Berkeley Global Campus at Richmond Bay
Soil Management Plan
Project Approval Checklist
University of California

SMP FORM A: PROJECT OVERVIEW			
1. Tracking No, Revision No. and Date:	**SMP Project 20160324-B163PHYTOREM** *If after 6 months the project has not proceeded to the next step, the information on this form must be reviewed and updated as necessary*		
2. Project Name:	Phytoremediation Research Project		
3. Description:	Attach figure identifying project location		
4. Points of Contact:	Name: Karl Hans		Position: Senior Env Scientist, EH&S
	Email: khans@berkeley.edu		Phone: (510) 643-9574
5. Estimated Schedule:			
6. DTSC Work Notice Requirements	Yes ☐	No ☒	If Yes, notify DTSC 14 days prior to activity
7. Impacts to Piezometer Network	Yes ☐	No ☒	Piezometer ID: If Yes, notify DTSC
8. Affected Area Overlaps with NOS?	Yes ☐	No ☒	If Yes, implement mitigation measures per LRDP Environmental Impact Report
9. Radiological Status Have radioactive materials been used within the project area?	Yes ☐	No ☒	
If yes, have buildings within the project area been properly decontaminated, decommissioned, and cleared by CDPH?	Yes ☐	No ☐	If No, contact CDPH; do not investigate project area until it is cleared by CDPH
10. Total Volume of Soil Excavation Planned and New Hardscape	Soil will be tilled but not removed. No hardscape will be placed or remain at the site. Calculations/Assumptions: Length x width x depth 45 Y X 4Y X 0.33Y = 60 cubic yards.		
11. *De Minimis* Status	Project exempt from SMP prescriptive requirements based on volume (< 10 CY or 500 square feet of hardscape)? Yes ☐ No ☒		
12. Notes:	A SMP sample was collected on September 8, 2015 in anticipation of the project prior to project scheduling. Sample results will be included with SMP Form B.		
13. SMP Form A Approval a. Greg Haet, Project Coordinator, EH&S	03/24/2016 (Signature, Date)		
b. Scott Shackleton, Facilities Management, UCB, College of Engineering	Scott Shackleton 3/28/16 (Signature, Date)		
c. Professional Civil Engineer or Geologist	(Name, Signature, Date, Stamp)		

SMP FORM B: SAMPLING, DATA EVALUATION, SOIL MANAGEMENT ACTION

Project Name: B163 Phytoremediation Research Project

Tracking Number: SMP Project 20160324-B163PHYTO Revision Number: NA

SMP Form B Initiation Date: 03/24/16

EH&S Point of Contact: Karl Hans

If this form has not been approved or no activities have occurred for 1 year, the information contained herein must be reviewed and updated as necessary prior to work occurring in the project area.

1. Sampling Design (attach Sampling Strategy Memorandum)			
a. SMP Areas Affected	4		*Ref: SMP Figure 6*
b. Sampling Density and Planned Number of Sample Locations	High (75 foot grid spacing); 1 sample location		
c. Chemicals of Concern and Summary of Existing Data	As, Hg, Pb, PCBs, PAHs, VOCs; no existing data is available		*Ref: SMP Tables 1 and 2, and 2015 GW sampling data*
d. Sampling Depths and Intervals			*Ref: SMP Section 4.1*
e. Project is within area of GW above screening criteria	Yes ☐ If Yes, consult RAW, notify DTSC	No ☒	*Ref: SMP Table C-2*
f. Sampling design meets all SMP prescriptive requirements	Yes ☐ If No, DTSC concurrence received? Yes ☒	No ☒ No ☐	Sampling not proposed 2.5 feet below project. VOCs not proposed as COC due to shallow sampling interval
2. Data Evaluation (Post-Sampling) (attach Data Summary Report)			
a. Sampling Design Implemented	Yes ☒ Include description	No ☐	
b. Sample Results Meet Category I	Yes ☐ If Yes, submit summary report with SMP Form B. If sample results indicate unanticipated contamination or discovery, notify DTSC	No ☒	*Consult SMP Table 3*
c. Soil Exceeding Category I is Defined Vertically and Laterally	Yes ☐ If No, consult sampling requirements or defer to excavation confirmation sampling	No ☐	NA ☒
d. Soil Meets Category II Criteria	Yes ☒ Soil proposed for on-site management requires plan. Soil above Category II criteria requires excavation plan	No ☐	NA ☐
3. Soil Management Action (attach On-Site Management or Soil Excavation Plan)			
a. On-Site Management Plan Meets SMP Requirements	Yes ☐ If No, provide explanation or contact DTSC: This is a two year phytoremediation research project which will result in removal of some contaminants . Follow-up sampling will be required in the area before final soils management options can be developed. The area contains pyrite cinders which will likely be managed according to the Pyrite Cinder Management Plan.	No ☒	*Consult SMP Section 4.3*
b. Excavation Plan Meets SMP Requirements	Yes ☐ If No, provide explanation or contact DTSC:	No ☐	*Consult SMP Section 4.3*
4. SMP Form B Approval a. Greg Haet, Project Coordinator, EH&S	(Signature, Date) 03/24/2016		
b. Scott Shackleton, Facilities Management, UCB, College of Engineering	(Signature, Date) 3/28/2016		
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5. References Used to Complete Form	Remediating arsenic contamination in pyrite cinder soil using an arsenic-hyperaccumulating fern: field studies March 9, 2015 Matzen, Olson, Pallud Sampling Results – Curtis and Tompkins Analytical Report 269651, 9/23/15 attached

Berkeley Global Campus at Richmond Bay
Soil Management Plan
Project Approval Checklist
University of California

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b. Scott Shackleton, Facilities Management, UCB, College of Engineering	(Signature, Date)		
c. Professional Civil Engineer or Geologist	Jason Brodersen (Name, Signature, Date, Stamp)		REGISTERED GEOLOGIST JASON D. BRODERSEN No. 6202 3/24/2016 STATE OF CALIFORNIA

SMP FORM B: SAMPLING, DATA EVALUATION, SOIL MANAGEMENT ACTION

Project Name: B163 Phytoremediation Research Project

Tracking Number: SMP Project 20160324-B163PHYTO Revision Number: NA

SMP Form B Initiation Date: 03/24/16

EH&S Point of Contact: Karl Hans

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f. Sampling design meets all SMP prescriptive requirements	Yes ☐ If No, DTSC concurrence received? Yes ☒	No ☒ No ☐	Sampling not proposed 2.5 feet below project. VOCs not proposed as COC due to shallow sampling interval.
2. Data Evaluation (Post-Sampling) (attach Data Summary Report)			
a. Sampling Design Implemented	Yes ☒ Include description	No ☐	
b. Sample Results Meet Category I	Yes ☐ If Yes, submit summary report with SMP Form B If sample results indicate unanticipated contamination or discovery, notify DTSC	No ☒	*Consult SMP Table 3*
c. Soil Exceeding Category I is Defined Vertically and Laterally	Yes ☐ If No, consult sampling requirements or defer to excavation confirmation sampling	No ☐	NA ☒
d. Soil Meets Category II Criteria	Yes ☒ Soil proposed for on-site management requires plan Soil above Category II criteria requires excavation plan	No ☐	NA ☐
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4. SMP Form B Approval a. Greg Haet, Project Coordinator, EH&S	3/24/2016 (Signature, Date)		
b. Scott Shackleton, Facilities Management, UCB, College of Engineering	(Signature, Date)		
c. Professional Civil Engineer or Geologist	JASON BRODERSEN (Name, Signature, Date, Stamp)		REGISTERED GEOLOGIST JASON D. BRODERSEN No. 6292 3/25/2016 STATE OF CALIFORNIA

Remediating arsenic contamination in pyrite cinder soil using an arsenic-hyperaccumulating fern: field studies

Work Plan

Sarick Matzen, Anders Olson, Céline Pallud

Environmental Sciences, Policy, and Management Department
UC Berkeley

Composed 2/7/16
Revised 3/9/2016

Work Plan Contents:

Project summary:

This project is a field experiment investigating the use of green plants to remediate soil contaminated with arsenic, or arsenic phytoremediation. We work with hyperaccumulating plants, which can accumulate over 1000 mg/kg of a trace element (i.e., arsenic) in their aboveground biomass. The biomass is then harvested to remove the trace element from the soil.

The goal of this project is to determine the effects of lead (Pb), zinc (Zn) and copper (Cu) on arsenic (As) uptake and accumulation in the brake fern (*Pteris vittata* L.), a known arsenic hyperaccumulator (1). The project will consist of a field experiment, where ferns are planted in soil contaminated with pyrite cinders (containing As, Pb, Zn, and Cu) behind Building 163 (east side) at the Richmond Field Station/Berkeley Global Campus.

Work will include preparing an experimental plot approximately 150 m^2 (1560 ft^2) (40.95 m × 3.65 m / ~126' × 12') for fern planting. The site preparation will include tilling the soil, erecting a hoop house ~ 2 m (6.5') tall over the site (Figures 1, 2, and 4), and installing drip irrigation. Approximately 1000 ferns will be planted in 24 test plots after site preparation. The experiment will run from Spring 2016 through Fall 2017. The site will be completely dismantled and soil covered at the end of the experiment.

(1) Ma et al., 2001. A fern that hyperaccumulates arsenic. *Nature* 409: 579.

Project location:

In this work plan, the "site" refers to the east side of Building 163, Richmond Field Station/Berkeley Global Campus.

Work timeline:

Action		Timeframe							
	Jan-Mar 2016	Apr-Jun 2016	Jul-Sep 2016	Oct-Dec 2016	Jan-Mar 2017	Apr-Jun 2017	Jul-Sep 2017	Oct-Dec 2017	Jan-Mar 2018
Site prep and hoop house construction (upon approval of work plan)	■	■							
Fern planting		■							
Harvest 1 and bulk soil sampling 1				■					
Frond harvest 2 and bulk soil sampling 2								■	
Study conclusion and site clean-up									■

Work Outline:

Experiment set-up:

1) **Safety plan:**
    a. **Standard Operating Procedure:** Before work begins, a Standard Operating Procedure (SOP) will be developed for working with contaminated soil and plant tissue at the site. All workers will be trained on and will sign the SOP. SOP will be developed in collaboration with the campus Office of Environment, Health & Safety.
    b. **Personal Protective Equipment:** All workers will wear appropriate PPE including jumpsuits, site-specific boots/shoe covers, gloves, and respirators and safety glasses when required. Workers will wash hands before leaving facility.
    c. **Clean area:** A "clean area" free of contaminated materials will be designated for work breaks and storage of personal items while working at site. Food and drink will be consumed only in the clean area and not in other areas of the site.
    d. **Restroom access:** While working, project personnel will have access to the restroom in Building 185 or 163.
2) **Environmental contaminant reduction:**
    a. **Runoff reduction:** To prevent water from draining off roof of Building 163 onto test site, gutters and drainpipe (purchased by Pallud Lab) will be installed by RFS staff on Building 163 E side. If necessary, straw wattles will be installed to prevent runoff off-site.
    b. **Dust/Erosion reduction:** Soil will be worked while moist to reduce generation of dust. Soil will be covered (by plastic sheeting, weed cloth, and/or mulch) during work at site to prevent runoff/erosion of contaminated soil.
3) **Site prep:**
    a. **Tillage:** Site will be tilled with a hand-operated rototiller, with the goal of homogenizing site soil and pyrite cinders and leveling site surface before setting up test plots. Soil/cinders will be tilled while slightly moist, to minimize dust dispersal from site. Tillage will mix soil to a depth of 30 cm.
    b. **Weed control:** All existing plants will be removed prior to planting *P. vittata*. Weed removal will occur in conjunction with tillage. Before initial tillage, site will be weeded (with hand tools). Weed seeds brought to surface during tilling will be encouraged to germinate by covering site with clear plastic for 1-2 weeks. Newly germinated weeds will then be removed with hand tools. This process will be repeated as time allows during site preparation stage. Pulled weeds will be composted in an on-site compost pile.
4) **Hoop house installation:**
    a. **Location:** Two hoop houses (each 19.2 m (63 ft) × 3.65 m (12 ft)) will be constructed between B163 and the fence on the east side of the RFS property (Figure 1). Access to the east door of B163 will be maintained.
    b. **Framing base:** Hoop house base will consist of a level 2 × 6 treated wood frame 19.2 m (63 ft) long by 3.65 m (12 ft) wide (Figure 2).
    c. **Anchor stakes:** Hollow stakes (1 5/8" OD) will be sunk 0.6 m (2 ft) into soil every 3.65 m along long sides of hoop house frame. Stakes will extend 15 cm (6") above soil surface, and hoop ends (15 cm/6") will be inserted into stakes. Stakes will be screwed to frame.
    d. **Soil coverage during construction:** After foundation and stakes are installed, soil will be covered with weed cloth inside the hoop houses, and wood chip mulch outside the hoop houses.
    e. **Hoops:** Hoops will be constructed out of 1 3/8" OD 17 gauge galvanized pipe (chain link fence top rail). Hoop will be bent out of 2 lengths (10'6") of pipe to form an arch with a

radius approximately 2 m (6.5'). Hoops are bent on a flat 4' × 8' surface. The two lengths will be screwed together at apex. Hoops will be placed every 1.5 m (4.9'). Hoop ends will be inserted into stakes (Figure 4a).

f. **Perlin:** A perlin constructed out of 1 3/8" pipe will run the length of the hoop house at hoop apex, attached to hoops with hose clamps (Figure 4).
g. **Diagonal end supports:** Cable supports will pull end hoops towards center of hoop house (Figure 4).
h. **Guy wires:** The south end of the South Hoop House will receive the brunt of high velocity winds coming through the Golden Gate. To help the south end withstand the force, guy wires will extend from end of the South Hoop House to stakes ~ 3 m (10') in front of hoop house.
i. **End framing:** Hoop house ends will be framed out with 2 × 4s to allow for door installation (Figure 4).
j. **Plastic:** Hoops houses will be covered in 6 mil UV resistant commercial grade greenhouse plastic (AT Dura-film Super 4). Ends will be covered in the same plastic. Plastic will be attached with lathe on ends hoops and end framing.
k. **Shade cloth:** Hoop houses will also be covered in 60 % shade cloth to create conditions conducive to fern growth.

5) Test plots:

a. **Dimensions:** 24 test plots (1.5 m × 2.7 m) will be staked out, 12 plots per hoop house (Figure 2). Each test plot will hold 45 ferns in a 5 × 9 fern grid, with ferns at 30 cm spacing (Figure 3). Holes in weed cloth will be cut at correct spacing using a jig constructed out of ¼" plywood.
b. **Paths:** To allow for access to plots, plots will be separated by a 0.45 m path running down middle of hoop house, with 0.3 m lateral paths separating each plot.
c. **Signage:** Plots will be permanently staked with wooden stakes and labeled.
d. **Initial/T0 soil sampling:** Initial soil samples will be taken using the multi-increment sampling method, one T0 sample per plot. Samples will be taken at 2 depths (0-15cm, 15-30 cm).

6) Irrigation:

a. **Water access:** Water will be accessed for irrigation from hose bib on SE corner of B163.
b. **Drip irrigation installation:** Drip tape with 12"OC emitters (TA1512L/Low Flow/13 GPH/$269.95) will be used, with emitters aligned with fern crowns (1 row of drip tape per row of ferns/ 1260' total). After plots are staked, drip tape will be installed. Headers will be located at south end of each hoop house. A 4-valve timer will be installed at south end of South Hoop House.
c. **Irrigation frequency:** Ferns will be watered as needed after transplanting. Once ferns are established, ferns will be watered up to 3times per week during summer, with water reduced to no water during winter. Ferns will be watered as necessary, but not overwatered to avoid wasting water during the drought.

7) **Fern planting:** Ferns will be planted in holes cut in weed cloth. To avoid cutting drip tape, tape will be moved out of the way during fern planting, and replaced immediately after planting to begin watering.

8) Equipment storage:

a. Storage room: A room in B185 or B163 (as available) will be converted to storage for site tools and equipment for the duration of the project.

In-progress experiment work:

1. **Regular maintenance:** Site will be maintained during weekly visits by Sarick Matzen (graduate student), Anders Olson (project manager), and undergraduate interns. Weekly work will include weeding, sampling, etc.

2. **Plot treatment application:** Test plots will be treated with fertilizers (compost, organic nitrogen, inorganic nitrogen, organic phosphorus, inorganic phosphorus) or mycorrhizal fungi in March and July.
3. **Fern frond harvest:** Fern fronds will be harvested in Fall 2016 and Fall 2017. Representative samples will be taken in conjunction with harvest. Harvested fronds will be dried in B110 (or other facility as determined by the campus Office of Environment, Health & Safety) and disposed of as hazardous waste according to EH&S protocol. Fern samples will be taken to the Pallud Lab on the UC Berkeley campus for analysis.
4. **Soil sampling:** Bulk soil will be sampled post harvest in Fall 2016 and Fall 2017 at 2 depths (0-15 cm, 15-30 cm). Soil samples will be taken to the Pallud Lab on the UC Berkeley campus for analysis.
5. **Site characterization:** Additional samples will be taken to characterize the site soils, as required.

Experiment conclusion/site clean-up:

1. **Fern removal:** At the conclusion of the experiment (Winter 2017), ferns (including rhizomes and fronds) will be removed and disposed of as hazardous waste.
2. **Dismantling infrastructure:** Hoop house and irrigation materials will be dismantled and removed from site. Weed cloth will be disposed of.
3. **Covering soil:** Soil will be covered in mulch at the conclusion of the experiment, or with another suitable treatment as determined by RFS staff.

Figure 1. Site Plan

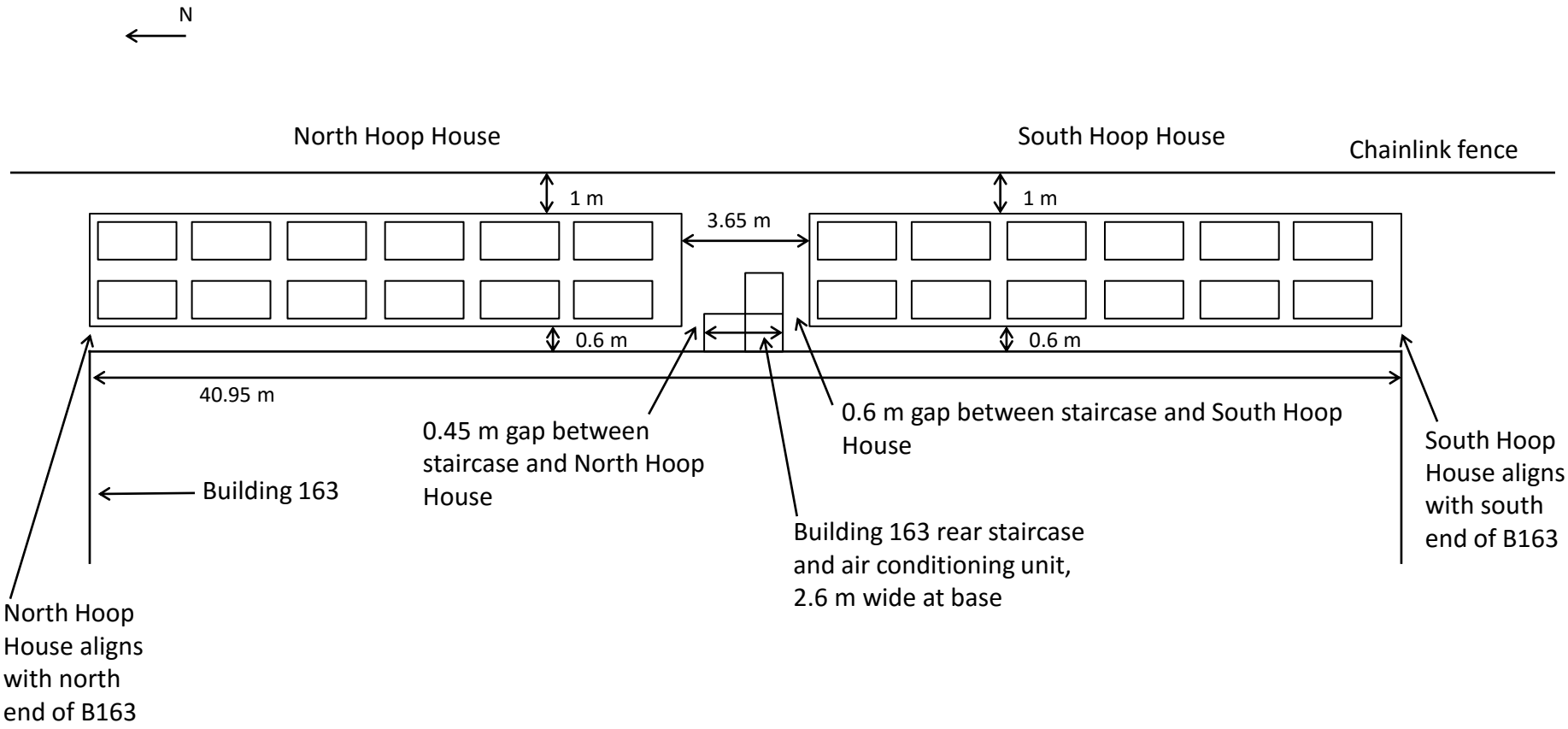


Figure 2. Hoop house floor plan (2 hoop houses total)

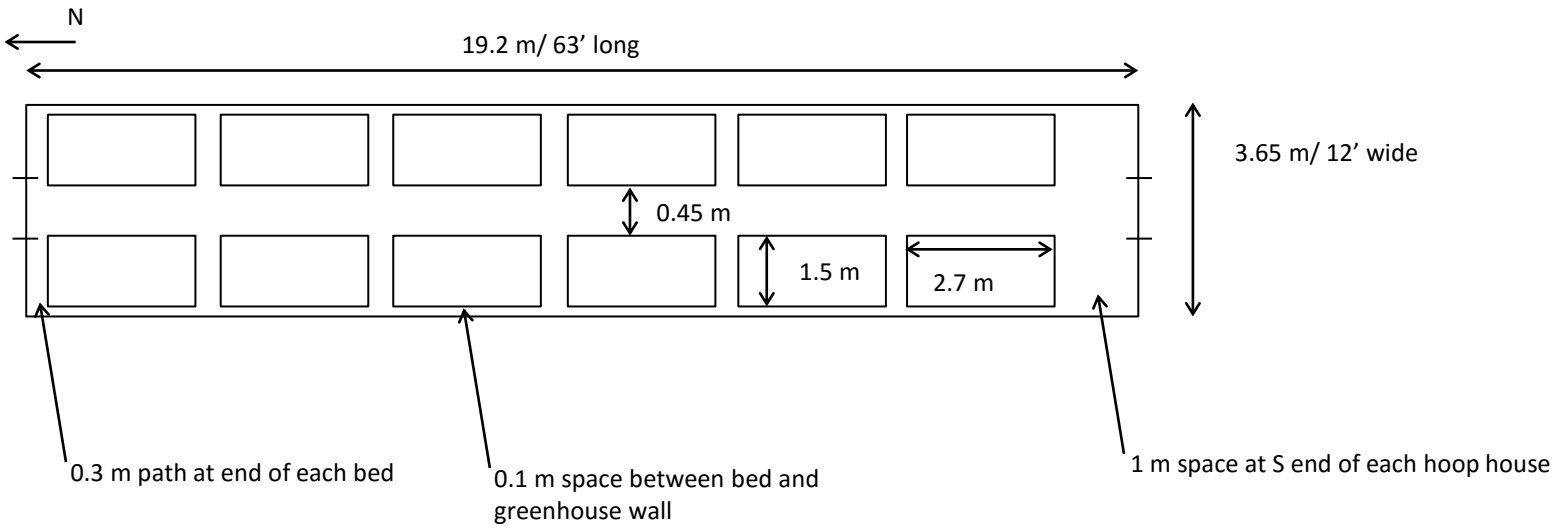


Figure 3. Individual fern plot plan (24 plots total, in 2 hoophouses)

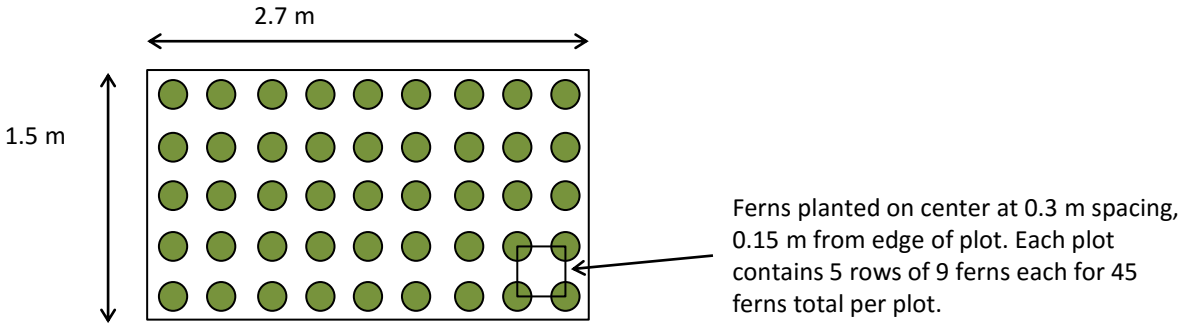


Figure 4. Hoop House structure

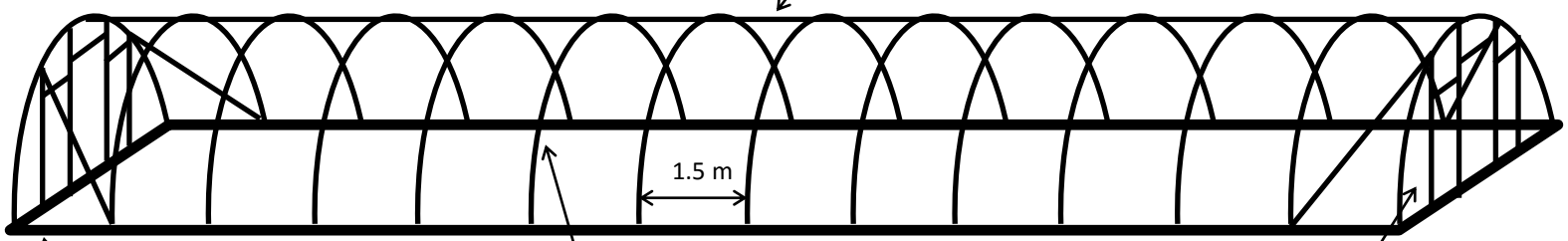
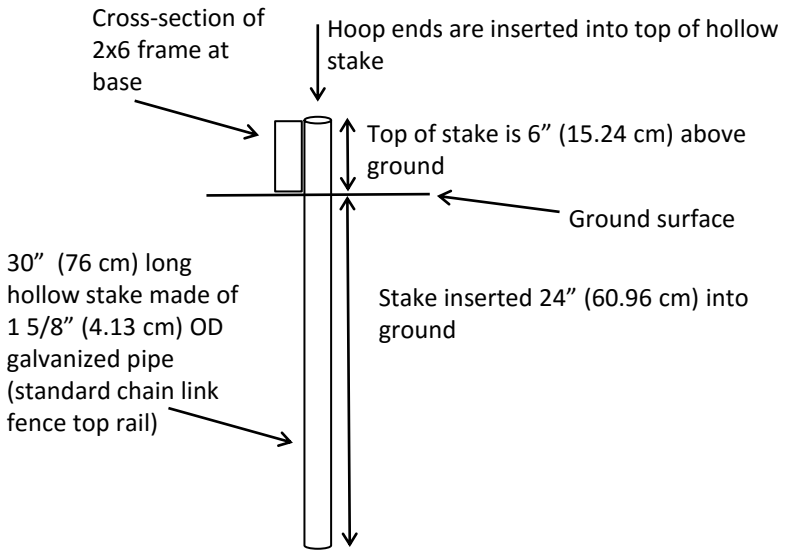


Figure 4a. Anchor stake detail



Berkeley Global Campus at Richmond Bay
Richmond Field Station Site (RFS)
Soils Management Plan Sampling Report
B163 in Support of Pyrite Cinder Phytoremediation Research Project
UC Berkeley EH&S April 1, 2016

Introduction

In April 2015 UC Berkeley researchers from the Pallud laboratory (College of Natural Resources, Environmental Sciences, Policy, and Management Department) requested access to an area of the RFS to conduct a research field study on hyper-accumulation of arsenic in ferns from pyrite cinders buried in the soil (see attached *Work Plan, Remediating arsenic contamination in pyrite cinder soil using an arsenic-hyperaccumulating fern: field sutides,* Matzen, et.al, March 9, 2016). The optimal location was determined to be the east side of B163 due to the extent of pyrite cinders in soil in this area, access to utilities needed to conduct the work, and other factors.

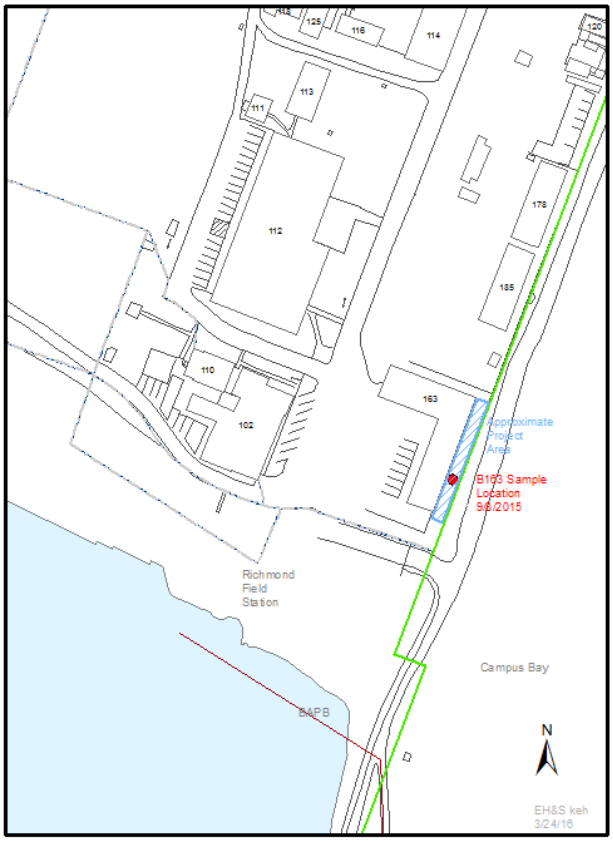
In anticipation of the field activities the campus Office of Environment, Health & Safety (EH&S) reviewed the Soils Management Plan, Removal Action Workplan, Attachment C (SMP), dated July 8, 2014 for applicability. Because the field study will involve soil disturbance of more than 10 cubic yards of soil, implementation of SMP tasks is required, including completion of SMP Forms and soil sampling. This report describes the soil sampling completed as required by the SMP.

Soil Sampling B163 East

Building 163 is located in the southeast corner of the RFS uplands just inside of Gate 4. This area is located in SMP Area 4 (SMP Figure C-5) which is designated as a High Density Sampling Area requiring a minimum of one sample per 75 foot grid spacing, or 5,625 square feet. The project area is estimated to be approximately 1,500 square feet. Therefore one sample was required by the SMP.

On September 8, 2015 a soil sample was collected from between ground surface and one foot below ground surface using a clean disposable scoop. Two four-ounce glass jars were collected and transported the same day to Curtis and Tompkins Laboratory in Berkeley for chemical analyses.

The approximate sampling location is shown on the following figure. The sample was collected from within the planned phytoremediation area. The sample was a mix of soil and pyrite cinders.



Sampling Analytical Results

SMP Sampling Areas and Recommended Analytes (SMP Figure C-6) recommends analysis for arsenic, mercury, lead, PCBs, PAHs, and VOCs in SMP Area 4. Because the soil disturbance will be in the top 1 foot layer, VOCs were excluded from the analyses because they would not be expected to be detected due to volatilization. Therefore, the soil samples were submitted to be analyzed for arsenic, lead, mercury, polychlorinated biphenyls (PCB), and polycyclic aromatic hydrocarbns (PAH) using the methods listed below.

- Arsenic, lead, and mercury analysis by EPA 6020A/7471A
- PCB analysis by EPA 8082A
- PAH analysis by EPA 8270 SIM

Summary tables for the analyses and the full C&T report (C&T 269651) are attached. Note, that it was expected that arsenic and lead would be detected above background due to the presence of pyrite cinder in the samples.

Attachments:
Remediating arsenic contamination in pyrite cinder soil using an arsenic-hyperaccumulating fern: field sutides, Work Plan, Matzen, et.al, March 9, 2016

Richmond Field Station, September 8, 2015, B163 Soil Sampling Analyses Summary

Curtis and Tompkins Report C&T 269651

Richmond Field Station, September 8, 2015, B163 Soil Sampling Analyses Summary

TABLE 1.
METALS SOIL SAMPLING RESULTS

	Metals (mg/kg)		
Screening Criteria (mg/kg unless otherwise noted)	**Arsenic**	**Lead**	**Mercury**
Commercial worker	*0.224*	*320*	*275*
Construction worker	*1.58*	*320*	*77.0*
Maintenance worker	*1.58*	*320*	*1,920*
Off-Site Receptors	*745*	*--*	*412,000*
Other	*16*[(1)]	*43*[(2)]	*0.42*
Category I Criteria	*16*	*320*	*77.0*
Category II Criteria	*16*	*800*	*275*
Disposal Criteria			
TTLC	*500*	*1,000*	*20*
TCLP (mg/L)[(3)]	*5*	*5*	*0.2*
STLC (mg/L)[(4)]	*5*	*5*	*0.2*
Sample Location			
20150908B163PHYTO	**110**	140	2.9

Notes:
Bold values indicate that the result exceeds the Category I criterion.
Screening criteria are based on Table C-1 of the Final Soil Management Plan, Attachment C of the Removal Action Plan, July 18, 2014.

1 Arsenic background concentration for RFS (Tetra Tech 2014).
2 Concentration based on 99th percentile of LBNL background dataset (Diamond and others 2009).
3 Soil sample results should be compared to 20 times the TCLP value for purposes of waste characterization.
4 Soil sample results should be compared to 10 times the STLC value for purposes of waste characterization.

-- Not applicable
mg/kg Milligrams per kilogram
NA Not available
J Estimated value
LBNL Lawrence Berkeley National Laboratory
RCRA Resource Conservation and Recovery Act
STLC Soluble Threshold Limit Concentration
TCLP Toxicity characteristic leaching procedure
TTLC Total Threshold Limits Concentration

References:
Diamond, D., David Baskin, Dennis Brown, Loren Lund, Julie Najita, and Iraj Javandel. 2009. "Analysis of Background Distributions of Metals in the Soil at Lawrence Berkeley National Laboratory." Lawrence Berkeley National Laboratory Environmental Restoration Program. Originally published June 2002; revised in April 2009.
Tetra Tech, Inc. 2014. Final Remedial Action Workplan. Research, Education, and Support Area and Groundwater within the Former Richmond Field Station Site, Richmond Bay Campus, Richmond, California. July 18.

TABLE 2.
PCB SOIL SAMPLING RESULTS

Screening Criteria (mg/kg unless otherwise noted)	**PCBs (mg/kg)**					
	Aroclor-1016	**Aroclor-1221**	**Aroclor-1232**	**Aroclor-1242**	**Aroclor-1248**	**Aroclor-1254**
Commercial worker	*NA*	*NA*	*NA*	*0.528*	*0.528*	*0.528*
Construction worker	*NA*	*NA*	*NA*	*3.50*	*3.50*	*2.02*
Maintenance worker	*NA*	*NA*	*NA*	*3.50*	*3.50*	*3.50*
Off-Site Receptor	*NA*	*NA*	*NA*	*5,620*	*5,620*	*5,620*
Other	*1*[(1)]	*1*[(1)]	*1*[(1)]	*1*[(1)]	*1*[(1)]	*1*[(1)]
Category I Criteria	*1*	*1*	*1*	*1*	*1*	*1*
Category II Criteria	*1*	*1*	*1*	*1*	*1*	*1*
Disposal Criteria						
TTLC	*50*	*50*	*50*	*50*	*50*	*50*
TCLP (mg/L)[(3)]	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
STLC (mg/L)[(4)]	*5*	*5*	*5*	*5*	*5*	*5*
Sample Location						
20150908B163PHYTO	0.011 U	0.021 U	0.011 U	0.011 U	0.011 U	0.011 U

Notes:
Bold values indicate that the result exceeds the Category I criterion.
Screening criteria based on the Final Soil Management Plan, Table C-1, July 18, 2014.

1 Toxic Substances Control Act (TSCA) criteria for high occupancy areas with no cap (EPA 2005).
2 San Francisco Bay Regional Water Quality Control Board (RWQCB) Direct Exposure Soil Screening Levels for Commercial/Industrial Worker Exposure Scenario (Table K-2) (RWQCB 2013).
3 Soil sample results should be compared to 20 times the TCLP value for purposes of waste characterization.
4 Soil sample results should be compared to 10 times the STLC value for purposes of waste characterization.

-- Not applicable
mg/kg Milligrams per kilogram
NA Not available
J Estimated value
STLC Soluble Threshold Limit Concentration
TCLP Toxicity characteristic leaching procedure
TTLC Total Threshold Limits Concentration
U Not detected
Y Sample exhibits chromatographic pattern which does not resemble strata

References:
RWQCB. 2013. "February 2013 Update to Environmental Screening Levels." February. Available on-line at: http://www.waterboards.ca.gov/rwqcb2/water_issues/programs/esl.shtml.
EPA. 2005. Polychlorinated Biphenyl (PCB) Site Revitalization Guidance Under the Toxic Substances Control Act. November. Available on-line at: http://www.epa.gov/osw/hazard/tsd/pcbs/pubs/pcb-guid3-06.pdf

TABLE 3.
SVOC and PAH SOIL SAMPLING RESULTS

SVOCs (mg/kg)																				
Screening Criteria (mg/kg unless otherwise noted)	**1-Methylnaphthalene**	**2-Methylnaphthalene**	**4-Methylphenol**	**Acenaphthene**	**Acenaphthylene**	**Anthracene**	**Benzo(a)anthracene**	**Benzo(a)pyrene**	**Benzo(b)fluoranthene**	**Benzo(g,h,i)perylene**	**Benzo(k)fluoranthene**	**bis(2-Ethylhexyl)phthalate**	**Chrysene**	**Dibenz(a,h)anthracene**	**di-n-Butylphthalate**	**Fluoranthene**	**Fluorene**	**Indeno(1,2,3-cd)pyrene**	**Naphthalene**	**Phenanthrene**	**Pyrene**
Commercial worker	*36.4*	*1,510*	*47,800*	*22,600*	*22,600*	*100,000*	*0.880*	*0.145*	*0.88*	*11,300*	*0.880*	*95.5*	*8.80*	*0.145*	*47,800*	*15,100*	*15,100*	*0.880*	*18.0*	*15,100*	*11,300*
Construction worker	*243*	*403*	*13,000*	*6,050*	*6,050*	*30,200*	*5.87*	*0.963*	*5.87*	*3,020*	*5.87*	*647*	*58.7*	*0.963*	*13,000*	*4,030*	*4,030*	*5.87*	*450*	*4,030*	*3,020*
Maintenance worker	*243*	*10,100*	*100,000*	*100,000*	*100,000*	*100,000*	*5.87*	*0.963*	*5.87*	*75,600*	*5.87*	*647*	*58.7*	*0.963*	*100,000*	*100,000*	*100,000*	*5.87*	*450*	*100,000*	*75,600*
Off-Site Receptors	*--*	*--*	*823,000,000*	*--*	*--*	*--*	*11,500*	*1,150*	*11,500*	*--*	*11,500*	*1,330,000*	*115,000*	*2,670*	*--*	*--*	*--*	*11,500*	*3.57*	*--*	*--*
Other	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*
Category I Criteria	*36.4*	*403*	*13,000*	*6,050*	*6,050*	*30,200*	*0.880*	*0.145*	*0.880*	*3,020*	*0.880*	*95.5*	*8.80*	*0.145*	*13,000*	*4,030*	*4,030*	*0.880*	*3.57*	*4,030*	*3020*
Category II Criteria	*364*	*4,030*	*100,000*	*60,500*	*60,500*	*100,000*	*8.80*	*1.45*	*8.80*	*30,200*	*8.80*	*955*	*88.0*	*1.45*	*100,000*	*40,300*	*40,300*	*8.80*	*35.7*	*40,300*	*30200*
Sample Location																					
20150908B163PHYTO	0.19 U	0.19 U	NA	0.19 U	0.22	0.27	**0.93**	**0.84**	0.48	0.45	0.48	NA	1.4	**0.17 J**	NA	2.4	NA	0.40	0.19 U	1.4	2.2

Notes:
Only chemicals that were detected or have screening criteria are listed.
Bold values indicate that the result exceeds the Category I criterion.
Screening criteria based on the Final Soil Management Plan, Table C-1, July 18, 2014.

--	Not applicable
mg/kg	Milligrams per kilogram
NA	Not available
J	Estimated value
U	Not detected

TABLE 4.
BAP EQUIVALENCY QUOTIENT CALCULATIONS

BAP (EQ) (mg/kg)				
Screening Criteria (mg/kg)				**BAP (EQ)**
Commercial worker				*0.145*
Maintenance worker				*0.963*
Off-Site Receptors				*1,150*
Ambient (1)				*0.4*
Category I Criteria				*0.4*
Category II Criteria				*1.45*
	PEF (unitless) (2)	**20150908B163PHYTO**	**Benzo(a)pyrene Equivalent (3)**	**Total BAP (EQ)**
Benzo(a)pyrene	1	0.84	0.84	--
Benzo(a)anthracene	0.1	0.93	0.093	--
Benzo(b)fluoranthene	0.1	0.94	0.094	--
Benzo(k)fluoranthene	0.01	0.48	0.0048	--
Chrysene	0.001	1.4	0.0014	--
Dibenz(a,h)anthracene	1	0.17	0.17	--
Indeno(1,2,3-cd)pyrene	0.1	0.40	0.040	--
Total BAP (EQ)		Sum of Results x PEF (4)		**1.2**

Notes:
Bold values indicate that the result exceeds the Category I criterion.
Screening criteria based on the Final Soil Management Plan, Table C-1, July 18, 2014.

1 95th percentile Upper Confidence Limit (UCL) of the mean BAP (EQ) values of the ambient surface soil dataset from urban environments in Northern California of 0.4 mg/kg (DTSC 2009).
2 PEF is calculated based on values provided by EPA (1993, 2012).
3 Calculated by multiplying the result for individual PAH by the corresponding PEF.
4 Calculated by summing the benzo(a)pyrene equivalent values.

BAP (EQ) Benzo(a)pyrene equivalency quotient
EPA U.S. Environmental Protection Agency
mg/kg Milligrams per kilogram
NA Not applicable
PEF Potency equivalent factor
U Not detected

References:
DTSC. 2009. Use of the Northern and Southern California Polynuclear Aromatic Hydrocarbon (PAH) Studies in the Manufactured Gas Plant Site Cleanup Process. July 1.
EPA. 1993. "Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons." Office of Research and Development. Washington, DC. EPA/600/R-93/089. July.
EPA. 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites. November. Available on-line at: http://www.epa.gov/region9/superfund/prg/index.html


Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 269651
ANALYTICAL REPORT
Semivolatile Organics by GC/MS SIM

Tetra Tech EMI	Project : 103S225322.01
1999 Harrison Street	Location : B163 Phytoremediation
Oakland, CA 94612	Level : IV

Sample ID	Lab ID
20150908 B163PHYTO	269651-001

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: _____ Date: 09/23/2015

Mike Dahlquist
Project Manager
mike.dahlquist@ctberk.com

CA ELAP# 2896, NELAP# 4044-001

Curtis & Tompkins, Ltd.

CASE NARRATIVE
SEMIVOLATILE ORGANICS BY GC/MS SIM (EPA 8270C-SIM)

Laboratory number:	**269651**
Client:	**Tetra Tech EMI**
Project:	**103S225322.01**
Location:	**B163 Phytoremediation**
Request Date:	**09/08/15**
Samples Received:	**09/08/15**

This data package contains sample and QC results for one soil sample, requested for the above referenced project on 09/08/15. See attached cooler receipt form for any sample receipt problems or discrepancies.

Semivolatile Organics by GC/MS SIM (EPA 8270C-SIM):

Low recoveries were observed for 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene in the MS/MSD for batch 227022; the parent sample was not a project sample, the LCS was within limits, and the associated RPDs were within limits.

20150908 B163PHYTO (lab # 269651-001) was diluted due to the dark and viscous nature of the sample extract.

No other analytical problems were encountered.

Chain of Custody

269651

Tetra Tech EM Inc.
San Francisco Office

135 Main St. Suite 1800
San Francisco. CA 94105
415-543-4880
Fax 415-543-5480

Chain of Custody Record No. 5368

Page 1 of 1

5368

Lab PO#:	Lab:
to follow	CT

Project name:	TtEMI technical contact:	Field samplers:
B163 phytoremediation	Sara Woolley	Dayna Aragon

Project (CTO) number:	TtEMI project manager:	Field samplers' signatures:
10352253.22.01	Jason Brodersen	Dayna

Sample ID	Sample Location (Pt. ID)	Date	Time	Matrix	MS / MSD	No./Container Types: 40 ml VOA	1 liter Amber	500 ml Poly	Sleeve	Glass Jar 4oz	Preservative Added:	Analysis Required: VOA	SVOA	~~Pest~~/PCBs	Metals * As, Hg, Pb	TPH Purgeables	TPH Extractables	PAH SIM
20150908 B163 phyto		9/8/15	0915	soil						2					X	X		X

	Name (print)	Company Name	Date	Time
Relinquished by:	Dayna Aragon	Tetra Tech	9/8/15	1130
Received by:	Pat Gonzalez	CT	9/18/15	11.30
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

Turnaround time/remarks:
* individual metals: As, Hg, Pb

Fed Ex #:

WHITE-Laboratory Copy YELLOW-Sample Tracker PINK-File Copy

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 269651 Date Received 9/8/15 Number of coolers 1
Client Tetra Tech Project B163 Phytoremediation

Date Opened 9/8 By (print) SL (sign)
Date Logged in ↓ By (print) ↓ (sign) ↓

1. Did cooler come with a shipping slip (airbill, etc) _____ YES (NO)
Shipping info _____

2A. Were custody seals present? .... ☐ YES (circle) on cooler on samples ☒ NO
How many _____ Name _____ Date _____
2B. Were custody seals intact upon arrival? _____ YES NO (N/A)
3. Were custody papers dry and intact when received? _____ (YES) NO
4. Were custody papers filled out properly (ink, signed, etc)? _____ (YES) NO
5. Is the project identifiable from custody papers? (If so fill out top of form) (YES) NO
6. Indicate the packing in cooler: (if other, describe) _____

☐ Bubble Wrap ☐ Foam blocks ☐ Bags ☐ None
☐ Cloth material ☒ Cardboard ☐ Styrofoam ☐ Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

Type of ice used: ☒ Wet ☐ Blue/Gel ☐ None Temp(°C) 5.6°C

☐ Samples Received on ice & cold without a temperature blank; temp. taken with IR gun

☐ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? _____ YES (NO)
If YES, what time were they transferred to freezer? _____
9. Did all bottles arrive unbroken/unopened? _____ (YES) NO
10. Are there any missing / extra samples? _____ YES (NO)
11. Are samples in the appropriate containers for indicated tests? _____ (YES) NO
12. Are sample labels present, in good condition and complete? _____ (YES) NO
13. Do the sample labels agree with custody papers? _____ (YES) NO
14. Was sufficient amount of sample sent for tests requested? _____ (YES) NO
15. Are the samples appropriately preserved? _____ (YES) NO N/A
16. Did you check preservatives for all bottles for each sample? _____ (YES) NO N/A
17. Did you document your preservative check? _____ (YES) NO N/A
18. Did you change the hold time in LIMS for unpreserved VOAs? _____ (YES) NO N/A
19. Did you change the hold time in LIMS for preserved terracores? _____ (YES) NO N/A
20. Are bubbles > 6mm absent in VOA samples? _____ (YES) NO N/A
21. Was the client contacted concerning this sample delivery? _____ YES (NO)
If YES, Who was called? _____ By _____ Date: _____

COMMENTS

_____
_____
_____
_____
_____
_____

Rev 10, 9/12

Results & QC Summary

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS SIM

Lab #:	269651	Location:	B163 Phytoremediation
Client:	Tetra Tech EMI	Prep:	EPA 3550B
Project#:	103S225322.01	Analysis:	EPA 8270C-SIM
Field ID:	20150908 B163PHYTO	Batch#:	227022
Lab ID:	269651-001	Sampled:	09/08/15
Matrix:	Soil	Received:	09/08/15
Units:	ug/Kg	Prepared:	09/10/15
Basis:	dry	Analyzed:	09/10/15
Diln Fac:	33.30		

Moisture: 11%

Analyte	Result	RL	MDL
1,4-Dioxane	ND	1,200	110
Naphthalene	ND	190	45
1-Methylnaphthalene	ND	190	38
2-Methylnaphthalene	ND	190	40
Acenaphthylene	ND	190	37
Acenaphthene	220	190	37
Fluorene	ND	190	37
Phenanthrene	1,400	190	37
Anthracene	270	190	37
Fluoranthene	2,400	190	37
Pyrene	2,200	190	37
Benzo(a)anthracene	930	190	37
Chrysene	1,400	190	37
Benzo(b)fluoranthene	940	190	37
Benzo(k)fluoranthene	480	190	37
Benzo(a)pyrene	840	190	37
Indeno(1,2,3-cd)pyrene	400	190	37
Dibenz(a,h)anthracene	170 J	190	37
Benzo(g,h,i)perylene	450	190	37

Surrogate	%REC	Limits
Nitrobenzene-d5	DO	40-120
2-Fluorobiphenyl	DO	46-120
Terphenyl-d14	DO	43-120

J= Estimated value
DO= Diluted Out
ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Semivolatile Organics by GC/MS SIM

Lab #:	269651	Location:	B163 Phytoremediation
Client:	Tetra Tech EMI	Prep:	EPA 3550B
Project#:	103S225322.01	Analysis:	EPA 8270C-SIM
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC803033	Batch#:	227022
Matrix:	Soil	Prepared:	09/10/15
Units:	ug/Kg	Analyzed:	09/10/15

Analyte	Result	RL	MDL
1,4-Dioxane	ND	33	3.0
Naphthalene	ND	4.9	1.2
1-Methylnaphthalene	ND	4.9	1.0
2-Methylnaphthalene	ND	4.9	1.1
Acenaphthylene	ND	4.9	0.99
Acenaphthene	ND	4.9	0.99
Fluorene	ND	4.9	0.99
Phenanthrene	ND	4.9	0.99
Anthracene	ND	4.9	0.99
Fluoranthene	ND	4.9	0.99
Pyrene	ND	4.9	0.99
Benzo(a)anthracene	ND	4.9	0.99
Chrysene	ND	4.9	0.99
Benzo(b)fluoranthene	ND	4.9	0.99
Benzo(k)fluoranthene	ND	4.9	0.99
Benzo(a)pyrene	ND	4.9	0.99
Indeno(1,2,3-cd)pyrene	ND	4.9	0.99
Dibenz(a,h)anthracene	ND	4.9	0.99
Benzo(g,h,i)perylene	ND	4.9	0.99

Surrogate	%REC	Limits
Nitrobenzene-d5	61	40-120
2-Fluorobiphenyl	62	46-120
Terphenyl-d14	61	43-120

ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Semivolatile Organics by GC/MS SIM

Lab #:	269651	Location:	B163 Phytoremediation
Client:	Tetra Tech EMI	Prep:	EPA 3550B
Project#:	103S225322.01	Analysis:	EPA 8270C-SIM
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC803034	Batch#:	227022
Matrix:	Soil	Prepared:	09/10/15
Units:	ug/Kg	Analyzed:	09/10/15

Analyte	Spiked	Result	%REC	Limits
1,4-Dioxane	99.37	38.42	39	17-120
Naphthalene	33.12	19.03	57	50-120
1-Methylnaphthalene	33.12	20.29	61	52-120
2-Methylnaphthalene	33.12	19.35	58	53-120
Acenaphthylene	33.12	18.90	57	48-120
Acenaphthene	33.12	18.73	57	49-120
Fluorene	33.12	19.74	60	51-120
Phenanthrene	33.12	17.95	54	50-120
Anthracene	33.12	16.95	51	46-120
Fluoranthene	33.12	18.75	57	50-120
Pyrene	33.12	18.68	56	48-120
Benzo(a)anthracene	33.12	17.74	54	52-120
Chrysene	33.12	19.36	58	52-120
Benzo(b)fluoranthene	33.12	18.94	57	51-120
Benzo(k)fluoranthene	33.12	19.84	60	51-120
Benzo(a)pyrene	33.12	18.47	56	47-120
Indeno(1,2,3-cd)pyrene	33.12	18.21	55	43-120
Dibenz(a,h)anthracene	33.12	18.55	56	41-120
Benzo(g,h,i)perylene	33.12	17.92	54	42-120

Surrogate	%REC	Limits
Nitrobenzene-d5	50	40-120
2-Fluorobiphenyl	55	46-120
Terphenyl-d14	58	43-120

Curtis & Tompkins, Ltd.

Batch QC Report

Semivolatile Organics by GC/MS SIM

Lab #:	269651	Location:	B163 Phytoremediation
Client:	Tetra Tech EMI	Prep:	EPA 3550B
Project#:	103S225322.01	Analysis:	EPA 8270C-SIM
Field ID:	ZZZZZZZZZZ	Batch#:	227022
MSS Lab ID:	269622-001	Sampled:	09/03/15
Matrix:	Soil	Received:	09/08/15
Units:	ug/Kg	Prepared:	09/10/15
Basis:	as received	Analyzed:	09/10/15
Diln Fac:	1.000		

Type: MS Lab ID: QC803035

Analyte	MSS Result	Spiked	Result	%REC	Limits
1,4-Dioxane	<2.997	98.78	38.17	39	16-120
Naphthalene	81.94	32.93	103.0	64	37-120
1-Methylnaphthalene	39.78	32.93	57.29	53	47-120
2-Methylnaphthalene	78.99	32.93	92.42	41 *	46-120
Acenaphthylene	<0.9990	32.93	20.35	62	44-120
Acenaphthene	<0.9990	32.93	20.28	62	43-120
Fluorene	<0.9990	32.93	21.54	65	44-122
Phenanthrene	<0.9990	32.93	19.09	58	27-140
Anthracene	<0.9990	32.93	18.10	55	36-130
Fluoranthene	<0.9990	32.93	19.91	60	26-134
Pyrene	<0.9990	32.93	19.28	59	18-144
Benzo(a)anthracene	<0.9990	32.93	18.16	55	24-138
Chrysene	<0.9990	32.93	20.10	61	19-130
Benzo(b)fluoranthene	<0.9990	32.93	19.92	61	23-133
Benzo(k)fluoranthene	<0.9990	32.93	19.56	59	31-136
Benzo(a)pyrene	<0.9990	32.93	19.04	58	21-134
Indeno(1,2,3-cd)pyrene	<0.9990	32.93	19.04	58	8-120
Dibenz(a,h)anthracene	<0.9990	32.93	19.17	58	11-120
Benzo(g,h,i)perylene	<0.9990	32.93	18.39	56	1-120

Surrogate	%REC	Limits
Nitrobenzene-d5	53	40-120
2-Fluorobiphenyl	56	46-120
Terphenyl-d14	59	43-120

*= Value outside of QC limits; see narrative
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Semivolatile Organics by GC/MS SIM

Lab #:	269651	Location:	B163 Phytoremediation
Client:	Tetra Tech EMI	Prep:	EPA 3550B
Project#:	103S225322.01	Analysis:	EPA 8270C-SIM
Field ID:	ZZZZZZZZZZ	Batch#:	227022
MSS Lab ID:	269622-001	Sampled:	09/03/15
Matrix:	Soil	Received:	09/08/15
Units:	ug/Kg	Prepared:	09/10/15
Basis:	as received	Analyzed:	09/10/15
Diln Fac:	1.000		

Type: MSD Lab ID: QC803036

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
1,4-Dioxane	99.70	31.44	32	16-120	20	62
Naphthalene	33.23	75.58	-19 *	37-120	31	51
1-Methylnaphthalene	33.23	46.35	20 *	47-120	22	49
2-Methylnaphthalene	33.23	72.51	-19 *	46-120	24	48
Acenaphthylene	33.23	17.71	53	44-120	15	38
Acenaphthene	33.23	18.11	54	43-120	12	45
Fluorene	33.23	19.16	58	44-122	13	46
Phenanthrene	33.23	16.81	51	27-140	14	69
Anthracene	33.23	15.90	48	36-130	14	57
Fluoranthene	33.23	17.73	53	26-134	13	69
Pyrene	33.23	17.47	53	18-144	11	72
Benzo(a)anthracene	33.23	16.78	50	24-138	9	73
Chrysene	33.23	13.48	41	19-130	40	71
Benzo(b)fluoranthene	33.23	18.07	54	23-133	11	58
Benzo(k)fluoranthene	33.23	17.71	53	31-136	11	57
Benzo(a)pyrene	33.23	16.54	50	21-134	15	53
Indeno(1,2,3-cd)pyrene	33.23	15.44	46	8-120	22	57
Dibenz(a,h)anthracene	33.23	12.75	38	11-120	41	44
Benzo(g,h,i)perylene	33.23	14.91	45	1-120	22	58

Surrogate	%REC	Limits
Nitrobenzene-d5	49	40-120
2-Fluorobiphenyl	53	46-120
Terphenyl-d14	54	43-120

*= Value outside of QC limits; see narrative
RPD= Relative Percent Difference

CURTIS & TOMPKINS DFTPP TUNE FOR 269651 MSSIM Soil
EPA 8270C

Inst : MSBNA04 Run Name : TUN IDF : 1.0
Seqnum : 535336171013 File : whl13 Time : 21-AUG-2015 16:48

Standards: S27500

Mass	Ion Abundance Criteria	Abundance	% Relative Abundance	Q
51	30% - 60% of mass 198	201236	44.01	
68	< 2% of mass 69	0	0.00	
69		173223	100.00	
70	< 2% of mass 69	751	0.43	
127	40% - 60% of mass 198	210261	45.98	
197	< 1% of mass 198	0	0.00	
198		457301	100.00	
199	5% - 9% of mass 198	30368	6.64	
275	10% - 30% of mass 198	92360	20.20	
365	> 1% of mass 198	12085	2.64	
441	Present, < mass 443	40837	78.99	
442	> 40% and < 100% of mass 198	277509	60.68	
443	17% - 23% of mass 442	51696	18.63	

KMH 08/21/15 [4,4'-DDT]: Picked or reassigned peak.

Analyst: KMH Date: 08/21/15 Reviewer: LW Date: 08/24/15

CURTIS & TOMPKINS DFTPP TUNE FOR 269651 MSSIM Soil
EPA 8270C

Inst : MSBNA04 Run Name : DFTPP IDF : 1.0
Seqnum : 535365043002 File : wia02 Time : 10-SEP-2015 12:28

Standards: S27500

Mass	Ion Abundance Criteria	Abundance	% Relative Abundance	Q
51	30% - 60% of mass 198	136096	47.59	
68	< 2% of mass 69	0	0.00	
69		122925	100.00	
70	< 2% of mass 69	587	0.48	
127	40% - 60% of mass 198	141181	49.37	
197	< 1% of mass 198	0	0.00	
198		285973	100.00	
199	5% - 9% of mass 198	18752	6.56	
275	10% - 30% of mass 198	54264	18.98	
365	> 1% of mass 198	6484	2.27	
441	Present, < mass 443	18821	76.43	
442	> 40% and < 100% of mass 198	130506	45.64	
443	17% - 23% of mass 442	24625	18.87	

NPM 09/10/15 [4,4'-DDD]: Picked or reassigned peak.

NPM 09/10/15 [4,4'-DDT]: Picked or reassigned peak.

Analyst: NPM Date: 09/10/15 Reviewer: LW Date: 09/10/15

CURTIS & TOMPKINS INITIAL CALIBRATION FOR 269651 MSSIM Soil: EPA 8270C-SIM

Inst : MSBNA04
Calnum : 535336171001
Units : ug/mL

Name : 4PAHSIM
Date : 21-AUG-2015 17:22
X Axis : R

Level	File	Seqnum	Sample ID	Analyzed	Stds
L1	whl14	535336171014	ICAL	21-AUG-2015 17:22	S27275
L2	whl15	535336171015	ICAL	21-AUG-2015 17:54	S27276
L3	whl16	535336171016	ICAL	21-AUG-2015 18:26	S27277
L4	whl17	535336171017	ICAL	21-AUG-2015 18:58	S27278
L5	whl18	535336171018	ICAL	21-AUG-2015 19:30	S27279
L6	whl19	535336171019	ICAL	21-AUG-2015 20:02	S27280
L7	whl20	535336171020	ICAL	21-AUG-2015 20:34	S27281

Analyte	L1	L2	L3	L4	L5	L6	L7	Type	a0	a1	a2	Avg	r^2 %RSD	Max %RSD	Min RF	Min r^2	Flg
1,4-Dioxane	0.3176m	0.3042m	0.3011m	0.2940m	0.2958m	0.2953m	0.2908	AVRG		3.33529		0.2998	3	15	0.05	0.99	
Naphthalene	1.0969	1.1099	1.1299	1.1014	1.1061	1.0848	1.0319	AVRG		0.91373		1.0944	3	15	0.05	0.99	
2-Methylnaphthalene	0.7021	0.7158	0.7256	0.7139	0.7187	0.7109	0.6764	AVRG		1.41032		0.7091	2	15	0.05	0.99	
1-Methylnaphthalene	0.6489	0.6675	0.6754	0.6612	0.6609	0.6609	0.6206	AVRG		1.52325		0.6565	3	15	0.05	0.99	
Acenaphthylene	1.7690	1.7816	1.8510	1.8106	1.8354	1.8070	1.7192	AVRG		0.55671		1.7963	2	15	0.05	0.99	
Acenaphthene	1.0181	1.0433	1.0586	1.0327	1.0482	1.0379	0.9821	AVRG		0.96940		1.0316	2	15	0.05	0.99	
Fluorene	1.2851	1.3227	1.3420	1.2993	1.3137	1.2738	1.2135	AVRG		0.77347		1.2929	3	15	0.05	0.99	
Phenanthrene	1.0547	1.0418	1.0833	1.0542	1.0650	1.0195	0.9432	AVRG		0.96398		1.0374	4	15	0.05	0.99	
Anthracene	1.0029	1.0216	1.0647	1.0402	1.0653	1.0216	0.9181	AVRG		0.98116		1.0192	5	15	0.05	0.99	
Fluoranthene	0.8945	0.9168	0.9468	0.9294	0.9435	0.9077	0.8395	AVRG		1.09747		0.9112	4	15	0.05	0.99	
Pyrene	1.5652	1.5811	1.6266	1.5862	1.6069	1.5550	1.4194	AVRG		0.63983		1.5629	4	15	0.05	0.99	
Benzo(a)anthracene	1.0989	1.0918	1.1005	1.0778	1.0916	1.0596	1.0414	AVRG		0.92574		1.0802	2	15	0.05	0.99	
Chrysene	0.8677	0.8647	0.8887	0.8787	0.8943	0.8667	0.8339	AVRG		1.14854		0.8707	2	15	0.05	0.99	
Benzo(b)fluoranthene	1.0829	1.1004	1.1062	1.0992	1.0856	1.0522	1.0218	AVRG		0.92737		1.0783	3	15	0.05	0.99	
Benzo(k)fluoranthene	1.0629	1.1212m	1.1560	1.1000	1.1277	1.0579	0.9598	AVRG		0.92281		1.0836	6	15	0.05	0.99	
Benzo(a)pyrene	0.9130	0.9609	0.9895	0.9678	0.9907	0.9820	0.9155	AVRG		1.04176		0.9599	3	15	0.05	0.99	
Indeno(1,2,3-cd)pyrene	1.2335	1.2503	1.3015	1.3006	1.3295	1.3224	1.2614	AVRG		0.77785		1.2856	3	15	0.05	0.99	
Dibenz(a,h)anthracene	0.9341	0.9339	0.9884	0.9896	1.0264	1.0372	0.9986	AVRG		1.01330		0.9869	4	15	0.05	0.99	
Benzo(g,h,i)perylene	1.1289	1.1527	1.2018	1.1842	1.2032	1.1992	1.1614	AVRG		0.85040		1.1759	2	15	0.05	0.99	
Nitrobenzene-d5	0.2934m	0.3019m	0.3055m	0.3035	0.3070	0.3065	0.2978	AVRG		3.30860		0.3022	2	15	0.05	0.99	
2-Fluorobiphenyl	1.5909	1.6247	1.6637	1.6032	1.5792	1.5537	1.4589	AVRG		0.63210		1.5820	4	15	0.05	0.99	
Terphenyl-d14	1.1507	1.1539	1.1923	1.1596	1.1761	1.1504	1.0798	AVRG		0.86818		1.1518	3	15	0.05	0.99	

Spiked Amounts / Drifts	L1	%D	L2	%D	L3	%D	L4	%D	L5	%D	L6	%D	L7	%D
1,4-Dioxane	0.5000	6	1.0000	1	2.5000	0	5.0000	-2	10.000	-1	25.000	-2	50.000	-3
Naphthalene	0.1000	0	0.2000	1	0.5000	3	1.0000	1	2.0000	1	5.0000	-1	10.000	-6
2-Methylnaphthalene	0.1000	-1	0.2000	1	0.5000	2	1.0000	1	2.0000	1	5.0000	0	10.000	-5
1-Methylnaphthalene	0.1000	-1	0.2000	2	0.5000	3	1.0000	1	2.0000	1	5.0000	1	10.000	-5
Acenaphthylene	0.1000	-2	0.2000	-1	0.5000	3	1.0000	1	2.0000	2	5.0000	1	10.000	-4
Acenaphthene	0.1000	-1	0.2000	1	0.5000	3	1.0000	0	2.0000	2	5.0000	1	10.000	-5
Fluorene	0.1000	-1	0.2000	2	0.5000	4	1.0000	0	2.0000	2	5.0000	-1	10.000	-6
Phenanthrene	0.1000	2	0.2000	0	0.5000	4	1.0000	2	2.0000	3	5.0000	-2	10.000	-9
Anthracene	0.1000	-2	0.2000	0	0.5000	4	1.0000	2	2.0000	5	5.0000	0	10.000	-10
Fluoranthene	0.1000	-2	0.2000	1	0.5000	4	1.0000	2	2.0000	4	5.0000	0	10.000	-8
Pyrene	0.1000	0	0.2000	1	0.5000	4	1.0000	1	2.0000	3	5.0000	-1	10.000	-9
Benzo(a)anthracene	0.1000	2	0.2000	1	0.5000	2	1.0000	0	2.0000	1	5.0000	-2	10.000	-4
Chrysene	0.1000	0	0.2000	-1	0.5000	2	1.0000	1	2.0000	3	5.0000	0	10.000	-4
Benzo(b)fluoranthene	0.1000	0	0.2000	2	0.5000	3	1.0000	2	2.0000	1	5.0000	-2	10.000	-5
Benzo(k)fluoranthene	0.1000	-2	0.2000	3	0.5000	7	1.0000	2	2.0000	4	5.0000	-2	10.000	-11
Benzo(a)pyrene	0.1000	-5	0.2000	0	0.5000	3	1.0000	1	2.0000	3	5.0000	2	10.000	-5
Indeno(1,2,3-cd)pyrene	0.1000	-4	0.2000	-3	0.5000	1	1.0000	1	2.0000	3	5.0000	3	10.000	-2
Dibenz(a,h)anthracene	0.1000	-5	0.2000	-5	0.5000	0	1.0000	0	2.0000	4	5.0000	5	10.000	1
Benzo(g,h,i)perylene	0.1000	-4	0.2000	-2	0.5000	2	1.0000	1	2.0000	2	5.0000	2	10.000	-1
Nitrobenzene-d5	0.1000	-3	0.2000	0	0.5000	1	1.0000	0	2.0000	2	5.0000	1	10.000	-1
2-Fluorobiphenyl	0.1000	1	0.2000	3	0.5000	5	1.0000	1	2.0000	0	5.0000	-2	10.000	-8
Terphenyl-d14	0.1000	0	0.2000	0	0.5000	4	1.0000	1	2.0000	2	5.0000	0	10.000	-6

NPM 08/24/15 [1,4-Dioxane]: Corrected automatically drawn baseline in multiple levels.

NPM 08/24/15 [Nitrobenzene-d5]: Corrected automatically drawn baseline in multiple levels.

NPM 08/24/15 [Benzo(k)fluoranthene]: Corrected automatically drawn baseline in ICAL (whl15).

Analyst: NPM Date: 08/24/15 Reviewer: LW Date: 08/24/15

m=manual integration

Instrument amount = a0 + response * a1 + response^2 * a2; AVRG=Average response factor

535336171001

CURTIS & TOMPKINS 2ND SOURCE CALIBRATION SUMMARY FOR 269651 MSSIM Soil
EPA 8270C-SIM

Inst : MSBNA04 Name : 4PAHSIM
Calnum : 535336171001 Cal Date : 21-AUG-2015

ICV 535336171021 (whl21 21-AUG-2015) stds: S27288

Analyte	Spiked	Quant	Units	%D	Max	Flags
1,4-Dioxane	10.00	10.34	ug/mL	3	30	m
Naphthalene	1.000	0.9473	ug/mL	-5	30	
2-Methylnaphthalene	1.000	1.013	ug/mL	1	30	
1-Methylnaphthalene	1.000	1.036	ug/mL	4	30	
Acenaphthylene	1.000	1.032	ug/mL	3	30	
Acenaphthene	1.000	0.9606	ug/mL	-4	20	
Fluorene	1.000	0.9746	ug/mL	-3	30	
Phenanthrene	1.000	0.9730	ug/mL	-3	30	
Anthracene	1.000	1.006	ug/mL	1	30	
Fluoranthene	1.000	0.9788	ug/mL	-2	20	
Pyrene	1.000	1.060	ug/mL	6	30	
Benzo(a)anthracene	1.000	0.9819	ug/mL	-2	30	
Chrysene	1.000	1.191	ug/mL	19	30	m
Benzo(b)fluoranthene	1.000	0.9609	ug/mL	-4	30	
Benzo(k)fluoranthene	1.000	0.9144	ug/mL	-9	30	
Benzo(a)pyrene	1.000	1.009	ug/mL	1	20	
Indeno(1,2,3-cd)pyrene	1.000	0.9829	ug/mL	-2	30	
Dibenz(a,h)anthracene	1.000	1.065	ug/mL	6	30	
Benzo(g,h,i)perylene	1.000	0.9684	ug/mL	-3	30	

Analyst: NPM Date: 08/24/15 Reviewer: LW Date: 08/24/15

m=manual integration

CURTIS & TOMPKINS CONTINUING CALIBRATION FOR 269651 MSSIM Soil
EPA 8270C-SIM

Inst : MSBNA04 IDF : 1.0
Seqnum : 535365043003 File : wia03 Time : 10-SEP-2015 12:47
Cal : 535336171001 Caldate : 21-AUG-2015
Standards: S27279

Analyte	Avg RF/CF	RF/CF	Spiked	Quant	Units	%D	Max %D	Min RF	Flags
1,4-Dioxane	0.2998	0.2793	10.00	9.315	ug/mL	-7	30	0.0500	
Naphthalene	1.0944	1.0412	2.000	1.903	ug/mL	-5	30	0.0500	
2-Methylnaphthalene	0.7091	0.6788	2.000	1.915	ug/mL	-4	30	0.0500	
1-Methylnaphthalene	0.6565	0.6476	2.000	1.973	ug/mL	-1	30	0.0500	
Acenaphthylene	1.7963	1.8494	2.000	2.059	ug/mL	3	30	0.0500	
Acenaphthene	1.0316	1.0804	2.000	2.095	ug/mL	5	20	0.0500	
Fluorene	1.2929	1.2946	2.000	2.003	ug/mL	0	30	0.0500	
Phenanthrene	1.0374	1.0987	2.000	2.118	ug/mL	6	30	0.0500	
Anthracene	1.0192	1.0417	2.000	2.044	ug/mL	2	30	0.0500	
Fluoranthene	0.9112	1.0269	2.000	2.254	ug/mL	13	20	0.0500	
Pyrene	1.5629	1.5947	2.000	2.041	ug/mL	2	30	0.0500	
Benzo(a)anthracene	1.0802	1.0916	2.000	2.021	ug/mL	1	30	0.0500	
Chrysene	0.8707	0.9023	2.000	2.073	ug/mL	4	30	0.0500	
Benzo(b)fluoranthene	1.0783	1.1625	2.000	2.156	ug/mL	8	30	0.0500	
Benzo(k)fluoranthene	1.0836	1.1894	2.000	2.195	ug/mL	10	30	0.0500	
Benzo(a)pyrene	0.9599	1.0267	2.000	2.139	ug/mL	7	20	0.0500	
Indeno(1,2,3-cd)pyrene	1.2856	1.4109	2.000	2.195	ug/mL	10	30	0.0500	
Dibenz(a,h)anthracene	0.9869	1.0958	2.000	2.221	ug/mL	11	30	0.0500	
Benzo(g,h,i)perylene	1.1759	1.2798	2.000	2.177	ug/mL	9	30	0.0500	
Nitrobenzene-d5	0.3022	0.2967	2.000	1.963	ug/mL	-2	30	0.0500	
2-Fluorobiphenyl	1.5820	1.6871	2.000	2.133	ug/mL	7	30	0.0500	
Terphenyl-d14	1.1518	1.1935	2.000	2.072	ug/mL	4	30	0.0500	

Analyst: NPM Date: 09/10/15 Reviewer: LW Date: 09/10/15

CURTIS & TOMPKINS INTERNAL STANDARD SUMMARY FOR SEQUENCE 535365043

Date : 09/10/15
Sequence : MSBNA04 wia

Reference : wia03
Analyzed : 09/10/15 12:47

#	Type	Sample ID	DCBZ14D4	RT	NAPHD8	RT	ACEND10	RT	PHEND10	RT	CHYD12	RT	PERYD12	RT
		CCV+CCV/BS+CCV/LCS+ICV+ICV/BS+ICV/CCV+ICV/LCS+RCCV+RICV STD	74324	7.96	233126	9.53	141512	11.80	231033	13.76	152179	17.32	140731	19.27
		LOWER LIMIT	37162	7.46	116563	9.03	70756	11.30	115517	13.26	76090	16.82	70366	18.77
		UPPER LIMIT	148648	8.46	466252	10.03	283024	12.30	462066	14.26	304358	17.82	281462	19.77
003	CCV		74324	7.96	233126	9.53	141512	11.80	231033	13.76	152179	17.32	140731	19.27
004	SAMPLE	269657-001	72219	7.96	227797	9.53	157469	11.80	301930	13.76	196023	17.33	192889	19.27
005	BLANK	QC803033	75624	7.96	237578	9.53	160698	11.81	299752	13.76	188312	17.32	177944	19.27
006	LCS	QC803034	72870	7.95	224878	9.53	156525	11.80	293022	13.76	189828	17.33	178732	19.27
007	SAMPLE	269548-001	71432	7.96	245293	9.53	155443	11.80	295796	13.76	169424	17.33	165162	19.27
008	MSS	269622-001	65972	7.95	212090	9.53	143519	11.80	274566	13.76	158939	17.33	155698	19.27
009	SAMPLE	269622-002	67744	7.95	212336	9.53	152172	11.80	284765	13.76	168987	17.33	162598	19.27
010	SAMPLE	269651-001	74351	7.96	246937	9.53	187674	11.80	330868	13.77	216014	17.33	223577	19.28
011	MS	QC803035	63416	7.96	201572	9.53	143806	11.80	274343	13.76	162604	17.33	158536	19.27
012	MSD	QC803036	62370	7.96	197303	9.53	138036	11.80	271294	13.76	162271	17.33	157746	19.27
013	SAMPLE	269548-001	70412	7.96	228993	9.53	152554	11.80	297274	13.76	177616	17.33	171196	19.27
014	SAMPLE	269683-001	45718	7.96	146488	9.54	101113	11.81	200922	13.77	144293	17.33	139515	19.28
015	LCS	QC803034	51126	7.96	163409	9.53	113399	11.81	224345	13.76	139318	17.32	131388	19.27
016	MS	QC803035	41662	7.97	132323	9.54	93470	11.81	191752	13.77	120634	17.33	114384	19.28
017	MSD	QC803036	45485	7.96	148433	9.53	105073	11.80	212728	13.76	133061	17.32	128295	19.27

CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 535336171

Instrument : MSBNA04 Begun : 08/21/15 10:51
Method : EPA 8270C, EPA 8270C-SIM SOP Version : 8270-SIM_OBPA_rv1, bna_rv13

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
002	whl02	TUN	DFTPP			08/21/15 10:51	1.0	1	
003	whl03	CCV	CHECK			08/21/15 11:10	1.0	2	17:DIOXANE14=62
004	whl04	CCV	CHECK			08/21/15 11:44	1.0	2	6:DIOXANE14=53
005	whl05	TUN	DFTPP			08/21/15 12:10	1.0	1	t
006	whl06	TUN	DFTPP			08/21/15 12:41	1.0	1	t
007	whl07	TUN	DFTPP			08/21/15 13:18	1.0	1	t
008	whl08	CCV	CHECK			08/21/15 13:38	1.0	3	t cc- cc+ , 3:FLA=68
009	whl09	CCV	CHECK			08/21/15 14:41	1.0	3	t cc+
010	whl10	TUN	DFTPP			08/21/15 15:13	1.0	1	
011	whl11	CCV	CHECK			08/21/15 15:50	1.0	2	2:DBAHA=11
012	whl12	IB	IB			08/21/15 16:23	1.0		
013	whl13	TUN	TUN			08/21/15 16:48	1.0	1	
014	whl14	ICAL	ICAL			08/21/15 17:22	1.0	4	
015	whl15	ICAL	ICAL			08/21/15 17:54	1.0	5	
016	whl16	ICAL	ICAL			08/21/15 18:26	1.0	3	
017	whl17	ICAL	ICAL			08/21/15 18:58	1.0	6	
018	whl18	ICAL	ICAL			08/21/15 19:30	1.0	7	
019	whl19	ICAL	ICAL			08/21/15 20:02	1.0	8	
020	whl20	ICAL	ICAL			08/21/15 20:34	1.0	2	
021	whl21	ICV	ICAL			08/21/15 21:06	1.0	9	

KMH 08/21/15 : file 1 skipped by mistake, adjusted tune, clipped column before run 10

NPM 08/24/15 : I verified that the vials loaded on the instrument matched the sequence data entry, for runs 1 through 21.

Standards used: 1=S27500 2=S27281 3=S27277 4=S27275 5=S27276 6=S27278 7=S27279 8=S27280 9=S27288
Flags used: +=high bias -=low bias cc=CCV CCC failure t=tune failure
Page 1 of 1

CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 535365043

Instrument : MSBNA04 Begun : 09/10/15 12:03
Method : EPA 8270C, EPA 8270C-SIM SOP Version : 8270-SIM_OBPA_rv1, bna_rv13

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
001	wia01	IB	IB			09/10/15 12:03	1.0		?t
002	wia02	TUN	DFTPP			09/10/15 12:28	1.0	1	
003	wia03	CCV				09/10/15 12:47	1.0	2	
004	wia04	SAMPLE	269657-001	Soil	226946	09/10/15 13:20	1.0	3	
005	wia05	BLANK	QC803033	Soil	227022	09/10/15 13:54	1.0	3	
006	wia06	LCS	QC803034	Soil	227022	09/10/15 14:25	1.0	3	spk
007	wia07	SAMPLE	269548-001	Soil	226867	09/10/15 14:57	1.0	3	2:NAPH=23
008	wia08	MSS	269622-001	Soil	227022	09/10/15 15:28	1.0	3	
009	wia09	SAMPLE	269622-002	Soil	227022	09/10/15 15:59	1.0	3	
010	wia10	SAMPLE	269651-001	Soil	227022	09/10/15 16:30	33.30	3	
011	wia11	MS	QC803035	Soil	227022	09/10/15 17:02	1.0	3	
012	wia12	MSD	QC803036	Soil	227022	09/10/15 17:33	1.0	3	
013	wia13	SAMPLE	269548-001	Soil	226867	09/10/15 18:05	5.0	3	
014	wia14	SAMPLE	269683-001	Soil	227022	09/10/15 18:50	1.0	3	
015	wia15	LCS	QC803034	Soil	227022	09/10/15 19:21	1.0	3	
016	wia16	MS	QC803035	Soil	227022	09/10/15 20:49	1.0	3	
017	wia17	MSD	QC803036	Soil	227022	09/10/15 21:21	1.0	3	

NPM 09/10/15 : I verified that the vials loaded on the instrument matched the sequence data entry, for runs 1 through 4.

NPM 09/11/15 : I verified that the vials loaded on the instrument matched the sequence data entry, for runs 1 through 17.

Standards used: 1=S27500 2=S27279 3=S27354
Flags used: ?t=missing tune spk=5% spike rule
Page 1 of 1

SAMPLE PREPARATION SUMMARY

Batch # : 227022 Analysis : 8270-SIM
Started By : GDM Prep Date : 10-SEP-2015 08:24 Finished By : GDM
Method : 3550B SOP Version : 8270-SIM_3550_rv5 Units : g
Spike #1 ID : S27778 Spike #2 ID : S27221

Sample	Stype	Matrix	Initial	Final	Clean DF	Prep DF	pH	Sp 1 Vol	Sp 2 Vol	Sp 3 Vol	Clean Method	Analysis	Comments
269622-001		Soil	30.03	1	1	0.0333		1				8270-SIM	
269622-002		Soil	30.07	1	1	0.03326		1				8270-SIM	
269651-001		Soil	30.01	1	1	0.03332		1				8270-SIM	
269683-001		Soil	29.63	1	1	0.03375		1				8270-SIM	Prepped 10-SEP-2015 15:00
269720-001		Soil	29.98	1	1	0.03336		1				8270-SIM	See comment 1 below
269720-002		Soil	30.29	1	1	0.03301		1				8270-SIM	See comment 1 below
269720-003		Soil	30.31	1	1	0.03299		1				8270-SIM	See comment 1 below
269720-004		Soil	29.71	1	1	0.03366		1				8270-SIM	See comment 1 below
QC803033	BLANK	Soil	30.32	1	1	0.03298		1				8270-SIM	
QC803034	LCS	Soil	30.19	1	1	0.03312		1	1			8270-SIM	
QC803035	MS	Soil	30.37	1	1	0.03293		1	1			8270-SIM	
QC803036	MSD	Soil	30.09	1	1	0.03323		1	1			8270-SIM	

Comment 1: Prepped 11-SEP-2015 10:20; as per JG

Analyst: ICK Date: 09/11/15 Reviewer: LW Date: 09/11/15

TITLE Soil Aliquot **PROJECT** **DATE**

Continued from page

Sample	ID	Weight(g)	Analysis	Batch #	Scale Used	Comments
269602-008	B	29.76	P/P		Dish 1	MSS PCB MSS 8081
9		29.77				
10		29.68				
11		29.75				
12	↓	29.82				
MB	N/A	29.84	↓			FS148781
LCS		30.20	PCB			↓
MS		29.90	↓			269602-008
MSD		29.80				↓
LCS		29.95	8081			FS148781
MS		29.80	↓			269602-009
MSD	↓	30.09				↓
203280-053		30.20	PCB			MOL
↓	54	29.73				
209157-035		29.69				
213022-046		29.71				
216647-048		30.02				
239923-020		30.07				
239921-020		29.80				
200799-043		29.75	8081			
↓	44	30.33	↓			

JDO 9/10/15

269651-001	B	30.01	8270-SIM	227022	Dish 1	MSS
269622-001		30.03				
↓	2	30.07				
MB	N/A	30.32				FS148781
LCS		30.19				↓
MS		30.37				269622-001
MSD		30.09				↓

GDM 9/10/15

1601683-001	A	29.63	8270-SIM	↓	Dish 1	MSS per SOP

APM 9/10/2015

Continued to page

SIGNATURE DATE

DISCLOSED TO AND UNDERSTOOD BY DATE

PROPRIETARY INFORMATION

TITLE Soil Aliquot PROJECT DAT

Continued from page

Sample I.D.	Weight(g)		Analysis	~~Pstand~~ scatcused		comments
269693-013	comp	29.82	8270		Dish-1	comp of 269693 001 + 02 @ ...
14		29.78				03 + 04
15		29.83				05 + 06
16		29.58				07 + 08
17		30.33				09 + 10
18		30.0				11 + 11
MB	MS	29.95				F5148787
LS		30.37				+
MS		30.27				269693-015
MSD		30.16				+
269720-001	B	29.98	8270 SIM	227022		
2		30.24				
3		30.31				
4		29.71				

ARW 9/11/2014

269560.001	A	29.88	8270	Dish-1	~~VOAs per SOP~~ ICU 9/11/15
269590.001	+	29.68	+	L	

ARW 9/11/2014

SIGNATURE DATE

Continued to page

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PROPRIETARY INFORMATION

BNA Soil Prep Log

Curtis & Tompkins, Ltd.

Page: 94 **BK 3679**

LIMS Batch No: 227022
LIMS Analysis 8270-SIM
Date Extracted: 9/10/15

Extraction Method:
☑ EPA 3550b Sonication
☐ Other _____

Cleanup Method (if necessary):
☐ EPA 3640a GPC
☐ Other _____

	Sample #	Container ID	Weight of Sample (g)	Final Volume (mL)	Cleanup (x if needed)	Comments
	269651-001	B	30.01	☑ 1.0 ☐		
	269622-001		30.03	☑ 1.0 ☐		
	2		30.07	☑ 1.0 ☐		
	MB QC 803033	N/A	30.32	☑ 1.0 ☐		
5	LCS	4	30.19	☑ 1.0 ☐		
	MS	5	30.37	☑ 1.0 ☐		
	MSD	6	30.09	☑ 1.0 ☐		
				☐ 1.0 ☐		
	269683001	A	29.63	☑ 1.0 ☐		1/10 @ 1520 by APW after 7 ext
10	269770-001	B	29.98	☑ 1.0 ☐		1/10 on 9/11/15 @ 1020 by APW after 7 ext
	V		30.29	☑ 1.0 ☐		
	3		30.31	☑ 1.0 ☐		
	4		29.79	☑ 1.0 ☐		
				☐ 1.0 ☐		
15				☐ 1.0 ☐		
				☐ 1.0 ☐		
				☐ 1.0 ☐		
				☐ 1.0 ☐		
				☐ 1.0 ☐		
20				☐ 1.0 ☐		
				☐ 1.0 ☐		
				☐ 1.0 ☐		
				☐ 1.0 ☐		
				☐ 1.0 ☐		
				☐ 1.0 ☐		

LK 9/11/15 NPM 9/10/15

☐ MS/MSD not included due to: ☐ insufficent volume, or ☐ other (reason) _____

	Mfg & Lot # / LIMS # / Time	Date/Initials
Baked, CH_2Cl_2-rinsed granular Na_2SO_4 used for QC & to dry samples	FS148781	GDM 9/10/15
1.0 mL of surrogate solution was added to all samples	S27778	
1.0 mL of matrix spiking solution was added to all spikes	S27221	
≥100mL 1:1 CH_2Cl_2:Acetone was added to all: CH_2Cl_2	FS152740	
Acetone	FC153394	
Solvent was added at (time)	0824/1580/1020	
☑ sonicated 3 times w/ ≥100mL ☐ soxhlet extractors on at:	✓	
soxhlets off at:	N/A	
Extracts filtered through baked, CH_2Cl_2-rinsed ~~powdered~~ granular Na_2SO_4	FS148781	
Concentrated to final volume at temperature (degrees C)	70	
Relinquished to BNA department	✓	

9/10/15
Extraction Chemist / Date

Continued from page _____
Continued on page _____

NPM 9/10/15
Reviewed by / Date

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 269651
ANALYTICAL REPORT
PCBs

Tetra Tech EMI	Project : 103S225322.01
1999 Harrison Street	Location : B163 Phytoremediation
Oakland, CA 94612	Level : IV

Sample ID	Lab ID
20150908 B163PHYTO	269651-001

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: _____ Date: 09/23/2015

Mike Dahlquist
Project Manager
mike.dahlquist@ctberk.com

CA ELAP# 2896, NELAP# 4044-001

Curtis & Tompkins, Ltd.

CASE NARRATIVE
PCBS (EPA 8082)

Laboratory number:	**269651**
Client:	**Tetra Tech EMI**
Project:	**103S225322.01**
Location:	**B163 Phytoremediation**
Request Date:	**09/08/15**
Samples Received:	**09/08/15**

This data package contains sample and QC results for one soil sample, requested for the above referenced project on 09/08/15. See attached cooler receipt form for any sample receipt problems or discrepancies.

PCBs (EPA 8082):

All samples underwent sulfuric acid cleanup using EPA Method 3665A.

All samples underwent sulfur cleanup using the copper option in EPA Method 3660B.

Matrix spikes QC803204,QC803205 (batch 227063) were not analyzed because the parent sample required a dilution that would have diluted out the spikes.

No other analytical problems were encountered.

Chain of Custody

269651

Tetra Tech EM Inc.
San Francisco Office

135 Main St. Suite 1800
San Francisco. CA 94105
415-543-4880
Fax 415-543-5480

Chain of Custody Record No. 5368

Page 1 of 1

5368

Lab PO#:	Lab:
to follow	CT

Project name:	TtEMI technical contact:	Field samplers:
B163 phytoremediation	Sara Woolley	Dayna Aragon

Project (CTO) number:	TtEMI project manager:	Field samplers' signatures:
10352253.22.01	Jason Brodersen	Dayna

Sample ID	Sample Location (Pt. ID)	Date	Time	Matrix	MS / MSD	No./Container Types: 40 ml VOA	1 liter Amber	500 ml Poly	Sleeve	Glass Jar 4oz	Preservative Added: Nitric	Nitric	Nitric	Analysis Required: VOA	SVOA	~~Pest~~/PCBs	Metals * As, Hg, Pb	TPH Purgeables	TPH Extractables	PAH SIM
20150908 B163 phyto		9/8/15	0915	soil						2							X	X		X

	Name (print)	Company Name	Date	Time
Relinquished by:	Dayna Aragon	TetraTech	9/8/15	1130
Received by:	Pat Gonzalez	CT	9/18/15	11.30
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

Turnaround time/remarks:
* individual metals: As, Hg, Pb

Fed Ex #:

WHITE-Laboratory Copy YELLOW-Sample Tracker PINK-File Copy

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 269651 Date Received 9/8/15 Number of coolers 1
Client Tetra Tech Project B163 Phytoremediation

Date Opened 9/8 By (print) SL (sign)
Date Logged in ↓ By (print) ↓ (sign) ↓

1. Did cooler come with a shipping slip (airbill, etc) YES (NO)
Shipping info

2A. Were custody seals present? .... ☐ YES (circle) on cooler on samples ☒ NO
How many Name Date
2B. Were custody seals intact upon arrival? YES NO N/A
3. Were custody papers dry and intact when received? YES NO
4. Were custody papers filled out properly (ink, signed, etc)? YES NO
5. Is the project identifiable from custody papers? (If so fill out top of form) YES NO
6. Indicate the packing in cooler: (if other, describe)

☐ Bubble Wrap ☐ Foam blocks ☐ Bags ☐ None
☐ Cloth material ☒ Cardboard ☐ Styrofoam ☐ Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

Type of ice used: ☒ Wet ☐ Blue/Gel ☐ None Temp(°C) 5.6°C

☐ Samples Received on ice & cold without a temperature blank; temp. taken with IR gun

☐ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? YES (NO)
If YES, what time were they transferred to freezer?
9. Did all bottles arrive unbroken/unopened? YES NO
10. Are there any missing / extra samples? YES (NO)
11. Are samples in the appropriate containers for indicated tests? YES NO
12. Are sample labels present, in good condition and complete? YES NO
13. Do the sample labels agree with custody papers? YES NO
14. Was sufficient amount of sample sent for tests requested? YES NO
15. Are the samples appropriately preserved? YES NO N/A
16. Did you check preservatives for all bottles for each sample? YES NO N/A
17. Did you document your preservative check? YES NO N/A
18. Did you change the hold time in LIMS for unpreserved VOAs? YES NO N/A
19. Did you change the hold time in LIMS for preserved terracores? YES NO N/A
20. Are bubbles > 6mm absent in VOA samples? YES NO N/A
21. Was the client contacted concerning this sample delivery? YES (NO)
If YES, Who was called? By Date:

COMMENTS

Rev 10, 9/12

Results & QC Summary

Curtis & Tompkins, Ltd.

Polychlorinated Biphenyls (PCBs)

Lab #:	269651	Location:	B163 Phytoremediation
Client:	Tetra Tech EMI	Prep:	EPA 3550B
Project#:	103S225322.01	Analysis:	EPA 8082
Field ID:	20150908 B163PHYTO	Batch#:	227063
Lab ID:	269651-001	Sampled:	09/08/15
Matrix:	Soil	Received:	09/08/15
Units:	ug/Kg	Prepared:	09/11/15
Basis:	dry	Analyzed:	09/12/15
Diln Fac:	1.000		

Moisture: 11%

Analyte	Result	RL	MDL
Aroclor-1016	ND	11	2.6
Aroclor-1221	ND	21	7.1
Aroclor-1232	ND	11	3.5
Aroclor-1242	ND	11	3.2
Aroclor-1248	ND	11	3.4
Aroclor-1254	ND	11	2.7
Aroclor-1260	ND	11	1.7

Surrogate	%REC	Limits
TCMX	49	46-141
Decachlorobiphenyl	45	25-135

ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Polychlorinated Biphenyls (PCBs)

Lab #:	269651	Location:	B163 Phytoremediation
Client:	Tetra Tech EMI	Prep:	EPA 3550B
Project#:	103S225322.01	Analysis:	EPA 8082
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC803199	Batch#:	227063
Matrix:	Soil	Prepared:	09/11/15
Units:	ug/Kg	Analyzed:	09/11/15

Analyte	Result	RL	MDL
Aroclor-1016	ND	9.6	2.4
Aroclor-1221	ND	19	6.3
Aroclor-1232	ND	9.6	3.1
Aroclor-1242	ND	9.6	2.9
Aroclor-1248	ND	9.6	3.0
Aroclor-1254	ND	9.6	2.4
Aroclor-1260	ND	9.6	1.5

Surrogate	%REC	Limits
TCMX	137	46-141
Decachlorobiphenyl	125	25-135

ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Polychlorinated Biphenyls (PCBs)

Lab #:	269651	Location:	B163 Phytoremediation
Client:	Tetra Tech EMI	Prep:	EPA 3550B
Project#:	103S225322.01	Analysis:	EPA 8082
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC803200	Batch#:	227063
Matrix:	Soil	Prepared:	09/11/15
Units:	ug/Kg	Analyzed:	09/11/15

Analyte	Spiked	Result	%REC	Limits
Aroclor-1016	164.2	221.7	135	64-140
Aroclor-1260	164.2	229.5	140	65-146

Surrogate	%REC	Limits
TCMX	139	46-141
Decachlorobiphenyl	133	25-135

Curtis & Tompkins, Ltd.

Batch QC Report

Polychlorinated Biphenyls (PCBs)

Lab #:	269651	Location:	B163 Phytoremediation
Client:	Tetra Tech EMI	Prep:	EPA 3550B
Project#:	103S225322.01	Analysis:	EPA 8082
Field ID:	ZZZZZZZZZZ	Batch#:	227063
MSS Lab ID:	269601-001	Sampled:	09/04/15
Matrix:	Soil	Received:	09/04/15
Units:	ug/Kg	Prepared:	09/11/15
Basis:	as received	Analyzed:	09/11/15
Diln Fac:	1.000		

Type: MS Lab ID: QC803201

Analyte	MSS Result	Spiked	Result	%REC	Limits
Aroclor-1016	<2.348	165.0	213.2	129	60-161
Aroclor-1260	<1.535	165.0	233.2	141	42-166

Surrogate	%REC	Limits
TCMX	120	46-141
Decachlorobiphenyl	119	25-135

Type: MSD Lab ID: QC803202

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Aroclor-1016	164.9	189.8	115	60-161	12	43
Aroclor-1260	164.9	197.4	120	42-166	17	51

Surrogate	%REC	Limits
TCMX	108	46-141
Decachlorobiphenyl	96	25-135

RPD= Relative Percent Difference

CURTIS & TOMPKINS INITIAL CALIBRATION FOR 269651 PCBS Soil: EPA 8082

Inst : GC06
Calnum : 205330219001
Units : pg/uL

Name : 1660_229
Date : 17-AUG-2015 23:02
X Axis : R

Level	File	Seqnum	Sample ID	Analyzed	Stds
L1	229_011	205330219011	PCB10_2	17-AUG-2015 23:02	S26867
L2	229_012	205330219012	PCB25_5	17-AUG-2015 23:29	S26868
L3	229_013	205330219013	PCB100_20	17-AUG-2015 23:57	S26869
L4	229_014	205330219014	PCB250_50	18-AUG-2015 00:24	S26870
L5	229_015	205330219015	PCB500_100	18-AUG-2015 00:52	S26871
L6	229_016	205330219016	PCB750_150	18-AUG-2015 01:19	S26872
L7	229_017	205330219017	PCB1000_200	18-AUG-2015 01:47	S26873

Analyte	Ch	L1	L2	L3	L4	L5	L6	L7	Type	a0	a1	a2	Avg	r^2 %RSD	MnR^2	MxRSD	Flg
Aroclor-1016 Peak # 1	A	318.50	283.48	260.98	253.52	245.49	204.13	212.27	AVRG		0.00394		254.05	16	.99	20	
Aroclor-1016 Peak # 2	A	367.60	349.72	337.84	335.08	317.37	272.36	272.14	AVRG		0.00311		321.73	12	.99	20	
Aroclor-1016 Peak # 3	A	218.80	208.96	209.16	204.79	201.23	166.37	177.13	AVRG		0.00505		198.06	10	.99	20	
Aroclor-1016 Peak # 4	A	123.50	140.40	121.37	123.24	122.18	98.153	101.94	AVRG		0.00843		118.68	12	.99	20	
Aroclor-1016 Peak # 5	A	182.70	202.00	179.52	176.69	172.90	146.39	151.61	AVRG		0.00578		173.12	11	.99	20	
Aroclor-1260 Peak # 1	A	784.50	765.16	707.66	686.09	672.44	565.06	569.91	AVRG		0.00147		678.69	13	.99	20	
Aroclor-1260 Peak # 2	A	396.30	432.44	444.39	451.72	462.76	393.39	411.94	AVRG		0.00234		427.56	6	.99	20	
Aroclor-1260 Peak # 3	A	424.70	411.24	394.48	394.92	397.43	336.99	346.33	AVRG		0.00259		386.58	8	.99	20	
Aroclor-1260 Peak # 4	A	893.70	887.92	856.45	882.07	904.18	760.53	797.70	AVRG		0.00117		854.65	6	.99	20	
Aroclor-1260 Peak # 5	A	338.90	340.40	381.60	395.92	405.61	340.56	362.20	AVRG		0.00273		366.46	8	.99	20	
TCMX	A	5835.0	5908.6	5484.6	5497.3	5572.0	4739.7	5093.9	AVRG		1.84E-4		5447.3	8	.99	20	
Decachlorobiphenyl	A	7593.0	7648.2	7266.4	7063.1	6818.7	5670.0	5825.3	AVRG		1.46E-4		6840.7	12	.99	20	
Aroclor-1016 Peak # 1	B	190.00	203.00	187.74	192.70	181.66	158.89	164.97	AVRG		0.00547		182.71	9	.99	20	
Aroclor-1016 Peak # 2	B	643.10	604.32	553.32	555.04	545.11	465.64	483.77	AVRG		0.00182		550.04	11	.99	20	
Aroclor-1016 Peak # 3	B	274.20	259.80	252.02	246.65	242.56	208.03	212.91	AVRG		0.00413		242.31	10	.99	20	
Aroclor-1016 Peak # 4	B	157.30	142.92	141.52	132.46	129.54	113.15	113.43	AVRG		0.00752		132.90	12	.99	20	
Aroclor-1016 Peak # 5	B	166.40	159.36	162.45	159.29	155.99	132.53	139.67	AVRG		0.00651		153.67	8	.99	20	
Aroclor-1260 Peak # 1	B	809.50	785.72	766.74	712.80	671.05	571.85	586.89	AVRG		0.00143		700.65	14	.99	20	
Aroclor-1260 Peak # 2	B	356.20	455.24	479.95	470.47	469.69	391.24	418.18	AVRG		0.00230		434.42	11	.99	20	
Aroclor-1260 Peak # 3	B	350.30	354.72	376.24	367.03	355.87	300.05	315.20	AVRG		0.00289		345.63	8	.99	20	
Aroclor-1260 Peak # 4	B	1013.8	957.64	958.23	951.91	989.01	827.06	857.73	AVRG		0.00107		936.48	7	.99	20	
Aroclor-1260 Peak # 5	B	457.90	449.52	442.88	455.61	471.61	403.57	423.67	AVRG		0.00225		443.54	5	.99	20	
TCMX	B	6865.5	6867.2	6325.7	6550.3	6678.8	5712.3	6169.7	AVRG		1.55E-4		6452.8	6	.99	20	
Decachlorobiphenyl	B	10015	9952.2	9314.4	8789.6	8322.4	6899.5	7021.0	AVRG		1.16E-4		8616.3	15	.99	20	

Spiked Amounts / Drifts	Ch	L1	%D	L2	%D	L3	%D	L4	%D	L5	%D	L6	%D	L7	%D
Aroclor-1016 Peak # 1	A	10.000	**25**	25.000	12	100.00	3	250.00	0	500.00	-3	750.00	-20	1000.0	-16
Aroclor-1016 Peak # 2	A	10.000	14	25.000	9	100.00	5	250.00	4	500.00	-1	750.00	-15	1000.0	-15
Aroclor-1016 Peak # 3	A	10.000	10	25.000	6	100.00	6	250.00	3	500.00	2	750.00	-16	1000.0	-11
Aroclor-1016 Peak # 4	A	10.000	4	25.000	18	100.00	2	250.00	4	500.00	3	750.00	-17	1000.0	-14
Aroclor-1016 Peak # 5	A	10.000	6	25.000	17	100.00	4	250.00	2	500.00	0	750.00	-15	1000.0	-12
Aroclor-1260 Peak # 1	A	10.000	16	25.000	13	100.00	4	250.00	1	500.00	-1	750.00	-17	1000.0	-16
Aroclor-1260 Peak # 2	A	10.000	-7	25.000	1	100.00	4	250.00	6	500.00	8	750.00	-8	1000.0	-4
Aroclor-1260 Peak # 3	A	10.000	10	25.000	6	100.00	2	250.00	2	500.00	3	750.00	-13	1000.0	-10
Aroclor-1260 Peak # 4	A	10.000	5	25.000	4	100.00	0	250.00	3	500.00	6	750.00	-11	1000.0	-7
Aroclor-1260 Peak # 5	A	10.000	-8	25.000	-7	100.00	4	250.00	8	500.00	11	750.00	-7	1000.0	-1
TCMX	A	2.0000	7	5.0000	8	20.000	1	50.000	1	100.00	2	150.00	-13	200.00	-6
Decachlorobiphenyl	A	2.0000	11	5.0000	12	20.000	6	50.000	3	100.00	0	150.00	-17	200.00	-15
Aroclor-1016 Peak # 1	B	10.000	4	25.000	11	100.00	3	250.00	5	500.00	-1	750.00	-13	1000.0	-10
Aroclor-1016 Peak # 2	B	10.000	17	25.000	10	100.00	1	250.00	1	500.00	-1	750.00	-15	1000.0	-12
Aroclor-1016 Peak # 3	B	10.000	13	25.000	7	100.00	4	250.00	2	500.00	0	750.00	-14	1000.0	-12
Aroclor-1016 Peak # 4	B	10.000	18	25.000	8	100.00	6	250.00	0	500.00	-3	750.00	-15	1000.0	-15
Aroclor-1016 Peak # 5	B	10.000	8	25.000	4	100.00	6	250.00	4	500.00	2	750.00	-14	1000.0	-9
Aroclor-1260 Peak # 1	B	10.000	16	25.000	12	100.00	9	250.00	2	500.00	-4	750.00	-18	1000.0	-16
Aroclor-1260 Peak # 2	B	10.000	-18	25.000	5	100.00	10	250.00	8	500.00	8	750.00	-10	1000.0	-4
Aroclor-1260 Peak # 3	B	10.000	1	25.000	3	100.00	9	250.00	6	500.00	3	750.00	-13	1000.0	-9
Aroclor-1260 Peak # 4	B	10.000	8	25.000	2	100.00	2	250.00	2	500.00	6	750.00	-12	1000.0	-8
Aroclor-1260 Peak # 5	B	10.000	3	25.000	1	100.00	0	250.00	3	500.00	6	750.00	-9	1000.0	-4
TCMX	B	2.0000	6	5.0000	6	20.000	-2	50.000	2	100.00	4	150.00	-11	200.00	-4
Decachlorobiphenyl	B	2.0000	16	5.0000	16	20.000	8	50.000	2	100.00	-3	150.00	-20	200.00	-19

ICK 08/18/15 : Corrected automatically drawn baseline in all levels.

Analyst: ICK Date: 08/18/15 Reviewer: EAH Date: 08/19/15

Instrument amount = a0 + response * a1 + response^2 * a2; AVRG=Average response factor

205330219001

CURTIS & TOMPKINS 2ND SOURCE CALIBRATION SUMMARY FOR 269651 PCBS Soil
EPA 8082

Inst : GC06 Name : 1660_229
Calnum : 205330219001 Cal Date : 17-AUG-2015

ICV 205330219019 (229_019 18-AUG-2015) stds: S27898

Analyte	Ch	Spiked	Quant	Units	%D	Max	Flags
Aroclor-1016	A	250.0	233.5	pg/uL	-7	15	
Aroclor-1260	A	250.0	232.2	pg/uL	-7	15	
Aroclor-1016	B	250.0	234.2	pg/uL	-6	15	
Aroclor-1260	B	250.0	234.8	pg/uL	-6	15	

Analyst: ICK Date: 08/18/15 Reviewer: EAH Date: 08/19/15

CURTIS & TOMPKINS CONTINUING CALIBRATION FOR 269651 PCBS Soil
EPA 8082

Inst : GC06 Run Name : PCB500_100 IDF : 1.0
Seqnum : 205366201010 File : 254_010 Time : 11-SEP-2015 12:16
Cal : 205330219001 Caldate : 17-AUG-2015
Standards: S27717

Analyte	Ch	Avg RF/CF	RF/CF	Spiked	Quant	Units	%D	Max %D	Flags
Aroclor-1016	A			500.0	413.4	pg/uL	**-17**	15	c- ***
Aroclor-1260	A			500.0	333.2	pg/uL	**-33**	15	c- ***
TCMX	A	5447.3	5083.9	100.0	93.33	pg/uL	-7	15	
Decachlorobiphenyl	A	6840.7	5242.1	100.0	76.63	pg/uL	**-23**	15	c-
Aroclor-1016	B			500.0	478.3	pg/uL	-4	15	
Aroclor-1260	B			500.0	453.6	pg/uL	-9	15	
TCMX	B	6452.8	6727.4	100.0	104.3	pg/uL	4	15	
Decachlorobiphenyl	B	8616.3	7455.3	100.0	86.53	pg/uL	-13	15	

VQ 09/11/15 : Corrected automatically drawn baseline.

Analyst: VQ Date: 09/11/15 Reviewer: EAH Date: 09/11/15

-=low bias c=CCV

CURTIS & TOMPKINS CONTINUING CALIBRATION FOR 269651 PCBS Soil
EPA 8082

Inst : GC06 Run Name : PCB500_100 IDF : 1.0
Seqnum : 205366201028 File : 254_028 Time : 12-SEP-2015 00:10
Cal : 205330219001 Caldate : 17-AUG-2015
Standards: S27717

Analyte	Ch	Avg RF/CF	RF/CF	Spiked	Quant	Units	%D	Max %D	Flags
Aroclor-1016	A			500.0	471.8	pg/uL	-6	15	
Aroclor-1260	A			500.0	458.5	pg/uL	-8	15	
TCMX	A	5447.3	5568.5	100.0	102.2	pg/uL	2	15	
Decachlorobiphenyl	A	6840.7	5625.6	100.0	82.24	pg/uL	**-18**	15	c-
Aroclor-1016	B			500.0	535.6	pg/uL	7	15	
Aroclor-1260	B			500.0	559.0	pg/uL	12	15	
TCMX	B	6452.8	7355.7	100.0	114.0	pg/uL	14	15	
Decachlorobiphenyl	B	8616.3	8173.7	100.0	94.86	pg/uL	-5	15	

VQ 09/12/15 : Corrected automatically drawn baseline.

Analyst: VQ Date: 09/12/15 Reviewer: EAH Date: 09/14/15

-=low bias c=CCV

CURTIS & TOMPKINS CONTINUING CALIBRATION FOR 269651 PCBS Soil
EPA 8082

Inst : GC06 Run Name : PCB500_100 IDF : 1.0
Seqnum : 205366201044 File : 254_044 Time : 12-SEP-2015 07:30
Cal : 205330219001 Caldate : 17-AUG-2015
Standards: S27717

Analyte	Ch	Avg RF/CF	RF/CF	Spiked	Quant	Units	%D	Max %D	Flags
Aroclor-1016	A			500.0	486.4	pg/uL	-3	15	
Aroclor-1260	A			500.0	476.7	pg/uL	-5	15	
TCMX	A	5447.3	5675.5	100.0	104.2	pg/uL	4	15	
Decachlorobiphenyl	A	6840.7	5716.1	100.0	83.56	pg/uL	**-16**	15	c-
Aroclor-1016	B			500.0	567.5	pg/uL	13	15	
Aroclor-1260	B			500.0	584.1	pg/uL	**17**	15	c+ ***
TCMX	B	6452.8	7547.2	100.0	117.0	pg/uL	**17**	15	c+
Decachlorobiphenyl	B	8616.3	8241.3	100.0	95.65	pg/uL	-4	15	

VQ 09/12/15 : Corrected automatically drawn baseline.

Analyst: VQ Date: 09/12/15 Reviewer: EAH Date: 09/14/15
+=high bias -=low bias c=CCV

CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 205330219

Instrument : GC06 Begun : 08/17/15 07:39
Method : EPA 8082 SOP Version : pcb_rv10

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
001	229_001	X	HEX			08/17/15 07:39	1.0		
002	229_002	X	HEX			08/17/15 08:07	1.0		
003	229_003	CCV	PCB250_50			08/17/15 08:34	1.0	1	
005	229_005	X	HEX			08/17/15 20:16	1.0		
006	229_006	X	HEX			08/17/15 20:44	1.0		
007	229_007	X	HEX			08/17/15 21:12	1.0		
008	229_008	X	HEX			08/17/15 21:39	1.0		
009	229_009	X	HEX			08/17/15 22:07	1.0		
010	229_010	IB	CALIB			08/17/15 22:34	1.0		
011	229_011	ICAL	PCB10_2			08/17/15 23:02	1.0	2	
012	229_012	ICAL	PCB25_5			08/17/15 23:29	1.0	3	
013	229_013	ICAL	PCB100_20			08/17/15 23:57	1.0	4	
014	229_014	ICAL	PCB250_50			08/18/15 00:24	1.0	5	
015	229_015	ICAL	PCB500_100			08/18/15 00:52	1.0	6	
016	229_016	ICAL	PCB750_150			08/18/15 01:19	1.0	7	
017	229_017	ICAL	PCB1000_200			08/18/15 01:47	1.0	8	
018	229_018	X	HEX			08/18/15 02:14	1.0		
019	229_019	ICV	ULTRA_1660			08/18/15 02:42	1.0	9	
020	229_020	ICV	ULTRA_1660			08/18/15 03:09	1.0	9	
021	229_021	X	HEX			08/18/15 03:37	1.0		

ICK 08/18/15 : I verified that the vials loaded on the instrument matched the sequence data entry, for runs 1 through 21.

Standards used: 1=S27716 2=S26867 3=S26868 4=S26869 5=S26870 6=S26871 7=S26872 8=S26873 9=S27898

CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 205366201

Instrument : GC06 Begun : 09/11/15 07:21
Method : EPA 8082 SOP Version : pcb_rv10

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
001	254_001	X	HEX			09/11/15 07:21	1.0		
002	254_002	CCV	PCB500_100			09/11/15 07:49	1.0	1	
003	254_003	CCV	AR1242_250			09/11/15 08:41	1.0	2	
004	254_004	CCV	AR2154_250			09/11/15 09:09	1.0	3	
005	254_005	SAMPLE	269619-003	Miscell.	226955	09/11/15 09:36	20.0		6:PCB1221#5=3100
006	254_006	SAMPLE	269619-004	Miscell.	226955	09/11/15 10:04	1.0		
007	254_007	SAMPLE	269619-005	Miscell.	226955	09/11/15 10:31	50.0		5:PCB1221#5=2300
008	254_008	CCV	AR1242_250			09/11/15 11:21	1.0	2	
009	254_009	CCV	AR2154_250			09/11/15 11:48	1.0	3	
010	254_010	CCV	PCB500_100			09/11/15 12:16	1.0	1	
011	254_011	SAMPLE	269702-001	Soil	227014	09/11/15 16:22	1.0		
012	254_012	MSS	269701-001	Soil	227014	09/11/15 16:50	1.0		
013	254_013	BLANK	QC803153	Water	227051	09/11/15 17:18	1.0		
014	254_014	BS	QC803154	Water	227051	09/11/15 17:45	1.0		
015	254_015	BSD	QC803155	Water	227051	09/11/15 18:13	1.0		
016	254_016	SAMPLE	269667-002	Water	227051	09/11/15 18:40	1.0		
017	254_017	SAMPLE	269703-002	Water	227051	09/11/15 19:08	1.0		
018	254_018	BLANK	QC803199	Soil	227063	09/11/15 19:35	1.0		
019	254_019	LCS	QC803200	Soil	227063	09/11/15 20:03	1.0		
020	254_020	MSS	269601-001	Soil	227063	09/11/15 20:30	1.0		
021	254_021	MS	QC803201	Soil	227063	09/11/15 20:58	1.0		
022	254_022	MSD	QC803202	Soil	227063	09/11/15 21:25	1.0		
023	254_023	SAMPLE	269601-002	Soil	227063	09/11/15 21:53	1.0		
024	254_024	SAMPLE	269601-003	Soil	227063	09/11/15 22:20	1.0		
025	254_025	SAMPLE	269601-004	Soil	227063	09/11/15 22:48	1.0		14:PCB1221#2=28000
026	254_026	CCV	AR1242_250			09/11/15 23:15	1.0	2	
027	254_027	CCV	AR2154_250			09/11/15 23:43	1.0	3	
028	254_028	CCV	PCB500_100			09/12/15 00:10	1.0	1	
029	254_029	CCV	AR1242_250			09/12/15 00:38	1.0	2	
030	254_030	CCV	AR2154_250			09/12/15 01:05	1.0	3	
031	254_031	XCCV	PCB500_100			09/12/15 01:33	1.0	1	
032	254_032	SAMPLE	269601-005	Soil	227063	09/12/15 02:00	1.0		
033	254_033	SAMPLE	269601-006	Soil	227063	09/12/15 02:28	1.0		2:PCB1221#4=3200
034	254_034	SAMPLE	269601-007	Soil	227063	09/12/15 02:55	1.0		
035	254_035	SAMPLE	269601-008	Soil	227063	09/12/15 03:22	1.0		
036	254_036	SAMPLE	269615-001	Soil	227063	09/12/15 03:50	1.0		
037	254_037	SAMPLE	269651-001	Soil	227063	09/12/15 04:17	1.0		
038	254_038	SAMPLE	269654-001	Soil	227063	09/12/15 04:45	1.0		
039	254_039	SAMPLE	269654-002	Soil	227063	09/12/15 05:13	1.0		
040	254_040	MSS	269685-001	Soil	227063	09/12/15 05:40	1.0		
041	254_041	SAMPLE	269685-002	Soil	227063	09/12/15 06:08	1.0		7:PCB1254#5=2600
042	254_042	CCV	AR1242_250			09/12/15 06:35	1.0	2	
043	254_043	CCV	AR2154_250			09/12/15 07:03	1.0	3	
044	254_044	CCV	PCB500_100			09/12/15 07:30	1.0	1	
045	254_045	CCV	AR1242_250			09/12/15 07:57	1.0	2	
046	254_046	CCV	AR2154_250			09/12/15 08:25	1.0	3	
047	254_047	CCV	PCB500_100			09/12/15 08:53	1.0	1	
048	254_048	SAMPLE	269720-001	Soil	227063	09/12/15 09:20	1.0		
049	254_049	SAMPLE	269720-002	Soil	227063	09/12/15 09:48	1.0		
050	254_050	BLANK	QC803290	Oil	227085	09/12/15 10:15	1.0		
051	254_051	LCS	QC803291	Oil	227085	09/12/15 10:43	1.0		
052	254_052	SAMPLE	269720-003	Soil	227063	09/12/15 11:10	1.0		

CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 205366201

Instrument : GC06 Begun : 09/11/15 07:21
Method : EPA 8082 SOP Version : pcb_rv10

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
053	254_053	SAMPLE	269720-004	Soil	227063	09/12/15 11:38	1.0		
054	254_054	SAMPLE	269601-004	Soil	227063	09/12/15 12:05	20.0		
055	254_055	SAMPLE	269685-002	Soil	227063	09/12/15 12:33	10.0		
056	254_056	CCV	AR1242_250			09/12/15 13:00	1.0	2	
057	254_057	CCV	AR2154_250			09/12/15 13:28	1.0	3	
058	254_058	CCV	PCB500_100			09/12/15 13:55	1.0	1	

VQ 09/12/15 : I verified that the vials loaded on the instrument matched the sequence data entry, for runs 1 through 58.

Standards used: 1=S27717 2=S27428 3=S27920

SAMPLE PREPARATION SUMMARY

Batch # : 227063
Started By : GDM
Method : 3550B
Spike #1 ID : S27892
Prep Date : 11-SEP-2015 10:20
SOP Version : 8081_3550_rv15
Spike #2 ID : S27779
Analysis : 8081
Finished By : GDM
Units : g
Spike #3 ID : S27541

Sample	Stype	Matrix	Initial	Final	Clean DF	Prep DF	pH	Sp 1 Vol	Sp 2 Vol	Sp 3 Vol	Clean Method	Analysis	Comments
269601-001		Soil	30.24	20	1	0.6614		.8				PCB	
269601-002		Soil	30.33	20	1	0.6594		.8				PCB	
269601-003		Soil	30.36	20	1	0.6588		.8				PCB	
269601-004		Soil	30.31	20	1	0.6598		.8				PCB	
269601-005		Soil	30.42	20	1	0.6575		.8				PCB	
269601-006		Soil	30.34	20	1	0.6592		.8				PCB	
269601-007		Soil	30.1	20	1	0.6645		.8				PCB	
269601-008		Soil	30.12	20	1	0.664		.8				PCB	
269615-001		Soil	30.34	20	1	0.6592		.8				PCB	
269649-001		Soil	30.17	20	1	0.6629		.8				8081	
269651-001		Soil	30.3	20	1	0.6601		.8				PCB	
269654-001		Soil	30.44	20	1	0.657		.8				PCB	
269654-002		Soil	30.43	20	1	0.6572		.8				PCB	
269685-001		Soil	30.14	20	1	0.6636		.8				8081	
269685-002		Soil	30.39	20	1	0.6581		.8				8081, PCB	
269690-005		Soil	30.21	20	1	0.662		.8				8081	
269720-001		Soil	30.37	20	1	0.6585		.8				8081, PCB	
269720-002		Soil	29.56	20	1	0.6766		.8				8081, PCB	
269720-003		Soil	29.85	20	1	0.67		.8				8081, PCB	
269720-004		Soil	29.75	20	1	0.6723		.8				8081, PCB	
QC803199	BLANK	Soil	30.14	20	1	0.6636		.8				PCB	
QC803200	LCS	Soil	30.45	20	1	0.6568		.8	1			PCB	
QC803201	MS	Soil	30.3	20	1	0.6601		.8	1			PCB	
QC803202	MSD	Soil	30.33	20	1	0.6594		.8	1			PCB	
QC803203	LCS	Soil	30.15	20	1	0.6633		.8		.4		8081	
QC803204	MS	Soil	30.13	20	1	0.6638		.8		.4		8081	
QC803205	MSD	Soil	30.15	20	1	0.6633		.8		.4		8081	

ICK 09/14/15 : PCB ready for review.

AVW 09/14/15 : Matrix spikes QC803204,QC803205 (batch 227063) were not analyzed because the parent sample required a dilution that would have diluted out the spikes.

ICK: 09/14/15 AVW: 09/14/15 EAH: 09/14/15

TITLE PROJECT DATE

Continued from page

Sample ID		Weight	Analysis	Batch #	Scale Used	Comments
269585-002	A	30.17	8081	227063	Dish 1	Aliased 269585-001
	4	29.91				-003
	6	30.12				-005
	8	30.21				-007
269601-001	A	30.24	PCB			
	2	30.33				
	3	30.36				
	4	30.31				
	5	30.42				
	6	30.34				
	7	30.10				
	8	30.12				
269615-001	AC	30.34	PCB			
269649-001	BA	30.17	8081			
269651-001	B	30.30	PCB			
269654-001		30.44				
2		30.43				
269685-001	A	30.14	P/P			
2		30.39				
269690-005	Comp	30.21	8081			Comp of 269690-001-004
MB	N/A	30.14	P/P			FS148781
LCS		30.15	8081			
MS		30.13				269685-~~001~~ ~~269601-001~~
MSD		30.15				GDM 9/11/15
LCS		30.45	PCB			FS148781
MS		30.30				269601-001 ~~269685-001~~
MSD		30.33				GDM 9/11/15

GDM 9/11/15

269720-001	B	30.37	P/P		Dish 1	
	2	29.56				
	3	29.85				
	4	29.75				

AR6 9/11/15

Continued to page

SIGNATURE DATE

DISCLOSED TO AND UNDERSTOOD BY DATE

PROPRIETARY INFORMATION

Curtis & Tompkins, Ltd. **Florisil Cleanup** **EPA 3620B**

Prep Chemist: GDM
Cleanup Date: 9/11/15

Benchbook # **BK 3684**
Page 17

Sample #	Extraction Batch#	Initial Volume (mL)	Final Volume (mL)	Comments
269649-001	227063	☑ 1.0 ☐	☑ 1.0 ☐	
269685-001	|	☑ 1.0 ☐	☑ 1.0 ☐	
⊥ 2	|	☑ 1.0 ☐	☑ 1.0 ☐	
269690-005	|	☑ 1.0 ☐	☑ 1.0 ☐	
269720-001	|	☑ 1.0 ☐	☑ 1.0 ☐	
| 2	|	☑ 1.0 ☐	☑ 1.0 ☐	
| 3	|	☑ 1.0 ☐	☑ 1.0 ☐	
⊥ 4	|	☑ 1.0 ☐	☑ 1.0 ☐	
MB QC803199	|	☑ 1.0 ☐	☑ 1.0 ☐	
LCS QC803203	|	☑ 1.0 ☐	☑ 1.0 ☐	
MS | 4	|	☑ 1.0 ☐	☑ 1.0 ☐	
MSD ⊥ 5	⊥	☑ 1.0 ☐	☑ 1.0 ☐	
		☐ 1.0 ☐	☐ 1.0 ☐	
		☐ 1.0 ☐	☐ 1.0 ☐	
		☐ 1.0 ☐	☐ 1.0 ☐	
		☐ 1.0 ☐	☐ 1.0 ☐	
		☐ 1.0 ☐	☐ 1.0 ☐	
		☐ 1.0 ☐	☐ 1.0 ☐	
		☐ 1.0 ☐	☐ 1.0 ☐	
		☐ 1.0 ☐	☐ 1.0 ☐	
		☐ 1.0 ☐	☐ 1.0 ☐	
		☐ 1.0 ☐	☐ 1.0 ☐	
		☐ 1.0 ☐	☐ 1.0 ☐	
		☐ 1.0 ☐	☐ 1.0 ☐	
		☐ 1.0 ☐	☐ 1.0 ☐	
		☐ 1.0 ☐	☐ 1.0 ☐	
		☐ 1.0 ☐	☐ 1.0 ☐	
		☐ 1.0 ☐	☐ 1.0 ☐	
		☐ 1.0 ☐	☐ 1.0 ☐	
		☐ 1.0 ☐	☐ 1.0 ☐	KK 9/14/15

	Mfg & Lot # / Time / Program	Initials / Date
☑ Extracts were cleaned up using Florisil cartridges	RCS2713604	GDM 9/11/15
Florisil cartridges/ columns rinsed 3x with Hexane	F5153229	|
Extracts were eluted with 9.0 mL ~~9.T~~ Hexane/Acetone 8:2 — Hexane	F5153229	|
Acetone	FC153394	|
Concentrated to volumes as noted above	✓	⊥

Extraction Chemist / Date: [signature] 9/11/15

Continued from page —
Continued on page —

Reviewed by / Date: [signature] 9/14/15

PCB (8082) Soil Prep Log

Curtis & Tompkins, Ltd.

LIMS Batch No: 227063 ☑ EPA 3550b Sonication

LIMS Analysis PCB (P/P) ☐ Other _____

Date Extracted: 9/11/15

BK 3702

	Sample #	Container ID	Sample Wt (g)	Final Vol (mL)	Comments
	269601-001	A	30.24	☐ 25.0 ☒ 20.0	
	2		30.33	☐ 25.0 ☒ 20.0	
	3		30.36	☐ 25.0 ☒ 20.0	
	4		30.31	☐ 25.0 ☒ 20.0	
5	5		30.42	☐ 25.0 ☒ 20.0	
	6		30.34	☐ 25.0 ☒ 20.0	
	7		30.10	☐ 25.0 ☒ 20.0	
	8		30.12	☐ 25.0 ☒ 20.0	
	269615-001	C	30.34	☐ 25.0 ☒ 20.0	
10	269651-001	D	30.30	☐ 25.0 ☒ 20.0	
	269654-001	B	30.44	☐ 25.0 ☒ 20.0	
	2		30.43	☐ 25.0 ☒ 20.0	
	269685-001	A	30.14	☐ 25.0 ☒ 20.0	
	2		30.39	☐ 25.0 ☒ 20.0	
15	269720-001	B	30.37	☐ 25.0 ☒ 20.0	
	2		29.56	☐ 25.0 ☒ 20.0	
	3		29.85	☐ 25.0 ☒ 20.0	
	4		29.75	☐ 25.0 ☒ 20.0	
	MB QC803199	N/A	30.14	☐ 25.0 ☒ 20.0	QC803199
20	LCS 320X B		30.45	☐ 25.0 ☒ 20.0	200
	MS 320X H		30.30	☐ 25.0 ☒ 20.0	201
	MSD 320X 8		30.33	☐ 25.0 ☒ 20.0	202
	ICK 9/14/15			☐ 25.0 ☐ ____	
				☐ 25.0 ☐ ____	
				☐ 25.0 ☐ ____	ICK 9/14/15

☐ MS/MSD not included due to: ☐ insufficent volume, or ☐ other (reason) _____

	Mfg & Lot # / LIMS # / Time	Initials / Date
Solvent-rinsed granular Na_2SO_4 weighed out for QC samples	FS148781	GDM 9/11/15
dried with CH_2Cl_2-rinsed ☒ granular Na_2SO_4 ☐ powder	↓	
0.8 mL of surrogate solution was added to all samples	S27892	
1.0 mL of matrix spiking solution was added to all spikes	S27779	
1:1 CH_2Cl_2 (lot# FS141085):Acetone(lot# FC153394) was added to all	✓	
Solvent added at (time)	1020	
☒ sonicated 3 times w/ ≥100mL ☐ soxhlet extractors on at:	✓	
Soxhlets off at:	N/A	
Extracts filtered through baked, CH_2Cl_2-rinsed ~~powdered~~ granular Na_2SO_4	FS148781	
Solvent exchanged with Hexane, Lot#	FS153829	
Concentrated to final volume at temperature (degrees C)	100	
EPA 3665A Clean-up: vortexed w/ H_2SO_4 Lot#	FS152524	
Centrifuged for 1 min; 5mL transferred to labelled vial	✓	
Relinquished to PCB group	✓	

9/11/15

Extraction Chemist / Date

Continued from page ____

Continued on page ____

9/14/15

Reviewed by / Date

8081 Soil Prep Log — Curtis & Tompkins, Ltd.

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Extraction Method: ☑ EPA 3550b Sonication ☐ _____

Cleanup Method: ☒ EPA 3620b Florisil

LIMS Batch No: 227063

Date Extracted: 9/11/15

	Sample #	Container ID	Sample Wt (g)	Final Vol (mL)	Comments
	269649-001	A	30.17	☑ 20.0 ☐	
	269685-001	A	30.14	☑ 20.0 ☐	
	〃 2	〃	30.39	☑ 20.0 ☐	
	269690-005	comp	30.21	☑ 20.0 ☐	
5	269720-001	B	30.37	☑ 20.0 ☐	
	〃 2	〃	29.56	☑ 20.0 ☐	
	〃 3	〃	29.85	☑ 20.0 ☐	
	〃 4	〃	29.75	☑ 20.0 ☐	
	MB QC803199	N/A	30.14	☑ 20.0 ☐	
10	LCS QC803200	〃	30.15	☑ 20.0 ☐	QC803203
	MS 〃 1	〃	30.13	☑ 20.0 ☐	↓ 4
	MSD 〃 2	〃	30.15	☑ 20.0 ☐	↓ 5
	MK 9/14/15			☐ 20.0 ☐	
				☐ 20.0 ☐	
15				☐ 20.0 ☐	
				☐ 20.0 ☐	
				☐ 20.0 ☐	
				☐ 20.0 ☐	
				☐ 20.0 ☐	
20				☐ 20.0 ☐	
				☐ 20.0 ☐	
				☐ 20.0 ☐	
				☐ 20.0 ☐	
				☐ 20.0 ☐	
				☐ 20.0 ☐	MK 9/14/15

	Mfg & Lot # / LIMS # / Time	Initials / Date
Solvent-rinsed granular Na_2SO_4 weighed out for QC samples	FS148781	GDM 9/11/15
dried with CH_2Cl_2-rinsed ☑ granular Na_2SO_4 ☐ powder	〃	
0.8 mL of surrogate solution was added to all samples	S2 7892	
0.4 mL of spike solution was added to all spikes	S27541	
1:1 CH_2Cl_2 (lot# FS140885):Acetone(lot# FC15339 4) was added to all	✓	
Solvent added at (time)	1020	
☑ sonicated 3 times w/ ≥100mL ☐ soxhlet extractors on at:	✓	
soxhlets off at:	N/A	
Extracts filtered through baked, CH_2Cl_2-rinsed ~~powdered~~ granular Na_2SO_4	FS148781	
Exchanged 2x with Hexane	FS153229	
Concentrated to final volume at temperature (degrees C)	100	
☒ Florisil Cleanup Performed	✓	
Extracts relinquished to Pesticide Group	✓	

9/11/15
Extraction Chemist / Date

Continued from page ____
Continued on page ____

9/14/15
Reviewed by / Date

REPORTING SUMMARY FOR 269651 PCBS Soil

Sample ID	Analyte	Inst ID	Ch	Date & Time
269651-001	Aroclor-1016	GC06	A	09/12/15 04:17
269651-001	Aroclor-1221	GC06	A	09/12/15 04:17
269651-001	Aroclor-1232	GC06	A	09/12/15 04:17
269651-001	Aroclor-1242	GC06	A	09/12/15 04:17
269651-001	Aroclor-1248	GC06	A	09/12/15 04:17
269651-001	Aroclor-1254	GC06	A	09/12/15 04:17
269651-001	Aroclor-1260	GC06	A	09/12/15 04:17
269651-001	TCMX	GC06	A	09/12/15 04:17
269651-001	Decachlorobiphenyl	GC06	A	09/12/15 04:17
QC803199	Aroclor-1016	GC06	B	09/11/15 19:35
QC803199	Aroclor-1221	GC06	B	09/11/15 19:35
QC803199	Aroclor-1232	GC06	B	09/11/15 19:35
QC803199	Aroclor-1242	GC06	B	09/11/15 19:35
QC803199	Aroclor-1248	GC06	B	09/11/15 19:35
QC803199	Aroclor-1254	GC06	B	09/11/15 19:35
QC803199	Aroclor-1260	GC06	B	09/11/15 19:35
QC803199	TCMX	GC06	A	09/11/15 19:35
QC803199	Decachlorobiphenyl	GC06	A	09/11/15 19:35
QC803200	Aroclor-1016	GC06	B	09/11/15 20:03
QC803200	Aroclor-1260	GC06	B	09/11/15 20:03
QC803200	TCMX	GC06	B	09/11/15 20:03
QC803200	Decachlorobiphenyl	GC06	B	09/11/15 20:03
QC803201	Aroclor-1016	GC06	B	09/11/15 20:58
QC803201	Aroclor-1260	GC06	B	09/11/15 20:58
QC803201	TCMX	GC06	B	09/11/15 20:58
QC803201	Decachlorobiphenyl	GC06	B	09/11/15 20:58
QC803202	Aroclor-1016	GC06	B	09/11/15 21:25
QC803202	Aroclor-1260	GC06	B	09/11/15 21:25
QC803202	TCMX	GC06	B	09/11/15 21:25
QC803202	Decachlorobiphenyl	GC06	B	09/11/15 21:25

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 269651
ANALYTICAL REPORT
Metals

Tetra Tech EMI	Project : 103S225322.01
1999 Harrison Street	Location : B163 Phytoremediation
Oakland, CA 94612	Level : IV

Sample ID	Lab ID
20150908 B163PHYTO	269651-001

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: _____ Date: 09/23/2015

Mike Dahlquist
Project Manager
mike.dahlquist@ctberk.com

CA ELAP# 2896, NELAP# 4044-001

Curtis & Tompkins, Ltd.

CASE NARRATIVE
METALS (EPA 6010B AND EPA 7471A)

Laboratory number:	**269651**
Client:	**Tetra Tech EMI**
Project:	**103S225322.01**
Location:	**B163 Phytoremediation**
Request Date:	**09/08/15**
Samples Received:	**09/08/15**

This data package contains sample and QC results for one soil sample, requested for the above referenced project on 09/08/15. See attached cooler receipt form for any sample receipt problems or discrepancies.

Metals (EPA 6010B and EPA 7471A):

High % difference was observed for arsenic in the serial dilution of 20150908 B163PHYTO (lab # 269651-001).

No other analytical problems were encountered.

Chain of Custody

269651

Tetra Tech EM Inc.
San Francisco Office

135 Main St. Suite 1800
San Francisco. CA 94105
415-543-4880
Fax 415-543-5480

Chain of Custody Record No. 5368

Page 1 of 1

5368

Lab PO#: to follow	**Lab:** CT		
Project name: B163 phytoremediation	**TtEMI technical contact:** Sara Woolley	**Field samplers:** Dayna Aragon	
Project (CTO) number: 10352253.22.01	**TtEMI project manager:** Jason Brodersen	**Field samplers' signatures:** Dayna	

Sample ID	Sample Location (Pt. ID)	Date	Time	Matrix	MS / MSD	No./Container Types: 40 ml VOA	1 liter Amber	500 ml Poly	Sleeve	Glass Jar 4oz	Preservative Added: Nitric	Nitric	Nitric	Analysis Required: VOA	SVOA	~~Pest~~/PCBs	Metals * As, Hg, Pb	TPH Purgeables	TPH Extractables	PAH SIM
20150908 B163 phyto		9/8/15	0915	soil						2							X	X		X

	Name (print)	Company Name	Date	Time
Relinquished by: Dayna Aragon	Dayna Aragon	Tetra Tech	9/8/15	1130
Received by: Pat Gonzalez	Pat Gonzalez	CT	9/18/15	11.30
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

Turnaround time/remarks:
* individual metals: As, Hg, Pb

Fed Ex #:

WHITE-Laboratory Copy YELLOW-Sample Tracker PINK-File Copy

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 269651 Date Received 9/8/15 Number of coolers 1
Client Tetra Tech Project B163 Phytoremediation

Date Opened 9/8 By (print) SL (sign)
Date Logged in ↓ By (print) ↓ (sign) ↓

1. Did cooler come with a shipping slip (airbill, etc) _____ YES (NO)
Shipping info _____

2A. Were custody seals present? .... ☐ YES (circle) on cooler on samples ☒ NO
How many _____ Name _____ Date _____
2B. Were custody seals intact upon arrival? _____ YES NO N/A
3. Were custody papers dry and intact when received? _____ YES NO
4. Were custody papers filled out properly (ink, signed, etc)? _____ YES NO
5. Is the project identifiable from custody papers? (If so fill out top of form) YES NO
6. Indicate the packing in cooler: (if other, describe) _____

☐ Bubble Wrap ☐ Foam blocks ☐ Bags ☐ None
☐ Cloth material ☒ Cardboard ☐ Styrofoam ☐ Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

Type of ice used: ☒ Wet ☐ Blue/Gel ☐ None Temp(°C) 5.6°C

☐ Samples Received on ice & cold without a temperature blank; temp. taken with IR gun

☐ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? _____ YES (NO)
If YES, what time were they transferred to freezer? _____
9. Did all bottles arrive unbroken/unopened? _____ YES NO
10. Are there any missing / extra samples? _____ YES (NO)
11. Are samples in the appropriate containers for indicated tests? _____ YES NO
12. Are sample labels present, in good condition and complete? _____ YES NO
13. Do the sample labels agree with custody papers? _____ YES NO
14. Was sufficient amount of sample sent for tests requested? _____ YES NO
15. Are the samples appropriately preserved? _____ YES NO N/A
16. Did you check preservatives for all bottles for each sample? _____ YES NO N/A
17. Did you document your preservative check? _____ YES NO N/A
18. Did you change the hold time in LIMS for unpreserved VOAs? _____ YES NO N/A
19. Did you change the hold time in LIMS for preserved terracores? _____ YES NO N/A
20. Are bubbles > 6mm absent in VOA samples? _____ YES NO N/A
21. Was the client contacted concerning this sample delivery? _____ YES (NO)
If YES, Who was called? _____ By _____ Date: _____

COMMENTS

_____
_____
_____
_____
_____
_____

Rev 10, 9/12

Results & QC Summary

Curtis & Tompkins, Ltd.

Metals Analytical Report

Lab #:	269651	Project#:	103S225322.01
Client:	Tetra Tech EMI	Location:	B163 Phytoremediation
Field ID:	20150908 B163PHYTO	Basis:	dry
Matrix:	Soil	Sampled:	09/08/15
Units:	mg/Kg	Received:	09/08/15

Type: SAMPLE
Lab ID: 269651-001
Moisture: 11%

Analyte	Result	RL	MDL	Diln Fac	Batch#	Prepared	Analyzed	Prep	Analysis
Arsenic	110	0.29	0.095	1.000	227255	09/16/15	09/17/15	EPA 3050B	EPA 6010B
Lead	140	0.29	0.084	1.000	227255	09/16/15	09/17/15	EPA 3050B	EPA 6010B
Mercury	2.9	0.18	0.010	10.00	226927	09/09/15	09/09/15	METHOD	EPA 7471A

Type: BLANK
Lab ID: QC802686
Diln Fac: 1.000
Batch#: 226927
Prepared: 09/08/15
Analyzed: 09/08/15
Prep: METHOD
Analysis: EPA 7471A

Analyte	Result	RL	MDL
Mercury	ND	0.017	0.0011

Type: BLANK
Lab ID: QC803955
Diln Fac: 1.000
Batch#: 227255
Prepared: 09/16/15
Analyzed: 09/17/15
Prep: EPA 3050B
Analysis: EPA 6010B

Analyte	Result	RL	MDL
Arsenic	ND	0.25	0.083
Lead	ND	0.25	0.073

ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Metals Analytical Report

Lab #:	269651	Location:	B163 Phytoremediation
Client:	Tetra Tech EMI	Prep:	METHOD
Project#:	103S225322.01	Analysis:	EPA 7471A
Analyte:	Mercury	Diln Fac:	1.000
Type:	LCS	Batch#:	226927
Lab ID:	QC802687	Prepared:	09/08/15
Matrix:	Soil	Analyzed:	09/08/15
Units:	mg/Kg		

Spiked	Result	%REC	Limits
0.2083	0.1945	93	80-120

Curtis & Tompkins, Ltd.

Batch QC Report

Metals Analytical Report

Lab #:	269651	Location:	B163 Phytoremediation
Client:	Tetra Tech EMI	Prep:	METHOD
Project#:	103S225322.01	Analysis:	EPA 7471A
Analyte:	Mercury	Diln Fac:	5.000
Field ID:	ZZZZZZZZZZ	Batch#:	226927
MSS Lab ID:	269572-001	Sampled:	09/01/15
Matrix:	Soil	Received:	09/03/15
Units:	mg/Kg	Prepared:	09/08/15
Basis:	dry	Analyzed:	09/08/15

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	Moisture	RPD	Lim
MS	QC802688	3.791	0.4735	4.645	180 NM	69-142	56%		
MSD	QC802689		0.4898	4.298	104 NM	69-142	56%	8	36

NM= Not Meaningful: Sample concentration > 4X spike concentration
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Metals Analytical Report

Lab #:	269651	Location:	B163 Phytoremediation
Client:	Tetra Tech EMI	Prep:	METHOD
Project#:	103S225322.01	Analysis:	EPA 7471A
Analyte:	Mercury	Basis:	dry
Field ID:	ZZZZZZZZZZ	Diln Fac:	25.00
Type:	Serial Dilution	Batch#:	226927
MSS Lab ID:	269572-001	Sampled:	09/01/15
Lab ID:	QC802690	Received:	09/03/15
Matrix:	Soil	Analyzed:	09/08/15
Units:	mg/Kg		

MSS Result	MSS RL	Result	RL	Moisture %	Diff	Lim
3.791	0.1926	4.079	0.9630	56%	8	10

RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Metals Analytical Report

Lab #:	269651	Location:	B163 Phytoremediation
Client:	Tetra Tech EMI	Prep:	EPA 3050B
Project#:	103S225322.01	Analysis:	EPA 6010B
Matrix:	Soil	Batch#:	227255
Units:	mg/Kg	Prepared:	09/16/15
Diln Fac:	1.000	Analyzed:	09/17/15

Type: BS Lab ID: QC803956

Analyte	Spiked	Result	%REC	Limits
Arsenic	50.00	49.38	99	80-120
Lead	50.00	46.16	92	80-120

Type: BSD Lab ID: QC803957

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Arsenic	50.00	49.90	100	80-120	1	20
Lead	50.00	46.37	93	80-120	0	20

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Metals Analytical Report

Lab #:	269651	Location:	B163 Phytoremediation
Client:	Tetra Tech EMI	Prep:	EPA 3050B
Project#:	103S225322.01	Analysis:	EPA 6010B
Field ID:	20150908 B163PHYTO	Batch#:	227255
MSS Lab ID:	269651-001	Sampled:	09/08/15
Matrix:	Soil	Received:	09/08/15
Units:	mg/Kg	Prepared:	09/16/15
Basis:	dry	Analyzed:	09/17/15
Diln Fac:	1.000		

Type: MS Moisture: 11%
Lab ID: QC803958

Analyte	MSS Result	Spiked	Result	%REC	Limits
Arsenic	112.9	56.75	171.7	104	69-120
Lead	140.7	56.75	180.7	70	53-125

Type: MSD Moisture: 11%
Lab ID: QC803959

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Arsenic	56.18	176.2	113	69-120	3	35
Lead	56.18	194.4	96	53-125	8	42

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Metals Analytical Report

Lab #:	269651	Location:	B163 Phytoremediation
Client:	Tetra Tech EMI	Prep:	EPA 3050B
Project#:	103S225322.01	Analysis:	EPA 6010B
Field ID:	20150908 B163PHYTO	Basis:	dry
Type:	Serial Dilution	Diln Fac:	5.000
MSS Lab ID:	269651-001	Batch#:	227255
Lab ID:	QC803960	Sampled:	09/08/15
Matrix:	Soil	Received:	09/08/15
Units:	mg/Kg	Analyzed:	09/17/15

Moisture: 11%

Analyte	MSS Result	MSS RL	Result	RL	% Diff	Lim
Arsenic	112.9	0.2866	97.85	1.433	13 *	10
Lead	140.7	0.2866	130.8	1.433	7	10

*= Value outside of QC limits; see narrative
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Metals Analytical Report

Lab #:	269651	Location:	B163 Phytoremediation
Client:	Tetra Tech EMI	Prep:	EPA 3050B
Project#:	103S225322.01	Analysis:	EPA 6010B
Field ID:	20150908 B163PHYTO	Basis:	dry
Type:	Post Digest Spike	Diln Fac:	1.000
MSS Lab ID:	269651-001	Batch#:	227255
Lab ID:	QC803961	Sampled:	09/08/15
Matrix:	Soil	Received:	09/08/15
Units:	mg/Kg	Analyzed:	09/17/15

Moisture: 11%

Analyte	MSS Result	Spiked	Result	%REC	Limits
Arsenic	112.9	5.733	103.8	-158 NM	75-125
Lead	140.7	5.733	129.0	-203 NM	75-125

NM= Not Meaningful: Sample concentration > 4X spike concentration

REPORTING SUMMARY FOR 269651 METALS Soil
Curtis & Tompkins Laboratories

Lab ID	Inst ID	Analyzed	IDF	AS	PB	HG
269651-001	MET54	09/09/15 15:51	1.0			
269651-001	MET54	09/09/15 15:54	10.0			+
269651-001	MET08	09/17/15 08:58	1.0	+	+	
269651-001	MET08	09/17/15 10:34	100.0			
269651-001	MET09	09/17/15 11:34	1.0			
QC802686	MET44	09/08/15 13:01	1.0			+
QC802686	MET54	09/09/15 15:39	1.0			
QC802687	MET44	09/08/15 13:02	1.0			+
QC802687	MET54	09/09/15 15:40	1.0			
QC802688	MET44	09/08/15 13:06	1.0			
QC802688	MET44	09/08/15 13:12	5.0			+
QC802689	MET44	09/08/15 13:07	1.0			
QC802689	MET44	09/08/15 13:13	5.0			+
QC802690	MET44	09/08/15 13:09	5.0			
QC802690	MET44	09/08/15 13:16	25.0			+
QC803955	MET08	09/17/15 08:36	1.0	+	+	
QC803955	MET09	09/17/15 11:20	1.0			
QC803956	MET08	09/17/15 08:41	1.0	+	+	
QC803956	MET09	09/17/15 11:25	5.0			
QC803957	MET08	09/17/15 08:49	1.0	+	+	
QC803957	MET09	09/17/15 11:29	5.0			
QC803958	MET08	09/17/15 09:05	1.0	+	+	
QC803958	MET09	09/17/15 11:41	5.0			
QC803959	MET08	09/17/15 09:11	1.0	+	+	
QC803959	MET09	09/17/15 11:48	5.0			
QC803960	MET09	09/17/15 20:52	5.0	+	+	
QC803961	MET09	09/17/15 21:16	1.0	+	+	

CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 85374709

Instrument : MET08 Begun : 09/17/15 05:09
Method : EPA 6010B SOP Version : icp metals_rv17

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
001	met08_sn_6010	ICALBLK				09/17/15 05:09	1.0		
002	met08_sn_6010	ICAL	L1			09/17/15 05:14	1.0	1	
003	met08_sn_6010	ICAL	L2			09/17/15 05:19	1.0	2	
004	met08_sn_6010	ICAL	L3			09/17/15 05:24	1.0	3	
005	met08_sn_6010	ICAL	L4			09/17/15 05:29	1.0	4	
006	met08_sn_6010	ICAL	L5			09/17/15 05:36	1.0	5	
007	met08_sn_6010	ICV				09/17/15 05:42	1.0	6	
008	met08_sn_6010	XCRI				09/17/15 05:49	1.0	7	
009	met08_sn_6010	CRI				09/17/15 06:21	1.0	7	
010	met08_sn_6010	ICB				09/17/15 06:37	1.0		
011	met08_sn_6010	ICSA				09/17/15 06:42	1.0	8	10:AL=500000
012	met08_sn_6010	ICSAB				09/17/15 07:19	1.0	9	4:CA=520000
013	met08_sn_6010	BLANK	QC803955	Soil	227255	09/17/15 08:36	1.0		
014	met08_sn_6010	BS	QC803956	Soil	227255	09/17/15 08:41	1.0		6:FE=100000
015	met08_sn_6010	BSD	QC803957	Soil	227255	09/17/15 08:49	1.0		6:FE=100000
016	met08_sn_6010	MSS	269651-001	Soil	227255	09/17/15 08:58	1.0		4:FE=1700000
017	met08_sn_6010	MS	QC803958	Soil	227255	09/17/15 09:05	1.0		7:FE=1600000
018	met08_sn_6010	MSD	QC803959	Soil	227255	09/17/15 09:11	1.0		7:FE=1700000
019	met08_sn_6010	SAMPLE	269839-001	Soil	227255	09/17/15 09:18	1.0		2:FE=210000
020	met08_sn_6010	SAMPLE	269839-003	Soil	227255	09/17/15 09:26	1.0		3:FE=310000
021	met08_sn_6010	SAMPLE	269839-005	Soil	227255	09/17/15 09:33	1.0		2:FE=200000
022	met08_sn_6010	SAMPLE	269839-008	Soil	227255	09/17/15 09:40	1.0		2:FE=200000
023	met08_sn_6010	CCV				09/17/15 09:48	1.0	10	
024	met08_sn_6010	CCB				09/17/15 09:55	1.0		
025	met08_sn_6010	SAMPLE	269839-009	Soil	227255	09/17/15 10:00	1.0		3:FE=250000
026	met08_sn_6010	SAMPLE	269839-010	Soil	227255	09/17/15 10:08	1.0		3:FE=240000
027	met08_sn_6010	SAMPLE	269839-011	Soil	227255	09/17/15 10:15	1.0		3:FE=260000
028	met08_sn_6010	SAMPLE	269839-012	Soil	227255	09/17/15 10:23	1.0		3:FE=250000
029	met08_sn_6010	MSS	269651-001	Soil	227255	09/17/15 10:34	100.0		
030	met08_sn_6010	CCV				09/17/15 10:39	1.0	10	
031	met08_sn_6010	CCB				09/17/15 10:46	1.0		
032	met08_sn_6010	BLANK	QC803522	Soil	227147	09/17/15 10:51	1.0		
033	met08_sn_6010	BS	QC803523	Soil	227147	09/17/15 10:56	5.0		
034	met08_sn_6010	BSD	QC803524	Soil	227147	09/17/15 11:00	5.0		
035	met08_sn_6010	MSS	269685-001	Soil	227147	09/17/15 11:05	100.0		
036	met08_sn_6010	MS	QC803525	Soil	227147	09/17/15 11:14	5.0		5:FE=1100000
037	met08_sn_6010	MSD	QC803526	Soil	227147	09/17/15 11:21	5.0		4:FE=1300000
038	met08_sn_6010	SER	QC803527	Soil	227147	09/17/15 11:28	500.0		
039	met08_sn_6010	PDS	QC803528	Soil	227147	09/17/15 11:33	100.0	11 12 13	
040	met08_sn_6010	SAMPLE	269685-002	Soil	227147	09/17/15 11:40	100.0		
041	met08_sn_6010	SAMPLE	269658-006	Soil	227147	09/17/15 11:44	1.0		5:CA=520000
042	met08_sn_6010	CCV				09/17/15 11:51	1.0	10	
043	met08_sn_6010	CCB				09/17/15 11:58	1.0		
044	met08_sn_6010	SAMPLE	269685-002	Soil	227147	09/17/15 12:03	1.0		5:FE=410000
045	met08_sn_6010	X	RINSE			09/17/15 12:10	1.0		
046	met08_sn_6010	X	RINSE			09/17/15 12:15	1.0		
047	met08_sn_6010	X	RINSE			09/17/15 12:20	1.0		
048	met08_sn_6010	BS	QC803523	Soil	227147	09/17/15 12:25	5.0		
049	met08_sn_6010	BSD	QC803524	Soil	227147	09/17/15 12:29	5.0		
050	met08_sn_6010	CCV				09/17/15 12:33	1.0	10	
051	met08_sn_6010	CCB				09/17/15 12:40	1.0		
052	met08_sn_6010	BS	QC803523	Soil	227147	09/17/15 12:45	1.0		6:MG=110000

CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 85374709

Instrument : MET08 Begun : 09/17/15 05:09
Method : EPA 6010B SOP Version : icp metals_rv17

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
053	met08_sn_6010	BSD	QC803524	Soil	227147	09/17/15 12:53	1.0		6:MG=110000
054	met08_sn_6010	X	RINSE			09/17/15 13:00	1.0		
055	met08_sn_6010	X	RINSE			09/17/15 13:05	1.0		
056	met08_sn_6010	X	RINSE			09/17/15 13:10	1.0		
057	met08_sn_6010	BS	QC803523	Soil	227147	09/17/15 13:15	5.0		
058	met08_sn_6010	BSD	QC803524	Soil	227147	09/17/15 13:19	5.0		
059	met08_sn_6010	CCV				09/17/15 13:24	1.0	10	
060	met08_sn_6010	CCB				09/17/15 13:30	1.0		
061	met08_sn_6010	X	RINSE			09/17/15 13:35	1.0		
062	met08_sn_6010	X	RINSE			09/17/15 13:40	1.0		
063	met08_sn_6010	X	RINSE			09/17/15 13:45	1.0		
064	met08_sn_6010	X	RINSE			09/17/15 13:50	1.0		
065	met08_sn_6010	X	RINSE			09/17/15 13:55	1.0		
066	met08_sn_6010	X	RINSE			09/17/15 14:01	1.0		
067	met08_sn_6010	CCV				09/17/15 14:06	1.0	10	
068	met08_sn_6010	CCB				09/17/15 14:12	1.0		
069	met08_sn_6010	BLANK	QC803797	Miscell.	227215	09/17/15 14:31	1.0		
070	met08_sn_6010	BS	QC803798	Miscell.	227215	09/17/15 14:36	1.0		
071	met08_sn_6010	BSD	QC803799	Miscell.	227215	09/17/15 14:45	1.0		6:FE=100000
072	met08_sn_6010	SAMPLE	269628-001	Miscell.	227215	09/17/15 14:54	10.0		
073	met08_sn_6010	SAMPLE	269704-005	Water	227077	09/17/15 14:59	1.0		1:NA=700000
074	met08_sn_6010	SAMPLE	269671-002	Water	227231	09/17/15 15:07	1.0		
075	met08_sn_6010	SAMPLE	269685-002	Soil	227147	09/17/15 15:12	1.0		8:FE=2100000
076	met08_sn_6010	X	RINSE			09/17/15 15:19	1.0		
077	met08_sn_6010	X	RINSE			09/17/15 15:25	1.0		
078	met08_sn_6010	X	RINSE			09/17/15 15:30	1.0		
079	met08_sn_6010	CCV				09/17/15 15:35	1.0	10	
080	met08_sn_6010	CCB				09/17/15 15:41	1.0		
081	met08_sn_6010	SAMPLE	269685-002	Soil	227147	09/17/15 15:47	100.0		
082	met08_sn_6010	PDS	QC803528	Soil	227147	09/17/15 15:52	1.0	11 12 13	2:FE=3200000
083	met08_sn_6010	X	RINSE			09/17/15 15:59	1.0		
084	met08_sn_6010	X	RINSE			09/17/15 16:04	1.0		
085	met08_sn_6010	X	RINSE			09/17/15 16:09	1.0		
086	met08_sn_6010	X	RINSE			09/17/15 16:14	1.0		
087	met08_sn_6010	SAMPLE	269629-001	Miscell.	227215	09/17/15 16:19	10.0		
088	met08_sn_6010	SAMPLE	269639-001	Miscell.	227215	09/17/15 16:24	10.0		
089	met08_sn_6010	SAMPLE	269641-001	Miscell.	227215	09/17/15 16:29	10.0		
090	met08_sn_6010	SAMPLE	269643-001	Miscell.	227215	09/17/15 16:34	10.0		2:BA=56000
091	met08_sn_6010	CCV				09/17/15 16:40	1.0	10	
092	met08_sn_6010	CCB				09/17/15 16:47	1.0		
093	met08_sn_6010	SAMPLE	269761-001	WET Leachate	227257	09/17/15 16:54	10.0		1:NA=140000
094	met08_sn_6010	SAMPLE	269761-002	WET Leachate	227257	09/17/15 16:59	10.0		1:NA=150000
095	met08_sn_6010	SAMPLE	269761-003	WET Leachate	227257	09/17/15 17:05	10.0		1:NA=140000
096	met08_sn_6010	SAMPLE	269761-004	WET Leachate	227257	09/17/15 17:10	10.0		1:NA=130000
097	met08_sn_6010	SAMPLE	269761-001	TCLP Leachate	227251	09/17/15 17:15	10.0		1:NA=130000
098	met08_sn_6010	SAMPLE	269761-002	TCLP Leachate	227251	09/17/15 17:20	10.0		1:NA=140000
099	met08_sn_6010	SAMPLE	269761-003	TCLP Leachate	227251	09/17/15 17:25	10.0		1:NA=150000
100	met08_sn_6010	SAMPLE	269761-004	TCLP Leachate	227251	09/17/15 17:30	10.0		1:NA=130000
101	met08_sn_6010	CCV				09/17/15 17:35	1.0	10	
102	met08_sn_6010	CCB				09/17/15 17:43	1.0		
103	met08_sn_6010	BLANK	QC803944	TCLP Leachate	227251	09/17/15 17:59	10.0		1:NA=150000
104	met08_sn_6010	BS	QC803945	TCLP Leachate	227251	09/17/15 18:04	1.0		

CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 85374709

Instrument : MET08 Begun : 09/17/15 05:09
Method : EPA 6010B SOP Version : icp metals_rv17

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
105	met08_sn_6010	BSD	QC803946	TCLP Leachate	227251	09/17/15 18:08	1.0		
106	met08_sn_6010	MSS	269798-001	TCLP Leachate	227251	09/17/15 18:13	10.0		1:NA=160000
107	met08_sn_6010	MS	QC803947	TCLP Leachate	227251	09/17/15 18:18	10.0		
108	met08_sn_6010	MSD	QC803948	TCLP Leachate	227251	09/17/15 18:23	10.0		
109	met08_sn_6010	X	RINSE			09/17/15 18:28	1.0		
110	met08_sn_6010	BLANK	QC803967	WET Leachate	227257	09/17/15 18:33	10.0		1:NA=160000
111	met08_sn_6010	BS	QC803968	WET Leachate	227257	09/17/15 18:38	1.0		
112	met08_sn_6010	BSD	QC803969	WET Leachate	227257	09/17/15 18:42	1.0		
113	met08_sn_6010	CCV				09/17/15 18:47	1.0	10	
114	met08_sn_6010	CCB				09/17/15 18:54	1.0		
115	met08_sn_6010	MSS	269749-001	WET Leachate	227257	09/17/15 19:00	10.0		1:NA=150000
116	met08_sn_6010	MS	QC803970	WET Leachate	227257	09/17/15 19:05	10.0		
117	met08_sn_6010	MSD	QC803971	WET Leachate	227257	09/17/15 19:10	10.0		
118	met08_sn_6010	SAMPLE	269757-001	WET Leachate	227257	09/17/15 19:15	10.0		2:NA=130000
119	met08_sn_6010	SAMPLE	269704-002	Miscell.	227203	09/17/15 19:20	1.0		1:B=270000
120	met08_sn_6010	SAMPLE	269757-002	WET Leachate	227257	09/17/15 19:25	10.0		1:NA=150000
121	met08_sn_6010	CCV				09/17/15 19:30	1.0	10	
122	met08_sn_6010	CCB				09/17/15 19:38	1.0		
123	met08_sn_6010	CCB				09/17/15 19:42	1.0		
124	met08_sn_6010	MSS	269752-001	Miscell.	227201	09/17/15 19:47	1.0		5:CA=1600000
125	met08_sn_6010	SAMPLE	269752-003	Miscell.	227201	09/17/15 19:54	1.0		5:CA=1300000
126	met08_sn_6010	SAMPLE	269752-006	Miscell.	227201	09/17/15 20:01	1.0		5:CA=2100000
127	met08_sn_6010	SAMPLE	269752-009	Miscell.	227201	09/17/15 20:08	1.0		5:CA=1800000
128	met08_sn_6010	SAMPLE	269752-010	Miscell.	227201	09/17/15 20:14	1.0		5:CA=1600000
129	met08_sn_6010	SAMPLE	269752-014	Miscell.	227201	09/17/15 20:21	1.0		5:CA=1600000
130	met08_sn_6010	SAMPLE	269752-017	Miscell.	227201	09/17/15 20:28	1.0		5:CA=1800000
131	met08_sn_6010	SAMPLE	269752-015	Miscell.	227201	09/17/15 20:35	1.0		6:CA=1500000
132	met08_sn_6010	SAMPLE	269752-016	Miscell.	227201	09/17/15 20:42	1.0		5:CA=2300000
133	met08_sn_6010	SAMPLE	269752-017	Miscell.	227201	09/17/15 20:48	1.0		5:CA=1700000
134	met08_sn_6010	CCV				09/17/15 20:55	1.0	10	
135	met08_sn_6010	CCB				09/17/15 21:03	1.0		
136	met08_sn_6010	SAMPLE	269752-018	Miscell.	227201	09/17/15 21:08	1.0		5:CA=1800000
137	met08_sn_6010	X	RINSE			09/17/15 21:12	1.0		
138	met08_sn_6010	SAMPLE	269752-018	Miscell.	227201	09/17/15 21:17	1.0		5:CA=1800000
139	met08_sn_6010	SAMPLE	269752-019	Miscell.	227201	09/17/15 21:24	1.0		7:CA=1600000
140	met08_sn_6010	SAMPLE	269752-020	Miscell.	227201	09/17/15 21:31	1.0		5:CA=1800000
141	met08_sn_6010	X	RINSE			09/17/15 21:38	1.0		
142	met08_sn_6010	BLANK	QC804129	Soil	227294	09/17/15 21:43	1.0		
143	met08_sn_6010	BS	QC804130	Soil	227294	09/17/15 21:48	5.0		
144	met08_sn_6010	BSD	QC804131	Soil	227294	09/17/15 21:53	5.0		
145	met08_sn_6010	MSS	269838-001	Soil	227294	09/17/15 21:58	1.0		6:FE=320000
146	met08_sn_6010	MS	QC804132	Soil	227294	09/17/15 22:05	5.0		
147	met08_sn_6010	CCV				09/17/15 22:12	1.0	10	
148	met08_sn_6010	CCB				09/17/15 22:20	1.0		
149	met08_sn_6010	MSD	QC804133	Soil	227294	09/17/15 22:25	5.0		
150	met08_sn_6010	SAMPLE	269841-001	Soil	227294	09/17/15 22:33	1.0		7:MG=1300000
151	met08_sn_6010	SAMPLE	269842-001	Soil	227294	09/17/15 22:40	1.0		6:FE=450000
152	met08_sn_6010	SAMPLE	269842-002	Soil	227294	09/17/15 22:46	1.0		3:FE=380000
153	met08_sn_6010	SAMPLE	269842-003	Soil	227294	09/17/15 22:53	1.0		3:FE=850000
154	met08_sn_6010	SAMPLE	269842-004	Soil	227294	09/17/15 23:00	1.0		3:FE=770000
155	met08_sn_6010	SAMPLE	269842-005	Soil	227294	09/17/15 23:07	1.0		3:FE=480000
156	met08_sn_6010	SAMPLE	269842-006	Soil	227294	09/17/15 23:13	1.0		2:FE=270000

CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 85374709

Instrument : MET08 Begun : 09/17/15 05:09
Method : EPA 6010B SOP Version : icp metals_rv17

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
157	met08_sn_6010	SAMPLE	269842-007	Soil	227294	09/17/15 23:21	1.0		3:FE=450000
158	met08_sn_6010	SAMPLE	269842-008	Soil	227294	09/17/15 23:28	1.0		4:FE=590000
159	met08_sn_6010	CCV				09/17/15 23:35	1.0	10	
160	met08_sn_6010	CCB				09/17/15 23:42	1.0		
161	met08_sn_6010	SAMPLE	269842-009	Soil	227294	09/17/15 23:47	1.0		3:FE=570000
162	met08_sn_6010	SAMPLE	269842-010	Soil	227294	09/17/15 23:54	1.0		4:FE=670000
163	met08_sn_6010	X	RINSE			09/18/15 00:01	1.0		
164	met08_sn_6010	BLANK	QC804019	Water	227269	09/18/15 00:06	1.0		
165	met08_sn_6010	BS	QC804020	Water	227269	09/18/15 00:11	1.0		
166	met08_sn_6010	BSD	QC804021	Water	227269	09/18/15 00:15	1.0		
167	met08_sn_6010	MSS	269878-001	Water	227269	09/18/15 00:19	1.0		2:MG=260000
168	met08_sn_6010	MS	QC804022	Water	227269	09/18/15 00:27	1.0		3:MG=280000
169	met08_sn_6010	MSD	QC804023	Water	227269	09/18/15 00:35	1.0		3:MG=270000
170	met08_sn_6010	X	RINSE			09/18/15 00:42	1.0		
171	met08_sn_6010	CCV				09/18/15 00:48	1.0	10	
172	met08_sn_6010	CCB				09/18/15 00:55	1.0		
173	met08_sn_6010	SAMPLE	269654-002	Soil	227147	09/18/15 01:00	1.0		5:FE=360000
174	met08_sn_6010	SAMPLE	269693-018	Soil	227147	09/18/15 01:07	1.0		3:FE=520000
175	met08_sn_6010	X	RINSE			09/18/15 01:14	1.0		
176	met08_sn_6010	?SAMPLE	269745-001	WET Leachate	227251	09/18/15 01:19	10.0		
177	met08_sn_6010	SAMPLE	269977-004	TCLP Leachate	227251	09/18/15 01:24	10.0		2:NA=130000
178	met08_sn_6010	SAMPLE	269977-001	TCLP Leachate	227251	09/18/15 01:33	10.0		1:NA=140000
179	met08_sn_6010	SAMPLE	269977-002	TCLP Leachate	227251	09/18/15 01:38	10.0		1:NA=130000
180	met08_sn_6010	SAMPLE	269977-003	TCLP Leachate	227251	09/18/15 01:43	10.0		1:NA=130000
181	met08_sn_6010	SAMPLE	269750-001	WET Leachate	227257	09/18/15 01:48	10.0		1:NA=140000
182	met08_sn_6010	SAMPLE	269909-001	WET Leachate	227257	09/18/15 01:53	10.0		1:NA=160000
183	met08_sn_6010	CCV				09/18/15 01:59	1.0	10	
184	met08_sn_6010	CCB				09/18/15 02:06	1.0		
185	met08_sn_6010	?SAMPLE	269756-001		227257	09/18/15 02:11	10.0		
186	met08_sn_6010	?SAMPLE	269758-001		227257	09/18/15 02:20	10.0		
187	met08_sn_6010	?SAMPLE	269758-002		227257	09/18/15 02:25	10.0		
188	met08_sn_6010	?SAMPLE	269758-003		227257	09/18/15 02:30	10.0		
189	met08_sn_6010	X	RINSE			09/18/15 02:35	1.0		
190	met08_sn_6010	SAMPLE	269774-001	Wipe	227217	09/18/15 02:41	1.0		
191	met08_sn_6010	SAMPLE	269774-002	Wipe	227217	09/18/15 02:45	1.0		
192	met08_sn_6010	SAMPLE	269774-003	Wipe	227217	09/18/15 02:49	1.0		
193	met08_sn_6010	SAMPLE	269774-004	Wipe	227217	09/18/15 02:53	1.0		
194	met08_sn_6010	SAMPLE	269774-005	Wipe	227217	09/18/15 02:57	1.0		
195	met08_sn_6010	CCV				09/18/15 03:01	1.0	10	
196	met08_sn_6010	CCB				09/18/15 03:09	1.0		
197	met08_sn_6010	SAMPLE	269774-006	Wipe	227217	09/18/15 03:14	1.0		
198	met08_sn_6010	SAMPLE	269774-007	Wipe	227217	09/18/15 03:18	1.0		
199	met08_sn_6010	SAMPLE	269774-008	Wipe	227217	09/18/15 03:24	1.0		
200	met08_sn_6010	X	RINSE			09/18/15 03:29	1.0		
201	met08_sn_6010	SAMPLE	269745-001	Soil	227244	09/18/15 03:34	1.0		5:FE=360000
202	met08_sn_6010	SAMPLE	269754-002	Miscell.	227244	09/18/15 03:40	1.0		6:CA=1900000
203	met08_sn_6010	SAMPLE	269754-003	Miscell.	227244	09/18/15 03:47	1.0		6:CA=1700000
204	met08_sn_6010	SAMPLE	269754-004	Miscell.	227244	09/18/15 03:54	1.0		5:CA=1400000
205	met08_sn_6010	SAMPLE	269754-005	Miscell.	227244	09/18/15 04:01	1.0		5:CA=1700000
206	met08_sn_6010	SAMPLE	269754-006	Miscell.	227244	09/18/15 04:07	1.0		5:CA=2300000
207	met08_sn_6010	CCV				09/18/15 04:14	1.0	10	
208	met08_sn_6010	CCB				09/18/15 04:19	1.0		

CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 85374709

Instrument : MET08 Begun : 09/17/15 05:09
Method : EPA 6010B SOP Version : icp metals_rv17

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
209	met08_sn_6010	SAMPLE	269754-007	Miscell.	227244	09/18/15 04:24	1.0		5:CA=1600000
210	met08_sn_6010	SAMPLE	269754-008	Miscell.	227244	09/18/15 04:31	1.0		5:CA=1600000
211	met08_sn_6010	SAMPLE	269754-009	Miscell.	227244	09/18/15 04:37	1.0		5:CA=1400000
212	met08_sn_6010	SAMPLE	269754-010	Miscell.	227244	09/18/15 04:44	1.0		5:CA=1500000
213	met08_sn_6010	SAMPLE	269754-011	Miscell.	227244	09/18/15 04:51	1.0		6:CA=1800000
214	met08_sn_6010	SAMPLE	269754-012	Miscell.	227244	09/18/15 04:58	1.0		6:CA=1800000
215	met08_sn_6010	SAMPLE	269754-013	Miscell.	227244	09/18/15 05:05	1.0		5:CA=1700000
216	met08_sn_6010	SAMPLE	269754-014	Miscell.	227244	09/18/15 05:11	1.0		6:CA=1300000
217	met08_sn_6010	CCV				09/18/15 05:18	1.0	10	
218	met08_sn_6010	XCCB				09/18/15 05:23	1.0		
219	met08_sn_6010	CCB				09/18/15 05:27	1.0		

NCD 09/17/15 : I verified that the vials loaded on the instrument matched the sequence data entry, for runs 1 through 60.

JDB 09/17/15 : I verified that the vials loaded on the instrument matched the sequence data entry, for runs 61 through 92.

CRT 09/17/15 : I verified that the vials loaded on the instrument matched the sequence data entry, for runs 93 through 129.

Standards used: 1=S27752 2=S27986 3=S27987 4=S27988 5=S27758 6=S27757 7=S27759 8=S27611 9=S27612 10=S27756 11=S26229 12=S26230 13=S27470

CURTIS & TOMPKINS INTERNAL STANDARD SUMMARY FOR SEQUENCE 85374709

Date : 09/17/15 Reference : met08_sn_6010
Sequence : MET08 09/17/15 Analyzed : 09/17/15 05:14

#	Type	Sample ID	Y A
		ICAL STD	4185065
		LOWER LIMIT	1255520
		UPPER LIMIT	8370131
010	ICB		4096296
011	ICSA		3491749
012	ICSAB		3443368
013	BLANK	QC803955	4162333
014	BS	QC803956	3873230
015	BSD	QC803957	3864844
016	MSS	269651-001	3749594
017	MS	QC803958	3709999
018	MSD	QC803959	3703015
019	SAMPLE	269839-001	3959600
020	SAMPLE	269839-003	3984975
021	SAMPLE	269839-005	3935674
022	SAMPLE	269839-008	3950924
023	CCV		4102209
024	CCB		4181970
025	SAMPLE	269839-009	4073895
026	SAMPLE	269839-010	3998535
027	SAMPLE	269839-011	4039826
028	SAMPLE	269839-012	3970023
029	MSS	269651-001	4113978
030	CCV		3982009
031	CCB		4083499
032	BLANK	QC803522	4154753
033	BS	QC803523	3960590
034	BSD	QC803524	3966241
035	MSS	269685-001	4112528
036	MS	QC803525	3731752
037	MSD	QC803526	3770617
038	SER	QC803527	4099497
039	PDS	QC803528	3993465
040	SAMPLE	269685-002	4099634
041	SAMPLE	269658-006	3780236
042	CCV		3908074
043	CCB		3985698
044	SAMPLE	269685-002	4100508
048	BS	QC803523	3921616
049	BSD	QC803524	3880753
050	CCV		3912403
051	CCB		4021527
052	BS	QC803523	3752759
053	BSD	QC803524	3777005
057	BS	QC803523	3936352
058	BSD	QC803524	3949663
059	CCV		3585512
060	CCB		4007330
067	CCV		3983183
068	CCB		4147840
069	BLANK	QC803797	4119005

CURTIS & TOMPKINS INTERNAL STANDARD SUMMARY FOR SEQUENCE 85374709

Date : 09/17/15 Reference : met08_sn_6010
Sequence : MET08 09/17/15 Analyzed : 09/17/15 05:14

#	Type	Sample ID	Y A
070	BS	QC803798	3925465
071	BSD	QC803799	3825205
072	SAMPLE	269628-001	4129544
073	SAMPLE	269704-005	3771468
074	SAMPLE	269671-002	4343415
075	SAMPLE	269685-002	3608618
079	CCV		4066992
080	CCB		4196114
081	SAMPLE	269685-002	4168633
082	PDS	QC803528	3529488
087	SAMPLE	269629-001	4260460
088	SAMPLE	269639-001	4178895
089	SAMPLE	269641-001	4186665
090	SAMPLE	269643-001	4083914
091	CCV		4008805
092	CCB		4098608
093	SAMPLE	269761-001	3897777
094	SAMPLE	269761-002	3897471
095	SAMPLE	269761-003	3884364
096	SAMPLE	269761-004	3930454
097	SAMPLE	269761-001	3868279
098	SAMPLE	269761-002	3895375
099	SAMPLE	269761-003	3955646
100	SAMPLE	269761-004	3933931
101	CCV		3951219
102	CCB		4204172
103	BLANK	QC803944	3940258
104	BS	QC803945	3987453
105	BSD	QC803946	4080919
106	MSS	269798-001	3902929
107	MS	QC803947	4055337
108	MSD	QC803948	3911766
110	BLANK	QC803967	3909877
111	BS	QC803968	4213448
112	BSD	QC803969	4138768
113	CCV		3984273
114	CCB		4251486
115	MSS	269749-001	3944017
116	MS	QC803970	3927073
117	MSD	QC803971	4003256
118	SAMPLE	269757-001	3992906
119	SAMPLE	269704-002	4000904
120	SAMPLE	269757-002	4034310
121	CCV		4087777
122	CCB		4170904
123	CCB		4158104
124	MSS	269752-001	3531899
125	SAMPLE	269752-003	3684013
126	SAMPLE	269752-006	3458652
127	SAMPLE	269752-009	3610607
128	SAMPLE	269752-010	3772563
129	SAMPLE	269752-014	3645774

CURTIS & TOMPKINS INTERNAL STANDARD SUMMARY FOR SEQUENCE 85374709

Date : 09/17/15 Reference : met08_sn_6010
Sequence : MET08 09/17/15 Analyzed : 09/17/15 05:14

#	Type	Sample ID	Y A
130	SAMPLE	269752-017	3547070
131	SAMPLE	269752-015	3637268
132	SAMPLE	269752-016	3483078
133	SAMPLE	269752-017	3556460
134	CCV		3956767
135	CCB		4167912
136	SAMPLE	269752-018	3462267
138	SAMPLE	269752-018	3600405
139	SAMPLE	269752-019	3570761
140	SAMPLE	269752-020	3522504
142	BLANK	QC804129	4236391
143	BS	QC804130	3996284
144	BSD	QC804131	3985400
145	MSS	269838-001	3963216
146	MS	QC804132	4010309
147	CCV		4031015
148	CCB		4269207
149	MSD	QC804133	4033450
150	SAMPLE	269841-001	3669912
151	SAMPLE	269842-001	4005733
152	SAMPLE	269842-002	3989309
153	SAMPLE	269842-003	4032510
154	SAMPLE	269842-004	4145257
155	SAMPLE	269842-005	4150969
156	SAMPLE	269842-006	4022232
157	SAMPLE	269842-007	4085248
158	SAMPLE	269842-008	4059488
159	CCV		4080209
160	CCB		4236270
161	SAMPLE	269842-009	4033328
162	SAMPLE	269842-010	4310710
164	BLANK	QC804019	4611707
165	BS	QC804020	4349310
166	BSD	QC804021	4437924
167	MSS	269878-001	3708320
168	MS	QC804022	3662510
169	MSD	QC804023	3707158
171	CCV		4229319
172	CCB		4346293
173	SAMPLE	269654-002	4402624
174	SAMPLE	269693-018	4123390
177	SAMPLE	269977-004	4225693
178	SAMPLE	269977-001	4151105
179	SAMPLE	269977-002	4120642
180	SAMPLE	269977-003	4162257
181	SAMPLE	269750-001	4080414
182	SAMPLE	269909-001	4147142
183	CCV		4255913
184	CCB		4438461
190	SAMPLE	269774-001	4148618
191	SAMPLE	269774-002	4313442
192	SAMPLE	269774-003	4147309

CURTIS & TOMPKINS INTERNAL STANDARD SUMMARY FOR SEQUENCE 85374709

Date : 09/17/15 Reference : met08_sn_6010
Sequence : MET08 09/17/15 Analyzed : 09/17/15 05:14

#	Type	Sample ID	Y A
193	SAMPLE	269774-004	4218795
194	SAMPLE	269774-005	4246693
195	CCV		4198141
196	CCB		4273574
197	SAMPLE	269774-006	4163640
198	SAMPLE	269774-007	4259544
199	SAMPLE	269774-008	4296501
201	SAMPLE	269745-001	4184920
202	SAMPLE	269754-002	3857529
203	SAMPLE	269754-003	3861163
204	SAMPLE	269754-004	3901813
205	SAMPLE	269754-005	3925453
206	SAMPLE	269754-006	3653613
207	CCV		4321741
208	CCB		4482420
209	SAMPLE	269754-007	3914280
210	SAMPLE	269754-008	3916074
211	SAMPLE	269754-009	3935674
212	SAMPLE	269754-010	3974934
213	SAMPLE	269754-011	3890659
214	SAMPLE	269754-012	3859801
215	SAMPLE	269754-013	3929000
216	SAMPLE	269754-014	3864484
217	CCV		4268350
219	CCB		4468619

CURTIS & TOMPKINS INITIAL CALIBRATION FOR 269651 METALS Soil: EPA 6010B

Inst : MET08
Calnum : 85374709001
Units : ug/L

Date : 17-SEP-2015 05:09
X Axis : R

Reviewer : ---

Level	File	Seqnum	Sample ID	Analyzed	Stds
L1	met08_sn_6010	85374709002	L1	17-SEP-2015 05:14	S27752
L2	met08_sn_6010	85374709003	L2	17-SEP-2015 05:19	S27986
L3	met08_sn_6010	85374709004	L3	17-SEP-2015 05:24	S27987
L4	met08_sn_6010	85374709005	L4	17-SEP-2015 05:29	S27988
L5	met08_sn_6010	85374709006	L5	17-SEP-2015 05:36	S27758

Analyte	Ch	L1	L2	L3	L4	L5	Type	a0	a1	a2	Avg	r^2 %RSD	MnR^2	Flg
Arsenic	A	11.800	11.347	11.697	12.596		LOR0	0.00000	0.07944		11.860	1.000	0.995	
Lead	A	30.320	29.505	31.327	32.320		LOR0	0.00000	0.03095		30.868	1.000	0.995	

Spiked Amounts / Drifts	Ch	L1	%D	L2	%D	L3	%D	L4	%D	L5	%D
Arsenic	A	5.0000	-6	100.00	-10	1000.0	-7	10000	0		
Lead	A	5.0000	-6	100.00	-9	1000.0	-3	10000	0		

Instrument amount = a0 + response * a1 + response^2 * a2; LOR0=Linear regression forced thru origin, including 0,0 point

85374709001

CURTIS & TOMPKINS 2ND SOURCE CALIBRATION SUMMARY FOR 269651 METALS Soil
EPA 6010B

Inst : MET08
Calnum : 85374709001 Cal Date : 17-SEP-2015

ICV 85374709007 (17-SEP-2015) stds: S27757

Analyte	Ch	Spiked	Quant	Units	%D	Max	Flags
Arsenic	A	5000	4921	ug/L	-2	10	
Lead	A	5000	4832	ug/L	-3	10	

CURTIS & TOMPKINS INSTRUMENT BLANK FOR 269651 METALS Soil
EPA 6010B

Inst : MET08 IDF : 1.0
Seqnum : 85374709010 File : met08_sn_6010 Time : 17-SEP-2015 06:37
Cal : 85374709001 Caldate : 17-SEP-2015

Analyte	Ch	Quant	IQL	LOD	Units	Flags
Arsenic	A	ND	5.000	4.000	ug/L	
Lead	A	ND	5.000	2.500	ug/L	

ISTD (ICAL 002)	Ch	ICAL Abund	Abund	%Drift
Yttrium	A	4185065	4096296	-2.12

CURTIS & TOMPKINS INTERFERENCE CHECK STANDARD A FOR 269651 METALS Soil
EPA 6010B

Inst : MET08 IDF : 1.0
Seqnum : 85374709011 File : met08_sn_6010 Time : 17-SEP-2015 06:42
Cal : 85374709001 Caldate : 17-SEP-2015
Standards: S27611

Analyte	Ch	Quant	IQL	Units	Flags
Arsenic	A	[3.133]	5.000	ug/L	
Lead	A	[1.479]	5.000	ug/L	

Interferent	Ch	Spiked	Quant	Units	%Rec
Chromium	A	20000	19340	ug/L	97
Copper	A	20000	20700	ug/L	103
Manganese	A	20000	18720	ug/L	94
Nickel	A	20000	18170	ug/L	91
Vanadium	A	20000	20640	ug/L	103
Aluminum	R	500000	496700	ug/L	99
Calcium	R	500000	490200	ug/L	98
Iron	R	200000	188900	ug/L	94
Magnesium	R	500000	486900	ug/L	97
Titanium	R	20000	19980	ug/L	100

ISTD (ICAL 002)	Ch	ICAL Abund	Abund	%Drift
Yttrium	A	4185065	3491749	-16.57

CURTIS & TOMPKINS INTERFERENCE CHECK STANDARD AB FOR 269651 METALS Soil
EPA 6010B

Inst : MET08 IDF : 1.0
Seqnum : 85374709012 File : met08_sn_6010 Time : 17-SEP-2015 07:19
Cal : 85374709001 Caldate : 17-SEP-2015
Standards: S27612

Analyte	Ch	Spiked	Quant	Units	%D	Max %D	Flags
Arsenic	A	500.0	552.2	ug/L	10	20	
Lead	A	1000	1019	ug/L	2	20	

ISTD (ICAL 002)	Ch	ICAL Abund	Abund	%Drift
Yttrium	A	4185065	3443368	-17.72

CURTIS & TOMPKINS CONTINUING CALIBRATION FOR 269651 METALS Soil
EPA 6010B

Inst : MET08 IDF : 1.0
Seqnum : 85374709023 File : met08_sn_6010 Time : 17-SEP-2015 09:48
Cal : 85374709001 Caldate : 17-SEP-2015
Standards: S27756

Analyte	Ch	Avg RF/CF	RF/CF	Spiked	Quant	Units	%D	Max %D	Flags
Arsenic	A	11.860	12.097	5000	4805	ug/L	-4	10	
Lead	A	30.868	30.616	5000	4738	ug/L	-5	10	

ISTD (ICAL 002)	Ch	ICAL Abund	Abund	%Drift
Yttrium	A	4185065	4102209	-1.98

CURTIS & TOMPKINS INSTRUMENT BLANK FOR 269651 METALS Soil
EPA 6010B

Inst : MET08 IDF : 1.0
Seqnum : 85374709024 File : met08_sn_6010 Time : 17-SEP-2015 09:55
Cal : 85374709001 Caldate : 17-SEP-2015

Analyte	Ch	Quant	IQL	LOD	Units	Flags
Arsenic	A	ND	5.000	4.000	ug/L	
Lead	A	ND	5.000	2.500	ug/L	

ISTD (ICAL 002)	Ch	ICAL Abund	Abund	%Drift
Yttrium	A	4185065	4181970	-0.07

CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 95374709

Instrument : MET09 Begun : 09/17/15 05:09
Method : EPA 6010B SOP Version : icp metals_rv17

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
001	met09_sn_	ICALBLK				09/17/15 05:09	1.0		
002	met09_sn_	ICAL	L1			09/17/15 05:14	1.0	1	
003	met09_sn_	ICAL	L2			09/17/15 05:20	1.0	2	
004	met09_sn_	ICAL	L3			09/17/15 05:24	1.0	3	
005	met09_sn_	ICAL	L4			09/17/15 05:28	1.0	4	
006	met09_sn_	ICAL	L5			09/17/15 05:35	1.0	5	
007	met09_sn_	XICV				09/17/15 05:42	1.0	6	
008	met09_sn_	ICV				09/17/15 05:47	1.0	6	
009	met09_sn_	XCRI				09/17/15 05:54	1.0	7	
010	met09_sn_	CRI				09/17/15 06:21	1.0	7	
011	met09_sn_	ICB				09/17/15 06:37	1.0		
012	met09_sn_	ICSA				09/17/15 06:42	1.0	8	10:AL=480000
013	met09_sn_	ICSAB				09/17/15 07:11	1.0	9	4:AL=500000
014	met09_sn_	BLANK	QC803901	Miscell.	227244	09/17/15 09:08	1.0		
015	met09_sn_	BS	QC803902	Miscell.	227244	09/17/15 09:13	5.0		
016	met09_sn_	BSD	QC803903	Miscell.	227244	09/17/15 09:17	5.0		
017	met09_sn_	MSS	269754-001	Miscell.	227244	09/17/15 09:21	1.0		9:CA=1600000
018	met09_sn_	MS	QC803904	Miscell.	227244	09/17/15 09:28	5.0		2:CA=370000
019	met09_sn_	X	RINSE			09/17/15 09:36	1.0		
020	met09_sn_	MSD	QC803905	Miscell.	227244	09/17/15 09:41	5.0		2:CA=390000
021	met09_sn_	X	RINSE			09/17/15 09:49	1.0		
022	met09_sn_	SAMPLE	269745-001	Soil	227244	09/17/15 09:54	1.0		5:FE=370000
023	met09_sn_	MSS	269754-001	Miscell.	227244	09/17/15 10:01	100.0		
024	met09_sn_	CCV				09/17/15 10:05	1.0	10	
025	met09_sn_	CCB				09/17/15 10:12	1.0		
026	met09_sn_	BLANK	QC803921	Filtrate	227248	09/17/15 10:17	1.0		
027	met09_sn_	BS	QC803853	Water	227231	09/17/15 10:22	1.0		
028	met09_sn_	BSD	QC803854	Water	227231	09/17/15 10:26	1.0		
029	met09_sn_	MS	QC803855	Water	227231	09/17/15 10:31	1.0		
030	met09_sn_	MSD	QC803856	Water	227231	09/17/15 10:35	1.0		
031	met09_sn_	MSS	269754-001	Miscell.	227244	09/17/15 10:39	1.0		9:CA=1600000
032	met09_sn_	X	RINSE			09/17/15 10:46	1.0		
033	met09_sn_	X	RINSE			09/17/15 10:51	1.0		
034	met09_sn_	BLANK	QC803921	Filtrate	227248	09/17/15 10:57	1.0		
035	met09_sn_	SAMPLE	269745-001	Soil	227244	09/17/15 11:02	1.0		5:FE=380000
036	met09_sn_	CCV				09/17/15 11:09	1.0	10	
037	met09_sn_	CCB				09/17/15 11:16	1.0		
038	met09_sn_	BLANK	QC803955	Soil	227255	09/17/15 11:20	1.0		
039	met09_sn_	BS	QC803956	Soil	227255	09/17/15 11:25	5.0		
040	met09_sn_	BSD	QC803957	Soil	227255	09/17/15 11:29	5.0		
041	met09_sn_	MSS	269651-001	Soil	227255	09/17/15 11:34	1.0		4:FE=1700000
042	met09_sn_	MS	QC803958	Soil	227255	09/17/15 11:41	5.0		1:FE=400000
043	met09_sn_	MSD	QC803959	Soil	227255	09/17/15 11:48	5.0		1:FE=430000
044	met09_sn_	SAMPLE	269839-001	Soil	227255	09/17/15 11:56	1.0		2:FE=200000
045	met09_sn_	SAMPLE	269839-003	Soil	227255	09/17/15 12:04	1.0		3:FE=300000
046	met09_sn_	SAMPLE	269839-005	Soil	227255	09/17/15 12:11	1.0		2:FE=190000
047	met09_sn_	SAMPLE	269839-008	Soil	227255	09/17/15 12:18	1.0		2:FE=200000
048	met09_sn_	CCV				09/17/15 12:26	1.0	10	
049	met09_sn_	CCB				09/17/15 12:33	1.0		
050	met09_sn_	SAMPLE	269839-009	Soil	227255	09/17/15 12:38	1.0		3:FE=240000
051	met09_sn_	SAMPLE	269839-010	Soil	227255	09/17/15 12:45	1.0		3:FE=230000
052	met09_sn_	SAMPLE	269839-011	Soil	227255	09/17/15 12:52	1.0		3:FE=250000

CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 95374709

Instrument : MET09 Begun : 09/17/15 05:09
Method : EPA 6010B SOP Version : icp metals_rv17

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
053	met09_sn_	SAMPLE	269839-012	Soil	227255	09/17/15 12:59	1.0		3:FE=240000
054	met09_sn_	MSS	269671-001	Water	227231	09/17/15 13:06	1.0		
055	met09_sn_	CCV				09/17/15 13:10	1.0	10	
056	met09_sn_	CCB				09/17/15 13:17	1.0		
057	met09_sn_	MSS	269590-001	Miscell.	227203	09/17/15 13:25	10.0		2:FE=200000
058	met09_sn_	X	RINSE			09/17/15 13:33	1.0		
059	met09_sn_	X	RINSE			09/17/15 13:38	1.0		
060	met09_sn_	X	RINSE			09/17/15 13:44	1.0		
061	met09_sn_	X	RINSE			09/17/15 13:49	1.0		
062	met09_sn_	X	RINSE			09/17/15 13:54	1.0		
063	met09_sn_	X	RINSE			09/17/15 13:59	1.0		
064	met09_sn_	CCV				09/17/15 14:04	1.0	10	
065	met09_sn_	CCB				09/17/15 14:11	1.0		
066	met09_sn_	BS	QC803523	Soil	227147	09/17/15 14:16	1.0		5:NA=110000
067	met09_sn_	BSD	QC803524	Soil	227147	09/17/15 14:24	1.0		
068	met09_sn_	X	RINSE			09/17/15 14:31	1.0		
069	met09_sn_	X	RINSE			09/17/15 14:36	1.0		
070	met09_sn_	X	RINSE			09/17/15 14:42	1.0		
071	met09_sn_	CCV				09/17/15 14:46	1.0	10	
072	met09_sn_	CCB				09/17/15 14:53	1.0		
073	met09_sn_	BLANK	QC803746	Miscell.	227201	09/17/15 14:58	1.0		
074	met09_sn_	BS	QC803747	Miscell.	227201	09/17/15 15:03	5.0		
075	met09_sn_	BSD	QC803748	Miscell.	227201	09/17/15 15:07	5.0		
076	met09_sn_	MSS	269752-001	Miscell.	227201	09/17/15 15:11	1.0		6:CA=1500000
077	met09_sn_	MS	QC803749	Miscell.	227201	09/17/15 15:18	5.0		
078	met09_sn_	MSD	QC803750	Miscell.	227201	09/17/15 15:26	5.0		
079	met09_sn_	SER	QC803751	Miscell.	227201	09/17/15 15:34	5.0		
080	met09_sn_	PDS	QC803752	Miscell.	227201	09/17/15 15:42	1.0	11 12 13	2:CA=1500000
081	met09_sn_	SAMPLE	269752-002	Miscell.	227201	09/17/15 15:49	1.0		7:CA=1500000
082	met09_sn_	SAMPLE	269752-003	Miscell.	227201	09/17/15 15:56	1.0		6:CA=1200000
083	met09_sn_	CCV				09/17/15 16:03	1.0	10	
084	met09_sn_	CCB				09/17/15 16:09	1.0		
085	met09_sn_	SAMPLE	269752-004	Miscell.	227201	09/17/15 16:15	1.0		7:CA=1400000
086	met09_sn_	SAMPLE	269752-005	Miscell.	227201	09/17/15 16:22	1.0		6:CA=1500000
087	met09_sn_	BLANK	QC804102	Filtrate	227287	09/17/15 16:25	1.0		
088	met09_sn_	BS	QC804103	Filtrate	227287	09/17/15 16:29	1.0		
089	met09_sn_	BSD	QC804104	Filtrate	227287	09/17/15 16:33	1.0		
090	met09_sn_	MSS	269828-002	Filtrate	227287	09/17/15 16:37	1.0		3:MG=270000
091	met09_sn_	X	RINSE			09/17/15 16:45	1.0		
092	met09_sn_	MS	QC804105	Filtrate	227287	09/17/15 16:50	1.0		
093	met09_sn_	X	RINSE			09/17/15 16:58	1.0		
094	met09_sn_	MSD	QC804106	Filtrate	227287	09/17/15 17:03	1.0		1:MG=270000
095	met09_sn_	X	RINSE			09/17/15 17:11	1.0		
096	met09_sn_	CCV				09/17/15 17:16	1.0	10	
097	met09_sn_	CCB				09/17/15 17:23	1.0		
098	met09_sn_	SAMPLE	269752-004	Miscell.	227201	09/17/15 17:27	1.0		7:CA=1400000
099	met09_sn_	SAMPLE	269752-006	Miscell.	227201	09/17/15 17:34	1.0		6:CA=1900000
100	met09_sn_	SAMPLE	269752-007	Miscell.	227201	09/17/15 17:41	1.0		6:CA=1800000
101	met09_sn_	SAMPLE	269752-008	Miscell.	227201	09/17/15 17:48	1.0		6:CA=1500000
102	met09_sn_	SAMPLE	269752-009	Miscell.	227201	09/17/15 17:55	1.0		6:CA=1800000
103	met09_sn_	SAMPLE	269752-010	Miscell.	227201	09/17/15 18:02	1.0		6:CA=1500000
104	met09_sn_	SAMPLE	269752-011	Miscell.	227201	09/17/15 18:09	1.0		6:CA=1400000

CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 95374709

Instrument : MET09 Begun : 09/17/15 05:09
Method : EPA 6010B SOP Version : icp metals_rv17

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
105	met09_sn_	SAMPLE	269752-012	Miscell.	227201	09/17/15 18:16	1.0		6:CA=1300000
106	met09_sn_	SAMPLE	269752-013	Miscell.	227201	09/17/15 18:23	1.0		6:CA=1600000
107	met09_sn_	SAMPLE	269752-014	Miscell.	227201	09/17/15 18:30	1.0		6:CA=1600000
108	met09_sn_	CCV				09/17/15 18:37	1.0	10	
109	met09_sn_	CCB				09/17/15 18:44	1.0		
110	met09_sn_	SAMPLE	269685-002	Soil	227147	09/17/15 18:49	10.0		2:FE=290000
111	met09_sn_	SAMPLE	269752-015	Miscell.	227201	09/17/15 18:57	1.0		7:CA=1400000
112	met09_sn_	SAMPLE	269752-016	Miscell.	227201	09/17/15 19:03	1.0		6:CA=2100000
113	met09_sn_	SAMPLE	269752-017	Miscell.	227201	09/17/15 19:11	1.0		6:CA=1700000
114	met09_sn_	SAMPLE	269752-018	Miscell.	227201	09/17/15 19:17	1.0		6:CA=1700000
115	met09_sn_	SAMPLE	269752-019	Miscell.	227201	09/17/15 19:24	1.0		8:CA=1500000
116	met09_sn_	SAMPLE	269752-020	Miscell.	227201	09/17/15 19:31	1.0		6:CA=1800000
117	met09_sn_	X	RINSE			09/17/15 19:38	1.0		
118	met09_sn_	CCV				09/17/15 19:43	1.0	10	
119	met09_sn_	CCB				09/17/15 19:50	1.0		
120	met09_sn_	MS	QC803749	Miscell.	227201	09/17/15 19:55	5.0		
121	met09_sn_	MSD	QC803750	Miscell.	227201	09/17/15 20:03	5.0		
122	met09_sn_	SAMPLE	269752-015	Miscell.	227201	09/17/15 20:11	100.0		
123	met09_sn_	PDS	QC803752	Miscell.	227201	09/17/15 20:15	1.0	11 12 13	2:CA=1500000
124	met09_sn_	SAMPLE	269752-008	Miscell.	227201	09/17/15 20:22	1.0		6:CA=1600000
125	met09_sn_	SAMPLE	269752-015	Miscell.	227201	09/17/15 20:29	1.0		7:CA=1400000
126	met09_sn_	X	RINSE			09/17/15 20:36	1.0		
127	met09_sn_	SAMPLE	269752-019	Miscell.	227201	09/17/15 20:41	1.0		8:CA=1500000
128	met09_sn_	X	RINSE			09/17/15 20:48	1.0		
129	met09_sn_	SER	QC803960	Soil	227255	09/17/15 20:52	5.0		
130	met09_sn_	CCV				09/17/15 21:00	1.0	10	
131	met09_sn_	XCCB				09/17/15 21:07	1.0		
132	met09_sn_	CCB				09/17/15 21:11	1.0		
133	met09_sn_	PDS	QC803961	Soil	227255	09/17/15 21:16	1.0	11 12 13	
134	met09_sn_	SAMPLE	269748-001	Soil	227255	09/17/15 21:23	1.0		2:FE=400000
135	met09_sn_	SAMPLE	269748-002	Soil	227255	09/17/15 21:31	1.0		3:FE=450000
136	met09_sn_	SAMPLE	269748-003	Soil	227255	09/17/15 21:39	1.0		3:FE=450000
137	met09_sn_	SAMPLE	269753-001	Soil	227255	09/17/15 21:46	1.0		3:FE=490000
138	met09_sn_	SAMPLE	269756-001	Soil	227255	09/17/15 21:54	1.0		5:FE=590000
139	met09_sn_	SAMPLE	269757-001	Soil	227255	09/17/15 22:01	1.0		4:PB=900000
140	met09_sn_	SAMPLE	269757-002	Soil	227255	09/17/15 22:08	1.0		3:FE=390000
141	met09_sn_	SAMPLE	269758-001	Soil	227255	09/17/15 22:16	1.0		2:FE=400000
142	met09_sn_	SAMPLE	269758-002	Soil	227255	09/17/15 22:24	1.0		3:FE=430000
143	met09_sn_	CCV				09/17/15 22:31	1.0	10	
144	met09_sn_	XCCB				09/17/15 22:38	1.0		
145	met09_sn_	CCB				09/17/15 22:42	1.0		
146	met09_sn_	SAMPLE	269758-003	Soil	227255	09/17/15 22:47	1.0		3:FE=410000
147	met09_sn_	SAMPLE	269777-001	Soil	227255	09/17/15 22:55	1.0		2:FE=500000
148	met09_sn_	X	RINSE			09/17/15 23:03	1.0		
149	met09_sn_	SAMPLE	269654-001	Soil	227147	09/17/15 23:07	1.0		5:FE=380000
150	met09_sn_	SAMPLE	269654-002	Soil	227147	09/17/15 23:14	1.0		5:FE=370000
151	met09_sn_	SAMPLE	269693-013	Soil	227147	09/17/15 23:21	1.0		3:FE=530000
152	met09_sn_	SAMPLE	269693-014	Soil	227147	09/17/15 23:29	1.0		3:FE=540000
153	met09_sn_	SAMPLE	269693-015	Soil	227147	09/17/15 23:36	1.0		5:FE=540000
154	met09_sn_	SAMPLE	269693-016	Soil	227147	09/17/15 23:43	1.0		5:FE=560000
155	met09_sn_	SAMPLE	269693-017	Soil	227147	09/17/15 23:50	1.0		3:FE=500000
156	met09_sn_	CCV				09/17/15 23:58	1.0	10	

CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 95374709

Instrument : MET09 Begun : 09/17/15 05:09
Method : EPA 6010B SOP Version : icp metals_rv17

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
157	met09_sn_	XCCB				09/18/15 00:05	1.0		
158	met09_sn_	CCB				09/18/15 00:09	1.0		
159	met09_sn_	SAMPLE	269693-018	Soil	227147	09/18/15 00:14	1.0		5:FE=550000
160	met09_sn_	X	RINSE			09/18/15 00:22	1.0		
161	met09_sn_	BLANK	QC803551	Soil	227153	09/18/15 00:27	1.0		
162	met09_sn_	BS	QC803552	Soil	227153	09/18/15 00:32	5.0		1:SR=2100
163	met09_sn_	BSD	QC803553	Soil	227153	09/18/15 00:37	5.0		1:SR=2000
164	met09_sn_	MSS	269569-009	Soil	227153	09/18/15 00:41	1.0		3:FE=420000
165	met09_sn_	MS	QC803554	Soil	227153	09/18/15 00:49	5.0		1:FE=130000
166	met09_sn_	MSD	QC803555	Soil	227153	09/18/15 00:56	5.0		1:FE=120000
167	met09_sn_	SER	QC803556	Soil	227153	09/18/15 01:04	5.0		
168	met09_sn_	PDS	QC803557	Soil	227153	09/18/15 01:12	1.0	11 12 13	1:FE=420000
169	met09_sn_	CCV				09/18/15 01:20	1.0	10	
170	met09_sn_	CCB				09/18/15 01:27	1.0		
171	met09_sn_	SAMPLE	269569-010	Soil	227153	09/18/15 01:32	1.0		2:FE=380000
172	met09_sn_	SAMPLE	269569-011	Soil	227153	09/18/15 01:40	1.0		2:FE=320000
173	met09_sn_	SAMPLE	269569-012	Soil	227153	09/18/15 01:47	1.0		4:FE=420000
174	met09_sn_	SAMPLE	269569-013	Soil	227153	09/18/15 01:55	1.0		2:FE=410000
175	met09_sn_	SAMPLE	269569-014	Soil	227153	09/18/15 02:03	1.0		2:FE=530000
176	met09_sn_	X	RINSE			09/18/15 02:11	1.0		
177	met09_sn_	SAMPLE	269643-001	Miscell.	227215	09/18/15 02:15	1.0		5:BA=300000
178	met09_sn_	SAMPLE	269644-001	Miscell.	227215	09/18/15 02:23	10.0		
179	met09_sn_	SAMPLE	269645-001	Miscell.	227215	09/18/15 02:28	10.0		1:CA=130000
180	met09_sn_	SAMPLE	269647-001	Miscell.	227215	09/18/15 02:33	10.0		
181	met09_sn_	CCV				09/18/15 02:38	1.0	10	
182	met09_sn_	CCB				09/18/15 02:45	1.0		

NCD 09/17/15 : I verified that the vials loaded on the instrument matched the sequence data entry, for runs 1 through 97.

CRT 09/17/15 : I verified that the vials loaded on the instrument matched the sequence data entry, for runs 98 through 124.

JDB 09/18/15 : I verified that the vials loaded on the instrument matched the sequence data entry, for runs 125 through 182.

Standards used: 1=S27752 2=S27986 3=S27987 4=S27988 5=S27758 6=S27757 7=S27759 8=S27611 9=S27612 10=S27756 11=S26229 12=S26230 13=S27470

CURTIS & TOMPKINS INTERNAL STANDARD SUMMARY FOR SEQUENCE 95374709

Date : 09/17/15 Reference : met09_sn_
Sequence : MET09 09/17/15 Analyzed : 09/17/15 05:14

#	Type	Sample ID	Y A
		ICAL STD	3166298
		LOWER LIMIT	949889
		UPPER LIMIT	6332596
011	ICB		3113486
012	ICSA		2810682
013	ICSAB		2822517
014	BLANK	QC803901	3151670
015	BS	QC803902	3045295
016	BSD	QC803903	3049928
017	MSS	269754-001	2948890
018	MS	QC803904	3043658
020	MSD	QC803905	3059939
022	SAMPLE	269745-001	3195935
023	MSS	269754-001	3183092
024	CCV		3130248
025	CCB		3186834
026	BLANK	QC803921	3172211
027	BS	QC803853	3226444
028	BSD	QC803854	3179191
029	MS	QC803855	3177404
030	MSD	QC803856	3202553
031	MSS	269754-001	3001735
034	BLANK	QC803921	3178910
035	SAMPLE	269745-001	3220958
036	CCV		3120431
037	CCB		3194568
038	BLANK	QC803955	3260177
039	BS	QC803956	3164815
040	BSD	QC803957	3152451
041	MSS	269651-001	3138934
042	MS	QC803958	3183827
043	MSD	QC803959	3167182
044	SAMPLE	269839-001	3208218
045	SAMPLE	269839-003	3258559
046	SAMPLE	269839-005	3262881
047	SAMPLE	269839-008	3200347
048	CCV		3213920
049	CCB		3236982
050	SAMPLE	269839-009	3272957
051	SAMPLE	269839-010	3225160
052	SAMPLE	269839-011	3312830
053	SAMPLE	269839-012	3215656
054	MSS	269671-001	3339957
055	CCV		3125976
056	CCB		3208843
057	MSS	269590-001	3224746
064	CCV		3117475
065	CCB		3147467
066	BS	QC803523	3080027
067	BSD	QC803524	3096244
071	CCV		3152239

CURTIS & TOMPKINS INTERNAL STANDARD SUMMARY FOR SEQUENCE 95374709

Date : 09/17/15 Reference : met09_sn_
Sequence : MET09 09/17/15 Analyzed : 09/17/15 05:14

#	Type	Sample ID	Y A
072	CCB		3210168
073	BLANK	QC803746	3215357
074	BS	QC803747	3140673
075	BSD	QC803748	3086449
076	MSS	269752-001	2928896
077	MS	QC803749	2962090
078	MSD	QC803750	2976508
079	SER	QC803751	3004545
080	PDS	QC803752	2940136
081	SAMPLE	269752-002	2922369
082	SAMPLE	269752-003	2989646
083	CCV		3134994
084	CCB		3134706
085	SAMPLE	269752-004	2968143
086	SAMPLE	269752-005	2954881
087	BLANK	QC804102	3191826
088	BS	QC804103	3151980
089	BSD	QC804104	3188579
090	MSS	269828-002	2737257
092	MS	QC804105	2791631
094	MSD	QC804106	2776938
096	CCV		3112552
097	CCB		3130093
098	SAMPLE	269752-004	2966204
099	SAMPLE	269752-006	2952991
100	SAMPLE	269752-007	2953001
101	SAMPLE	269752-008	2969269
102	SAMPLE	269752-009	2986740
103	SAMPLE	269752-010	2982637
104	SAMPLE	269752-011	3015693
105	SAMPLE	269752-012	2963863
106	SAMPLE	269752-013	2923595
107	SAMPLE	269752-014	2928908
108	CCV		3094029
109	CCB		3164851
110	SAMPLE	269685-002	3174003
111	SAMPLE	269752-015	2933138
112	SAMPLE	269752-016	2906600
113	SAMPLE	269752-017	2946225
114	SAMPLE	269752-018	2940205
115	SAMPLE	269752-019	2988235
116	SAMPLE	269752-020	2967059
118	CCV		3151343
119	CCB		3236554
120	MS	QC803749	3077599
121	MSD	QC803750	3034743
122	SAMPLE	269752-015	3149704
123	PDS	QC803752	2963408
124	SAMPLE	269752-008	2955137
125	SAMPLE	269752-015	2958247
127	SAMPLE	269752-019	2963305
129	SER	QC803960	3190837

CURTIS & TOMPKINS INTERNAL STANDARD SUMMARY FOR SEQUENCE 95374709

Date : 09/17/15 Reference : met09_sn_
Sequence : MET09 09/17/15 Analyzed : 09/17/15 05:14

#	Type	Sample ID	Y A
130	CCV		3157178
132	CCB		3178982
133	PDS	QC803961	3097264
134	SAMPLE	269748-001	3455810
135	SAMPLE	269748-002	3308884
136	SAMPLE	269748-003	3498376
137	SAMPLE	269753-001	3266013
138	SAMPLE	269756-001	3261454
139	SAMPLE	269757-001	3810894
140	SAMPLE	269757-002	3330112
141	SAMPLE	269758-001	3268069
142	SAMPLE	269758-002	3204563
143	CCV		3086091
145	CCB		3102302
146	SAMPLE	269758-003	3230578
147	SAMPLE	269777-001	3299050
149	SAMPLE	269654-001	3347982
150	SAMPLE	269654-002	3381763
151	SAMPLE	269693-013	3199590
152	SAMPLE	269693-014	3282768
153	SAMPLE	269693-015	3160958
154	SAMPLE	269693-016	3141614
155	SAMPLE	269693-017	3134159
156	CCV		3083991
158	CCB		3096142
159	SAMPLE	269693-018	3133218
161	BLANK	QC803551	3117578
162	BS	QC803552	3095677
163	BSD	QC803553	3000567
165	MS	QC803554	3027809
166	MSD	QC803555	3066513
167	SER	QC803556	3065522
168	PDS	QC803557	3029378
169	CCV		2988993
170	CCB		3104323
177	SAMPLE	269643-001	2970689
178	SAMPLE	269644-001	3119490
179	SAMPLE	269645-001	3103037
180	SAMPLE	269647-001	3173046
181	CCV		3099661
182	CCB		3098130

CURTIS & TOMPKINS INITIAL CALIBRATION FOR 269651 METALS Soil: EPA 6010B

Inst : MET09
Calnum : 95374709001
Units : ug/L

Date : 17-SEP-2015 05:09
X Axis : R

Reviewer : ---

Level	File	Seqnum	Sample ID	Analyzed	Stds
L1	met09_sn_	95374709002	L1	17-SEP-2015 05:14	S27752
L2	met09_sn_	95374709003	L2	17-SEP-2015 05:20	S27986
L3	met09_sn_	95374709004	L3	17-SEP-2015 05:24	S27987
L4	met09_sn_	95374709005	L4	17-SEP-2015 05:28	S27988
L5	met09_sn_	95374709006	L5	17-SEP-2015 05:35	S27758

Analyte	Ch	L1	L2	L3	L4	L5	Type	a0	a1	a2	Avg	r^2 %RSD	MnR^2	Flg
Arsenic	A	6.0600	6.3380	6.6428	6.5455		LOR0	0.00000	0.15275		6.3966	1.000	0.995	
Lead	A	28.980	28.832	31.284	31.048		LOR0	0.00000	0.03221		30.036	1.000	0.995	

Spiked Amounts / Drifts	Ch	L1	%D	L2	%D	L3	%D	L4	%D	L5	%D
Arsenic	A	5.0000	-7	100.00	-3	1000.0	1	10000	0		
Lead	A	5.0000	-7	100.00	-7	1000.0	1	10000	0		

Instrument amount = a0 + response * a1 + response^2 * a2; LOR0=Linear regression forced thru origin, including 0,0 point

CURTIS & TOMPKINS 2ND SOURCE CALIBRATION SUMMARY FOR 269651 METALS Soil
EPA 6010B

Inst : MET09
Calnum : 95374709001 Cal Date : 17-SEP-2015

ICV 95374709008 (17-SEP-2015) stds: S27757

Analyte	Ch	Spiked	Quant	Units	%D	Max	Flags
Arsenic	A	5000	4970	ug/L	-1	10	
Lead	A	5000	4962	ug/L	-1	10	

CURTIS & TOMPKINS INSTRUMENT BLANK FOR 269651 METALS Soil
EPA 6010B

Inst : MET09 IDF : 1.0
Seqnum : 95374709011 File : met09_sn_ Time : 17-SEP-2015 06:37
Cal : 95374709001 Caldate : 17-SEP-2015

Analyte	Ch	Quant	IQL	LOD	Units	Flags
Arsenic	A	ND	5.000	4.000	ug/L	
Lead	A	ND	5.000	4.000	ug/L	

ISTD (ICAL 002)	Ch	ICAL Abund	Abund	%Drift
Yttrium	A	3166298	3113486	-1.67

CURTIS & TOMPKINS INTERFERENCE CHECK STANDARD A FOR 269651 METALS Soil
EPA 6010B

Inst : MET09 IDF : 1.0
Seqnum : 95374709012 File : met09_sn_ Time : 17-SEP-2015 06:42
Cal : 95374709001 Caldate : 17-SEP-2015
Standards: S27611

Analyte	Ch	Quant	IQL	Units	Flags
Arsenic	A	[1.429]	5.000	ug/L	
Lead	A	[-3.974]	5.000	ug/L	

Interferent	Ch	Spiked	Quant	Units	%Rec
Chromium	A	20000	19400	ug/L	97
Copper	A	20000	22110	ug/L	111
Manganese	A	20000	19200	ug/L	96
Nickel	A	20000	18550	ug/L	93
Vanadium	A	20000	19890	ug/L	99
Aluminum	R	500000	478700	ug/L	96
Calcium	R	500000	456700	ug/L	91
Iron	R	200000	180300	ug/L	90
Magnesium	R	500000	471700	ug/L	94
Titanium	R	20000	20750	ug/L	104

ISTD (ICAL 002)	Ch	ICAL Abund	Abund	%Drift
Yttrium	A	3166298	2810682	-11.23

CURTIS & TOMPKINS INTERFERENCE CHECK STANDARD AB FOR 269651 METALS Soil
EPA 6010B

Inst : MET09 IDF : 1.0
Seqnum : 95374709013 File : met09_sn_ Time : 17-SEP-2015 07:11
Cal : 95374709001 Caldate : 17-SEP-2015
Standards: S27612

Analyte	Ch	Spiked	Quant	Units	%D	Max %D	Flags
Arsenic	A	500.0	524.9	ug/L	5	20	
Lead	A	1000	916.4	ug/L	-8	20	

ISTD (ICAL 002)	Ch	ICAL Abund	Abund	%Drift
Yttrium	A	3166298	2822517	-10.86

CURTIS & TOMPKINS CONTINUING CALIBRATION FOR 269651 METALS Soil
EPA 6010B

Inst : MET09 IDF : 1.0
Seqnum : 95374709118 File : met09_sn_ Time : 17-SEP-2015 19:43
Cal : 95374709001 Caldate : 17-SEP-2015
Standards: S27756

Analyte	Ch	Avg RF/CF	RF/CF	Spiked	Quant	Units	%D	Max %D	Flags
Arsenic	A	6.3966	6.1573	5000	4703	ug/L	-6	10	
Lead	A	30.036	28.679	5000	4618	ug/L	-8	10	

ISTD (ICAL 002)	Ch	ICAL Abund	Abund	%Drift
Yttrium	A	3166298	3151343	-0.47

CURTIS & TOMPKINS INSTRUMENT BLANK FOR 269651 METALS Soil
EPA 6010B

Inst : MET09 IDF : 1.0
Seqnum : 95374709119 File : met09_sn_ Time : 17-SEP-2015 19:50
Cal : 95374709001 Caldate : 17-SEP-2015

Analyte	Ch	Quant	IQL	LOD	Units	Flags
Arsenic	A	ND	5.000	4.000	ug/L	
Lead	A	ND	5.000	4.000	ug/L	

ISTD (ICAL 002)	Ch	ICAL Abund	Abund	%Drift
Yttrium	A	3166298	3236554	2.22

CURTIS & TOMPKINS CONTINUING CALIBRATION FOR 269651 METALS Soil
EPA 6010B

Inst : MET09 IDF : 1.0
Seqnum : 95374709130 File : met09_sn_ Time : 17-SEP-2015 21:00
Cal : 95374709001 Caldate : 17-SEP-2015
Standards: S27756

Analyte	Ch	Avg RF/CF	RF/CF	Spiked	Quant	Units	%D	Max %D	Flags
Arsenic	A	6.3966	6.1785	5000	4719	ug/L	-6	10	
Lead	A	30.036	28.329	5000	4562	ug/L	-9	10	

ISTD (ICAL 002)	Ch	ICAL Abund	Abund	%Drift
Yttrium	A	3166298	3157178	-0.29

CURTIS & TOMPKINS INSTRUMENT BLANK FOR 269651 METALS Soil
EPA 6010B

Inst : MET09 IDF : 1.0
Seqnum : 95374709132 File : met09_sn_ Time : 17-SEP-2015 21:11
Cal : 95374709001 Caldate : 17-SEP-2015

Analyte	Ch	Quant	IQL	LOD	Units	Flags
Arsenic	A	ND	5.000	4.000	ug/L	
Lead	A	ND	5.000	4.000	ug/L	

ISTD (ICAL 002)	Ch	ICAL Abund	Abund	%Drift
Yttrium	A	3166298	3178982	0.40

CURTIS & TOMPKINS CONTINUING CALIBRATION FOR 269651 METALS Soil
EPA 6010B

Inst : MET09 IDF : 1.0
Seqnum : 95374709143 File : met09_sn_ Time : 17-SEP-2015 22:31
Cal : 95374709001 Caldate : 17-SEP-2015
Standards: S27756

Analyte	Ch	Avg RF/CF	RF/CF	Spiked	Quant	Units	%D	Max %D	Flags
Arsenic	A	6.3966	6.0717	5000	4637	ug/L	-7	10	
Lead	A	30.036	28.613	5000	4608	ug/L	-8	10	

ISTD (ICAL 002)	Ch	ICAL Abund	Abund	%Drift
Yttrium	A	3166298	3086091	-2.53

CURTIS & TOMPKINS INSTRUMENT BLANK FOR 269651 METALS Soil
EPA 6010B

Inst : MET09 IDF : 1.0
Seqnum : 95374709145 File : met09_sn_ Time : 17-SEP-2015 22:42
Cal : 95374709001 Caldate : 17-SEP-2015

Analyte	Ch	Quant	IQL	LOD	Units	Flags
Arsenic	A	ND	5.000	4.000	ug/L	
Lead	A	ND	5.000	4.000	ug/L	

ISTD (ICAL 002)	Ch	ICAL Abund	Abund	%Drift
Yttrium	A	3166298	3102302	-2.02

SAMPLE PREPARATION SUMMARY

Batch # : 227255
Started By : VV
Method : 3050B
Spike #1 ID : S26660
Prep Date : 16-SEP-2015 22:00
Spike #2 ID : S26661
Analysis : ICP
Finished By : VV
Units : g

Sample	Stype	Matrix	Initial	Final	Clean DF	Prep DF	pH	Sp 1 Vol	Sp 2 Vol	Sp 3 Vol	Clean Method	Analysis	Comments
269651-001		Soil	.98	50	1	51.02						6010	
269748-001		Soil	.9	50	1	55.56						6010	
269748-002		Soil	1.1	50	1	45.45						6010	
269748-003		Soil	.97	50	1	51.55						6010	
269753-001		Soil	.99	50	1	50.51						6010	
269756-001		Soil	1	50	1	50.0						6010	
269757-001		Soil	1.02	50	1	49.02						6010	
269757-002		Soil	1	50	1	50.0						6010	
269758-001		Soil	1.01	50	1	49.50						6010	
269758-002		Soil	1.02	50	1	49.02						6010	
269758-003		Soil	1.02	50	1	49.02						6010	
269777-001		Soil	.98	50	1	51.02						6010	
269839-001		Soil	.99	50	1	50.51						6010	
269839-003		Soil	1.02	50	1	49.02						6010	
269839-005		Soil	1	50	1	50.0						6010	
269839-008		Soil	.92	50	1	54.35						6010	
269839-009		Soil	1.06	50	1	47.17						6010	
269839-010		Soil	.99	50	1	50.51						6010	
269839-011		Soil	1.1	50	1	45.45						6010	
269839-012		Soil	.98	50	1	51.02						6010	
QC803955	BLANK	Soil	1	50	1	50.0							
QC803956	BS	Soil	1	50	1	50.0		.5	.5				
QC803957	BSD	Soil	1	50	1	50.0		.5	.5				
QC803958	MS	Soil	.99	50	1	50.51		.5	.5				
QC803959	MSD	Soil	1	50	1	50.0		.5	.5				
QC803960	SER	Soil	.98	50	1	51.02							
QC803961	PDS	Soil	.98	50	1	51.02							

Analyst: NCD Date: 09/17/15 Reviewer: PRW Date: 09/17/15

Soil Digestion for ICP & ICP-MS — Curtis & Tompkins, Ltd.

LIMS Batch #: 227255 | Scale Used: ☒ Metals Prep ☐ ____ | Digestion Method: ☒ EPA 3050b ☐ ____ | **BK3717** | Page 34

Date Digested: 9-16-15

Digested by: ✓ ✓

Lvl.	Sample #	Container ID	Weight of Sample (g)	Final Volume (mL)	Filtered? (y/n)	ID ✓	Comments
	BLK # 803955	QC	Ø	☒ 50 ☐ ____	Yes	✓	
	* BS 803956	↓	Ø	☒ 50 ☐ ____	Yes	✓	
	* BSD 803957	↓	Ø	☒ 50 ☐ ____	Yes	✓	
	* 269651-001 MS		0.99	☒ 50 ☐ ____	Yes	✓	
5	* - 001 MSD		1.00	☒ 50 ☐ ____	Yes	✓	
IV	↓ - 001	B	0.98	☒ 50 ☐ ____	Yes	✓	
II	269748-001	D	0.90	☒ 50 ☐ ____	Yes	✓	
↓	↓ - 002	D	1.10	☒ 50 ☐ ____	Yes	✓	
↓	↓ - 003	E	0.97	☒ 50 ☐ ____	Yes	✓	
II 10	269753-001	A	0.99	☒ 50 ☐ ____	Yes	✓	
II	269756-001	A	1.00	☒ 50 ☐ ____	Yes	✓	
II	269757-001	A	1.02	☒ 50 ☐ ____	Yes	✓	
↓	↓ - 002	↓	1.00	☒ 50 ☐ ____	Yes	✓	
II	269758-001	A	1.01	☒ 50 ☐ ____	Yes	✓	
↓ 15	↓ - 002	↓	1.02	☒ 50 ☐ ____	Yes	✓	
↓	↓ - 003	↓	1.02	☒ 50 ☐ ____	Yes	✓	
II	269777-001	D	0.98	☒ 50 ☐ ____	Yes	✓	
II	269839-001	A	0.99	☒ 50 ☐ ____	Yes	✓	
↓	↓ - 003	↓	1.02	☒ 50 ☐ ____	Yes	✓	
↓ 20	↓ - 005	↓	1.00	☒ 50 ☐ ____	Yes	✓	
↓	↓ - 008	↓	0.92	☒ 50 ☐ ____	Yes	✓	
↓	↓ - 009	↓	1.06	☒ 50 ☐ ____	Yes	✓	
↓	↓ - 010	↓	0.99	☒ 50 ☐ ____	Yes	✓	
↓	↓ - 011	↓	1.10	☒ 50 ☐ ____	Yes	✓	
↓	↓ - 012	↓	0.98	☒ 50 ☐ ____	Yes	✓	

	Reagent ID or LIMS #	Initials / Date
Digestion tubes, lot#	SCP-212524	VV 9-16-15
0.5 mL of spike solution (Std1) was added to all spikes	S266601 *	
0.5 mL of spike solution (Std2) was added to all spikes	S266611	
Digestion Temperature (°C), Block and Probe Location	95°C B-4	
Digestion begun at (time)	22:00	
1:1 HNO3	117003-091615	
concentrated HNO3	117003-JTB	
3mL 30% hydrogen peroxide	88775-JTB	↓
concentrated HCl	911502-Fisher	VV 9-17-15
Digestion ended at (time)	01:25	
☒ filtered	Whatman-9665584	
Relinquished to ICP group	ICAP	↓

9-16-15

Digestion Chemist / Date

Continued from page Ø

Continued on page ____

Reviewed Online / See LIMS

CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 1065362211

Instrument : MET44 Begun : 09/08/15 12:51
Method : EPA 7470A SOP Version : hg_water_rv16

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
001	met44	ICALBLK				09/08/15 12:51	1.0		
002	met44	ICAL	ICAL1			09/08/15 12:52	1.0	1	
003	met44	ICAL	ICAL2			09/08/15 12:53	1.0	1	
004	met44	ICAL	ICAL3			09/08/15 12:54	1.0	1	
005	met44	ICAL	ICAL4			09/08/15 12:56	1.0	1	
006	met44	ICAL	ICAL5			09/08/15 12:57	1.0	1	
007	met44	ICV				09/08/15 12:58	1.0	2	
008	met44	ICB				09/08/15 12:59	1.0		
009	met44	BLANK	QC802686	Soil	226927	09/08/15 13:01	1.0		
010	met44	LCS	QC802687	Soil	226927	09/08/15 13:02	1.0		
011	met44	LOD	255716-016	Soil	226927	09/08/15 13:03	1.0		
012	met44	MSS	269572-001	Soil	226927	09/08/15 13:04	1.0		1:HG=19
013	met44	MS	QC802688	Soil	226927	09/08/15 13:06	1.0		1:HG=23
014	met44	MSD	QC802689	Soil	226927	09/08/15 13:07	1.0		1:HG=21
015	met44	SER	QC802690	Soil	226927	09/08/15 13:09	5.0		
016	met44	MSS	269572-001	Soil	226927	09/08/15 13:10	5.0		
017	met44	MS	QC802688	Soil	226927	09/08/15 13:12	5.0		
018	met44	MSD	QC802689	Soil	226927	09/08/15 13:13	5.0		
019	met44	CCV				09/08/15 13:14	1.0	3	
020	met44	CCB				09/08/15 13:15	1.0		
021	met44	SER	QC802690	Soil	226927	09/08/15 13:16	25.0		
022	met44	SAMPLE	269586-001	Soil	226927	09/08/15 13:18	1.0		
023	met44	SAMPLE	269586-002	Soil	226927	09/08/15 13:19	1.0		
024	met44	SAMPLE	269589-001	Soil	226927	09/08/15 13:20	1.0		
025	met44	SAMPLE	269596-002	Soil	226927	09/08/15 13:21	1.0		
026	met44	SAMPLE	269599-001	Soil	226927	09/08/15 13:23	1.0		
027	met44	SAMPLE	269599-006	Soil	226927	09/08/15 13:24	1.0		
028	met44	SAMPLE	269599-015	Soil	226927	09/08/15 13:25	1.0		
029	met44	SAMPLE	269599-016	Soil	226927	09/08/15 13:26	1.0		
030	met44	SAMPLE	269599-017	Soil	226927	09/08/15 13:28	1.0		
031	met44	CCV				09/08/15 13:29	1.0	3	
032	met44	CCB				09/08/15 13:30	1.0		
033	met44	SAMPLE	269599-018	Soil	226927	09/08/15 13:31	1.0		
034	met44	CCV				09/08/15 13:33	1.0	3	
035	met44	CCB				09/08/15 13:34	1.0		
036	met44	X	MANUALFIASCYCLE			09/08/15 13:36	1.0		
037	met44	X	MANUALFIASCYCLE			09/08/15 13:38	1.0		

ARD 09/08/15 : I verified that the vials loaded on the instrument matched the sequence data entry, for runs 1 through 20.

JDB 09/11/15 : I verified that the vials loaded on the instrument matched the sequence data entry, for runs 21 through 35.

Standards used: 1=S28009 2=S28011 3=S28012

CURTIS & TOMPKINS INITIAL CALIBRATION FOR 269651 METALS Soil: EPA 7470A

Inst : MET44
Calnum : 1065362211001
Units : ug/L

Date : 08-SEP-2015 12:51
X Axis : R

Level	File	Seqnum	Sample ID	Analyzed	Stds
L1	met44	1065362211002	ICAL1	08-SEP-2015 12:52	S28009 (500X)
L2	met44	1065362211003	ICAL2	08-SEP-2015 12:53	S28009 (200X)
L3	met44	1065362211004	ICAL3	08-SEP-2015 12:54	S28009 (50X)
L4	met44	1065362211005	ICAL4	08-SEP-2015 12:56	S28009 (20X)
L5	met44	1065362211006	ICAL5	08-SEP-2015 12:57	S28009 (10X)

Analyte	L1	L2	L3	L4	L5	Type	a0	a1	a2	Avg	r^2 %RSD	MnR^2	Flg
Mercury	0.0110	0.0120	0.0122	0.0119	0.0120	LIN0	0.00375	83.5026		0.0118	1.000	.99	

Spiked Amounts / Drifts	L1	%D	L2	%D	L3	%D	L4	%D	L5	%D
Mercury	0.2000	-6	0.5000	1	2.0000	2	5.0000	-1	10.000	0

Instrument amount = a0 + response * a1 + response^2 * a2; LIN0=Linear regression including 0,0 point

CURTIS & TOMPKINS 2ND SOURCE CALIBRATION SUMMARY FOR 269651 METALS Soil
EPA 7470A

Inst : MET44
Calnum : 1065362211001 Cal Date : 08-SEP-2015

ICV 1065362211007 (08-SEP-2015) stds: S28011

Analyte	Spiked	Quant	Units	%D	Max	Flags
Mercury	5.000	4.972	ug/L	-1	10	

CURTIS & TOMPKINS INSTRUMENT BLANK FOR 269651 METALS Soil
EPA 7470A

Inst : MET44 IDF : 1.0
Seqnum : 1065362211008 File : met44 Time : 08-SEP-2015 12:59
Cal : 1065362211001 Caldate : 08-SEP-2015

Analyte	Quant	IQL	LOD	Units	Flags
Mercury	ND	0.2000	---	ug/L	

CURTIS & TOMPKINS CONTINUING CALIBRATION FOR 269651 METALS Soil
EPA 7470A

Inst : MET44 IDF : 1.0
Seqnum : 1065362211019 File : met44 Time : 08-SEP-2015 13:14
Cal : 1065362211001 Caldate : 08-SEP-2015
Standards: S28012

Analyte	Avg RF/CF	RF/CF	Spiked	Quant	Units	%D	Max %D	Flags
Mercury	0.0118	0.0119	5.000	4.981	ug/L	0	20	

CURTIS & TOMPKINS INSTRUMENT BLANK FOR 269651 METALS Soil
EPA 7470A

Inst : MET44 IDF : 1.0
Seqnum : 1065362211020 File : met44 Time : 08-SEP-2015 13:15
Cal : 1065362211001 Caldate : 08-SEP-2015

Analyte	Quant	IQL	LOD	Units	Flags
Mercury	ND	0.2000	---	ug/L	

CURTIS & TOMPKINS CONTINUING CALIBRATION FOR 269651 METALS Soil
EPA 7470A

Inst : MET44 IDF : 1.0
Seqnum : 1065362211031 File : met44 Time : 08-SEP-2015 13:29
Cal : 1065362211001 Caldate : 08-SEP-2015
Standards: S28012

Analyte	Avg RF/CF	RF/CF	Spiked	Quant	Units	%D	Max %D	Flags
Mercury	0.0118	0.0116	5.000	4.830	ug/L	-3	20	

CURTIS & TOMPKINS INSTRUMENT BLANK FOR 269651 METALS Soil
EPA 7470A

Inst : MET44 IDF : 1.0
Seqnum : 1065362211032 File : met44 Time : 08-SEP-2015 13:30
Cal : 1065362211001 Caldate : 08-SEP-2015

Analyte	Quant	IQL	LOD	Units	Flags
Mercury	ND	0.2000	---	ug/L	

CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 1075363776

Instrument : MET54
Method : EPA 7470A

Begun : 09/09/15 14:56
SOP Version : hg_water_rv16

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
001	met54	ICALBLK				09/09/15 14:56	1.0		
002	met54	ICAL	ICAL1			09/09/15 15:01	1.0	1	
003	met54	ICAL	ICAL2			09/09/15 15:02	1.0	1	
004	met54	ICAL	ICAL3			09/09/15 15:03	1.0	1	
005	met54	ICAL	ICAL4			09/09/15 15:04	1.0	1	
006	met54	ICAL	ICAL5			09/09/15 15:05	1.0	1	
007	met54	ICV				09/09/15 15:06	1.0	2	
008	met54	ICB				09/09/15 15:08	1.0		
009	met54	BLANK	QC802841	Soil	226971	09/09/15 15:09	1.0		
010	met54	BS	QC802842	Soil	226971	09/09/15 15:10	1.0		
011	met54	BSD	QC802843	Soil	226971	09/09/15 15:11	1.0		
012	met54	MSS	269560-001	Miscell.	226971	09/09/15 15:12	1.0		
013	met54	MS	QC802844	Miscell.	226971	09/09/15 15:13	1.0		
014	met54	MSD	QC802845	Miscell.	226971	09/09/15 15:14	1.0		
015	met54	SAMPLE	269602-001	Soil	226971	09/09/15 15:15	1.0		
016	met54	SAMPLE	269602-002	Soil	226971	09/09/15 15:16	1.0		
017	met54	SAMPLE	269602-003	Soil	226971	09/09/15 15:18	1.0		
018	met54	SAMPLE	269602-004	Soil	226971	09/09/15 15:19	1.0		
019	met54	CCV				09/09/15 15:20	1.0	3	
020	met54	CCB				09/09/15 15:21	1.0		
021	met54	SAMPLE	269602-005	Soil	226971	09/09/15 15:22	1.0		
022	met54	SAMPLE	269602-006	Soil	226971	09/09/15 15:23	1.0		
023	met54	SAMPLE	269602-007	Soil	226971	09/09/15 15:24	1.0		
024	met54	SAMPLE	269602-008	Soil	226971	09/09/15 15:26	1.0		
025	met54	SAMPLE	269602-009	Soil	226971	09/09/15 15:27	1.0		
026	met54	SAMPLE	269602-010	Soil	226971	09/09/15 15:28	1.0		
027	met54	SAMPLE	269602-011	Soil	226971	09/09/15 15:29	1.0		
028	met54	SAMPLE	269602-012	Soil	226971	09/09/15 15:30	1.0		
029	met54	SAMPLE	269656-001	Soil	226971	09/09/15 15:31	1.0		
030	met54	SAMPLE	269656-002	Soil	226971	09/09/15 15:32	1.0		
031	met54	CCV				09/09/15 15:33	1.0	3	
032	met54	CCB				09/09/15 15:34	1.0		
033	met54	SAMPLE	269656-003	Soil	226971	09/09/15 15:36	1.0		
034	met54	SAMPLE	269657-001	Soil	226971	09/09/15 15:37	1.0		
035	met54	X	RINSE			09/09/15 15:38	1.0		
036	met54	BLANK	QC802686	Soil	226927	09/09/15 15:39	1.0		
037	met54	LCS	QC802687	Soil	226927	09/09/15 15:40	1.0		
038	met54	SAMPLE	269611-001	Soil	226927	09/09/15 15:41	1.0		
039	met54	SAMPLE	269612-001	Soil	226927	09/09/15 15:42	1.0		
040	met54	SAMPLE	269615-001	Soil	226927	09/09/15 15:43	1.0		
041	met54	SAMPLE	269622-001	Soil	226927	09/09/15 15:44	1.0		
042	met54	SAMPLE	269622-002	Soil	226927	09/09/15 15:46	1.0		
043	met54	CCV				09/09/15 15:47	1.0	3	
044	met54	CCB				09/09/15 15:48	1.0		
045	met54	SAMPLE	269636-001	Soil	226927	09/09/15 15:49	1.0		
046	met54	SAMPLE	269638-001	Soil	226927	09/09/15 15:50	1.0		
047	met54	SAMPLE	269651-001	Soil	226927	09/09/15 15:51	1.0		1:HG=26
048	met54	X	RINSE			09/09/15 15:53	1.0		
049	met54	SAMPLE	269651-001	Soil	226927	09/09/15 15:54	10.0		
050	met54	CCV				09/09/15 15:55	1.0	3	
051	met54	CCB				09/09/15 15:56	1.0		
052	met54	X	MANUALFIASCYCLE			09/09/15 15:58	1.0		

CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 1075363776

Instrument : MET54 Begun : 09/09/15 14:56
Method : EPA 7470A SOP Version : hg_water_rv16

ARD 09/09/15 : I verified that the vials loaded on the instrument matched the sequence data entry, for runs 1 through 51.

Standards used: 1=S28009 2=S28011 3=S28012

CURTIS & TOMPKINS INITIAL CALIBRATION FOR 269651 METALS Soil: EPA 7470A

Inst : MET54
Calnum : 1075363776001
Units : ug/L

Date : 09-SEP-2015 14:56
X Axis : R

Level	File	Seqnum	Sample ID	Analyzed	Stds
L1	met54	1075363776002	ICAL1	09-SEP-2015 15:01	S28009 (500X)
L2	met54	1075363776003	ICAL2	09-SEP-2015 15:02	S28009 (200X)
L3	met54	1075363776004	ICAL3	09-SEP-2015 15:03	S28009 (50X)
L4	met54	1075363776005	ICAL4	09-SEP-2015 15:04	S28009 (20X)
L5	met54	1075363776006	ICAL5	09-SEP-2015 15:05	S28009 (10X)

Analyte	L1	L2	L3	L4	L5	Type	a0	a1	a2	Avg	r^2 %RSD	MnR^2	Flg
Mercury	0.0095	0.0102	0.0105	0.0104	0.0103	LIN0	-0.0018	96.7817		0.0102	1.000	.99	

Spiked Amounts / Drifts	L1	%D	L2	%D	L3	%D	L4	%D	L5	%D
Mercury	0.2000	-9	0.5000	-2	2.0000	1	5.0000	0	10.000	0

Instrument amount = a0 + response * a1 + response^2 * a2; LIN0=Linear regression including 0,0 point

CURTIS & TOMPKINS 2ND SOURCE CALIBRATION SUMMARY FOR 269651 METALS Soil
EPA 7470A

Inst : MET54
Calnum : 1075363776001 Cal Date : 09-SEP-2015

ICV 1075363776007 (09-SEP-2015) stds: S28011

Analyte	Spiked	Quant	Units	%D	Max	Flags
Mercury	5.000	5.011	ug/L	0	10	

CURTIS & TOMPKINS INSTRUMENT BLANK FOR 269651 METALS Soil
EPA 7470A

Inst : MET54 IDF : 1.0
Seqnum : 1075363776008 File : met54 Time : 09-SEP-2015 15:08
Cal : 1075363776001 Caldate : 09-SEP-2015

Analyte	Quant	IQL	LOD	Units	Flags
Mercury	ND	0.2000	0.1000	ug/L	

CURTIS & TOMPKINS CONTINUING CALIBRATION FOR 269651 METALS Soil
EPA 7470A

Inst : MET54 IDF : 1.0
Seqnum : 1075363776043 File : met54 Time : 09-SEP-2015 15:47
Cal : 1075363776001 Caldate : 09-SEP-2015
Standards: S28012

Analyte	Avg RF/CF	RF/CF	Spiked	Quant	Units	%D	Max %D	Flags
Mercury	0.0102	0.0101	5.000	4.866	ug/L	-3	20	

CURTIS & TOMPKINS INSTRUMENT BLANK FOR 269651 METALS Soil
EPA 7470A

Inst : MET54 IDF : 1.0
Seqnum : 1075363776044 File : met54 Time : 09-SEP-2015 15:48
Cal : 1075363776001 Caldate : 09-SEP-2015

Analyte	Quant	IQL	LOD	Units	Flags
Mercury	ND	0.2000	0.1000	ug/L	

CURTIS & TOMPKINS CONTINUING CALIBRATION FOR 269651 METALS Soil
EPA 7470A

Inst : MET54 IDF : 1.0
Seqnum : 1075363776050 File : met54 Time : 09-SEP-2015 15:55
Cal : 1075363776001 Caldate : 09-SEP-2015
Standards: S28012

Analyte	Avg RF/CF	RF/CF	Spiked	Quant	Units	%D	Max %D	Flags
Mercury	0.0102	0.0100	5.000	4.828	ug/L	-3	20	

CURTIS & TOMPKINS INSTRUMENT BLANK FOR 269651 METALS Soil
EPA 7470A

Inst : MET54 IDF : 1.0
Seqnum : 1075363776051 File : met54 Time : 09-SEP-2015 15:56
Cal : 1075363776001 Caldate : 09-SEP-2015

Analyte	Quant	IQL	LOD	Units	Flags
Mercury	ND	0.2000	0.1000	ug/L	

SAMPLE PREPARATION SUMMARY

Batch # : 226927
Started By : ARD
Method : METHOD
Spike #1 ID : S28009

Prep Date : 08-SEP-2015 11:55

Analysis : HG
Finished By : ARD
Units : g

Sample	Stype	Matrix	Initial	Final	Clean DF	Prep DF	pH	Sp 1 Vol	Sp 2 Vol	Sp 3 Vol	Clean Method	Analysis	Comments
255716-016		Soil	.6	50	1	83.33		.05				HG	
269572-001		Soil	.59	50	1	84.75						T22/HG	
269586-001		Soil	.62	50	1	80.65						T22/HG	
269586-002		Soil	.65	50	1	76.92						T22/HG	
269589-001		Soil	.63	50	1	79.37						T22/HG	
269596-002		Soil	.56	50	1	89.29						T22/HG	
269599-001		Soil	.59	50	1	84.75						T22/HG	
269599-006		Soil	.56	50	1	89.29						T22/HG	
269599-015		Soil	.62	50	1	80.65						T22/HG	
269599-016		Soil	.65	50	1	76.92						T22/HG	
269599-017		Soil	.61	50	1	81.97						T22/HG	
269599-018		Soil	.61	50	1	81.97						T22/HG	
269611-001		Soil	.58	50	1	86.21						T22/HG	Prepped 09-SEP-2015 11:20
269612-001		Soil	.62	50	1	80.65						T22/HG	Prepped 09-SEP-2015 11:20
269615-001		Soil	.65	50	1	76.92						T22/HG	Prepped 09-SEP-2015 11:20
269622-001		Soil	.59	50	1	84.75						T22/HG	Prepped 09-SEP-2015 11:20
269622-002		Soil	.57	50	1	87.72						T22/HG	Prepped 09-SEP-2015 11:20
269636-001		Soil	.56	50	1	89.29						T22/HG	Prepped 09-SEP-2015 11:20
269638-001		Soil	.63	50	1	79.37						T22/HG	Prepped 09-SEP-2015 11:20
269651-001		Soil	.62	50	1	80.65						7471-HG	Prepped 09-SEP-2015 11:20
QC802686	BLANK	Soil	.6	50	1	83.33							
QC802687	LCS	Soil	.6	50	1	83.33		1.25					
QC802688	MS	Soil	.6	50	1	83.33		1.25					
QC802689	MSD	Soil	.58	50	1	86.21		1.25					
QC802690	SER	Soil	.59	50	1	84.75							

Analyst: ARD Date: 09/08/15 Reviewer: PRW Date: 09/08/15

Soil Digestion for Mercury

Curtis & Tompkins, Ltd.

LIMS Batch #: 226927
Date Digested: 09.08.15

Scale Used: ☒ Metals Prep ☐ _____
Digestion Method: ☒ EPA 7471A ☐ _____

BK3704
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	Sample #	container ID	Sample Weight (g)	Final Volume (mL)	Filtered? (y/n)	Comments
	Blank		Ø	☒50 ☐___	Y	QC802686
	~~BS~~ LCS *		Ø	☒50 ☐___	↓	↓ 687
	~~BSD~~		Ø	☐50 ☐___		ARD 9.8.15
	MSS: 269572-001	A	0.59	☒50 ☐___	Y	
5	MS *	↓	0.60	☒50 ☐___		
	MSD *	↓	0.58	☒50 ☐___		
	269586-001	B	0.62	☒50 ☐___		
	↓ -002	↓	0.65	☒50 ☐___		
	269589-001	D	0.63	☒50 ☐___		
10	269596-002	A	0.56	☒50 ☐___		
	269599-001	B	0.59	☒50 ☐___		
	-006	↓	0.56	☒50 ☐___		
	-015	↓	0.62	☒50 ☐___		
	-016		0.65	☒50 ☐___		COMP 002-005 @ 50g/
15	-017		0.61	☒50 ☐___		↓ 007-010 ↓
	-018		0.61	☒50 ☐___		↓ 011-014 ↓
ARD 9.8.15	~~269~~ 255716-016		Ø	☒50 ☐___	↓	spike w/ 0.05mL S28009
	269611-001	B	0.58	☒50 ☐___	Y	Added 9.9.15 @ 11:20 end @ 11:50
	269612-001	C	0.62	☒50 ☐___		
20	269615-001	C	0.65	☒50 ☐___		
	269622-001	B	0.59	☒50 ☐___		
	↓ -002	↓	0.57	☒50 ☐___		
	269636-001	C	0.56	☒50 ☐___		
	269638-001	C	0.63	☒50 ☐___		
	269651-001	A	0.62	☒50 ☐___	↓	↓ ↓

	Reagent ID/ LIMS# / Time	Initials / Date
Digestion Tubes, Lot #	EK-140811	ARD 9/8/15
1.25 mL of spike standard was added to all spikes	S28009 *	↓
☒ CAL digested with this batch — ICAL Source LIMS S#	S28010	
ICV / CCV LIMS S#	S28011 / S28012	
Digestion Temperature (°C), Block and Probe Location	95° B29	
Digestion Started at (time)	11:55	
Aqua Regia Acids (HNO3+ HCl)	JTB 090815	
5% $KMnO_4$	FS 082115	
NaCl.hydroxylamine hydrochloride	FS 090415	
Stannous Chloride	FS 090115	
Digestion Completd at (time)	12:25	
☒ filtered thru' 0.45 um syringe filter (lot #)	SSB-50194103	↓

9/8/15
Prep Chemist / Date

Continued from page Ø
Continued on page _____

Reviewed Online / See LIMS

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 269651
ANALYTICAL REPORT
Wet Chemistry

Tetra Tech EMI	Project : 103S225322.01
1999 Harrison Street	Location : B163 Phytoremediation
Oakland, CA 94612	Level : IV

Sample ID	Lab ID
20150908 B163PHYTO	269651-001

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: _____ Date: 09/23/2015

Mike Dahlquist
Project Manager
mike.dahlquist@ctberk.com

CA ELAP# 2896, NELAP# 4044-001

Curtis & Tompkins, Ltd.

CASE NARRATIVE
WET CHEMISTRY (ASTM D2216/CLP)

Laboratory number:	**269651**
Client:	**Tetra Tech EMI**
Project:	**103S225322.01**
Location:	**B163 Phytoremediation**
Request Date:	**09/08/15**
Samples Received:	**09/08/15**

This data package contains sample and QC results for one soil sample, requested for the above referenced project on 09/08/15. See attached cooler receipt form for any sample receipt problems or discrepancies.

Moisture (ASTM D2216/CLP):
No analytical problems were encountered.

Chain of Custody

269651

Tetra Tech EM Inc.
San Francisco Office

135 Main St. Suite 1800
San Francisco. CA 94105
415-543-4880
Fax 415-543-5480

Chain of Custody Record No. 5368

Page 1 of 1

5368

Lab PO#: to follow	**Lab:** CT		
Project name: B163 phytoremediation	**TtEMI technical contact:** Sara Woolley	**Field samplers:** Dayna Aragon	
Project (CTO) number: 10352253.22.01	**TtEMI project manager:** Jason Brodersen	**Field samplers' signatures:** Dayna	

Sample ID	Sample Location (Pt. ID)	Date	Time	Matrix	MS / MSD	No./Container Types: 40 ml VOA	1 liter Amber	500 ml Poly	Sleeve	Glass Jar 4oz	Preservative Added: Nitric	Nitric	Nitric	Analysis Required: VOA	SVOA	~~Pest~~/PCBs	Metals * As, Hg, Pb	TPH Purgeables	TPH Extractables	PAH SIM
20150908 B163 phyto		9/8/15	0915	soil						2							X	X		X

	Name (print)	Company Name	Date	Time
Relinquished by: Dayna Aragon	Dayna Aragon	Tetra Tech	9/8/15	1130
Received by: Pat Gonzalez	Pat Gonzalez	CT	9/18/15	11.30
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

Turnaround time/remarks:
* individual metals: As, Hg, Pb

Fed Ex #:

WHITE-Laboratory Copy YELLOW-Sample Tracker PINK-File Copy

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 269651 Date Received 9/8/15 Number of coolers 1
Client Tetra Tech Project B163 Phytoremediation

Date Opened 9/8 By (print) SL (sign)
Date Logged in ↓ By (print) ↓ (sign) ↓

1. Did cooler come with a shipping slip (airbill, etc) ____ YES (NO)
Shipping info ____

2A. Were custody seals present? .... ☐ YES (circle) on cooler on samples ☒ NO
How many ____ Name ____ Date ____
2B. Were custody seals intact upon arrival? ____ YES NO N/A
3. Were custody papers dry and intact when received? ____ YES NO
4. Were custody papers filled out properly (ink, signed, etc)? ____ YES NO
5. Is the project identifiable from custody papers? (If so fill out top of form) ___ YES NO
6. Indicate the packing in cooler: (if other, describe) ____

☐ Bubble Wrap ☐ Foam blocks ☐ Bags ☐ None
☐ Cloth material ☒ Cardboard ☐ Styrofoam ☐ Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

Type of ice used: ☒ Wet ☐ Blue/Gel ☐ None Temp(°C) 5.6°C

☐ Samples Received on ice & cold without a temperature blank; temp. taken with IR gun

☐ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? ____ YES (NO)
If YES, what time were they transferred to freezer? ____
9. Did all bottles arrive unbroken/unopened? ____ YES NO
10. Are there any missing / extra samples? ____ YES (NO)
11. Are samples in the appropriate containers for indicated tests? ____ YES NO
12. Are sample labels present, in good condition and complete? ____ YES NO
13. Do the sample labels agree with custody papers? ____ YES NO
14. Was sufficient amount of sample sent for tests requested? ____ YES NO
15. Are the samples appropriately preserved? ____ YES NO N/A
16. Did you check preservatives for all bottles for each sample? ____ YES NO N/A
17. Did you document your preservative check? ____ YES NO N/A
18. Did you change the hold time in LIMS for unpreserved VOAs? ____ YES NO N/A
19. Did you change the hold time in LIMS for preserved terracores? ____ YES NO N/A
20. Are bubbles > 6mm absent in VOA samples? ____ YES NO N/A
21. Was the client contacted concerning this sample delivery? ____ YES (NO)
If YES, Who was called? ____ By ____ Date: ____

COMMENTS

Rev 10, 9/12

Results & QC Summary

Percent Moisture Summary Report

Batch: 227001
Date: 09/09/15
Method: CLP SOW 390
Analyst: MFV

Sample	Tare (g)	Wet (g)	Dry (g)	Percent Solids	Percent Moisture
269650-001	11.1206	17.6174	17.3837	96	4
269650-002	11.0911	18.0205	17.4822	92	8
269650-003	11.3235	16.6167	16.3347	95	5
269650-004	11.1083	16.8708	16.4266	92	8
269650-005	11.3639	17.7384	17.4646	96	4
269650-006	10.8420	18.3021	17.7324	92	8
269650-007	11.3580	18.9710	18.7033	96	4
269650-008	11.2144	18.0723	17.7155	95	5
269650-009	11.2799	16.4369	16.0796	93	7
269650-010	11.2650	17.6610	17.2643	94	6
269650-011	11.4434	17.9068	17.5367	94	6
269650-012	11.3164	18.3460	17.9699	95	5
269650-013	11.3473	17.8278	17.4702	94	6
269650-014	11.0478	17.5758	17.2710	95	5
269650-015	10.9449	16.9945	16.6135	94	6
269650-016	11.2442	17.4434	16.9672	92	8
269650-017	11.3814	16.8866	16.5720	94	6
269650-018	11.3311	17.0132	16.6697	94	6
269651-001	11.2568	17.3814	16.7269	89	11
QC802952	10.8927	17.2647	16.8933	94	6
of 269650-018			RPD:	0.2%	3.6%

Moisture LOG **Curtis & Tompkins, Ltd.**

LIMS Batch #: 227001
Date: 9-9-15

Page: **93**
Benchbook#: **BK 3694**
Scale Used
☑ Leachates Analytical
☐ _____

	Sample # / Letter	Dish #	Dish Weight (g)	Sample + Dish Wt (g)	Final Weight (g)	*Comments
	BLK	88	11.3056	Ø	11.3053	
	269650-001 A	79	11.1206	17.6174	17.3837	
	-002	24	11.0911	18.0205	17.4822	
	-003	32	11.3235	16.6167	16.3347	
5	-004	13	11.1083	16.8708	16.4266	
	-005	45	11.3639	17.7384	17.4646	
	-006	90	10.8420	18.3021	17.7324	
	-007	30	11.3580	18.9710	18.7033	
	-008	69	11.2144	18.0723	17.7155	
10	-009	70	11.2799	16.4369	16.0796	
	-010	59	11.2650	17.6610	17.2643	
	-011	77	11.4434	17.9068	17.5367	
	-012	87	11.3164	18.3460	17.9699	
	-013	41	11.3473	17.8278	17.4702	
15	-014	62	11.0478	17.5758	17.2710	
	-015	8	10.9449	16.9945	16.6135	
	-016	44	11.2442	17.4434	16.9672	
	-017	16	11.3814	16.8866	16.5720	
	-018	95	11.3311	17.0132	16.6697	
20	269651-001	58	11.2568	17.3814	16.7269	
	269650-018	21	10.8927	17.2647	16.8933	SDUP
				MN 9-10-15		

Date/ Time IN: 9-9-15 2330
Temp (C) IN: 104
Date/ Time OUT: 9-10-15 1815
Temp (C) OUT: 104

9-9-15
Extraction Chemist **Date**

Reviewed Online / See LIMS

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PROJECT AB 163 METTLER

Notebook No. BR2394

Continued From Page

DATE	ANALYST	0.2000	100.0000	SET #
09/05/15	VV	0.2001	100.0001	10827
9-8-15	MN	0.1999	100.0005	10827
9/9/15	ARD	0.2000	100.0003	10827
9-10-15	MN	0.2000	100.0002	10827

Continued on Page

Read and Understood By

Signed | Date | Signed | Date