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Fluor Federal Services, Inc. Paducah Deactivation Project

CP3-ES-5003 Rev. 0B	TITLE: Quality Assured Data	Page 1 of 38

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0	Initial Release	ALL	12/22/15
0A	Changed CP3-ES-5007 to CP4-ES-5007, changed CP4-ES-5003-F01 to CP3-ES-5003-F01, changed page 1 to instructions page in 6.5 Note, changed page 4 to page 2 of CP3-ES-5003-F01 in section 6.5. Deleted Table D.2 (duplicate table); added Table D.4 in Appendix D. Added Paducah to Appendix H title. Revised forms: CP3-ES-5003-F01,-F02,-F03 changing CP4-ES-5003 to CP3-ES-5003 and adding form number to title.	3,6,7,8,9, 24,31,32, 33,34,35, 36,37,38	6/22/15
0B	Added Exceptions to section 1.2, added section 6.1 Note, and added language to section 6.5 Note regarding NCS and safety sample data.	3,5,8	3/20/17

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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 Fluor Federal Services, Inc. Paducah Deactivation Project (FPDP) for the U. S. Department of Energy (DOE)-owned Paducah Site and subcontractors. This procedure applies to screening and definitive data that is collected by all FPDP 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 as defined in Appendix A
- 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

ChgB

2.0 REFERENCES

2.1 Use References

- CP2-QA-1000, *Quality Assurance Program Description for the Fluor Federal Services, Inc., Paducah Deactivation Project*

2.2 Source References

- CP2-WM-0001, *Fluor Federal Services, Inc. Paducah Deactivation Project Waste Management Plan*
- CP4-ES-5007, *Data Management Coordination*

ChgA

- EPA QA/G-4, *Guidance for the Data Quality Objectives Process*
- *EPA QA/G-9, Guidance for Environmental Data Quality Assessment*

3.0 COMMITMENTS

NCSA GEN-001, *General Plant Limits for Activities Performed at PGDP*

4.0 RESPONSIBILITIES

4.1 Scientist/Data Entry Specialist

4.1.1 Assists the project in populating Project Environmental Measurements System (PEMS).

4.1.2 Performs loading of Electronic Data Deliverables (EDDs).

4.1.3 Performs electronic verification of data.

4.1.4 Tracks data assessment process.

4.2 Environmental Monitoring Manager

4.2.1 Ensures long-term electronic storage of data.

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

4.2.3 Ensures compliance with Paducah Data Management Policy.

4.3 Data Reviewer

4.3.1 Performs data assessment.

4.3.2 Determines if quality assured data is generated.

4.4 Scientist

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

4.4.2 Performs contractual screenings.

4.4.3 Ensures that data validation deliverables meet the requirements specified in the Statement of Work (SOW).

4.5 Project Team

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

- Data Reviewer
- Environmental Monitoring Manager
- Project Manager
- QA Reviewer
- Quality Representative

- Requestor
- Sampling Personnel

4.6 QA Reviewer

Reviews data to ensure that data quality requirements are met.

4.7 Release Requester

Requests release of data to an external agency.

4.8 Requester

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

4.9 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 Fluor Federal Services, Inc., Paducah Deactivation Project.*

6.0 INSTRUCTIONS

NOTE:

Steps are performed sequentially unless otherwise noted.

6.1 Initiation of Data Collection

NOTE:

The 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. ChgB

Requester

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

Requester/Project Team

6.1.2 Choose the Data Quality Objective (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 applicable plans, such as the Sampling and Analysis Plan (SAP), CP2-QA-1000, *Quality Assurance Program Description for the Fluor Federal Services, Inc., Paducah Deactivation Project*, Environmental Monitoring Plan (EMP), CP2-WM-0001, *Fluor Federal Services, Inc. Paducah Deactivation Project Waste Management Plan,* and Project Data Management Implementation Plan (DMIP) are in place.

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

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

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

6.1.9 Ensure the SOW contains the required methods, detection limits, and deliverables. For samples requiring polychlorinated biphenyl (PCB) analysis (other than KPDES samples), the laboratory basic ordering agreement (BOA) includes the Toxic Substance Control Act (TSCA)/Federal Facilities Compliance Act (FFCA) signed agreement that is in place between DOE and the Environmental Protection Agency (EPA). The laboratory must comply with the agreement.

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

6.2 Laboratory Contractual Screening

Scientist

6.2.1 Upon receipt of data from the laboratory, conduct contractual screening using PEMS.

6.2.2 Resolve any issues identified during contractual screening with the laboratory.

6.2.3 Complete the appropriate sections of form CP3-ES-5003-F01, *Data Assessment Review Checklist and Comment Form* and document any exceptions to the SOW. ChgA

6.3 Data Verification

Scientist/ Data Entry Specialist

6.3.1 Perform electronic review **and** ensure data is flagged correctly.

6.3.2 Resolve any issues identified during electronic review.

6.3.3 **If** data has been corrected, **then** reevaluate using the electronic data review process **and** return to step 6.3.1.

Requester/Project Team/Scientist

6.3.4 **If** deviations in the data cannot be readily resolved with the samplers, laboratory, and requester, **then** determine the usability of the data or the need for additional review of the data.

Scientist/ Data Entry Specialist

6.3.5 Notify the Requester/Project Team that contractual screening and data verification has been completed and that the data is ready for assessment.

6.4 Data Validation

NOTE:

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

If Level II, Level III, or Level IV data validation is required, **then** completions of CP3-ES-5003-F03, *Data Verification Checklist* and CP3-ES-5003-F01, *Data Assessment Review Checklist and Comment Form* are required.

Requester/Project Team/Scientist

6.4.1 Initiate data validation as defined in Step 6.1.6.

6.4.2 **If** data validation is **NOT** required for the remaining data set, **then** proceed to Section 6.5.

Scientist

6.4.3 Develop a SOW for the validation activity.

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

6.4.5 Upon receipt of the validation deliverables, conduct a contractual screening against the validation SOW.

6.4.6 Review the results of the validation process.

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

6.4.8 Enter validation qualifiers into PEMS **and** ensure a QC check is performed as required by CP4-ES-5007, *Data Management Coordination,* if validation qualifiers are entered manually. Chg A

6.4.9 Notify the Requester/Project Team that data validation is complete.

6.4.10 Provide the Requester/Project Team with an electronic and/or hard copy of the data, quality checks, and validation results (if applicable).

Requester/Project Team

6.4.11 Document the performance of data validation on CP3-ES-5003-F01, *Data Assessment Review Checklist and Comment Form.*

6.5 Data Assessment and Determination of Data Usability

NOTE:

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.

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.* Chg A

Assay data may 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.

The official lab data report that includes uncertainty will be provided for data collected in support of making NCS decisions. The data will be loaded to PEMS and will undergo data verification and data assessment, but data verification and data assessment will not be performed prior to providing the lab data report to the project and NCS. 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.

Scientist

6.5.1 Ensure data verification checks have been completed on CP3-ES-5003-F01, *Data Assessment Review Checklist and Comment Form,* or CP3-ES-5003-F03, *Data Verification Checklist,* if Level II, Level III, or Level IV data validation is required.

6.5.2 Print all verification queries such as contractual screening, holding time exceedances, etc.

6.5.3 Print any additional queries or reports generated from Paducah PEMS, field data report (if applicable), lab data report, lab comments, assessment information such as data loading notes, etc.

6.5.4 Note any questions, comments, or follow-up actions in the data assessment package as follows:

A. Initial **and** date the comments and notes in black or blue ink.

B. Write legibly.

C. Complete the forms in black ink.

6.5.5 Provide the data reviewer, assigned by the requestor/project team, with a data assessment package, which includes the information listed in Steps **6.5.1** and **6.5.2** as well as the required forms.

Data Reviewer assigned by the requestor / project team

6.5.6 Begin data assessment using CP3-ES-5003-F01, *Data Assessment Review Checklist and Comment Form.*

6.5.7 Review the analytical data by looking at the hard copy data printouts, queries, reports, and other documentation provided in the data assessment package.

6.5.8 Complete the applicable shaded areas and the questions on CP3-ES-5003-F01, *Data Assessment Review Checklist and Comment Form.*

6.5.9 **If** needed, **then** document any notes or comments on page 2 of CP3-ES-5003-F01, *Data Assessment Review Checklist and Comment Form* **and** perform the following: Chg A

A. Return form to the SMO.

or

B. Send comments via e-mail to the SMO.

6.5.10 Return the data assessment package to the SMO.

NCSA GEN-001

6.5.11 **If** samples are taken for NCS purposes, **then** verbal relay of analytical results shall be prohibited.

Scientist

6.5.12 Resolve any issues noted in the data assessment package by the Data Reviewer **and** ensure a documented response (either written or e-mail) is included in the data assessment package.

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

Data Reviewer assigned by the requestor/project team

6.5.14 Sign CP3-ES-5003-F01, *Data Assessment Review Checklist and Comment Form,* **AND** return the data assessment package to the SMO.

Scientist

6.5.15 Provide the data assessment package to the QA Reviewer.

QA Reviewer

6.5.16 Review the data assessment package.

6.5.17 **IF** needed, **then** document any notes or comments on page 2 of CP3-ES-5003-F01, *Data Assessment Review Checklist and Comment Form* **and** perform the following: Chg A

A. Return form to the SMO.

or

B. Send comments via e-mail to the SMO.

6.5.18 Return the data assessment package to the SMO.

Scientist

6.5.19 Resolve any issues noted in the data assessment package by the QA Reviewer **and** ensure a documented response (either written or e-mail) is included in the data assessment package.

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

QA Reviewer

6.5.21 Sign CP3-ES-5003-F01, *Data Assessment Review Checklist and Comment Form,* **and** return the data assessment package to the SMO.

Data Entry Specialist/Scientist

6.5.22 Generate a "clean" hard copy data printout from Paducah PEMS to include any corrections that may have been made to the data set **and** place it in the data assessment package.

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

6.5.24 Load data (RTL file) to Paducah OREIS.

6.5.25 After data has been loaded to Paducah OREIS, ensure all emails **and** the required forms are included in the data assessment package in proper order.

Requester/ Project Team

6.5.26 Make project decisions based on data.

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

6.6 Data Release to External Agencies

Release Requester/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 FPDP, its subcontractors, and DOE. The DC and TIO reviews are only required for data related to non-environmental matrices.

6.6.1 Complete CP3-ES-5003-F02, *Paducah Data Release to External Agencies Form.*

6.6.2 Ensure all necessary signatures are present.

NOTE:

Electronic data formats will contain information to indicate data source and may contain data qualifier definitions. Hardcopy data formats will contain a cover letter to indicate data source.

6.6.3 Transmit data, either hard copy or electronically, as requested.

6.7 Records Management

Data Entry Specialist/Requester

6.7.1 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 to External Agencies Form*
- CP3-ES-5003-F03, *Data Verification Checklist*
- DQOs (e-mails, meeting minutes, SAP, answers to Appendix D questions, if applicable).
- Data Validation deliverables consisting of the validation SOW, validation report, and validation-qualified laboratory results (qualified Form I's and e-mails documenting identified deficiencies)

7.2 Records Disposition

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

Appendix A – Acronyms/Definitions

ACRONYMS

ASTM – American Society for Testing Materials

BOA –Basic Ordering Agreement

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

FPDP – Fluor Federal Services, Inc., Paducah Deactivation Project

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

QA – Quality Assurance

QC – Quality Control

RMDC – Records Management and Document Control

RI/FS – Remedial Investigation/Feasibility Study

Appendix A – Acronyms/Definitions (Continued)

RTL – Ready-to-Load

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 Screening – 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 screening 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 (or estimate) 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., Paducah PEMS), laboratory and sample management comments, CP3-ES-5003-F01, *Data Assessment Review Checklist and Comment Form*, 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

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.

Appendix A – Acronyms/Definitions (Continued)

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 screening 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 FPDP, its subcontractors, and DOE.

Historical Data – Data which was collected and managed prior to implementation of this procedure.

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 can 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 adequate confidence that the data conforms to established technical requirements and is sufficient for the intended use.

Quality Reviewer –Performs independent review of data assessment package and verifies completion of assessment. QA Reviewer can be personnel from SMO, Waste Characterization Organization, project team, etc. Quality reviewer 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 (estimated) 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 – Paducah Sampling and Data Management Flowchart

COC	Chain of Custody
DAP	Data Assessment Package
DC	Derivative Classifier
EDD	Electronic Data Deliverable
OREIS	Oak Ridge Environmental Information System
PEMS	Project Environmental Measurements System
RTL	Ready to Load
SMO	Sample Management Office
SOW	Statement of Work
TIO	Technical Information Officer

Appendix C – DATA CYCLE FLOWCHART

Appendix C – DATA CYCLE FLOWCHART (Continued)

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

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 tables are provided for guidance in documenting a simplified version of the DQO process. Use the applicable table for your project.

Table D.1 – ENVIRONMENTAL MONITORING PROJECTS – DQO PROCESS
Table D.2 – ENVIRONMENTAL RESTORATION PROJECTS – DQO PROCESS
Table D.3 – SITE CHARACTERIZATION PROJECTS – DQO PROCESS
Table 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, QAPs, EMPs, WMPs, DMIPs, etc., as necessary.
- An e-mail is routinely provided for special sampling requests. When special sampling is requested, the e-mail will be printed and will serve as the DQO documentation.

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

Table 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 [i.e., 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)

Table 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 (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 or do you need to know the "hot spots"? What are the site conditions that affect sampling [i.e., 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)

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?
   - 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 [i.e., 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? 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)

Table D.4 – WASTE CHARACTERIZATION PROJECTS – DQO PROCESS

Chg A

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 (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 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, 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 the DQO Process, Step 7. 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 sample.

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

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, 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 releasibility 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

Chg A

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

Data Project Number:			Data 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)

Chg A

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

Data Project Number:	Data Project Title:	
Comment	**Action Required**	**Comment Resolved**

Example

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

Chg A

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

Example

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

Chg A

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.

Example

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

Chg A

CP3-ES-5003-F02 - PADUCAH DATA RELEASE TO EXTERNAL AGENCIES

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)

Site DC: _____ Date: _____

Site TIO: _____ Date: _____

Example

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

ChgA

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.

Example

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

ChgA

CP3-ES-5003-F03-Data Verification Checklist

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.			

Example

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

ChgA

CP3-ES-5003-F03-Data Verification Checklist

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.

Example

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: _____