Intergovernmental Data Quality Task Force

Uniform Federal Policy for Quality Assurance Project Plans

Optimized UFP-QAPP Worksheets

March 2012

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Executive Summary

The Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP) is a consensus quality systems document prepared by the Intergovernmental Data Quality Task Force (IDQTF), a working group made up of representatives from the U.S. Environmental Protection Agency (EPA), the Department of Defense (DoD), and the Department of Energy (DOE). Originally issued in 2005, the UFP-QAPP was developed to provide procedures and guidance for consistently implementing the national consensus standard ANSI/ASQ E-4, *Quality Systems for Environmental Data and Technology Programs,* for the collection and use of environmental data at Federal facilities.

The UFP-QAPP consists of the following parts:

> Part 1: UFP-QAPP Manual – general guidance and instructions for preparing QAPPs
> Part 2A: UFP-QAPP Workbook – a collection of templates or worksheets that, once completed, addresses all required elements of a QAPP
> Part 2B: UFP-QAPP Compendium – specifications for minimum quality assurance (QA) and quality control (QC) activities for hazardous waste projects
> Part 2C: Example QAPPs – documents illustrating the implementation of the UFP-QAPP and use of the worksheets for different types of projects in a *graded approach*

This document represents the first revision to Part 2A: The UFP-QAPP Workbook. The original workbook consisted of 37 worksheets or templates, designed to facilitate the preparation of QAPPs. By walking the project team and other stakeholders through a *systematic planning process*, the worksheets were designed to help focus data collection on the specific decisions to be made so that the type, quality, and quantity of data to be collected would be suitable for their intended uses and agreed upon before data collection began.

Although use of the UFP-QAPP workbook has streamlined the preparation and review of QAPPs over the past several years, it has also revealed opportunities for improvement. In 2010, the IDQTF established a subgroup to make recommendations for optimizing the worksheets. The optimization effort was performed with the following objectives:

1. Eliminate redundancy of information contained in certain worksheets;
2. Increase the ease of worksheet population, review, and use;
3. Clarify and promote the use of the systematic planning process and the implementation of a graded approach; and
4. Promote consistency in the use of QA/QC terminology and procedures among the Federal agencies.

Overview of Part 2A, Revision 1

The optimization of the UFP-QAPP worksheets was performed in close coordination with EPA's update of QA/G5, *Guidance for Quality Assurance Project Plans*, which has been superseded by (CIO 2106-G-05 QAPP, September 2011), to promote greater consistency between the two documents. While use of the term QAPP has been retained, the information contained in the worksheets continues to capture the elements that would comprise related project-planning documents, such as a Sampling and Analysis Plan (SAP), Work Plan (WP), and Field Sampling Plan (FSP).

The preparation of Revision 1 involved the consolidation of several worksheets into a final product containing 27 worksheets. For ease of reference, the revised worksheets are named to reflect the original worksheets on which they are based. Instructions for completing the worksheets are contained in green text. Examples are provided in blue text. Examples are for illustration purposes only and should not be construed to establish acceptable standards for any purpose.

The remaining parts of the original UFP-QAPP manual have not been updated but may still be used as aids to the development of QAPPs. The IDQTF is in the process of preparing enhanced instructions and supplemental guidance to aid in the preparation of QAPPs.

Scope and Applicability

The UFP-QAPP Workbook, Revision 1 is a tool to guide project teams through the systematic planning process. Although designed for use in support of hazardous waste programs (CERCLA and RCRA) at Federal facilities, use of the UFP-QAPP is applicable to any environmental program for which data will be collected and analyzed, and worksheets may be customized accordingly. Examples of customized applications include the development of QAPPS for compliance testing conducted in accordance with the Clean Water Act (CWA) and environmental investigations conducted in accordance with the Military Munitions Response Program (MMRP). Project teams are encouraged to use the *graded approach* when developing QAPPS, giving appropriate consideration to the significance of the environmental problems to be investigated, the types of environmental decisions to be made, the impact on human health and the environment, and available resources.

The optimized worksheets address all requirements of ANSI/ASQ E4-2004 and CIO 2106. Users are free to modify the worksheets as necessary to suit project-specific requirements; however all elements required by ANSI/ASQ E-4 and CIO 2106-G-05 must be addressed, or a satisfactory explanation must be provided for their exclusion. Table 1 provides a crosswalk between the worksheets and the respective elements of CIO 2106-G-05. In addition, each revised worksheet includes a reference to the appropriate CIO 2106-G-05 element.

It is emphasized that the final, approved QAPP is designed to be a stand-alone document containing all specifications and procedures necessary for project personnel to carry out their assigned responsibilities. For example, the field team should be able to rely on the QAPP for complete sampling instructions, including how to sample, where to sample, how many samples to collect, the types of bottles, preservatives, related QC, etc. If the approved QAPP provides insufficient procedures to carry out all tasks, then SOP's must be attached to the QAPP. If required elements are contained in other documents, those documents may be referenced; however the documents must be available to all personnel responsible for reviewing and implementing the QAPP.

TABLE1. CROSSWALK: UFP-QAPP WORKBOOK TO 2106-G-05 QAPP

Optimized UFP-QAPP Worksheets		**2106-G-05 QAPP Guidance Section**	
1 & 2	Title and Approval Page	2.2.1	Title, Version, and Approval/Sign-Off
3 & 5	Project Organization and QAPP Distribution	2.2.3	Distribution List
		2.2.4	Project Organization and Schedule
4 , 7 & 8	Personnel Qualifications and Sign-off Sheet	2.2.1	Title, Version, and Approval/Sign-Off
		2.2.7	Special Training Requirements and Certification
6	Communication Pathways	2.2.4	Project Organization and Schedule
9	Project Planning Session Summary	2.2.5	Project Background, Overview, and Intended Use of Data
10	Conceptual Site Model	2.2.5	Project Background, Overview, and Intended Use of Data
11	Project/Data Quality Objectives	2.2.6	Data/Project Quality Objectives and Measurement Performance Criteria
12	Measurement Performance Criteria	2.2.6	Data/Project Quality Objectives and Measurement Performance Criteria
13	Secondary Data Uses and Limitations	Chapter 3	QAPP ELEMENTS FOR EVALUATING EXISTING DATA
14 & 16	Project Tasks & Schedule	2.2.4	Project Organization and Schedule
15	Project Action Limits and Laboratory-Specific Detection / Quantitation Limits	2.2.6	Data/Project Quality Objectives and Measurement Performance Criteria
17	Sampling Design and Rationale	2.3.1	Sample Collection Procedure, Experimental Design, and Sampling Tasks
18	Sampling Locations and Methods	2.3.1	Sample Collection Procedure , Experimental Design, and Sampling Tasks
		2.3.2	Sampling Procedures and Requirements
19 & 30	Sample Containers, Preservation, and Hold Times	2.3.2	Sampling Procedures and Requirements
20	Field QC	2.3.5	Quality Control Requirements
21	Field SOPs	2.3.2	Sampling Procedures and Requirements
22	Field Equipment Calibration, Maintenance, Testing, and Inspection	2.3.6	Instrument/Equipment Testing, Calibration and Maintenance Requirements, Supplies and Consumables
23	Analytical SOPs	2.3.4	Analytical Methods Requirements and Task Description
24	Analytical Instrument Calibration	2.3.6	Instrument/Equipment Testing, Calibration and Maintenance Requirements, Supplies and Consumables

Optimized UFP-QAPP Worksheets		2106-G-05 QAPP Guidance Section	
25	Analytical Instrument and Equipment Maintenance, Testing, and Inspection	2.3.6	Instrument/Equipment Testing, Calibration and Maintenance Requirements, Supplies and Consumables
26 & 27	Sample Handling, Custody, and Disposal	2.3.3	Sample Handling, Custody Procedures, and Documentation
28	Analytical Quality Control and Corrective Action	2.3.5	Quality Control Requirements
29	Project Documents and Records	2.2.8	Documentation and Records Requirements
31, 32 & 33	Assessments and Corrective Action	2.4	ASSESSMENTS AND DATA REVIEW (CHECK)
		2.5.5	Reports to Management
34	Data Verification and Validation Inputs	2.5.1	Data Verification and Validation Targets and Methods
35	Data Verification Procedures	2.5.1	Data Verification and Validation Targets and Methods
36	Data Validation Procedures	2.5.1	Data Verification and Validation Targets and Methods
37	Data Usability Assessment	2.5.2	Quantitative and Qualitative Evaluations of Usability
		2.5.3	Potential Limitations on Data Interpretation
		2.5.4	Reconciliation with Project Requirements

QAPP Worksheet #1 & 2: Title and Approval Page
(UFP-QAPP Manual Section 2.1)
(EPA 2106-G-05 Section 2.2.1)

This worksheet identifies the principal points of contact for all organizations having decision authority in the project and documents their commitment to implement the QAPP. Signatories usually include the lead organization's Project Manager and QA Manager, and individuals with approval or oversight authority from each regulatory agency. Signatures indicate that officials have reviewed the QAPP and concur with its implementation it as written. If separate concurrence letters are issued, the original correspondence should be maintained with the final, approved QAPP in the project file. It is the lead organization's responsibility to make sure all signatures are in place before work begins.

1. Project Identifying Information
    a. Site name/project name
    b. Site location/number
    c. Contract/Work assignment number

2. Lead Organization
    a. Lead Organization Project Manager (name/title/signature/date)
    b. Lead Organization Quality Manager (name/title/signature/date)

3. Federal Regulatory Agency (name/title/signature/date)

4. State Regulatory Agency (name/title/signature/date)

5. Other Stakeholders (as needed)

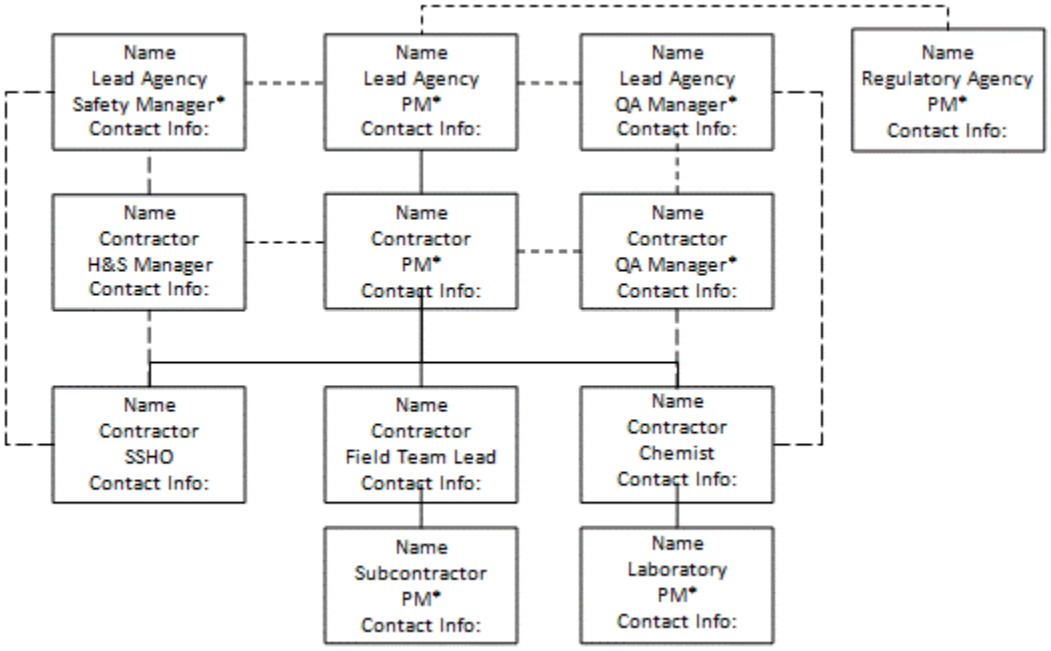
6. List plans and reports from previous investigations relevant to this project

QAPP Worksheet #3 & 5: Project Organization and QAPP Distribution
(UFP-QAPP Manual Section 2.3 and 2.4)
(EPA 2106-G-05 Section 2.2.3 and 2.2.4)

This worksheet identifies key project personnel, as well as lines of authority and lines of communication among the lead agency, prime contractor, subcontractors, and regulatory agencies. An example is provided below. For the purpose of the draft QAPP, it is permissible to show "TBD" in cases where roles have not been assigned; however, all key personnel must be identified in the final, approved QAPP.

For the purpose of document control, this worksheet also can be used to document recipients of controlled copies of the QAPP. The draft QAPP, final QAPP, and any changes/revisions must be provided to all QAPP recipients shown on this chart. Use asterisks or other symbol to designate QAPP recipients. Contractors and subcontractors shown on this chart are responsible for document control within their organizations.

*QAPP recipient Lines of authority _____ Lines of Communication _____



QAPP Worksheet #4, 7 & 8: Personnel Qualifications and Sign-off Sheet
(UFP-QAPP Manual Sections 2.3.2 – 2.3.4)
(EPA 2106-G-05 Section 2.2.1 and 2.2.7)

This worksheet is used to identify key project personnel for each organization performing tasks defined in this QAPP. In this example, organizations include the prime contractor and laboratory. Add spaces for addition organizations and personnel as needed. This worksheet lists individuals' project titles or roles; qualifications; and any specialized/non-routine training, certifications, or clearances required by the project, e.g., explosives and ordnance disposal (EOD) technician, Professional Engineer, Certified Professional Geologist, etc.

ORGANIZATION: Prime Contractor

Name	Project Title/Role	Education/Experience	Specialized Training/Certifications	Signature/Date

ORGANIZATION: Laboratory

Name	Project Title/Role	Education/Experience	Specialized Training/Certifications	Signature/Date

*Signatures indicate personnel have read and agree to implement this QAPP as written

QAPP Worksheet #6: Communication Pathways
(UFP-QAPP Manual Section 2.4.2)
(EPA 2106-G-05 Section 2.2.4)

This worksheet should be used to document specific issues (communication drivers) that will trigger the need to communicate with other project personnel or stakeholders. Its purpose is to ensure there are procedures in place for providing the appropriate notifications and generating the appropriate documentation when handling important communications, including those involving regulatory interfaces, unexpected events, emergencies, non-conformances, and stop-work orders. Examples are provided below; additional drivers may be added as needed.

Communication Driver	Organization	Name	Contact Information	Procedure (timing, pathway, documentation, etc.)
Regulatory agency interface				
Field progress reports				
Stop work due to safety issues				
QAPP changes prior to field work				
QAPP changes during project execution				
Field corrective actions				
Sample receipt variances				
Laboratory quality control variances				
Analytical corrective actions				
Data verification issues, e.g., incomplete records				
Data validation issues, e.g., non-compliance with procedures				
Data review corrective actions				

QAPP Worksheet #9: Project Planning Session Summary
(UFP-QAPP Manual Section 2.5.1 and Figures 9-12)
(EPA 2106-G-05 Section 2.2.5)

A copy of this worksheet should be completed for each project planning session, whether sessions are internal (project teams only) or external (includes regulators and/or stakeholders). It is used to provide a concise record of participants, key decisions or agreements reached, and action items. Depending on the stage of planning, project-planning sessions should involve key technical personnel as needed. Scoping sessions can be by phone, web-conferencing, and/or face-to-face meeting depending upon logistical considerations. Previous meeting minutes can be included as attachments if necessary and referenced. Users may find it helpful to have copies of worksheets on hand for all planning sessions, in whatever state of completion they may be. However, worksheets 10, 11, 15, and 17 should be prioritized in the early stages of project planning. The following template may be modified to suit both the project and the specific planning session.

Date of planning session:
Location:
Purpose:

Participants:

Name	Organization	Title/Role	Email/Phone

Notes/Comments:

Consensus decisions made:

Action Items:

Action	Responsible Party	Due Date

QAPP Worksheet #10: Conceptual Site Model
(UFP-QAPP Manual Section 2.5.2)
(EPA 2106-G-05 Section 2.2.5)

This worksheet is used to present the project's conceptual site model (CSM). The CSM is a tool to assist in the development of DQOs. The CSM uses primarily text and/or figures but may also include tables to convey succinctly what is currently known about the site, and it should be updated as new data are collected. As with the QAPP in general, the level of detail in the CSM should be based on the graded approach. If an investigation includes multiple sites with unique characteristics or problems to be addressed, then a separate CSM should be prepared for each site.

The CSM should include the following information:

- Background information, i.e., site history (unless this information is presented in an Executive Summary)
- Sources of known or suspected hazardous waste;
- Known or suspected contaminants or classes of contaminants;
- Primary release mechanism;
- Secondary contaminant migration;
- Fate and transport considerations;
- Potential receptors and exposure pathways;
- Land use considerations;
- Key physical aspects of the site (e.g., site geology, hydrology, topography, climate); and
- Current interpretation of nature and extent of contamination to the extent that it will influence project-specific decision-making.

Data gaps and uncertainties associated with the CSM need to be clearly identified.

QAPP Worksheet #11: Project/Data Quality Objectives
(UFP-QAPP Manual Section 2.6.1)
(EPA 2106-G-05 Section 2.2.6)

This worksheet is used to develop and document project quality objectives (PQOs) or data quality objectives (DQOs) using a systematic planning process (SPP). Examples of SPP include: 1) the DQO Process[1], and 2) the U.S. Army Corps of Engineers' Technical Planning Process (TPP)[2]. The type of SPP used will vary based on the graded approach. This worksheet is mainly populated as text although some diagrams that capture decision processes are recommended. Regardless of the SPP applied, the QAPP must document the environmental decisions that need to be made and the level of data quality needed to ensure that those decisions are based on sound scientific data. The following guidelines are based on EPA's 7-step DQO process.

1. State the Problem. The problem statement should be consistent with information contained in the CSM (Worksheet #10).

2. Identify the Goals of the Study. Identify specific study questions and define alternative outcomes. The goals for either decision or estimation problems should explain how the data will be used to answer questions and choose among the stated alternatives. Characterizing the "nature and extent of contamination" is a commonly stated but inappropriate study goal because it is vague and not focused on potential outcomes.

3. Identify Information Inputs. Specify the types of data that are required to fill gaps in the CSM. Explain in specific terms how all data will be used. In addition to analytical data, this could include published information on geology, climate, population distributions, endangered species, etc. Information inputs should be consistent with decisions made during project scoping, as documented on Worksheet #9.

4. Define the Boundaries of the Study. Specify the target population and characteristics of interest, define spatial /temporal limits and the scale of inference (i.e., which populations will be represented by which data.) Developing the list of target analytes presents one of the greatest opportunities for streamlining a project, as it can help avoid unnecessary costs associated with not only sampling, but also analysis, data review, reporting and management. Target analytes should be focused on specific constituents reasonably known or suspected to be present. The list of target analytes should be based on data gaps in the CSM. Focusing the list of analytes also provides better opportunities for optimizing method performance to best suit those analytes.

[1] Guidance on Systematic Planning Using the Data Quality Objectives Process, U.S. EPA, EPA QA/G-4, February 2006.
[2] Technical Project Planning Process, U.S. Army Corps of Engineers, EM 200-1-2, August 1998

5. Develop the Analytic Approach. Define the parameter(s) of interest, specify the type of inference (e.g., "samples from groundwater monitoring wells x, y, and z will represent potable water at the site) and develop the logic for drawing conclusions from findings (i.e., which sample results will be used to support which decisions.) For decision problems, these are expressed as "if---then" statements, or decision rules, that link potential results with conclusions or future actions. For estimation problems, specify the estimator and the estimation procedure.

6. Specify Performance or Acceptance Criteria. For projects that involve hypothesis testing (e.g. presence or absence of contamination exceeding some threshold value) for decision-making, this will involve specifying probability limits for decision errors. For estimations and other analytic approaches (e.g. estimating the volume of groundwater or soil potentially requiring remediation), this will involve the development of performance criteria (for new data being collected) or acceptance criteria (for existing data being considered for use).

7. Develop the Detailed Plan for Obtaining Data. Worksheet #11 generally will briefly explain the basis for the sampling design, and then refer to Worksheet #17 – Sample Design and Rationale, for further details. Worksheets #19, 20, 24-28, and 30 will specify analysis design requirements.

QAPP Worksheet #12: Measurement Performance Criteria
(UFP-QAPP Manual Section 2.6.2)
(EPA 2106-G-05 Section 2.2.6)

This worksheet documents the quantitative measurement performance criteria (MPC) in terms of precision, bias, and sensitivity for both field and laboratory measurements and is used to guide the selection of appropriate measurement techniques and analytical methods. MPC are developed to ensure collected data will satisfy the PQOs or DQOs documented on Worksheet #11. A separate worksheet should be completed for each type of field or laboratory measurement. For analytical methods, MPC should be determined for each matrix, analyte, and concentration level. [Qualitative MPC (representativeness and comparability) should be addressed in the sample design, which is documented on Worksheet #17.] If MPC are analyte-specific, include this detail in a separate table or modify this worksheet as necessary. An example is provided below in blue text. The example is provided for illustration only – it should not be construed as guidance for establishing MPC.

Matrix: Groundwater
Analytical Group or Method: VOA/8260B
Concentration Level: Low

Data Quality Indicator (DQI)	QC sample or measurement performance activity	Measurement Performance Criteria
Overall Precision	Field Duplicates	RPD ≤ 30% when VOCs are detected in both samples ≥ sample-specific LOQ
Analytical Precision (laboratory)	Laboratory Control Sample Duplicates	RPD ≤ 25%
Analytical Accuracy/Bias (laboratory)	Laboratory Control Samples	Analyte-specific (Attach list)
Analytical Accuracy/Bias (matrix interference)	Matrix Spike Duplicates	Analyte-specific (Attach list)
Overall accuracy/bias (contamination)	Equipment Blanks	No target analyte concentrations ≥ 1/2 LOQ
Sensitivity	LOQ verification sample (spiked at LOQ)	Recovery within ±25% of LOQ
Completeness	See Worksheet #34	See Worksheet #34

QAPP Worksheet #13: Secondary Data Uses and Limitations
(UFP-QAPP Manual Section 2.7)
(EPA 2106-G-05 Chapter 3: QAPP Elements For Evaluating Existing Data)

This worksheet should be used to identify sources of secondary data (i.e., data generated for purposes other than this specific project or data pertinent to this project generated under a separate QAPP) and summarize information relevant to their uses for the current project. This worksheet should be supplemented by text describing specifically how all secondary data will be used. The project team needs to carefully evaluate the quality of secondary data (in terms of precision, bias, representativeness, comparability, and completeness) to ensure they are of the type and quality necessary to support their intended uses. Secondary data can include the following: sampling and testing data collected during previous investigations, historical data, background information, interviews, modeling data, photographs, aerial photographs, topographic maps, and published literature. When evaluating the reliability of secondary data and determining limitations on their uses, consider the source of the data, the time period during which they were collected, data collection methods, potential sources of uncertainty, the type of supporting documentation available, and the comparability of data collection methods to the currently proposed methods. Examples are provided below.

Data type	Source	Data uses relative to current project	Factors affecting the reliability of data and limitations on data use
Meteorological	National Weather Service	Estimations of seasonal fluctuations in storm water runoff.	Published data are available for past 20 years. No known limitations.
Topographic	USGS	Surface water drainage pathways.	Topography in area X has been altered by grading activities between 2008 and 2009.
Background concentrations of RCRA metals in soil	SI Report, AE Engineering 2006	Comparison to metals concentrations in surface and subsurface soils in area X.	Substantial excavation has taken place since 1996 in areas from which background samples were collected. Depth of subsurface samples is unknown. Supplemental background samples will be collected. (See WS 17)
Past site uses	Plant operating records and personnel interviews	Potential locations of burn pits.	Records for operations prior to 1966 lost in fire. Information prior to 1966 based solely on interviews.

QAPP Worksheet #14/16: Project Tasks & Schedule
(UFP-QAPP Manual Section 2.8.2)
(EPA 2106-G-05 Section 2.2.4)

The QAPP should include a project schedule showing specific tasks, the person or group responsible for their execution, and planned start and end dates. Options for presenting this information include the following template or a Gantt Chart can be attached and referenced. Examples of activities that should be listed include key on-site and off-site activities. Any critical steps and dates should be highlighted.

Activity	Responsible party	Planned start date	Planned completion date	Deliverable(s)	Deliverable due date
Mobilization/demobilization	AE Services	1 October 2010	11 October 2010	Field notes	1 November 2010
Sample collection- soils	AE Services- Field team leader	2 October 2010	4 October 2010	Field notes	1 November 2010
Sample collection- sediments	AE Services- Field team leader	5 October 2010	10 October 2010	Field notes	1 November 2010
Analysis	ABC Labs	October 2010	NLT 5 November 2010	Report of Analyses/Data package	NLT 5 November 2010
Validation	Corl-Val Inc.	November 2010	NLT 1 December 2010	Validation Summary report	NLT 1 December 2010
Summarize data	AE Services- PM	December 2010	15 February 2011	Draft RI Report	15 February 2011
Usability assessment	Project Team	March 2011	March 2011	Meeting minutes/Usability assessment summary report	March 2011

QAPP Worksheet #15: Project Action Limits and Laboratory-Specific Detection/Quantitation Limits
(UFP-QAPP Manual Section 2.6.2.3 and Figure 15)
(EPA 2106-G-05 Section 2.2.6)

This worksheet should be completed for each matrix, analyte, analytical method, and concentration level (if applicable). Its purpose is to make sure the selected analytical laboratory and method can provide accurate data (i.e., quantitative results with known precision and bias) at the Project Action Limit (PAL). During the systematic planning process, identify target analytes, PALs, and the reference limits (e.g. regulatory limits or risk-based limits) on which action limits are based. (If more than one set of reference limits are applicable, add additional columns.) Target analytes that are critical to project-specific decision-making should be highlighted. Next, determine the matrix-specific quantitation limit goal. The quantitation limit goal should be lower than the PAL by an amount determined the DQOs/PQOs. This information, along with the MPC documented on Worksheet #12, should be used to select analytical methods and laboratories. Once the methods and laboratories have been selected, the remaining columns should be completed with laboratory-specific information. Project teams need to keep in mind that the laboratory-specific quantitation limit is usually determined in reagent water; therefore, the Project Quantitation Limit Goal (matrix-specific quantitation limit) will be higher. Explanations should be provided in cases where the quantitation limit is greater than either the project quantitation limit goal or the PAL. The laboratory must provide documentation that demonstrates precision and bias at the laboratory-specific quantitation limit. The laboratory-specific quantitation limit cannot be lower than the lowest calibration standard for any given method and analyte.

Matrix: Soil

Analytical Method: 8260

Concentration level (if applicable): Low

Analyte	Project Action Limit (PAL)	PAL Reference	Project Quantitation Limit Goal	Laboratory-specific quantitation limit[1]	Laboratory-specific detection limit[2]
Benzene	5.0 mg/Kg dry weight	2003 Region 3 BTAG	2.0 mg/Kg dry weight	1.0 mg/Kg	0.1 mg/Kg

[1] Define quantitation limit terminology used by the project/laboratory
[2] Define detection limit terminology used by the project/laboratory

QAPP Worksheet #17: Sampling Design and Rationale
(UFP-QAPP Manual Section 3.1.1)
(EPA 2106-G-05 Section 2.3.1)

This worksheet should be used to describe the sampling design and the basis for its selection. This worksheet will mainly consist of text. It documents the last step of the systematic planning process. If a site consists of multiple areas to be sampled, a separate worksheet should be used for each.

There are two general types of sampling designs: 1) probability-based designs, which should be used when statistical conclusions are required, and 2) judgmental designs, which are more applicable to help refine conceptual site models when further study is planned, or to confirm previous findings, but which usually do not provide sufficient basis on their own to support statistical conclusions. Advice on selecting appropriate sample designs may be found in Chapter 2 of *Guidance for Choosing a Sampling Design for Environmental Data Collection*, EPA QA/G-5s. *Regardless of the type of design selected, this worksheet should explain the basis for its selection.* It also should describe the following:

1. The physical boundaries for the area under study (include maps or diagrams).
2. The time period being represented by the collected data.
3. The descriptions and basis for dividing the site into sampling areas (e.g., decision units, exposure units, etc.) that support the decision statements documented on Worksheet #11.
4. The basis for the number and placement of samples within sampling areas.
5. If sample locations are specified in the QAPP, descriptions of how actual sample positions will be located once in the field. (Include maps or diagrams).
6. If a sample cannot be collected where planned, the decision process for changing the location.
7. If sample locations will be determined in the field, the decision process for doing so.
8. Contingencies in the event field conditions are different than expected and could have an effect on the sample design.

QAPP Worksheet #18: Sampling Locations and Methods
(UFP-QAPP Manual Section 3.1.1 and 3.1.2)
(EPA 2106-G-05 Section 2.3.1 and 2.3.2)

The primary value of this worksheet is as a completeness check for field personnel and auditors/assessors. It facilitates checks to make sure all planned samples have been collected and appropriate methods have been used. Ideally, this worksheet should list each individual sample that is planned to be collected, including field QC samples. Samples with common entries may be grouped but field QC samples and samples that are unique must be listed separately. If a sample is being collected in increments, use only one line to identify the sample as it will be analyzed; there is no need to list the increments separately. (If the increments are placed in separate containers to be combined in the laboratory, then each container must be labeled.) If a project involves the collection of a large number of samples, however, it may be acceptable to list groups of similar samples on a single row. Detailed sampling SOPs must be available to field personnel and should be included as an appendix to the QAPP and referenced in this worksheet. The comments field can be used as a reminder to note any special sample handling required in the field and/or GPS coordinates. A map with locations marked should be included. Use additional worksheets as necessary.

Sample ID	Matrix[1]	Depth (ft BGS)	Type	Analyte/ Analytical Group	Sampling SOP	Comments
CHS-S-VOC-001	S	0-2	Hand auger	VOCs	TECH-025	GPS coordinates 123 x 456
CHS-S-VOC-001D	S	0-2	Field Duplicate	VOCs	"	
CHS-S-VOC-002	S	6-8	Hand auger	VOCs	"	
CHS-S-VOC-002MS/MSD	S	6-8	MS/MSD	VOCs	"	
CHS-S-MET-001	S	2-4	Hand auger	RCRA Metals	TECH-033	
CHS-S-MET-001D	S	2-4	Field Duplicate	RCRA Metals	"	
CHS-PCB-001 thru 009	S	0-2	Hand auger	PCB's	TECH-026	Use disposable equipment only

[1]Key: SS = surface soil, S = soil, SD = sediment, GW = groundwater, SW = surface water

QAPP Worksheet #19 & 30: Sample Containers, Preservation, and Hold Times
(UFP-QAPP Manual Section 3.1.2.2)
(EPA 2106-G-05 Section 2.3.2)

The purpose of this worksheet is to serve as a reference guide for field personnel. It is also an aid to completing the Chain of Custody form and shipping documents. Complete this table for each laboratory used. If laboratory accreditation/certification is required for this project, the project team must verify that the laboratory maintains current accreditation/certification status for each analyte/matrix/method combination, as applicable, throughout its involvement with the project. If the accreditation expiration dates are the same for all entries then a global expiration date can be added at the top of the table as appropriate.

Laboratory (Name, sample receipt address, POC, e-mail, and phone numbers):

List any required accreditations/certifications:

Back-up Laboratory:

Sample Delivery Method:

Analyte/ Analyte Group	Matrix	Method/ SOP	Accreditation Expiration Date	Container(s) (number, size & type per sample)	Preservation	Preparation Holding Time	Analytical Holding Time	Data Package Turnaround
Volatile Organic Compounds	Soil	5035/8260 C	12 Nov 2011	2, 40-ml VOA vials w/ PTFE-faced silicone	4 ± 2°C	14 days	14 days	28 days
Chlorinated Herbicides	Groundwater	8151A	12 Nov 2011	1 L amber glass	4 ± 2°C	7 days	40 days	28 days

QAPP Worksheet #20: Field QC Summary
(UFP-QAPP Section 3.1.1 and 3.1.2)
(EPA 2106-G-05 Section 2.3.5)

This worksheet provides a summary of the types of samples to be collected and analyzed for the project. Its purpose is to show the relationship between the number of field samples and associated QC samples for each combination of analyte/analytical group and matrix. This worksheet is also useful for informing the laboratory of the number of samples to expect and for preparing analytical cost estimates. The number and types of QC samples should be based on project-specific DQOs, and this worksheet should be adapted as necessary to accommodate project-specific requirements. Not all types of QC samples shown in the example below will be necessary for all projects. However, some projects may require additional QC samples (e.g. proficiency testing samples), which can be listed in the "other" column.

Samples that are collected at different depths at the same location, and analyzed separately, should be counted as separate field samples. Even if they are taken from the same container as the parent field sample, matrix spikes and matrix spike duplicates are counted separately, because they are analyzed separately. If composite samples or incremental samples are being collected, include only the sample that will be analyzed; subsamples and increments should not be listed separately; however, all containers making up the sample (as received by the laboratory) must be labeled.

Matrix	Analyte/Analytical Group	Field Samples	Field Duplicates	Matrix Spikes	Matrix Spike Duplicates	Field Blanks	Equipment Blanks	Trip Blanks	Other	Total # analyses
Soil	VOCs (low conc.)	40	2	2	2	0	0	1	N/A	47
Soil	RCRA Metals	60	2	2	2	0	1	0	N/A	69
Groundwater	VOCs (low conc.)	20	2	1	1	0	0	1	N/A	25

QAPP Worksheet #21: Field SOPs
(UFP-QAPP Manual Section 3.1.2)
(EPA 2106-G-05 Section 2.3.2)

This worksheet is intended for use to document the specific field procedures being implemented, which is important for measurement traceability. The QAPP must contain detailed descriptions of procedures for all field activities, including sample collection; sample preservation; equipment cleaning and decontamination; equipment testing, maintenance and inspection; and sample handling and custody. If these procedures are included in existing SOPs, then the SOPs should be reviewed to make sure they are either 1) sufficiently prescriptive to be implemented as written, or 2) modified as necessary for this project. If an SOP provides more than one procedure or option (for example, one SOP covers the use of several different types of field equipment for the same procedure) this worksheet must note the specific option or equipment being used.) Basic information about the SOPs should be provided in this table, and the SOPS themselves should be included in an appendix to the QAPP. Field SOPs must be readily available to all field personnel responsible for their implementation. The QAPP must explain any planned modifications to field SOPs. Modifications should be clearly noted on the SOPs themselves. The specific type(s) of SOP modifications/deviations must be summarized in the comments column or a reference provided.

SOP # or reference	Title, Revision, Date, and URL (if available)	Originating Organization	SOP option or Equipment Type (if SOP provides different options)	Modified for Project? Y/N	Comments
DECON-003	Decontamination SOP, Revision 3, October 2005	Ma & Pa Sampling Inc.	Applies to all equip. used for non-volatile organics	Y	Methanol will be used instead of acetone as the final rinse solvent
Soil-Grab-01A	Surface soil sampling SOP, Revision 0, June 2004	Ma & Pa sampling Inc.	Disposable Trowel	Y	Refer to cover sheet of attached SOP for summary of deviations

QAPP Worksheet #22: Field Equipment Calibration, Maintenance, Testing, and Inspection
(UFP-QAPP Manual Section 3.1.2.4)
(EPA 2106-G-05 Section 2.3.6)

This worksheet should document procedures for calibrating, maintaining, testing, and/or inspecting all field equipment (e.g., tools, pumps, gauges, magnetometers, pH meters, water-level measurement devices, etc.). If these activities are documented in an SOP or manufacturer's instructions, and the relevant SOP or instruction is attached, then the frequency, acceptance criteria and corrective action columns may be left blank. Note that all the information summarized in this worksheet should be recorded in the field notes/logs.

Field Equipment	Activity	SOP Reference	Title or position of responsible person	Frequency	Acceptance Criteria	Corrective Action
pH meter	Calibration	Tech 001	Field Crew Chief			
pH meter	Maintenance	Operators Manual	Equipment Coordinator			
pH meter	Testing	Tech 001	Field Crew Chief			
pH meter	Inspection	Tech 001	Field Crew Chief			

QAPP Worksheet #23: Analytical SOP's
(UFP-QAPP Manual Section 3.2.1)
(EPA 2106-G-05 Section 2.3.4)

This worksheet documents information about the specific sample preparation and analytical procedures to be used, which is important for measurement traceability. Screening data are used for interim investigations and/or will not be used for final risk assessment or site assessment decisions unless they have been confirmed with definitive procedures. SOPs for all sample preparation and analytical procedures must be current and referenced whether these activities are performed in the field or in an off-site laboratory. If this information is not known at the time the QAPP is being prepared (i.e., laboratory selection has not occurred), it is acceptable to enter "TBD" for the required information. This worksheet must be completed, however, before the QAPP is approved. If required by the project, copies of the SOPs should be included as a hardcopy or electronic appendix. The project team should review all SOPs to make sure they are either 1) sufficiently prescriptive to be implemented as written or 2) modified as necessary for this project. If an SOP provides more than one procedure or option [e.g., extraction procedures for analytes of different concentration levels (SW5035), sulfur cleanup options (SW3660), or derivatization techniques (SW8151)], the specific option being implemented must be noted. This worksheet must summarize planned modifications to existing SOPs, and modifications should be clearly noted on the copies of the SOPs themselves. All personnel responsible for implementing sample preparation and analytical SOPs must have access to the specific SOPs they are using.

SOP #	Title, Date, and URL (if available)	Definitive or Screening Data	Matrix/Analytical Group	SOP Option or Equipment Type	‡Modified for Project? Y/N
BR549	Mercury by Semi-Automated Cold Vapor Atomic Absorption, 09/15/11 -- rev. 5.7, 7470A/7471A	Definitive	Soil/metals	CVAA	Y- A 2.00-g soil sample is digested.
JB007	Acid Digestion of Sediments, Sludges, and Soils Using Block Digestion, 09/09/11, rev 1.5, 3050B	Definitive	Soil/metals	Hot Block digestion	N
BR035	Closed System Purge-and-Trap/Extraction for VOCs in Soil and Waste, 04/01/11, Rev 2, 5035	Definitive	Soil/VOCs	Low-level closed system purge and trap	N
BR151	Field Screening for Vapor Intrusion using portable GC/MS	Screening	Indoor air	Hapsite GC/MS	N

‡ A brief summary of project-specific SOP modifications must be provided on this worksheet or referenced.

QAPP Worksheet #24: Analytical Instrument Calibration
(UFP-QAPP Manual Section 3.2.2)
(EPA 2106-G-05 Section 2.3.6)

This worksheet should be completed for all analytical instruments, whether used in the field or the laboratory. As appropriate to the instrument, calibration procedures should include tuning, initial calibration, calibration blank, initial calibration verification (second source), continuing calibration verification, linear dynamic range (ICP and ICP/MS only), and verification of detection and quantification limits (however defined.) See also Worksheet 15. If information for a specific procedure is provided in an SOP, and the SOP is attached, then this worksheet can reference the SOP and identify the responsible person.

Instrument	Calibration Procedure	Calibration Range	Frequency	Acceptance Criteria	Corrective Action (CA)	Title/position responsible for Corrective Action	SOP Reference

QAPP Worksheet #25: Analytical Instrument and Equipment Maintenance, Testing, and Inspection
(UFP-QAPP Manual Section 3.2.3)
(EPA 2106-G-05 Section 2.3.6)

The project team should determine whether it is necessary to complete all fields in this table. For example, if the selected laboratory is operating under a quality system that conforms to ISO 17025:2005, then the activities documented in this table will be documented in the laboratory's quality manual (however named). In this case, it may be acceptable to simply reference the quality manual (including revision number and date.) If the project has specific requirements that are different from those contained in the laboratory's quality manual, however, this table should be completed for those items.

Instrument / Equipment	Maintenance Activity	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Title/position responsible for corrective action	Reference

QAPP Worksheet #26 & 27: Sample Handling, Custody, and Disposal
(UFP-QAPP Manual Section 3.3)
(EPA 2106-G-05 Section 2.3.3)

This worksheet is used to document responsibilities for maintaining custody of samples from sample collection through disposal. Examples of forms, sample labels, and chain of custody documentation should be included as an attachment to the QAPP. The information in this worksheet table can be referenced to the appropriate SOP's if they are attached to the QAPP.

Sampling Organization:

Laboratory:

Method of sample delivery (shipper/carrier):

Number of days from reporting until sample disposal:

Activity	Organization and title or position of person responsible for the activity	SOP reference
Sample labeling		
Chain-of-custody form completion		
Packaging		
Shipping coordination		
Sample receipt, inspection, & log-in		
Sample custody and storage		
Sample disposal		

QAPP Worksheet #28: Analytical Quality Control and Corrective Action
(UFP-QAPP Manual Section 3.4 and Tables 4, 5, and 6)
(EPA 2106-G-05 Section 2.3.5)

The purpose of this worksheet is to ensure that the selected analytical methods are capable of meeting project-specific MPC, which are based on PQOs/DQOs). Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, and analytical group. If method/SOP QC acceptance criteria do not meet the project-specific MPC, the data obtained may be unusable for making reliable project decisions. In this case the project team should consider selecting an alternate method or modifying the method. The list of QC samples in this example is incomplete. See Section 2.2 of Part 2B of the UFP-QAPP QA/QC Compendium, the QA Matrix in Section 3.4, and Tables 4, 5, and 6 for further information and guidance on QC samples.

Matrix: Soil
Analytical Group: Metals
Analytical Method/SOP: SW-846 6020A/SOP#BR549

QC Sample	Number/Frequency	Method/SOP Acceptance Criteria	Corrective Action	Title/position of person responsible for corrective action	Project-Specific MPC
Method Blank	1 per prep. batch of up to 20 samples.	No analytes detected > ½ reporting limit (RL), 1/10 the amount measured in any sample, or	Reprep and reanalyze the method blank and all samples processed with the contaminated	Analyst / Laboratory Quality Assurance Officer	All analytes in the method blank must be less than ½ the RL or 1/5 of the PAL's on WS#15, whichever is greater
LCS containing all analytes	One per preparatory batch of up to 20 samples.	QC acceptance criteria specified in DoD QSM v4.2, if available. Otherwise use in-house limits	Correct problem, reprep and reanalyze LCS and all samples in associated batch for failed analytes.	Analyst / Laboratory Quality Assurance Officer	All analytes in samples found to be within +/- 20% of the PAL's on WS#15 MUST pass method/SOP criteria

QAPP Worksheet #29: Project Documents and Records
(UFP-QAPP Manual Section 3.5.1)
(EPA 2106-G-05 Section 2.2.8)

This worksheet should be used to record information for all documents and records that will be generated for the project. It describes how information will be collected, verified, and stored. Its purpose is to support data completeness, data integrity, and ease of retrieval. Examples are provided in blue text.

Sample Collection and Field Records			
Record	Generation	Verification	Storage location/archival
Field logbook or data collection sheets	Field Task Leader (name)	Project Director (name)	Project File
Chain-of-Custody Forms			
Air Bills			
Contractor Daily QC Reports			
Deviations			
Corrective Action Reports			
Correspondence			

Project Assessments			
Record	Generation	Verification	Storage location/archival
Field audit checklists			
Data verification checklists			
Data validation report			
Data usability assessment report			

Laboratory Records			
Record	Generation	Verification	Storage location/archival

Laboratory Data Deliverables						
Record	VOCs	SVOCs	PCBs	Pesticides	Metals	Other
Narrative	X	X	X	X	X	
COC	X	X	X	X	X	
Summary Results	X	X	X	X	X	
QC Results	X	X	X	X	X	
Chromatograms	X	X	X	X		
Tentatively Identified Compounds		X				

QAPP Worksheet #31, 32 & 33: Assessments and Corrective Action
(UFP-QAPP Manual Sections 4.1.1 and 4.1.2)
(EPA 2106-G-05 Section 2.4 and 2.5.5)

This worksheet is used to document responsibilities for conducting project assessments, responding to assessment findings and implementing corrective action. Appropriately scheduled assessments (e.g., field sampling technical systems audits (TSA) at the beginning of sampling) allow management to implement corrective action in a timely manner, thereby correcting nonconformances and minimizing their impact on DQOs/PQOs. Assessment checklists should be included in the QAPP or referenced.

Assessments:

Assessment Type	Responsible Party & Organization	Number/Frequency	Estimated Dates	Assessment Deliverable	Deliverable due date
Readiness Review	ABC Task Manager and QAM, ABC Engineering	One assessment one week prior to mobilization	[fill in planned dates]	Readiness Review Memorandum and Checklist	24 hours following assessment
Field Sampling TSA	ABC QAM & Florida DEP	One each on first day of soil, biota, and groundwater sampling episodes		TSA Memorandum and Checklist	24 hours following assessment
On-site analytical TSA	Project Chemist ABC Engineering	Prior to start of on-site analytical work and every 2 weeks thereafter		On-site Analytical TSA Memorandum and Checklist	48 hours following assessment
Project-specific PT samples	Project Chemist ABC Engineering	One sample per medium sampled for SVOCs and metals	Three weeks prior to start of field sampling	PT Deficiency Report	48 hours following receipt of PT results
Management Review	ABC Project Manager & ABC QAM	Interim Management Review following site mobilization. Final management review upon completion of field work.	[fill in anticipated dates]	QA Management Report	48 hours following Management Review

Assessment Response and Corrective Action:

Assessment Type	Responsibility for responding to assessment findings	Assessment Response Documentation	Timeframe for Response	Responsibility for Implementing Corrective Action	Responsible for monitoring Corrective Action implementation
Readiness Review	Project Manager ABC Engineering	Readiness Review Corrective Action Response	24 hours from receipt of Readiness Review Memorandum	As directed by PM	ABC QAM
Field Sampling TSA	Field Task Leader	Field Sampling Corrective Action Response	24 hours from receipt of Memorandum	Field Task Leader	ABC QAM
On-site analytical TSA	On-site Analytical Manager	On-site Analytical Corrective Action Response	48 hours from receipt of Memorandum and before further analyses can be conducted.	On-site Analytical Manager	ABC Project Chemist
Project-specific PT samples	Off-site Laboratory QAM	PT Deficiency Memorandum	7 days following receipt of PT Deficiency Report and before analysis field samples	Laboratory Technical Director	ABC Project Chemist
Management Reviews	ABC Task Manager	QA Management Response	48 hours from receipt of QA Management Report	As assigned in QA Management Response	ABC QAM

QAPP Worksheet #34: Data Verification and Validation Inputs
(UFP-QAPP Manual Section 5.2.1 and Table 9)
(EPA 2106-G-05 Section 2.5.1)

This worksheet is used to list the inputs that will be used during data verification and validation. Inputs include planning documents, field records, and laboratory records. Data verification is a check that all specified activities involved in collecting and analyzing samples have been completed and documented and that the necessary records (objective evidence) are available to proceed to data validation. Data validation is the evaluation of conformance to stated requirements, including those in the contract, methods, SOPs and the QAPP. Examples of records subject to verification and validation are listed below. The actual inputs required should be based on the graded approach, as defined during project planning.

Item	Description	Verification (completeness)	Validation (conformance to specifications)
Planning Documents/Records			
1	Approved QAPP	X	
2	Contract	X	
4	Field SOPs	X	
5	Laboratory SOPs	X	
Field Records			
6	Field logbooks	X	X
7	Equipment calibration records	X	X
8	Chain-of-Custody Forms	X	X
9	Sampling diagrams/surveys	X	X
10	Drilling logs	X	X
11	Geophysics reports	X	X
12	Relevant Correspondence	X	X
13	Change orders/deviations	X	X
14	Field audit reports	X	X
15	Field corrective action reports	X	X
Analytical Data Package			
16	Cover sheet (laboratory identifying information)	X	X
17	Case narrative	X	X
18	Internal laboratory chain-of-custody	X	X
19	Sample receipt records	X	X
20	Sample chronology (i.e. dates and times of receipt, preparation, & analysis)	X	X
21	Communication records	X	X
22	Project-specific PT sample results	X	X
23	LOD/LOQ establishment and verification	X	X
24	Standards Traceability	X	X

Item	Description	Verification (completeness)	Validation (conformance to specifications)
25	Instrument calibration records	X	X
26	Definition of laboratory qualifiers	X	X
27	Results reporting forms	X	X
28	QC sample results	X	X
29	Corrective action reports	X	X
30	Raw data	X	X
31	Electronic data deliverable	X	X

QAPP Worksheet #35: Data Verification Procedures
(UFP-QAPP Manual Section 5.2.2)
(EPA 2106-G-05 Section 2.5.1)

This worksheet documents procedures that will be used to verify project data. It applies to both field and laboratory records. Data verification is a completeness check to confirm that all required activities were conducted, all specified records are present, and the contents of the records are complete. As illustrated in the following example, verification often is performed at more than one step by more than one person.

Records Reviewed	Requirement Documents	Process Description	Responsible Person, Organization
Field logbook	QAPP, SOP Field 02	Verify that records are present and complete for each day of field activities. Verify that all planned samples including field QC samples were collected and that sample collection locations are documented. Verify that meteorological data were provided for each day of field activities. Verify that changes/exceptions are documented and were reported in accordance with requirements. Verify that any required field monitoring was performed and results are documented.	Daily - Project Manager At conclusion of field activities - Project QA Manager
Chain-of-custody forms	QAPP, SOP Field 02	Verify the completeness of chain-of-custody records. Examine entries for consistency with the field logbook. Check that appropriate methods and sample preservation have been recorded. Verify that the required volume of sample has been collected and that sufficient sample volume is available for QC samples (e.g., MS/MSD). Verify that all required signatures and dates are present. Check for transcription errors.	Daily - Field Crew Chief At conclusion of field activities - Project Chemist

Laboratory Deliverable	QAPP	Verify that the laboratory deliverable contains all records specified in the QAPP. Check sample receipt records to ensure sample condition upon receipt was noted, and any missing/broken sample containers were noted and reported according to plan. Compare the data package with the CoCs to verify that results were provided for all collected samples. Review the narrative to ensure all QC exceptions are described. Check for evidence that any required notifications	Before release - Laboratory QAM Upon receipt - Project Chemist
Audit Reports, Corrective Action Reports	QAPP	Verify that all planned audits were conducted. Examine audit reports. For any deficiencies noted, verify that corrective action was implemented according to plan.	Project QAM

QAPP Worksheet #36
Data Validation Procedures
(UFP-QAPP Manual Section 5.2.2)
(EPA 2106-G-05 Section 2.5.1)

This worksheet documents procedures that will be used to validate project data. Data validation is an analyte and sample-specific process for evaluating compliance with contract requirements, methods/SOPs, and MPC. The scope of data validation needs to be defined during project planning because it affects the type and level of documentation required for both field and laboratory activities. If data validation procedures are contained in an SOP or other document, the procedures should be referenced in this table and included as an attachment to the QAPP. The example provided below makes use of terminology contained in *Guidance for Labeling Externally Validated Laboratory Data for Superfund Use*, EPA 540-R-08-005, which was developed to promote the use of consistent terminology by external data reviewer to describe the scope and content of data review activities. The validation code and label identifier table, as well as any checklists to be used should be attached to the QAPP. Any data qualifiers to be applied by the data validator must be defined. Of particular importance, third party data validation should NOT include the rejection of data (noted by the designation of the "R" data qualifier). Data validation should note when performance criteria are not met but the final rejection of any data and their use is a decision reserved specifically for the project team.

Data Validator: ABC DV, Inc.

Analytical Group/Method:	Volatile Organics – SW-846 8260 (modified)	Metals – SW-846 6010
Data deliverable requirements:	SEDD Stage 3 plus chromatograms (pdf)	SEDD Stage 3
Analytical specifications:	WS 28-1, SOP VOA-02 (modified)	WS 28-2, SOP Met-03
Measurement performance criteria:	WS 12	WS 12
Percent of data packages to be validated:	100%	100%
Percent of raw data reviewed:	100%	0
Percent of results to be recalculated:	10%	0
Validation procedure:	EPA Region 11 VOA – Level 4	EPA Region 11 Met – Level 3
Validation code (*see attached table):	SV3EM	SV3E
Electronic validation program/version:	ABC DV Tool V2.2	ABC DV Tool V2.2

Validation Code and Label Identifier Table (To be attached to the QAPP)

Validation Code*	Validation Label	Description/Reference
S1VE	Stage 1 Validation Electronic	EPA 540-R-08-005
S1VM	Stage 1 Validation Manual	
S1VEM	Stage 1 Validation Electronic and Manual	
S2aVE	Stage 2a Validation Electronic	
S2aVM	Stage 2a Validation Manual	
S2aVEM	Stage 2a Validation Electronic and Manual	
S2bVE	Stage 2b Validation Electronic	
S2bVM	Stage 2b Validation Manual	
S2bVEM	Stage 2b Validation Electronic and Manual	
S3VE	Stage 3 Validation Electronic	
S3VM	Stage 3 Validation Manual	
S3VEM	Stage 3 Validation Electronic and Manual	
S4VE	Stage 4 Validation Electronic	
S4VM	Stage 4 Validation Manual	
S4VEM	Stage 4 Validation Electronic and Manual	
NV	Not Validated	

The following data qualifiers will be applied during data validation by a third party. Potential impacts on project-specific data quality objectives will be discussed in the data validation report.

NM – Measurement Performance Criteria contained in WS 12 were not met.
J – The result is an estimated value. The nature of the bias will be discussed in the data validation report.
E – Erroneous result (e.g., improper calculation, peak integration, etc.)

QAPP Worksheet #37: Data Usability Assessment
(UFP-QAPP Manual Section 5.2.3 including Table 12)
(EPA 2106-G-05 Section 2.5.2, 2.5.3, and 2.5.4)

This worksheet documents procedures that will be used to perform the data usability assessment. The data usability assessment is performed at the conclusion of data collection activities, using the outputs from data verification and data validation. It is the data interpretation phase, which involves a qualitative and quantitative evaluation of environmental data to determine if the project data are of the right type, quality, and quantity to support the decisions that need to be made. It involves a retrospective evaluation of the systematic planning process, and, like the systematic planning process, involves participation by key members of the project team. The data usability assessment evaluates whether underlying assumptions used during systematic planning are supported, sources of uncertainty have been accounted for and are acceptable, data are representative of the population of interest, and the results can be used as intended, with the acceptable level of confidence.

Identify personnel (organization and position/title) responsible for participating in the data usability assessment:

Project Manager
Project QAM
Risk Assessor
Geologist/Hydrogeologist
Project Chemist
Field Task Leader
Statistician

Describe how the usability assessment will be documented:

Summarize the data usability assessment process including statistics, equations, and computer algorithms that will be used to analyze the data:

Step 1	**Review the project's objectives and sampling design** Review the key outputs defined during systematic planning (i.e.,PQOs or DQOs and MPCs) to make sure they are still applicable. Review the sampling design for consistency with stated objectives. This provides the context for interpreting the data in subsequent steps.

Step 2	**Review the data verification and data validation outputs** Review available QA reports, including the data verification and data validation reports. Perform basic calculations and summarize the data (using graphs, maps, tables, etc.). Look for patterns, trends, and anomalies (i.e., unexpected results). Review deviations from planned activities (e.g., number and locations of samples, holding time exceedances, damaged samples, non-compliant PT sample results, and SOP deviations) and determine their impacts on the data usability. Evaluate implications of unacceptable QC sample results.
Step 3	**Verify the assumptions of the selected statistical method** Verify whether underlying assumptions for selected statistical methods (if documented in the QAPP) are valid. Common assumptions include the distributional form of the data, independence of the data, dispersion characteristics, homogeneity, etc. Depending on the robustness of the statistical method, minor deviations from assumptions usually are not critical to statistical analysis and data interpretation. If serious deviations from assumptions are discovered, then another statistical method may need to be selected.
Step 4	**Implement the statistical method** Implement the specified statistical procedures for analyzing the data and review underlying assumptions. For decision projects that involve hypothesis testing (e.g., “concentrations of lead in groundwater are below the action level”) consider the consequences for selecting the incorrect alternative; for estimation projects (e.g., establishing a boundary for surface soil contamination), consider the tolerance for uncertainty in measurements.
Step 5	**Document data usability and draw conclusions** Determine if the data can be used as intended, considering implications of deviations and corrective actions. Discuss data quality indicators. Assess the performance of the sampling design and Identify limitations on data use. Update the conceptual site model and document conclusions. Prepare the data usability summary report which can be in the form of text and/or a table.