
US EPA Approval Signature

Date

Ms. Christine Clark
Regional Sample Control Center
U.S. EPA Region I
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March 29, 2002
Revised: May 17, 2002

RE: TO No. 9, Task No. 2, TDF No. 206F
Connecticut River Fish Tissue Study
Environmental Research Institute (ERI), UCONN
Inorganic Analyses

Mercury: 46/ Fish Tissue/ CT1-SMB-FC01 to -FC05, CT2-SMB-FC01 to -FC05,
CT3-SB-FI01 to -FI04, CT3-SMB-FC01 to -FC05, CT4-
SMB-FC01 to -FC05, CT5-SMB-FC01 to -FC05, CT6-
SMB-FC01 to -FC05, CT7-SMB-FC01 to -FC05, CT-BT-
FC01 to FC05, CT8-WS-FC01, CT8-WS-FC02

8/Aqueous Equipment Blanks/ Rinsate Blk (Phase I) (8/7/00), Rinsate Blk (Phase II)
(8/7/00), Phase I (Blank) (10/23/00), Phase II (Blank)
(10/23/00), Phase I Blank (11/1/00), Phase II Blank
(11/1/00), Rinsate Blk (Phase I) (11/20/00), Rinsate Blk
(Phase II) (11/20/00)

1/Tissue SRM/ DOLT-2, *Squalus acanthius* liver tissue obtained from the
National Research Council of Canada, Ottawa, Ontario,
Canada K1A 0R6

Dear Ms. Clark:

A modified Tier III data validation was performed on the inorganic analytical data for 46 tissue samples and 8 equipment blanks collected from the Connecticut River by the following state agencies: CTDEP, MADEP, NHDES with USFWS, and VTDEC for the NEIWPC and the U.S. EPA. The samples were analyzed according to EPA Method 245.6. The samples were validated according to EPA Method 245.6 and criteria in the Connecticut River Fish Tissue Study Quality Assurance Project Plan (QAPP), April 6, 2000; defaulting next to Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, December 1996 criteria, then to Region I Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses, February 1989 criteria, and finally to EPA Region I's Environmental Services Assistance Team Inorganic Data Validation SOP ESAT-01-0081 (1/31/01). The data were evaluated based on the following parameters:

- Overall Evaluation of Data and Potential Usability Issues
- Data Completeness (CSF Audit - Tier I)

*	●	Preservation and Technical Holding Times
	●	PE Samples/Accuracy Check
	●	Calibration Verification
	●	Laboratory and Field Blank Analysis
N/A	●	ICP Interference Check Sample Results
	●	Matrix Spike Recoveries/Laboratory Fortified Matrix
*	●	Laboratory and Field Duplicates
*	●	Laboratory Fortified Blank Results
N/A	●	Furnace Atomic Absorption Results
N/A	●	Serial Dilution Results
	●	Compound Quantitation and Reported Quantitation Limits
	●	System Performance

* - All criteria were met for this parameter.

N/A - Not Applicable

The following information was used to generate the Data Validation Memorandum attachments:

Table I: Recommendation Summary Table - summarizes validation recommendations

Table II: Overall Evaluation of Data - summarizes Site DQOs and potential usability issues

Data Summary Tables - summarize accepted, qualified, and rejected data

Overall Evaluation of Data and Potential Usability Issues

The following is a summary of the site DQOs:

- To perform a watershed-wide fish tissue monitoring program which will document current conditions with regard to contaminant concentrations of representative fish species from the mainstem of the Connecticut River. This information will enable states to revise human health risk assessments and will provide a basis for trend analysis when subsequent sampling is performed by monitoring teams.

A modified Tier III data validation was performed on the inorganic analytical data. Raw run data for the analyses were available for all samples with the exception of four rinse blanks. The four rinse blanks, sampled on 8/7/00 and 11/20/00, were not validated. Additionally, no laboratory benchsheets and logbook pages were available for validation.

A Standard Reference Material sample (DOLT-2, *Squalus acanthius* liver tissue) was obtained from the National Research Council of Canada, Ottawa, Ontario, Canada K1A 0R6. The laboratory analyzed this sample in duplicate and reported % recoveries for Mercury at 93.7% and 84.4%, respectively. These recoveries were within the established limits of 75 to 125%.

Data validation identified minor data quality problems which did not significantly impact the usability of the data. See discussion below for details. The reported results are usable for site

objectives.

Data Completeness

The following data or information in the data package had discrepancies and/or was missing:

1. For chain-of-custody #1-10957 and #1-10958, the station location is listed as CT-2 for the following samples: CT3-SB-FI01 to -FI04, and CT3-SB-OI01 to -OI04. The Field Sampler was asked to verify the station locations for these samples.
2. For chain-of-custody #1-10693, samples CT3-SMB-FC04 to -FC05, the Field Sampler was asked to verify the date sampled.
3. The RPD values reported on the Quality Control Summary Sheets for nearly all Laboratory Duplicates were incorrect. However, it is noted that the formula for the Laboratory Duplicate listed in Section 11.9 of the Quality Assurance Project Report is correct. The laboratory was asked to determine where the error occurred and submit corrected data sheets.
4. The data sheet for ERI sample numbers 0011038-001 to -006, has a sample receipt date of 11/20/00. The chain-of-custody indicates that samples were relinquished to FedEx on 11/20/00, 2pm. The laboratory was asked to verify sample receipt date.
5. The data sheet for ERI sample numbers 0007095-1 to -020 has the Date Samples Collected as 7/6-7/26/00. The correct collection date is 7/26/00 only. The laboratory was asked to submit a corrected data sheet.
6. The data sheet for ERI sample numbers 0007071-1 to -028 has the Date Samples Collected as 7/14-7/17/00. The correct collection date should also include 7/19/00. The laboratory was asked to submit a corrected data sheet.
7. Dilution factors and %Lipids were not reported for any samples. The laboratory was asked to submit this information or indicate where it can be found.
8. Although %recovery information was submitted for the standard reference material analysis results, true and observed concentrations were not reported. The laboratory was asked to provide true concentrations and observed concentrations for each of the SRM analyses.

Items 1 and 2 were requested from the sampler via the EPA Task Order Project Officer (TOPO) on July 19, 2001. Items 3 through 5 were requested from the laboratory via the TOPO on July 25, 2001. Items 6 through 8 were requested from the laboratory via the TOPO on February 1, 2002.

Items 1 and 2 were adequately addressed on 7/24/01 and 7/25/01, respectively. Items 3 through 6 were adequately addressed on 2/5/02. Item 7 was adequately addressed on 3/11/02. Item 8 was adequately addressed on 5/14/02.

PE Samples/Accuracy Check

A Standard Reference Material sample (DOLT-2, *Squalus acanthius* liver tissue) was obtained from the National Research Council of Canada, Ottawa, Ontario, Canada K1A 0R6. The sample was analyzed in duplicate on November 11, 2000. The laboratory reported % recoveries for Mercury at 93.7% and 84.4%, respectively. These values are within the established QC limits (75-125%) and are acceptable.

Calibration Verification

The laboratory calibration standards did not undergo digestion procedures prior to analysis as mentioned in the ERI QA report. Digestion is required for the calibration standards according to EPA method 245.6. However, the PE sample was digested and the results were within acceptable limits as mentioned above. Also, Laboratory Fortified Blank (LFB) and Laboratory Fortified Matrix (LFM) samples were digested and analyzed along with the field samples. These LFB and LFM samples were all within acceptable limits except for one LFM sample discussed on the next page. Therefore, no qualification is needed due to the non-digested calibration standards.

Laboratory and Field Blank Analysis

Blank contamination conditions and actions are as follows:

Sample Conc. > IDL and < Action Level	Sample Conc. > Action Level	Negative Blank Contamination, Blank Conc. >2x(IDL)	
Report Sample Conc. with a "U"	A	Report Sample Conc. < A.L. with a "J"	UJ (NDs)
		Use Professional Judgement	

All of the blanks associated with this sample group were checked for possible sources of contamination. The following table summarizes the highest concentration that was detected in any blank for each analyte, with the associated action levels and affected samples:

Laboratory Blanks

Analyte	Type of Blank	Blank Conc. mg/kg (wet wt)	Action Level mg/kg (wet wt)	Samples Affected
Mercury	LRB (11/1/00)	0.0107	0.054	CT-BT-FC01 to CT-BT-FC05

LRB - laboratory reagent blank

Blank actions are based on Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, December 1996 criteria and Region I Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses, February 1989 criteria. Blank action levels are calculated as 5 times the highest concentration of the contaminant determined in any blank. The positive sample results that are less than the blank action level are reported as non-detects (U) at the reported concentration on the Data Summary Table.

Matrix Spike/Laboratory Fortified Matrix

MS/LFM recovery conditions and actions are as follows:

Criteria %R:	<30%	30% - 65%	>135%
Positive Sample Results	J	J	J
Non-detected Results	R	UJ	A

For sample CT7-SMB-FC02, mercury did not meet the matrix spike recovery (%R) criteria of 65-135% as specified in the Connecticut River Fish Tissue Study Quality Assurance Project Plan (QAPP), April 6, 2000. The result, actions, and affected samples were as follows:

CT7-SMB-FC02						
Analyte	Spike Sample Result ug/L	Sample Result ug/L	Recovery %	Action		Samples Affected
				Positive Detects	NDs	
Mercury	10.87 (*)	7.79 (0.68 mg/kg wet wt)	61.5	J	UJ	CT7-SMB-FC01 to CT7-SMB-FC05

* The spike sample result could not be reported in mg/kg, wet weight since the amount of sample used was not available.

Professional judgement was used to qualify only the associated samples as listed above. The positive mercury results for samples CT7-SMB-FC01 to CT7-SMB-FC05 were estimated (J).

Compound Quantitation and Reported Quantitation Limits

The results were reported on a dry weight basis by the laboratory. Since the laboratory provided % solids data, the data validator recalculated the results on a wet weight basis on the Data Summary Table.

System Performance

No trends were noted with the Mercury analysis.

The laboratory performed additional Quality Control measures, post digestion spike samples and post digestion dilution samples, with each sample batch which were not required by the method or the QAPP. All these results for the QC measures were within laboratory control limits.

Very truly yours,

LOCKHEED MARTIN
ENVIRONMENTAL

Leslie Chan
Scientist

Louis Macri
Team Manager

Attachments: Table I: Recommendation Summary Table
Table II: Overall Evaluation of Data
Data Summary Table
Data Validation Worksheets
Support Documentation
Analytical Method
Communications/Phone Logs
Field Sampling Notes
Workplan and QAPP

Connecticut River Fish Tissue Study

TABLE I: RECOMMENDATION SUMMARY TABLE
Tissue Samples

Element	Qualifier
Mercury	J ^{1,2}

- J¹ - The detection limit was raised (U) to the reported sample concentrations for mercury in samples CT-BT-FC01 to CT-BT-FC05 due to blank contamination.
- J² - The mercury result for samples CT7-SMB-FC01 to CT7-SMB-FC05 was estimated (J) due to MS/LFM recovery exceeding criteria.

Overall Evaluation of Data - Data Validation Memorandum - Table II

INORGANICS					
DQO (list all DQOs)	Sampling* and/or Analytical Method Appropriate Yes or No	Measurement Error		Sampling Variability	Potential Usability Issues
		Analytical Error	Sampling Error		
To perform a watershed-wide fish tissue monitoring program which will document current conditions with regard to contaminant concentrations of representative fish species from the mainstem of the Connecticut River. This information will enable states to revise human health risk assessments and will provide a basis for trend analysis when subsequent sampling is performed by monitoring teams.	Yes, Sampling Method appropriate for all samples. Yes, Analytical Method appropriate for all samples.	Refer to qualification in R/S Key on Table I. J ^{1,2}	Refer to qualification in R/S Key on Table I. None	**	A Standard Reference Material sample (DOLT-2, <i>Squalus acanthius</i> liver tissue) was obtained from the National Research Council of Canada, Ottawa, Ontario, Canada K1A 0R6. The laboratory analyzed this sample in duplicate and reported % recoveries for Mercury at 93.7% and 84.4%, respectively. These recoveries were within the established limits of 75 to 125%. Data validation identified minor data quality problems which did not significantly impact the usability of the data. The reported results are usable for site objectives.

* The evaluation of "sampling error" cannot be completely assessed in the data validation.

** Sampling variability is not assessed in data validation.

Validator: _____

Date: _____