ATTACHMENT 1
QAPP WORKSHEETS

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CROSSWALK

The following table provides a "cross-walk" between the QAPP elements outlined in the Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP Manual), the necessary information, and the location of the information within the text document and corresponding QAPP Worksheet. Any QAPP elements and required information that are not applicable to the project are circled.

QAPP Element(s) and Corresponding Section(s) of UFP-QAPP Manual	Required Information	Crosswalk to QAPP Section	Crosswalk to QAPP Worksheet No.
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2.5 Project Planning/Problem Definition 2.5.1 Project Planning (Scoping) 2.5.2 Problem Definition, Site History, and Background	- Project Planning Session Documentation (including Data Needs tables) - Project Scoping Session Participants Sheet - Problem Definition, Site History, and Background - Site Maps (historical and present)	1	9 10
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QAPP Element(s) and Corresponding Section(s) of UFP-QAPP Manual	Required Information	Crosswalk to QAPP Section	Crosswalk to QAPP Worksheet No.
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QAPP Element(s) and Corresponding Section(s) of UFP-QAPP Manual	Required Information	Crosswalk to QAPP Section	Crosswalk to QAPP Worksheet No.
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QAPP Worksheet #1
Title and Approval Page

Title: Quality Assurance Project Plan
Site Name/Project Name: [ ]
Site Location: [ ]
Revision Number: [ ]
Revision Date: [ ]

[Name of Organization]
Lead Organization

[Contractor Project Manager's Name; or EPA Region 2 DESA Sampler Lead Name]
[Contractor Project Manager's phone #; or EPA Region2 DESA Sampler Lead phone #]
[Contractor Project Manager's e-mail; or EPA Region 2 DESA Sampler Lead e-mail]
Preparer's Name and Organizational Affiliation

Preparer's Address, Telephone Number, and E-mail Address

[Date]
Preparation Date (Day/Month/Year)

Program Manager, if applicable: _____
Signature

[Name of Contractor Program Manager and Date]
Printed Name/Organization/Date

QA Officer: _____
Signature

[Names of Contractor QAO and/or EPA Region 2 QAO, and Date]
Printed Name/Organization/Date

EPA Region 2 Project Manager (RPM or BPM)/On-Scene Coordinator (OSC): _____
Signature

[Name of EPA Region 2 Project Manager (RPM or BPM) or OSC and Date]
Printed Name/Organization/Date

Document Control Number: [ ]

QAPP Worksheet #2
QAPP Identifying Information

Site Name/Project Name: [ ]
Site Location: [ ]
Operable Unit: [ ]
Title: Quality Assurance Project Plan
Revision Number: [ ]
Revision Date: [ ]

1. **Identify guidance used to prepare QAPP:** Uniform Federal Policy for Quality Assurance Project Plans

2. **Identify regulatory program:** EPA Region 2

3. **Identify approval entity:** EPA Region 2

4. **Indicate whether the QAPP is a generic or a project-specific QAPP. (circle one)**

5. **List dates of scoping sessions that were held:** [Dates of initial request]

6. **List dates and titles of QAPP documents written for previous site work, if applicable:**

7. **List organizational partners (stakeholders) and connection with lead organization:** **[i.e.** NYSDEC, NYSDOH, NJDEP]

8. **List data users:**
EPA Region 2 (see Worksheet #4 for individuals)

9. **If any required QAPP elements and required information are not applicable to the project, then provide an explanation for their exclusion below:**
   - [Not applicable because…]

10. **Document Control Number:**
[ ]

QAPP Worksheet #3
Distribution List

[List those entities to which copies of the approved QAPP, subsequent QAPP revisions, addenda, and amendments are sent]

QAPP Recipient	Title	Organization	Telephone Number	Fax Number	E-mail Address	Document Control Number
[Project Manager Name]	Contractor Project Manager; or EPA Region 2 Remedial Project Manager, Brownfields Project Manager or On-Scene Coordinator	Name of Organization	[ ]	[ ]	[Name]@e-mail address	[Repeat DCN throughout]
[QAO Name]	Contractor QA Officer; or EPA Region 2 QAO	Name of Organization	[ ]	[ ]	[Name]@e-mail address	
[Lead Sampler's Name]	Contractor Project Manager; or EPA Region 2 DESA	Name of Organization	[ ]	[ ]	[Name]@e-mail address	

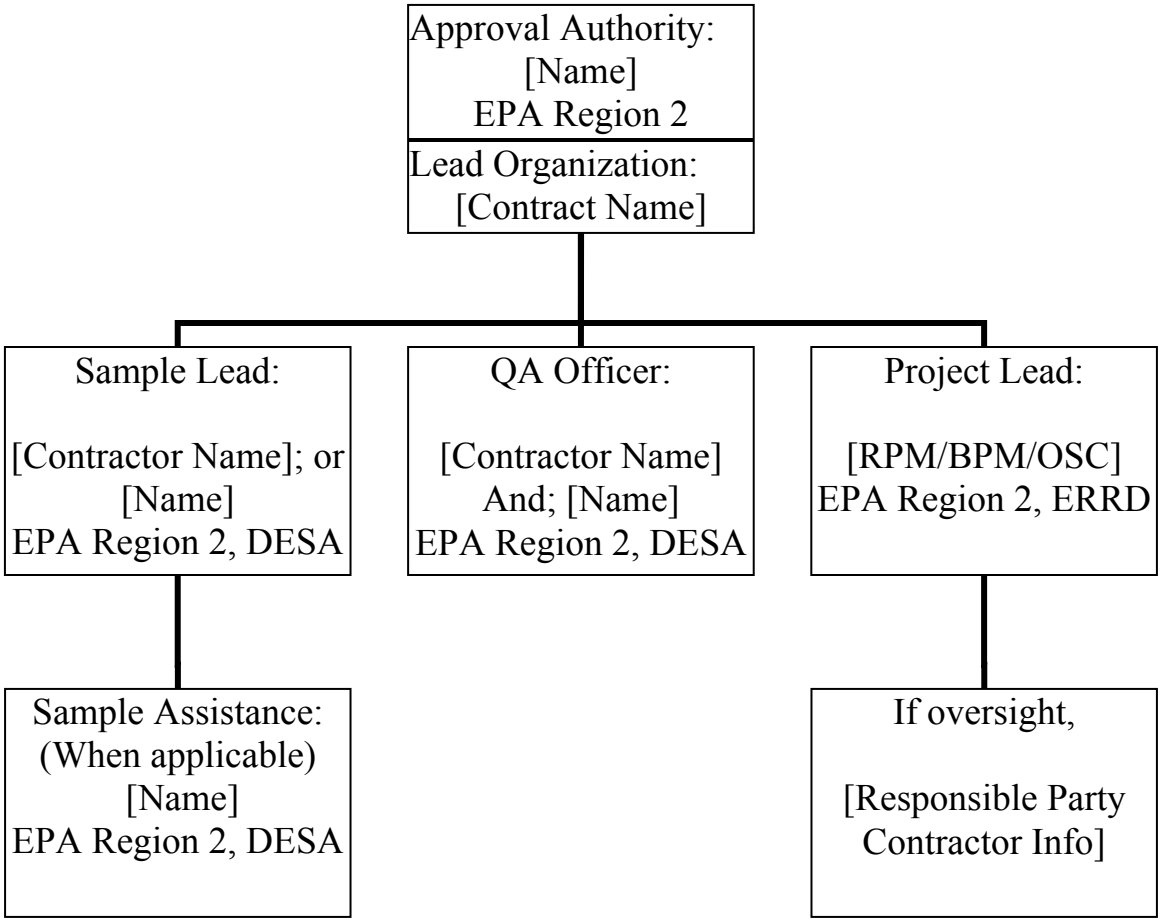
QAPP Worksheet #4
Project Personnel Sign-Off Sheet

[Have copies of this form signed by key project personnel from each organization to indicate that they have read the applicable sections of the QAPP and will perform the tasks as described; add additional sheets as required. Ask each organization to forward signed sheets to the central project file.]

Organization: Name of Organization

Project Personnel	Title	Telephone Number	Signature	Date QAPP Read
[Project Manager Name]	Contractor Project Manager; or EPA Region 2 Remedial Project Manager, Brwonfields Project Manager or On-Scene Coordinator	[ ]		
[QAO Name]	Contractor QAO EPA Region 2 QAO	[ ]		
[Lead Sampler's Name]	Contractor Project Manager; or EPA Region 2 DESA	[ ]		
[Assistant Sampler]	Field Support	[ ]		
[Assistant Sampler]	Field Support	[ ]		
[If applicable]	Hydrogeologist			
[If applicable]	Risk Assessor			

QAPP Worksheet #5
Project Organizational Chart



Acronyms:

DESA: Division of Environmental Science and Assessment
RPM: Remedial Project Manager
BPM: Brownfields Project Manager
OSC: On-Scene Coordinator

QAPP Worksheet #6
Communication Pathways

Communication Drivers	Responsible Entity	Name	Phone Number	Procedure (Timing, Pathways, etc.)
Point of contact with EPA RPM/BPM/OSC	Contractor Project Manager	[ ]	[ ]	All technical, QA and decision-making matters in regard to the project (verbal, written or electronic)
Adjustments to QAPP	Contractor Quality Assurance Officer	[ ]	[ ]	QAPP approval dialogue
If oversight sampling,	Responsible Party Contractor			Coordination with contractor

QAPP Worksheet #7
Personnel Responsibilities and Qualifications Table

Name	Title	Organizational Affiliation	Responsibilities	Education and Experience Qualifications
[ ]	Contractor Project Manager	Lead Organization	Implementing and executing the technical, QA and health and safety during sampling event	[ ]
[ ]	Sampling Assistance, if applicable	EPA/DESA	Sample activities and management	[ ]
[ ]	Remedial Project Manager; Brownfields Project Manager or On-Scene Coordinator	EPA/ERRD	All project coordination, direction and decision making	[ ]
If applicable	Hydrogeologist	EPA/ERRD		
If applicable	Risk Assessor	EPA/ERRD		
If oversight	Responsible Party Contractor			

QAPP Worksheet #8
Special Personnel Training Requirements Table

Project Function	Specialized Training – Title or Description of Course	Training Provider	Training Date	Personnel/Groups Receiving Training	Personnel Titles/ Organizational Affiliation	Location of Training Records/Certificates[1]
[Specify location of training records and certificates for samplers]						

[1]**If training records and/or certificates are on file elsewhere, document their location in this column. If training records and/or certificates do not exist or are not available, then this should be noted.**

QAPP Worksheet #9
Project Scoping Session Participants Sheet

Site Name/Project Name: [ ]
Site Location: [ ]
Operable Unit: [ ]

Date of Session: [ ]
Scoping Session Purpose: To discuss questions, comments and assumptions regarding technical issues involved with the project

Name	Title	Affiliation	Phone #	E-mail Address	Project Role

Comments/Decisions: _____

Action Items: _____

Consensus Decisions: _____

QAPP Worksheet #10
Problem Definition

PROBLEM DEFINITION

[Purpose or reason for this particular sampling event. Problem to be addressed. Environmental questions being asked.]

SITE HISTORY/CONDITIONS

Site Location and Description

[Brief description of the site and sampling locations and how they were chosen]

Site History

[Brief description of the site history, include contaminants of concern, environmental indicators, historic results and any actions at the site]

PROJECT DECISION STATEMENTS

1. [If….., then…..statement for general purpose of sampling]
2. [If….., then…..statement for specific sampling type]
3. [If….., then…..statement for result and action level]
4. [If necessary, additional "If….., then…..statement"]
5. [If necessary, additional "If….., then…..statement"]

QAPP Worksheet #11
Project Quality Objectives/Systematic Planning Process Statements

Overall project objectives include:

- [Explain objective of sampling event]
- [Contaminants and matrix of event]
- [Receptors]
- [Remedies]

Who will use the data?
Data will be used by EPA Region 2 ERRD (RPM and/or OSC); or Brownfields Grantee to determine …….

What will the data be used for?
[Explain the ultimate use of data.]

What types of data are needed?

- [Sampling type and matrix]
- [Field screening or parameters, if applicable]
- [Type of sampling]
- [Access agreements, if applicable]
- [Sampling locations]

How "good" do the data need to be in order to support the environmental decision?
[RPD required, accuracy and precision of analytical methods and sampling, Refer to Worksheet #12]

How much data are needed?
[Number of samples, matrix and analysis]

Where, when, and how should the data be collected/generated?
[Sample locations and time frame]

Who will collect and generate the data?
[Lead Organization]

How will the data be reported?
[All data will be reported…….]

How will the data be archived?
[CLP data will be archived in….]

QAPP Worksheet #12
Measurement Performance Criteria Table

(UFP-QAPP Manual Section 2.6.2)

Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) and QC sample and/or activity used to assess the measurement performance for both the sampling and analytical measurement systems. Use additional worksheets if necessary. If MPC for specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Gas
Analytical Group	Volatile Organics
Concentration Level	Low (ppbv)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
	TO-15	Precision (field)	± 25 % D*	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	± 25 % D*	Laboratory Replicate Sample	A
		Accuracy (laboratory)	70-130 %R*	Laboratory Audit Standard	A
		Accuracy (laboratory)	No analyte > CRQL*	Laboratory Method Blank	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference Compendium Method TO-15 Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by GC/MS, 2nd Edition, January 1999; Table 3 "Summary of Internal Quality Control Procedures for VOCs by EPA method TO-15, Revision 01/21/2000.

QAPP Worksheet #12
Measurement Performance Criteria Table

(UFP-QAPP Manual Section 2.6.2)

Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) and QC sample and/or activity used to assess the measurement performance for both the sampling and analytical measurement systems. Use additional worksheets if necessary. If MPC for specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Gas
Analytical Group	Volatile Organics
Concentration Level	Low (ppv)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
	CLP SAV01.X	Precision (field)	≤ 25 % RPD*	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	± 25% RPD*	Laboratory Control Sample/CCV	A
		Accuracy (laboratory)	±30%R*	Laboratory Control Sample	A
		Accuracy (laboratory)	No analyte > ½ CRQL*	Method Blank	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Contract Laboratory Program Statement of Work for Volatile Organic Analysis in Air, SAV01.X, Draft, February 2007

QAPP Worksheet #12
Measurement Performance Criteria Table

(UFP-QAPP Manual Section 2.6.2)

Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) and QC sample and/or activity used to assess the measurement performance for both the sampling and analytical measurement systems. Use additional worksheets if necessary. If MPC for specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Aqueous
Analytical Group	TCL Volatile Organics
Concentration Level	Trace (ug/L)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
	SOM01.2	Precision (field)	Project-Specific %RPD	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	Project-Specific %RPD; List compound specific RPD	Field Duplcate; MS/MSD**	S & A; A
		Accuracy (laboratory)	List compound specific %R	***DMCs; MS/MSD**	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. 34/Trace VOA Trace VOA - Blank Type Criteria Table
****Optional*** MS/MSD – Reference CLP SOM01.2, Exhibit D, Table 6 for Criteria
***Deuterated Monitoring Compounds (DMCs) – Reference CLP SOM01.2, Exhibit D, Table 5 for Criteria

QAPP Worksheet #12
Measurement Performance Criteria Table

(UFP-QAPP Manual Section 2.6.2)

Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) and QC sample and/or activity used to assess the measurement performance for both the sampling and analytical measurement systems. Use additional worksheets if necessary. If MPC for specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Aqueous
Analytical Group	TCL Volatile Organics
Concentration Level	Low/Medium (ug/L)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
	SOM01.2	Precision (field)	Project-Specific %RPD	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	Project-Specific %RPD; List compound specific RPD	Field Duplicate; MS/MSD**	S & A; A
		Accuracy (laboratory)	List compound specific %R	***DMCs; MS/MSD**	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. 33/Low/Medium VOA - Blank Type Criteria Table
****Optional*** MS/MSD – Reference CLP SOM01.2, Exhibit D, Table 6 for Criteria
***Deuterated Monitoring Compounds (DMCs) – Reference CLP SOM01.2, Exhibit D, Table 5 for Criteria

QAPP Worksheet #12
Measurement Performance Criteria Table

(UFP-QAPP Manual Section 2.6.2)

Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) and QC sample and/or activity used to assess the measurement performance for both the sampling and analytical measurement systems. Use additional worksheets if necessary. If MPC for specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Aqueous
Analytical Group	TCL Semivolatiles
Concentration Level	Low/Medium (ug/L)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
	SOM01.2	Precision (field)	Project-Specific %RPD	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	Project-Specific %RPD; List compound specific RPD	Field Duplicate; MS/MSD**	S & A; A
		Accuracy (laboratory)	List compound specific %R	***DMCs; MS/MSD**	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. 35/Low/Medium Semivolatile - Blank Type Criteria Table
****Optional*** MS/MSD – Reference CLP SOM01.2, Exhibit D, Table 6 for Criteria
*****Deuterated Monitoring Compounds (DMCs) – Reference CLP SOM01.2, Exhibit D, Table 5 for Criteria

QAPP Worksheet #12
Measurement Performance Criteria Table

(UFP-QAPP Manual Section 2.6.2)

Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) and QC sample and/or activity used to assess the measurement performance for both the sampling and analytical measurement systems. Use additional worksheets if necessary. If MPC for specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Aqueous
Analytical Group	TCL Pesticides
Concentration Level	Low/Medium (ug/L)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
	SOM01.2	Precision (field)	Project-Specific %RPD	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	Project-Specific %RPD; List compound specific RPD	Field Duplicate; MS/MSD**	S & A; A
		Accuracy (laboratory)	List compound specific %R	***LCS; MS/MSD**	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. 36/Low/Medium Pesticide - Blank Type Criteria Table
**MS/MSD – Reference CLP SOM01.2, Exhibit D, Table 3 for Criteria
***Laboratory Control Sample (LCS) – Reference CLP SOM01.2, Exhibit D, Table 2 for Criteria

QAPP Worksheet #12
Measurement Performance Criteria Table

(UFP-QAPP Manual Section 2.6.2)

Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) and QC sample and/or activity used to assess the measurement performance for both the sampling and analytical measurement systems. Use additional worksheets if necessary. If MPC for specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Aqueous
Analytical Group	TCL Aroclors (PCBs)
Concentration Level	Low/Medium (ug/L)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
	SOM01.2	Precision (field)	Project-Specific %RPD	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	Project-Specific %RPD; List compound specific RPD	Field Duplicate; MS/MSD**	S & A; A
		Accuracy (laboratory)	List compound specific %R	***LCS; MS/MSD**	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. 37/Low/Medium Aroclor - Blank Type Criteria Table
**MS/MSD – Reference CLP SOM01.2, Exhibit D, Table 1 for Criteria
***Laboratory Control Sample (LCS) – Reference CLP SOM01.2, Exhibit D, Table 2 for Criteria

QAPP Worksheet #12
Measurement Performance Criteria Table

(UFP-QAPP Manual Section 2.6.2)

Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) and QC sample and/or activity used to assess the measurement performance for both the sampling and analytical measurement systems. Use additional worksheets if necessary. If MPC for specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Soil
Analytical Group	TCL Volatiles
Concentration Level	Low/Medium (ug/kg)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
	SOM01.2	Precision (field)	Project-Specific %RPD	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	Project-Specific %RPD; List compound specific RPD	Field Duplicate; MS/MSD**	S & A; A
		Accuracy (laboratory)	List compound specific %R	***DMCs; MS/MSD**	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. 34/Trace VOA Trace VOA - Blank Type Criteria Table
****Optional*** MS/MSD – Reference CLP SOM01.2, Exhibit D, Table 6 for Criteria
***Deuterated Monitoring Compounds (DMCs) – Reference CLP SOM01.2, Exhibit D, Table 5 for Criteria

QAPP Worksheet #12
Measurement Performance Criteria Table

(UFP-QAPP Manual Section 2.6.2)

Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) and QC sample and/or activity used to assess the measurement performance for both the sampling and analytical measurement systems. Use additional worksheets if necessary. If MPC for specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Soil
Analytical Group	TCL Semivolatiles
Concentration Level	Low/Medium (ug/kg)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
	SOM01.2	Precision (field)	Project-Specific %RPD	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	Project-Specific %RPD; List compound specific RPD	Field Duplicate; MS/MSD**	S & A; A
		Accuracy (laboratory)	List compound specific %R	***DMCs; MS/MSD**	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. 34/Trace VOA Trace VOA - Blank Type Criteria Table
****Optional*** MS/MSD – Reference CLP SOM01.2, Exhibit D, Table 6 for Criteria
***Deuterated Monitoring Compounds (DMCs) – Reference CLP SOM01.2, Exhibit D, Table 5 for Criteria

QAPP Worksheet #12
Measurement Performance Criteria Table

(UFP-QAPP Manual Section 2.6.2)

Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) and QC sample and/or activity used to assess the measurement performance for both the sampling and analytical measurement systems. Use additional worksheets if necessary. If MPC for specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Soil
Analytical Group	TCL Pesticides
Concentration Level	Low/Medium (ug/kg)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
	SOM01.2	Precision (field)	Project-Specific %RPD	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	Project-Specific %RPD; List compound specific RPD	Field Duplicate; MS/MSD**	S & A; A
		Accuracy (laboratory)	List compound specific %R	***LCS; MS/MSD**	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. 36/Low/Medium Pesticide - Blank Type Criteria Table
**MS/MSD – Reference CLP SOM01.2, Exhibit D, Table 3 for Criteria
***Laboratory Control Sample (LCS) – Reference CLP SOM01.2, Exhibit D, Table 2 for Criteria

QAPP Worksheet #12
Measurement Performance Criteria Table

(UFP-QAPP Manual Section 2.6.2)

Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) and QC sample and/or activity used to assess the measurement performance for both the sampling and analytical measurement systems. Use additional worksheets if necessary. If MPC for specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Soil
Analytical Group	TCL Aroclors (PCBs)
Concentration Level	Low/Medium (ug/kg)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
	SOM01.2	Precision (field)	Project-Specific %RPD	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	Project-Specific %RPD; List compound specific RPD	Field Duplicate; MS/MSD**	S & A; A
		Accuracy (laboratory)	List compound specific %R	***LCS; MS/MSD**	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. 36/Low/Medium Pesticide - Blank Type Criteria Table
**MS/MSD – Reference CLP SOM01.2, Exhibit D, Table 3 for Criteria
***Laboratory Control Sample (LCS) – Reference CLP SOM01.2, Exhibit D, Table 2 for Criteria

QAPP Worksheet #12
Measurement Performance Criteria Table

(UFP-QAPP Manual Section 2.6.2)

Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) and QC sample and/or activity used to assess the measurement performance for both the sampling and analytical measurement systems. Use additional worksheets if necessary. If MPC for specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Aqueous
Analytical Group	TAL Metals
Concentration Level	ICP-AES (ug/L)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
	ILM05.4	Precision (field)	≤ 20% RPD*	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	≤ 20% RPD*	Duplicate Sample **	A
		Accuracy (laboratory)	75–125%; 80–120 %	*** Matrix Spike; LCSW****	A A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP - (include absolute difference criteria)
**Reference USEPA CLP ILM05.4, Exhibit D of ICP-AES for Duplicate Sample Criteria - (include absolute difference criteria)
***Reference USEPA CLP ILM05.4, Exhibit D of ICP-AES for Spike Sample Criteria
****Reference USEPA CLP ILM05.4, Exhibit D of ICP-AES for aqueous Laboratory Control Sample (LCSW) Criteria w/exception of Ag and Sb

QAPP Worksheet #12
Measurement Performance Criteria Table

(UFP-QAPP Manual Section 2.6.2)

Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) and QC sample and/or activity used to assess the measurement performance for both the sampling and analytical measurement systems. Use additional worksheets if necessary. If MPC for specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Aqueous
Analytical Group	TAL Metals
Concentration Level	ICP-MS (ug/L)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
	ILM05.4	Precision (field)	≤20% RPD*	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	≤20% RPD*	Duplicate Sample **	A
		Accuracy (laboratory)	75–125%; 80–120 %	*** Matrix Spike; LCSW****	A A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP - (include absolute difference criteria)
**Reference USEPA CLP ILM05.4, Exhibit D of ICP-MS for Duplicate Sample Criteria - - (include absolute difference criteria)
***Reference USEPA CLP ILM05.4, Exhibit D of ICP-MS for Spike Sample Criteria
****Reference USEPA CLP ILM05.4, Exhibit D of ICP-MS for LCSW Criteria

QAPP Worksheet #12
Measurement Performance Criteria Table

(UFP-QAPP Manual Section 2.6.2)

Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) and QC sample and/or activity used to assess the measurement performance for both the sampling and analytical measurement systems. Use additional worksheets if necessary. If MPC for specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Aqueous
Analytical Group	TAL –Total Mercury
Concentration Level	Cold Vapor Atomic Absorption (CVAA)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
	ILM05.4	Precision (field)	≤20% RPD*	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	≤20% RPD*	Duplicate Sample **	A
		Accuracy (laboratory)	75–125%;	*** Matrix Spike;	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP - (include absolute difference criteria)
**Reference USEPA CLP ILM05.4, Exhibit D of ICP-MS for Duplicate Sample Criteria - - (include absolute difference criteria)
***Reference USEPA CLP ILM05.4, Exhibit D of ICP-MS for Spike Sample Criteria

QAPP Worksheet #12
Measurement Performance Criteria Table

(UFP-QAPP Manual Section 2.6.2)

Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) and QC sample and/or activity used to assess the measurement performance for both the sampling and analytical measurement systems. Use additional worksheets if necessary. If MPC for specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Aqueous
Analytical Group	TAL –Total Cyanide
Concentration Level	Colorimeter or Spectrophotometer

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
	ILM05.4	Precision (field)	≤20% RPD*	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	≤20% RPD*	Duplicate Sample **	A
		Accuracy (laboratory)	75–125%;	*** Matrix Spike	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP- (include absolute difference criteria)
**Reference USEPA CLP ILM05.4, Exhibit D of ICP-MS for Duplicate Sample Criteria - (include absolute difference criteria)
***Reference USEPA CLP ILM05.4, Exhibit D of ICP-MS for Spike Sample Criteria

QAPP Worksheet #12
Measurement Performance Criteria Table

(UFP-QAPP Manual Section 2.6.2)

Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) and QC sample and/or activity used to assess the measurement performance for both the sampling and analytical measurement systems. Use additional worksheets if necessary. If MPC for specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Soil
Analytical Group	TAL Metals
Concentration Level	ICP-AES (mg/kg)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
	ILM05.4	Precision (field)	≤ 35% RPD*	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	≤ 35% RPD*	Duplicate Sample **	A
		Accuracy (laboratory)	75–125%;	*** Matrix Spike; LCSS****	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP - (include absolute difference criteria)
**Reference USEPA CLP ILM05.4, Exhibit D of ICP-AES for Duplicate Sample Criteria
***Reference USEPA CLP ILM05.4, Exhibit D of ICP-AES for Spike Sample Criteria
****Reference USEPA CLP ILM05.4, Exhibit D of ICP-AES for solid Laboratory Control Sample (LCSS) **Note: Control Limits established by USEPA for LCSS**

QAPP Worksheet #12
Measurement Performance Criteria Table

(UFP-QAPP Manual Section 2.6.2)

Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) and QC sample and/or activity used to assess the measurement performance for both the sampling and analytical measurement systems. Use additional worksheets if necessary. If MPC for specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Soil
Analytical Group	TAL –Total Mercury
Concentration Level	Cold Vapor Atomic Absorption (CVAA)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
	ILM05.4	Precision (field)	≤ 35% RPD*	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	≤ 35% RPD*	Duplicate Sample **	A
		Accuracy (laboratory)	75–125%;	*** Matrix Spike; LCSS****	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP – (include absolute difference criteria)
**Reference USEPA CLP ILM05.4, Exhibit D of ICP-AES for Duplicate Sample Criteria
Reference USEPA CLP ILM05.4, Exhibit D of ICP-AES for Spike Sample Criteria*Reference USEPA CLP ILM05.4, Exhibit D of ICP-AES for solid Laboratory Control Sample (LCSS) **Note: Control Limits established by USEPA for LCSS**

QAPP Worksheet #12
Measurement Performance Criteria Table

(UFP-QAPP Manual Section 2.6.2)

Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) and QC sample and/or activity used to assess the measurement performance for both the sampling and analytical measurement systems. Use additional worksheets if necessary. If MPC for specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Soil
Analytical Group	TAL –Total Cyanide
Concentration Level	Colorimeter or Spectrophotometer

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
	ILM05.4	Precision (field)	≤35% RPD*	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	≤35% RPD*	Duplicate Sample **	A
		Accuracy (laboratory)	75–125%;	*** Matrix Spike; LCSS****	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP – (include absolute difference criteria)
**Reference USEPA CLP ILM05.4, Exhibit D of ICP-AES for Duplicate Sample Criteria
Reference USEPA CLP ILM05.4, Exhibit D of ICP-AES for Spike Sample Criteria*Reference USEPA CLP ILM05.4, Exhibit D of ICP-AES for solid Laboratory Control Sample (LCSS) **Note: Control Limits established by USEPA for LCSS**

QAPP Worksheet #13
Secondary Data Criteria and Limitations Table

Secondary Data	Data Source (Originating Organization, Report Title, and Date)	Data Generator(s) (Originating Org., Data Types, Data Generation/ Collection Dates)	How Data May Be Used (if deemed usable during data assessment stage)	Limitations on Data Use
Previous Investigation Sampling Results	[Document with results, i.e. RI/FS, ROD]	[Who collected data and when]	[What was purpose of previous sampling]	[Reason for additional sampling, ie data gaps, and discussions on comparability issues, incomplete data sets as well as qualified data]

QAPP Worksheet #14
Summary of Project Tasks

Sampling Tasks: [Samples to be collected, i.e. 10 ground water samples from monitoring wells, 15 soil samples from 0 – 6 inches, etc.]

Analysis Tasks: [Analysis requested by media]

Quality Control Tasks: [Should include information about QA/QC samples to be collected (ie field duplicate, MS/MSD, PE, etc).]

Data Management Tasks: [Should include: The data collected for the sampling activities will be organized, analyzed, and summarized in a final project report that will be submitted to the RPM/BPM or OSC according to the Project Schedule. The report will be prepared by the project officer and include appropriate data quality assessment. Standard methods and references will be used as guidelines for data reduction and reporting.]

Documentation and Records: [Should include: Field notebook, sample labels, custody seals, chain of custody, sample logs, etc.]

Assessment/Audit Tasks: No performance audit of field operations is anticipated at this time. If conducted, performance and systems audits will be in accordance with the U.S. EPA Region 2, SST SOP #01, Performing Oversight of CERCLA Field Operations, Revision 0, April 2000.

Data Review Tasks: All CLP data will be validated by EPA Region 2 DESA/HWSB/HWSS in accordance with [latest SOW]; all Non-CLP data will be validated by the EPA Region 2 ERRD prime contrators when utilizing a subcontracted laboratory, or the Brownfields Grantee's contractor in accordance with [applicable analytical method(s)].

QAPP Worksheet #15
Reference Limits and Evaluation Table

Matrix: Gas
Analytical Group: Volatile Organic Compounds
Concentration Level: Low

Analyte	CAS Number	U.S. EPA Reg. 3 Risk Based Conc. Ambient Air*				Analytical Method TO-15				Project Quantiation Limit		Achievable Laboratory Limits			
		Soil Gas		Indoor Air		Scan		SIM		ppbv	µg/m^3	MDLs		QLs	
		ppbv	µg/m^3	ppbv	µg/m^3	ppbv	µg/m^3	ppbv	µg/m^3						
Acetone	67-64-1	13892	33,000	1389	3300	0.5	1.2	0.07	0.23			TBD	TBD	TBD	TBD
Benzene	71-43-2	0.72	2.3	0.07	0.23	0.5	1.6	0.07	0.22			TBD	TBD	TBD	TBD
Bromodichloromethane	75-27-4	0.16	1.0	0.016	0.1	0.5	3.4	0.07	0.47			TBD	TBD	TBD	TBD
4-Bromofluorobenzene	460-00-4					0.5	0.47	0.07	0.5			TBD	TBD	TBD	TBD
Bromoform	75-25-2	1.6	16	0.16	1.6	0.5	5.2	0.07	0.72			TBD	TBD	TBD	TBD
Bromomethane	74-83-9	13	51	1.3	5.1	0.5	1.9	0.07	0.27			TBD	TBD	TBD	TBD
1,3-Butadiene	106-99-0	0.28	0.63	0.03	0.06	0.5	1.11	0.07	0.16			TBD	TBD	TBD	TBD
2-Butanone	78-93-3	17,295	51,000	1729	5100	0.5	1.5	0.07	0.21			TBD	TBD	TBD	TBD
Carbon Disulfide	75-15-0	2344	7300	234	730	0.5	1.6	0.07	0.22			TBD	TBD	TBD	TBD
Carbon Tetrachloride	56-23-5	0.19	1.2	0.02	0.12	0.5	3.2	0.07	0.44			TBD	TBD	TBD	TBD
Chlorobenzene	108-90-7	118	510	11.8	51	0.5	2.3	0.07	0.32			TBD	TBD	TBD	TBD
Chloroethane	75-00-3	8.3	22	0.83	2.2	0.5	1.3	0.07	0.18			TBD	TBD	TBD	TBD
Chloroform	67-66-3	0.16	0.77	0.02	0.08	0.5	2.4	0.07	0.34			TBD	TBD	TBD	TBD
Chloromethane	74-87-3	460	950	46	95	0.5	1.03	0.07	0.14			TBD	TBD	TBD	TBD
alpha-Chlorotoluene	100-44-7	0.07	0.37	0.007	0.037	0.5	2.59	0.07	0.36			TBD	TBD	TBD	TBD
Cumene	98-92-8	814	4000	81	400	0.5	2.5	0.07	0.34			TBD	TBD	TBD	TBD
Cyclohexane	110-82-7	18,012	62,000	1801	6200	0.5	1.7	0.07	0.24			TBD	TBD	TBD	TBD
Dibromochloromethane	124-48-1	0.1	0.75	0.01	0.08	0.5	4.3	0.07	0.596			TBD	TBD	TBD	TBD
1,2-Dibromoethane	106-93-4	0.004	0.03	0.0004	0.003	0.5	3.84	0.07	0.54			TBD	TBD	TBD	TBD
1,2-Dichlorobenzene	95-50-1	250	1500	25	150	0.5	3.01	0.07	0.42			TBD	TBD	TBD	TBD
1,3-Dichlorobenzene	541-73-1	18.3	110	1.8	11	0.5	3.01	0.07	0.42			TBD	TBD	TBD	TBD
1,4-Dichlorobenzene	106-46-7	0.46	2.8	0.05	0.28	0.5	3.01	0.07	0.42			TBD	TBD	TBD	TBD
1,1-Dichloroethane	75-34-3	1259	5100	126	510	0.5	2.02	0.07	0.28			TBD	TBD	TBD	TBD
1,2-Dichloroethane	107-06-2	0.17	0.69	0.02	0.07	0.5	2.02	0.07	0.28			TBD	TBD	TBD	TBD
1,2-Dichloroethane-d4	107-07-0					0.5	2.11	0.07	0.29			TBD	TBD	TBD	TBD

*EPA Region 3 Risk Based Concentrations for Ambient Air dated April 6, 2007. [Use the most recent version]

QAPP Worksheet #15
Reference Limits and Evaluation Table

Matrix: Gas
Analytical Group: Volatile Organic Compounds - Continued
Concentration Level: Low

Analyte	CAS Number	U.S. EPA Reg. 3 Risk Based Conc. Ambient Air *				Analytical Method TO-15				Project Quantiation Limit		Achievable Laboratory Limits			
		Soil Gas		Indoor Air		Scan		SIM		ppbv	µg/m^3	MDLs		QLs	
1,1-Dichloroethene	75-35-4	555	2200	55	220	0.5	2.02	0.07	0.28			TBD	TBD	TBD	TBD
cis-1,2-Dichloroethene	156-59-2	93	370	9.3	37	0.5	1.98	0.07	0.28			TBD	TBD	TBD	TBD
trans-1,2-Dichloroethene	156-60-5	156	620	15.6	62	0.5	1.98	0.07	0.28			TBD	TBD	TBD	TBD
1,2-Dichloropropane	78-87-5	0.2	0.92	0.02	0.09	0.5	2.27	0.07	0.32			TBD	TBD	TBD	TBD
cis-1,2-Dichloropropene	10061-01-5					0.5	2.27	0.07	0.32			TBD	TBD	TBD	TBD
trans-1,2-Dichloropropene	10061-02-6					0.5	2.27	0.07	0.32			TBD	TBD	TBD	TBD
cis-1,3-Dichloropropene	100-610-15					0.5	2.27	0.07	0.32			TBD	TBD	TBD	TBD
trans-1,3-Dichloropropene	10061-02-6					0.5	2.27	0.07	0.32			TBD	TBD	TBD	TBD
1,4-Dioxane	123-91-1	1.6	5.7	0.16	0.57	0.5	1.8	0.07	0.25			TBD	TBD	TBD	TBD
Ethanol	64-17-5					0.5	0.94	0.07	0.13			TBD	TBD	TBD	TBD
Ethylbenzene	100-41-4	2533	11,000	253	1100	0.5	2.17	0.07	0.30			TBD	TBD	TBD	TBD
4-Ethyltoluene	622-96-8					0.5	2.46	0.07	0.34			TBD	TBD	TBD	TBD
Freon 11	75-69-4	1299.2	7300	129.9	730	0.5	2.81	0.07	0.39			TBD	TBD	TBD	TBD
Freon 12	75-71-8	363.9	1800	36.4	180	0.5	2.47	0.07	0.35			TBD	TBD	TBD	TBD
Freon 113	76-13-1	40,447.7	310,000	4044.8	31,000	0.5	3.83	0.07	0.54			TBD	TBD	TBD	TBD
Freon 114	76-14-2					0.5	3.50	0.07	0.49			TBD	TBD	TBD	TBD
Heptane	142-82-5					0.5	2.05	0.07	0.29			TBD	TBD	TBD	TBD
Hexachlorobutadiene	87-68-3	0.08	0.80	0.008	0.08	0.5	5.33	0.07	0.75			TBD	TBD	TBD	TBD
Hexane	110-54-3	2071	7300	207	730	0.5	1.76	0.07	0.25			TBD	TBD	TBD	TBD
2-Hexanone	591-78-6					0.5	2.05	0.07	0.29			TBD	TBD	TBD	TBD
Hydrogen Sulfide	7783-06-4	151	210	1.5	2.1	0.5	0.70	0.07	0.10			TBD	TBD	TBD	TBD
Methane	74-82-8					0.5	0.33	0.07	0.05			TBD	TBD	TBD	TBD
Methylene Chloride	75-09-2	11	38	1.1	3.8	0.5	1.74	0.07	0.24			TBD	TBD	TBD	TBD
4-Methyl-2-pentanone	108-10-1	7567	31000	757	3100	0.5	2.05	0.07	0.29			TBD	TBD	TBD	TBD
Methyl tert-butyl ether	1634-04-4	4.4	16	0.44	1.6	0.5	1.80	0.07	0.25			TBD	TBD	TBD	TBD
2-Propanol	67-63-0					0.5	1.23	0.07	0.17			TBD	TBD	TBD	TBD
Propylbenzene	103-65-1					0.5	2.46	0.07	0.34			TBD	TBD	TBD	TBD

*EPA Region 3 Risk Based Concentrations for Ambient Air dated April 6, 2007. [Use the most recent version]

QAPP Worksheet #15
Reference Limits and Evaluation Table

Matrix: Gas
Analytical Group: Volatile Organic Compounds - Continued
Concentration Level: Low

Analyte	CAS Number	U.S. EPA Reg. 3 Risk Based Conc. Ambient Air *				Analytical Method TO-15				Project Quantiation Limit		Achievable Laboratory Limits			
		Soil Gas		Indoor Air		Scan		SIM				MDLs		QLs	
		ppbv	µg/m^3	ppbv	µg/m^3	ppbv	µg/m^3	ppbv	µg/m^3	ppbv	µg/m^3				
Styrene	100-42-5	2347	10000	235	1000	0.5	2.13	0.07	0.30			TBD	TBD	TBD	TBD
1,1,2,2-Tetrachloroethane	79-34-5	0.04	0.31	0.004	0.03	0.5	3.43	0.07	0.48			TBD	TBD	TBD	TBD
Tetrachloroethene**	127-18-4	0.46	3.1	0.05	0.31	0.5	3.39	0.07	0.47			TBD	TBD	TBD	TBD
Tetrahydrofuran	109-99-9	3.1	9.2	0.31	0.92	0.5	1.47	0.07	0.21			TBD	TBD	TBD	TBD
Toluene	108-88-3	13,534	51,000	1353	5100	0.5	1.88	0.07	0.26			TBD	TBD	TBD	TBD
Toulene-d8	2037-26-5					0.5	2.05	0.07	0.29			TBD	TBD	TBD	TBD
1,2,4-Trichlorobenzene	120-82-1	50	370	5.0	37	0.5	3.71	0.07	0.52			TBD	TBD	TBD	TBD
1,1,1-Trichloroethane (TCA)	71-55-6	1833	10,000	183	1000	0.5	2.73	0.07	0.38			TBD	TBD	TBD	TBD
1,1,2-Trichloroethane	79-00-5	0.20	1.1	0.02	0.11	0.5	2.73	0.07	0.38			TBD	TBD	TBD	TBD
Trichloroethene (TCE)**	79-01-6	0.03	0.16	0.003	0.016	0.5	2.69	0.07	0.38			TBD	TBD	TBD	TBD
1,3,5-Trimethylbenzene	108-67-8					0.5	2.46	0.07	0.38			TBD	TBD	TBD	TBD
1,2,4-Trimethylbenzene	95-63-6					0.5	2.46	0.07	0.34			TBD	TBD	TBD	TBD
Vinyl Chloride	75-01-4	0.27	0.72	0.03	0.07	0.5	1.28	0.07	0.18			TBD	TBD	TBD	TBD
p-Xylene	106-42-3	253	1100	25	110	0.5	2.17	0.07	0.30			TBD	TBD	TBD	TBD
m-Xylene	108-38-3	253	1100	25	110	0.5	2.17	0.07	0.30			TBD	TBD	TBD	TBD
o-Xylene	95-47-6	253	1100	25	110	0.5	2.17	0.07	0.30			TBD	TBD	TBD	TBD

*EPA Region 3 Risk Based Cncentrations for Ambient Air dated 4/6/2007. [Use the most recent version]
** EPA Region 2 risk assessors have derived the following risk based concentrations for TCE and PCE: TCE is 5.0 µg/m^3 for indoor air and 50 µg/m^3 for sub-slab air and PCE is 100 µg/m^3 for indoor air and 1000 µg/m^3 for sub-slab air.

QAPP Worksheet #15
Reference Limits and Evaluation Table

Matrix: Soil, Sediment **
Analytical Group: Target Compound List Volatile Organic Compounds
Concentration Level: Low and Medium

Analyte	CAS Number	NJDEP Soil Cleanup Criteria (mg/kg)*			NYSDEC 6NYCRR Part 375 (mg/kg)***	Project Quantiation Limit (mg/kg)	Analytical Method – SOM01.2 (Low) Quantitation Limits (mg/kg)	Analytical Method – SOM01.2 (Medium) Quantitation Limits (mg/kg)
		Residential	Non-Residential	Impact to GW				
Dichlorodifluoromethane	75-71-8						0.005	0.25
Chloromethane	74-87-3	520	1000	10			0.005	0.25
Vinyl Chloride	75-01-4	2.0	7.0	10	0.02		0.005	0.25
Bromomethane	74-83-9	79	1000	1.0			0.005	0.25
Chloroethane	75-00-3						0.005	0.25
Trichlorofluoromethane	75-69-4						0.005	0.25
1,1-Dichloroethene	75-35-4	8.0	150	10	0.33		0.005	0.25
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1						0.005	0.25
Acetone	67-64-1	1000	1000	100	0.05		0.01	0.5
Carbon Disulfide	75-15-0						0.005	0.25
Methyl Acetate	79-20-9						0.005	0.25
Methylene Chloride	75-09-2	49	210	1.0	0.05		0.005	0.25
trans-1,2-Dichloroethene	156-60-5	1000	1000	50	0.19		0.005	0.25
Methyl tert-Butyl Ether	1634-04-4				0.93		0.005	0.25
1,1-Dichloroethane	75-34-3	570	1000	10			0.005	0.25
cis-1,2-Dichloroethene	156-59-2	79	1000	1.0	0.25		0.005	0.25
2-Butanone	78-93-3	1000	1000	50			0.01	0.5
Chloroform	67-66-3	19	28	1.0	0.37		0.005	0.25
1,1,1-Trichloroethane	71-55-6	210	1000	50	0.68		0.005	0.25
Cyclohexane	110-82-7						0.005	0.25
Carbon Tetrachloride	56-23-5	2.0	4.0	1.0	0.76		0.005	0.25
Benzene	71-43-2	3.0	13	1.0	0.06		0.005	0.25
1,2-Dichloroethane	107-06-2	6.0	24	1.0	0.02		0.005	0.25
Trichloroethene	79-01-6	23	54	1.0			0.005	0.25
Methylcyclohexane	108-87-2						0.005	0.25
1,2-Dichloropropane	78-87-5	10	43				0.005	0.25
Bromodichloromethane	75-27-4	11	46	1.0			0.005	0.25
cis-1,3-Dichloropropene	10061-01-5	4.0	5.0	1.0			0.005	0.25
4-Methyl-2-Pentanone	108-10-1	1000	1000	50			0.01	0.5

For detailed references, see Footnotes below.

QAPP Worksheet #15
Reference Limits and Evaluation Table

Matrix: Soil, Sediment **
Analytical Group: Target Compound List Volatile Organic Compounds - Continued
Concentration Level: Low and Medium

Analyte	CAS Number	NJDEP Soil Cleanup Criteria (mg/kg)*			NYSDEC 6NYCRR Part 375 (mg/kg)***	Project Quantiation Limit (mg/kg)	Analytical Method – SOM01.2 (Low) Quantitation Limits (mg/kg)	Analytical Method – SOM01.2 (Medium) Quantitation Limits (mg/kg)
		Residential	Non-Residential	Impact to GW				
Toluene	108-88-3	1000	1000	500	0.7		0.005	0.25
trans-1,3-Dichloropropene	10061-02-6	4.0	5.0	1.0			0.005	0.25
1,1,2-Trichloroethane	79-00-5	22	420	1.0			0.005	0.25
Tetrachloroethene	127-18-4	4.0	6.0	1.0	1.3		0.005	0.25
2-Hexanone	591-78-6						0.01	0.5
Dibromochloromethane	124-48-1	110	1000	1.0			0.005	0.25
1,2-Dibromoethane	106-93-4						0.005	0.25
Chlorobenzene	108-90-7	37	680	1.0	1.1		0.005	0.25
Ethylbenzene	100-41-4	1000	1000	100	1		0.005	0.25
Xylenes (total)	1330-20-7	410	1000	67	0.26		0.005	0.25
Styrene	100-42-5	23	97	100			0.005	0.25
Bromoform	75-25-2	86	370	1.0			0.005	0.25
Isopropylbenzene	98-82-8						0.005	0.25
1,1,2,2-Tetrachloroethane	79-34-5	34	70	1.0			0.005	0.25
1,3-Dichlorobenzene	541-73-1	5100	10,000	100	2.4		0.005	0.25
1,4-Dichlorobenzene	106-46-7	570	10,000	100	1.8		0.005	0.25
1,2-Dichlorobenzene	95-50-1	5100	10,000	50	1.1		0.005	0.25
1,2-Dibromo-3-chloropropane	96-12-8						0.005	0.25
1,2,4-Trichlorobenzene	120-82-1	68	1200	100			0.005	0.25

*New Jersey Department of Environmental Protection (NJDEP) - Direct Contact Soil Cleanup Criteria, May 12, 1999. [Use the most recent version].
** For sediment guidance values refer to the NJDEP Guidance for Sediment Quality Evaluations, November 1998.
***New York Department of Environmental Conservation (NYSDEC), December 2006, 6 NYCRR Part 375 Environmental Remediation Programs, Subpart 375-6: Remedial Program Soil Cleanup Objectives (SCOs). Value listed from Table 375-6.8(a) for Unrestricted Use SCOs. The SCOs for unrestricted use were capped at a maximum value of 100 ppm.

QAPP Worksheet #15
Reference Limits and Evaluation Table

Matrix: Soil, Sediment **
Analytical Group: Target Compound List – Semi-Volatile Organic Compounds
Concentration Level: Low and Medium

Analyte	CAS Number	NJDEP Soil Cleanup Criteria (mg/kg)*			NYSDEC 6NYCRR Part 375 (mg/kg)***	Project Quantiation Limit (mg/kg)	Analytical Method – SOM01.2 (Low) Quantitation Limits (mg/kg)	Analytical Method – SOM01.2 (Medium) Quantitation Limits (mg/kg)
		Residential	Non-Residential	Impact to GW				
1,1'-Biphenyl	92-52-4						0.17	5.0
2,2'-oxybis(1-Chloropropane)	108-60-1						0.17	5.0
2,4,5-Trichlorophenol	95-95-4	5600	10,000	50			0.17	5.0
2,4,6-Trichlorophenol	88-06-2	62	270	10			0.17	5.0
2,4-Dichlorophenol	120-83-2	170	3100	10			0.17	5.0
2,4-Dimethylphenol	105-67-9	1100	10,000	10			0.17	5.0
2,4-Dinitrophenol	51-28-5	110	2100	10			0.33	10
2,4-Dinitrotoluene	121-14-2	1	4	10			0.17	5.0
2,6-Dinitrotoluene	606-20-2	1	4	10			0.17	5.0
2-Chloronaphthalene	91-58-7						0.17	5.0
2-Chlorophenol	95-57-8	280	5200	10			0.17	5.0
2-Methylnaphthalene	91-57-6						0.17	5.0
2-Methylphenol (o-cresol)	95-48-7	2800	10000		0.33		0.17	5.0
2-Nitroaniline	88-74-4						0.33	10
2-Nitrophenol	88-75-5						0.17	5.0
3,3'-Dichlorobenzidine	91-94-1	2	6	100			0.17	5.0
3-Nitroaniline	99-09-2						0.33	10
4,6-Dinitro-2-methylphenol	534-52-1						0.33	10
4-Bromophenyl-phenylether	101-55-3						0.17	5.0
4-Chloro-3-methylphenol	59-50-7	10,000	10,000	100			0.17	5.0
4-Chloroaniline	106-47-8	230	4200				0.17	5.0
4-Chlorophenyl-phenyl ether	7005-72-3						0.17	5.0
4-Methylphenol (p-cresol)	106-44-5	2800	10,000		0.33		0.17	5.0
4-Nitroaniline	100-01-6						0.33	10
4-Nitrophenol	100-02-7						0.33	10
Acenaphthene	83-32-9	3400	10,000	100	20		0.17	5.0
Acenaphthylene	208-96-8				100		0.17	5.0
Acetophenone	98-86-2						0.17	5.0
Anthracene	120-12-7	10,000	10,000	100	100		0.17	5.0

For detailed references, see Footnotes below.

QAPP Worksheet #15
Reference Limits and Evaluation Table

Matrix: Soil, Sediment **
Analytical Group: Target Compound List – Semi-Volatile Organic Compounds - Continued
Concentration Level: Low and Medium

Analyte	CAS Number	NJDEP Soil Cleanup Criteria (mg/kg)*			NYSDEC 6NYCRR Part 375 (mg/kg)***	Project Quantiation Limit (mg/kg)	Analytical Method – SOM01.2 (Low) Quantitation Limits (mg/kg)	Analytical Method – SOM01.2 (Medium) Quantitation Limits (mg/kg)
		Residential	Non-Residential	Impact to GW				
Atrazine	1912-24-9						0.17	5.0
Benzaldehyde	100-52-7						0.17	5.0
Benzo(a)anthracene	56-55-3	0.9	4	500	1		0.17	5.0
Benzo(a)pyrene	50-32-8	0.66	0.66	100	1		0.17	5.0
Benzo(b)fluoranthene	205-99-2	0.9	4	50	1		0.17	5.0
Benzo(g,h,i)perylene	191-24-2				100		0.17	5.0
Benzo(k)fluoranthene	207-08-9	0.9	4	500	0.8		0.17	5.0
Bis(2-Chloroethoxy)methane	111-91-1						0.17	5.0
Bis-(2-Chloroethyl) ether	111-44-4	0.66	3	10			0.17	5.0
bis(2-Ethylhexyl)phthalate	117-81-7	49	210	100			0.17	5.0
Butylbenzylphthalate	85-68-7	1100	10,000	100			0.17	5.0
Caprolactam	105-60-2						0.17	5.0
Carbazole	86-74-8						0.17	5.0
Chrysene	218-01-9	9	40	500	1		0.17	5.0
Dibenzo(a,h)anthracene	53-70-3	0.66	0.66	100	0.33		0.17	5.0
Dibenzofuran	132-64-9						0.17	5.0
Diethylphthalate	84-66-2	10,000	10,000	50			0.17	5.0
Dimethylphthalate	131-11-3	10,000	10,000	50			0.17	5.0
Di-n-butylphthalate	84-74-2	5700	10,000	100			0.17	5.0
Di-n-octylphthalate	117-84-0	1100	10,000	100			0.17	5.0
Fluoranthene	206-44-0	2300	10,000	100	100		0.17	5.0
Fluorene	86-73-7	2300	10,000	100	30		0.17	5.0
Hexachlorobenzene	118-74-1	0.66	2	100			0.17	5.0
Hexachlorobutadiene	87-68-3	1	21	100			0.17	5.0
Hexachlorocyclopentadiene	77-47-4	400	7300	100			0.17	5.0
Hexachloroethane	67-72-1	6	100	100			0.17	5.0
Indeno(1,2,3-cd)pyrene	193-39-5	0.9	4	500	0.5		0.17	5.0

For detailed references, see Footnotes below.

QAPP Worksheet #15
Reference Limits and Evaluation Table

Matrix: Soil, Sediment**
Analytical Group: Target Compound List – Semi-Volatile Organic Compounds - Continued
Concentration Level: Low and Medium

Analyte	CAS Number	NJDEP Soil Cleanup Criteria (mg/kg)*			NYSDEC 6NYCRR Part 375 (mg/kg)***	Project Quantiation Limit (mg/kg)	Analytical Method – SOM01.2 (Low) Quantitation Limits (mg/kg)	Analytical Method – SOM01.2 (Medium) Quantitation Limits (mg/kg)
		Residential	Non-Residential	Impact to GW				
Isophorone	78-59-1	1100	10,000	50			0.17	5.0
Naphthalene	91-20-3	230	4200	100	12		0.17	5.0
Nitrobenzene	98-95-3	28	520	10			0.17	5.0
N-Nitrosodiphenylamine	86-30-6	140	600	100			0.17	5.0
N-Nitroso-di-n-propylamine	621-64-7	0.66	0.66	10			0.17	5.0
Pentachlorophenol	87-86-5	6	24	100	0.8		0.33	10
Phenanthrene	85-01-8				100		0.17	5.0
Phenol	108-95-2	10,000	10,000	50	0.33		0.17	5.0
Pyrene	129-00-0	1700	10,000	100	100		0.17	5.0

*New Jersey Department of Environmental Protection (NJDEP) - Direct Contact Soil Cleanup Criteria, May 12, 1999. [Use the most recent version].
** For sediment guidance values refer to the NJDEP Guidance for Sediment Quality Evaluations, November 1998.
***New York Department of Environmental Conservation (NYSDEC), December 2006, 6 NYCRR Part 375 Environmental Remediation Programs, Subpart 375-6: Remedial Program Soil Cleanup Objectives (SCOs). Values listed from Table 375-6.8(a) for Uunrestricted Use SCOs. The SCOs for unrestricted use were capped at a maximum value of 100 ppm.

QAPP Worksheet #15
Reference Limits and Evaluation Table

Matrix: Soil, Sediment **
Analytical Group: Target Compound List Pesticides
Concentration Level: Low

Analyte	CAS Number	NJDEP Soil Cleanup Criteria (mg/kg)*			NYSDEC 6NYCRR Part 375 (mg/kg)***	Project Quantiation Limit (mg/kg)	Analytical Method – SOM01.2 Quantitation Limits (mg/kg)
		Residential	Non-Residential	Impact to GW			
alpha-BHC	319-84-6				0.02		0.0017
beta-BHC	319-85-7				0.036		0.0017
delta-BHC	319-86-8				0.04		0.0017
gamma-BHC (Lindane)	58-89-9	0.52	2.2	50	0.1		0.0017
Heptachlor	76-44-8	0.15	0.65	50	0.042		0.0017
Aldrin	309-00-2	0.04	0.17	50			0.0017
Heptachlor epoxide	1024-57-3						0.0017
Endosulfan I	959-98-8				2.4		0.0017
Dieldrin	60-57-1	0.042	0.18	50	0.005		0.0033
4,4'-DDE	72-55-9	2	9	50	0.0033		0.0033
Endrin	72-20-8	17	310	50	0.014		0.0033
Endosulfan II	33213-65-9				2.4		0.0033
4,4'-DDD	72-54-8	3	12	50	0.0033		0.0033
Endosulfan sulfate	1031-07-8				2.4		0.0033
4,4'-DDT	50-29-3	2	9	500	0.0033		0.0033
Methoxychlor	72-43-5	280	5200	50			0.017
Endrin ketone	53494-70-5						0.0033
Endrin aldehyde	7421-93-4						0.0033
alpha-Chlordane	5103-71-9				0.094		0.0017
gamma-Chlordane	5103-74-2						0.0017
Toxaphene	8001-35-2	0.10	0.2	50			0.17

*New Jersey Department of Environmental Protection (NJDEP) - Direct Contact Soil Cleanup Criteria, May 12, 1999. [Use the most recent version].
** For sediment guidance values refer to the NJDEP Guidance for Sediment Quality Evaluations, November 1998.
***New York Department of Environmental Conservation (NYSDEC), December 2006, 6 NYCRR Part 375 Environmental Remediation Programs, Subpart 375-6: Remedial Program Soil Cleanup Objectives (SCOs). Values listed from Table 375-6.8(a) for Uunrestricted Use SCOs. The SCOs for unrestricted use were capped at a maximum value of 100 ppm.

QAPP Worksheet #15
Reference Limits and Evaluation Table

Matrix: Soil, Sediment**
Analytical Group: Target Compound List Aroclors (PCBs)
Concentration Level: Low

Analyte	CAS Number	NJDEP Soil Cleanup Criteria (mg/kg)*			NYSDEC 6NYCRR Part 375 (mg/kg)***	Project Quantiation Limit (mg/kg)	Analytical Method – SOM01.2 Quantitation Limits (mg/kg)
		Residential	Non-Residential	Impact to GW			
Aroclor-1016	12674-11-2	0.49	2	50	0.1		0.033
Aroclor-1221	11104-28-2	0.49	2	50	0.1		0.033
Aroclor-1232	11141-16-5	0.49	2	50	0.1		0.033
Aroclor-1242	53469-21-9	0.49	2	50	0.1		0.033
Aroclor-1248	12672-29-6	0.49	2	50	0.1		0.033
Aroclor-1254	11097-69-1	0.49	2	50	0.1		0.033
Aroclor-1260	11096-82-5	0.49	2	50	0.1		0.033
Aroclor-1262	37324-23-5	0.49	2	50	0.1		0.033
Aroclor-1268	11100-14-4	0.49	2	50	0.1		0.033

*New Jersey Department of Environmental Protection (NJDEP) - Direct Contact Soil Cleanup Criteria, May 12, 1999. [Use the most recent version].
** For sediment guidance values refer to the NJDEP Guidance for Sediment Quality Evaluations, November 1998.
***New York Department of Environmental Conservation (NYSDEC), December 2006, 6 NYCRR Part 375 Environmental Remediation Programs, Subpart 375-6: Remedial Program Soil Cleanup Objectives (SCOs). Values listed from Table 375-6.8(a) for Uunrestricted Use SCOs. The SCOs for unrestricted use were capped at a maximum value of 100 ppm.

QAPP Worksheet #15
Reference Limits and Evaluation Table

Matrix: Soil, Sediment**
Analytical Group: Target Analyte List Inorganics (Mercury and Cyanide)
Concentration Level: Low

Analyte	CAS Number	NJDEP Soil Cleanup Criteria (mg/kg)*		NYSDEC 6NYCRR Part 375 (mg/kg)***	Project Quantiation Limit (mg/kg)	Analytical Method – SOM01.2 Quantitation Limits (mg/kg)
		Residential	Non-Residential			
Aluminum	7429-90-5					20
Antimony	7440-36-0	14	340			6
Arsenic	7440-38-2	20	20	13		1
Barium	7440-39-3	700	47,000	350		20
Beryllium	7440-41-7	2	2	7.2		0.5
Cadmium	7440-43-9	39	100	2.5		0.5
Calcium	7440-70-2					500
Chromium	7440-47-3					1
Cobalt	7440-48-4					5
Copper	7440-50-8	600	600	50		2.5
Iron	7439-89-6					10
Lead	7439-92-1	400	600	63		1
Magnesium	7439-95-4					500
Manganese	7439-96-5			1600		1.5
Mercury	7439-97-6	14	270	0.18		0.1
Nickel	7440-02-0	250	2400	30		4
Potassium	7440-09-7					500
Selenium	7782-49-2	63	3100	3.9		3.5
Silver	7440-22-4	110	4100	2		1
Sodium	7440-23-5					500
Thallium	7440-28-0	2	2			2.5
Vanadium	7440-62-2	370	7100			5
Zinc	7440-66-6	1500	1500	109		6
Cyanide	57-12-5	1100	21,000	27		2.5

*New Jersey Department of Environmental Protection (NJDEP) - Direct Contact Soil Cleanup Criteria, May 12, 1999. [Use the most recent version].
** For sediment guidance values refer to the NJDEP Guidance for Sediment Quality Evaluations, November 1998.
***New York Department of Environmental Conservation (NYSDEC), December 2006, 6 NYCRR Part 375 Environmental Remediation Programs, Subpart 375-6: Remedial Program Soil Cleanup Objectives (SCOs). Values listed from Table 375-6.8(a) for Uunrestricted Use SCOs. The SCOs for unrestricted use were capped at a maximum value of 100 ppm.

QAPP Worksheet #15
Reference Limits and Evaluation Table

Matrix: Groundwater, Surface Water**/***
Analytical Group: Target Compound List Volatile Organic Compounds
Concentration Level: Trace & Low

Analyte	CAS Number	NJAC Groundwater Quality Standards* (ug/L)	NYS Groundwater Quality Standards (ug/L)***	Project Quantiation Limit (ug/L)	Analytical Method – SOM01.2 Trace Quantitation Limits (ug/L)	Analytical Method – SOM01.2 Low Quantitation Limits (ug/L)
Dichlorodifluoromethane	75-71-8	1000	5		0.5	5
Chloromethane (Methyl Chloride)	74-87-3		5		0.5	5
Vinyl Chloride	75-01-4	1	2		0.5	5
Bromomethane	74-83-9	10	5		0.5	5
Chloroethane	75-00-3		5		0.5	5
Trichlorofluoromethane	75-69-4	2000	5		0.5	5
1,1-Dichloroethene	75-35-4	1	5		0.5	5
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1		5		0.5	5
Acetone (2-Propanone)	67-64-1	6000			5	10
Carbon Disulfide	75-15-0	700	60		0.5	5
Methyl Acetate	79-20-9	7000			0.5	5
Methylene Chloride	75-09-2	3.0	5		0.5	5
trans-1,2-Dichloroethene	156-60-5	100	5		0.5	5
Methyl tert-Butyl Ether	1634-04-4	70	10		0.5	5
1,1-Dichloroethane	75-34-3	50	5		0.5	5
cis-1,2-Dichloroethene	156-59-2	70	5		0.5	5
2-Butanone (Methyl Ethyl Ketone)	78-93-3	300	50		5	10
Bromochloromethane	74-97-5		5		0.5	5
Chloroform	67-66-3	70	7		0.5	5
1,1,1-Trichloroethane	71-55-6	30	5		0.5	5
Cyclohexane	110-82-7				0.5	5
Carbon Tetrachloride	56-23-5	1	5		0.5	5
Benzene	71-43-2	1	1		0.5	5
1,2-Dichloroethane	107-06-2	2	0.6		0.5	5
Trichloroethene	79-01-6	1	5		0.5	5
Methylcyclohexane	108-87-2				0.5	5
1,2-Dichloropropane	78-87-5	1	1		0.5	5
Bromodichloromethane	75-27-4	1			0.5	5
cis-1,3-Dichloropropene	10061-01-5	1	0.4		0.5	5
4-Methyl-2-Pentanone	108-10-1				5	10
Toluene	108-88-3	600	5		0.5	5
trans-1,3-Dichloropropene	10061-02-6	1	0.4		0.5	5

For detailed references, see Footnotes below.

QAPP Worksheet #15
Reference Limits and Evaluation Table

Matrix: Groundwater, Surface Water**/***
Analytical Group: Target Compound List Volatile Organic Compounds – Continued
Concentration Level: Trace & Low

Analyte	CAS Number	NJAC Groundwater Quality Standards* (ug/L)	NYS Groundwater Quality Standards (ug/L)***	Project Quantiation Limit (ug/L)	Analytical Method – SOM01.2 Trace Quantitation Limits (ug/L)	Analytical Method – SOM01.2 Low Quantitation Limits (ug/L)
1,1,2-Trichloroethane	79-00-5	3	1		0.5	5
Tetrachloroethene	127-18-4	1	5		0.5	5
2-Hexanone	591-78-6				5	10
Dibromochloromethane	124-48-1	1			0.5	5
1,2-Dibromoethane	106-93-4				0.5	5
Chlorobenzene	108-90-7	50	5		0.5	5
Ethylbenzene	100-41-4	700	5		0.5	5
Xylenes (total)	1330-20-7	1000	5		0.5	5
Styrene	100-42-5	100	5		0.5	5
Bromoform	75-25-2	4			0.5	5
Isopropylbenzene	98-82-8		5		0.5	5
1,1,2,2-Tetrachloroethane	79-34-5	1	5		0.5	5
1,3-Dichlorobenzene	541-73-1	600	3		0.5	5
1,4-Dichlorobenzene	106-46-7	75	3		0.5	5
1,2-Dichlorobenzene	95-50-1	600	3		0.5	5
1,2-Dibromo-3-chloropropane	96-12-8	0.02	0.04		0.5	5
1,2,4-Trichlorobenzene	120-82-1	9	5		0.5	5
1,2,3-Trichlorobenzene	87-61-6		5		0.5	5

*NJDEP N.J.A.C. 7:9C, Ground Water Quality Standards (GWQS) dated November 7, 2005. [Use the most recent version]
** For surface water use NJDEP NJAC 7:9B Surface Water Quality Standards, October 2006
***NYSDEC NYCRR Title 6, Parts 700-706: Water Quality Regulations; Part 703: SurfaceWater and Groundwater Quality Standards and Groundwater Effluent Limitations, Amended August 1999; and Division of Water StandardsTechnical and Operational Guidance Series (TOGS 1.1.1), Ambient Water Quality Standards and Guuidance Values and Groundwater Effluent Limitations, June 1998 [Use the most recent version]

QAPP Worksheet #15
Reference Limits and Evaluation Table

Matrix: Groundwater, Surface Water**/***
Analytical Group: Target Compound List - Semi-Volatile Organic Compounds
Concentration Level: Low

Analyte	CAS Number	NJAC Groundwater Quality Standards* (ug/L)	NYS GW Quality Standards (ug/L)***	Project Quantiation Limit (ug/L)	Analytical Method – SOM01.2 Quantitation Limits (ug/L)
1,1'-Biphenyl	92-52-4	400	5		5
1,2,4,5 Tetrachlorobenzene	95-94-3		5		5
2,2'-oxybis(1-Chloropropane)	108-60-1				5
2,4,5-Trichlorophenol	95-95-4	700			5
2,4,6-Trichlorophenol	88-06-2	20			5
2,4-Dichlorophenol	120-83-2	20	1		5
2,4-Dimethylphenol	105-67-9	100	1		5
2,4-Dinitrophenol	51-28-5	40	1		10
2,4-Dinitrotoluene	121-14-2	10	5		5
2,6-Dinitrotoluene	606-20-2	10	5		5
2-Chloronaphthalene	91-58-7	6000			5
2-Chlorophenol	95-57-8	40			5
2-Methylnaphthalene	91-57-6				5
2-Methylphenol	95-48-7				5
2-Nitroaniline	88-74-4		5		10
2-Nitrophenol	88-75-5				5
3,3'-Dichlorobenzidine	91-94-1	30	5		5
3-Nitroaniline	99-09-2		5		10
4,6-Dinitro-2-methylphenol	534-52-1				10
4-Bromophenyl-phenylether	101-55-3				5
4-Chloro-3-methylphenol	59-50-7				5
4-Chloroaniline	106-47-8	30	5		5
4-Chlorophenyl-phenyl ether	7005-72-3				5
4-Methylphenol	106-44-5				5
4-Nitroaniline	100-01-6		5		10
4-Nitrophenol	100-02-7				10
Acenaphthene	83-32-9	400			5
Acenaphthylene	208-96-8				5
Acetophenone	98-86-2	700			5
Anthracene	120-12-7	2000			5
Atrazine	1912-24-9	3	7.5		5
Benzaldehyde	100-52-7				5

*NJDEP N.J.A.C. 7:9C, Ground Water Quality Standards (GWQS) dated November 7, 2005. [Use the most recent version]
** For surface water use NJDEP NJAC 7:9B Surface Water Quality Standards, October 2006; **For NYSDEC Criteria- See VOC ***Footnote**

QAPP Worksheet #15
Reference Limits and Evaluation Table

Matrix: Groundwater, Surface Water**/***
Analytical Group: Target Compound List - Semi-Volatile Organic Compounds - Continued
Concentration Level: Low

Analyte	CAS Number	NJAC Groundwater Quality Standards (ug/L)*	NYS GW Quality Standards (ug/L)***	Project Quantiation Limit (ug/L)	Analytical Method – SOM01.2 Quantitation Limits (ug/L)
Benzo(a)anthracene	56-55-3	0.1			5
Benzo(a)pyrene	50-32-8	0.1			5
Benzo(b)fluoranthene	205-99-2	0.2			5
Benzo(g,h,i)perylene	191-24-2				5
Benzo(k)fluoranthene	207-08-9	0.5			5
Bis(2-Chloroethoxy)methane	111-91-1		5		5
Bis-(2-Chloroethyl) ether	111-44-4	7	1		5
bis(2-Ethylhexyl)phthalate	117-81-7	3	5		5
Butylbenzylphthalate	85-68-7	100			5
Caprolactam	105-60-2				5
Chrysene	218-01-9	5			5
Dibenzo(a,h)anthracene	53-70-3	0.3			5
Dibenzofuran	132-64-9				5
Diethylphthalate	84-66-2	6000			5
Dimethylphthalate	131-11-3				5
Di-n-butylphthalate	84-74-2	700	50		5
Di-n-octylphthalate	117-84-0	100			5
Fluoranthene	206-44-0	300			5
Fluorene	86-73-7	300			5
Hexachlorobenzene	118-74-1	0.02	0.04		5
Hexachlorobutadiene	87-68-3	1	0.5		5
Hexachlorocyclopentadiene	77-47-4	40	5		5
Hexachloroethane	67-72-1	7	5		5
Indeno(1,2,3-cd)pyrene	193-39-5	0.2			5
Isophorone	78-59-1	40			5
Naphthalene	91-20-3				5
Nitrobenzene	98-95-3	300	0.4		5
N-Nitrosodiphenylamine	86-30-6	10			5
N-Nitroso-di-n-propylamine	621-64-7	10			5
Pentachlorophenol	87-86-5	0.3	1		10
Phenanthrene	85-01-8				5
Phenol	108-95-2	2000	1		5
Pyrene	129-00-0	200			5

*NJDEP N.J.A.C. 7:9C, Ground Water Quality Standards (GWQS) dated November 7, 2005. [Use the most recent version]
** For surface water use NJDEP NJAC 7:9B Surface Water Quality Standards, October 2006; **For NYSDEC Criteria-See VOC ***Footnote**

QAPP Worksheet #15
Reference Limits and Evaluation Table

Matrix: Groundwater, Surface Water**/***
Analytical Group: Target Compound List - Pesticides
Concentration Level: Low

Analyte	CAS Number	NJAC Groundwater Quality Standards (ug/L)*	NYS Groundwater Quality Standards (ug/L)***	Project Quantiation Limit (ug/L)	Analytical Method – SOM01.2 Quantitation Limits (ug/L)
alpha-BHC	319-84-6	0.02			0.05
beta-BHC	319-85-7	0.04			0.05
delta-BHC	319-86-8				0.05
gamma-BHC (Lindane)	58-89-9	0.03			0.05
Heptachlor	76-44-8	0.05	0.04		0.05
Aldrin	309-00-2	0.04			0.05
Heptachlor epoxide	1024-57-3	0.2	0.03		0.05
Endosulfan I	959-98-8	40			0.05
Dieldrin	60-57-1	0.03	0.004		0.1
4,4'-DDE	72-55-9	0.1	0.2		0.1
Endrin	72-20-8	2			0.1
Endosulfan II	33213-65-9	0.4			0.1
4,4'-DDD	72-54-8	0.1	0.3		0.1
Endosulfan sulfate	1031-07-8	40			0.1
4,4'-DDT	50-29-3	0.1	0.2		0.1
Methoxychlor	72-43-5	40	35		0.5
Endrin ketone	53494-70-5		5		0.1
Endrin aldehyde	7421-93-4		5		0.1
alpha-Chlordane	5103-71-9				0.05
gamma-Chlordane	5103-74-2				0.05
Toxaphene	8001-35-2	2	0.06		5

*NJDEP N.J.A.C. 7:9C, Ground Water Quality Standards (GWQS) dated November 7, 2005. [Use the most recent version]
** For surface water use NJDEP NJAC 7:9B Surface Water Quality Standards, October 2006
***NYSDEC NYCRR Title 6, Parts 700-706: Water Quality Regulations; Part 703: SurfaceWater and Groundwater Quality Standards and Groundwater Effluent Limitations, Amended August 1999; and Division of Water StandardsTechnical and Operational Guidance Series (TOGS 1.1.1), Ambient Water Quality Standards and Guuidance Values and Groundwater Effluent Limitations, June 1998 [Use the most recent version]

QAPP Worksheet #15
Reference Limits and Evaluation Table

Matrix: Groundwater, Surface Water**/***
Analytical Group: Target Compound List Aroclors (PCBs)
Concentration Level: Low

Analyte	CAS Number	NJAC Groundwater Quality Standards (ug/L)*	NYS Groundwater Quality Standards (ug/L)***	Project Quantiation Limit (ug/L)	Analytical Method – SOM01.2 Quantitation Limits (ug/L)
Aroclor-1016	12674-11-2	0.5	0.09		1
Aroclor-1221	11104-28-2	0.5	0.09		1
Aroclor-1232	11141-16-5	0.5	0.09		1
Aroclor-1242	53469-21-9	0.5	0.09		1
Aroclor-1248	12672-29-6	0.5	0.09		1
Aroclor-1254	11097-69-1	0.5	0.09		1
Aroclor-1260	11096-82-5	0.5	0.09		1
Aroclor-1262	37324-23-5	0.5	0.09		1
Aroclor-1268	11100-14-4	0.5	0.09		1

*NJDEP N.J.A.C. 7:9C, Ground Water Quality Standards (GWQS) dated November 7, 2005. [Use the most recent version]
** For surface water use NJDEP NJAC 7:9B Surface Water Quality Standards, October 2006
***NYSDEC NYCRR Title 6, Parts 700-706: Water Quality Regulations; Part 703: SurfaceWater and Groundwater Quality Standards and Groundwater Effluent Limitations, Amended August 1999; and Division of Water StandardsTechnical and Operational Guidance Series (TOGS 1.1.1), Ambient Water Quality Standards and Guuidance Values and Groundwater Effluent Limitations, June 1998 [Use the most recent version]

QAPP Worksheet #15
Reference Limits and Evaluation Table

Matrix: Groundwater, Surface Water**/***
Analytical Group: Target Analyte List Inorganics (metals and cyanide)
Concentration Level: Low – ICP-AES and ICP-MS

Analyte	CAS Number	NJAC Groundwater Quality Standards (ug/L)*	NYS GW Quality Standards (ug/L)***	Project Quantiation Limit (ug/L)	Analytical Method – ILMO5.4 ICP-AES Quantitation Limits (ug/L)	Analytical Method – ILMO5.4 ICP-MS Quantitation Limits (ug/L)
Aluminum	7429-90-5	200			200	--
Antimony	7440-36-0	6	3		60	2
Arsenic	7440-38-2	3	25		10	1
Barium	7440-39-3	6000	1000		200	10
Beryllium	7440-41-7	1			5	1
Cadmium	7440-43-9	4	5		5	1
Calcium	7440-70-2				5000	--
Chromium	7440-47-3	70	50		10	2
Cobalt	7440-48-4				50	1
Copper	7440-50-8	1300	200		25	2
Iron	7439-89-6	300	300		100	--
Lead	7439-92-1	5	25		10	1
Magnesium	7439-95-4				5000	--
Manganese	7439-96-5	50	300		15	1
Mercury	7439-97-6	2	0.7		0.2	--
Nickel	7440-02-0	100	100		40	1
Potassium	2023695				5000	--
Selenium	7782-49-2	40	10		35	5
Silver	7440-22-4	40	50		10	1
Sodium	7440-23-5	50000	20000		5000	--
Thallium	7440-28-0	2			25	1
Vanadium	7440-62-2				50	5
Zinc	7440-66-6	2000			60	2
Cyanide	57-12-5	100	200		10	--

*NJDEP N.J.A.C. 7:9C, Ground Water Quality Standards (GWQS) dated November 7, 2005. [Use the most recent version]
** For surface water use NJDEP NJAC 7:9B Surface Water Quality Standards, October 2006
***NYSDEC NYCRR Title 6, Parts 700-706: Water Quality Regulations; Part 703: SurfaceWater and Groundwater Quality Standards and Groundwater Effluent Limitations, Amended August 1999; and Division of Water StandardsTechnical and Operational Guidance Series (TOGS 1.1.1), Ambient Water Quality Standards and Guuidance Values and Groundwater Effluent Limitations, June 1998 [Use the most recent version]

QAPP Worksheet #16
Project Schedule/Timeline Table

Activities	Organization	Dates (MM/DD/YY)		Deliverable	Deliverable Due Date
		Anticipated Date(s) of Initiation	Anticipated Date of Completion		
Preparation of QAPP	Contractor Project Manager ; or EPA Region 2 DESA			QAPP	
Review of QAPP	Contractor QAO; and/or EPA Region 2 QAO			Approved QAPP	
Preparation of Health and Safety Plan	Contractor Project Manager; or EPA Region 2 DESA			HASP	
Procurement of Equipment	Contractor Project Manager; or EPA Region 2 DESA			N/A	
Laboratory Request	Contractor Project Manager; or EPA Region 2 DESA			CLP Request Form	
Field Reconnaissance/Access	Contractor Project Manager; or EPA Region 2 DESA			N/A	N/A
Collection of Field Samples	Contractor Project Manager; or EPA Region 2 DESA			N/A	N/A
Laboratory Package Received	EPA Region 2 DESA; or Brownfields Grantee‘s Contractor			Unvalidated data package	
Validation of Laboratory Results	EPA Region 2 DESA; or Contractor Project Manager, if subcontracted			Validated data Packages	
Data Evaluation/ Preparation of Final Report	Contractor Project Manager; or EPA Region 2 DESA			Final Report	11/24/07

QAPP Worksheet #17
Sampling Design and Rationale

Contractor or EPA Region 2 DESA will collect approximately [number and type] samples from [location]. The [type] samples will be analyzed by [laboratory]. Include map, QA/QC samples, sampling methods and SOPs, Refer to Worksheet #21.

QAPP Worksheet #18
Sampling Locations and Methods/SOP Requirements Table

Matrix	Sampling Location(s)	Units	Analytical Group(s)	Concentration Level	No. of Samples (identify field duplicates)	Sampling SOP Reference	Rationale for Sampling Location
Gas			VOCs	Low - Scan			
			VOCs	Low - SIM			
Soil			VOCs	Low			
			VOCs	Medium			
			SVOCs	Low			
			SVOCs	Medium			
			Pesticides	Low			
			PCBs	Low			
			Metals	Low			
Sediment			VOCs	Low			
			VOCs	Medium			
			SVOCs	Low			
			SVOCs	Medium			
			Pesticides	Low			
			PCBs	Low			
			Metals	Low			

QAPP Worksheet #18
Sampling Locations and Methods/SOP Requirements Table

Matrix	Sampling Location(s)	Dépit (units)	Analytical Group(s)	Concentration Level	No. of Samples (identify field duplicates)	Sampling SOP Reference	Rationale for Sampling Location
Groundwater			VOCs	Trace			
			VOCs	Low			
			SVOCs	Low			
			Pesticides	Low			
			PCBs	Low			
			Metals	ICP/AES			
			Metals	ICP/MS			
Potable Water			VOCs	Trace			
			VOCs	Low			
			SVOCs	Low			
			Pesticides	Low			
			PCBs	Low			
			Metals	ICP/AES			
			Metals	ICP/MS			

QAPP Worksheet #18
Sampling Locations and Methods/SOP Requirements Table

Matrix	Sampling Location(s)	Dépit (units)	Analytical Group(s)	Concentration Level	No. of Samples (identify field duplicates)	Sampling SOP Reference	Rationale for Sampling Location
Surface Water			VOCs	Trace			
			VOCs	Low			
			SVOCs	Low			
			Pesticides	Low			
			PCBs	Low			
			Metals	ICP/AES			
			Metals	ICP/MS			

QAPP Worksheet #19
Analytical SOP Requirements Table

Matrix	No. of Samples	Analytical Group [Lab Assignment]	Concentration Level	Analytical and Preparation Method/SOP Reference	Sample Volume	Containers (number, size, and type)	Preservation Requirements	Maximum Holding Time (preparation/ analysis)
Gas		Soil Gas [ ]	Low	TO-15 scan	6 L	SUMMA canister	NA	30 days
		Indoor Air	Low	TO-15 SIM	6 L	SUMMA canister	NA	30 days
Soil		TCL Volatile Organics [CLP]	Low	SOM01.2	15 grams	(3) EnCore Samplers	Cool to 4°C	48 hours (from time of sample collection)
		Percent Moisture [CLP]	NA	SOM01.2	50 grams	(1) 4 oz. jar	NA	NA
		TCL Semi-Volatile Organic Compounds [CLP]	Low	SOM01.2	100 grams	(1) 8 oz. glass jar w/Teflon lined cap	Cool to 4°C	10 days extract; 40 days analyze
		TCL Pesticide Compounds [CLP]	Low	SOM01.2	100 grams	(1) 8 oz. glass jar w/Teflon lined cap	Cool to 4°C	10 days extract; 40 days analyze
		TCL PCB Compounds [CLP]	Low	SOM01.2	100 grams	Included with Pesticides	Cool to 4°C	10 days extract; 40 days analyze
		TAL Metals [CLP]	Low	ILM05.4	250 grams	(1) 8 oz. glass jar w/Teflon lined cap	Cool to 4°C	180 days (Hg-26 days)

QAPP Worksheet #19
Analytical SOP Requirements Table

Matrix	No. of Samples	Analytical Group [Lab Assignment]	Concentration Level	Analytical and Preparation Method/SOP Reference	Sample Volume	Containers (number, size, and type)	Preservation Requirements	Maximum Holding Time (preparation/ analysis)
Aqueous		Low Concentration Volatile Organics [CLP]	Trace or Low	SOM01.2	120 ml	(3) 40 ml VOA vials w/Teflon lined septum	1:1 HCl to pH<2; cool to 4°C	10 days
		Semi-Volatile Organics [CLP]	Low	SOM01.2	1000 ml	(2) 1L amber glass bottles w/Teflon lined cap	Cool to 4°C	5 days extract, 40 days analyze
		Pesticide Compounds [CLP]	Low	SOM01.2	1000 ml	(2) 1L amber glass bottle w/Teflon lined cap	Cool to 4°C	5 days extract, 40 days analyze
		PCB Compounds [CLP]	Low	SOM01.2	1000 ml	Included with pesticides	Cool to 4°C	5 days extract, 40 days analyze
		TAL Metals [CLP]	Low	ILM05.4	250 ml	(1) 1 L HDPE	HNO_3 to pH<2; cool to 4°C	6 months (Hg-26 days)

QAPP Worksheet #19
Analytical SOP Requirements Table

Matrix	No. of Samples	Analytical Group [Lab Assignment]	Concentration Level	Analytical and Preparation Method/SOP Reference	Sample Volume	Containers (number, size, and type)	Preservation Requirements	Maximum Holding Time (preparation/ analysis)
Equipment Blanks		Trace Concentration Volatile Organics [CLP]	Low	SOM01.2	120 ml	(3) 40 ml VOA vials w/Teflon lined septum	1:1 HCl to pH<2; cool to 4°C	10 days
		Semi-Volatile Organics [CLP]	Low	SOM01.2	1000 ml	(2) 1L amber glass bottles w/Teflon lined cap	Cool to 4°C	5 days extract, 40 days analyze
		Pesticide Compounds [CLP]	Low	SOM01.2	1000 ml	(2) 1L amber glass bottle w/Teflon lined cap	Cool to 4°C	5 days extract, 40 days analyze
		PCB Compounds [CLP]	Low	SOM01.2	1000 ml	Included with Pesticides	Cool to 4°C	5 days extract, 40 days analyze
		TAL Metals [CLP]	Low	ILM05.4	250 ml	(1) 1 L PE	HNO_3 to pH<2; cool to 4°C	6 months (Hg-26 days)
Trip Blanks		Trace Concentration Volatile Organics [CLP / DESA]	Low	SOM01.2	120 ml	(4) 40 ml VOA vials w/Teflon lined septum	1:1 HCl to pH<2; cool to 4°C	10 days

QAPP Worksheet #20
Field Quality Control Sample Summary Table

Matrix	Analytical Group	Concentration Level	Analytical and Preparation SOP Reference	No. of Sampling Locations	No. of Field Duplicate Pairs	No. of Extra Volume Laboratory QC (e.g., MS/MSD) Samples	No. of Equipment Blanks	No. of Trip. Blanks	No of PE Samples
Soil Gas	Soil Gas	Low	TO-15 scan						
	Indoor Air	Low	TO-15 SIM						
Soil	TCL Volatile Organics	Low	SOM01.2						
	Percent Moisture	NA	SOM01.2						
	TCL Semi-Volatile Organic Compounds	Low	SOM01.2						
	TCL Pesticide Compounds	Low	SOM01.2						
	TCL PCB Compounds	Low	SOM01.2						
	TAL Metals	Low	ILM05.4						
Aqueous	Trace Concentration Volatile Organics	Low	SOM01.2						
	Semi-Volatile Organics	Low	SOM01.2						
	Pesticide Compounds	Low	SOM01.2						
	PCB Compounds	Low	SOM01.2						
	TAL Metals	Low	ILM05.4						

QAPP Worksheet #20
Field Quality Control Sample Summary Table

Matrix	Analytical Group	Concentration Level	Analytical and Preparation SOP Reference	No. of Sampling Locations	No. of Field Duplicate Pairs	No. of Extra Volume Laboratory QC (e.g., MS/MSD) Samples	No. of Equipment Blanks	No. of Trip. Blanks	No of PE Samples
Aqueous	pH; conductivity; dissolved oxygen; turbidity; temperature	NA							

QAPP Worksheet #21
Project Sampling SOP References Table (Example for EPA Region 2 DESA/HWSB/SST)

Reference Number	Title, Revision Date and/or Number	Originating Organization	Equipment Type	Modified for Project Work? (Y/N)	Comments
SST-01	Field Oversight (including split sampling and duplicates); Performing Oversight of CERCLA Field Operations Rev. 0, February 2007	EPA/DESA/HWSB/SST	N/A		
SST-02	Field Portable X-Ray Fluorescence Spectrometry for the Determination of Elemental Concentrations in Soil and Sediment Rev. 0 February 2007	EPA/DESA/HWSB/SST	XRF meter and accessories		
SST-04	Soil Gas Sampling: Slam Bar/Power Hammer Technique Rev. 0 February 2007	EPA/DESA/HWSB/SST	Soil Gas kit with 3' rods and hammer drill, Teflon lined tubing, Tedlar bags and vaccuum box, pump,		
SST-06	Photo-Ionization Detector SOP Rev 1 June 2007	EPA/DESA/HWSB/SST	PID meter and calibration equipment		
SST-07	Groundwater Sampling Procedure: Low Stress (Low flow) Purging and Sampling Rev 0 February 2007	EPA/DESA/HWSB/SST	Submersible, bladder or peristaltic (inorganic only) pump, Teflon lined tubing, water level meter, parameter meter, power source		
SST-08	Indoor Air Sampling with SUMMA Canisters Rev 3 February 2007	EPA/DESA/HWSB/SST	SUMMA Canisters with pressure gauge, wrench, Teflon tubing		
SST-09	Potable Well Sampling Rev 1 February 2007	EPA/DESA/HWSB/SST	Hoses, buckets, wrench		
SOP #2016	Sediment Sampling from Compendium of ERT Surface Water and Sediment Sampling Procedures January 1991	EPA/OSWER/ERT	Flags, stainless steel bowls, scoops and augers, dredge, coring device		
SOP #2013	Surface Water Sampling from Compendium of ERT Surface Water and Sediment Sampling Procedures January 1991	EPA/OSWER/ERT	Flags, stainless steel bowls, scoops and augers, dredge, coring device		
SOP #2012	Soil Sampling from the Compendium of ERT Soil Sampling and Surface Geophysics Procedures.	EPA/OSWER/ERT	Stainless steel bowls, scoops and augers		

QAPP Worksheet #22
Field Equipment Calibration, Maintenance, Testing, and Inspection Table

Field Equipment	Calibration Activity	Maintenance Activity	Testing/ Inspection Activity	Frequency	Acceptance Criteria		Corrective Action	Responsible Person	SOP Reference
YSI or equivalent	Calibrate with standard solutions	NA	NA	Prior to day's activities; end of day's activities; anytime anomaly suspected	pH Meter	+/- 0.1 units	Clean probe, replace battery, replace membrane, replace probe	Contractor Project Leader [ ]	
					Dissolved Oxygen	± 3%			
					Specific Conductivity	± 1%			
					Temperature	± 0.1 °C			
					Turbidity	± 2 NTU			
					Temperature	± 0.1 °C			
					Turbidity	± 2 NTU			
Water Level Indicator or Interface Probe	NA	NA	Visual inspection	Prior to day's activities	No defects noted		Replace	Contractor Project Leader [ ]	
PID	NA	Check/replace battery	NA	Prior to day's activities; anytime anomaly suspected	+/- 5 ppm		Replace battery; replace probe	Contractor Project Leader [ ]	

QAPP Worksheet #23
Analytical SOP References Table

Reference Number	Title, Revision Date, and/or Number	Definitive or Screening Data	Analytical Group	Instrument	Organization Performing Analysis	Modified for Project Work? (Y/N)*
TO-15	Determination Of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters And Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS)	Definitive	Gases	GC/MS	National Non-RAS Laboratory	
SOM01.2	USEPA Contract Laboratory Program Statement of Work for Multi-Media, Multi-Concentration Organic Analysis,; October 2006	Definitive	Target Compound List Volatile Organics	GC/MS	CLP RAS Laboratory	
SOM01.2	USEPA Contract Laboratory Program Statement of Work for Multi-Media, Multi-Concentration Organic Analysis,; October 2006	Definitive	Trace Concentration Volatile Organics	GC/MS	CLP RAS Laboratory	
SOM01.2	USEPA Contract Laboratory Program Statement of Work for Multi-Media, Multi-Concentration Organic Analysis,; October 2006	Definitive	Target Compound List Semi-Volatile Organics	GC/MS	CLP RAS Laboratory	
SOM01.2	USEPA Contract Laboratory Program Statement of Work for Multi-Media, Multi-Concentration Organic Analysis,; October 2006	Definitive	Target Compound List Pesticides	GC/ECD	CLP RAS Laboratory	

* If yes, explain the modification

QAPP Worksheet #23
Analytical SOP References Table

Reference Number	Title, Revision Date, and/or Number	Definitive or Screening Data	Analytical Group	Instrument	Organization Performing Analysis	Modified for Project Work? (Y/N)*
SOM01.2	USEPA Contract Laboratory Program Statement of Work for Multi-Media, Multi-Concentration Organic Analysis,; October 2006	Definitive	Target Compound List PCBs	GC/ECD	CLP RAS Laboratory	
ILM05.4	USEPA Contract Laboratory Program Statement of Work for Multi-Media, Multi-Concentration Inorganic Analysis,; December 2006	Definitive	Target Analyte List Metals	ICP-AES / ICP-MS	CLP RAS Laboratory	

* If yes, explain the modification

QAPP Worksheet #24
Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP Reference
GC/MS	See TO-15	Initial calibration: upon award of the contract, whenever the laboratory takes corrective action which may change or affect the initial calibration criteria (e.g., ion source cleaning or repair, column replacement, etc.), or if the continuing calibration acceptance criteria have not been met. Continuing calibration: Following initial calibration verification, once every 12 hours, end of run. GC/MS Tuning with 4-Bromoflurobenzene (BFB): Beginning of each 12 hour period during which standards and samples are analyzed. Retention Time Evaluation: each analysis.	Initial calibration/ Continuing calibration: relative response factor (RRF) greater than or equal to minimum acceptable response factor listed in Table 5 of procedure; %RSD must be less than or equal to value listed in Table 5 of procedure. GC/MS Tuning: See ion abundance table in TO-15. Retention Time Evaluation: +/- 0.50 minute of the internal standard retention time in the associated calibration check verification	Initial calibration: inspect system for problems (e.g., clean ion source, change the column, service the purge and trap device), correct problem, re-calibrate. Continuing calibration: inspect system, recalibrate the instrument, reanalyze samples. GC/MS Tuning: inspect the system, identify problem. MS tune criteria must be met before calibration Retention time evaluation: re-calibrate and verify, re-analyze samples back to the last good calibration check verification	EPA National Non-RAS Laboratory GC/MS Technician; Subcontractor Laboratory GC/MS Technician	TO-15

QAPP Worksheet #24
Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP Reference
GC/MS	See SOM01.2	Initial calibration: upon award of the contract, whenever the laboratory takes corrective action which may change or affect the initial calibration criteria (e.g., ion source cleaning or repair, column replacement, etc.), or if the continuing calibration acceptance criteria have not been met. Continuing calibration: Once every 12 hours	Initial calibration/ Continuing calibration: relative response factor (RRF) greater than or equal to minimum acceptable response factor listed in Table 5 of procedure; %RSD must be less than or equal to value listed in Table 5 of procedure.	Initial calibration: inspect system for problems (e.g., clean ion source, change the column, service the purge and trap device), correct problem, re-calibrate. Continuing calibration: inspect system, recalibrate the instrument, reanalyze samples.	EPA CLP RAS Laboratory GC/MS Technician	SOM01.2
GC/ECD	See SOM01.2	Initial calibration: upon award of the contract, whenever major instrument maintenance or modification is performed or if the calibration verification technical acceptance criteria have not been met. Calibration verification: Once every 12 hours	Initial calibration/ Calibration verification: resolution between two adjacent peaks must be greater than or equal to 60.0 percent, single components must be greater than or equal to 90.0 percent resolved, RTs within the RT window, %D must be greater than or equal to -25 percent and less than or equal to 25 percent, %RSD must be less than or equal to 20.0 percent.	Initial calibration: inspect the system (e.g., change the column, bake out the detector, clean the injection port) , correct problem, re-calibrate. Calibration verification: inspect system, recalibrate the instrument, reanalyze samples.	EPA CLP RAS Laboratory GC/ECD Technician	SOM01.2

QAPP Worksheet #24
Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP Reference
ICP-AES / ICP-MS	See ILM05.4; as per instrument manufacturer's recommended procedures	ICP-AES or ICP-MS Initial calibration: daily or once every 24 hours and each time the instrument is set up. ICP-AES or ICP-MS Continuing calibration: beginning and end of run, and frequency of 10% or every 2 hours during an analysis run.	ICP-AES: As per instrument manufacturer's recommended procedures, with at least 2 standards. ICP-MS: As per instrument manufacturer's recommended procedures, with at least 2 standards. A minimum of three replicate integrations are required for data acquisition.	ICP-AES or ICP-MS: inspect the system, correct problem, re-calibrate, re-analyze samples.	EPA CLP RAS Laboratory ICP-AES / ICP-MS Technician	ILM05.4
YSI	Calibrate with standard solutions; as per instrument manufacturer's recommended procedures	Prior to day's activities; end of day's activities; anytime anomaly suspected	+/- 0.1 units	Clean probe, replace battery, replace membrane, replace probe	EPA SST	Manufacturer's Instructions
La Motte Turbidity Meter	Calibrate with standard solutions; as per instrument manufacturer's recommended procedures	Prior to day's activities; end of day's activities; anytime anomaly suspected		Replace battery, replace standards, replace bottle, replace lightbulb	EPA SST	Manufacturer's Instructions

QAPP Worksheet #25
Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table

Instrument/ Equipment	Maintenance Activity	Testing/Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference[1]
GC/MS	See TO-15; as per instrument manufacturer's recommendations	See TO-15; as per instrument manufacturer's recommendations	See TO-15; as per instrument manufacturer's recommendations	Acceptable re-calibration; see TO-15	Inspect the system, correct problem, re-calibrate and/or reanalyze samples.	EPA National Non-RAS Laboratory GC/MS Technician	TO-15
GC/MS	See SOM01.2; as per instrument manufacturer's recommendations	See SOM01.2; as per instrument manufacturer's recommendations	See SOM01.2; as per instrument manufacturer's recommendations	Acceptable re-calibration; see SOM01.2	Inspect the system, correct problem, re-calibrate and/or reanalyze samples.	EPA CLP RAS Laboratory GC/MS Technician	SOM01.2
GC/ECD	See SOM01.2; as per instrument manufacturer's recommendations	See SOM01.2; as per instrument manufacturer's recommendations	See SOM01.2; as per instrument manufacturer's recommendations	Acceptable re-calibration; see SOM01.2	Inspect the system, correct problem, re-calibrate and/or reanalyze samples.	EPA CLP RAS Laboratory GC/ECD Technician	SOM01.2
ICP-AES / ICP-MS	As per instrument manufacturer's recommendations	As per instrument manufacturer's recommendations; check connections	As per instrument manufacturer's recommendations	Acceptable re-calibration; see ILM05.4	Inspect the system, correct problem, re-calibrate and/or reanalyze samples.	EPA CLP RAS Laboratory ICP-AES / ICP-MS Technician	ILM05.4
YSI Multi-parameter meter	Check/replace battery	Visual inspection	Prior to day's activities; anytime anomaly suspected	No visual defects; +/- 0.1 units	Replace battery; replace probe	EPA SST	Manufacturer's Instructions
LaMotte Turbidity Meter	Check/replace battery	Visual inspection	Prior to day's activities; anytime anomaly suspected		Replace battery; replace light bulb	EPA SST	Manufacturer's Instructions

QAPP Worksheet #26
Sample Handling System

SAMPLE COLLECTION, PACKAGING, AND SHIPMENT
Sample Collection (Personnel/Organization): [ ] Contrator Project Manager or EPA Region 2 DESA
Sample Packaging (Personnel/Organization): [ ] Contractor Project Manager or EPA Region 2 DESA
Coordination of Shipment (Personnel/Organization): [ ] Contractor Project Manager or EPA Region 2 DESA
Type of Shipment/Carrier: Federal Express; or applicable
SAMPLE RECEIPT AND ANALYSIS
Sample Receipt (Personnel/Organization): Sample Custodian, EPA CLP RAS Laboratory//National Non-RAS Laboratory
Sample Custody and Storage (Personnel/Organization): Sample Custodian, EPA CLP RAS Laboratory//National Non-RAS Laboratory
Sample Preparation (Personnel/Organization): Sample Technicians, EPA CLP RAS Laboratory//National Non-RAS Laboratory
Sample Determinative Analysis (Personnel/Organization): Sample Technicians, EPA CLP RAS Laboratory//National Non-RAS Laboratory
SAMPLE ARCHIVING
Field Sample Storage (No. of days from sample collection): Samples to be shipped within [ ], and arrive at laboratory within 24 hours (1 day) of sample shipment
Sample Extract/Digestate Storage (No. of days from extraction/digestion): As per analytical methodology; see Worksheet #19
SAMPLE DISPOSAL
Personnel/Organization: Sample Technicians, EPA CLP RAS Laboratory/ National Non-RAS Laboratory
Number of Days from Analysis: Until analysis and QA/QC checks are completed; as per analytical methodology; see Worksheet #19.

QAPP Worksheet #27
Sample Custody Requirements

Sample Identification Procedures: Each sample will be labeled with the site identification code [ ] and a sample type letter code and number that depicts a specific location. Each sample will also be labeled with a CLP or Non-CLP assigned number. Depending on the type of sample, additional information such as depth, sampling round, date, etc. will be added. Examples are provided in the QAPP.
Field Sample Custody Procedures (sample collection, packaging, shipment, and delivery to laboratory): Each sample will be individually identified and labeled after collection, then sealed with custody seals and enclosed in a plastic cooler. The sample information will be recorded on chain-of-custody (COC) forms, and the samples shipped to the appropriate laboratory via overnight delivery service or courier. EPA FORMS II Lite program will be used for field documentation. Refer to the U.S. EPA OSWER 9240.0-44, EPA 540-R-07-06 *Contract Laboratory Program Guidance for Field Samplers*, dated July 2007
Laboratory Sample Custody Procedures (receipt of samples, archiving, disposal): A sample custodian at the laboratory will accept custody of the shipped samples, and check them for discrepancies, proper preservation, integrity, etc. If noted, issues will be forwarded to the laboratory manager for corrective action. The sample custodian will relinquish custody to the appropriate department for analysis. At this time, no samples will be archived at the laboratory. Disposal of the samples will occur only after analyses and QA/QC checks are completed.

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Gas
Analytical Group	Volatile Compounds
Concentration Level	Low (ppbv)
Sampling SOP(s)	
Analytical Method/SOP Reference	TO-15
Sampler's Name	
Field Sampling Organization	
Analytical Organization	
No. of Sample Locations	

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Laboratory Method Blank	1 per ≤ 20 samples	No analyte >CRQL	Suspend analysis unit source recertified	National Non-RAS Laboratory Technician	Accuracy	No analyte > CRQL
Laboratory Replicate Sample	1 per ≤ 20 samples	± 25%D	± 25%D	National Non-RAS Laboratory Technician	Precision	± 25%RPD
Laboratory Control Sample	1 per ≤ 20 samples	±30% R	Flag outliers	National Non-RAS Laboratory Technician	Accuracy	±30% R

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Gas
Analytical Group	Volatile Compounds
Concentration Level	Low (ppbv)
Sampling SOP(s)	
Analytical Method/SOP Reference	CLP SAV01.X
Sampler's Name	
Field Sampling Organization	
Analytical Organization	
No. of Sample Locations	

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Laboratory Method Blank	1 per ≤ 20 samples	No analyte > ½ CRQL	Suspend analysis unit source recertified	National Non-RAS Laboratory Technician	Accuracy	No analyte > ½ CRQL
Laboratory Replicate Sample	1 per ≤ 20 samples	± 25%RPD	± 25%RPD	National Non-RAS Laboratory Technician	Precision	± 25%RPD
Laboratory Control Sample	1 per ≤ 20 samples	± 30%R	Flag outliers	National Non-RAS Laboratory Technician	Accuracy	± 30%R

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Compound List Volatile Organics
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Method Blank	1 every 12 hours	No analyte > CRQL*		Suspend analysis unit source recertified	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	No analyte > CRQL*	
Matrix Spike (Not Required)	1 per ≤ 20 samples; if requested	1,1-Dichloroethene	59-172 %R	Flag outliers	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	1,1-Dichloroethene	59-172 %R
		Trichloroethene	62-137 %R				Trichloroethene	62-137 %R
		Benzene	66-142 %R				Benzene	66-142 %R
		Toluene	59-139 %R				Toluene	59-139 %R
		Chlorobenzene	60-133 %R				Chlorobenzene	60-133 %R
Matrix Spike Duplicate (Not Required)	1 per ≤ 20 samples; if requested	1,1-Dichloroethene	0-22 %RPD	Flag outliers	EPA CLP RAS Laboratory GC/MS Technician	Precision	1,1-Dichloroethene	0-22 %RPD
		Trichloroethene	0-24 %RPD				Trichloroethene	0-24 %RPD
		Benzene	0-21 %RPD				Benzene	0-21 %RPD
		Toluene	0-21 %RPD				Toluene	0-21 %RPD
		Chlorobenzene	0-21 %RPD				Chlorobenzene	0-21 %RPD
Deuterated Monitoring Compounds	all samples	Vinyl chloride-d3	68-122 %R	Check calculations and instruments, reanalyze affected samples up to 3 DMCs per sample may fail to meet necessary limits (Section 11.3.4, Page D45/SOM01.2)	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	Vinyl chloride-d3	68-122 %R
		Chloroethane-d5	61-130 %R				Chloroethane-d5	61-130 %R

*with the exception of methylene chloride, 2-butanone & acetone which can be up to 2 times the CRQL. (USEPA CLP Nat'l Fuctional Guidelines, Final, July 2007)

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Compound List Volatile Organics [cont'd]
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Deuterated Monitoring Compounds [cont'd]	all samples	1,1-Dichloroethene-d2	45-132 %R	Check calculations and instruments, reanalyze affected samples; up to 3 DMCs per sample may fail to meet necessary limits (Section 11.3.4, Page D45 of SOM01.2)	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	1,1-Dichloroethene-d2	45-132 %R
		2-Butanone-d5	20-182 %R				2-Butanone-d5	20-182 %R
		Chloroform-d	72-123 %R				Chloroform-d	72-123 %R
		1,2-Dichloroethane-d4	79-122 %R				1,2-Dichloroethane-d4	79-122 %R
		Benzene-d6	80-121 %R				Benzene-d6	80-121 %R
		1,2-Dichloropropane-d6	74-124 %R				1,2-Dichloropropane-d6	74-124 %R
		Toluene-d8	78-121 %R				Toluene-d8	78-121 %R
		trans-1,3-Dichloropropene-d4	72-130 %R				trans-1,3-Dichloropropene-d4	72-130 %R
		2-Hexanone-d5	17-184 %R				2-Hexanone-d5	17-184 %R
		1,4-Dioxane-d8	50-150 %R				1,4-Dioxane-d8	50-150 %R
		1,1,2,2-Tetrachloroethane-d2	56-161 %R				1,1,2,2-Tetrachloroethane-d2	56-161 %R

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Compound List Volatile Organics [cont'd]
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Deuterated Monitoring Compounds [cont'd]	all samples	1,2-Dichlorobenzene-d4	70-131 %R	Check calculations and instruments, reanalyze affected samples; up to 3 DMCs per sample may fail to meet necessary limits (Section 11.3.4, Page D45/VOC of SOM01.2)	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	1,2-Dichlorobenzene-d4	70-131 %R
Internal Standards	all samples	50-200% of area, ± 30 sec retention time shift		Check calculations and instruments, reanalyze affected samples; up to 3 DMCs per sample may fail to meet necessary limits (Section 11.3.4, Page D45/VOC of SOM01.2)	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	50-100% of area, ± 30 sec retention time shift	

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Compound List Semi-Volatile Organics
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Method Blank	1 per ≤ 20 samples or whenever samples extracted	No analyte > CRQL*		Suspend analysis unit source recertified	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	No analyte > CRQL*	
Matrix Spike (Not Required)	1 per ≤ 20 samples; if requested	Phenol	26-90 %R	Flag outliers	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	Phenol	26-90 %R
		2-Chlorophenol	25-102 %R				2-Chlorophenol	25-102 %R
		N-Nitroso-di-n-propylamine	41-126 %R				N-Nitroso-di-n-propylamine	41-126 %R
		4-Chloro-3-methylphenol	26-103 %R				4-Chloro-3-methylphenol	26-103 %R
		Acenaphthene	31-137 %R				Acenaphthene	31-137 %R
		4-Nitrophenol	11-114 %R				4-Nitrophenol	11-114 %R
		2,4-Dinitrotoluene	28-89 %R				2,4-Dinitrotoluene	28-89 %R
		Pentachloro-phenol	17-109 %R				Pentachloro-phenol	17-109 %R
		Pyrene	35-142 %R				Pyrene	35-142 %R
Matrix Spike Duplicate (Not Required)	1 per ≤ 20 samples; if requested	Phenol	0-35 %RPD	Flag outliers	EPA CLP RAS Laboratory GC/MS Technician	Precision	Phenol	0-35 %RPD
		2-Chlorophenol	0-50 %RPD				2-Chlorophenol	0-50 %RPD
		N-Nitroso-di-n-propylamine	0-38 %RPD				N-Nitroso-di-n-propylamine	0-38 %RPD

*with the exception of bis (2-Etheylhexyl) phthalate which can be up to 5 times the CRQL. (USEPA CLP Nat'l Fuctional Guidelines, Final, July 2007)

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Compound List Semi-Volatile Organics [cont'd]
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Matrix Spike Duplicate (Not Required) [cont'd]	1 per ≤ 20 samples; if requested	4-Chloro-3-methylphenol	0-33 %RPD	Flag outliers	EPA CLP RAS Laboratory GC/MS Technician	Precision	4-Chloro-3-methylphenol	0-33 %RPD
		Acenaphthene	0-19 %RPD				Acenaphthene	0-19 %RPD
		4-Nitrophenol	0-50 %RPD				4-Nitrophenol	0-50 %RPD
		2,4-Dinitrotoluene	0-47 %RPD				2,4-Dinitrotoluene	0-47 %RPD
		Pentachloro-phenol	0-47 %RPD				Pentachloro-phenol	0-47 %RPD
		Pyrene	0-36 %RPD				Pyrene	0-36 %RPD
Deuterated Monitoring Compounds	all samples	Phenol-d5	17-103 %R	Check calculations and instruments, reanalyze affected samples; up to 4 DMCs may fail to meet recovery limits (Section 11.3.4, Page D48/SVOC of SOM01.2)	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	Phenol-d5	17-103 %R
		Bis(2-chloroethyl)ether-d8	12-98 %R				Bis(2-chloroethyl)ether-d8	12-98 %R
		2-Chlorophenol-d4	13-101 %R				2-Chlorophenol-d4	13-101 %R
		4-Methylphenol-d8	8-100 %R				4-Methylphenol-d8	8-100 %R
		Nitrobenzene-d5	16-103 %R				Nitrobenzene-d5	16-103 %R
		2-Nitrophenol-d4	16-104 %R				2-Nitrophenol-d4	16-104 %R

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Compound List Semi-Volatile Organics [cont'd]
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Deuterated Monitoring Compounds [cont'd]	all samples	2,4-Dichlorophenol-d3	23-104 %R	Check calculations and instruments, reanalyze affected samples; up to 4 DMCs may fail to meet recovery limits (Section 11.3.4, Page D48/SVOC of SOM01.2)	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	2,4-Dichlorophenol-d3	23-104 %R
		4-Chloroaniline-d4	1-145 %R				4-Chloroaniline-d4	1-145 %R
		Dimethylphthalate-d6	43-111 %R				Dimethylphthalate-d6	43-111 %R
		Acenaphthylene-d8	20-97 %R				Acenaphthylene-d8	20-97 %R
		4-Nitrophenol-d4	16-166 %R				4-Nitrophenol-d4	16-166 %R
		Fluorene-d10	40-108 %R				Fluorene-d10	40-108 %R
		4,6-Dinitro-2-methylphenol-d2	1-121 %R				4,6-Dinitro-2-methylphenol-d2	1-121 %R
		Anthracene-d10	22-98 %R				Anthracene-d10	22-98 %R
		Pyrene-d10	51-120 %R				Pyrene-d10	51-120 %R
		Benzo(a)pyrene-d12	43-111 %R				Benzo(a)pyrene-d12	43-111 %R

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Compound List Semi-Volatile Organics [cont'd]
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Internal Standards	all samples	50-200% of area, ± 30 sec retention time shift	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	50-200% of area, ± 30 sec retention time shift

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Compound List Pesticides
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM012
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Method Blank	1 per ≤ 20 samples or whenever samples extracted	No analyte > CRQL		Suspend analysis unit source recertified	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	No analyte > CRQL	
Matrix Spike	1 per ≤ 20 samples	gamma-BHC (Lindane)	46-127 %R	Flag outliers	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	gamma-BHC (Lindane)	46-127 %R
		Heptachlor	35-130 %R				Heptachlor	35-130 %R
		Aldrin	34-132 %R				Aldrin	34-132 %R
		Dieldrin	31-134 %R				Dieldrin	31-134 %R
		Endrin	42-139 %R				Endrin	42-139 %R
		4,4-DDT	23-134 %R				4,4-DDT	23-134 %R
Matrix Spike Duplicate	1 per ≤ 20 samples	gamma-BHC	0-50 %RPD	Flag outliers	EPA CLP RAS Laboratory GC/ECD Technician	Precision	gamma-BHC	0-50 %RPD
		Heptachlor	0-31 %RPD				Heptachlor	0-31 %RPD
		Aldrin	0-43 %RPD				Aldrin	0-43 %RPD
		Dieldrin	0-38 %RPD				Dieldrin	0-38 %RPD
		Endrin	0-45 %RPD				Endrin	0-45 %RPD
		4,4-DDT	0-50 %RPD				4,4-DDT	0-50 %RPD

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Compound List Pesticides [cont'd]
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Laboratory Control Sample	all samples	gamma-BHC	50-120 %R	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	gamma-BHC	50-120 %R
		Heptachlor epoxide	50-150 %R				Heptachlor epoxide	50-150 %R
		Dieldrin	30-130 %R				Dieldrin	30-130 %R
		4,4'-DDE	50-150 %R				4,4'-DDE	50-150 %R
		Endrin	50-120 %R				Endrin	50-120 %R
		Endosulfan sulfate	50-120 %R				Endosulfan sulfate	50-120 %R
		gamma-Chlordane	30-130 %R				gamma-Chlordane	30-130 %R
Surrogate	all samples		30–150 %R	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy		30-150 %R

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Compound List PCBs
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Method Blank	1 per ≤ 20 samples or whenever samples extracted	No analyte > CRQL		Suspend analysis unit source recertified	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	No analyte > CRQL	
Matrix Spike	1 per ≤ 20 samples	Aroclor-1016	29-135 %R	EPA CLP RAS Laboratory GC/ECD Technician	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	Aroclor-1016	29-135 %R
		Aroclor-1260	29-135 %R				Aroclor-1260	29-135 %R
Matrix Spike Duplicate	1 per ≤ 20 samples	Aroclor-1016	0-15 %RPD	EPA CLP RAS Laboratory GCECD Technician	EPA CLP RAS Laboratory GC/ECD Technician	Precision	Aroclor-1016	0-15 %RPD
		Aroclor-1260	0-20 %RPD				Aroclor-1260	0-20 %RPD
Laboratory Control Sample	all samples	Aroclor-1016	50-150 %R	EPA CLP RAS Laboratory GC/ECD Technician	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	Aroclor-1016	50-150 %R
		Aroclor-1260	50-150 %R				Aroclor-1260	50-150 %R
Surrogate	all samples		30-150%R	EPA CLP RAS Laboratory GC/ECD Technician	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy		30-150%R

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Analyte List Inorganics – Metals
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	ILM05.4
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Preparation Blank	1 per ≤ 20 samples	No constituent > CRQL	Suspend analysis until source rectified; redigest and reanalyze affected samples	EPA CLP RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	No constituent > CRQL
Spike	1 per ≤ 20 samples	75-125%R*	Flag outliers	EPA CLP RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	75-125%R*
Duplicate	1 per ≤ 20 samples	± 20% RPD**	Flag outliers	EPA CLP RAS Laboratory ICP-AES/ICP-MS Technician	Precision	± 20% RPD**
Post-Digestion Spike	after any analyte (except Ag and Hg) fails spike %R	75-125%R	Flag outliers	EPA CLP RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	75-125%R
Interference Check Sample [ICP Analysis Only]	beginning, end and periodically during run (2 times every 8 hours)	Within ± 2 times CRQL of true value or ± 20% of true value, whichever is greater	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory ICP-AES/ICP-MS Technician	Sensitivity	Within ± 2 times CRQL of true value or ± 20% of true value, whichever is greater

*except when the sample concentration is greater than 4 times the spike concentration, then disregrard the recoveries; no data validation action taken
**Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP - (include absolute difference criteria)
**except when the sample and/or duplicateconcentration is less than 5 times the CRQL, then ± CRQL.

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Analyte List Inorganics- Metals [cont'd]
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	ILM05.4
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Laboratory Control Sample	1 per $\leq$ 20 samples	Control limits established by EPA*	Suspend analysis until source rectified; redigest and reanalyze affected samples	EPA CLP RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	Control limits established by EPA*

* If the EPA LCS is unavailable, other EPA QC samples or other certified materials may be used. In such cases, control limits for the LCS must be documnetd and provided.

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compund List Trace Concentration Volatile Organics
Concentration Level	Trace (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Method Blank	1 every 12 hours	No analyte > CRQL*		Suspend analysis unit source recertified	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	No analyte > CRQL*	
Matrix Spike (Not Required)	1 per ≤ 20 samples; if requested	1,1-Dichloroethene	61-145 %R	Flag outliers	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	1,1-Dichloroethene	61-145 %R
		Benzene	76-127 %R				Benzene	76-127 %R
		Trichloroethene	71-120 %R				Trichloroethene	71-120 %R
		Toluene	76-125 %R				Toluene	76-125 %R
		Chlorobenzene	75-130 %R				Chlorobenzene	75-130 %R
Matrix Spike Duplicate (Not Required)	1 per ≤ 20 samples; if requested	1,1-Dichloroethene	0-14 %RPD	Flag outliers	EPA CLP RAS Laboratory GC/MS Technician	Precision	1,1-Dichloroethene	0-14 %RPD
		Benzene	0-11 %RPD				Benzene	0-11 %RPD
		Trichloroethene	0-14 %RPD				Trichloroethene	0-14 %RPD
		Toluene	0-13 %RPD				Toluene	0-13 %RPD
		Chlorobenzene	0-13 %RPD				Chlorobenzene	0-13 %RPD
Deuterated Monitoring Compounds	all samples	Vinyl chloride-d3	65-131 %R	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	Vinyl chloride-d3	65-131 %R
		Chloroethane-d5	71-131 %R				Chloroethane-d5	71-131 %R

*with the exception of methylene chloride, 2-butanone and acetone which can be up to 2 times the CRQL, or in some situations may require these compunds be up to 4 times the CRQL.

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compund List Trace Concentration Volatile Organics [cont'd]
Concentration Level	Trace (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Deuterated Monitoring Compounds [cont'd]	all samples	1,1-Dichloroethene-d2	55-104 %R	Check calculations and instruments, reanalyze affected samples; up to 3 DMCs per sample may fail to meet recovery limits	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	1,1-Dichloroethene-d2	55-104 %R
		2-Butanone-d5	49-155 %R				2-Butanone-d5	49-155 %R
		Chloroform-d	78-121 %R				Chloroform-d	78-121 %R
		1,2-Dichloroethane-d4	78-129 %R				1,2-Dichloroethane-d4	78-129 %R
		Benzene-d6	77-124 %R				Benzene-d6	77-124 %R
		1,2-Dichloropropane-d6	79-124 %R				1,2-Dichloropropane-d6	79-124 %R
		Toluene-d8	77-121 %R				Toluene-d8	77-121 %R
		trans-1,3-Dichloropropene-d4	73-121 %R				trans-1,3-Dichloropropene-d4	73-121 %R
		2-Hexanone-d5	28-135 %R				2-Hexanone-d5	28-135 %R
		1,4-Dioxane-d8	50-150 %R				1,4-Dioxane-d8	50-150 %R
		1,1,2,2-Tetrachloroethane-d2	73-125 %R				1,1,2,2-Tetrachloroethane-d2	73-125 %R

QAP P Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compund List Trace Concentration Volatile Organics [cont'd]
Concentration Level	Trace (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Deuterated Monitoring Compounds [cont'd]	all samples	1,2-Dichlorobenzene-d4	80-131 %R	Check calculations and instruments, reanalyze affected samples; up to 3 DMCs per sample may fail to meet recovery limits	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	1,2-Dichlorobenzene-d4	80-131 %R
Internal Standards	all samples	60-140%		Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	± 40 % of response area, ± 20 sec retention time shift	

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compund List Volatile Organics
Concentration Level	Low (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Method Blank	1 every 12 hours	No analyte > CRQL*		Suspend analysis unit source recertified	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	No analyte > CRQL*	
Matrix Spike (Not Required)	1 per ≤ 20 samples; if requested	1,1-Dichloroethene	61-145 %R	Flag outliers	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	1,1-Dichloroethene	61-145 %R
		Benzene	76-127 %R				Benzene	76-127 %R
		Trichloroethene	71-120 %R				Trichloroethene	71-120 %R
		Toluene	76-125 %R				Toluene	76-125 %R
		Chlorobenzene	75-130 %R				Chlorobenzene	75-130 %R
Matrix Spike Duplicate (Not Required)	1 per ≤ 20 samples; if requested	1,1-Dichloroethene	0-14 %RPD	Flag outliers	EPA CLP RAS Laboratory GC/MS Technician	Precision	1,1-Dichloroethene	0-14 %RPD
		Benzene	0-11 %RPD				Benzene	0-11 %RPD
		Trichloroethene	0-14 %RPD				Trichloroethene	0-14 %RPD
		Toluene	0-13 %RPD				Toluene	0-13 %RPD
		Chlorobenzene	0-13 %RPD				Chlorobenzene	0-13 %RPD
Deuterated Monitoring Compounds	all samples	Vinyl chloride-d3	65-131 %R	Check calculations and instruments, reanalyze affected samples; see asterisk below	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	Vinyl chloride-d3	65-131 %R
		Chloroethane-d5	71-131 %R				Chloroethane-d5	71-131 %R

*with the exception of methylene chloride, 2-butanone and acetone which can be up to 2 times the CRQL.

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compound List Volatile Organics [cont'd]
Concentration Level	Low (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Deuterated Monitoring Compounds [cont'd]	all samples	1,1-Dichloroethene-d2	55-104 %R	Check calculations and instruments, reanalyze affected samples; *up to 3 DMCs per sample may fail to meet recovery limits	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	1,1-Dichloroethene-d2	55-104 %R
		2-Butanone-d5	49-155 %R				2-Butanone-d5	49-155 %R
		Chloroform-d	78-121 %R				Chloroform-d	78-121 %R
		1,2-Dichloroethane-d4	78-129 %R				1,2-Dichloroethane-d4	78-129 %R
		Benzene-d6	77-124 %R				Benzene-d6	77-124 %R
		1,2-Dichloropropane-d6	79-124 %R				1,2-Dichloropropane-d6	79-124 %R
		Toluene-d8	77-121 %R				Toluene-d8	77-121 %R
		trans-1,3-Dichloropropene-d4	73-121 %R				trans-1,3-Dichloropropene-d4	73-121 %R
		2-Hexanone-d5	28-135 %R				2-Hexanone-d5	28-135 %R
		1,4-Dioxane-d8	50-150 %R				1,4-Dioxane-d8	50-150 %R
		1,1,2,2-Tetrachloroethane-d2	73-125 %R				1,1,2,2-Tetrachloroethane-d2	73-125 %R

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compound List Volatile Organics [cont'd]
Concentration Level	Low (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Deuterated Monitoring Compounds [cont'd]	all samples	1,2-Dichlorobenzene-d4	80-131 %R	Check calculations and instruments, reanalyze affected samples; *up to 3 DMCs per sample may fail to meet recovery limits	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	1,2-Dichlorobenzene-d4	80-131 %R
Internal Standards	all samples	60-140%		Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	± 40 % of response area, ± 20 sec retention time shift	

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compound List Semi-Volatile Organics
Concentration Level	Low/Medium (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency / Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Method Blank	1 per ≤ 20 samples OR whenever samples extracted	No analyte > CRQL*		Suspend analysis unit source recertified	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	No analyte > CRQL	
Matrix Spike (Not Required)	1 per ≤ 20 samples; if requested	Phenol	12-110 %R	Flag outliers	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	Phenol	12-110 %R
		2-Chlorophenol	27-123 %R				2-Chlorophenol	27-123 %R
		N-Nitroso-di-n-propylamine	41-116 %R				N-Nitroso-di-n-propylamine	41-116 %R
		4-Chloro-3-methylphenol	23-97 %R				4-Chloro-3-methylphenol	23-97 %R
		Acenaphthene	46-118 %R				Acenaphthene	46-118 %R
		4-Nitrophenol	29-94 %R				4-Nitrophenol	29-94 %R
		2,4-Dinitrotoluene	24-96 %R				2,4-Dinitrotoluene	24-96 %R
		Pentachlorophenol	9-103 %R				Pentachlorophenol	9-103 %R
		Pyrene	26-127 %R				Pyrene	26-127 %R

*with the exception of bis (2-Etheylhexyl) phthalate which can be up to 5 times the CRQL. (USEPA CLP Nat'l Fuctional Guidelines, Final, July 2007)

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compound List Semi-Volatile Organics [cont'd]
Concentration Level	Low/Medium (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency / Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Matrix Spike Duplicate (Not Required)	1 per ≤ 20 samples; if requested	Phenol	0-42 %RPD	Flag outliers	EPA CLP RAS Laboratory GC/MS Technician	Precision	Phenol	0-42 %RPD
		2-Chlorophenol	0-40 %RPD				2-Chlorophenol	0-40 %RPD
		N-Nitroso-di-n-propylamine	0-38 %RPD				N-Nitroso-di-n-propylamine	0-38 %RPD
		4-Chloro-3-methylphenol	0-42 %RPD				4-Chloro-3-methylphenol	0-42 %RPD
		Acenaphthene	0-31 %RPD				Acenaphthene	0-31 %RPD
		4-Nitrophenol	0-50 %RPD				4-Nitrophenol	0-50 %RPD
		2,4-Dinitrotoluene	0-38 %RPD				2,4-Dinitrotoluene	0-38 %RPD
		Pentachlorophenol	0-50 %RPD				Pentachlorophenol	0-50 %RPD
		Pyrene	0-31 %RPD				Pyrene	0-31 %RPD
Deuterated Monitoring Compounds	all samples	Phenol-d5	39-106 %R	Check calculations and instruments, reanalyze affected samples; up to 4 DMCs may fail to meet recovery limits	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	Phenol-d5	39-106 %R
		Bis(2-chloroethyl)ether-d8	40-105 %R				Bis(2-chloroethyl)ether-d8	40-105 %R
		2-Chlorophenol-d4	41-106 %R				2-Chlorophenol-d4	41-106 %R

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compound List Semi-Volatile Organics [cont'd]
Concentration Level	Low/Medium (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency / Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Deuterated Monitoring Compounds [cont'd]	all samples	4-Methylphenol-d8	25-111 %R	Check calculations and instruments, reanalyze affected samples; up to 4 DMCs may fail to meet recovery limits	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	4-Methylphenol-d8	25-111 %R
		Nitrobenzene-d5	43-108 %R				Nitrobenzene-d5	43-108 %R
		2-Nitrophenol-d4	40-108 %R				2-Nitrophenol-d4	40-108 %R
		2,4-Dichlorophenol-d3	37-105 %R				2,4-Dichlorophenol-d3	37-105 %R
		4-Chloroaniline-d4	1-145 %R				4-Chloroaniline-d4	1-145 %R
		Dimethylphthalate-d6	47-114 %R				Dimethylphthalate-d6	47-114 %R
		Acenaphthylene-d8	41-107 %R				Acenaphthylene-d8	41-107 %R
		4-Nitrophenol-d4	33-116 %R				4-Nitrophenol-d4	33-116 %R
		Fluorene-d10	42-111 %R				Fluorene-d10	42-111 %R
		4,6-Dinitro-2-methylphenol-d2	22-104 %R				4,6-Dinitro-2-methylphenol-d2	22-104 %R
		Anthracene-d10	44-110 %R				Anthracene-d10	44-110 %R
		Pyrene-d10	52-119 %R				Pyrene-d10	52-119 %R

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compound List Semi-Volatile Organics [cont'd]
Concentration Level	Low/Medium (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency / Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Deuterated Monitoring Compounds [cont'd]	all samples	Benzo(a)pyrene-d12	32-121 %R	Check calculations and instruments, reanalyze affected samples; up to 4 DMCs may fail to meet recovery limits	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	Benzo(a)pyrene-d12	32-121 %R
Internal Standards	all samples	50-100% of area, $\pm$ 20 sec retention time shift		Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	50-100% of area, $\pm$ 20 sec retention time shift	

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compound List Pesticides
Concentration Level	Low/Medium (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Method Blank	1 per ≤ 20 samples OR whenever samples extracted	No analyte > CRQL		Suspend analysis unit source recertified	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	No analyte > CRQL	
Matrix Spike	1 per ≤ 20 samples; if requested	gamma-BHC (Lindane)	56-123 %R	Flag outliers	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	gamma-BHC (Lindane)	56-123 %R
		Heptachlor	40-131 %R				Heptachlor	40-131 %R
		Aldrin	40-120 %R				Aldrin	40-120 %R
		Dieldrin	52-126 %R				Dieldrin	52-126 %R
		Endrin	56-121 %R				Endrin	56-121 %R
		4,4'-DDT	38-127 %R				4,4'-DDT	38-127 %R
Matrix Spike Duplicate	1 per ≤ 20 samples; if requested	gamma-BHC	0-15 %RPD	Flag outliers	EPA CLP RAS Laboratory GC/ECD Technician	Precision	gamma-BHC	0-15 %RPD
		Heptachlor	0-20 %RPD				Helptachlor	0-20 %RPD
		Aldrin	0-22 %RPD				Aldrin	0-22 %RPD
		Dieldrin	0-18 %RPD				Dieldrin	0-18 %RPD
		Endrin	0-21 %RPD				Endrin	0-21 %RPD
		4,4'-DDT	0-27 %RPD				4,4'-DDT	0-27 %RPD
Laboratory Control Sample	1 per ≤ 20 samples	gamma-BHC	50-120 %R	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	gamma-BHC	50-120 %R

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compound List Pesticides [cont'd]
Concentration Level	Low/Medium (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Laboratory Control Sample [cont'd]	1 per ≤ 20 samples	Heptachlor epoxide	50-150 %R	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	Helpachlor epoxide	50-150 %R
Laboratory Control Sample [cont'd]	1 per ≤ 20 samples	Dieldrin	30-130 %R	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	Dieldrin	30-130 %R
		4,4'-DDE	50-150 %R				4,4'-DDE	50-150 %R
		Endrin	50-120 %R				Endrin	50-120 %R
		Endosulfan sulfate	50-120 %R				Endosulfan sulfate	50-120 %R
		gamma-Chlordane	30-130 %R				gamma-Chlordane	30-130 %R
Surrogate	all samples		30-150 %R	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy		30-150 %R

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compound List PCBs
Concentration Level	Low/Medium (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Method Blank	1 per ≤ 20 samples OR whenever samples extracted	No analyte > CRQL		Suspend analysis unit source recertified	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	No analyte > CRQL	
Matrix Spike	1 per ≤ 20 samples; if requested	Aroclor-1016	29-135 %R	Flag outliers	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	Aroclor-1016	29-135 %R
		Aroclor-1260	29-135 %R				Aroclor-1260	29-135 %R
Matrix Spike Duplicate	1 per ≤ 20 samples; if requested	Aroclor-1016	0-15 %RPD	Flag outliers	EPA CLP RAS Laboratory GC/ECD Technician	Precision	Aroclor-1016	0-15 %RPD
		Aroclor-1260	0-20 %RPD				Aroclor-1260	0-20 %RPD
Laboratory Control Sample	1 per ≤ 20 samples	Aroclor-1016	50-150 %R	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	Aroclor-1016	50-150 %R
		Aroclor-1260	50-150 %R				Aroclor-1260	50-150 %R
Surrogate	all samples		30-150 %R	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy		30-150 %R

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Analyte List Inorganics Metals
Concentration Level	Low/Medium (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	ILM05.4
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Preparation Blank	1 per ≤ 20 samples	No constituent > CRQL	Suspend analysis until source rectified; redigest and reanalyze affected samples	EPA CLP RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	No constituent > CRQL
Spike	1 per ≤ 20 samples	75-125%R*	Flag outliers	EPA CLP RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	75-125%R*
Duplicate	1 per ≤ 20 samples	± 20% RPD**	Flag outliers	EPA CLP RAS Laboratory ICP-AES/ICP-MS Technician	Precision	± 20% RPD**
Post-Digestion Spike	after any analyte (except Ag and Hg) fails spike %R	75-125%R	Flag outliers	EPA CLP RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	75-125%R
Interference Check Sample [ICP Analysis Only]	beginning, end and periodically (not less than once per 20 samples)	± 2 times CRQL of true value or ± 20% of true value, whichever is greater	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory ICP-AES/ICP-MS Technician	Sensitivity	± 2 times CRQL of true value or ± 20% of true value, whichever is greater

*except when the sample concentration is greater than 4 times the spike concentration, then disregrard the recoveries; no data validation action taken
**Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP - (include absolute difference criteria)
**except when the sample and/or duplicate concentration is less than 5 times the CRQL, then ± CRQL.

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Analyte List Inorganics Metals [cont'd]
Concentration Level	Low/Medium (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	ILM05.4
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Laboratory Control Sample	1 per $\leq$ 20 samples	80-120%R (except Ag and Sb)	Suspend analysis until source rectified; redigest and reanalyze affected samples	EPA CLP RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	80-120%R (except Ag and Sb)

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Analyte List Inorganics – Total Mercury
Concentration Level	Low/Medium (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	ILM05.4 – Cold Vapor Atomic Absorption (CVAA)
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Preparation Blank (PB)	1 per $\leq$ 20 samples	No analyte > CRQL	Suspend analysis; redigest and reanalyze	EPA CLP RAS Laboratory Technician	Accuracy	No analyte > CRQL
Duplicate Sample	1 per $\leq$ 20 samples	$\pm$ 20% RPD*	Flag outliers	EPA CLP RAS Laboratory Technician	Precision	$\pm$ 20% RPD
Spike Sample	1 per $\leq$ 20 samples	75 – 125 %R	Flag outliers	EPA CLP RAS Laboratory Technician	Accuracy	75 – 125 %R

*Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP - (include absolute difference criteria)

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Analyte List Inorganics - Total Cyanide
Concentration Level	Low/Medium (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	ILM05.4 – Colorimeter or Spectrophotometer
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Preparation Blank (PB)	1 per $\leq$ 20 samples	No analyte > CRQL	Suspend analysis; redistill and reanalyze	EPA CLP RAS Laboratory Technician	Accuracy	No analyte > CRQL
Duplicate Sample	1 per $\leq$ 20 samples	$\pm$ 20% RPD*	Flag outliers	EPA CLP RAS Laboratory Technician	Precision	$\pm$ 20% RPD
Spike Sample	1 per $\leq$ 20 samples	75 – 125 %R	Flag outliers	EPA CLP RAS Laboratory Technician	Accuracy	75 – 125 %R

*Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP - (include absolute difference criteria)

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Analyte List Inorganics –Total Mercury
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	ILM05.4 – Cold Vapor Atomic Absorption (CVAA)
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Preparation Blank (PB)	1 per $\leq$ 20 samples	No analyte > CRQL	Suspend analysis; redigest and reanalyze	EPA CLP RAS Laboratory Technician	Accuracy	No analyte > CRQL
Duplicate Sample	1 per $\leq$ 20 samples	$\pm$ 20% RPD	Flag outliers	EPA CLP RAS Laboratory Technician	Precision	$\pm$ 20% RPD
Spike Sample	1 per $\leq$ 20 samples	75 – 125 %R	Flag outliers	EPA CLP RAS Laboratory Technician	Accuracy	75 – 125 %R
Laboratory Control Sample	1 $\leq$ 20 samples	Control limits established by EPA*	Flag outliers	EPA CLP RAS Laboratory Technician	Accuracy	Control limits established by EPA*

* If the EPA LCS is unavailable, other EPA QC samples or other certified materials may be used. In such cases, control limits for the LCS must be documnetd and provided.

QAPP Worksheet #28
QC Samples Table

(UFP-QAPP Manual Section 3.4)

Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Analyte List Inorganics – Total Cyanide
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	ILM05.4 – Colorimeter or Spectrophotometer
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Preparation Blank (PB)	1 per $\leq$ 20 samples	No analyte > CRQL	Suspend analysis; redigest and reanalyze	EPA CLP RAS Laboratory Technician	Accuracy	No analyte > CRQL
Duplicate Sample	1 per $\leq$ 20 samples	$\pm$ 20% RPD	Flag outliers	EPA CLP RAS Laboratory Technician	Precision	$\pm$ 20% RPD
Spike Sample	1 per $\leq$ 20 samples	75 – 125 %R	Flag outliers	EPA CLP RAS Laboratory Technician	Accuracy	75 – 125 %R
Laboratory Control Sample	1 $\leq$ 20 samples	Control limits established by EPA*	Flag outliers	EPA CLP RAS Laboratory Technician	Accuracy	Control limits established by EPA*

* If the EPA LCS is unavailable, other EPA QC samples or other certified materials may be used. In such cases, control limits for the LCS must be documnetd and provided.

QAPP Worksheet #29
Project Documents and Records Table

Sample Collection Documents and Records	Analysis Documents and Records	Data Assessment Documents and Records	Other
• Site and field logbooks • Boring logs • Well construction diagrams • COC forms • Well Data Sheets • Field Data Sheets	• Sample receipt logs • Internal and external COC forms • Equipment calibration logs • Sample preparation worksheets/logs • Sample analysis worksheets/run logs • Telephone/email logs • Corrective action documentation	• Data validation reports • Field inspection checklist(s) • Laboratory Audit checklist (if performed) • Review forms for electronic entry of data into database • Corrective action documentation	

QAPP Worksheet #30
Analytical Services Table

Matrix	Analytical Group	Concentration Level	Analytical SOP	Data Package Turnaround Time	Laboratory/Organization (Name and Address, Contact Person and Telephone Number)	Backup Laboratory/Organization (Name and Address, Contact Person and Telephone Number)
Soil Gas	TO-15 Scan VOCs	Low	TO-15		EPA Non-RAS Air Program	NA
Indoor Air Gas	TO-15 SIM VOCs	Low	TO-15		EPA Non-RAS Air Program	NA
Aqueous	Trace Concentration VOCs	Low				NA
	Low Conc. VOCs	Low				NA
	SVOCs	Low				
	PCBs	Low				
	Pesticides	Low				
	TAL Metals and Cyanide	Low				
Soil	TCL VOCs	Low				NA
	TCL SVOCs	Low				NA
	TCL PCBs	Low				NA
	TCL Pesticides	Low				NA
	TAL Total Metals	Low				NA

QAPP Worksheet #31
Planned Project Assessments Table

Assessment Type	Frequency	Internal or External	Organization Performing Assessment	Person(s) Responsible for Performing Assessment (Title and Organizational Affiliation)	Person(s) Responsible for Responding to Assessment Findings (Title and Organizational Affiliation)	Person(s) Responsible for Identifying and Implementing Corrective Actions (Title and Organizational Affiliation)	Person(s) Responsible for Monitoring Effectiveness of Corrective Actions (Title and Organizational Affiliation)
Laboratory Technical Systems/ Performance Audits	[ ]	External	Regulatory Agency	Regulatory Agency	EPA CLP RAS Laboratory	EPA CLP RAS Laboratory	EPA or other Regulatory Agency
Performance Evaluation Samples	[ ]	External	Regulatory Agency	Regulatory Agency	EPA CLP RAS Laboratory	EPA CLP RAS Laboratory	EPA or other Regulatory Agency
On-Site Field Inspection	[ ]	Internal	EPA	[ ]	[ ]	[ ]	[ ]

QAPP Worksheet #32
Assessment Findings and Corrective Action Responses

Assessment Type	Nature of Deficiencies Documentation	Individual(s) Notified of Findings (Name, Title, Organization)	Timeframe of Notification	Nature of Corrective Action Response Documentation	Individual(s) Receiving Corrective Action Response (Name, Title, Org.)	Timeframe for Response
Project Readiness Review	Checklist or logbook entry	Contractor Project Leader, [ ]	Immediately to within 24 hours of review	Checklist or logbook entry	Contractor Project Leader [ ]	Immediately to within 24 hours of review
Field Observations/ Deviations from Work Plan	Logbook	Project Leader [ ] and EPA RPM	Immediately to within 24 hours of deviation	Logbook	Contractor Project Leader [ ] and EPA RPM	Immediately to within 24 hours of deviation
Laboratory Technical Systems/ Performance Audits	Written Report	EPA CLP Laboratory	30 days	Letter	EPA CLP Laboratory	14 days
On-Site Field Inspection	Written Report	Contractor Project Leader [ ]	7 calendar days after completion of the audit	Letter/Internal Memorandum	Contractor Project Leader and/or EPA RPM	To be identified in the cover letter of the report
Performance Evaluation Samples	Electronic Report	EPA CLP Laboratory	30 days	Letter or Written Report	EPA CLP Laboratory	14 days

QAPP Worksheet #33
QA Management Reports Table

Type of Report	Frequency (daily, weekly, monthly, quarterly, annually, etc.)	Projected Delivery Date(s)	Person(s) Responsible for Report Preparation (Title and Organizational Affiliation)	Report Recipient(s) (Title and Organizational Affiliation)
EPA CLP RAS Laboratory Data (unvalidated)	As performed	[ ]	EPA CLP RAS Laboratory	Adly Michael, RSCC, EPA Region 2 and Contractor Project Leader [ ]
EPA CLP RAS Laboratory Data (validated)	As performed	Up to 60 days after receipt of unvalidated data	EPA Region 2	Contractor Project Leader [ ]
Laboratory Technical Systems/ Performance Audits	[ ]	Unknown	EPA or other Regulatory Agency	EPA CLP RAS Laboratory
Performance Evaluation Samples	[ ]	Unknown	EPA or other Regulatory Agency	EPA CLP RAS Laboratory
On-Site Field Inspection	[ ]	7 calendar days after completion of the inspection	Contractor Project Leader [ ]	Contractor Project Leader [ ]
Field Change Request	As required per field change	Three days after identification of need for field change	Contractor Project Leader [ ]	EPA RPM
Final Report	[ ]	2 weeks after receipt of EPA approval of data package	Contractor Project Leader [ ]	EPA RPM

QAPP Worksheet #34
Verification (Step I) Process Table

Verification Input	Description	Internal/ External	Responsible for Verification (Name, Organization)
Site/field logbooks	Field notes will be prepared daily by the EPA Sample Leader and will be complete, appropriate, legible and pertinent. Upon completion of field work, logbooks will be placed in the project files.	I	Contractor Project Leader [ ]
Chains of custody	COC forms will be reviewed against the samples packed in the specific cooler prior to shipment. The reviewer will initial the form. An original COC will be sent with the samples to the laboratory, while copies are retained for (1) the Sampling Trip Report and (2) the project files.	I	Contractor Project Leader [ ]
Sampling Trip Reports	STRs will be prepared for each week of field sampling [for which samples are sent to an EPA CLP RAS laboratory.] Information in the STR will be reviewed against the COC forms, and potential discrepancies will be discussed with field personnel to verify locations, dates, etc.	I	Contractor Project Leader [ ]
Laboratory analytical data package	Data packages will be reviewed/verified internally by the laboratory performing the work for completeness and technical accuracy prior to submittal.	I	EPA CLP RAS Laboratory
Laboratory analytical data package	Data packages will be reviewed as to content and sample information upon receipt by EPA.	I	Contractor Project Leader [ ]
Final Sample Report	The project data results will be compiled in a sample report for the project. Entries will be reviewed/verified against hardcopy information.	I	Contractor Project Leader [ ]

QAPP Worksheet #35
Validation (Steps IIa and IIb) Process Table

Step IIa/IIb	Validation Input	Description	Responsible for Validation (Name, Organization)
IIa	SOPs	Ensure that the sampling methods/procedures outlined in QAPP were followed, and that any deviations were noted/approved.	Contractor Project Leader [ ]
IIb	SOPs	Determine potential impacts from noted/approved deviations, in regard to PQOs.	Contractor Project Leader [ ]
IIa	Chains of custody	Examine COC forms against QAPP and laboratory contract requirements (e.g., analytical methods, sample identification, etc.).	ESAT Data Validation Personnel, EPA Region 2
IIa	Laboratory data package	Examine packages against QAPP and laboratory contract requirements, and against COC forms (e.g., holding times, sample handling, analytical methods, sample identification, data qualifiers, QC samples, etc.).	ESAT Data Validation Personnel, EPA Region 2
IIb	Laboratory data package	Determine potential impacts from noted/approved deviations, in regard to PQOs. Examples include PQLs and QC sample limits (precision/accuracy).	ESAT Data Validation Personnel, Contractor Project Leader [ ]
IIb	Field duplicates	Compare results of field duplicate (or replicate) analyses with RPD criteria	Contractor Project Leader [ ]

QAPP Worksheet #36
Validation (Steps IIa and IIb) Summary Table

Step IIa/IIb	Matrix	Analytical Group	Concentration Level	Validation Criteria	Data Validator (title and organizational affiliation)
IIa / IIb	Soil/Sediment/ Aqueous	VOCs	Trace	Data Validation SOP for Organic Analysis of Trace Concentration VOCs under SOW SOM01.2	ESAT Data Validation Personnel, EPA Region 2 Data Validation Personnel,
IIa / IIb	Soil/Sediment/ Aqueous	VOCs	Low and Medium	Data Validation SOP for Organic Analysis of Low/Medium Concentration VOCs under SOW SOM01.2	ESAT Data Validation Personnel, EPA Region 2 Data Validation Personnel
IIa / IIb	Soil/Sediment/ Aqueous	SVOCs	Low and Medium	Data Validation SOP for Organic Analysis of Low/Medium Concen. SVOCs under SOW SOM01.2	ESAT Data Validation Personnel, EPA Region 2 Data Validation Personnel,
IIb	Soil/Sediment/ Aqueous	Pesticides	Low and Medium	Data Validation SOP for Organic Analysis of Low/Medium Concentration Pesticides under SOW SOM01.2	ESAT Data Validation Personnel, EPA Region 2 Data Validation Personnel,

QAPP Worksheet #36
Validation (Steps IIa and IIb) Summary Table

Step IIa/IIb	Matrix	Analytical Group	Concentration Level	Validation Criteria	Data Validator (title and organizational affiliation)
IIa / IIb	Soil/Sediment/ Aqueous	PCBs	Low and Medium	Data Validation SOP for Organic Analysis of Low/Medium Concentration Aroclors under SOW SOM01.2	ESAT Data Validation Personnel, EPA Region 2 Data Validation Personnel,
IIa / IIb	Air	VOCs	Low	Validating Volatile Organic Analysis of Ambient Air in canister by Method TO-15 October 2006	ESAT Data Validation Personnel, EPA Region 2 Data Validation Personnel
IIa / IIb	Soil/Sediment/ Aqueous	SVOCs	Low and Medium	Data Validation SOP for Organic Analysis of Low/Medium Concen. SVOCs under SOW SOM01.2	ESAT Data Validation Personnel, EPA Region 2 Data Validation Personnel,
IIb	Soil/Sediment/ Aqueous	Pesticides	Low and Medium	Data Validation SOP for Organic Analysis of Low/Medium Concentration Pesticides under SOW SOM01.2	ESAT Data Validation Personnel, EPA Region 2 Data Validation Personnel,

(UFP-QAPP Manual Section 5.2.3)
Describe the procedures/methods/activities that will be used to determine whether data are of the right type, quality, and quantity to support environmental decision-making for the project. Describe how data quality issues will be addressed and how limitations on the use of the data will be handled.

QAPP Worksheet #37
Usability Assessment

Summarize the usability assessment process and all procedures, including interim steps and any statistics, equations, and computer algorithms that will be used:
Describe the evaluative procedures used to assess overall measurement error associated with the project:
Identify the personnel responsible for performing the usability assessment:
Describe the documentation that will be generated during usability assessment and how usability assessment results will be presented so that they identify trends, relationships (correlations), and anomalies:
Discuss the impacts of any qualified data, any deviations from original plan or sampling procedures, whether the project objectives were met, etc.