide/PCB Data Summary Table	_____	_____
16)	Diskette with Data Summary Table Files	_____	_____

CADRE Report
Prepared by:_____ Affiliation:_____ Date:_____

CADRE Report
Approved by:_____ Affiliation:_____ Date:_____

Received and
Audited by:_____ Affiliation:_____ Date:_____

REGION I

COMPLETE SDG FILE

RECEIPT/TRANSFER FORM

Case:_____ SDG#:_____ Data Package#:_____

Receipt Date	Received By: Name	Init.	Affiliation	CSF Activity	Custody Seals Present/Intact (On Receipt)	Released: To	Date
					Y N Y N		
					Y N Y N		
					Y N Y N		
					Y N Y N		
					Y N Y N		
					Y N Y N		
					Y N Y N		
					Y N Y N		
					Y N Y N		
					Y N Y N		
					Y N Y N		

ATTACHMENT VI

CARD/CADRE SDG Tracking Form

CARD/CADRE SDG TRACKING FORM

CASE:_____ SDG:_____ NO. SAMPLES:_____ MATRIX:___ LABORATORY:_____
FIELD SAMPLING CONTRACTOR:_____
SITE:_____ PARAMETERS:_____
==========
DATE PKG. RECD AT ESD RSCC:_____ DATE PKG.RECD BY ESAT:_____
DATE DOWNLOAD ATTEMPTED:_____ WAS EXTRACT AVAILABLE?:_____
IF NOT AVAILABLE, WHY?_____
DATE DOWNLOADED:_____ CARD DOWNLOAD FILE NAME:_____
DOWNLOAD FORMAT:(ASF OR CARD)_____
DATE IMPORTED INTO CADRE:____ CADRE IMPORT FILE NAME:_____
==========
DATE IMPORTED INTO CADRE:_____ NO. FORMS (RECORDS) IMPORTED:_____
IMPORT TIME:____ NO. ERRORS DETECTED:__ ERROR REPORT PRINTED:_
EXPLANATION OF MANUAL ENTRY REQUIRED:_____
_____
TIME REQUIRED FOR MANUAL ENTRY:_____
==========
__ SUMMARY TABLES GENERATED FILENAME(S): BNA (S)_____ (W)_____
VOA (S)_____ (W)_____
PEST (S)_____ (W)_____
__ FORMATTED __ CONVERTED TO WP __ FLOPPIED
__ BACKUP MADE BACKUP FILENAME(S): BNA (S)_____ (W)_____
VOA (S)_____ (W)_____
PEST (S)_____ (W)_____
==========
___ ALL WORKSHEETS GENERATED

__ SAMPLE LISTING __ ANALYTICAL SEQUENCE __ HOLDING TIMES
__ CALIBRATION REPORT __ CALIBRATION LISTING __ IPC __ % MOISTURE
__ QUANTITATION LIMIT __ BLANKS _____ SMC/SURROGATES __ MS/MSD
__ INTERNAL STANDARD __ MS/MSD NON-SPIKE TABLES __ SUMMARY TABLES

CADRE REPORT __ DISKETTE OF DATA SUMMARY TABLES ___ DATABASE FILES
INCLUDED: __ HARDCOPY REPORT __ HARDCOPY DATA SUMMARY TABLES

DATE CADRE REPORT AND DATA PACKAGE PREPARED FOR SHIPPING:_____
CADRE REPORT AND DATA PACKAGE SENT TO FIELD SAMPLING CONTRACTOR BY:_____
DATE CADRE REPORT AND DATA PACKAGE SENT TO FIELD SAMPLING CONTRACTOR:_____

ATTACHMENT VII

Memorandum for Qualifying Soil/Sediment Data with Low Percent Solid

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
Environmental Services Division
60 Westview Street, Lexington, MA 02173-3185

MEMORANDUM

DATE: March 29, 1990

SUBJ: Qualifying Soil/Sediment Data with low Percent Solids

FROM: Moira Lataille/CLP-TPO
Deborah Szaro/CLP-TPO

TO: Data Validators

The RAS Inorganic and Organic SOWs may be used to analyze water and soil/sediment samples. However, what constitutes a soil/sediment sample is not addressed in either of the SOWs or the current CLP User's guide.

To maintain consistency in the validation of soil/sediment data, Region I will adhere to the definition of soil sample used by the Office of Water Regulations and Standards Industrial Technology Division.

> Soil Samples--Soils, sediments and sludge samples containing more than 30% solids.(l)

Therefore, all soil data may be accepted when the percent solids are greater than 30%.

All positive results are to be approximated (J'd) when % solids are 10% or greater and less than or equal to 30%.

All positive results are to be rejected when % solids are less than 10%.

All non-detected results are to be rejected when % solids are less than or equal to 30%.

Summary

% Solids >30%
A = All results

% Solids $\leq$ 30% $\geq$ 10%
J = All positive results
R = All non-detects

% Solids < 10%
R = All results

Reference:

1. Method 1620: Metals by Inductively Coupled Plasma Atomic Emission Spectroscopy and Atomic Absorption Spectroscopy-Draft Sept 1989.