

Superfund Records Center  
SITE: Centredale  
BREAK: 37  
OTHER: 35825



US ARMY CORPS  
OF ENGINEERS  
New England District

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\_\_\_\_\_ Contract No. DACW33-01-D-0004  
Delivery Order No. 01  
September 2002

***FINAL***  
***DATA MANAGEMENT PLAN***  
***UPDATE***

**Interim Data Collection  
Remedial Investigation And  
Feasibility Study  
Centredale Manor Restoration  
Project Site  
North Providence, Rhode Island**

**Update to Tasks 19-22 DMP (9/4/2001)  
To Support Centredale RI/FS**

**DATA MANAGEMENT PLAN UPDATE**

**Interim Data Collection  
Remedial Investigation And Feasibility Study  
Centredale Manor Restoration Project Site  
North Providence, Rhode Island**

**CONTRACT NO. DACW33-01-D-004  
DELIVERY ORDER NO. 01**

*Submitted to:*

**Department of the Army  
U.S. Army Corps of Engineers  
New England Division**

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**ACRONYM LIST**

|       |   |
|-------|---|
| CD    | Compact Disk  |
| COC   | Chain of Custody                                    |
| DMP   | Data Management Plan                                |
| EDD   | Electronic Data Deliverable                         |
| EDI   | Electronic Data Interchange                         |
| FOL   | Field Operations Leader                             |
| FS    | Feasibility Study                                   |
| FSP   | Field Sampling Plan                                 |
| GPS   | Global Positioning System                           |
| HCH   | Hexachlorocyclohexane                               |
| PCB   | Polychlorinated biphenyl                            |
| QA    | Quality Assurance                                   |
| QAPP  | Quality Assurance Project Plan                      |
| QAU   | Quality Assurance Unit                              |
| QC    | Quality Control                                     |
| RI    | Remedial Investigation                              |
| RIDEM | Rhode Island Department of Environmental Management |
| SDG   | Sample Delivery Group                               |
| USACE | U.S. Army Corps of Engineers                        |
| USEPA | United States Environmental Protection Agency       |

## 1.0 INTRODUCTION

The purpose of the Centredale Manor Restoration Project Site Data Management Plan (DMP) is to address data management requirements for Remedial Investigation (RI) and Feasibility Study (FS) Interim Data Collection field investigation (Battelle, 2002c). These requirements include roles and responsibilities, and the tracking, storing, and retrieving of data. The DMP also identifies software to be used to ensure compatibility with existing site databases, minimum data requirements, data format, and backup data management. This document is an update of the DMP prepared for the baseline risk assessments (Harding ESE, 2001).

Two apartment complexes are located on the northern portion of the Centredale Manor site. Centredale Manor, a multi-unit apartment complex for elderly adults, is located at 2074 Smith Street (Route 44). The Brook Village apartment complex is located at 2072 Smith Street. The site also consists of reaches of the Woonasquatucket River associated with Allendale Pond, Lyman Mill Pond, Manton Pond, and Dyerville Pond. The general limits of the site are defined by historical chemical manufacturing operations as well as by areas impacted by these operations. The site is bounded by Route 44 to the north, a former mill raceway and the eastern bank of the Woonasquatucket River to the east, Dyerville Dam to the south, and the western bank of the Woonasquatucket River to the west.

Prior to 1936, Centredale Worsted Mills, a woolens-manufacturing plant, occupied the portion of the site located at 2072 and 2074 Smith Street. Circa 1940, Metro Atlantic Chemical Corporation began operations as a chemical manufacturer believed to manufacture hexachlorophene (of which hexachloroxanthene [HCX] is a by-product) and trichlorophenols. Operations at Metro Atlantic Chemical Corporation ceased during the 1960s or early 1970s. Between 1952 and 1969, New England Container Company operated a drum reconditioning facility on a portion of the property. Chemical residues were burned prior to drum reconditioning. In 1972, fire destroyed most property structures. Brook Village was constructed in 1977 and Centredale Manor was constructed in 1982.

Evidence of improper historical waste disposal was discovered during construction of the apartment complexes. Approximately 400 drums and 6,000 cubic yards of soil were removed from the site. Potential chemicals used onsite were identified based on drum labels including: caustics, halogenated solvents, polychlorinated biphenyls (PCBs), and inks. Evidence suggests that contaminants were buried, released directly to the ground, or released directly to the Woonasquatucket River. As a result, contaminants have migrated downstream and have impacted sediments in the Woonasquatucket River, Allendale Pond, Lyman Mill Pond, Manton Pond, Dyerville Pond, and some floodplain areas associated with these water bodies.

Sampling activities conducted by U.S. Environmental Protection Agency (USEPA) and Rhode Island Department of Environmental Management (RIDEM) revealed elevated polychlorinated dibenzo dioxins and furans (dioxins and furans) in soils and sediments as well as from fish taken from Woonasquatucket River. The site was added to the National Priorities List on February 4, 2000. For the Woonasquatucket River, there is currently a fish consumption advisory in place that recommends that people not eat fish, eels, turtles, or plants from the river downstream of the Smithfield Treatment Plant.

## 2.0 DATA MANAGEMENT

Data governed by this DMP are those chemical and physical data that result from the RI/FS Interim Data Collection field investigation (Battelle, 2002c). Battelle and its subcontractors will be collecting environmental samples and completing field measurements during the field investigation program. Battelle and its subcontractors will be providing the chemical laboratory analysis and third party

validation for the environmental samples. Battelle and its subcontractors will document field measurements and field logs in hardcopy format.

Figure 1 provides a flow chart showing the Centredale RI/FS data management process and identifying the company responsible for each step. The major steps in the data management process are:

1. Collect, document, and store field data in hardcopy and electronic format.
2. Analyze samples, modify database structure, and enter data into field electronic data deliverable (EDD).
3. EDD format and completeness checks.
4. Battelle and subcontractors provide unvalidated lab and field data to Battelle Laboratory Project Manager.
5. Validation by third party validator.
6. Provide validated data to Database Manager.
7. Incorporate validated final laboratory data into database.
8. Quality Assurance (QA) audit.
9. Completed final database provided to USEPA and U.S. Army Corps of Engineers (USACE).

These steps are further described in the following sections of this plan.

### 3.0 DATABASE

The USEPA Centredale Manor data are stored in a Microsoft Access 97 database format. Battelle will maintain this project database. Battelle will incorporate data into database tables (tbResultsLabAnal, Well\_Sample\_Data, tbReject and Codes). The database structure is provided in Appendix A.

The Battelle Database Manager will modify the database structure by adding a Codes table. A Codes table will be created to store all codes and code descriptions for all coded database fields. The codes will reflect existing data as well as any new data loaded into the database. The tbFraction table will be used to populate the codes table for a description of the CLASS codes. Historically, codes were inconsistently used in the database. Therefore, any existing data in coded fields that were previously entered as text strings rather than codes will not be updated and will not be entered into Codes table.

The Battelle Database Manager will modify the database structure by renaming selected fields, adding new fields and combining or archiving tables as follows:

- The Well\_Sample\_Data table structure will be modified by renaming the QC\_TYPE field to FIELD\_QC\_TYPE.
- The tbResultsLabAnal table structure will be modified by renaming the FRACTION field to CLASS. CLASS will more accurately reflect the data contents of this field.
- A LAB\_QC\_TYPE field will be added to the tbResultsLabAnal table. The LAB\_QC\_TYPE field will store the laboratory quality control (QC) codes identified in Appendix A, Database Field Definitions. The lab QC type for all existing data was not captured in the database; therefore, the tbResultsLabAnal table LAB\_QC\_TYPE field for existing data will be set to "N".
- The tbReject table structure will be modified by renaming the FRACTION field to CLASS and adding the LAB\_QC\_TYPE field. The tbReject table LAB\_QC\_TYPE field for existing data will also be set to "N".
- The Database Manager will combine the tbResultsLabAnal and tbResultsLabAnalQC tables of the Project database into the single tbResultsLabAnal table.

- The `tbResultsLabAnalQC`, `tbSort`, `tbFraction`, `TbUnits`, `TbMatrix`, `EFCSL` and `tbDeletedResultsLabAnal` tables will be archived because they will not be used for the remainder of this project. The Battelle Database Manager will create any new sort tables that are needed for reports.

Appendix E provides the electronic data interchange (EDI) standards for the Centredale Manor Project. The goal of the standards is to ensure that the EDDs will be submitted in a uniform manner to the Battelle Data Management Team. The RI/FS Field Sampling Plan (FSP) (Battelle, 2002a) and Quality Assurance Project Plan (QAPP) addendum (Battelle, 2002b) detail the field and laboratory electronic data submission format, contents, and data reporting requirements. The EDDs are based on a universal spreadsheet format, ensuring consistency with all laboratories involved in the data interchange.

There should be one file submitted per sample delivery group (SDG) or laboratory batch. All data should be formatted as values (no formulas). There should not be any blank rows, hidden columns and hidden rows in the file.

The first line of each file will be the column header. The column names will be the same as the database field names and must exactly match the spelling provided in Appendix B of the FSP and Table 3 of the QAPP addendum.

Field and laboratory EDD formats are in Appendix E. Field formats should be reviewed carefully prior to submitting the EDD to Battelle. A field reported as *Null* cannot have spaces or returns. A number field must be reported with a number or *Null*. For example, if a text value, such as "N/A" or a space, is reported in the Results field the data will not be acceptable to the database and the EDD will be rejected.

The EDD must satisfy certain uniqueness requirements in order to prevent duplication of results in the database. These fields are not null fields in the database; therefore, the laboratory EDD must provide a value for these fields. The following fields define a unique data point for reported laboratory results:

NSAMPLE  
CLASS  
EPASAMNO  
PARAMETER

Note that the CLASS field was previously named FRACTION. The FRACTION field has been renamed to CLASS to more accurately reflect the data contents of this database field.

#### 4.0 FIELD DOCUMENTATION

Field measurements and observations (e.g., sample descriptions) will be compiled only in hardcopy format and will not be incorporated into the database. Chain of Custody (COC) data and Global Positioning System (GPS) data will be entered into the field EDD.

Each field sample will be assigned a unique sample tracking number (or Sample ID). The sample ID will consist of a four- to five-segment, alpha-numeric code that identifies the area, sample medium, specific sample location identifier, sample event, sample depth or the QC sample designation, if appropriate. The format for the sample ID is presented in Appendix B. Other pertinent information regarding sample identification will be recorded in the field logbooks or on sample log sheets.

The samples collected at the site will be held under Chain of Custody. For a full description of COC procedures and protocol see the FSP ( Battelle, 2002a). Each shipment of samples will include a COC record (Appendix C). The COC record is used to document sample-handling information (i.e., sample type, sample ID, and number of containers corresponding to each sample number). The following information should be recorded on the COC record:

- Project reference;
- Site name, sample ID, date of collection, time of collection, matrix, filter status, number and type of sample containers for each analysis, preservation methods, total number of containers for each sample, and sample depth;
- Names of the sampler(s) and the person shipping the samples; and
- Date and time that the samples were relinquished for shipping and received in Laboratory.

After samples are shipped, hard copies of the COC records and sample collection forms will be compiled by the Field Operations Leader (FOL), who will be responsible for ensuring that the applicable field data are accurately entered into the field EDD format (Appendix E). This file type will be a Microsoft Excel spreadsheet.

The FOL will be responsible for ensuring that the field EDD contains final field data and that the EDD includes valid values and other criteria outlined in Appendix E. The FOL will also be responsible for verifying that all samples listed on the COC are reported in the field EDD. The field EDD will be submitted to the Battelle Database Manager for incorporation into the Well\_Sample\_Data Table of the project database.

GPS data loggers will be used to establish the vertical and horizontal coordinates of all sample locations. All coordinates will be recorded in the Rhode Island State Plane Coordinate System NAD 83, with horizontal and vertical coordinates given in feet. Locations will be established with a margin of error of less than three feet. Further details of the GPS data collection methods are included in the FSP (Battelle, 2002a). After collection of the GPS data, northing, easting and elevation data for each location will be loaded into the field EDD by the FOL.

After the field data are loaded into the database, a report will be generated to compare to the hardcopy COC data and field records. This report will be reviewed and signed by Battelle's Quality Assurance Unit (QAU) and filed with the hardcopy COC data. The electronic COC data will also provide a completeness comparison with data received from the laboratory.

All hardcopy field records will be signed and dated upon creation. Copies of hardcopy field records (COC, field notes, sample log-sheets) will be stored chronologically in 3-ring binders. Each 3-ring binder will have a login entry sheet at the front with name of person entering the data, date, number of pages, and a brief description of the data. An example of the login entry sheet is provided in Appendix D. Upon completion of the field program, copies of the hardcopy data of all field records and login sheets will be maintained in the project file for backup and verification of electronic data by Battelle's QAU.

## 5.0 LABORATORY DATA

Results from samples collected for laboratory analysis (chemical and grain-size) will be stored in the database as well as in hardcopy format. Upon completion of a SDG, Battelle and its subcontractors will provide unvalidated final analytical data to the Battelle Laboratory Project Manager in the EDD format specified in Appendix E. This file type will be a Microsoft Excel spreadsheet and the naming convention will be a concatenation of the SDG identifier, the media abbreviation and the class (e.g., VOA, PAH). For example, the file name for SDG 122207 for PAH in Soil will be 122207SPA.H.XLS.



Each Laboratory Project Manager will be responsible for checking the unvalidated EDD for valid values and other criteria outlined in Appendix E. The Laboratory Project Manager will also be responsible for verifying all samples listed on the COC are reported in the hardcopy laboratory data and EDD.

Hardcopy laboratory data will be maintained in the project file for backup and verification of the electronic data. The hardcopy laboratory reports will also include explanation of the QA/QC flags used in the EDD. The hardcopy laboratory data reports will be stored in 3-ring binders using the procedures outlined in Section 4.0.

## 6.0 VALIDATION

Battelle will send the analytical data to a third-party validator, prior to Battelle loading the analytical data into the Project database (Section 7.0). Upon completion of third-party validation of a SDG, Battelle will receive an electronic data table of updates. This file will be the same as the unvalidated EDD, except the final\_result, final\_qual and valid\_comment fields will be filled in as necessary by the validators. The name of the file will have a "V" attached to distinguish it from the unvalidated EDD file. For example, the file name for the validated SDG 122207 for PAH in Soil will be V122207SPA.H.XLS. The Battelle Laboratory Project Manager will provide the validated EDD files to the Battelle Database Manager.

## 7.0 DATABASE LOADING

The validated laboratory EDD will be loaded into the tbResultsLabAnal table of the project database. The date-appended field will be set to the actual load date. The validated field will be set to "Y". The Our\_result and Dataset field will be updated as needed for reports. The Database Manager will review the data set for any rejected data records qualified with an "R". The Database Manager will move all "R" qualified data rows from the tbResultsLabAnal table into the tbReject table. COC tracking data entered into the Well\_Sample\_Data table (see Section 4.0) will be used to identify missing analytical data. The Battelle Laboratory Project Manager will be contacted to provide the missing data.

The validated EDD will be considered the official laboratory report. The unvalidated EDD will be of next importance, followed by the laboratory hardcopy. Hardcopy data validation narratives and data validation revision tables produced during the validation process will be maintained in the project files for backup and verification of the electronic data.

The field EDD will be loaded into the Well\_Sample\_Data table of the project database.

The Battelle Database Manager will provide the database to Battelle's QAU for an audit to ensure database completion and accuracy.

## 8.0 DATA DELIVERY

When all chemical data and associated sample information have been incorporated into the project database and have undergone QA/QC checks, the final database (tbResultsLabAnal, Well\_Sample\_Data, tbReject, and tbCodes tables) will be transmitted on compact disk (CD) to USEPA and USACE. The database CD will be provided within one month of the date on which all the validated data are received by Battelle.

Battelle will also provide an electronic copy (CD) of each of the laboratory EDDs and data validation revision files to the USEPA and USACE.

## 9.0 REFERENCES

Battelle. 2002a. *Draft Field Sampling Plan, Interim Data Collection, Remedial Investigation and Feasibility Study, Centredale Manor Restoration Project Site*. Prepared for the U. S. Army Corps of Engineers New England District, September.

Battelle. 2002b. *Draft Quality Assurance Project Plan Addendum, Interim Data Collection, Remedial Investigation and Feasibility Study, Centredale Manor Restoration Project Site*. Prepared for the U. S. Army Corps of Engineers New England District, September.

Battelle. 2002c. *Draft Work Plan, Interim Data Collection, Remedial Investigation and Feasibility Study, Centredale Manor Restoration Project Site*. Prepared for the U. S. Army Corps of Engineers New England District, September.

Harding ESE. 2001. *Final Data Management Plan, Centredale Manor Restoration Superfund Project Site, North Providence, Rhode Island*. Prepared for U.S. Army Corps of Engineers New England District, September 4.

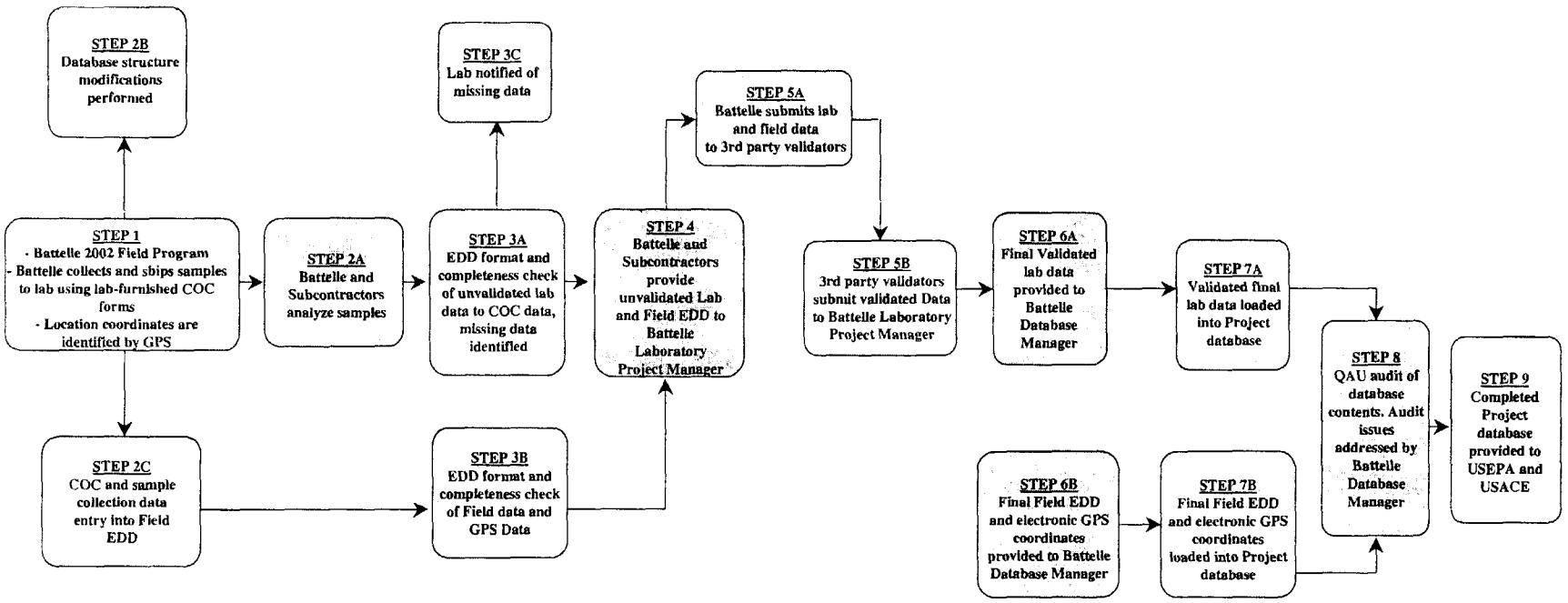


Figure 1. Data Management Process

## **APPENDIX A**

### **CENTREDALE MANOR RESTORATION PROJECT SITE DATABASE STRUCTURE**

- **DATABASE TABLE DEFINITIONS**
- **DATABASE FIELD DEFINITIONS**
- **DATABASE ENTITY-RELATIONSHIP DIAGRAM**

**Table A-1. Database Table Definitions.**

| <b>Table</b>            | <b>Definition</b>  | <b>Comments</b>   |
|-------------------------|--|---|
| EFCSL                   | Relates epasamno, fraction, case, sdg, and laboratory. Populated using information from COCs. Used in combination with well_sample_data and tbsample to track progress of data delivery from laboratories. | Table will be archived  |
| <b>tbCodes</b>          | <b>Stores valid codes and descriptions for coded database fields</b>   | <b>New Table</b>  |
| tbDeletedResultsLabAnal | Stores dilution and reanalysis analytical results deleted from tbsresultslabanal following data validation.  | Table will be archived  |
| tbFraction              | Stores valid values for fraction.  | Table will be archived  |
| tbMatrix                | Stores valid values for matrix.  | Table will be archived  |
| <b>tbReject</b>         | <b>Stores a "before validation" copy of analytical results that have been rejected during data validation.</b>   |   |
| <b>tbResultsLabAnal</b> | <b>Stores analytical results including laboratory QC samples and PE samples.</b>   |   |
| tbResultsLabAnalQC      | Stores analytical results for laboratory QC samples and PE samples.  | Table will be archived after contents are moved to tbResultsLabAnal table |
| <b>tbSample</b>         | <b>Lookup table used during analytical data upload to relate epasamno and nsample.</b>   |   |
| tbSort                  | Stores valid values for Chemical Abstracts Service number (casno) and standard chemical name used by TtNUS (parameter).  | Table will be archived  |
| tbUnits                 | Stores valid values for units.   | Table will be archived  |
| <b>Well_Sample_Data</b> | <b>Stores sample collection data (e.g., location, date, matrix).</b>   |   |

Table A-2. Database Field Definitions.

| Table    | Field Number | Field Name  | Field Type | Field Size | Definition   |
|----------|--------------|-------------|------------|------------|--|
| tbCodes  | 1            | FIELD_NAME  | dbText     | 30         | Field name.  |
| tbCodes  | 2            | CODE        | dbText     | 30         | Database code.   |
| tbCodes  | 3            | DESCRIPTION | dbText     | 150        | Code description.  |
| tbReject | 1            | NSAMPLE     | dbText     | 30         | Unique sample number as recorded in the Field Sample ID column in the Chain of Custody. The Lab assigned sample ID for Lab QC.   |
| tbReject | 2            | CLASS       | dbText     | 15         | Analysis code. Dioxins = 'DIOX', Metals = 'M', Volatiles = 'OV', Semivolatiles/BNAs = 'OS', Pesticides/PCBs = 'PESTP', Herbicides = 'HERB', Explosives = 'EXP', Any petroleum hydrocarbon or fuel = 'TPH', Wet Chemistry = 'WET', Radionuclide = 'RAD', Miscellaneous = 'MISC', Total Organic Carbon = 'TOC', Grain Size = 'GS'. For TCLP analyses, add "T" suffix, e.g. TCLP Metals = 'MT'. |
| tbReject | 3            | PARAMETER   | dbText     | 45         | Chemical name used in this database for a particular CAS number.   |
| tbReject | 4            | EPASAMNO    | dbText     | 15         | CLP traffic report number or Delivery of Analytical Services (DAS) number. Used by laboratory to report results. Lab appends suffix of "DL" or "RE" to the EPASAMNO to identify dilutions and reanalyses. If EPA Sample Number is not applicable use sample ID from NSAMPLE field.   |
| tbReject | 5            | CASNO       | dbText     | 50         | Chemical Abstracts Service number, without dashes.   |
| tbReject | 6            | LAB_RESULT  | dbDouble   |            | Numerical portion of the analytical result, in units recorded in the units field, and as qualified by the qualifier recorded in the qual field.  |
| tbReject | 7            | QUAL        | dbText     | 5          | Qualifier portion of analytical result. Non-detected results generally include a "U" in the qualifier.   |
| tbReject | 8            | OUR_RESULT  | dbText     | 15         | Combination of LAB_RESULT (to correct significant figures) & " " & QUAL. Used for reporting.   |
| tbReject | 9            | UNITS       | dbText     | 10         | The units of measure for reported result.  |
| tbReject | 10           | CASE        | dbText     | 5          | In CLP program, identifies samples sent to a laboratory over a specific period of time.  |
| tbReject | 11           | SDG         | dbText     | 15         | Sample Delivery Group or Lab Batch Number. In CLP and DAS analyses, SDGs are groups of up to 20 samples that are reported together in one data package and the SDG may be set to the first (alphabetically) EPASAMNO in the SDG.   |

Table A-2. Database Field Definitions (continued)

| Table            | Field Number | Field Name   | Field Type | Field Size | Definition   |
|------------------|--------------|--------------|------------|------------|--|
| tbReject         | 12           | LABORATORY   | dbText     | 25         | Name of the laboratory.  |
| tbReject         | 13           | LAB_ID       | dbText     | 15         | Laboratory Identification Number. Used internally by the laboratory to identify the sample.  |
| tbReject         | 14           | REC_DATE     | dbDate     | 8          | Date a sample is received by the laboratory.   |
| tbReject         | 15           | EXTR_DATE    | dbDate     | 8          | Date sample was extracted or prepared for analysis by the laboratory.  |
| tbReject         | 16           | ANAL_DATE    | dbDate     | 8          | Date the sample was analyzed by the laboratory.  |
| tbReject         | 17           | METHOD       | dbText     | 50         | Analytical method used.  |
| tbReject         | 18           | MDL          | dbDouble   |            | Method Detection Limit.  |
| tbReject         | 19           | IDL          | dbDouble   |            | Instrument Detection Limit.  |
| tbReject         | 20           | CRDL_CRQL    | dbDouble   |            | Contract Required Detection Limit or Contract Required Quantitation Limit.   |
| tbReject         | 21           | DIL_FACTOR   | dbDouble   |            | Dilution factor.   |
| tbReject         | 22           | PCT_MOIST    | dbDouble   |            | Percent Moisture.  |
| tbReject         | 23           | COMMENTS     | dbText     | 20         | Optional additional information.   |
| tbReject         | 24           | DATASET      | dbText     | 75         | Combination of Case, SDG, Fraction, and Units fields. Used to group analytical results for reporting.  |
| tbReject         | 25           | VALIDATED    | dbBoolean  | 1          | Valid values are True and False.   |
| tbReject         | 26           | DATEAPPENDED | dbDate     | 8          | Date record was appended to this table.  |
| tbReject         | 27           | DVTIER       | dbInteger  |            | Level of Data Validation. Valid values are 0 (Not Validated), 1 ( cursory), 2 (moderately rigorous), 3 (rigorous).   |
| tbReject         | 28           | LAB_QC_CODE  | dbText     | 6          | Normal Environmental Sample = "N", Laboratory Duplicate = "DUP", Matrix Spike = "MS", Matrix Spike Duplicate = "MSD", Laboratory Control Sample = "LCS", Laboratory Control Sample Duplicate = "LCSD", Method Blank = "MB", Preparation Blank = "PB", Standard Reference Material = "SRM", Blank Spike = "BS". |
| tbResultsLabAnal | 1            | NSAMPLE      | dbText     | 30         | Unique sample number as recorded in the Field Sample ID column in the Chain of Custody. The Lab assigned sample ID for Lab QC.   |

Table A-2. Database Field Definitions (continued)

| Table            | Field Number | Field Name | Field Type | Field Size | Definition   |
|------------------|--------------|------------|------------|------------|--|
| tbResultsLabAnal | 2            | CLASS      | dbText     | 15         | Analysis code. Dioxins = 'DIOX', Metals = 'M', Volatiles = 'OV', Semivolatiles/BNAs = 'OS', Pesticides/PCBs = 'PESTP', Herbicides = 'HERB', Explosives = 'EXP', Any petroleum hydrocarbon or fuel = 'TPH', Wet Chemistry = 'WET', Radionuclide = 'RAD', Miscellaneous = 'MISC', Total Organic Carbon = 'TOC', Grain Size = 'GS'. For TCLP analyses, add "T" suffix, e.g. TCLP Metals = 'MT'. |
| tbResultsLabAnal | 3            | PARAMETER  | dbText     | 45         | Chemical name used in this database for a particular CAS number.   |
| tbResultsLabAnal | 4            | EPASAMNO   | dbText     | 15         | CLP traffic report number or Delivery of Analytical Services (DAS) number. Used by laboratory to report results. Lab appends suffix of "DL" or "RE" to the EPASAMNO to identify dilutions and reanalyses. If EPA Sample Number is not applicable use sample ID from NSAMPLE field.   |
| tbResultsLabAnal | 5            | CASNO      | dbText     | 50         | Chemical Abstracts Service number, without dashes.   |
| tbResultsLabAnal | 6            | LAB_RESULT | dbDouble   |            | Numerical portion of the analytical result, in units recorded in the units field, and as qualified by the qualifier recorded in the qual field.  |
| tbResultsLabAnal | 7            | QUAL       | dbText     | 5          | Qualifier portion of analytical result. Non-detected results generally include a "U" in the qualifier.   |
| tbResultsLabAnal | 8            | OUR_RESULT | dbText     | 15         | Combination of LAB_RESULT (to correct significant figures) & " " & QUAL. Used for reporting.   |
| tbResultsLabAnal | 9            | UNITS      | dbText     | 10         | The units of measure for reported result.  |
| tbResultsLabAnal | 10           | CASE       | dbText     | 5          | In CLP program, identifies samples sent to a laboratory over a specific period of time.  |
| tbResultsLabAnal | 11           | SDG        | dbText     | 15         | Sample Delivery Group or Lab Batch Number. In CLP and DAS analyses, SDGs are groups of up to 20 samples that are reported together in one data package and the SDG may be set to the first (alphabetically) EPASAMNO in the SDG.   |
| tbResultsLabAnal | 12           | LABORATORY | dbText     | 25         | Name of the laboratory.  |
| tbResultsLabAnal | 13           | LAB_ID     | dbText     | 15         | Laboratory Identification Number. Used internally by the laboratory to identify the sample.  |
| tbResultsLabAnal | 14           | REC_DATE   | dbDate     | 8          | Date a sample is received by the laboratory.   |
| tbResultsLabAnal | 15           | EXTR_DATE  | dbDate     | 8          | Date sample was extracted or prepared for analysis by the laboratory.  |



Table A-2. Database Field Definitions (continued)

| Table            | Field Number | Field Name   | Field Type | Field Size | Definition   |
|------------------|--------------|--------------|------------|------------|--|
| tbResultsLabAnal | 16           | ANAL_DATE    | dbDate     | 8          | Date the sample was analyzed by the laboratory.  |
| tbResultsLabAnal | 17           | METHOD       | dbText     | 50         | Analytical method used.  |
| tbResultsLabAnal | 18           | MDL          | dbDouble   |            | Method Detection Limit.  |
| tbResultsLabAnal | 19           | IDL          | dbDouble   |            | Instrument Detection Limit.  |
| tbResultsLabAnal | 20           | CRDL_CRQL    | dbDouble   |            | Contract Required Detection Limit or Contract Required Quantitation Limit.   |
| tbResultsLabAnal | 21           | DIL_FACTOR   | dbDouble   |            | Dilution factor.   |
| tbResultsLabAnal | 22           | PCT_MOIST    | dbDouble   |            | Percent Moisture.  |
| tbResultsLabAnal | 23           | COMMENTS     | dbText     | 20         | Optional additional information.   |
| tbResultsLabAnal | 24           | DATASET      | dbText     | 75         | Combination of Case, SDG, Fraction, and Units fields. Used to group analytical results for reporting.  |
| tbResultsLabAnal | 25           | VALIDATED    | dbBoolean  | 1          | Valid values are True and False.   |
| tbResultsLabAnal | 26           | DATEAPPENDED | dbDate     | 8          | Date record was appended to this table.  |
| tbResultsLabAnal | 27           | DVTIER       | dbInteger  |            | Level of Data Validation. Valid values are 0 (Not Validated), 1 (cursory), 2 (moderately rigorous), 3 (rigorous).  |
| tbResultsLabAnal | 28           | LAB_QC_CODE  | dbText     | 6          | Normal Environmental Sample = "N", Laboratory Duplicate = "DUP", Matrix Spike = "MS", Matrix Spike Duplicate = "MSD", Laboratory Control Sample = "LCS", Laboratory Control Sample Duplicate = "LCSD", Method Blank = "MB", Preparation Blank = "PB", Standard Reference Material = "SRM", Blank Spike = "BS". |
| tbSample         | 1            | EPASAMNO     | dbText     | 30         | CLP traffic report number or Delivery of Analytical Services (DAS) number. Used by laboratory to report results. Lab appends suffix of "DL" or "RE" to the EPASAMNO to identify dilutions and reanalyses. If EPA Sample Number is not applicable use sample ID from NSAMPLE field.                             |
| tbSample         | 2            | NSAMPLE      | dbText     | 30         | Unique sample number as recorded in the Field Sample ID column in the Chain of Custody. The Lab assigned sample ID for Lab QC.   |
| Well_Sample_Data | 1            | NSAMPLE      | dbText     | 30         | Unique sample number as recorded in the Field Sample ID column in the Chain of Custody. The Lab assigned sample ID for Lab QC.   |

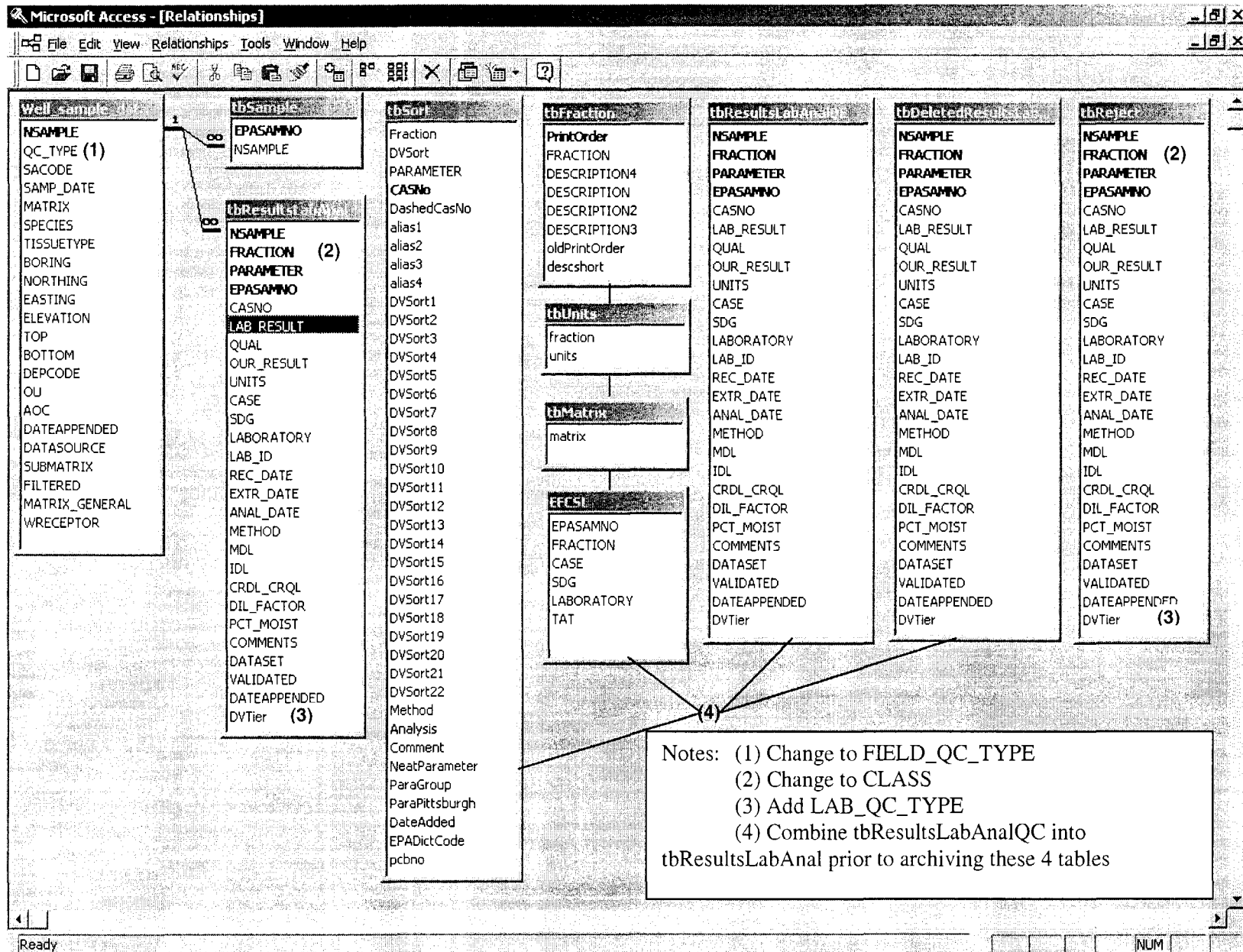
**Table A-2. Database Field Definitions (continued)**

| Table            | Field Number | Field Name    | Field Type | Field Size | Definition  |
|------------------|--------------|---------------|------------|------------|---|
| Well_Sample_Data | 2            | FIELD_QC_TYPE | dbText     | 50         | Field QC sample code. Valid values are Performance Evaluation = "PE", Trip Blank = "TB", Rinsate Blank = "RB", Source Blank = "SB", Field Blank = "FB", Filter Blank "FLTB", Normal Sample = "N", and Field Duplicate = "Field Dup. " & NSAMPLE of duplicated sample    |
| Well_Sample_Data | 3            | SACODE        | dbText     | 10         | Sample Code. Used to identify field duplicates, averages, and maximums. Valid values are Normal (not duplicated) = "N", Duplicate 1 = "DUP1", Duplicate 2 = "DUP2", Average of duplicate 1 and duplicate 2 = "AVG", and Maximum of duplicate 1 and duplicate 2 = "MAX". |
| Well_Sample_Data | 4            | SAMP_DATE     | dbDate     | 8          | Date sample was collected.  |
| Well_Sample_Data | 5            | MATRIX        | dbText     | 50         | Physical state of the sample.   |
| Well_Sample_Data | 6            | SPECIES       | dbText     | 50         | Used where matrix = "Biota" to indicate the species.  |
| Well_Sample_Data | 7            | TISSUETYPE    | dbText     | 25         | Used where matrix = "Biota" to specify the type of tissue collected.  |
| Well_Sample_Data | 8            | BORING        | dbText     | 15         | General name given to a sample location at a particular northing and easting (e.g. SB01). Several nsamples may have the same boring (e.g. soil samples collected from the same location at different depths).   |
| Well_Sample_Data | 9            | NORTHING      | dbDouble   |            | State plane coordinate (NAD 1983) of boring.  |
| Well_Sample_Data | 10           | EASTING       | dbDouble   |            | State plane coordinate (NAD 1983) of boring.  |
| Well_Sample_Data | 11           | ELEVATION     | dbDouble   |            | In feet (NGVD 1929).  |
| Well_Sample_Data | 12           | TOP           | dbDouble   |            | Top of sample interval in feet. Applicable to soil and sediment samples.  |
| Well_Sample_Data | 13           | BOTTOM        | dbDouble   |            | Bottom of sample interval in feet. Applicable to soil and sediment samples.   |
| Well_Sample_Data | 14           | DEPCODE       | dbText     | 50         | Used to group soil and sediment samples based on sample depth. "a" = surface, "b" = subsurface.   |
| Well_Sample_Data | 15           | OU            | dbText     | 50         | Operable Unit.  |
| Well_Sample_Data | 16           | AOC           | dbText     | 50         | Area Of Concern. Used to group samples, usually geographically.   |
| Well_Sample_Data | 17           | DATEAPPENDED  | dbDate     | 8          | Date record was appended to this table.   |
| Well_Sample_Data | 18           | DATASOURCE    | dbText     | 50         | Generally the name of a prime contractor responsible for collection of the sample or name of source for the sample collection and location data   |

Table A-2. Database Field Definitions (continued)

| Table            | Field Number | Field Name     | Field Type | Field Size | Definition   |
|------------------|--------------|----------------|------------|------------|--|
| Well_Sample_Data | 19           | SUBMATRIX      | dbText     | 20         | Used to group samples for risk assessment purposes.  |
| Well_Sample_Data | 20           | FILTERED       | dbText     | 100        | Used to indicate whether a water sample was filtered in the field. Valid values are "Filtered" and "Unfiltered." |
| Well_Sample_Data | 21           | MATRIX_GENERAL | dbText     | 50         | Used to group samples for risk assessment purposes.  |
| Well_Sample_Data | 22           | WRECEPTOR      | dbText     | 100        | Used to group samples for risk assessment purposes.  |

Table A-3. Database Entity-Relationship Diagram.



**APPENDIX B**

**FORMAT FOR SAMPLE LOCATION TRACKING NUMBER**

## APPENDIX B FORMAT FOR SAMPLE LOCATION TRACKING NUMBER

### Normal Samples

Each analytical sample collected from the study area will be assigned a unique sample location tracking number. Consistent with previous investigations, the sample location tracking number will consist of a four- to five-segment, alpha-numeric code that identifies the area, sample medium, specific sample location identifier, sample event, sample depth or the quality control (QC) sample designation, if appropriate. Any other pertinent information regarding sample identification will be recorded in the field logbooks or on sample log sheets.

The alphanumeric coding to be used in the sample location numbering system is explained in the following diagram and the subsequent definitions:

AAA - AA - NNNN - NNNN - NN

Where "A" represents an alpha character and "N" represents a numeric character.

1. The three alpha character group identifies the area investigated (e.g., "CMS" for Centredale Manor Site). The character groups are as follows:

CMS     –   Centredale Manor Site  
LPX     –   Lyman Mill Pond

2. The two alpha character group identifies the matrix sampled as follows:

SS       –   Soil  
GW       –   Groundwater

3. A four numeric character group describing a unique location number identified sequentially. Data collected will use a "4100" series.
4. A four-digit group stating the depth of the sample collected in feet. Note that the depth interval for groundwater samples will be recorded in the field log and the sample designation will not include this information.
5. A two digit round number for that station number "01" for the first sample collected from that location, and "02" for the second sample collected from that location, etc. For example, the sample identifier, CMS-SS-4101-0005-01 represents a soil sample collected from the Centredale Manor Site at location 4101, collected between 0 and 0.5 feet, and it was the first soil sample collected at that location.

### QC Samples

1. A three alpha character group identifying the area investigated (see above).
2. A two alpha character group will be used to identify QC samples as identified below. This two character group will replace the character group used to identifying the matrix in the primary sample:

DU = Field Duplicate  
RB = Rinsate Blank  
TB = Trip Blank

3. A six numeric character group describing the date of sample collection and a letter in sequence (A being the first collected that day, B being the second, etc.). For example, CMS-DU-091502A represents the first duplicate sample collected on 15 September 2002.

**APPENDIX C**  
**EXAMPLE OF COC RECORD**





**APPENDIX D**

**EXAMPLE OF FIELD HARDCOPY DATA LOGIN SHEET**



**APPENDIX E**

**FIELD AND LABORATORY EDD FORMATS**

Table E-1. Required Fields for RI/FS Field EDD

| Field Name     | Definition   |
|----------------|--|
| NSAMPLE        | Sample ID from sample custody records  |
| FIELD_QC_TYPE  | Normal = not a QC sample; DU = field duplicate, RB = rinsate blank, PE = performance evaluation sample; TB = trip blank.                 |
| SACODE         | "NORMAL" = not duplicated, "DUP1" = duplicated, "DUP2" = duplicate   |
| SAMP_DATE      | Collection date from custody records; Format DD-MON-YY.  |
| MATRIX         | Soil or groundwater  |
| SPECIES        | Not applicable for RI/FS; leave as NULL in EDD   |
| TISSUETYPE     | Not applicable for RI/FS; leave as NULL in EDD   |
| BORING         | Sample location (several nsamples will have the same boring ID; e.g. soil samples collected from the same location at different depths). |
| NORTHING       | State plane coordinate (NAD 1983) of boring.   |
| EASTING        | State plane coordinate (NAD 1983) of boring.   |
| ELEVATION      | In feet (NGVD 1929).   |
| TOP            | Top of sample interval in feet. Applicable to soil samples.  |
| BOTTOM         | Bottom of sample interval in feet. Applicable to soil samples.   |
| DEPCODE        | "A" = surface (0 to 1 ft), "B" = subsurface (1 to 3 ft composites and deeper).   |
| OU             | Not applicable for RI/FS; leave as NULL in EDD   |
| AOC            | Not applicable for RI/FS; leave as NULL in EDD   |
| DATEAPPENDED   | Leave as NULL in EDD.  |
| DATASOURCE     | Battelle   |
| SUBMATRIX      | Leave as NULL in EDD.  |
| FILTERED       | "Unfiltered" for RI/FS groundwater samples.  |
| MATRIX_GENERAL | Leave as NULL in EDD   |
| WRECEPTOR      | Leave as NULL in EDD   |

Table E-2. Required Fields for RI/FS Laboratory EDD

| EDD FIELD # | FIELD NAME | REQUIRED | DATA TYPE | FIELD WIDTH | DATA FIELD DESCRIPTION  |
|-------------|------------|----------|-----------|-------------|---|
| 1           | NSAMPLE    | Y        | C         | 30          | Field sample ID as listed on the Chain-of-Custody. The sample number indicated in this field should never be truncated. The only exception for this field not matching the chain-of-custody is for reanalyses and matrix spike results in which a RE or MS suffix will be added to the sample number respectively. For Lab QC use a unique Lab ID                             |
| 2           | CLASS      | Y        | C         | 15          | Dioxins = 'DIOX', Metals = 'M', Volatiles = 'OV', Semivolatiles/BNAs = 'OS', Pesticides/PCBs = 'PESTP', Herbicides = 'HERB', Explosives = 'EXP', Any petroleum hydrocarbon or fuel = 'TPH', Wet Chemistry = 'WET', Radionuclide = 'RAD', Miscellaneous = 'MISC', Total Organic Carbon = 'TOC', Grain Size = 'GS'. For TCLP analyses, add "T" suffix, e.g. TCLP Metals = 'MT'. |
| 3           | PARAMETER  | Y        | C         | 45          | Chemical or analyte name exactly as reported on laboratory hardcopy data package.   |
| 4           | EPASAMNO   | Y        | C         | 15          | If EPA Sample Number is not applicable use sample ID from NSAMPLE field.  |
| 5           | CASNO      |          | C         | 50          | Chemical Abstract Service number for the parameter listed. The CAS number should be reported exactly as it is listed in publications such as the Merck Index. This field should be left blank for those parameters not having CAS numbers (e.g. Total PAH).   |
| 6           | LAB_RESULT | Y        | N         | 20(6)       | Reported value in units specified in the UNITS field containing the proper number of significant digits. The % Recovery shall be placed in this field for matrix spike and laboratory control sample results.   |
| 7           | QUAL       |          | C         | 5           | The laboratory qualifier as reported on the laboratory hardcopy data package. For example, a 'U' qualifier should be used for all nondetected results.  |
| 8           | UNITS      | Y        | C         | 10          | The units of measure as reported on the laboratory hardcopy data package.   |
| 9           | CASE       |          | C         | 5           | In CLP Program, identifies samples sent to a laboratory over a specific period of time.   |
| 10          | SDG        | Y        | C         | 15          | Sample delivery group or Batch number identifier assigned by the laboratory. This number should exactly match the SDG designated on the hardcopy data package.  |
| 11          | LABORATORY | Y        | C         | 25          | Laboratory name.  |
| 12          | LAB_ID     | Y        | C         | 15          | Laboratory ID for the given sample.   |
| 13          | REC_DATE   |          | D         | 8           | Date sample was received by the Laboratory.   |
| 14          | EXTR_DATE  |          | D         | 8           | Date sample was extracted or prepared by the laboratory.  |
| 15          | ANAL_DATE  | Y        | D         | 8           | Date sample was analyzed by the laboratory.   |
| 16          | METHOD     | Y        | C         | 50          | Analytical method used to quantitate parameter concentrations as listed in the laboratory technical specification (e.g. '8270A' for SW-846 Method 8270A).   |
| 17          | MDL        | [1]      | N         | 15(6)       | Method Detection Limit (MDL) in units specified in the UNITS field and method specified in the METHOD field.  |

**Table E-2. Required Fields for RI/FS Laboratory EDD (continued)**

| EDD FIELD # | FIELD NAME  | REQUIRED | DATA TYPE | FIELD WIDTH | DATA FIELD DESCRIPTION  |
|-------------|-------------|----------|-----------|-------------|---|
| 18          | IDL         | [1]      | N         | 15(6)       | Instrument Detection Limit (IDL) in units specified in the UNITS field.   |
| 19          | CRDL_CRQL   | [1]      | N         | 15(6)       | Contract Required Detection/Quantitation Limit (CRDL/CRQL) in the units specified in the UNITS field. RDL for non-CLP parameters.   |
| 20          | DIL_FACTOR  |          | N         | 6(1)        | Dilution factor   |
| 21          | PCT_MOIST   |          | N         | 5(1)        | Percent moisture for soil samples; 100 for water samples.   |
| 22          | COMMENTS    |          | C         | 20          | Analytical result qualifier or comment other than that listed in the LAB_QUAL field. Example: 'Reanalysis'.   |
| 23          | DVTIER      | Y        | C         | 2           | Level of data Validation. Valid values are 0 (not validated), 1 (cursory), 2 (moderately rigorous, 3 (rigorous).  |
| 24          | LAB_QC_TYPE | Y        | C         | 6           | Normal Environmental Sample = "N", Laboratory Duplicate = "DUP", Matrix Spike = "MS", Matrix Spike Duplicate = "MSD", Laboratory Control Sample = "LCS", Laboratory Control Sample Duplicate = "LCS D", Method Blank = "MB", Preparation Blank = "PB", Standard Reference Material = "SRM", Blank Spike = "BS". |

[1] Either an IDL, MDL or CRDL\_CRQL (fields 17 through 19) needs to be provided for each sample - if applicable

Y - Yes

C - Character

N - Numeric           ( ) - number of decimal places

D - Date