Region 2 Quality Assurance Project Plan Training

For Brownfields Contractors

March 30. 2022

Objectives:

- Explain EPA QAPP Policy and Review Process
- Familiarize you with EPA Region 2 QAPP Requirements for the Brownfield's Program
- Review common QAPP deficiencies and issues
- Provide you with QAO contact information
- Answer questions

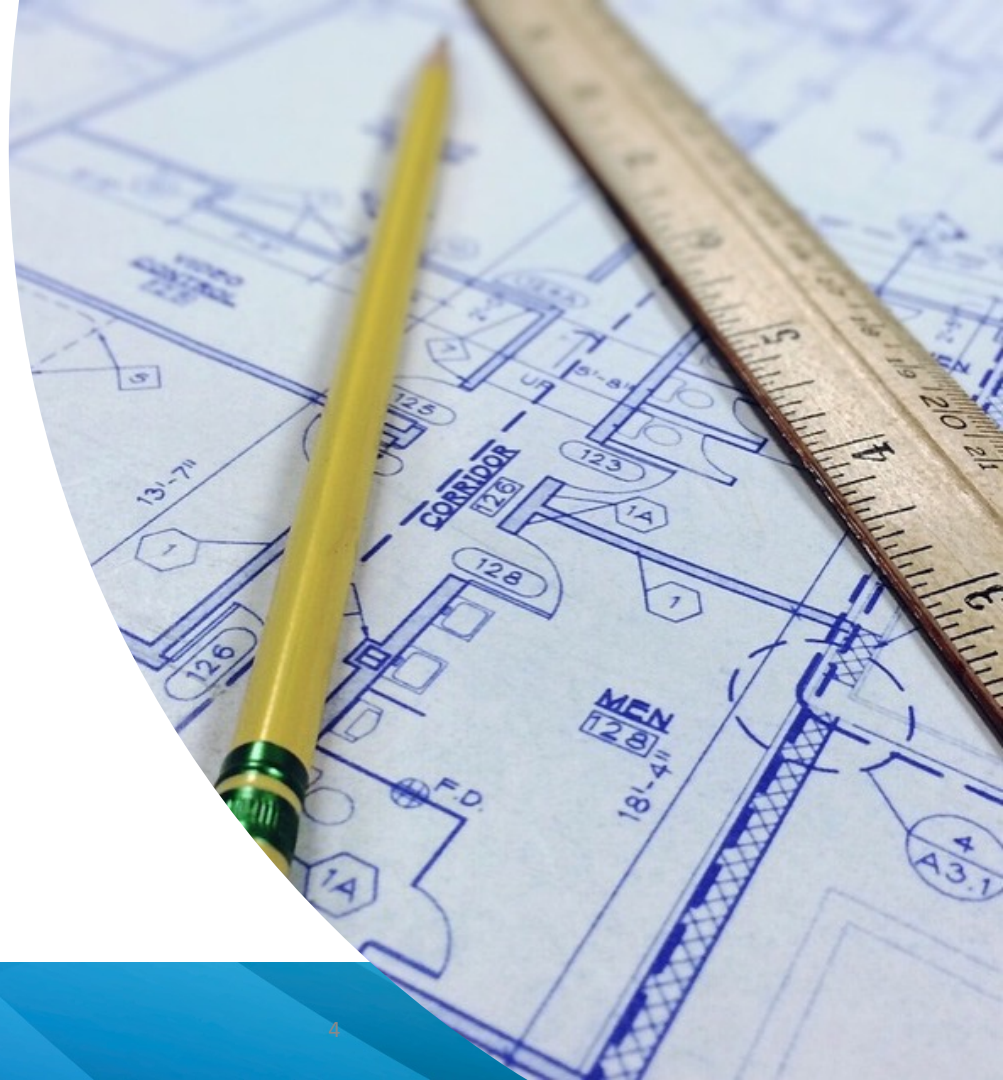
Background

2 CFR 1500.12 establishes quality assurance requirements for EPA Grants.

- Applies to all grants collecting, producing or using environmental information
- Requires written quality assurance documentation – Quality Assurance Project Plan (QAPP)
- Requires EPA approval of QAPPs
- Documents prepared in compliance with EPA Quality Policy are acceptable

What is a Quality Assurance Project Plan (QAPP)?

- Project Blueprint
- Documents the outputs of your project planning process.
- Provides the who, what, when, where, why and how concerning your environmental information operations.



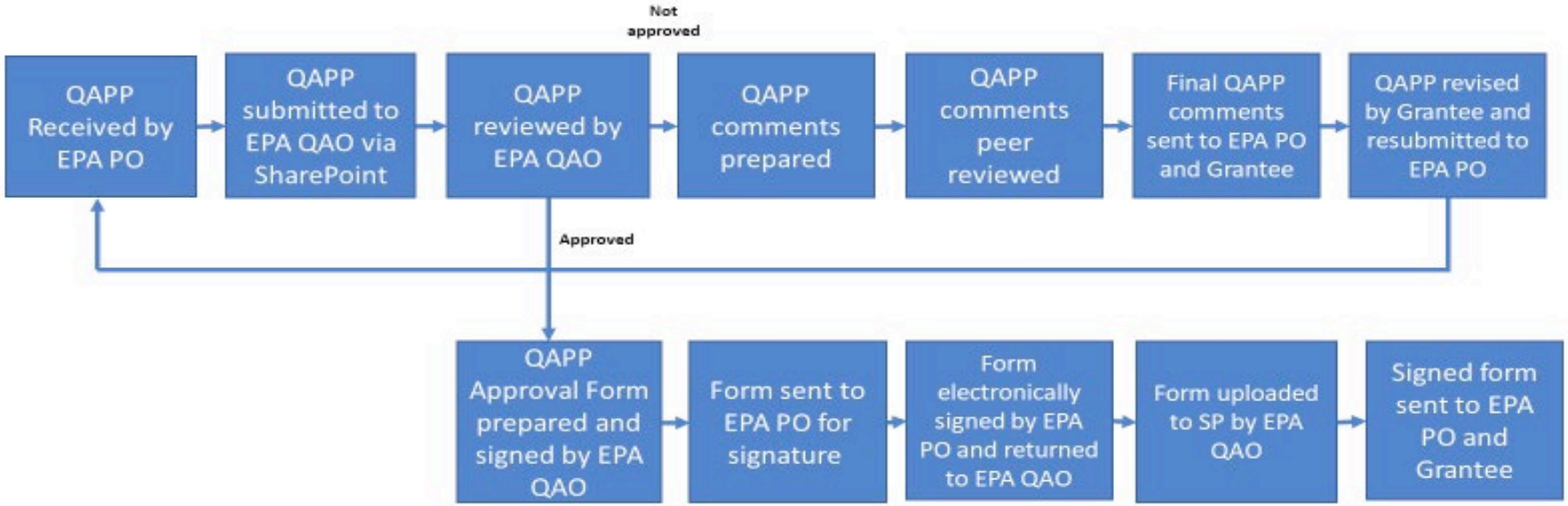
Region 2 Brownfields QAPP Guidance

- Region 2 has specific guidance which is available on the EPA Region 2 website at: https://www.epa.gov/system/files/documents/2021-08/bf_qapp-guidance-_final_revised-08_2021.pdf
- 13 topic areas to be addressed (some with sub-topics)
- 13 templates to complete (25 Tables)
- Use of templates ensures all required information is captured and expedites review by EPA

Generic QAPPs

- Can be prepared to cover multiple sites in particular geographic area.
- Address protocols for similar activities conducted across multiple areas, (i.e., laboratory instrument calibration, analytical procedures, data validation process).
- Must be supplemented with a site-specific QAPP addendum that discusses all site-specific information (i.e., site background, timeline, sampling locations)

QAPP Review and Approval Process for Brownfields Grants



Required QAPP Elements

- Project Management/Objectives
- Measurement/Data Acquisition
- Assessment/Oversight
- Data Review

Project Management/ Objectives

Templates #1, 2a, 2b, 3a, 3b and 4

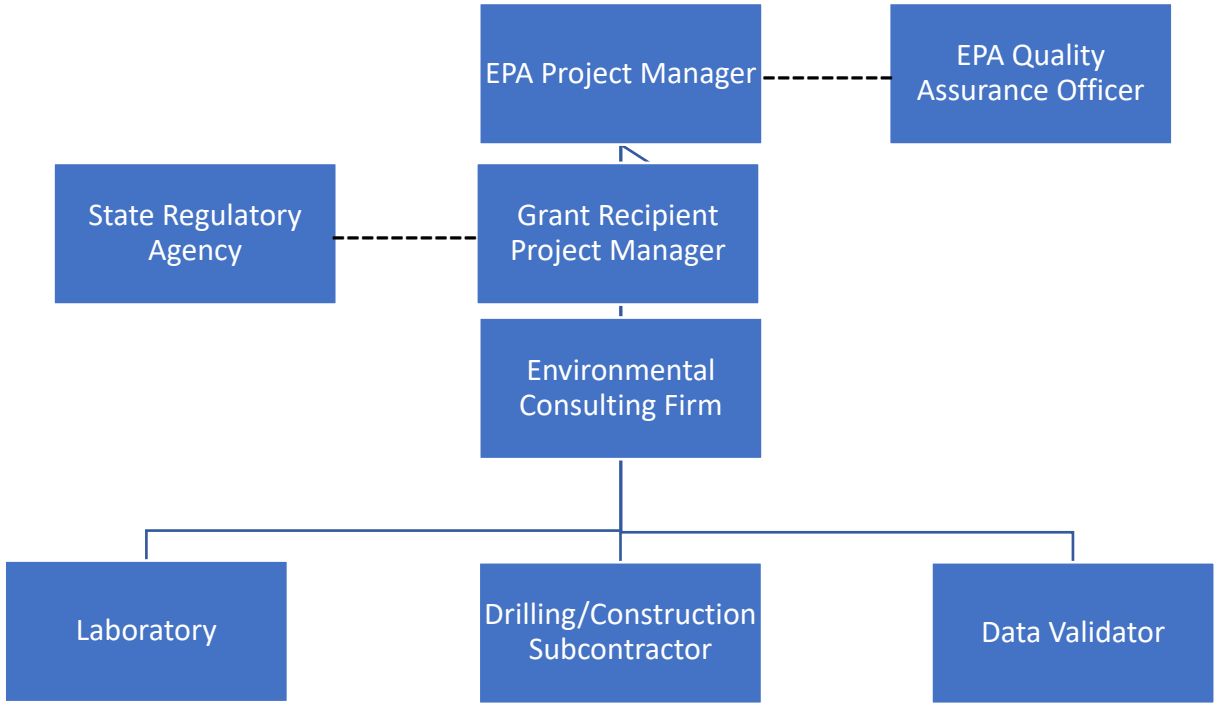
Template #1: Title and Approval Page

- Project Title
- Site Name/Location
- Document Revision Number and Date
- Assistance Agreement No.
- Approving Officials (names, titles, signatures and date signed)
  - Project Manager (Environmental Consultant)
  - Project QA Officer (Environmental Consultant)
  - Grant Recipient Program Manager (include email address)
  - EPA Project Officer
  - EPA QA Officer

Template #2a: Project Organizational Chart

- Depicts the reporting relationships between all the organizations involved in the project:
  - Grant Recipient
  - Environmental Consultant
  - Environmental Laboratory
  - State/Territory Regulatory Agency
  - EPA Project Officer
  - EPA QA Officer
  - Data Validator
  - Subcontractors

Template #2a – Project Organizational Chart



Template #2b: Personnel Responsibilities

Name	Title	Telephone Number	Organizational Affiliation	Responsibilities[1]
[ ]	Environmental Consultant Project Manager		Name of Environmental Consulting Firm	
[ ]	Sampling Assistance(s)		Name of Environmental Consulting Firm	
[ ]	Brownfields Recipient Program Manager		Name of Brownfields Recipient	
[ ]	State Brownfields Contact		Name of State Environmental Agency	
[ ]	EPA Brownfields Project Officer (BPO)		EPA Region 2	
[ ]	EPA Brownfields Quality Assurance Officer (QAO)		EPA Region 2	
[ ]	Environmental Laboratory Contact		Name of Environmental Laboratory	
[ ]	Third Party Data Validator[2]		Name of Third Party Data Validator	

Template #3a: Problem Definition

- Information should clearly define the problem, decisions to be made, outcomes to be achieved and environmental questions to be answered. Include the following information:

  - The reason the project is being undertaken
  - A detailed site history
  - Current property owner/use
  - Future reuse/development plans
  - Contaminants of concern.
  - Map of the site

Template #3a: Project Description

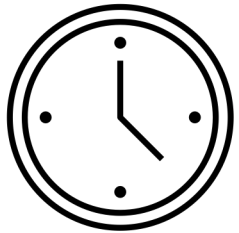
- Provide a high-level summary of the project
- List the measurements to be made and data to be obtained
- Describe the project's sampling approach
- Distinguish between critical data which will drive decisions and non-critical data used for supporting purposes
- Cite regulatory standards or criteria to which the data will be compared
- Include project decision statements linking results with possible actions. (If…..then…..statements)

Template #3b: Project Quality Objectives

- Define the type, quantity and quality of data needed to answer specific environmental questions and support proper environmental decisions.
  - Who will use the data?
  - What will the data be used for?
  - What types of data are needed?
  - How “good” do the data need to be in order to support the environmental decision?
  - How much data are needed?
  - Where, when and how should the data be collected?
  - Who will collect the data?
  - How will data be reported and archived?

Template #4: Project Schedule/Timeline

- Provide the start and completion dates for all key project tasks including, but not limited to:
  - QAPP review and approval,
  - Field activities and sampling,
  - Laboratory analyses
  - Data validation
  - Reporting.



Project Schedule

Activities	Organization	Dates (MM/DD/YY)		Deliverable	Deliverable Due Date
		Anticipated Date(s) of Initiation	Anticipated Date of Completion		
Preparation of QAPP	Name of Environmental Consultant			QAPP	
Review of QAPP	Names of EPA Region 2 BPO and QAO			Approved QAPP by EPA Region BPO	
Preparation of Health and Safety Plan	Name of Environmental Consultant			HASP	
Procurement of Equipment	Name of Environmental Consultant			N/A	
Laboratory Request	Name of Environmental Consultant			N/A	
Field Reconnaissance/Access	Name of Environmental Consultant			N/A	N/A
Collection of Field Samples	Name of Environmental Consultant			N/A	N/A
Laboratory Package Received	Name of Environmental Consultant			Unvalidated data package	
Validation of Laboratory Results	Name of Environmental Consultant or Third Party Data Validator [1]			Validated data Packages	
Data Evaluation/ Preparation of Final Report	Name of Environmental Consultant			Final Report	


Any
Questions

Project Measurement / Data Acquisition

Templates #5 through #11

Template #5a: Sampling and Analytical Requirements

List ALL site sampling locations and provide all required information as indicated in the table below in each column.

Matrix	Sampling Location(s)	Depth (units)	Analytical Group	No. of Samples (identify field duplicates)	Sampling SOP Reference	Rationale for Sampling Location
Groundwater	EPA-2	16 ft	VOCs	1	EPA Low Flow Sampling SOP	Wells selected were chosen based on the direction of groundwater flow relative to the source.

Brownfield QAPP Template #5a

Sampling Methods and Locations

The following table identifies the sampling methods and locations at the Site

Matrix	Sampling Locations	Depth *units*	Analytical groups	No. of Samples *identify field duplicates*	Sampling SOP Reference	Rationale for Sampling Location
Subsurface Soil/Fill	TP21-1 to TP21- and MW-A	0-1.5 Ft.	TCL VOCs TCL SVOCs RCRA Metals	Up to 4 field 1 field duplicate 1 equipment blank 1 MS/MSD	XYZ SOP	Samples selected to address Phase I ESA RECs
Subsurface Fill deemed to be SACM	TP21-1 to TP21- and MW-A	0-1.5 Ft.	PLM 1.1 PLM 1.6 PLM 1.4	Up to 3 field Up to 3 field Up to 3 field	XYZ SOP	Samples selected to address Phase I ESA REC regarding whether asbestos is in fill
Groundwater	MW-A	~20 Ft.	TCL VOCs TCL SVOCs RCRA Metals	Up to 1 field 1 field duplicate 1 equipment blank 1 trip blank 1 MS/MSD	XYZ SOP	Samples selected to address Phase I ESA RECs

Template #5b: Analytical Methods and Requirements

List all samples grouped by matrix and provide all required information as indicated in the table below.

Matrix	Analytical Group	Concentration Level	Analytical & Preparation Method/ SOP Reference	Sample Volume	Containers (number, size, type)	Preservation Requirements (chemical, temperature, light protected)	Maximum Holding Time (preparation/ analysis)
Groundwater	VOCs	Low	SW-846 Method 8260	120 ml	(3) 40 ml VOA vials w/Teflon lined septum	1:1 HCl to pH<2; cool to 4°C	14 days
Soil	SVOCs	Low/Medium	SW-846 Method 8270	120 g.	4 oz jar	4°C	14 days

Template #5b Analytical Methods and Requirements

Matrix	Analytical Group	Concentration Level[1]	Analytical & Preparation Method/ SOP Reference [2]	Sample Volume	Containers (number, size, type)	Preservation Requirements (chemical, temperature, light protected)	Maximum Holding Time (preparation/ analysis)
Soil	VOC	Low/Med	SW-846 Method 5035-8260D/	5 g x 3	3 x 40 ml septum-top vials 1 x 2 oz jar	Methanol/sodium bisulfate or methanol/water; cool to 4°C	2 days prep; 14 days analysis
Soil	SVOC	Low/Med	SW-846 Method 5035/8270E	100 g	1 x 8 oz glass w/Teflon cap	Cool <6°C	14 days extraction/40 days analysis
Soil	Pesticides	Low/Med	SW-846 Method 8081B	100 g	1 x 8 oz glass w/Teflon cap	Cool <6°C	14 days extraction/40 days analysis
Soil	PCBs	Low/Med	SW-846 Method 8082A	100 g	1 x 8 oz glass w/Teflon cap	Cool <6°C	14 days extraction/40 days analysis
Soil	NJ DEP EPH	Low/Med	NJ EPH Rev 3	100 g	1 x 8 oz glass w/Teflon cap	Cool <6°C	14 days extraction/40 days analysis
Soil	Cyanide, Total	Low/Med	SW-846 Method 9012	100 g	1 x 8 oz glass w/Teflon cap	Cool <6°C	14 days
Soil	Metals	Low/Med	SW-846 Method 6010D	100 g	1 x 8 oz glass w/Teflon cap	Cool <6°C	6 months

[1] Concentration Level refers to Trace; Low; Medium; High of the sample.

Template #5c: Reference Limits and Evaluation Table

Complete this table for **each sample matrix**, analytical group and concentration level.

Matrix Aqueous
Analytical Group VOCs
Concentration Level Low

Analyte	CAS Number	Name of State/Territory/Tribal: Regulatory Standards/Criteria	Analytical Method/Method Detection Limit	Achievable Laboratory Method Detection Limit/ Reporting Limit
Vinyl Chloride	75-01-4	NJDEP Ground Water Quality Standards (GWQS)/1ug/L	SW-846 Method 8260B/5.0 ug/L	**1.50 ug/L / 5.0 ug/L**

Brownfields QAPP Template #5c
Reference Limits and Evaluation Table

The target analytes, applicable state regulatory criteria (project-required action limits), and the published achievable detection limits and reporting limits for each analyte are shown below.

Matrix *Soil*							
Analytical Group *VOCs*							
Concentration Level *Low*							
Analyte	**CAS Number**	**Name of State/Territory/Tribal: Regulatory Standards/Criteria**				**Achievable Laboratory Method Detection Limit, ug/Kg**	**Achievable Laboratory Reporting Limit, ug/Kg**
		6 NYCRR Part 375 Soil Cleanup Objectives (mg/Kg)					
		UUSCO	**RRUSCO**	**CUSCO**	**PGWSCO**		
1,1,1-Trichloroethane	71-55-6	0.68	100	500	0.68	0.270	1
1,1,2,2-Tetrachloroethane	79-34-5	NA	NA	NA	0.6	0.240	1
1,1,2-Trichloroethane	79-00-5	NA	NA	NA	NA	0.393	1.5
1,1-Dichloroethane	75-34-3	0.27	26	240	0.27	0.295	1.5
1,1-Dichloroethene	75-35-4	0.33	100	500	0.33	0.260	1
1,2,3-Trichlorobenzene	87-61-6	NA	NA	NA	NA	0.403	5
1,2,4-Trichlorobenzene	120-82-1	NA	NA	NA	3.4	0.790	5
1,2-Dibromo-3-chloropropane	96-12-8	NA	NA	NA	NA	0.837	5
1,2-Dibromoethane	106-93-4	NA	NA	NA	NA	0.409	4
1,2-Dichlorobenzene	95-50-1	1.1	100	500	1.1	0.364	5
1,2-Dichloroethane	107-06-2	0.02	3.1	30	0.02	0.227	1

Template #5d: Analytical Laboratory Sensitivity and Project Criteria

Complete this template for **each matrix**, analytical group and concentration level, as required.

Section 5.D Analytical Laboratory Sensitivity and Project Criteria

The following tables define the data quality indicators performance criteria within the analytical method, and the associated QC sample(s) used to assess the specific performance criteria.

Matrix	Water/Soil/IDW
Analytical Group	Volatile Organic Compounds (VOCs)
Analytical Method/SOP Reference	SW8260B / M8260B / MSVOA-23

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	One per preparation batch	No target compounds should be > reporting limit (RL) except Acetone and Methylene chloride which should be < 2x RL. Surrogate and internal standard recoveries must meet criteria	Investigate source of contamination. Rerun all associated samples	Analyst/ Supervisor	Bias/ Contamination	Flag 'B' for laboratory contamination for all associated samples.
LCS	One per prep batch of 20 or fewer samples of similar matrix.	Water: 20-181% Soil: 50-146%	Evaluate and reanalyze if possible. If an MS/MSD was performed same day and acceptable, narrate. If the LCS recoveries are high but the sample results are <RL narrate. Otherwise, re-prep and reanalyze.	Analyst/ Supervisor	Accuracy/Bias	Same as QC Acceptance Limits
Internal Standards (IS)	Each field and QC sample	IS area -50% to +100% compared to IS from CV; IS RT window ± 0.5 minutes compared to CV RT	Re-analyze affected samples.	Analyst/ Supervisor	Accuracy	Same as QC Acceptance Limits
Surrogates	Each field and QC sample	Water: 58-141% Soil: 33-141%	If sample volume is available and within holding time, re-analyze affected samples.	Analyst/ Supervisor	Accuracy/Bias	Same as QC Acceptance Limits

Brownfields QAPP Template #5e
Secondary Data Criteria and Limitations Table

Identify ***all*** secondary data and information that will be used for the project, and their originating sources. Specify how the secondary data will be used, and the limitations on their use. **Below (in italics) is an example of such information.**

Secondary Data	Data Source (Originating Organization, Report Title, and Date)	Data Generator(s) (Originating Org., Data Types, Data Generation/ Collection Dates)	How Data Will Be Used	Limitations on Data Use
Previous Investigation and/or Sampling Results	[Document with results, i.e. Report]	[Who collected the data and when]	[i.e., Evaluate the purpose and scope of previous studies and compare with current study objectives]	[Reason for additional sampling, i.e. data gaps, and discussions on comparability issues, incomplete data sets as well as qualified data]
Municipality Drinking Water Data	*XYZ Municipality; Quarterly Drinking Water Check Report; 6/95-/6/96*	*Smith Laboratories Inc. – Volatiles Drinking Water Data; Sample Collection Dates - 6/12/95, 9/15/95, 12/10/95, 3/6/96, 6/12/96*	*To assess existing groundwater contamination*	*1. Unvalidated data used to generate the report* *2. Limited number of wells exist to sample*

Fill in all necessary information

Template #6: Project Specific Methods and Standard Operating Procedures (SOPs) Reference

- Three groups of methods / SOPs are required in this table.

1. Analytical Methods Reference, i.e. the EPA methods such as SW-846 methods and other EPA methods which were the basis for laboratory's proprietary analytical method.
2. Laboratory Analytical Methods, which will be utilized to perform the various analyses.
3. Field Sampling SOPs, which are either contractors' SOPs, or State or National Field Sampling Guidance.

Brownfields QAPP Template #6
Project Specific Method and Standard Operating Procedures (SOPs) Reference Table

List ***all*** field sampling SOPs, analytical method references (for preparation and analysis of the samples) and corresponding analytical laboratory SOPs that will be used for the Brownfields project. Include electronic copies of the SOPs in an Appendix to this QAPP.

ANALYTICAL METHOD REFERENCE (*Include document title, method name/number, revision number, date*)
1a.
2a.
3a.
ANALYTICAL LABORATORY SOPs (*Include document title, date, revision number, and originators' name*)
1b.
2b.
3b.
FIELD SAMPLING SOPs [1] (*Include document title, date, revision number, and originators' name*)
1c.
2c.
3c.
[1] Project Sampling SOPs include sample collection, sample preservation, equipment decontamination, preventive maintenance, etc.

Brownfields QAPP Template #7
Field Equipment Calibration, Maintenance, Testing, and Inspection

Field instruments to be used for field screening include: 1) a YST ProDSS water quality meter for screening of water quality parameters during groundwater sample collection; and 2) a miniRAE photoionization detector (PID) for screening of volatiles in soil and fill samples and ambient air inside wells. The PID will also be used for health and safety monitoring during intrusive field activities.

Field Equipment	Calibration Activity	Maintenance Activity	Testing Inspection Activity	Frequency	Acceptance Criteria		Corrective Action	SOP Reference
YST ProDSS Water Quality meter, or equivalent	Calibrate with standard solutions.	Per User's Guide.	Calibration check, probe check, and battery testing.	Annually, anytime anomaly suspected.	pH eter	+/- 0.1 units	Clean probe, replace battery, replace membrane, replace probe	YST ProDSS User's guide
					Dissolved Oxygen	± 0.2 mg/L		
					Specific Conductivity	± 3 %		
					Temperature	± 1.0 °C		
					Turbidity	± 5%		
					Oxidation Reduction Potential	± 15mV		
miniRAE PID with 10.6 eV lamp, or equivalent	Zero Calibration, span calibrate with isobutylene standard gas.	Per User's Guide.	Check and clean Probe. Check filter and check battery.	Prior to day's activities, anytime anomaly suspected .	±10%		Replace filter, blow-dry the sensor module, recalibrate	miniRAE 3000 user's guide

Brownfields QAPP Template #8a
Analytical Laboratory Instrument and Equipment Maintenance, Testing, and Inspection

Identify ***all*** analytical instrumentation that requires maintenance, testing or inspection and provide the SOP reference for each. Document the frequency, acceptance criteria and corrective action requirements on the template. **Below (in italics) is an example of such information.**

Instrument/ Equipment	Maintenance Activity	Testing/Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	Analytical SOP Reference
ICP-MS	*As per instrument manufacturer's recommendations*	*As per instrument manufacturer's recommendations; check connections*	*As per instrument manufacturer's recommendations*	*Acceptable recalibration; see ILM05.4*	*Inspect the system, correct problem, recalibrate and/or reanalyze samples.*	*Laboratory ICP-MS Technician*	*ILM05.4 (or SW-846 Method 6020)*

Fill in all necessary information

Template #8a
Analytical Instrument and Equipment Maintenance, Testing, and Inspection

Instrument/ Equipment	Maintenance Activity	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference
GC/MS	Check connections, replace disposables, bake out instrument, recondition trap and column	Review instrument output	Instrument performance and sensitivity	ICAL – instrument receipt, major instrument maintenance, when CCV fails CCV – every 12 hours of operation following instrument tune	Full Scan: %RSD ≤ 20% for all compounds and minimum RF found in Table 4 or "r" ≥ 0.99;	Evaluate chromatogram and integration. Recalibrate.	Analyst	8260
GC/MS/SIM	Change septum, clean injection port, change or clip column, install new liner, replace column, filters, and seals	Detector signals and chromatogr am review	Instrument performance and sensitivity	ICAL – instrument receipt, major instrument maintenance, when CCV fails CCV – every 12 hours of operation following instrument tune	Full Scan: RF ≥ 0.05 for SPCCs; %RSD ≤ 15% for all compounds except CCCs which must be ≤20% RSD or ""r"" ≥ 0.99; SIM: %RSD ≤ 20% or ""r"" ≥ 0.99	Re-inspect injector port, cut additional column, reanalyze CCV, recalibrate instrument	Analyst	8270
ICP-AES ICP-MS	Check connections, replace disposables, bake out instrument, recondition column	Review instrument output	Instrument performance and sensitivity	ICAL – instrument receipt, major instrument maintenance, when CCV fails Performance check – every 10 samples	ICAL linear curve fit with correlation coefficient >0.995 CCV: 90 - 110% recovery	Reanalyze/r ecalibrate	Analyst	6010/6020

Brownfields QAPP Template #8b

Analytical Laboratory Instrument Calibration

Identify all analytical instrumentation that requires calibration and provide the SOP reference number for each. Document the frequency, acceptance criteria, and corrective action requirements on the template. **Below (in italics) is an example of such information.**

Instrument/ Equipment	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Responsible Person	Analytical SOP Reference
ICP-MS	*See ILM05.4; as per instrument manufacturer's recommended procedures*	*ICP-MS Initial calibration: daily or once every 24 hours and each time the instrument is set up. Continuing calibration: beginning and end of run, and frequency of 10% or every 2 hours during an analysis run.*	*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-MS: inspect the system, correct problem, re-calibrate, re-analyze samples.*	*EPA CLP RAS Laboratory ICP-MS Technician*	*ILM05.4*

Fill in all necessary information

TEMPLATE #8b

Instrument/ Method	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	CORRECTIVE ACTION	Person Responsible for CORRECTIVE ACTION [2]	SOP Reference[1]
CVAA (Mercury)	Initial calibration	Before sample analysis, every 24 hours, whenever modifications are made to the system, or when continuing calibration verification fails	Correlation coefficient must be > 0.995	Correct problem and repeat initial calibration	Lab analyst	M7470A-Mercury-17 M7471A-B-Mercury-16
	Second-source calibration verification	Immediately following each initial calibration	All analytes within ±10% of expected value	Correct problem and repeat initial calibration	Lab analyst	
	Calibration Blank	Before any sequence, after every 10 samples and at the end of the sequence	No analytes detected at or above ½ reporting limit	Correct problem, then reanalyze previous 10 samples	Lab analyst	
	Continuing calibration verification	After every 10 samples and at the end of the sequence	All analytes within ±20% of expected value	Recalibrate and reanalyze all samples since last acceptable continuing calibration verification	Lab analyst	
GC/MS (VOC)	BFB Tuning	Prior to initial calibration and calibration verification (every 12 hours)	Refer to criteria listed in the method	Retune instrument and verify	Lab analyst	M8260B-C-GCMSVOA-23
	ultipoint initial calibration (minimum five points)	Prior to sample analysis, or when calibration verification fails	All analytes ≤15% RSD (8260B) ≤20% RSD (8260C) or correlation coefficient ≥ 0.990 ≤15% RSD for TO-15	Correct the problem and repeat the initial calibration	Lab analyst	
	Second-source calibration verification	Once for each multipoint initial calibration	All analytes within ±30% of expected value for 8260B/C and TO-15	Correct the problem and repeat initial calibration	Lab analyst	
	Continuing calibration verification	At start of each analytical sequence and every 12 hours thereafter	All analytes within ±20% of expected value ≤30% RSD TO-15	Correct problem, then recalibrate and reanalyze all samples since the last acceptable continuing calibration verification	Lab analyst	

Template #9a: Sample Handling System

The following Table/Template is used and required to identify the following:

1. Field personnel responsible for sample collection, packaging and shipping.

2. Laboratory personnel responsible for:
   - Samples receipt,
   - Preparation and analysis,
   - Properly storing remainder of samples and the extract/digestate,
   - Sample disposal, name of responsible person and how many days after the analysis should be disposed of.

Brownfields QAPP Template #9a
Sample Handling System

SAMPLE COLLECTION, PACKAGING, AND SHIPMENT
Sample Collection (Personnel/Organization): [ ] Name of Environmental Consultant Project Manager
Sample Packaging (Personnel/Organization): [ ] Name of Environmental Consultant Project Manager
Coordination of Shipment (Personnel/Organization): [ ] Name of Environmental Consultant Project Manager
Type of Shipment/Carrier: Applicable for project.
SAMPLE RECEIPT AND ANALYSIS
Sample Receipt (Personnel/Organization): [ ] Name of Environmental Laboratory Sample Custodian
Sample Custody and Storage (Personnel/Organization): [ ] Name of Environmental Laboratory Sample Custodian
Sample Preparation (Personnel/Organization): [ ] Name of Environmental Laboratory Sample Technicians
Sample Determinative Analysis (Personnel/Organization): [ ] Name(s) of Environmental Laboratory Sample Technician(s)
SAMPLE ARCHIVING
Field Sample Storage (No. of days from sample collection): Samples to be shipped within [enter time –hours/days], 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 Template #6.
SAMPLE DISPOSAL
Personnel/Organization: [ ] Name (s) of Environmental Laboratory Sample Technician(s)
Number of Days from Analysis: Until analysis and QA/QC checks are completed; as per analytical methodology; See Template #6.

Template #9b: Sample custody Requirements

The required information are as follows:

1. Sample identification procedure: a description of sample identification procedure including an example.
2. Field Sample Custody/Tracking Procedure: a description sample custody/tracking for the site-specific project, including an example.
3. Laboratory Sample Custody/Tracking Procedure: a description of sample receipt, archiving and disposal by the laboratory, including an example.
4. Chain of Custody Procedure: a description of the chain of custody procedure for this site-specific project, including an example.

TEMPLATE #10: Field Quality Control Summary

Summarize by matrix, analytical group, concentration level the number of field QC samples. A typical Brownfield project will include:

- A field sample duplicate for each matrix and parameter,
- Field rinsate blanks (equipment blanks),
- Trip blanks for aqueous VOCs samples,
- Matrix spike / Matrix spike duplicate (MS/MSD),
- Performance evaluation (PE) samples (optional).

Please note that the information presented in this Template is what will be used in the data evaluation/assessment process.

Template #10

Matrix	Water	Field QC Sensitivity and Project Criteria VOCs				
Analytical Group	VOCs (EDB and DBCP)					
Analytical Method/SOP Reference	8011/M504.1-8011-EDB&DBCP by GC-07					
QC Sample	**Frequency / Number**	**QC Acceptance Criteria**	**Corrective Action**	**Responsible Person**	**Data Quality Indicator /DQI**	**Measurement Performance Criteria**
Equipment Rinsate Blank	One per decontamination event per matrix; not to exceed one per day	≤ CRQL	Verify results; re-analyze, flag outliers. Check decontamination procedure.	Analyst/ Supervisor Project personnel	Contamination – Accuracy/Bias	≤ CRQL
Trip Blank	One per cooler containing aqueous VOCs	≤ CRQL	Verify results; re-analyze, flag outliers. Check collection and shipment procedure	Analyst/ Supervisor Project personnel	Bias/ Contamination	≤ CRQL
Field Duplicate	One per preparation batch	RPD ≤ 25% Surrogate and internal standard recoveries must meet criteria	Flag outliers and narrate. Project personnel will assess duplicate results, notify PM and address in data usability.	Analyst/ Supervisor Project personnel	Bias/ Contamination	Same as QC Acceptance Criteria.
MS/MSD	NA	RPD ≤ 25% Surrogate and internal standard recoveries must meet criteria	Flag outliers and narrate.	Analyst/ Supervisor	Accuracy	Same as QC Acceptance Criteria.

Template #11a

Data Management and Documentation

Below is a list that includes but not limited to the types of documentation that may be routinely generated, collected and managed in a Brownfields project.

Field Sample Collection Documents and Records	Analytical Laboratory Documents and Records	Data Assessment Documents and Records	Project File
• Site and field logbooks • Boring logs • Well construction diagrams • Chain-of-Custody (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 • Laboratory Analytical Data Package • 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	• How long the project file will be maintained and stored, and its final disposition after that period.

Brownfields QAPP Template #11b
Project Reports

Identify the types of reports that will be routinely provided during the Brownfields project (e.g., status reports, final reports, etc.). Include the type of report, frequency of reporting, the project delivery dates, the personnel responsible for report preparation, and the report recipients.

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)
	[ ]	[ ]	[ ] Name of Third Party Data Validation Subcontractor; or Environmental Consultant Independent Data Reviewer	[ ] Name of Environmental Consultant
	[ ]	[ ]	[ ] Name of Environmental Consultant Project Manager	[ ] Name of Brownfields Recipient
	[ ]	[ ]	[ ] Name of Environmental Consultant Project Manager	[ ] Name of Brownfields Recipient
	[ ]	[ ]	[ ] Name of Environmental Consultant Project Manager	[ ] Name of Brownfields Recipient; [ ] Name of EPA Region 2 Brownfields Project Officer

Fill in all necessary information

Section 11.B

Project Reports

Type of Report	Frequency	Preparer	Recipients
QAPP	Once, before primary data collection begins	XYZ Firm	All recipients of original QAPP
Progress Report	Quarterly	XYZ Firm	U.S. EPA Project Officer (Copying US EPA OPEI) City of Glens Falls
Progress Report	Annually	XYZ Firm	U.S. EPA Project Officer (Copying US EPA OPEI), City of Glens Falls
Draft Final Project Report	Once	XYZ Firm	U.S. EPA Project Officer City of Glens Falls
Final Project Report	Once	XYZ Firm	U.S. EPA Project Officer (Copying US EPA OPEI), City of Glens Falls

Frequent Comments on BF QAPPs:

- Include current Laboratory Certification Documentation.
- Peristaltic pumps are not appropriate when collecting GW samples for analysis of VOC or SVOC.
- Coring tool should be used to collect soil samples for VOC analysis only.
- Include proper preservation for aqueous samples. Note any acid used and target pH required.
- Trip blanks are required for aqueous VOC samples only.
- Template 5c is for Laboratory QC samples only.
- Template 10 is for Field QC samples only.

Frequent Comments on BF QAPPs:

- Acceptable criteria for RPD should be presented as RPD $\leq$ 20%, 25%, 30%...
- Ranges should not be presented for acceptable RPD
- Please note the difference between RPD and RSD. RPD is the required criteria for duplicate samples.
- The analytical data package must be included as one of the documents in template 11a.


Any
Questions

Oversight Assessments and Corrective Actions

Templates 12a and 12b

Assessment/Oversight
Template 12a: Planned Project Assessments

- **Purpose**: Identify the type, frequency and responsible parties of planned assessment activities.
- **Types of Assessment Activities**:
  - Laboratory Technical Systems/Performance Audits
    - Laboratory certification/accreditation (i.e., NELAC)
  - Performance Evaluation Samples (PES)
    - Laboratory certification
  - On-Site Field Inspection
- Brownfields projects are generally short term. Typical Assessment plan might include:
  - Oversight of field team and/or subcontractors
  - Peer review of final report
- Optional Template/activities, though may be a requirement in near future

Template #12a: Planned Project Assessments

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	[ ]						
Performance Evaluation Samples	[ ]						
On-Site Field Inspection	[ ]						

Assessment/Oversight

Template 12b: Assessment Findings and Corrective Action Responses

- **Purpose**: Describe procedures for handling QAPP and project deviations/deficiencies encountered during the planned assessments (12a).
- **Types of Assessments**:
  - Project Readiness Review
  - Field Observations/Deviations from Work Plans
  - Laboratory Technical System Audits
    - Laboratory Certification/Accreditation
  - On-site Field Inspection
  - Performance Evaluation Samples
- Generally dependent on activities conducted based on Template 12a
- Optional Template/activities though may be a requirement in near future
- For both Template 12 a & b, if activities are not applicable, state as such in QAPP and to not complete Templates, though highly recommended to include

Template #12b: 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	[ ] Name of Environmental Consultant Project Manager		Checklist or logbook entry	[ ] Name of Environmental Consultant	
Field Observations/ Deviations from Work Plan	Logbook	[ ] Name of Environmental Consultant Project Manager		Logbook	[ ] Name of Environmental Consultant; [ ] Name of Brownfields Recipient	
Laboratory Technical Systems/ Performance Audits	Written Report	[ ] Name of Environmental Laboratory		Letter	[ ] Name of Environmental Consultant; [ ] Name of Brownfields Recipient	
On-Site Field Inspection	Written Report	[ ] Name of Environmental Consultant Project Manager		Letter/Internal Memorandum	[ ] Name of Environmental Consultant; [ ] Name of Brownfields Recipient	
Performance Evaluation Samples	Electronic Report	[ ] Name of Environmental Laboratory		Letter or Written Report	[ ] Name of Environmental Laboratory	

Data Review

Templates 13a, 13b, 13c, 13d and Table 1

Data Review
Templates 13a, 13b, 13c and 13 d

- **Purpose:** Document the project and data verification process, validation process, and usability assessment.
- 13a: Project Data Verification Process (Step I)
- 13b: Project Validation Process (Step IIa and Step IIb)
- 13c: Project Matrix and Analytical Validation (Step IIa and Step IIb) Summary
- 13d: Usability Assessment (Step III)
- Step Identification
  - Step I – Completeness Check
  - Step IIa – Compliance with Methods, Procedures and Contracts
  - Step IIb – Comparison with Performance Criteria in QAPP
  - Step III – Usability Assessment

Data Review

Template 13a: Project Data Verification Process (Step I)

- Purpose: Describe the processes that will be followed to verify project data.
- Describe/include:
  - Items/input to be verified
  - When the activity will occur
  - Necessary documentation
  - Responsible party
  - Whether the data generator is an Internal or External partner

Template #13a: Project Data Verification Process (Step I)

Verification Input	Description	Internal/ External	Responsible for Verification (Name, Organization)
Site/Field Logbooks	*Field notes will be prepared daily by the Environmental Consultant Project Manager and will be complete, appropriate, legible and pertinent. Upon completion of field work, logbooks will be placed in the project files.*	*I*	*[ ] Name of Environmental Consultant Project Manager*
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*	*[ ] Name of Environmental Consultant Project Manager*
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*	*[ ] Name of Environmental Laboratory*
Laboratory analytical data package	*Data packages will be reviewed as to content and sample information upon receipt by the Environmental Consultant Project Manager and the Third Party Data Validation Personnel.*	*I/E*	*[ ] Name of Environmental Consultant Project Manager; [ ] Name of Data Validation Personnel*
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*	*[ ] Name of Environmental Consultant Project Manager*

Data Review

Template 13b: Project Validation Process (Step IIa and Step IIb)

- **Purpose:** Describe the processes that will be followed to validate project data.
- Describe/include:
  - The relevant data review step (Step IIa or IIb)
  - Each item that will be validated
  - When the activity will occur
  - Necessary documentation
  - Person responsible for each step/process
- Comparison of results of Field Duplicate analyses with relative percent difference (RPD) criteria should be done as part of this process.

Template 13b: Project Validation Process (Step IIa and Step IIb)

Step IIa/IIb[1]	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.*	*[ ] Name of Environmental Consultant Project Manager*
IIb	*SOPs*	*Determine potential impacts from noted/approved deviations, in regard to PQOs.*	*[ ] Name of Environmental Consultant Project Manager*
IIa	*Chains of custody*	*Examine COC forms against QAPP and laboratory contract requirements (e.g., analytical methods, sample identification, etc.).*	*[ ] Name of Data Validation Personnel*
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.).*	*[ ] Name of Data Validation Personnel*
IIb	*Laboratory data package*	*Determine potential impacts from noted/approved deviations, in regard to PQOs. Examples include PQLs and QC sample limits (precision/accuracy).*	*[ ] Name of Environmental Consultant Project Manager;* *[ ] Name of Data Validation Personnel [Name*
IIb	*Field duplicates*	*Compare results of field duplicate (or replicate) analyses with RPD criteria*	*[ ] Name of Environmental Consultant Project Manager;* *[ ] Name of Data Validation Personnel*

Data Review

Template 13c: Project Matrix and Analytical Validation (Step IIa and Step IIb) Summary

- Purpose: Identify the matrices, analytical groups, and concentrations levels that will be validated as well as the criteria that will be used to validate those data.
- Include:
  - Relevant data review step (Step IIa/IIb)
  - Matrix
  - Analytical group
  - Concentration Level
  - Validation Criteria
  - Data Validator (title and organizational affiliation)
- Evaluation of field and laboratory QC should be included
- Document any problems or issues and how they will impact sample data
- Indicate how results will be documented and presented in final report.

Template 13c: Project Matrix and Analytical Validation (Step IIa and Step IIb) Summary

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 and.or National Functional Guidelines (NFGs) for Organic Analysis of Trace Concentration VOCs under SOW SOM01.2 or SFAM01.1*	*[ ] Name of Data Validation Personnel*

Data Review
Template 13d: Usability Assessment (Step III)

- **Purpose:**
  - Describe the procedures/methods/activities that will be used to determine whether data are of the right type of quality and quantity to support environmental decision making for the project.
  - Describe how data quality issues will be addressed and how limitation on the use of data will be handled.

Template 13d: Usability Assessment (Step III)

Summarize the usability assessment process and all procedures, including interim steps and any statistics, equations, and computer algorithms that will be used:

Determine if any detectable amounts of contaminant(s) are present. If no detectable amounts are indicated and all data are acceptable for the verification and validation, then the data is usable.

If verification and validation are not acceptable then take corrective action (determine cause, data impact, evaluate the impact and document the rationale for resampling).

Describe the evaluative procedures used to assess overall measurement error associated with the project:

Determine if the quality control data is within the performance criteria (precision, accuracy, etc) through validation process IIb (Validation Activities).

Identify the personnel responsible for performing the usability assessment:

Project Management Team –Consisting of the Environmental Consultant Project Manager; Data Validator Personnel; Brownfields Recipient Project Manager.

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:

The Usability Report will describe the rationale for the data and the presentation of any data limitations. For example, if the performance criteria are not usable to address the regulatory requirements or support the project-decision for the Brownfields Recipient, then the Report should address how this problem will be resolved and discuss the alternative approach.

Template 13d: Usability Assessment (Step III) Example

Template 13d: Usability Assessment (Step III) Example

Template 13d: Usability Assessment (Step III) Example

Template 13d: Usability Assessment (Step III) Example

Table 1

Data Elements for Data Review Process				
Item	Step I - Data Verification	Step IIa - Data Validation Compliance	Step IIb - Data Validation Comparison	Step III -Data Usability
Planning Documents				
Evidence of approval of QAPP	X			Use outputs from previous steps
Identification of personnel	X			
Laboratory name	X			
Methods (sampling & analytical)	X	X	X	
Performance requirements (including QC criteria)	X	X		
Project quality objectives	X		X	
Reporting forms	X	X		
Sampling plans – locations, maps grids, sample ID numbers	X	X		
Site identification	X			
SOPs (sampling & analytical)	X	X		
Staff training & certification	X			
List of project-specific analytes	X	X		
Analytical Data Package				
Case narrative	X	X	X	Use outputs from previous steps
Internal lab chain of custody	X	X		
Sample condition upon receipt, & storage records	X	X		
Sample chronology (time of receipt, extraction/digestion, analysis)	X	X		
Identification of QC samples (sampling /lab)	X	X		
Associated PE sample results	X	X	X	
Communication Logs	X	X		
Copies of lab notebook, records, prep sheets	X	X		
Corrective action reports	X	X		
Definition of laboratory qualifiers	X	X	X	
Documentation of corrective action results	X	X	X	
Documentation of individual QC results (e.g., spike, duplicate, LCS)	X	X	X	
Documentation of laboratory method deviations	X	X	X	
Electronic data deliverables	X	X		
Instrument calibration reports	X	X	X	
Laboratory name	X	X		
Laboratory sample identification no.	X	X		
QC sample raw data	X	X	X	
QC summary report	X	X	X	

Table 1 cont.

Data Elements for Data Review Process				
Raw data	X	X	X	
Reporting forms, completed with actual results	X	X	X	Use outputs from previous steps
Signatures for laboratory sign-off (e.g., laboratory QA manager)	X	X		
Standards traceability records (to trace standard source form NIST, for example)	X	X	X	
Sampling Documents				
Chain of custody	X	X		
Communication logs	X	X		
Corrective action reports	X	X	X	
Documentation of corrective action results	X	X	X	
Documentation of deviation from methods	X	X	X	Use outputs from previous steps
Documentation of internal QA review	X	X	X	
Electronic data deliverables	X	X		
Identification of QC samples	X	X	X	
Meteorological data from field (e.g., wind, temperature)	X	X	X	
Sampling instrument decontamination records	X	X		
Sampling instrument calibration logs	X	X		
Sampling location and plan	X	X	X	
Sampling notes & drilling logs	X	X	X	
Sampling report (from field team leader to project manager describing sampling activities)	X	X	X	
External Reports				
External audit report	X	X	X	
External PT sample results	X	X		Use outputs from previous steps
Laboratory assessment	X	X		
Laboratory QA plan	X	X		
MDL study information	X	X	X	
NELAP accreditation	X	X		


Any
Questions

Region 2 Brownfields QAPP References:

- Guidance Document
- QAPP Review Checklist
- Example Generic QAPP
- Example Site-specific QAPP Addendum

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