CP3-ES-5003 FRev. 3B	**TITLE**: Quality Assured Data	Page 1 of 39

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REVISION/CHANGE LOG

Revision/Change Letter	Description of Changes	Pages Affected	Date of Revision/Change
FR0	Bluesheet	ALL	10/20/2017
FR1	Non-intent to incorporate bluesheet.	ALL	1/8/2018
FR2	Resolution for AI-0004565 associated with CA-002859. General Revision with the addition of step 6.5.8 and re-aligned flow charts in appendices to flow with addition of step 6.5.8. Changes included addition of verbiage “trend charts” under Data Assessment on page 1 of Instructions form CP3-ES-5003-F01. Completion of periodic review.	ALL	4/13/2021
FR2A	Non-intent change to delete acronym FDPD and replace with FRNP and to incorporate 2 additional Data Assessment Comment form pages to CP-ES-5003-F01.	11,13,15, 31-36	5/25/2021

REVISION/CHANGE LOG			
Revision/Change Letter	Description of Changes	Pages Affected	Date of Revision/Change
FR3	Resolution for #AI-0005792 and #AI-0005909 associated with CAPAs CA-003656 and CA-003655 respectively. General Revision of procedure with the addition of NOTEs in Section 6.3 and 6.7 addressing CAPAs. NOTEs include verbiage explaining situations in which data will be given to project before undergoing verification and assessment and that data being used in support of NCS purposes will include uncertainty and will be verified against laboratory data package before loaded into OREIS. Form CP3-ES-5003-F02 *Paducah Data Release to External Agencies* revised (deleted Site DC and Site TIO)	ALL	8/9/2022
FR3A	Periodic Review has been completed with no changes identified in procedure technical content. Nonintent change to FA, SME, Approver and dates has been incorporated per CP3-NS-2001. Date for review cycle has been reset.	All	10/4/2022
FR3B	Intent change change deleting verbiage " and the final data package" in Note above step 6.7.3. Deleted Environmental Monitoring Manager and revised to Sample Management Office Manager and update Subject Matter Expert and Approved By.	4-6, 8, 12	4/26/2023

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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure describes the process, including data collection and data review, to ensure consistent and quality assured data. This process ensures that all data released for decision making and/or external use have received adequate quality assurance reviews.

- Consistency is provided by the use of common resources and services such as the Sample Management Office (SMO), a centralized data system, and common definitions for data quality.
- Quality assured data is obtained through appropriate planning, adequate sampling and laboratory quality controls, and documented data review.

1.2 Scope

The requirements of this procedure apply to work performed by the Paducah Gaseous Diffusion Plant Deactivation and Remediation (PGDP D&R) personnel and subcontractors.

This procedure applies to screening and definitive data that is collected by all PGDP D&R projects at Paducah. The procedure allows for flexibility in implementation for programs and projects based on data collection needs and final use of the data.

Exceptions:

This procedure does **NOT** apply to any of the following:

- Historical data
- Data collected by the Safety and Health program
- Personnel and financial data
- Data generated through external agency operations, such as Kentucky Department for Environmental Protection
- Nondestructive assay (NDA) measurements
- Process technology data

2.0 REFERENCES

2.1 Use References

Chg B

- CP2-ES-0006, *Environmental Monitoring Plan Paducah Gaseous Diffusion Plant, Paducah, Kentucky*
- CP2-ES-0063, *Environmental Monitoring Data Management Implementation Plan at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*
- CP2-QA-1000, *Quality Assurance Program Description for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*
- CP2-WM-0001, *Four Rivers Nuclear Partnership, LLC, Paducah Deactivation and Remediation Project Waste Management Plan*
- CP3-ES-1034. *Nuclear Criticality Safety Requirements for Sample Labeling, Handling, and Assay Smears*

- CP3-QA-3001, *Issues Management*
- CP4-ES-5007, *Data Management Coordination*
- EPA QA/G-4, *Guidance for the Data Quality Objectives Process*
- *Paducah Gaseous Diffusion Plant Data Management Plan,* DOE/LX/07-2458
- *Paducah Gaseous Diffusion Plant Programmatic Quality Assurance Project Plan*
- *Project Specific Quality Assurance Project Plans (*QAPPs)

2.2 Source References

- None

3.0 COMMITMENTS

- NCSE GEN-01, *General Limits Used At PGDP*
- NCSE 111, *Characterization of Independent Samples in the C-709 and C-710 Laboratory Facilities*
- NCSR-FRNP-17-001, *Addressing Common Mode Failures of Independent Samples Sent Offsite for Analysis*

4.0 RESPONSIBILITIES

4.1 SMO

4.1.1 Populates project-specific laboratory statements of work (SOWs), chain-of-custodies (COCs), and labels in Project Environmental Measurements System (PEMS).

4.1.2 Performs loading of Electronic Data Deliverables (EDDs).

4.1.3 Performs electronic verification of data using queries in PEMS.

4.1.4 Tracks data assessment process.

4.1.5 Serves as the primary contact for all matters relating to the analytical laboratories.

4.1.6 Performs contractual screens.

4.1.7 Ensures that data validation deliverables meet the requirements specified in the SOW.

4.1.8 Performs loading of data into Paducah Oak Ridge Environmental Information System (OREIS).

4.2 Sample Management Office Manager

Chg B

4.2.1 Ensures long-term electronic storage of data.

4.2.2 Ensures compliance with Paducah Data Management Policy and Paducah Data Management Plan.

4.3 Data Reviewer

4.3.1 Performs data assessment.

4.3.2 Determines if quality assured data is generated.

4.3.3 Communicates any observations to Sample Management Office (SMO) Manager allowing manager to make a decision to initiate a Corrective Action Preventative Action (CAPA) report in the Issues Management system according to CP3-QA-3001, *Issues Management*. Chg B

4.4 Project Team

Assists team with the data collection planning, review, and decision making. Duties may include, but are **NOT** limited to the following:

- Data Reviewer
- SMO Manager Chg B
- Project Manager
- QA Reviewer
- Quality Representative
- Requester
- Sampling Personnel

4.5 QA Reviewer

4.5.1 Reviews data to ensure that data quality requirements are met.

4.5.2 Communicates any observations to SMO Manager allowing manager to make a decision to initiate a CAPA report in the Issues Management system according to CP3-QA-3001, *Issues Management*. Chg B

4.6 Requester

Coordinates sample collection, sample analysis, data assessment, and decision making.

4.7 Project Manager

Maintains responsibility and/or designates representatives, as needed:

- Technical lead
- Risk assessor
- Waste management coordinator
- Compliance coordinator
- Individual that needs data to support decision making

5.0 GENERAL INFORMATION

The collection, review, and management of data and information NOT addressed under this procedure are maintained in accordance with CP2-QA-1000, *Quality Assurance Program Description for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky.*

6.0 INSTRUCTIONS

NOTE:

Steps are performed sequentially unless otherwise noted.

6.1 Initiation of Data Collection

NOTE:

The Data Quality Objective (DQO) process used for data in support of making Nuclear Criticality Safety (NCS) decisions may deviate from Appendix D, *Options to Implementing and Documenting the DQO Process for Paducah Projects*, depending on NCS requirements.

Requester

6.1.1 Determine need for data to support the activity or program/project.

Requester/Project Team

6.1.2 Choose the DQO process option for the program or project outlined in Appendix D, *Options to Implementing and Documenting the DQO Process for Paducah Projects*.

6.1.3 Follow steps associated with the DQO process.

6.1.4 Select Quality Assurance (QA)/Quality Control (QC) requirements using Appendix E, *Data Quality Reference List* to incorporate into project plans.

6.1.5 Identify the data review steps for the project using Appendix F, *Options for Data Review*.

6.1.6 Ensure the following applicable plans are in place:

- Sampling Analysis Plan (SAP),
- Sampling Analysis and Event Plan (SAEP),
- CP2-QA-1000, *Quality Assurance Program Description for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*,
- CP2-ES-0006, *Environmental Monitoring Plan (EMP)*,
- CP2-WM-0001, *Four Rivers Nuclear Partnership LLC Paducah Deactivation and Remediation Project Waste Management Plan*,
- CP2-ES-0063, *Environmental Monitoring Data Management Implementation Plan (DMIP)*
- Project Specific DMIPs
- Project Specific QAPPs

6.1.7 Notify the SMO of electronic data quality checks that the project would like performed.

NOTE:

Routine sampling activities (i.e., groundwater, environmental monitoring, Kentucky Pollutant Discharge Elimination System [KPDES], etc.) are reviewed on a periodic basis.

6.1.8 Contact the SMO to develop the analytical SOW for new activities **OR** to notify of sample requests that are routine.

SMO

6.1.9 Develop project-specific laboratory SOW in PEMS.

6.1.10 Ensure the SOW specifies the analytical methods, reporting limits, and deliverable requirements.

6.1.11 Populate sample information in PEMS.

6.1.12 Generate COC forms, sample data forms, and labels from PEMS.

NOTE:

Samples requesting polychlorinated biphenyl (PCB) analysis (other than KPDES samples) require the lab to comply with the Toxic Substance Control Act (TSCA) and the Federal Facilities Compliance Act (FFCA). The laboratory basic ordering agreement (BOA) includes the signed agreement that is in place between U.S. Department of Energy (DOE) and the Environmental Protection Agency (EPA).

6.1.13 Ensure collection and shipment/delivery of samples to a SMO approved laboratory.

6.2 Process Laboratory Analytical Data

6.2.1 Import and load electronic data deliverables (EDD)s into PEMS.

6.2.2 Resolve any issues identified during loading data to PEMS.

6.3 Data Verification

NOTE:

Additional instructions for completing CP3-ES-5003-F01, *Data Assessment Review Checklist and Comment Form,* are provided on instructions page of CP3-ES-5003-F01*, Data Assessment Review Checklist and Comment Form*.

Situations may arise that require assay data to be provided to the project prior to undergoing data verification and data assessment due to projects having to make real-time decisions in the field. This requires approval of the SMO Manager.

Chg B

UF_6 safety sample data will be provided to operations personnel prior to undergoing data verification and data assessment due to projects having to make real-time decisions in the field.

6.3.1 Using PEMS, run data verification queries.

6.3.2 Conduct contractual screen:

1. Using PEMS, perform contractual screen by reviewing verification queries.

2. Resolve any issues identified during contractual screen with the laboratory.

3. Complete the required fields in the Data Verification section on form CP3-ES-5003-F01, *Data Assessment Review Checklist and Comment Form.*

4. Document any exceptions to the SOW.

Requester/Project Team/SMO

6.3.3 **If** deviations found during data verification cannot be readily resolved, **then** determine the usability of the data or the need for additional review of the data.

6.4 Data Validation

NOTES:

Contractual screen must be complete before data validation is performed.

CP3-ES-5003-F03, *Data Verification Checklist* must be completed when Level II, Level III, or Level IV data validation is required.

6.4.1 **If** data validation is **NOT** required, **then** proceed to Section 6.5.

SMO

6.4.2 Initiate data validation as defined in the plans listed in Step 6.1.6.

6.4.3 Develop a validation SOW for the data validation activity.

6.4.4 Submit the laboratory data packages to the validator or validation service selected.

6.4.5 Upon receipt of the data validation deliverables, review the results of the data validation report.

6.4.6 **If** data validation or deliverables are **NOT** acceptable, **then** resolve discrepancies with validator or validation service until acceptable.

6.4.7 Download data validation qualifiers into PEMS.

6.4.8 **If** validation qualifiers are entered manually, **then** ensure a QC check is performed as required by CP4-ES-5007, *Data Management Coordination*.

6.5 Data Assessment and Determination of Data Usability

NOTE:

Data validation must be accompanied by data assessment and is performed concurrent with data assessment.

Data validation can help ensure analyses are correct; however, data assessment must be performed to determine the data quality level (Data of Known Quality or Information only Data) and to ensure data is useable.

SMO

6.5.1 Using PEMS, create data assessment package by printing to pdf:

- data assessment queries (e.g. verify sampling completeness, verify qualifiers, etc.)

- data assessment reports (e.g. laboratory data, laboratory sample analysis comments, etc.)
- additional data assessment information (e.g. data loading notes, laboratory case narratives, etc.)

6.5.2 Provide the data reviewer, assigned by the requester/project team, with the data assessment package, CP3-ES-5003-F01 and CP3-ES-5003-F02, *Paducah Data Release Form*.

Data Reviewer assigned by the requester / project team

6.5.3 Begin data assessment using CP3-ES-5003-F01.

6.5.4 Review the analytical data provided in the data assessment package.

6.5.5 **If** reviewing data for the Environmental Monitoring program, **then** review for trends by using SMO provided trending charts **or** other equivalent means.

6.5.6 Complete the required fields and questions on CP3-ES-5003-F01.

6.5.7 Document any notes or comments on page 2 of CP3-ES-5003-F01 and submit to SMO.

SMO

6.5.8 **If** there are issues noted in the data assessment package by the Data Reviewer, **then** resolve issues **and**:

1. Ensure a documented response (either written or e-mail) is included in the data assessment package.

2. Provide the data assessment package to the Data Reviewer to ensure all comments or issues have been resolved.

Data Reviewer assigned by the requester/project team

6.5.9 Sign as Data Reviewer on CP3-ES-5003-F01.

6.5.10 Check Data Quality Level and Approval/Not Approved for Release **and** sign as Data Reviewer on CP3-ES-5003-F02.

6.5.11 Notify SMO when data assessment is complete.

NOTE:

The QA Reviewer and the Data Reviewer should be two separate individuals.

6.5.12 Provide the data assessment package to the QA Reviewer.

QA Reviewer

6.5.13 Review the data assessment package.

6.5.14 Document any notes or comments on page 2 of CP3-ES-5003-F01.

6.5.15 Return the data assessment package to the SMO.

SMO

6.5.16 **If** there are issues noted in the data assessment package by the QA Reviewer, **then** resolve issues **and**:

1. Ensure a documented response (either written or e-mail) is included in the data assessment package.

2. Print revised reports and/or queries from PEMS **and** place in data assessment package.

QA Reviewer

6.5.17 Sign as QA Reviewer on CP3-ES-5003-F01.

6.5.18 Notify SMO when QA review is complete.

SMO

6.5.19 Ensure all emails and the required forms are included in the data assessment package in proper order.

6.6 Data Release

SMO

NOTE:

A Derivative Classifier (DC) review is requested to ensure that the data or document does **NOT** contain any classified information. This review is required in order to flag data in Paducah OREIS as being approved for release. A Technical Information Officer (TIO) review is required prior to release of documents and/or information (e.g., data) to any parties outside FRNP, its subcontractors, and DOE. The DC and TIO reviews are only required for data related to non-environmental matrices.

6.6.1 **If** data is of non-environmental matrices (i.e., waste projects, characterization projects), **then** complete requestor portion of form PGDP-SS-FO-001,*Paducah Gaseous Diffusion Plant Classification Office/Technical Information Office and Operations Security Release Form.*

6.6.2 Submit PGDP-SS-FO-001 form and data package for DC and TIO review.

6.6.3 Once PGDP-SS-FO-001 has been completed, ensure all necessary signatures are present.

6.6.4 Add PGDP-SS-FO-001 to the data assessment package.

6.7 Loading Data to OREIS

6.7.1 Format data for loading to Paducah OREIS by creating a Ready-to-Load (RTL) file.

NOTE:

Data loaded to Paducah OREIS that is collected in support of making NCS decisions is verified against the laboratory data package to ensure data is loaded correctly.

NCSE GEN-01
NCSE 111
NCSR-FRNP-17-001

Verbal relay of analytical results taken for NCS purposes is prohibited.

6.7.2 Load data (RTL file) to Paducah OREIS.

NOTE:

The Paducah OREIS data report that includes uncertainty will be provided to the project for data collected in support of making NCS decisions. The data will be loaded to PEMS and will undergo data verification and data assessment.

The Paducah OREIS data report will be provided to the Characterization organization **when** sampling is requested by the Characterization organization.

Chg B

Requestor/Project Team

6.7.3 Make project decisions based on data.

6.7.4 **If** additional data needs to be collected, **then** return to Step **6.1.2**.

6.8 Records Management

6.8.1 Ensure all project records associated with the data collection activity, including all forms generated from this procedure, are transmitted to Records Management for submittal to Document Control for final disposition.

7.0 RECORDS

7.1 Records Generated

The following records may be generated by this procedure:

- Applicable queries, reports, and e-mails documenting identified deficiencies.
- CP3-ES-5003-F01, *Data Assessment Review Checklist and Comment Form*
- CP3-ES-5003-F02, *Paducah Data Release Form*
- CP3-ES-5003-*F03, Data Verification Checklist*
- DQOs (e-mails, meeting minutes, SAP, SAEP, answers to Appendix D questions, if applicable).
- Data Assessment Packages
- PGDP-SS-FO-001, *Paducah Gaseous Diffusion Plant Classification Office/Technical Information Office and Operations Security Release Form*

Forms are to be completed according to CP3-OP-0024, *Forms Control*.

7.2 Records Disposition

The records are to be maintained according to CP3-RD-0010, *Records Management Process*.

Appendix A – Acronyms/Definitions

ACRONYMS

ASTM – American Society for Testing Materials

BOA –Basic Ordering Agreement

CAPA -Corrective Action Preventative Action

COC – Chain of Custody

DC – Derivative Classifier

DMIP – Data Management Implementation Plan

DOE – United States Department of Energy

DQO – Data Quality Objectives

EDD – Electronic Data Deliverables

EMP – Environmental Monitoring Plan

EPA – United States Environmental Protection Agency

FFCA – Federal Facilities Compliance Act

FRNP – Four Rivers Nuclear Partnership

KPDES– Kentucky Pollutant Discharge Elimination System

MS – Matrix Spike

MSD – Matrix Spike Duplicate

NCS – Nuclear Criticality Safety

NCSA – Nuclear Criticality Safety Approval

OREIS – Paducah Oak Ridge Environmental Information System

OVA – Organic Vapor Analysis

PARCCS – Precision, Accuracy, Representativeness, Completeness, Comparability, Sensitivity

PEMS – Project Environmental Measurements System

PGDP D&R – Paducah Gaseous Diffusion Plant Deactivation and Remediation

QA – Quality Assurance

Appendix A – Acronyms/Definitions (Continued)

QC – Quality Control

RMDC – Records Management and Document Control

RI/FS – Remedial Investigation/Feasibility Study

RTL – Ready-to-Load

SAEP – Sampling Analysis and Event Plan

SAP – Sampling and Analysis Plan

SMO – Sample Management Office

SOW – Statement of Work

TIO – Technical Information Officer

TSCA – Toxic Substance Control Act

VOA – Volatile Organic Analysis

WMP – Waste Management Plan

DEFINITIONS

Contractual Screen – A process of evaluating a set of data against the requirements specified in the SOW to ensure that all requested information is received. The contractual screen includes, but is **NOT** limited to, the chain of custody (COC), analytes requested, method used, electronic data deliverables, units, holding times, and reporting limits achieved.

Data Assessment – A process for assuring that the type, quality, and quantity of data are appropriate for their intended use. It allows for the determination that the decision can be made with the desired level of confidence, given the quality of the data set. Data Assessment follows Data Verification and can be performed in parallel with Data Validation. Data Assessment must be performed to ensure data is useable.

Data Assessment Package – A package that includes data printouts from the integrated data system (i.e., PEMS), laboratory and sample management comments, CP3-ES-5003-F01, *Data Assessment Review Checklist and Comment Form*, CP3-ES-5003-F02, *Paducah Data Release*, routine queries generated to aid in the review of the data, and after the review is completed, any questions or comments by the Data Reviewer, SMO, or QA Reviewer. This package is submitted as a record to RMDC.

Data of Known Quality – Data, along with appropriate laboratory, verification, validation, and assessment qualifiers, that can be used for decision making purposes and was collected and managed according to this procedure.

Data Quality Checks – A list of quality control elements associated with a data collection activity, which are evaluated during data verification, data validation, and/or data assessment.

Appendix A – Acronyms/Definitions (Continued)

Data Quality Objectives (DQO) – A set of criteria established for the collection of data. The DQO process is a planning tool based on the scientific method that clearly identifies an environmental problem; the remedial decisions to address the problem; and the type, quantity, and quality of data needed to support the decision. This process is based on the DQO process developed by the Environmental Protection Agency (EPA). The DQO process may be applied in modified form to any data collection activity. The DQO process balances risk with cost in selecting the most appropriate data collection plan.

Data Reviewer – Performs independent review of data assessment package. Reviewer can be personnel from SMO, Waste Characterization Organization, project team, etc. Individual performing data assessment review may not be the same personnel performing the QA review.

Data Validation – A process performed for a data set by a qualified individual independent from sampling, laboratory, project management, or other decision making personnel for the project. Data validation evaluates the laboratory adherence to analytical method requirements.

Data Verification – A process for comparing a data set against a set standard or contractual requirement. Verification may be performed electronically, manually, or by a combination of both. Data verification includes contractual screen and can include other data quality checks established by the project team.

Definitive Data – Analytical measurements for which the presence, and corresponding concentration, of the target analyte(s) can be determined with a known degree of certainty. The measurements are supported with appropriate physical evidence documenting the acquisition and analysis. Definitive data in electronic form must be supported with retrievable, but **NOT** necessarily retrieved, physical evidence in the laboratory. This evidence can include analytical results, QA/QC results, chain of custody, logbooks, standards information, etc.

Electronic Data Deliverables (EDD) – Data that is received in electronic format from a laboratory, either through transfer on physical media or direct communication between computerized data management systems. EDD contents must meet defined completeness, consistency, and format requirements. These criteria are defined in the analytical SOW for each project.

External Agency – Any organization external to FRNP, its subcontractors, and DOE.

Information Only Data – Data for which quality is **NOT** assured and may or may **NOT** contain the appropriate qualifiers; however, data can be used for informational purposes or may be used for decision making with relevant documentation.

PARCCS Parameters – Precision, Accuracy, Representativeness, Completeness, Comparability, Sensitivity, as explained in Appendix E.

Quality Assured Data – Data that has undergone a documented review, as specified by this procedure, to provide confidence that the data conforms to established technical requirements and is sufficient for the intended use.

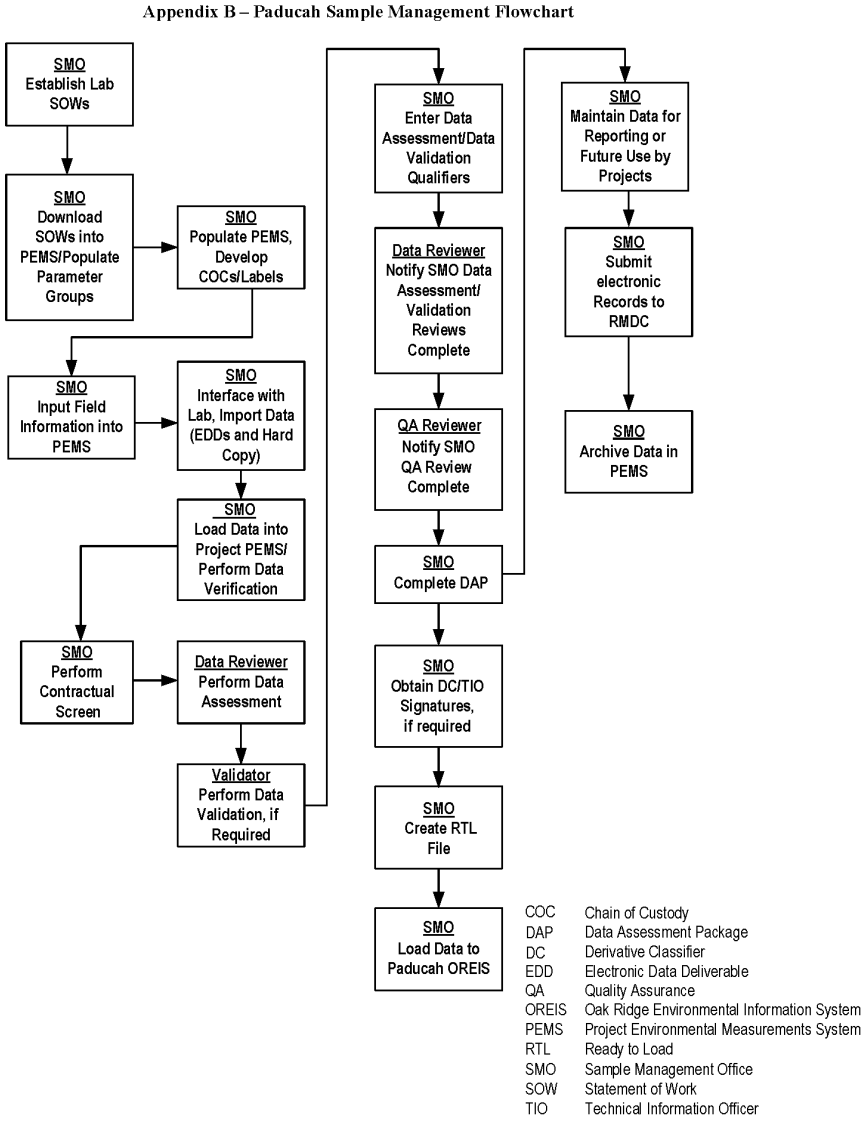
Appendix A – Acronyms/Definitions (Continued)

QA Reviewer –Performs independent review of data assessment package and verifies completion of assessment. Reviewer can be personnel from SMO, Waste Characterization Organization, project team, etc. Individual performing QA review may not be the same personnel performing the data assessment review.

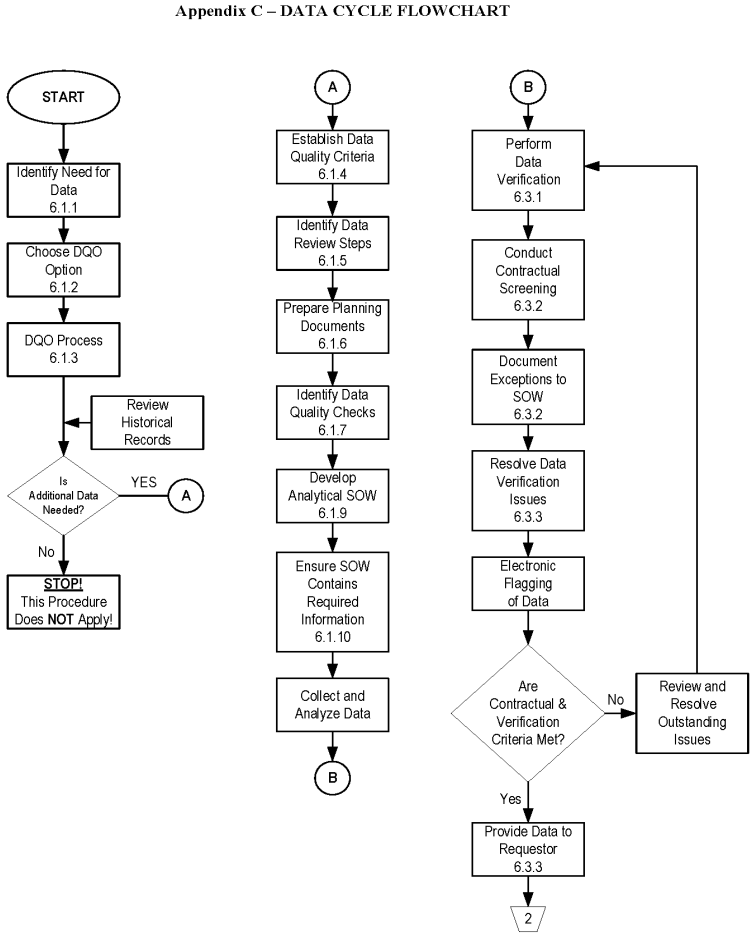
Screening Data – Measurements generated through the use of field or fixed laboratory methods in which the level of certainty in the data cannot be determined given physical evidence documenting the acquisition and analysis of the sample. Analytical methods producing field measurements or screening quality data include those that indicate the presence or absence of an analyte or class of analytes, or provide a semi-quantitative result. Field measurement and other screening quality data include, but are **NOT** limited to, Draeger tube; organic vapor analysis (OVA); soil gas surveys; radiation and contamination monitoring; and measurements for pH, conductivity, temperature, dissolved oxygen, and turbidity. Screening data results may be confirmed by collecting a specified percentage of definitive data.

Statement of Work - The contractual agreement between the requesting organization and the service provider. The SOW defines the scope of work including associated QA/QC, schedules, and deliverables.

Appendix B – Sample Management Flowchart

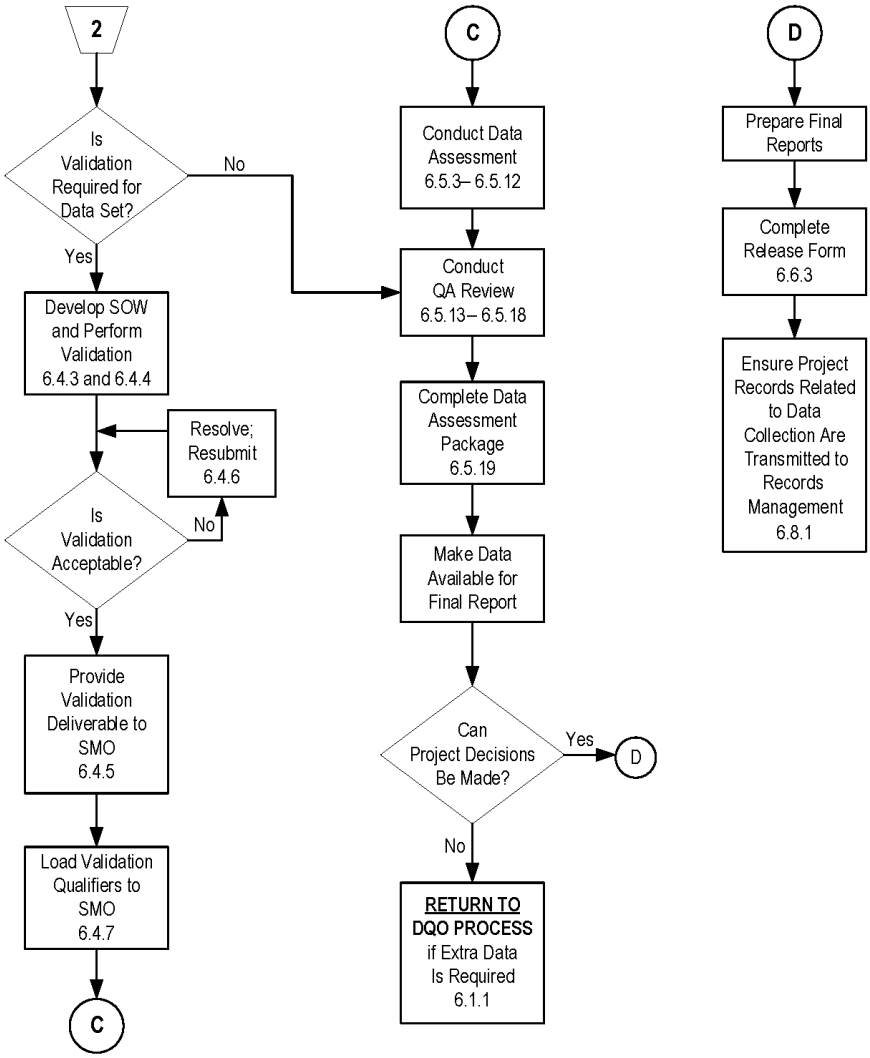


Appendix C – Data Cycle Flowchart



Appendix C – DATA CYCLE FLOWCHART (Continued)

Appendix C – DATA CYCLE FLOWCHART



Appendix D – OPTIONS TO IMPLEMENTING AND DOCUMENTING THE DQO PROCESS FOR PADUCAH PROJECTS INTRODUCTION

INTRODUCTION

The DQO process is a scientific and legally-defensible data collection and planning process to help users decide what type, quality, and quantity of data will be sufficient for decision making. This attachment is based on a series of planning steps designed to assure that data collected is adequate for the intended purpose.

PURPOSE

The purpose of this appendix is to provide options for implementing and documenting the DQO process.

DQO OPTIONS AND APPLICABILITY

Option 1

For Environmental Remediation projects, the detailed approach as found in the EPA *Guidance for the Data Quality Objectives Process* (EPA QA/G-4) is appropriate. For long-term environmental monitoring sampling programs and extensive waste sampling activities, this detailed and structured approach can be useful. However, full implementation of the process may not always be appropriate.

Option 2 (Minimum Requirements)

The following models are provided for guidance in documenting a simplified version of the DQO process. Use the applicable model for your project.

Model D.1 – ENVIRONMENTAL MONITORING PROJECTS – DQO PROCESS
Model D.2 – ENVIRONMENTAL RESTORATION PROJECTS – DQO PROCESS
Model D.3 – SITE CHARACTERIZATION PROJECTS – DQO PROCESS
Model D.4 – WASTE CHARACTERIZATION PROJECTS – DQO PROCESS

Option 3

A user-defined DQO process that includes the minimum requirements from Option 2 and any additional actions needed.

Appendix D – OPTIONS TO IMPLEMENTING AND DOCUMENTING THE DQO PROCESS FOR PADUCAH PROJECTS (Continued)

APPLICABILITY EXCLUSIONS

This attachment is **NOT** applicable to PCB spills, asbestos events, and environmental spills due to the quick response time and the well-defined actions to be taken in the event of the occurrence.

DOCUMENTATION

Documentation of the DQO process is required and will do the following:

- Provide a source of historic data and process knowledge for related sampling,
- Provide a tool for conducting data assessment,
- Facilitate efficient project management transfers, or
- Allow decisions to be recalled and defended.

The documentation may be presented in various ways and will include:

- An outline or text form following the format shown in this attachment. Include responses to the questions as separate, brief accounts of the information gathered, its sources, and the rationale for decisions made.
- References to various other documents, such as SAPs, SAEPs, QAPs, EMPs, WMPs, DMIPs, etc., as necessary.
- An e-mail and CP3-ES-1034-F01, *Sample Request Form,*are routinely provided for special sampling requests and serve as the DQO documentation.

Appendix D – OPTIONS TO IMPLEMENTING AND DOCUMENTING THE DQO PROCESS FOR PADUCAH PROJECTS (Continued)

Model D.1 – ENVIRONMENTAL MONITORING PROJECTS – DQO PROCESS

1. **The Problem and the Decision**--(The drivers for data collection activities.)
   - What is the description of the area of concern? (Where is the current location?)
   - What are the contaminants or analytes of interest? (What is the media of concern? What are the suspected contaminants? How were they selected? What are the known or potential routes of migration? What are the known or potential human and environmental receptors? What are the exposure pathways?)
   - What decision needs to be made regarding the area (i.e., disposition of waste, etc.)?

2. **Inputs to the Decision**--(The sources of data and information used to make the decision.)
   - What historical data exists? Is it adequate for use?
   - What process knowledge exists? Is it adequate for use?
   - What additional data must be collected? (What are the analytes and analytical methods?)

3. **Physical Boundaries to be Considered**--(Physical characteristics that affect the sampling design.)
   - What is the location of the potential contamination? (What are the depth and boundaries/geometry of the potential contamination area?)
   - What considerations affect the sample location choices? (Is the intention to characterize the average of the environmental media? What are the site conditions that affect sampling [power lines, trees, concrete pad, etc.]? Is it homogenous? Is the contamination level expected to be a continuous range?)
   - Are there other sampling constraints, such as temporal, schedule, seasonal concerns, regulatory requirements, etc.?

4. **Decision Statement and Uncertainty**
   - What are the steps to be taken after the analytical results are received? (Is this preliminary sampling? What results will trigger further testing, verification, or action? What additional steps will be taken? If I find ...., then what will I do? Consider the potential impact for making an incorrect decision based on the data.)

5. **Develop the Data Sampling Design**
   - State the type of data to be obtained. (Will it be screening, definitive, or a combination?)
   - State the approach to sample selection. (Will it be grab or composite, judgmental [selective] or random? Will it be a statistically-based selection?)
   - Optimize the design and approach for efficiency and effectiveness. (What confidence intervals are needed? What QA/QC will be required by sample method or this procedure? For minimum quality criteria, see Appendix E. For data validation requirements, see Appendix F. What additional QA/QC is requested?)

Appendix D – OPTIONS TO IMPLEMENTING AND DOCUMENTING THE DQO PROCESS FOR PADUCAH PROJECTS (Continued)

Model D.2 – ENVIRONMENTAL RESTORATION PROJECTS – DQO PROCESS

1. **The Problem and the Decision**--(The drivers for data collection activities.)
   - What is the description of the area of concern? (Where is the current location?)
   - What are the contaminants or analytes of interest? (What is the media of concern? What are the suspected contaminants? How were they selected? What are the known or potential routes of migration? What are the known or potential human and environmental receptors? What are the exposure pathways?)
   - What are potential corrective actions for this problem?
   - What decision needs to be made regarding the area (e.g., disposition of waste, etc.)?

2. **Inputs to the Decision**--(The sources of data and information used to make the decision.)
   - What historical data exists? Is it adequate for use?
   - What process knowledge exists? Is it adequate for use?
   - What additional data must be collected? (What are the analytes and analytical methods?)

3. **Physical Boundaries to be Considered**--(Physical characteristics that affect the sampling design.)
   - What is the location of the potential contamination? (What are the depth and boundaries/geometry of the potential contamination area?)
   - What considerations affect the sample location choices? (Is the intention to characterize the average of the environmental media or do you need to know the "hot spots"? What are the site conditions that affect sampling [power lines, trees, concrete pad, etc.]? Is it homogenous? Is the contamination level expected to be a continuous range?)
   - Are there other sampling constraints, such as temporal, schedule, seasonal concerns, NCS controls, regulatory requirements, etc.?

4. **Decision Statement and Uncertainty**
   - What are the steps to be taken after the analytical results are received? (Is this preliminary sampling? What results will trigger further testing, verification, or action? What additional steps will be taken? If I find ...., then what will I do? Consider the potential impact for making an incorrect decision based on the data.)

5. **Develop the Data Sampling Design**
   - State the type of data to be obtained. (Will it be screening, definitive, or a combination?)
   - State the approach to sample selection. (Will it be grab or composite, judgmental [selective] or random? Will it be a statistically-based selection?)
   - Optimize the design and approach for efficiency and effectiveness. (What confidence intervals are needed? What QA/QC will be required by sample method or this procedure? For minimum quality criteria, see Appendix E. For data validation requirements, see Appendix F. What additional QA/QC is requested?

Appendix D – OPTIONS TO IMPLEMENTING AND DOCUMENTING THE DQO PROCESS FOR PADUCAH PROJECTS (Continued)

Table D.3 – SITE CHARACTERIZATION PROJECTS – DQO PROCESS

1. **The Problem and the Decision**--(The drivers for data collection activities.)
   - What is the description of the area of concern? (Where is the location?)
   - What are the boundaries of the area that will be characterized?
   - What are the contaminants or analytes of interest? (What is the media of concern? What are the suspected contaminants? How were they selected?)

2. **Inputs to the Decision**--(The sources of data and information used to make the decision.)
   - What historical data exists? Is it adequate for use?
   - What process knowledge exists? Is it adequate for use? Are there any NCS hazards?
   - What additional data must be collected? (What are the analytes and analytical methods?)

3. **Physical Boundaries to be Considered**--(Physical characteristics that affect the sampling design.)
   - What is the location of the potential contamination? (What are the depth and boundaries/geometry of the potential contamination area?)
   - What considerations affect the sample location choices? (Is the intention to characterize the average of the environmental media? What are the site conditions that affect sampling [power lines, trees, concrete pad, etc.]? Is it homogenous? Is the contamination level expected to be a continuous range?)
   - Are there other sampling constraints, such as temporal, schedule, seasonal concerns, NCS concerns, regulatory requirements, etc.?

4. **Decision Statement and Uncertainty**
   - What are the steps to be taken after the analytical results are received? (Is this preliminary sampling? For what event? What results will trigger further testing, verification, or action? What additional steps will be taken? If I find ...., then what will I do? Consider the potential impact for making an incorrect decision based on the data.)

5. **Develop the Data Sampling Design**
   - State the type of data to be obtained. (Will it be screening, definitive, or a combination?)
   - State the approach to sample selection. (Will it be grab or composite, judgmental [selective] or random? Will it be a statistically-based selection?)
   - Optimize the design and approach for efficiency and effectiveness. (What confidence intervals are needed? What QA/QC will be required by sample method or this procedure? For minimum quality criteria, see Attachment E. For data validation requirements, see Appendix F. What additional QA/QC is requested?)

Appendix D – OPTIONS TO IMPLEMENTING AND DOCUMENTING THE DQO PROCESS FOR PADUCAH PROJECTS (Continued)

Model D.4 – WASTE CHARACTERIZATION PROJECTS – DQO PROCESS

The Problem and the Decision--(The drivers for data collection activities.)

- What is the description of the waste? (Where and when was it generated? What is the media and the volume? Where is it now?)
- Who needs information about the waste? Why do they need the information? (Waste Management for characterization purposes? Waste Management to determine TSD options? Waste Management to meet a specific vendor's WAC?)
- What are the contaminants or analytes of interest? (What are the suspected contaminants? How were they selected?)
- What decision needs to be made regarding the area (e.g., disposition of waste, NCS hazards,etc.)?

2. **Inputs to the Decision**--(The sources of data and information used to make the decision.)
   - What historical data exists? Is it adequate for use?
   - What process knowledge exists? Is it adequate for use?
   - What additional data must be collected? (What are the analytes and analytical methods?)

3. **Physical Boundaries to be Considered**--(Physical characteristics of waste that affect sampling design.)
   - What is the location of the potential contamination? (Surface contamination or volumetric?)
   - What considerations affect the sample location choices? (Is the intention to characterize the average of the waste stream or do you need to know the "hot spots"?)
   - How is the waste containerized?
   - Are there sampling problems? (What is the geometry of the waste? Is it homogenous? Is the contamination level expected to be a continuous range?)
   - Are there other sampling constraints, such as temporal, schedule, seasonal concerns, NCS concerns, regulatory requirements, etc.?

4. **Decision Statement and Uncertainty**
   - What are the steps to be taken after the analytical results are received? (Is this preliminary sampling? What results will trigger further testing, verification, or action? What additional steps will be taken? If I find ...., then what will I do? Consider the potential impact for making an incorrect decision based on the data.)

5. **Develop the Data Sampling Design**
   - State the type of data to be obtained. (Will it be screening, definitive, or a combination?)
   - State the approach to sample selection. (Will it be grab or composite, judgmental [selective] or random? Will it be a statistically-based selection?)
   - Optimize the design and approach for efficiency and effectiveness. (What confidence intervals are needed? What QA/QC will be required by sample method or this procedure? For minimum quality criteria, see Appendix E. For data validation requirements, see Appendix F. What additional QA/QC is requested?)

Appendix E – DATA QUALITY REFERENCE LIST

INTRODUCTION

The following information is an aid to the project manager, project scoping team members, and/or DQO facilitators to select the project data quality elements. This information should be obtained during the sampling design optimization step in Appendix D, Step **5**, or Step **7** of the Data Quality Objectives Process in EPA QA/G-4, *Guidance for the Data Quality Objectives*. The minimum requirements are listed for screening and/or definitive data. A program/project manager may choose to implement quality control above the minimum requirements; however, certain data quality elements are not applicable to screening data.

PURPOSE

The purpose of this appendix is to provide a reference list of data quality elements and data quality requirements for a data collection activity. The selected elements should be incorporated into applicable project plans.

SCREENING AND DEFINITIVE DATA

There are two types of data generated using this procedure. Screening Data is defined in Appendix A and generally refers to qualitative data. Screening data has been previously termed EPA Levels I and II. In order to increase confidence, screening data results should be confirmed by collecting a specified percentage of definitive data. The recommended percentage of definitive data for confirming screening data is 10 percent. This, in turn, makes the data more usable for decision making. Definitive Data also is defined in Appendix A and describes data usually generated from a fixed-based laboratory following appropriate quality control requirements for various analytical methods.

Definitive data has been previously termed EPA Levels III, IV and V. In this appendix and in appendix F, screening data is categorized by S, S1, or S2, depending on the level of detail needed for the data collection activity. Definitive data is categorized by D, D3A, D3B, D4, and D5. Appendix F provides additional explanation and examples for the categories.

Appendix E – DATA QUALITY REFERENCE LIST (Continued)

PARCCS PARAMETERS

Data are only useable if the precision and accuracy is known. Data is only useable for decision making if it is also precise, accurate, representative of the whole, comparable to expectations, complete as planned, and sensitive as needed. These requirements are known as the PARCCS parameters and are explained in detail below. Data quality criteria should be chosen to address all six parameters. The PARCCS parameters should be reviewed during data assessment.

Precision--a quantitative measurement of the variability of a group of measurements as compared to their average. Usually expressed as a percentage or a standard deviation, it evaluates the reproducibility of the system. Sample duplicates measure the reproducibility of the sampling event, while lab replicates measure the precision of the analytical process. The acceptable precision may be defined by the laboratory method used.

Accuracy--a quantitative measurement of the bias of the data. It represents how close the measurement data is to the true value. Sampling accuracy can be assessed by evaluating field and trip blanks. Analytical accuracy is measured by percent recoveries associated with the laboratory analytical control spikes (blank spikes), surrogate spikes, or matrix spikes. The acceptable accuracy may be defined by the laboratory method used.

Representativeness--a qualitative measurement of the ability of a sample or group of data to adequately describe or define the conditions being measured. Precision, accuracy, and completeness all affect representativeness. Sampling strategy (location, method, and frequency) is critical to assure that the samples statistically represent the population. Laboratory precision and accuracy reflect how representative the data is of the sa
mple.

Completeness--a quantitative measurement of the percentage of acceptable data as compared to the number planned. Both sampling and analytical completeness can be measured.

Comparability - a qualitative measurement of the confidence with which one data set can be compared with another. Comparability is achieved by using standard techniques for collection and analysis.

Sensitivity – the sensitivity of analysis (or the detection limit) is determined by the analytical method and the laboratory analyst and instrumentation.

Appendix E – DATA QUALITY REFERENCE LIST (Continued)

DATA QUALITY REFERENCE LIST		
Data Quality Element	**Minimum For: Screening (S) Definitive (D)**	**PARCCS**
Field Sampling Quality Control		
Sample Logbooks	S, D	Representativeness, Completeness
Sample Chain of Custody (COC)	S, D	Representativeness, Completeness
Transcription - Logbook vs. COC	S, D	Representativeness, Completeness
Containers	S, D	Representativeness
Preservation	S, D	Representativeness
Field Duplicates	S, D (5% Min for S, D)	Precision
Trip Blanks (VOA Only)	S, D (5% Min for S, D)	Accuracy
Field Blanks	S, D (5% Min for S, D)	Accuracy
Equipment Rinseates	S, D (5% Min for S, D)	Accuracy
Sampling Completeness Requirement		Representativeness, Completeness
Field/Laboratory Methods[a]	**Screening:** Analyte or instrument specific **Definitive:** SW-846, EPA, ASTM	
Analytical/Measurement Quality Control[b]		
Initial Calibration of Instrument	S, D	Accuracy
Calibration Check of Instrument	S, D	Accuracy
Calibration Range	S, D	Accuracy
Reporting Detection Limits (Method)	S, D	Comparability, Sensitivity
Analytical Error Determination	D	Precision, Accuracy
Laboratory COC	S, D	Representativeness, Completeness
Transcription COC vs Samples	S, D	Representativeness, Completeness
Holding Times	S, D	Representativeness, Comparability
Analytical Method	S, D	Comparability
Method Units	S, D	Accuracy, Comparability
Calculation Verifications	S, D	Representativeness, Completeness
Transcription-Lab data vs. EDD/Report	D	Representativeness, Completeness
Analytical Completeness Requirement	S, D	Precision
Lab Duplicates	S[b], D[b]	Accuracy, Precision
Blank Duplicates	D	Accuracy
Reagent Blanks	D[b]	Accuracy
Method Blanks	D[b]	Accuracy
Spikes/Laboratory Control Samples	D[b]	Accuracy
Matrix Spikes	D[b]	Precision
Matrix Spike Duplicates	D[b]	Accuracy
Post Digestion Spikes	D[b]	Precision, Accuracy
Performance Samples	S[b], D[b]	Accuracy
Interference Check Samples	D[b]	Accuracy

Appendix E – DATA QUALITY REFERENCE LIST (Continued)

DATA QUALITY REFERENCE LIST		
Data Quality Element	**Minimum for: Screening (S) Definitive (D)**	**PARCCS**
Analytical Deliverables	Electronic Data Deliverables (EDD) and hard copy results	
Identification number (sample number or location name)	S, D	
Date/time sampled	S, D	
Lab sample number	D	
Date analyzed	S, D	
Date completed	S2, D	
Parameter/analyte	S, D	
Qualifier	S, D	
Results	S, D	
Units	S, D	
Comments	S2, D	
Method (lab and field)	S2, D	
Blanks	S2, D	
Spikes (MS*, MSD*, blank [DI water spiked-provides feedback on the matrix effect])	D	
Surrogates, if applicable		
Lab duplicates*	D	
Reporting Detection Limits	D	
Former Level III Data Package	D	
Former Level IV Data Package Former Level V Data Package	These data packages include minimum definitive data elements plus additional information.	
Data Verification Percentages	S, D 100% for both	
Data Validation Percentages	D 5% Min**	
Data Assessment[c]	100%	

[a] If ER, waste characterization, or compliance monitoring activities are planned, SW-846 methods must be considered. If SW-846 methods are **NOT** available, use EPA-approved methods. If a remedial design is planned, ASTM methods must be considered. If environmental monitoring data is collected, EPA methods must be considered.

[b] Analytical quality control is dependent on the method specified.

[c] NOTE: 100% of the data should be assessed. However, individual project records, such as logbooks, chain of custody forms, etc., should be reviewed on a project designated frequency.

* Lab duplicates are optional and can be performed at lab or customer request. If doing a field duplicate, a lab duplicate is not value added.

** A greater percentage of validation may be required for some projects (i.e., risk assessments and remedial investigations). The project teams can increase as needed to ensure valid data.

S = S1 or S2 as defined in Appendix F.

D = D3A, D3B, D4, or D5 as defined in Appendix F

Appendix F – OPTIONS FOR DATA REVIEW

INTRODUCTION

To ensure the process for data quality continues, data review must be performed for results received from a data collection activity. The three elements of data review outlined in this procedure are verification, validation, and assessment.

PURPOSE

The purpose of this appendix is to provide guidelines for data review. The documentation checklist to be used for assessment of a data collection activity is also provided in this appendix.

DATA VERIFICATION

Data verification is the first step of data review. The preferred method for performing verification is electronic. Verification criteria are documented using the Data Assessment Review Checklist or the Data Verification Checklist (if Level II, Level III, or Level IV data validation is required). The extent of verification is based on the data category as demonstrated in the table below.

DATA VALIDATION

Data validation follows verification in the data review process. The data validation options in this appendix are similar to the format specified by the former EPA data quality levels with the exception of diverging from the former EPA Level III data validation. Grade 3A, as listed in the following Review Options and Applicability table, is a less rigorous form of validation based on the minimum data deliverable requirements. Grade 3B, Grade 4, and Grade 5 are the same as the former EPA Level III, Level IV, and Level V data validation, respectively. All grades of validation must be performed by a third party. Third party validation is defined as validation performed by persons independent from sampling, laboratory, and decision making for the project (i.e., not the project manager). Data validation is documented in a formal deliverable from the data validator. The option chosen (level and frequency) for validation is based on data category and the following considerations:

- Regulatory drivers/requirements
- End-user of data
- Future applicability of the data (other users such as regulatory agencies, risk assessment personnel, internal users, etc.)
- Legal ramifications and defensibility of data
- Confidence in laboratory (DOECAP approved laboratory)

The data set to be validated may be determined programmatically or by the individual project. The option chosen for data validation should be made by the project team.

DATA ASSESSMENT

Data assessment is the last review step prior to release of the data from the project team. It is an integration of all information collected about a result. Data verification and validation can ensure analyses are correct; however, data assessment must be performed to evaluate data usability. This includes a review of the data itself, the results of all previous reviews of the data, checking data for trends, and evaluation against the intended purpose for data collected. Data assessment must be performed for all data collection activities and documented using the Data Assessment Review Checklist. Data assessment is required prior to use of the data, or data release into the final data repository (i.e., Paducah OREIS). Data assessment frequency is determined based on decision making and releasability requirements. This decision is made by the project team.

Appendix F – OPTIONS FOR DATA REVIEW (Continued)

REVIEW OPTIONS AND APPLICABILITY

Data Category	Examples for Generation of Category	Former Level of Data	Data Verification	Data Validation	Data Assessment
Screening Data S1	OVA Qualitative	Level I or A	100% Grade 1 or None Review only the sample results presented.	NA	100%
Screening Data S2	Portable field GC Hydrolab pH, Conductivity Qualitative Semiquantitative	Level II or B	100% Grade 2 Electronic review of data. Review of quality control samples as defined in the Data Assessment Review Checklist	NA	100% Comparison to definitive data results, if applicable.
Definitive Data D3A	Routine laboratory Quantitative	Level III or C	100% Grade 3A	5% Validation would consist of looking at the criteria in the minimum lab deliverable in Attachment E, plus any additional information required for the program/project.	100%
Definitive Data D3B	Routine laboratory RI/FS Quantitative	Level III or C	100% Grade 3B	5% Traditional Level III data validation on a data package.	100%
Definitive Data D4	Routine laboratory Quantitative, RI/FS More rigorous QC	Level IV or D	100% Grade 4	5% Same as Grade 3B plus raw data.	100%
Definitive Data D5	Not standard methods Unusual parameters	Level V or E	100% Grade 5	5% Same as Grade 3B on the user-defined lab.	100%

Appendix G – CP3-ES-5003-F01 - Data Assessment Review Checklist and Comment Form

CP3-ES-5003-F01-Data Assessment Review Checklist and Comment Form

Project ID:			Project Title:				
ITEM			YES	NO	NA	COMMENTS	*
DATA VERIFICATION 1. Are analytical methods, units, and reporting detection limits correct as specified according to the laboratory SOW and regulatory limits?							
Data Quality Checks	Analytical Method	SMO:	Date:				
	Method Units	SMO:	Date:				
	Detection Limits	SMO:	Date:				
2. Have the impacts of holding time violations been evaluated?							
Data Quality Checks	Holding Times	SMO:	Date:				
3. Is data complete as planned?							
Data Quality Checks	Analytical Completeness	SMO:	Date:				
	Sampling Completeness	Data Reviewer:	Date:				
DATA VALIDATION 4. Does data validation indicate that data is useable?							
Data Quality Checks	Miscellaneous Laboratory Quality Control Samples	Data Reviewer:	Date:				
DATA ASSESSMENT 5. Are quality control sample results acceptable?							
Data Quality Checks	Field Duplicates	Data Reviewer:	Date:				
	Trip Blanks/Refrigerator Blanks (VOAs Only)	Data Reviewer:	Date:				
	Field Blanks	Data Reviewer:	Date:				
	Equipment Rinseates	Data Reviewer:	Date:				
6. Does the sampling design and data provide enough information to support Data Quality Objectives (DQOs) and the current decision?							
7. Have impacts of data qualifiers and laboratory comments from field samplers and laboratory technicians been considered?							
Data Quality Checks	Sample Logbooks	Data Reviewer:	Date:				
	Sample Chain of Custody	Data Reviewer:	Date:				
	Containers/Preservatives	Data Reviewer:	Date:				
8. Is data reasonable when compared to known/expected levels?							
9. Have outliers been evaluated to determine the possible cause?							
10. Is data of adequate quality to be used?							
DECISION DETERMINATION 11. Was this data generated according to Procedure "Quality Assured Data" and is data "Data of Known Quality?"							
12. Can current decision be made from this data based on this review?							

Data Assessment Performed By:
Data Reviewer: _____ Date: _____
(Performed assessment and data can be made available for final reporting.)

QA Reviewer: _____ Date: _____
(Reviewed and verified completion of assessment)
* Place a "check mark" in this column if assessment qualifiers are applied to the data.

Appendix G – CP3-ES-5003-F01 - Data Assessment Review Checklist and Comment Form (Continued)

CP3-ES-5003-F01-Data Assessment Review Checklist and Comment Form (Continued)

Project ID:	Project Title:	
Comment	Action Required	Comment

Appendix G – CP3-ES-5003-F01 - Data Assessment Review Checklist and Comment Form (Instructions page 1 of 2)

Data Assessment Review Checklist and Comment Form
(Instructions page 1 of 2)

INTRODUCTION

The Data Assessment Review Checklist will be used by applicable data review personnel to perform data assessment on a particular set of data. The purpose of this attachment is to document the **Data Quality Checks** and results of the review performed during **Data Assessment**.

DATA QUALITY CHECKS

Data Quality Checks are a list of field sampling and analytical/measurement quality control elements associated with a data collection activity, which are evaluated during data verification, data validation and/or data assessment. The table below identifies the Data Quality Checks that are routinely reviewed and the data review step where the Data Quality Check is evaluated. The Data Quality Checks are divided on the Data Assessment Review Checklist under the appropriate question to which it applies.

Data Quality Checks in the Data Review Process		
Data Verification	**Data Validation**	**Data Assessment**
• analytical method • method units • detection limits • holding times • analytical completeness	• initial and continuing calibration and the associated calibration range • analytical error determination • laboratory COC • calculations • laboratory duplicates • blank duplicates • reagent blanks • method blanks • spikes/laboratory control samples • matrix spikes/matrix spike duplicates • postdigestion spikes • performance samples • interference check samples	• sample logbooks • chain of custody records • containers • preservatives • field duplicates • trip blanks • refrigerator blanks • field blanks • equipment rinseates • sampling completeness • data quality objectives • trend charts

Appendix G – CP3-ES-5003-F01 - Data Assessment Review Checklist and Comment Form

Data Assessment Review Checklist and Comment Form
(Instructions page 2 of 2)

INSTRUCTIONS FOR COMPLETING THE ATTACHMENT

The **Project ID** and **Project Title** are to be documented at the top of the attached form, "Data Assessment Review Checklist."

The **Data Quality Checks** are indicated on the form by the shaded rows and are completed by either the **SMO** or the **Data Reviewer**. The first items to be completed on the form are the Data Quality Checks related to Data Verification. The SMO completes the checks related to Contractual Screening. These checks include **Analytical Method**, **Method Units**, **Detection Limits**, **Holding Times**, and **Analytical Completeness**. The **Sampling Completeness** check is completed by the Data Reviewer. Upon completion of performing the data verification steps, the SMO and Data Reviewer will initial and date the appropriate row, make any clarifying comments in the **Comments** column, document any significant information, comments, or questions by e-mail or with the "Data Assessment Comment Form" on page 2 of form CP3-ES-5003-F01.

The Data Reviewer will check the analytical/measurement quality control elements during Data Validation (see table on instructions page 1 of form CP3-ES-5003-F01 for a listing). If data validation was not performed for the data set, the Data Reviewer will indicate "N/A."

The Data Reviewer will check the field sampling quality control elements during Data Assessment (see table on instructions page 1 of form CP3-ES-5003-F01 for a listing) based upon information received from the Sampling group. If specific field sampling quality control elements were not performed for the data set, the Data Reviewer will indicate "N/A."

The Item column provides the major questions needed to perform data assessment. The Data Reviewer will proceed to review the information provided by the SMO, including the data set, and answer Question 1 through Question 12 on the "Data Assessment Review Checklist." The appropriate answer to the question will result in one of the **YES**, **NO**, or **N/A** columns being checked, and if necessary for explanation purposes, additional information written in the **Comments** column. Any significant information, comments, or questions must be documented either by e-mail or with the "Data Assessment Comment Form" on page 2 of form CP3-ES-5003-F01. If any data assessment qualifiers are applied during the review of the data, a "check mark" will be placed in the last column, denoted by the "*" to aid the Data Reviewer in ensuring the placement of the assessment qualifiers in the database. Once all questions are answered, the Data Reviewer will complete the form by signing on the "Data Assessment Performed By" signature.

The **QA Reviewer** is responsible for performing a final review of the data set and verifying that all issues and questions are resolved and that the checklist is complete. The QA Reviewer will complete the "Data Assessment Review Checklist" by signing on the "QA Reviewer" signature.

Appendix H – CP3-ES-5003-F02 - Paducah Data Release Form

CP3-ES-5003-F02 - Paducah Data Release Form

Data Reviewer:	Project ID:
Project Title:	
Data Quality Level: ☐ Data of Known Quality—Data, along with appropriate laboratory, verification, validation, and assessment qualifiers, can be used for decision making purposes and was collected and managed per procedure CP3-ES-5003. ☐ Information Only Data—Data quality is not assured and may or may not contain the appropriate qualifiers; however, data can be used for informational purposes or can be used for decision making with relevant documentation.	
☐ Approval for Release to: 1. _____ 2. _____ 3. _____ (List specific organizations to release to.) ☐ Not Approved for Release: _____ (Explanation) (Attach necessary documentation for additional release criteria.):	
Data Reviewer (or Designated Alternate): _____ Date: _____ (Signature Required)	

Appendix I – CP3-ES-5003-F03 - Data Verification Checklist

CP3-ES-5003-F03 - Data Verification Checklist

Project ID:	**Laboratory:**	**SDG(s):**

Data Package Review	Yes	No	NA
1. What data package level was requested from the laboratory? (circle one) Level 1 Level 2 Level 3 Level 4 Other			
2. Has all data been received from the laboratory in the correct deliverable format?			
3. Has any missing information been requested and received from the laboratory?			
4. Is a laboratory case narrative and/or cover letter present?			
5. Are chain of custody (COC) forms present for all samples?			
6. Are samples traceable through inspection of signature records on field and laboratory COCs?			
7. Do the COCs or case narrative indicate any problems with the sample receipt, condition of the samples, analytical problems, or special circumstances that would affect the quality of the data?			
Action: For any samples not traceable upon inspection of COCs, indicate the identities below and where the break in traceability occurred. For any other issue noted with the data package review, please provide a brief description of what occurred and what effect, if any, on data quality it may have.			

Holding Times and Sample Preservation	Yes	No	NA
8. Has a holding time violation occurred in which the acceptable hold time from sample collection to extraction or preparation been exceeded?			
9. Has a holding time violation occurred in which the acceptable hold time from sample extraction (or preparation) to analysis been exceeded?			
10. For samples submitted to the laboratory on the same day as sample collection, is there evidence that ice (if required) was present in coolers and sample cooling had begun?			
11. For samples shipped to the laboratory, were temperatures of samples upon receipt within acceptance criteria when temperature preservation is required?			
12. Has the laboratory indicated that any samples were received with improper chemical preservation?			
Action: Identify all samples that are outside of hold time or do not meet sample preservation and provide a description of the problem. For any other issue noted with the data package review, please provide a brief description of what occurred and what effect, if any, on data quality it may have.			

Sample Methodology	Yes	No	NA
13. Have all analytical methods been verified to match the requested analytical method?			
14. Are any requested analytes missing from the reported data?			
15. Are all samples reported with the correct units?			
16. Were all required reporting limits achieve?			
Action: Please provide a brief description of any issues with methods, missing data, units, or reporting limits.			

Appendix I – CP3-ES-5003-F03 - Data Verification Checklist (Continued)

CP3-ES-5003-F03 - Data Verification Checklist (continued)

Surrogates	Yes	No	NA
17. Does a review of reported data indicate that a sample surrogate (if required) is outside acceptable criteria? (Note: This could be identified by the laboratory in the case narrative, or on footnotes and/or data qualifiers reported on Form 1s or equivalent.)			
Action: Identify the sample(s) affected and the surrogate recovery. Follow the guidelines in the appropriate Data Verification and Validation Plan for qualification requirements, or provide this information to the data validator for further qualification.			

Laboratory Control Samples	Yes	No	NA
18. Are LCS results included in the data package?			
19. Does a review of reported data indicate that the LCS recovery related to a sample is outside acceptance criteria? (Note: This could be identified by the laboratory in the case narrative, or on footnotes and/or data qualifiers reported on Form 1s or equivalent).			
Action: Identify the sample(s) affected. Follow the guidelines in the appropriate Data Verification and Validation Plan for qualification requirements, or provide this information to the data validator for further qualification.			

Blank Results	Yes	No	NA
20. Are results for method and/or prep blanks included in the data package?			
21. Were there any positive detections identified in the method or prep blank?			
22. Have any field QC blanks been included in the data package? This may include field blanks, rinseate blanks, trip blanks, etc.			
23. Were there any positive detections identified in the field QC blanks?			
Action: If associated sample results are nondetect for the analyte(s) detected in the blank, then no further action is required. For samples with positive results, identify the samples that are affected by a positive blank detection. In the case of a method or prep blank, the laboratory will typically place a "B" qualifier on affected data. For the field QC blanks, identify the samples that are associated with the blank. Follow the guidelines in the appropriate Data Verification and Validation Plan for qualification requirements, or provide this information to the data validator for further qualification.			

Matrix Spike/Matrix Spike Duplicates	Yes	No	NA
24. Are MS/MSD results included in the data package?			
25. Are the recovery limits for the MS/MSD within acceptable limits?			
26. Are RPD results reported for MS/MSD analysis within acceptance limits?			
Action: Identify the sample(s) affected. Never qualify data based on the MS/MSD alone. Follow the guidelines in the appropriate Data Verification and Validation Plan for qualification requirements, or provide this information to the data validator for further qualification.			

Appendix I – CP3-ES-5003-F03 - Data Verification Checklist (Continued)

CP3-ES-5003-F03 - Data Verification Checklist (continued)

Duplicates	Yes	No	N/A
27. Does the data package include field or lab duplicates?			
28. Does the calculated RPD and/or the mean difference meet acceptance criteria?			

Action: Identify the parent and field duplicate samples below. Calculate the RPD and/or mean difference between the two samples. Follow the guidelines in the appropriate Data Verification and Validation Plan for qualification requirements, or provide this information to the data validator for further qualification.

By signing below, the person performing the Data Verification Checklist is verifying that all data received has been generated in accordance with the procedure CP3-ES-5003, *Quality Assured Data* and is *data of known quality*.

Data Verification
Performed by:_____Date: _____

QA Review:_____Date: _____