Electronic Data Deliverables Reference Guide

Version 1.0

EPA Region 4

Prepared By:

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ENERGY WATER INFORMATION GOVERNMENT

for
Region 4 Superfund Division
Environmental Protection Agency

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STATUS OF DOCUMENT

As of March 2010, this document and all contents contained herein are considered DRAFT and are subject to revision and subsequent republication. Ecological EDD specifications do not appear in this guidance as they are currently under development, and will appear in future addenda.

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Acronyms

CAS RN – Chemical Abstracts Service Registry Number
DART **–** Data Archival and ReTrieval
EDD **–** Electronic Data Deliverable
EDP **–** EQuIS Data Processor
EPA **–** Environmental Protection Agency
O&M **–** Operation and Maintenance
SESD **–** Science and Ecosystem Support Division
SRS – Substance Registry System
CLP **–** Contract Laboratory Program
PRP **–** Potentially Responsible Party

Definitions

Darter - Darter is a set of software utilities written by EPA that assist in moving data from other platforms such as FORMS, Niton, YSI and Scribe to the Region 4 EDD format.

Data Provider – It is important to distinguish between "Data Provider" and "Sample Provider" with regard to EDD submittals. The data provider is defined as the person or agency that organized, formatted and submitted the electronic data from a sampling event. This may or may not be the sample provider, particularly when working with historic data. In the EPA Region 4 EDD, this information is provided under "data_provider."

Electronic Data Deliverable (EDD) – An Electronic Data Deliverable, or EDD for short is a flat file format, such as text, Excel, or other tabular file that follows a consistent design meant to organize information in a useful format. EDD files use a row of headers (typically one to two rows) that describe what information should be completed in each column the header precedes, and in what format that data should be entered.

	Column 1	**Column 2**	**Column 3**	**Column 4**
Header Row 1	sys_loc_code	x_coord	y_coord	coord_type_code
Header Row 2	*text (20)*	*numeric*	*numeric*	*text (20)*
Data Row 1	MW14	-81.26551	38.80360	LAT LONG
Data Row 2	MW15	-81.60310	38.12871	LAT LONG

Scribe - Scribe is a software tool developed by EPA to assist in the process of managing environmental data. Scribe captures sampling, observational, and monitoring field data. Scribe can import electronic data deliverables (EDD) from analytical laboratories, location data from a global positioning system (GPS), or data generated using real-time analytical methods. An associated program called "Scriblets" is used to capture and import sampling and monitoring data collected on handheld portable data assistants (PDA).

Sample Provider – The Sample Provider refers to the agency or company actually responsible for the data received from a sampling event. In the case where subcontracting companies are hired by a

contractor under an EPA contract, the agency that has the contract with EPA, i.e., “the contractor” is the Sample Provider. This field is populated in the EPA Region 4 EDD under “sample_provider.”

.rvf – The “.rvf” file (reference value file) is associated with the Electronic Data Processor (EDP) from Earth Soft. This file contains the valid values reference tables used by EDP to populate the drop down menus used when a specific type of value is required in an EDD, such as the units “mg/kg” (milligrams per kilogram) or a media code such as “GW” (groundwater). These fields limit the type of data permitted in certain columns of the EDD, and all the most recent valid values are in the “.rvf” file. Therefore, it is extremely important to insure you are using the most current file. You should check the Earth Soft web site to see if your version is current before working on your data.

.**zip archive** - The ZIP file format is a data compression and archival format that contains one or more files that have been compressed, to reduce their file size, or stored as-is. Many software utilities are available to create, modify, or open (unzip, decompress) ZIP files, such as WinZip, BOMArchiveHelper, KGB Archiver, PicoZip, Info-ZIP, WinRAR, IZArc, 7-Zip, ALZip, TUGZip, PeaZip, Universal Extractor, and Zip Genius. Microsoft has included built-in ZIP support (under the name "compressed folders") in later versions of its Windows operating system. Apple has included built-in ZIP support in Mac OS X 10.3 and later via the BOMArchiveHelper utility. The zip, zipcloak, zipnote, and zipsplit tools are used widely in unix-like systems.

ZIP files typically use the file extensions “.zip” or “.ZIP” and the MIME media type application/zip. However, due to security features at EPA, compressed files with the extension .zip should be renamed to the extension “.zpp” or in the case of signed and sealed compressed EDD files “.edd.”

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

1.0 INTRODUCTION

The Region 4 EDD Reference Guide describes the formats of the various EDD files necessary for properly preparing, formatting and electronically submitting operation and maintenance (O&M) environmental data to EPA Region 4 using the EQuIS© Data Processor (EDP) from EarthSoft. Instructions for obtaining EDP can be found in Section 2.11 of this document. Instructions for using the EDP are available in the EPA Region 4 EDP Reference Manual. You may obtain instructions from the manufacturer as well at http://www.earthsoft.com.

While it should be understood that it would be a rare occasion that any one site would require the use of every possible Electronic Data Deliverable (EDD), and that simultaneously no amount of EDD files could completely cover the requirements of every possible site, every effort has been made to create EDD files that incorporate as much useful discreet information as is possible based on the commonalities of the various sites under the EPA Region 4 purview. Thus, a reasonable effort should be made by data managers to prepare data to correctly import into the EQuIS data base structure when required to do so. It is also understood that in some rare cases, historical data may lack key components necessary for complete importation and subsequently may only be partially input, or in some extremely rare cases not be capable of input at all. The decision to import or not import this data lies exclusively with EPA Region 4.

1.1 What You Will Find in this Guide

This document should serve as a reference guide for the experienced data base manager who understands the structure of their own data and the process used to format and import electronic data into management systems such as EQuIS. In this guide you will find a detailed description of all EDD formats currently used by EPA Region 4 as well as information for handling formatting issues with historic data.

1.2 What You Will NOT Find in this Guide

This guide does not contain detailed instructions on how to manage information nor does it contain directions for importing electronic data into the EPA EQuIS data base. This information is contained in the EPA Region 4 EDP Reference Manual. You will also not find lessons or instructions on general data management. It is assumed that persons dealing with data of this nature have some experience and understanding of basic data management guidelines and software.

1.3 Projects

Before data can be submitted to Region 4, the dataset must be defined as a "project" in the Region 4 data system. Once this has occurred, the system will generate an E-mail to the data provider (see below) requesting the data. The EDD(s) containing the data are attached to this E-mail and returned to Region 4. The project defines the numbers of samples, the media sampled, and the analyses performed (including lab results, field results, lithology, etc.). Each project will be assigned a unique ID (project ID) to identify the dataset in the system. Data from a given project can be sent to Region 4 in multiple submittals, if desired.

1.4 Data Provider

The Region 4 data system defines the "data provider" as the entity preparing and sending the EDDs to the Region. It is the responsibility of the data provider to ensure completeness of the data submittal, and to correct any errors in the dataset.

1.5 Historical Data

The determination as to the status of data as either "historical" or "current" is at the sole discretion of the Region 4 DART Coordinator. The data provider is encouraged to become familiar with and submit Electronic Data Deliverables (EDDs) in accordance with the standard EPA Region 4 EDP Reference Manual located on the Region 4 web site www.epa.gov/region4/waste/sf/edd/edd.html. EPA Region 4 will require all data providers to submit EDDs in accordance with this manual and reference guide.

The intent of developing special requirements for historical information is to decrease the burden and complications associated with reporting in-depth details about data that may have been collected a number of years ago while retaining the value of the information being reported. EPA recognizes that some information about data collected in the past may not be readily available and, by reducing the requirements for electronic historical data, is endeavoring to strike a balance between minimizing the amount of effort involved in inputting information and maximizing the ability to document remedy progress.

1.6 Current Data

Data is considered to be "current" if it was collected on or after the deadline specified for the specific data type and provider outlined in Table 1.1. The data provider should anticipate all future data being collected for a site on or after the deadline to be submitted according to the site-specific legal order, on a regular basis (at least annually, semi-annually) or in accordance with this manual.

In addition to the routine data checking performed on all data as it loads into the Region 4 system, current data will undergo an additional electronic Region 4 review prior to being loaded.

1.7 Scribe

Samples collected during the course of an Emergency Response that are analyzed using the Region 4 SESD lab or the CLP will be submitted as *Current Data: Fund Lead* (See Table 1.1). If samples are analyzed using a lab hired for the response, that data can be reported directly from Scribe using the Darter software utility.

Table 1.1 Data Reporting Requirements – Project ID Format

	Source	Project ID Format*
Historical Data	PRP	HPYYYY-####
	Fund Lead (SESD or CLP data)	HFYYYY-####
	Fund Lead (Not SESD or CLP data)	HCYYYY-####
	Other	HOYYYY-####
Current Data	PRP	PYYYY-####
	Fund Lead (SESD or CLP data)	YYYY-####
	Fund Lead (Not SESD or CLP data)	RYYYY-####
	Scribe (Not SESD or CLP data) – Emergency Response	SYYYY-####
	Other	OYYYY-####

*Project ID is provided by Region 4

2.0 GENERAL EDD REPORTING REQUIREMENTS

2.1 Defining the Data Submittal

It is important to define what is to be submitted *ahead of the data submittal*. While it is often not possible to know precisely how many rows of data may be submitted, it should be possible to provide a summary of the amounts and types of data that are to be submitted. This summary information is entered into a tracking system to generate summary reports for the RPM and the data provider.

The summary is a tabular list of the types of samples being submitted, the analyses performed (see Section 2.7), and the EDD file types (see Section 3). Table 2-1 presents an example summary. The data provider will receive a starter file in spreadsheet format (.csv) from the project RPM to be completed at the beginning of the process. See Table 2-2 for an explanation of when this should be submitted, depending on your submittal type. The data provider completes the file, indicating the data that will be submitted when ready, and E-mails the file to: r4dartcoordinator@epa.gov.

The format of the file is shown below (the actual file may have too many columns to display on the printed page):

Table 2-1 Data Submittal Summary Form

Media	**SVOA**	**VOA**	**PCBA**	**Etc.**
Surface Soil	54	54	27	
Subsurface Soil				
Sediment	12	12	12	
Groundwater	10	10		
Surface Water	12	12	12	
Etc.				
EDD Types				
AlternatePosition	N			
SiteLoc	N			
FieldResults	Y			
Well	Y			
Etc.				

The table is in two sections. The first section (Media) lists the number of samples anticipated to be submitted to Region 4 by media and analytical method. The second section simply lists the available EDD Types, with the data provider indicating by Y/N whether or not an EDD of that type will be submitted for that Project ID.

Note: Location EDD is assumed to be present if required. Also, if the media portion of the table is completed, FSample, TST, and RES are assumed to be present (see Section 3).

Table 2-2 When to Submit Your Data Submittal Summary Form

	Source	When to Submit
Historical Data	PRP	Submit with EDD(s)
	Fund Lead (SESD or CLP data)	Submit with EDD(s)
	Fund Lead (Not SESD or CLP data)	Submit with EDD(s)
	Other	Submit with EDD(s)
Current Data	PRP	Submit prior to field event
	Fund Lead (SESD or CLP data)	Submit prior to field event
	Fund Lead (Not SESD or CLP data)	Submit prior to field event
	Scribe (Not SESD or CLP data) – Emergency Response	Submit prior to field event
	Other	Submit prior to field event

2.2 File Formats

All data to be reported to EPA Region 4 must be submitted as signed ".edd" files generated by importing EDD files to EDP (Sect. 2.11) and exporting for submission. EDD files can be produced using any software with the capability to create text files but these files *must be checked* with the EDP (Sect. 2.11) prior to submittal to EPA Region 4. These files are especially easy to create using spreadsheet or database software packages. However, if these are unavailable, the files can be created using a word processor or text editor. Table 2-3 provides instructions for creating tab-delimited text files from some widely-used software packages.

Table 2-3 Instructions for Producing Tab-Delimited Text Files

Package	Type	Instructions
EQuIS	Database	Data already existing in an EQuIS Database of any version must still be exported to the various EDD files and checked with the EDP. Export individual tables into a spreadsheet format so that they may be reformatted into the correct data structure described in Section 3. Then follow the instructions from "Excel" below for exporting to the text file format.
Access	Database	Create tables using file structures in Section 3. After data are entered, close table. Click on table name (under table tab) and then select "File," "Save As," from the top menu. Save to an external file or database. Change "Save as Type" to a text file. Change the file extension from "txt" to "tab." Press OK. This will start the export wizard. In the export wizard, select "Delimited," then press the "Next" button. Select "Tab" as the delimiter type and (") as the text qualifier. Press the "Next" button. Select a destination and name for the file. Press the "Finish" button.
Excel	Spreadsheet	Select "File," "Save As," from the top menu. Change "Save as Type" to a "Text (Tab Delimited)" file. Press the "Save" button. Note: When using Excel, care must be taken to prevent the software from stripping leading and trailing zeroes from your dataset.
Quattro® v8	Spreadsheet	Select "File," "Save As," from the top menu. Change the "File Type" to "ASCII Text (Tab Delimited)." Press the "Save Button." Be sure to check that Quattro does not delete leading and trailing zeros.

Package	Type	Instructions
Lotus 1-2-3	Spreadsheet	Select "File," "Save As," from the top menu. Change "Save as Type" to a "Comma Separated Value (CSV)" file. Provide file name. Press the "Save" button. Be sure to check that Lotus does not delete leading and trailing zeros.

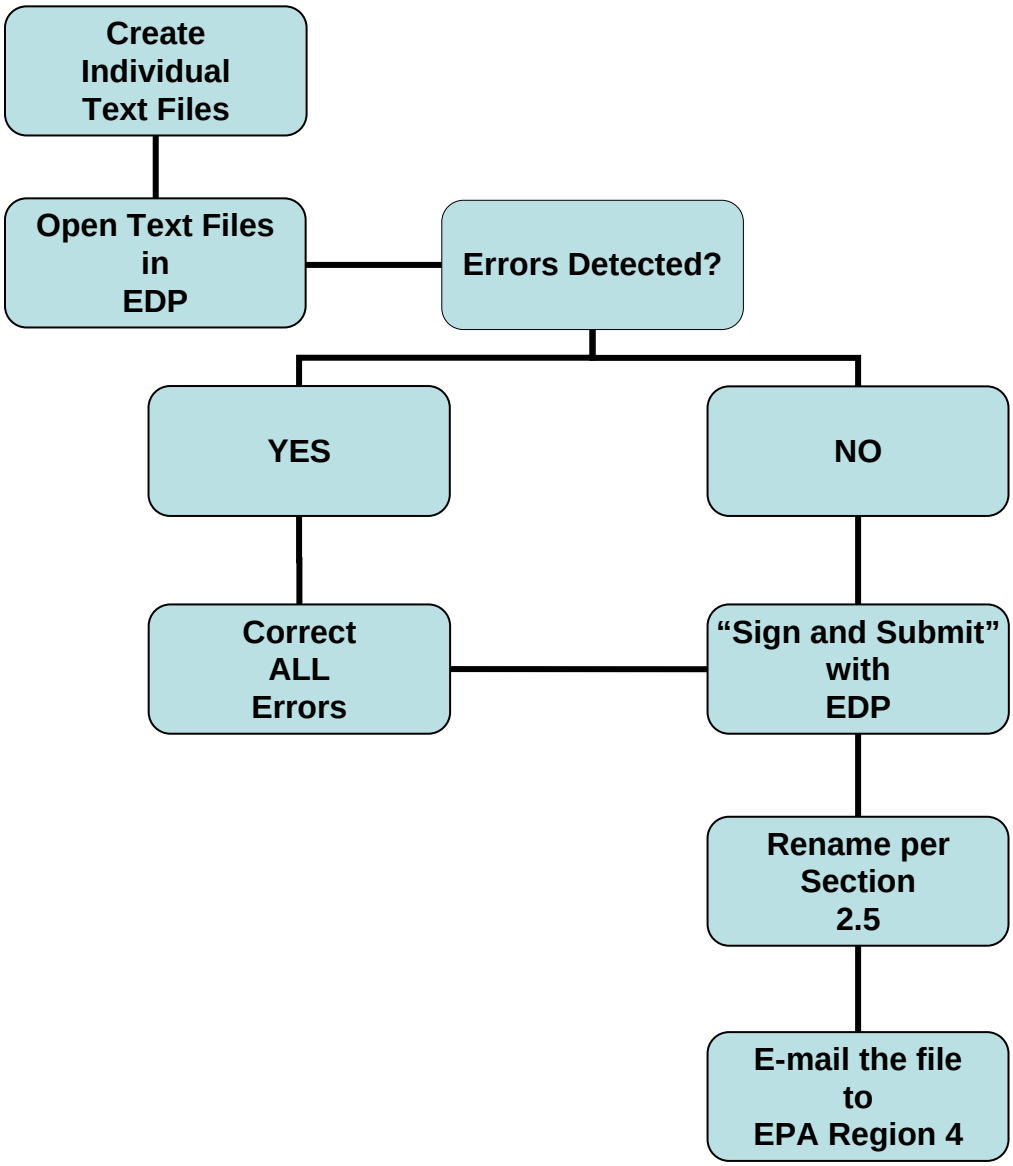
2.3 EDD Files

The tables in this guidance identify the various types of data being requested. Each EDD file should be saved as an individual text file and should be named in accordance with the naming convention rules. Table 2-4 provides general information on the files that make up this EDD. Detailed instructions for creating all the EDD files are provided in Section 3. Instructions for submitting your EDDs to EPA Region 4 are presented in Section 2.11 and in the EDP Reference Manual. Figure 2-1 shows the EDD creation process conceptually.

It is not possible to prepare a dataset for acceptance into a database without understanding the basics of how databases operate. Row uniqueness and referential integrity are requirements of the EQuIS database. Their requirements impact how the EDD is prepared.

Row uniqueness is assured when no two rows in a file contain the same values for all the fields listed under the heading "What makes a row of data unique?" in Table 2-4, also see Section 2.4.

Figure 2-1 Conceptual Model of the EDD Submittal Process



The relationship between rows within the files of the EDD must be assured by enforcing the "referential integrity" rules discussed in Table 2-4 under the column labeled "Dependence of other files on these data", also see Section 2.4.

Table 2-4 General Information on EDD Files

File Type	File Name	Contents	What makes a row of data unique?	Dependence of other files on these data
Site (Created by EPA)	EPAR4_Site_v1	One-time definition of site including EPA Region 4 data providers' contact information.	site_code (This will be provided by EPA Region 4)	The location file cannot be loaded without properly referenced sites (site_code). **Reserved.**
Location (Section 3.1)	EPAR4_Location_v1	One entry for each location on a site. Contains elevation, coordinate, and general locational data. Data should only be reported once for a location.	sys_loc_code	All Except Chemistry Test and Chemistry Result
Alternate Position (Section 3.2)	EPAR4_AlternatePosition_v1	Alternate position/location information for sample locations if required.	None. Related by sys_loc_code	None
Site Location (Section 3.3)	EPAR4_SiteLoc_v1	Information relating sample locations to the site, as on, off, or background.	None. Related by sys_loc_code	None
Field Results (Section 3.4)	EPAR4_FieldResults_v1	Results of field tests for unique locations. Not all locations will have Field Results, but Field Results must have a location.	sys_loc_code sample_name field_parameter result_date	None
Chemistry Field Sample (Section 3.5)	EPAR4_FSample_v1	One row for each sample submitted to the lab.	sys_sample_code	Chemistry Test and Chemistry Result
Chemistry Test (Section 3.6)	EPAR4_TST_v1	One row for each test run on each sample submitted including duplicates. Duplicates must have a unique sys_sample_code.	sys_sample_code lab_anl_method_name analysis_date analysis_time total_or_dissolved test_type	Chemistry Result
Chemistry Result (Section 3.7)	EPAR4_RES_v1	One row for each analyte reported for a given sample and test. Additional rows can be added to report total and dissolved results and to report results for re-extracts. Duplicates must have a unique sys_sample_code.	sys_sample_code lab_anl_method_name analysis_date analysis_time total_or_dissolved test_type cas_rn	None

Table 2-4 General Information on EDD Files

File Type	File Name	Contents	What makes a row of data unique?	Dependence of other files on these data
Well (Section 3.8)	EPAR4_Well_v1	Data that relates to any well used for sampling under the project.	sys_loc_code start_measurement_ date start_measurement_ time	Well Construction (sys_loc_code)
Well Construction (Section 3.9)	EPAR4_WellConstruction _v1	Well construction information including segment type, material type, depths, and diameters.	None. Related by sys_loc_code	None
Well Datum (Section 3.10)	EPAR4_WellDatum_v1	Well elevation information for measurements of water level. Includes datum used.	sys_loc_code start_date	None
Water Level (Section 3.11)	EPAR4_WaterLevel_v1	Groundwater level data for monitoring wells.	data_provider sys_loc_code activity_type task_code measurement_date water_level_depth	None
Geologic Sample (Section 3.12)	EPAR4_GeologicSample_ v1	Geology data for a borehole.	geo_sample_code	Geologic Sample Parameter Atterberg Static Properties
Geologic Sample Parameter (Section 3.13)	EPAR4_GeoSampleParam eter_v1	Field parameters specifically related to drilling a borehole, i.e. conductivity, turbidity.	None. Related by geo_sample_code and sys_loc_code	None
Water Table (Section 3.14)	EPAR4_WaterTable_v1	Aquifer information.	None. Related by and sys_loc_code	None
Lithology (Section 3.15)	Lithology	Lithology information from a borehole.	None. Related by sys_loc_code	None
Drill Activity (Section 3.16)	EPAR4_DrillActivity_v1	Drilling event information including unique location and depths.	None. Related by sys_loc_code and drill_event.	DrillParameter
Drill Parameter (Section 3.17)	EPAR4_DrillParameter_v1	Field parameters specifically related to drilling, i.e. conductivity, turbidity. Relates to Drill Activity.	None. Related by sys_loc_code and drill_event.	None
Downhole Point Parameter (Section 3.18)	EPAR4_DownholePoint_v 1	Drilling tip and sleeve stress information.	None. Related by sys_loc_code	None

Table 2-4 General Information on EDD Files

File Type	File Name	Contents	What makes a row of data unique?	Dependence of other files on these data
Atterberg Properties (Section 3.19)	EPAR4_Atterberg_v1	Atterberg properties information for moisture and slope. Related to the geologic sample.	None. Related by geo_sample_code and sys_loc_code	None
Static Properties (Section 3.20)	EPAR4_StaticProps_v1	Static physical properties such as geologic materials, specific gravity and porosity related to drilling.	None. Related by geo_sample_code and sys_loc_code	None

2.4 Data Integrity Rules

Data providers are responsible for performing three types of integrity checks on their data prior to submittal.

Validity: All codes used in a data set must be valid. Valid values for all coded fields are either provided in the description columns of the tables in Section 3 or in the reference tables of the EDP. Data providers must use the most up to date reference tables (.rvf files) available from Earth Soft. For example, sample matrix information is input in the sample_matrix_code field of the Sample Result file and must be reported using one of the values provided in the reference file associated with EDP. It is essential to obtain the latest version of the formats and reference files before beginning work.

Row Uniqueness: Row uniqueness must be verified using the guidance provided in Table 2-2. In database terminology this is called a primary key. For example, the sys_loc_code is the primary key in the Location EDD file and therefore no two rows in the file can have the same sys_loc_code value. The EDP will highlight duplicate rows of data to assist you in locating these errors.

Row Integrity: The relationship between rows within the files of the EDD must be assured by enforcing the "referential integrity" rules discussed in Table 2-2 under the column labeled "Dependence of other files on these data." For example, the values in the sys_loc_code field in the Sample Result file must match with a value previously reported in the sys_loc_code field of the Location file. **The EDP will not test for integrity between EDDs and existing data in the database until it is loaded.** The data provider will be responsible for taking care not to submit duplicate data. When the data is loaded into the DART system at EPA, if the data fails integrity tests, it will NOT be uploaded and you will be notified via automated E-mail that the data was not successfully loaded. You will need to correct any errors and resubmit the data along with the error report E-mail. Instructions are included with the E-mail.

2.5 File Naming Convention

The data submittal is actually a .zip archive file containing one or more of the individual EDD files (see Section 3).

The submitted file **IS REQUIRED** to be named according to the following convention after processing with the EDP:

Lab Project Number_Lab Project Name_Data Provider.EPAID.edd

Note:
Lab Project Number is provided by Region 4.
Lab Project Name is provided by Region 4.
Data Provider is provided by Region 4
EPAID is provided by Region 4
The .edd file is a standard .zip file. The extension must be changed to .edd or the file will be rejected by the USEPA E-mail server. EDP has an option to save the EDD with the .edd extension.

As an example, data for the Trans Circuits site (EPA identification number of 110002537844, (Lab Project Number 07-0274) that is being submitted to EPA Region 4 by Black and Veatch would be reported in a file named:

07-0274_Trans Circuits_PL-CONT_BV.110002537844.edd

This filename is in the E-mail you received when the project was created at Region 4 – you can copy and paste to rename your .edd file.

NOTE: In order for EPA Region 4 to properly process the EDDs, the file naming convention must be followed or the EDD will be sent back to the data provider for correction.

2.6 Valid Values

Valid values, also known as reference values or code lists, govern the contents of some fields in the EDD files and create some of the drop-down menus in EDP. In other words, some fields may only be populated with data that matches a value listed in the EPA Region 4 list of valid values in EDP *exactly*. A list of all the data fields that must contain valid values is presented in Table 2-5. This list is also cross-referenced to the EDD file(s) in which the field appears.

If data providers need to enter a value not already in the Region 4 list in Valid Value List in EDP, they can request the proposed addition to the valid value list by sending an E-mail to R4DartCoordinator@epa.gov. The data provider should explicitly state the valid value that she/he would like added, into what reference table the value needs to be added, provide a description of the value, and explain why the addition is necessary. In the case of requesting a new laboratory code, the data provider should include the full name of the laboratory and its address and contact information. When requesting an addition of an analyte, the data provider must include the appropriate CAS RN or EPA ID along with a description of the analyte. The EPA SRS

(http://iaspub.epa.gov/sor_internet/registry/substreg/home/overview/home.do) should be thoroughly examined for an existing CAS RN before submitting a request for the addition of new analytes. Select the "Search & Retrieve" tab and enter the CAS Number, Chemical name or other identifier. Be certain to check for synonyms. This will minimize possible confusion with conflicting numbers and small variations in chemical naming conventions. EQuIS relies on the CAS RN as the primary key, not the chemical name.

Table 2-5 Valid Values and Associated EDD files

Valid Value Name	Field Name	EDD File
Analyte	cas_rn, chemical_name, dnapl_cas_rn, lnapl_cas_rn	Result, Water Level
Analytical Method *(see Section 2.7 below)*	lab_anl_method_name	Test, Result
Company	data_provider, drilling_subcontractor, engineer_subcontractor, inspect_contractor, estab_company_code, excav_company_code	Location, All tables containing data_provider.
Company Type	Not Currently Used	None
Coordinate Elevation Datum	elev_datum_code,	Location, Alternate Position
Coordinate Elevation Method	elev_collect_method_code, datum_collect_method_code	Location, Alternate Position, Well Datum
Coordinate Geometric Type	geometric_type_code	Alternate Position
Coordinate Horizontal Datum	horz_datum_code	Alternate Position
Coordinate Horizontal Method	horz_collect_method_code, verification_code	Alternate Position
Coordinate Type	coord_type_code	Location, Alternate Position
Coordinate Type Verification	verification_code	Location
Downhole Point Parameter Type	param	Downhole Point
Field Parameters	field_parameter	Field Results
Fraction	total_or_dissolved	Test, Result
Geologic Unit	geo_unit_code_1, geo_unit_code_2, geo_unit_code_3, geo_unit_code_4, geo_unit_code_5, geologic_unit_code	Lithology, Static Properties
Lab Parameters (View)	cas_rn	Result
Location Parameter Type	param_code	Location Parameter
Location Type	loc_type	Location
Material	material_type, material_name	Lithology, Static Properties
Matrix	sample_matrix_code, lab_matrix_code	Result, Field Results
Preservative	preservative	Test
Qualifier	lab_qualifiers, validator_qualifiers	Result
Result Type	result_type_code	Result
Sample Method	sample_method, sampling_technique	Geologic Sample, Sample
Sample Parameter Type	param_code	Geologic Sample Parameter, Drill Parameter
Sample Type	sample_type_code	Result
State	loc_state_code, state	Location, Site
Subfacility Type	site_type	Site
Task Type	activity_code	Occurs in multiple.

Table 2-5 Valid Values and Associated EDD files

Valid Value Name	Field Name	EDD File
Test Batch Type	test_batch_type	Result
Test Type	test_type	Test
Unit	various_unit fields throughout all files	All Files
Well Segment Type	segment_type, material_type_code	Well Construction

2.7 Understanding Analytical Methods

Analytical Methods pose a special challenge in dealing with data from multiple sources and time frames within a single data base environment and must be handled with care to provide the most accurate information possible. The Region 4 valid value table included with the reference files contains analytical methods based on the EPA laboratory nomenclature

EPA Method Code:Lab Analytical Code i.e., **VOA:EPA 8260B**

In the example above, "VOA" refers to volatile organic compounds while "EPA 8260B" refers to the laboratory analytical method of discovery of volatile organic compounds by gas chromatography/mass spectrometry (GC/MS). When formatting your own data to comply with the standards necessary for input into the EPA Region 4 EQuIS System, it is important to insure the methods used in identifying your data fit properly into one of these standard methods. Table 2-6 below provides a list of EPA Method Codes

For "Historical" data, if the analytical method is not known, the data may be reported using only the appropriate "Method Code" from Table 2-6. For all "Current" data, the Method Code and Lab Analytical Code are required.

Table 2-6 EPA Method Codes

EPA Method Code	Description
ALG	Algal Assay
ASBES	Asbestos
CNA	Classical/Nutrient Analyses
DCNA	Dissolved Classical Nutrients
DIO	Dioxin
DMTL	Dissolved Metals
HERB	Herbicides
MICRO	Microbiology
OCP	Organochlorine Pesticides
OMTL	Organometallics
OPP	Organophosphorous Pesticides
PCBA	PCB Araclors
PCBC	PCB Congeners
PEST	Pesticides
PHYSP	Physical Properties
PSC	Particle Size Characterization

Table 2-6 EPA Method Codes

SMTL	Speciated Metals
SPLPM	SPLP Metals
SVOA	Semi Volatile Organics
TCLPM	TCLP Metals
TCLPP	TCLP Pesticides
TCLPS	TCLP Semi Volatiles
TCLPV	TCLP Volatiles
TMTL	Total Metals
VOA	Volatile Organics
Historic Method Codes	
HIST-CAN	Classical/Nutrient Analyses
HIST-DCNA	Dissolved Classical/Nutrients
HIST-DIO	Dioxin
HIST-DMTL	Dissolved Metals
HIST-HERB	Herbicides
HIST-OCP	Organochlorine Pesticides
HIST-OMTL	Organometallics
HIST-OPP	Organophosphorous Pesticides
HIST-PCBA	PCB Aroclors
HIST-PCBC	PCB Congeners
HIST-PESTPCB	Pesticides/PCBs
HIST-PHYSP	Physical Properties
HIST-PSC	Particle Size Characterization
HIST-SMTL	Speciated Metals
HIST-SPLPM	SPLP Metals
HIST-SPLPP	SPLP Pesticides
HIST-SVOA	Semi-Volatiles
HIST-TCLPM	TCLP Metals
HIST-TCLPP	TCLP Pesticides
HIST-TCLPS	TCLP SemiVolatiles
HIST-TCLPV	TCLP Volatiles
HIST-TMTL	Total Metals
HIST-VOA	Volatile Organics
HIST-CAN	Classical/Nutrient Analyses

2.8 Reporting Results

Laboratory results (both Detects and Non-detects) must be reported as shown in the example below. Each non-detect row must show an "N" in the detect_flag field and must have values entered in the quantitation_limit and detection_limit_unit fields (i.e., these fields cannot be left null. If no quantitation limit is available for historic data but a result value is available, a qualifier of "X" should be added to the interpreted_qualifiers column and a value of -999999 should be added to the quantitation_limit column. Table 2-7 presents an example of how to report a detect (1st row) and non-detect (2nd row) data. Results with a text value, such as "NA," "ND," or other non-numeric value should not be reported, as noted in the last row of Table 2-7.

Table 2-7 Example of Reporting Non-detects

result_value	detect_flag	quantitation_limit	detection_limit_unit	lab_qualifiers	interpreted_qualifiers
.15	Y	.005	ug/ml		
.005	N	.005	ug/ml	U	U
8.0	Y	-999999	ug/ml		X
8.0	N	-999999	ug/ml	U	UX
5.2	Y	-999999	ug/ml	J	JX
~~ND~~	~~N~~		~~ug/ml~~	~~U~~	

2.9 Reporting Duplicate Lab Results

"Laboratory Duplicates" can occur for a variety of reasons including dilutions, equipment tolerances, sample conditions, and holding time allowances. When duplicate results are reported from the lab, it is important to report BOTH results to EPA along with the Test Type specified in the EDD. An example of how to report laboratory duplicates is presented in Table 2-8 below.

Table 2-8 Example of Reporting Laboratory Duplicates

sys_sample_code	lab_anl_method_name	analysis_date	analysis_time	test_type	cas_rn	chemical_name	result_value*
C082402-10	TMTL:EPA 200.7	01/05/2008	12:41	initial	7440-36-0	Antimony	4200
C082402-11	TMTL:EPA 200.7	01/05/2008	13:05	dilution	7440-36-0	Antimony	85

*additional fields are required but have not been shown here for simplicity. All required fields for a normal result are required here.

2.10 Reporting Tentatively Identified Compounds (TICs)

Tentatively Identified Compounds (TICs) present an additional challenge in reporting to a single data base as there is no standardized method of reporting from one source to another. TICs should be reported when the following conditions are satisfied:

1) The compound is accompanied in the lab report by a valid CAS RN (or EPA ID) and chemical name. Validity should be checked with EPA SRS.
2) The quantitation_limit is present.
3) A valid lab_analytical_method was used and reported.

When reporting TICs that meet these conditions, the result_type_code in the Result EDD must be set to "TIC". Table 2-9 demonstrates the proper method for reporting this result data along with standard data.

Table 2-9 Example of TIC Reporting

lab_analytical_method	cas_rn	chemical_name	result_value	result_type_code
SVOA:CLP SOM01.0 BS	26914-18-1	Methylanthracene	.05	TIC
VOA:CLP SOM01.0 BS	51-28-5	2,4-Dinitrophenol	.07	TRG

All ancillary information associated with reporting TRG chemical results should also accompany TICs. These include sys_sample_code, lab_anl_method_name, analysis_date, analysis_time, cas_rn, chemical_name, result_type_code, quantitation_limit, result_unit, detection_limit_unit, and test_batch_id.

2.11 Using the EQuIS Data Processor to Check EDD Formatting

All EDD files must be processed with the EDP prior to submittal to EPA Region 4. The EDP is a no-cost application that performs a series of formatting checks on the files and then identifies any records that have errors along with a description of those errors. This allows the data provider to correct the errors before sending the files to EPA Region 4. EDD files that pass through the EDP error-free should also result in error-free import at EPA Region 4.

EDP and the Region 4 format file (.rvf) are available as a no-cost download from the EarthSoft website located at http://www.earthsoft.com/wordpress/products/edp/edp-format-for-epar4/.

Instructions on how to install and use the EDP are also provided on the website and in the Region 4 EDP Reference Manual. You will need to register the Region 4 formats with Earth Soft in order to use EDP. Follow the instructions provided with EDP for registering properly. You will not be able to use EDP with the correct Region 4 formats without proper registration.

Once you have installed and licensed EDP you should use this document as a guideline for formatting your data to conform to the necessary EDD formats. Load the Region 4 formats and reference tables into EDP per the instructions in the Region 4 EDP Reference Manual and import your individual EDDs to the correct location under Geology, Basic Field Results or Chemistry and test your data for readiness to import.

3.0 EDD FILE FORMATS

This section contains detailed information regarding the files that make up the Region 4 EDD. As stated in section 2.1, each file must be saved as individual text files and can be created using any software with the capability to create text files (including EDP). If a column is limited to a specific number of characters, the limit will be given in parenthesis within the "Data Type" column (e.g., Text (3) signifies the value cannot exceed 3 characters in length). Columns marked "Required" must be reported for each row in the file. If these fields are not reported, errors will be identified in the EDD and the EDD will need to be resubmitted. Columns marked "If available" should also be reported if possible.

The Location file needs to be submitted as part of the first EDD submittal. This file need only be submitted once unless information in the file changes or additional information, such as a new sampling location, needs to be added.

For all other EDD files, Region 4 will send a list of the EDDs expected for the data submittal.

Note: Region 4 will provide the valid values for data_provider, task_code and activity_code for each data submittal.

3.1 Location EDD File

The Location file is typically submitted only once and must be part of the first EDD submittal. The location file only needs to be resubmitted if a new sampling location is used, such as a new monitoring well, or to update previously submitted information. When resubmitting the location file, only include data for the new locations and/or for the locations whose information is being updated. The Location EDD file contains general information about sampling station locations and station ID numbers. This table does not need to be resubmitted if information has previously been submitted to EPA Region 4 in the EDD format.

Location files for should be named according to the following convention: **EPAR4_Location_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
data_provider	Text (20)		current/historical		Location data provider. Refer to Valid Values.
sys_loc_code	Text (20)	PK	current/historical		Unique Station or Well ID such as MW01, A24, SW12, or SB2S, for all samples. Required for mapping. Must be a valid code for the facility and will relate to the reported values in the sys_loc_code fields in other EDDs related to this facility.
x_coord	Numeric		current/historical		X coordinate/Easting (WGS 1984 in decimal degrees ONLY).
y_coord	Numeric		current/historical		Y coordinate/Northing (WGS 1984 in decimal degrees ONLY).
coord_type_code	Text (20)		current/historical		Code representing coordinate system in which x_coord and y_coord are expressed (LAT LONG). Refer to Valid Values.
verification_code	Text (20)		current/historical		Verification Code for coordinates. This value represents the accuracy with which the data locations were collected or discovered. Refer to Valid Values.
loc_type	Text (20)		current/historical		Media Code for the general location. In many cases, multiple sample types (i.e., surface soil, subsurface soil) were collected. Identify the initial media type here as multiple values are not available and only one location should be specified under sys_loc_code. Refer to Valid Values.
surf_elev	Numeric		No		Elevation of the ground surface, or if location is for surface water samples, water surface elevation. (Decimal feet).
elev_unit	Text (15)		No, unless surf_elev is populated.		Surface elevation unit (Decimal feet. This is required if surf_elev is populated in this EDD. Refer to Valid Values.
elev_datum_code	Text (50)		No, unless surf_elev is populated.		This is required if surf_elev is populated in current or historic location EDDs. Specifies the vertical datum used in collecting surface elevations. Refer to Valid Values.
elev_collect_method_code	Text (20)		No		This is required if surf_elev is populated in the location EDDs. Specifies the method used to collect elevation data. Refer to Valid Values.
parcel_code	Text (50)		No		Assessor's Parcel Number if available.
loc_desc	Text (255)		No		Short description of the location where the sample was collected, such as NE corner of building or may provide information about location changes, i.e., "Replaces MW34 due

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
					to submersion."
total_depth	Numeric		No		Total depth associated with location.
depth_to_bedrock	Numeric		No		Depth to bedrock.
units	Text (15)		No, unless total_depth or depth_to_bedrock is populated.		Depth units. Required if total_depth or depth_to_bedrock is populated. Refer to Valid Values.
bearing	Text (20)		No		Angle of variance from a given reference point (i.e. North)
plunge	Text (20)		No		Angle of variance (inclination) from horizontal.
loc_name	Text (40)		No		Location name. May be used for clarification or better relationship to text, i.e. MW04 was originally MW-04.
loc_type_2	Text (20)		No		Location type 2. Used to clarify sampling locations used for multiple media types, such as a bore hole that becomes a permanent monitoring well. Refer to Valid Values.
loc_purpose	Text (20)		No		Location purpose.
site_code	Text (20)		No	Site EDD, site_code	Code used to specify site for location. Must correlate with site_code in Site EDD.
start_date	DateTime		No		Date started at location. MM/DD/YYYY format.
end_date	DateTime		No		Date ended at location. MM/DD/YYYY format.
log_date	DateTime		No		Date log entry made. MM/DD/YYYY format.
survey_date	DateTime		No		Date survey was done. MM/DD/YYYY format.
surveyor_name	Text (255)		No		Name of surveyor. May use name or data_provider.
driller	Text (50)		No		Name of driller. May use name or data_provider.
drilling_subcontractor	Text (20)		No		Code of drilling subcontractor. Refer to Valid Values.
drilling_method	Text (40)		No		Simple description of drilling method.
geologist	Text (50)		No		Name of geologist. May use name or data_provider.
engineer	Text (50)		No		Name of engineer. May use name or data_provider.
engineer_subcontractor	Text (20)		No		Engineering subcontractor. Refer to Valid Values.

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
inspector	Text (50)		No		Name of inspector
inspect_contractor	Text (20)		No		Code of drilling subcontractor. Refer to Valid Values.
drawing_checker	Text (50)		No		Name of person checking the drawing.
drawing_check_date	DateTime		No		Date drawing was checked. MM/DD/YYYY Format.
drawing_editor	Text (50)		No		Name of person editing the drawing
drawing_edit_date	DateTime		No		Date drawing edits were made. MM/DD/YYYY format.
within_facility_yn	Text (1)		No		Yes/No value indicating if location is within facility. Y/N option only.
loc_county_code	Text (20)		No		Location county code.
loc_district_code	Text (20)		No		Location district code.
loc_state_code	Text (10)		No		Location state code. Refer to Valid Values.
loc_major_basin	Text (20)		No		Location major basin Refer to Valid Values.
loc_minor_basin	Text (20)		No		Location minor basin.
estab_company_code	Text (20)		No		Location establishing company code. Refer to Valid Values.
excav_company_code	Text (20)		No		Location excavation company code. Refer to Valid Values.
remark	Text (255)		No		Remark 1 – open text.
remark_2	Text (255)		No		Remark 2 – open text.
approved	Text (1)		No		Approval status. Y/N option only.
stream_code	Text (30)		No		Stream code.
stream_mile	Numeric		No		Stream mile.
custom_field_2	Text (255)		No		Custom field 2.
custom_field_3	Text (255)		No		Custom field 3.
custom_field_4	Text (255)		No		Custom field 4.
custom_field_5	Text (255)		No		Custom field 5.

3.2 Alternate Position EDD File

When multiple coordinates may exist for an identified location, an Alternate Position EDD may be submitted, ranking the locational information according to preference.

Alternate Position EDD files for should be named according to the following convention: **EPAR4_AlternatePosition_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
sys_loc_code	Text (20)		current/historical	Location EDD, sys_loc_code	Unique Station or Well ID. Required for mapping. Must be a valid code for the facility and must match one of the reported values in the sys_loc_code field of the location EDD file submitted in the current or previous EDD.
coord_type_code	Text (20)		current/historical		Unique identifier describing coordinate system in which this location is referenced (LAT LONG). Refer to Valid Values.
identifier	Text (20)		current/historical		Text identifier that facilitates unique representation of the coordinate system.
observation_date	DateTime				Date when position observation was made.
alt_x_coord	Text (20)				Alternate x coordinate. WGS 1984 in decimal degrees ONLY.
alt_y_coord	Text (20)				Alternate y coordinate. WGS 1984 in decimal degrees ONLY.
elev	Text (20)				Alternate elevation.
elev_unit	Text (15)				Unit of measurement for the elevation. Refer to Valid Values.
horz_collect_method_code	Text (20)				Code that represents the method used to determine the coordinates for a point on the earth. Refer to Valid Values.
horz_accuracy_value	Text (20)				Measure of the accuracy of the x, y coordinates.
horz_accuracy_unit	Text (15)				Unit of measure used to quantify the measure of horizontal accuracy. Refer to Valid Values.
horz_datum_code	Text (20)				Code that represents the reference datum used in determining x, y coordinates. Refer to Valid Values.
elev_collect_method_code	Text (20)				Code that represents the method used to collect the vertical measure or elevation of a reference point. Refer to Valid Values.

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
elev_accuracy_value	Text (20)				Measure of accuracy of the elevation.
elev_accuracy_unit	Text (15)				Unit of measure used to quantify the measure of vertical or elevation accuracy. Refer to Valid Values.
elev_datum_code	Text (20)				Code that represents the reference datum used to determine the vertical measure or elevation. Refer to Valid Values.
source_scale	Text (20)				Represents the proportional distance on the ground for one unit of measure on a map or photo.
subcontractor_name_code	Text (20)				Code used to represent the subcontractor or party responsible for providing coordinate information.
verification_code	Text (20)				Code that represents the process used to verify the coordinate information. Refer to Valid Values.
reference_point	Text (50)				Text that identifies the place for which geographic coordinates were established.
geometric_type_code	Text (20)				Code that defines the geometric entity represented. As sys_loc_code typically defines a location (borehole, well, etc.) this will likely be "point". Refer to Valid Values.
remark	Text (255)				Remarks.
rank	Numeric				Integer that represents preference where more than one coordinate system exists for a given sys_loc_code.

3.3 Site Location EDD File

The Site Location EDD identifies sampling locations in relation to the site as on site, off site or a background sample. It also ties a group of locations as various sys_loc_code fields directly to a site_code.

Site Location EDD files for should be named according to the following convention: **EPAR4_SiteLoc_v1. csv or .txt for tab-delimited files.**

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
sys_loc_code	Text (20)		current/historical	Location EDD, sys_loc_code	Unique Well ID. Required for mapping. Must be a valid code for the facility and must match one of the reported values in the sys_loc_code field of the location EDD file submitted in the current or previous EDD.
site_code	Text (20)		current/historical		Use Registry ID (EnviroFacts) or GNIS ID (USGS NHD).
site_loc_type_code	Text (10)				Code indicating whether the location is onsite, offsite or background.
gradient	Text (20)				Gradient at site.

3.4 Field Results EDD File

Field results may be entered for current and historical sampling events where field information such as temperature, pH, turbidity, salinity, and dissolved oxygen was captured. The field_parameter column should be used to identify what was captured with the results of that test in the result_value column and the appropriate units in the result_unit column. Field parameters not identified in the valid values table for Field Results should be submitted to EPA with an explanation of the parameter, its units, and result type (numeric, text, etc.) for possible inclusion into the valid values.

Field Results EDD files should be named according to the following convention: **EPAR4_FieldResults_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
data_provider	Text (20)		current/historical		Field Results data provider. Refer to Valid Values.
task_code	Text (20)		current/historical		Task Code.
activity_code	Text (20)		current/historical		Activity type. Refer to Valid Values.
sys_loc_code	Text (20)	PK	current/historical		Unique Station ID. Required for mapping. Must be a valid code for the facility and must match one of the reported values in the sys_loc_code field of the location EDD file submitted in the current or previous EDD.

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
sample_name	Text (255)	PK	current/historical		Sample ID.
field_parameter	Text (15)	PK	current/historical		Field parameter. Refer to Valid Values.
start_depth	Numeric				Sample start depth
end_depth	Numeric				Sample end depth
depth_unit	Text (2)				Sample depth unit. Refer to Valid Values.
result_date	DateTime	PK	current/historical		Result date/time (mm/dd/yr hh:mm:ss).
result_value	Text (14)		current/historical		Result value.
result_unit	Text (15)		current/historical		Result unit. Refer to Valid Values.
quantitation_limit	Text (20)				Quantitation limit.
sample_matrix_code	Text (20)		current/historical		Sample matrix code. Refer to Valid Values.
qualifier	Text (20)				Qualifier
sampling_reason	Text (40)				sampling reason
sample_method	Text (40)				Sampling method
reportable_result	Text (3)		current/historical		Reportable result. The default value is “Yes.” Y/N option only.
value_type	Text (10)		current/historical		How value was derived. Actual/Calculated/Estimated option only.
detect_flag	Text (1)		current/historical		May be either Y for detected analytes or N for non-detects.
remark	Text (225)				Unused in Region 4.

3.5 Chemistry Field Sample EDD File

The Chemistry Field Sample EDD is the crucial file by which all chemistry result data is based. Sys_sample_code uniquely identifies each sample that was returned from a laboratory with a result. This value is unique throughout the database, even for resamples, duplicates, etc. This does not represent the value submitted on the chain of custody when sending samples to the lab for analyses (which should be populated in the sample_name column).

Chemistry Field Sample EDD files should be named according to the following convention: **EPAR4_FSample_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
sys_sample_code	Text (40)	PK	current/historical		Lab Sample ID. For data generated by R4 and CLP, prefix Lab Sample ID with R4. Each sample must have a unique value, including spikes and duplicates. Laboratory QC samples must also have unique identifiers. Uniqueness throughout the database is the only restriction enforced by EQuIS.
sample_name	Text (30)				Sample ID from COC. Is not required to be unique (i.e., duplicates are OK). This is commonly called a Field Sample ID.
sample_matrix_code	Text (10)		current/historical		Media Code. Refer to Valid Values.
sample_type_code	Text (10)		current/historical		Code to distinguish between field samples (N) and field QA/QC and Laboratory samples. Refer to Valid Values.
sample_source	Text (10)		current/historical		Identifies where the sample came from. In this import, this should always be Field. Default value is “Field.” Field/Lab option only.
parent_sample_code	Text (40)			Sample EDD, sys_sample_code	The value of "sys_sample_code" that uniquely identifies the sample that was the source of this sample. For example, the value of this field for a duplicate sample would identify the normal sample of which this sample is a duplicate. Required in the laboratory EDD for all laboratory "clone" samples (e.g., spikes and duplicates). Field duplicates may be submitted blind to the laboratory, so this field is not required in the laboratory EDD for field "clones". Must be blank for samples which have no parent (e.g., normal field samples, LCS samples, method blanks, etc.).
sample_delivery_group	Text (10)				Sample delivery group as defined by the Chemistry project manager. This is an optional field for the laboratory EDD unless otherwise specified by the Chemistry project manager.
sample_date	DateTime				Date/time sample was collected in the field. Date information must be identical with the date from the AR/COC form. Leave blank for lab samples. Year may be entered in abbreviated YY format.
sample_time	DateTime				Time sample was collected in the field. Time information must be identical with the date from the AR/COC form. Leave blank for lab

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
					samples.
sys_loc_code	Text (20)				Unique Station or Well ID. Required for mapping. Must be a valid code for the facility and must match one of the reported values in the sys_loc_code field of the location EDD file submitted in the current or previous EDD.
start_depth	Numeric				Beginning depth (top) of soil sample. This is an optional field for the laboratory EDD unless otherwise specified by the Chem. project manager.
end_depth	Numeric				Ending depth (bottom) of soil sample. This is an optional field for the laboratory EDD unless otherwise specified by the Chem. project manager.
depth_unit	Text (15)				Unit of measurement for the sample begin and end depths. IRPIMS-style unit of measurement codes (see table X03) are recognized by Chem; other codes may be allowed by the Chem. project manager. This is an optional field for the laboratory EDD unless otherwise specified by the Chem. project manager. Refer to Valid Values.
chain_of_custody	Text (15)				Chain of custody identifier. A single sample may be assigned to only one chain of custody. This is an optional field for laboratory EDD unless otherwise specified by the Chem. project manager.
sent_to_lab_date	DateTime				Date sample was sent to lab (in MM/DD/YY format for EDD). Not included in the laboratory EDD.
sample_receipt_date	DateTime				Date that sample was received at laboratory (in MM/DD/YY format for EDD).
sampler	Text (30)				Name or initials of sampler. Not included in the laboratory EDD.
sampling_company_code	Text (20)		current/historical		Name or initials of sampling company (no controlled vocabulary). Not included in the laboratory EDD. Refer to Valid Values.
sampling_reason	Text (30)				Optional reason for sampling. No controlled vocabulary is enforced. Not included in the laboratory EDD.
sampling_technique	Text (40)				Sampling technique (no controlled vocabulary). Not included in the laboratory EDD. Refer to Valid Values.
task_code	Text (20)		current/historical		Unique identifier for sampling event.
activity_code	Text (20)		current/historical		The program activity associated with the sampling event (e.g. CME, SI, ODMDS, etc.). Refer to Valid Values.

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
collection_quarter	Text (5)				Quarter of the year sample was collected (e.g., "1Q96") Not included in the laboratory EDD.
composite_yn	Text (1)				Sample collection location. Boolean field used to indicate whether a sample is a composite sample. Not included in the laboratory EDD. Y/N option only.
composite_desc	Text (255)				Description of composite sample (if composite_yn is YES). Not included in the laboratory EDD.
sample_class	Text (10)				Navy sample class code. Not included in the laboratory EDD.
custom_field_1	Text (255)				Custom sample field.
custom_field_2	Text (255)				Custom sample field.
custom_field_3	Text (255)				Custom sample field.
comment	Text (255)				Sample comments as necessary (optional).
sample_receipt_time	DateTime				Time of lab receipt sample in 24-hr (military) HH:MM format

3.6 Chemistry Test EDD File

The Test EDD ties the Field EDD to the results by correlating the analytical method used with the sys_sample_code, along with the analysis date and time. It is important to follow the guidelines for the R4 prefix reserved for SESD LIMS (Element) data. Lab analytical methods should be matched to the valid values. Historical data should be matched as closely as possible or an R4-HIST or HIST method should be chosen that matches. When these assumptions are made, they should be listed in the technical documentation of the conversion. When no suitable analytical method can be found, the method should be submitted to EPA along with a description for review and possible inclusion in the valid values tables.

When preparing data from non-SESD/CLP labs as well as historical data, certain required data such as the analysis date and time may be missing. A convention has been created to handle these inconsistencies and enter data successfully into the EPA EQuIS system. When the analysis date is not present in the lab report, it should be reported in the EDD as 12/31/1899, with an analysis time of 23:59. This will allow the user to easily identify data with missing analysis dates, and to recognize that information was missing. Data results with an analysis date but no time should be given an analysis time of 23:59. It's important not to use arbitrary dates and times that are similar to other actual data times as these give the appearance that the data set was complete and not simply a guess.

Chemistry Test EDD files should be named according to the following convention: **EPAR4_TST_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
sys_sample_code	Text (40)	PK	current/historical	Sample EDD, sys_sample_code	Lab Sample ID. For data generated by SESD LIMS (Element), prefix Lab Sample ID with R4. Each sample must have a unique value, including spikes and duplicates. Laboratory QC samples must also have unique identifiers. Uniqueness throughout the database is the only restriction enforced by EQuIS.
lab_anl_method_name	Text (20)	PK	current/historical		Laboratory analytic method name or description. A controlled vocabulary (i.e., list of valid method names) is not required for the laboratory EDD unless otherwise specified by the EQuIS Chemistry project manager. The method name should be sufficient to reflect operation of the laboratory. For example both "SW8080-pest" and "SW8080-PCB" may be necessary to distinguish between laboratory methods, while "SW8080" may not provide sufficient detail. Refer to Valid Values.
analysis_date	DateTime	PK	current/historical		Date of sample analysis in MM/DD/YY format. May refer to either beginning or end of the analysis as required by EQuIS Chemistry project manager. This field is not always required, but most users will want it.
analysis_time	DateTime	PK	current/historical		Time of sample analysis in 24-hr (military) HH:MM format. Time zone and daylight savings must be same as analysis_date.
total_or_dissolved	Text (10)	PK			If required, then it must be either "T" for total [metal] concentration, "D" for dissolved or filtered [metal] concentration, or "N" for organic (or other) constituents for which neither "total" nor "dissolved" is applicable. This field might be required, depending on the test primary key used by the EQuIS Chemistry user. Default value is “N”.Refer to Valid Values.
column_number	Text (2)				If required, then it must be either "1C" for first column analyses, "2C" for second column analyses, or "NA" for analyses for which neither "1C" nor "2C" is applicable. Second column data may not be required, depending on the needs identified by the EQuIS Chemistry project

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
					manager, in which case all results may be reported as "NA". However, if any "2C" tests are reported, then there must be corresponding "1C" tests present also. Also, laboratories typically can report which of the two columns is to be considered "primary". This distinction is handled by the "reportable_result" field in the result table. This field might be required, depending on the test primary key used by the EQuIS Chemistry user. 1C/2C/NA option Only. Default is “NA”.
test_type	Text (20)	PK			Type of test in the laboratory. This field is used to distinguish between initial runs, re-extractions, reanalysis and dilutions. Refer to Valid Values.
lab_matrix_code	Text (10)				Code which describes the matrix as analyzed by the lab. May differ from sample_matrix_code. Default is “NA”. Refer to Valid Values.
analysis_location	Text		current/historical		Note where sample was analyzed. FL for mobile Field Laboratory analysis, LB for fixed_Based Laboratory analysis or FI for Field Instrument. FL/LB/FI option only.
basis	Text				Must be either Wet for wet_weight basis reporting, Dry for dry_weight basis reporting, or null for tests for which this distinction is not applicable. Wet/Dry option only.
container_id	Text (30)				Sample container identifier. This is an optional field for the laboratory EDD unless otherwise specified by the EQuIS Chemistry project manager.
dilution_factor	Numeric				Dilution factor at which the analyte was measured effectively. Enter "1" if not diluted.
lab_prep_method_name	Text (20)				Laboratory sample preparation method code. A controlled vocabulary. Refer to Valid Values.
prep_date	DateTime				Date sample preparation began in the MM/DD/YYYY format.
prep_time	DateTime				Time sample preparation began in 24-hr (military) format. Time zone and daylight savings must be same as analysis_date.
leachate_method	Text (15)				Laboratory leachate generation method name or description. A controlled vocabulary (i.e., list of valid method names) is not required for the laboratory EDD unless otherwise specified by the EQuIS Chemistry project manager. The method name should be sufficient to

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
					reflect operation of the laboratory.
leachate_date	DateTime				Date of leachate preparation in the MM/DD/YYYY format.
leachate_time	DateTime				Time of leachate preparation in 24-hr (military) format. Time zone and daylight savings must be same as analysis_date.
lab_name_code	Text (20)		current/historical		Unique identifier of the laboratory as defined by the EPA. Refer to Valid Values.
qc_level	Text (10)				Quality control level of analysis. May be either screen or definitive.
lab_sample_id	Text (20)				Laboratory LIMS sample identifier. If necessary, a field sample may have more than one LIMS lab_sample_id (maximum one per each test event).
percent_moisture	Text (5)				Percent moisture of the sample portion used in this test; this value may vary from test to test for any sample. Report 70.1% as 70.1 not as 70.1%.
subsample_amount	Text (14)				Amount of sample used for test.
subsample_amount_unit	Text (15)				Unit of measurement for subsample amount. Refer to Valid Values.
analyst_name	Text (30)				Name or initials of laboratory analyst. This is an optional field for the laboratory EDD unless otherwise specified by the EQuIS Chemistry project manager.
instrument_id	Text (50)				Instrument identifier. This is an optional field for the laboratory EDD unless otherwise specified by the EQuIS Chemistry project manager.
comment	Text (255)				Comments about the test as necessary. This is an optional field for the laboratory EDD unless otherwise specified by the EQuIS Chemistry project manager.
preservative	Text (20)				Sample preservative used. Refer to Valid Values.
final_volume	Text (15)				The final volume of the sample after sample preparation. Include all dilution factors.
final_volume_unit	Text (15)				The unit of measure that corresponds to the final_volume. Refer to Valid Values.

3.7 Chemistry Result EDD File

The Chemistry Sample Result EDD file contains result data for laboratory analyses only. For surface water samples, record the sample depths, start_depth (field 9), and end_depth (field 10), as depth below the water surface elevation. The water surface elevation at the time of the sampling should be recorded in the Water Level file (see Section 3.11).

Chemistry Results EDD files should be named according to the following convention: **EPAR4_RES_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
sys_sample_code	Text (40)	PK	current/historical	Test EDD, sys_sample_code	Lab Sample ID. For data generated by SESD LIMS (Element), prefix Lab Sample ID with R4. Each sample must have a unique value, including spikes and duplicates. Laboratory QC samples must also have unique identifiers. Uniqueness throughout the database is the only restriction enforced by EQuIS.
lab_anl_method_name	Text (20)	PK	current/historical	Test EDD, lab_anl_method_name	Laboratory analytic method name or description. A controlled vocabulary (i.e., list of valid method names) is not required for the laboratory EDD unless otherwise specified by the EQuIS Chemistry project manager. The method name should be sufficient to reflect operation of the laboratory. For example both "SW8080-pest" and "SW8080-PCB" may be necessary to distinguish between laboratory methods, while "SW8080" may not provide sufficient detail. Refer to Valid Values.
analysis_date	DateTime	PK	current/historical	Test EDD, analysis_date	Date of sample analysis in MM/DD/YY format. May refer to either beginning or end of the analysis as required by EQuIS Chemistry project manager. This field is not always required, but most users will want it.
analysis_time	DateTime	PK	current/historical	Test EDD, analysis_time	Time of sample analysis in 24-hr (military) HH:MM format. Time zone and daylight savings must be same as analysis_date.
total_or_dissolved	Text (10)	PK		Test EDD, total_or_dissolved	If required, then it must be either "T" for total [metal] concentration, "D" for dissolved or filtered [metal] concentration, or "N" for organic (or other) constituents for which neither "total" nor "dissolved" is applicable. This field might be required, depending on the test primary key used by the EQuIS Chemistry

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
					user. Default Value is “N”. Refer to Valid Values.
column_number	Text (2)				If required, then it must be either "1C" for first column analyses, "2C" for second column analyses, or "NA" for analyses for which neither "1C" nor "2C" is applicable. Second column data may not be required, depending on the needs identified by the EQuIS Chemistry project manager, in which case all results may be reported as "NA". However, if any "2C" tests are reported, then there must be corresponding "1C" tests present also. Also, laboratories typically can report which of the two columns is to be considered "primary". This distinction is handled by the "reportable_result" field in the result table. This field might be required, depending on the test primary key used by the EQuIS Chemistry user. Default value is “NA”. 1C/2C/NA option only.
test_type	Text (20)	PK		Test EDD, test_type	Type of test in the laboratory. This field is used to distinguish between initial runs, re-extractions, reanalysis and dilutions. Default value is “NA”. Refer to Valid Values.
cas_rn	Text (15)	PK	current/historical		CAS Number or R4 designation. Refer to Valid Values.
chemical_name	Text (60)		current/historical		Chemical or Analyte Name
result_value	Numeric				Result Value
result_error_delta	Text (20)				Error range applicable to the result value; typically used only for radiochemistry results.
result_type_code	Text (3)		current/historical		Must be either TRG for a target or regular result, TIC for tentatively identified compounds, SUR for surrogates, IS for internal standards, or SC for spiked compounds. Refer to Valid Values.
reportable_result	Text (3)		current/historical		Must be Yes for results considered to be reportable, or No for other results. Y/N option Only
detect_flag	Text (1)		current/historical		May be either Y for detected analytes or N for non-detects. Y/N option only
lab_qualifiers	Text (20)				Qualifier flags assigned by the lab. This is a controlled vocabulary column. Refer to Valid Values.
validator_qualifiers	Text (40)				Qualifier flags assigned by the validator. This is a controlled

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
					vocabulary column. Refer to Valid Values.
interpreted_qualifiers	Text (20)				Final qualifier flags. This is a controlled vocabulary column. Refer to Valid Values.
organic_yn	Text (1)				Must be either Y for organic constituents or N for inorganic constituents. Default value is "Y". Y/N option only.
method_detection_limit	Text (20)				Method detection limit.
reporting_detection_limit	Numeric				Concentration level above which results can be quantified with 95% confidence limit. Must reflect conditions such as dilution factors and moisture content. Report as the sample specific detection limit.
quantitation_limit	Text (20)				Concentration level above which results can be quantified with 95% confidence limit. Must reflect conditions such as dilution factors and moisture content. Report as the sample specific quantitation limit.
result_unit	Text (15)		current/historical		Units of measurement for the result unit. Controlled vocabulary. This field is required if a reporting_detection_limit is reported. Refer to Valid Values.
detection_limit_unit	Text (15)				Units of measurement for the detection limit(s). Controlled vocabulary. This field is required if a reporting_detection_limit is reported. Refer to Valid Values.
tic_retention_time	Text (8)				TIC Retention Time.
result_comment	Text (254)				Result specific comments.
qc_original_conc	Text (14)				The concentration of the analyte in the original (unspiked) sample. Might be required for spikes and spike duplicates (depending on user needs). Not necessary for surrogate compounds or LCS samples where the original concentration is assumed to be zero.
qc_spike_added	Text (14)				The concentration of the analyte added to the original sample. Might be required for spikes, surrogate compounds, LCS and any spiked sample (depending on user needs).
qc_spike_measured	Text (14)				The measured concentration of the analyte. Use zero for spiked compounds that were not detected in the sample. Might be required for spikes, spike duplicates, surrogate compounds, LCS

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
					and any spiked sample (depending on user needs).
qc_spike_recovery	Text (14)				The percent recovery calculated as specified by the laboratory QC program. Always required for spikes, spike duplicates, surrogate compounds, LCS and any spiked sample. Report as percentage multiplied by 100 (e.g., report 120% as 120).
qc_dup_original_conc	Text (14)				The concentration of the analyte in the original (unspiked) sample. May be required for spike or LCS duplicates only (depending on user needs). Not necessary for surrogate compounds or LCS samples (where the original concentration is assumed to be zero).
qc_dup_spike_added	Text (14)				The concentration of the analyte added to the duplicate sample. Might be required for spike or LCS duplicates, surrogate compounds, and any spiked and duplicated sample (depending on user needs).
qc_dup_spike_measured	Text (14)				The measured concentration of the analyte in the duplicate. Use zero for spiked compounds that were not detected in the sample. Might be required for spike and LCS duplicates, surrogate compounds, and any other spiked and duplicated sample.
qc_dup_spike_recovery	Text (14)				The duplicate percent recovery calculated as specified by the laboratory QC program. Always required for spike or LCS duplicates, surrogate compounds, and any other spiked and duplicated sample. Report as percentage multiplied by 100 (e.g., 50% as 50).
qc_rpd	Text (8)				The relative percent difference calculated as specified by the laboratory QC program. Required for duplicate samples as appropriate. Report as percentage multiplied by 100 (e.g., report 30% as 30).
qc_spike_lcl	Text (8)				Lower control limit for spike recovery. Required for spikes, spike duplicates, surrogate compounds, LCS and any spiked sample. Report as percentage multiplied by 100 (e.g., report 60% as 60).
qc_spike_ucl	Text (8)				Upper control limit for spike recovery. Required for spikes, spike duplicates, surrogate compounds, LCS and any spiked sample. Report as percentage multiplied by 100 (e.g., report 120% as

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
					120).
qc_rpd_cl	Text (8)				Relative percent difference control limit. Required for any duplicated sample. Report as percentage multiplied by 100 (e.g., report 25% as 25).
qc_spike_status	Text (10)				Used to indicate whether the spike recovery was within control limits. Use the * character to indicate failure, otherwise leave blank. Required for spikes, spike duplicates, surrogate compounds, LCS and any spiked sample.
qc_dup_spike_status	Text (10)				Used to indicate whether the duplicate spike recovery was within control limits. Use the * character to indicate failure, otherwise leave blank. Required for any spiked and duplicated sample.
qc_rpd_status	Text (10)				Used to indicate whether the relative percent difference was within control limits. Use the * character to indicate failure, otherwise leave blank. Required for any duplicated sample.
test_batch_type	Text (10)				Lab Batch type. Refer to Valid Values.
test_batch_id	Text (20)				Unique identifier for all lab batches.

3.8 Well EDD File

The Well EDD file should be submitted for all sites where extraction and/or injection wells are a part of the remedial work at the site. The purpose of the Well EDD file is to provide EPA Region 4 with detailed well information that may be correlated with water levels, well construction and geologic information. It also provides pump type, capacity and yield information.

Well EDD files for should be named according to the following convention: **EAPR4_Well_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
data_provider	Text (20)		current/historical		Location data provider. Refer to Valid Values.
task_code	Text (20)		current/historical		Unique identifier for sampling event.
activity_code	Text (20)		current/historical		The program activity associated with the sampling event (e.g. CME,

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
					SI, ODMDS, etc.). Refer to Valid Values.
sys_loc_code	Text (20)		current/historical	Location EDD, sys_loc_code	Unique Well ID. Required for mapping. Must be a valid code for the facility and must match one of the reported values in the sys_loc_code field of the location EDD file submitted in the current or previous EDD.
top_casing_elev	Numeric		current/historical		Elevation of the top of well casing.
well_id	Text (30)				Non-unique well identifier, name, or alias.
well_owner	Text (50)				Owner of well
well_purpose	Text (20)				Brief description of well use (i.e. Monitoring, Injection, Extraction, Water Supply, etc.)
well_status	Text (20)				Current status of well.
depth_of_well	Numeric				Total depth of the well as measured from a specified measuring point at construction.
depth_unit	Text (15)				Unit of measure for well depth. Refer to Valid Values.
depth_measure_method	Text (20)				Method used to make the well depth measurement.
stickup_height	Text (8)				Total height which well extends about ground surface.
stickup_unit	Text (15)				Unit of measure for stickup height. Refer to Valid Values.
sump_length	Text (20)				Length of sump at well installation.
sump_unit	Text (15)				Unit of measure for sump length. Refer to Valid Values.
installation_date	DateTime				Date well was installed.
construct_start_date	DateTime				Date well construction began, if different from installation date.
construct_complete_date	DateTime				Date well construction was completed, if different from installation date.
construct_contractor	Text (20)				Name of company that installed well.
pump_type	Text (20)				Type of pump installed, if applicable.
pump_capacity	Text (6)				Pump capacity.
pump_unit	Text (15)				Unit of measure for pump capacity (i.e. gal/minute). Refer to Valid Values.
pump_yield	Text (6)				Pump yield
pump_yield_method	Text (20)				Method of testing pump yield.
weep_hole	Text (1)				Does well have weep hole? Y/N option only.

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
head_configuration	Text (50)				Description of well head configuration.
access_port_yn	Text (1)				Does well have access port? Y/N option only.
casing_joint_type	Text (50)				Description of well casing joint type.
perforator_used	Text (50)				Description of well perforator, if applicable.
intake_depth	Numeric				Depth of well intake.
disinfected_yn	Text (1)				Has well been disinfected? Y/N option only.
historical_reference_elev	Numeric				Elevation of reference measuring point.
geologic_unit_code	Text (20)				Geologic unit which well samples from.
geologist_name	Text (50)				Geologist name.
driller	Text (50)				Driller.
custom_field_1	Text (255)				Custom field 1.
custom_field_2	Text (255)				Custom field 2.
custom_field_3	Text (255)				Custom field 3.
custom_field_4	Text (255)				Custom field 4.
custom_field_5	Text (255)				Custom field 5.
remark	Text (2000)				Remark.

3.9 Well Construction EDD File

The Well Construction EDD allows for the input of information regarding the materials, sizes, and program associated with well installation. Wells should be tied to a location by a valid sys_loc_code populated in the Location EDD (which may have been previously submitted). Record the activity code, task code, and other information related to the specific installation event.

Well Construction EDD files for should be named according to the following convention: **EPAR4_WellConstruction_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Key	Required	Parent	Description
sys_loc_code	Text (20)		current/historical	Location EDD, sys_loc_code	Unique Station or Well ID. Required for mapping. Must be a valid code for the facility and must match one of the reported values in the sys_loc_code field of the location EDD file submitted in the current or previous EDD.
segment_type	Text (20)		current/historical		Type of segment described in this record. Refer to Valid Values.
material_type_code	Text (20)		current/historical		Material used for construction of this well. Refer to Valid Values.
start_depth	Numeric		current/historical		Start depth of well segment (starts at zero).
depth_unit	Text (15)		current/historical		Unit of measure for well segment start depth and end depth. Refer to Valid Values.
inner_diameter	Numeric		current/historical		Inner diameter of well segment.
diameter_unit	Text (15)		current/historical		Unit of measure for inner and outer diameters. Refer to Valid Values.
perf_length	Numeric		current/historical		Total perforated length for Screen segment types.
end_depth	Numeric				End depth of well segment.
outer_diameter	Numeric				Outer diameter of well segment.
thickness	Numeric				Thickness of well segment.
thickness_unit	Text (15)				Unit of measure for thickness. Refer to Valid Values.
slot_type	Text (20)				For screen segments, indicates type of screen slot.
slot_size	Numeric				For screen segments, indicates size of screen slot.
slot_size_unit	Text (15)				Unit of measure for slot size where segment_type is Screen. Refer to Valid Values.
screen_type	Text (15)				Type of screen.
material_quantity	Text (20)				Quantity of fill material where applicable (annulus or grouted annulus segment types).
material_density	Text (20)				Density of fill material where applicable (annulus or grouted annulus segment types).
remark	Text (255)				Remarks.

3.10 Well Datum EDD File

When capturing elevation information for wells and groundwater levels, it is important to specify reference point from which water level readings were taken, especially if these values change.

Well Datum EDD files for should be named according to the following convention: **EPAR4_WellDatum_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
sys_loc_code	Text (20)	PK	current/historical	Location EDD, sys_loc_code	Unique Station or Well ID. Required for mapping. Must be a valid code for the facility and must match one of the reported values in the sys_loc_code field of the location EDD file submitted in the current or previous EDD.
start_date	DateTime	PK	current/historical		Date/time started (mm/dd/yr hh:mm:ss).
step_or_linear	Text (6)		current/historical		Indicates whether the change in well datum was step or linear.
datum_value	Numeric		current/historical		Elevation of measuring reference point from which water level readings were taken.
datum_unit	Text (15)		current/historical		Unit of measure for well datum. Refer to Valid Values.
datum_desc	Text (70)		current/historical		Description of well datum.
datum_collect_method_code	Text (20)				Code representing method used to measure well datum. Refer to Valid Values.

3.11 Water Level EDD File

The Water Level EDD file includes information on water level measurements collected at the site over the years. Depth to water, reference elevations, and groundwater elevation information should be recorded here. Surface water level data may be recorded in this file as well. In these cases you should indicate in the remarks column which data represents surface water. All other required fields remain required regardless of groundwater or surface water data. Light non-aqueous phase liquids (LNAPL) and dense non-aqueous phase liquids (DNAPL) occurrences and their depths should be recorded here as well.

Water Level EDD files for should be named according to the following convention: **EPAR4_WaterLevel_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
data_provider	Text (20)		current/historical		Location data provider. Refer to Valid Values.
task_code	Text (20)		current/historical		Unique identifier for sampling event.
activity_code	Text (20)		current/historical		The program activity associated with the sampling event (e.g. CME, SI, ODMDS, etc.). Refer to Valid Values.
sys_loc_code	Text (20)		current/historical	Location EDD, sys_loc_code	Unique Station or Well ID. Required for mapping. Must be a valid code for the facility and must match one of the reported values in the sys_loc_code field of the location EDD file submitted in the current or previous EDD.
measurement_date	DateTime		current/historical		Date/time of measurement (mm/dd/yr hh:mm:ss).
reference_elev	Numeric		current/historical		Elevation of reference measuring point.
water_level_depth	Numeric		current/historical		Depth of water level as measured from reference elevation
depth_unit	Text (15)		current/historical		Unit of measure for water level depth, corrected depth, and measured depth of well. Always in decimal feet. Refer to Valid Values.
water_level_elev	Numeric				Elevation of water level.
measured_depth_of_well	Numeric				Depth of well as measured at the time of this water level measurement.
corrected_depth	Numeric				Depth of water level, corrected, for example, for free product.
corrected_elevation	Numeric				Elevation of water level, corrected, for example, for free product.
technician	Text (50)				Name of technician taking measurements.
dry_indicator_yn	Text (1)				Is well dry? Y/N option only.
measurement_method	Text (20)				Method used to make the well depth measurement.
dip_or_elevation	Text (10)				Enforced vocabulary (dip, elevation).
batch_number	Text (10)				Batch, or grouping number, for water level measurement.
remark	Text (255)				Remarks.
lnapl_depth	Numeric				LNAPL depth.
lnapl_cas_rn	Text (15)				LNAPL CAS number. Refer to Valid Values.
dnapl_depth	Numeric				DNAPL depth.

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
dnapl_cas_rn	Text (15)				DNAPL CAS number. Refer to Valid Values.
equipment_code	Text (60)				Equipment code.

3.12 Geologic Sample EDD File

The variations in geology nomenclature make the submittal of geologic data, particularly historic geologic data, a special challenge. The Geology Sample EDD is the first of several EDDs used to capture as much geologic data in a useable form as possible. The Geologic Sample Parameter, Atterberg, and Static Properties EDDs rely on information populated in the Geologic Sample EDD. Other files, related to geology are correlated to the Geologic Sample EDD via the sys_loc_code for the boring. This EDD links locations, with geologic sample, task and activity codes.

Geologic Sample EDD files for should be named according to the following convention: **EPAR4_GeologicSample_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
data_provider	Text (20)		current/historical		Location data provider. Refer to Valid Values.
task_code	Text (20)		current/historical		Unique identifier for sampling event.
activity_code	Text (20)		current/historical		The program activity associated with the sampling event (e.g. CME, SI, ODMDS, etc.) Refer to Valid Values.
geo_sample_code	Text (40)	PK	current/historical		Unique Sample ID.
sample_name	Text (50)				Optional, non-unique Sample ID.
sys_loc_code	Text (20)		current/historical		Unique Station or Well ID. Required for mapping. Must be a valid code for the facility and must match one of the reported values in the sys_loc_code field of the location EDD file submitted in the current or previous EDD.
sample_top	Numeric		current/historical		Top (depth) of geologic sample.
sample_bottom	Numeric				Bottom (depth) of geologic sample.
sampling_date	DateTime				Date (and time, if appropriate) of sampling.
matrix_code	Text (20)				Geologic matrix or sample type (i.e. rock or soil, etc). Refer to Valid Values.

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
sample_method	Text (40)				Method used for sample collection. Refer to Valid Values.
sample_desc	Text (255)				Free text description of geologic sample.
custom_field_1	Text (255)				Custom field 1.
custom_field_2	Text (255)				Custom field 2.
custom_field_3	Text (255)				Custom field 3.
custom_field_4	Text (255)				Custom field 4.
custom_field_5	Text (255)				Custom field 5.

3.13 Geologic Sample Parameter EDD File

Measurements of conductivity, moisture, pH, and specific gravity for a geologic sample should be recorded here if available. The primary key is the geo_sample_code, which relates information recorded in the Geologic Sample Parameter EDD to the Geologic Sample EDD.

Geologic Sample Parameter EDD files for should be named according to the following convention: **EPAR4_GeoSampleParameter_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Key	Required	Parent	Description
geo_sample_code	Text (40)	PK	current/historical		Unique Sample ID.
param_code	Text (40)		current/historical		Parameter observed during acquisition of this sample (i.e. N1, N2, N3, N4, PID, FID, OVM, Length Advanced, Length Recovered, Tip Stress, etc.)
param_value	Text (255)		current/historical		Value observed or measured for this parameter.
param_unit	Text (15)		current/historical		Unit of measurement for parameter value, if applicable.
measurement_method	Text (20)				Method of measurement for this parameter, if applicable.
remark	Text (2000)				Remark.

3.14 Water Table EDD File

Water table depth information as well as general or specific aquifer information can be populated in the Water Table EDD. As always, it is important to refer to the valid values in the EDP reference tables to be certain information is accurate.

Water Table EDD files for should be named according to the following convention: **EPAR4_WaterTable_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Key	Required	Parent	Description
data_provider	Text (20)		current/historical		Location data provider. Refer to Valid Values.
task_code	Text (20)		current/historical		Unique identifier for sampling event.
activity_code	Text (20)		current/historical		The program activity associated with the sampling event (e.g. CME, SI, ODMDS, etc.). Refer to Valid Values.
sys_loc_code	Text (20)		current/historical	Location EDD, sys_loc_code	Unique Station or Well ID. Required for mapping. Must be a valid code for the facility and must match one of the reported values in the sys_loc_code field of the location EDD file submitted in the current or previous EDD.
type	Text (20)		current/historical		Designation of aquifer. Can be general (such as UNCONFINED or CONFINED), or a specific aquifer name such as OGALALLA.
sequence	Text (20)		current/historical		Sequence in which this measurement was taken. Intended to represent 1 of 2 mutually exclusive values, i.e. Unstabilized/Stabilized, or Initial/Final, or 1/2, etc.
depth	Numeric		current/historical		Depth of water table (starts at zero).
flowing_yn	Text (1)				Is water flowing from drill hole? Y/N option only.
measurement_method	Text (50)				Method used to obtain water table measurement.
capped_pressure	Numeric				Water pressure when capped.
capped_pressure_unit	Text (15)				Unit of measure for water pressure when capped. Refer to Valid Values.
reference_point	Text (50)				Point of reference for water table measurement.
reference_elevation	Numeric				Elevation of reference point for water table measurement.
temperature	Numeric				Water temperature.
temperature_unit	Text (15)				Unit of measure for water temperature. Refer to Valid Values.

3.15 Lithology EDD File

Due to the complexity of the possible lithology in any boring, the Lithology EDD is designed to allow for multiple material types (lithologic layer types) to be assigned by depth to a single location (sys_loc_code) under a single activity code. An example appears below the EDD table.

Lithology EDD files for should be named according to the following convention: **EPAR4_Lithology_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Key	Required	Parent	Description
data_provider	Text (20)		current/historical		Location data provider. Refer to Valid Values.
task_code	Text (20)		current/historical		Unique identifier for sampling event.
activity_code	Text (20)		current/historical		The program activity associated with the sampling event (e.g. CME, SI, ODMDS, etc.). Refer to Valid Values.
sys_loc_code	Text (20)		current/historical	Location EDD, sys_loc_code	Unique Station or Well ID. Required for mapping. Must be a valid code for the facility and must match one of the reported values in the sys_loc_code field of the location EDD file submitted in the current or previous EDD.
start_depth	Numeric		current/historical		Start depth of lithology layer (starts at zero). In feet.
material_type	Text (40)		current/historical		Code used to specify material type. Refer to Valid Values.
bearing	Numeric				Bearing, may be used for non-vertical boreholes
plunge	Numeric				plunge, may be used for non-vertical boreholes
geo_unit_code_1	Text (20)				Code used to specify geologic unit. Refer to Valid Values.
geo_unit_code_2	Text (20)				Code used to specify geologic unit. Refer to Valid Values.
geo_unit_code_3	Text (20)				Code used to specify geologic unit. Refer to Valid Values.
geo_unit_code_4	Text (20)				Code used to specify geologic unit. Refer to Valid Values.
geo_unit_code_5	Text (20)				Code used to specify geologic unit. Refer to Valid Values.
remark_1	Text (2000)				Lithologic layer remark 1.
remark_2	Text (2000)				Lithologic layer remark 2.
moisture	Text (20)				Qualitative description of soil moisture.
permeable	Text (20)				Indicator of permeability
consolidated_yn	Text (1)				Is layer consolidated? Y/N option only.

Field Name	Data Type	Key	Required	Parent	Description
cementation	Text (20)				Qualitative description of cementation.
color	Text (30)				Layer color.
observation	Text (255)				General layer observation.
consistency	Text (20)				Soil consistency.
sorting	Text (20)				Descriptor of soil particle size sorting.
grainsize	Text (20)				Measure of particle size.
odor	Text (20)				Soil odor.
angularity	Text (20)				Angularity of soil particles.
custom_field_1	Text (255)				Custom field 1.
custom_field_2	Text (255)				Custom field 2.
custom_field_3	Text (255)				Custom field 3.
custom_field_4	Text (255)				Custom field 4.
custom_field_5	Text (255)				Custom field 5.

Example of Required Fields in Lithology EDD

data_provider	task_code	activity_code	sys_loc_code	start_depth	material_type
PL-CONT_X1	625	RI	B09	0	TOPSOIL
PL-CONT_X1	625	RI	B09	0.5	SILTY CLAY
PL-CONT_X1	625	RI	B09	3	CLAY

3.16 Drill Activity EDD File

Drilling activity related to any drilling event can be stored in the Drill Activity EDD and coupled with the Drill Parameter EDD to save a solid record of the event, including rig and auger type, viscosity, and pressure as well as other information chronicling the drilling procedure. In most cases, this EDD will be used to document the start and end depths of a drilling event.

Drill Activity EDD files for should be named according to the following convention: **EPAR4_DrillActivty_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
data_provider	Text (20)		current/historical		Location data provider. Refer to Valid Values.
task_code	Text (20)		current/historical		Unique identifier for sampling event.
activity_code	Text (20)		current/historical		The program activity associated with the sampling event (e.g. CME, SI, ODMDS, etc.). Refer to Valid Values.
sys_loc_code	Text (20)		current/historical	Location EDD, sys_loc_code	Unique Station or Well ID. Required for mapping. Must be a valid code for the facility and must match one of the reported values in the sys_loc_code field of the location EDD file submitted in the current or previous EDD.
drill_event	Text (20)		current/historical		Used to uniquely identify a drilling event.
start_depth	Numeric		current/historical		Start depth of drill activity.
end_depth	Numeric		current/historical		End depth of drill activity.
start_date	DateTime				Date/time drilling activity started (mm/dd/yr hh:mm:ss).
end_date	DateTime				Date/time drilling activity was completed, (mm/dd/yr hh:mm:ss).
diameter	Text (20)				Diameter of drilled hole.
diameter_unit	Text (15)				Unit of measurement for diameter of drilled hole. Refer to Valid Values.
drill_method	Text (50)				Method of drilling/advancement.
casing_size	Text (50)				Size of casing installed. Note that this is a general text field and non-numeric entries such as "Schedule 40" are permitted.
rig_desc	Text (50)				Description of drilling rig.
rig_make	Text (50)				Drilling rig make.
rig_model	Text (50)				Drilling rig model.
rod_desc	Text (50)				Description of drilling rod.
bit_desc	Text (50)				Description of drilling bit.
hammer_desc	Text (50)				Description of hammer.
auger_desc	Text (50)				Description of auger.
sampler_desc	Text (50)				Description of sampler.
fluid	Text (50)				Drilling fluid used.
viscosity	Text (50)				Viscosity of drilling fluid.
drilling_pressure	Text (50)				Drilling pressure.

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
hammer_wt	Text (50)				Weight of hammer.
hammer_fall	Text (50)				Fall length of hammer.
lift_mechanism	Text (50)				Mechanism used to lift hammer.
new_yn	Text (1)				Is this a new borehole? Y/N option only.
repair_yn	Text (1)				Is this drilling activity to repair an existing borehole? Y/N option only.
deepen_yn	Text (1)				Is this drilling activity to deepen an existing borehole? Y/N option only.
abandon_yn	Text (1)				Is this drilling activity to abandon an existing borehole? Y/N option only.
replace_yn	Text (1)				Does this drilling activity replace another borehole? Y/N option only.
public_yn	Text (1)				Is this borehole owned or used by a public agency? Y/N option only.
purpose	Text (70)				Purpose of drilling activity.
remark	Text (255)				Drilling activity remark.
custom_field_1	Text (255)				Custom field 1.
custom_field_2	Text (255)				Custom field 2.
custom_field_3	Text (255)				Custom field 3.
custom_field_4	Text (255)				Custom field 4.
custom_field_5	Text (255)				Custom field 5.

3.17 Drill Parameter EDD File

Drill Parameter may be used to capture specific results for a drilling event listed in Drill Activity.

Drill Parameter EDD files for should be named according to the following convention: **EPAR4_DrillParameter_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
sys_loc_code	Text (20)		current/historical	Location EDD, sys_loc_code	Unique Station or Well ID. Required for mapping. Must be a valid code for the facility and must match one of the reported values in the sys_loc_code field of the location EDD file submitted in the current or previous EDD.
drill_event	Text (20)		current/historical		Used to uniquely identify a drilling event.
start_depth	Numeric		current/historical		Start depth of drill activity.
param_code	Text (20)		current/historical		Parameter observed or measured over this interval. Refer to Valid Values.
end_depth	Numeric				End depth of drill activity.
run_length	Text (20)		current/historical		Length of drilling run.
param_value	Text (255)				Value observed or measured over this interval for this parameter.
param_unit	Text (15)				Unit of measurement for parameter value. Refer to Valid Values.
remark	Text (255)				Drilling activity remark.

3.18 Downhole Point Parameter EDD File

The Downhole Point Parameter EDD should be used for recording drilling-specific results, such as tip and sleeve stress, pore pressure, and ratio. All fields are required in this EDD and must relate back to a valid location (sys_loc_code).

Downhole Point Parameter EDD files for should be named according to the following convention: **EPAR4_DownholePoint_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Key	Required	Parent	Description
data_provider	Text (20)		current/historical		Location data provider. Refer to Valid Values.
task_code	Text (20)		current/historical		Unique identifier for sampling event | Added
activity_code	Text (20)		current/historical		The program activity associated with the sampling event (e.g. CME, SI, ODMDS, etc.). Refer to Valid Values.
sys_loc_code	Text (20)		current/historical	Location EDD, sys_loc_code	Unique Station or Well ID. Required for mapping. Must be a valid code for the facility and must match one of the reported values in the sys_loc_code field of the location EDD file submitted in the current or previous EDD.
depth	Numeric		current/historical		Depth at which parameter was observed or measured (starts at zero).

Field Name	Data Type	Key	Required	Parent	Description
param	Text (20)		current/historical		Parameter observed or measured at this point. Refer to Valid Values.
param_value	Text (255)		current/historical		Value observed or measured at this point for this parameter.
param_unit	Text (15)		current/historical		Unit of measurement for parameter value. Refer to Valid Values.

3.19 Atterberg Properties EDD File

The Atterberg Properties EDD records the basic measure of the nature of a fine-grained soil. Depending on the moisture of the soil, it may appear in four states: solid, semi-solid, plastic, and liquid. For any given, state the consistency and behavior of a soil is different. This affects its engineering properties. This information allows for the determination of the boundary between each state based on changes in the soil's behavior.

Atterberg Properties EDD files for should be named according to the following convention: **EPAR4_Atterberg_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
geo_sample_code	Text (40)		current/historical	Chemistry Sample EDD, sys_sample_code	Unique Sample ID.
liquid_limit	Text (10)				Soil moisture content at the point of transition from plastic to liquid state.
plastic_limit	Text (10)				Soil moisture content at the point of transition from semisolid to plastic state, the point at which soil crumbles when rolled into threads of 1/8" diameter.
shrinkage_limit	Text (10)				Soil moisture content at the point of transition from solid to semisolid state, or the point at which the volume of soil mass ceases to change with continuing loss of moisture.
flow_index	Text (10)				Slope of the flow line, where the flow line is the relationship between moisture content and log N, N being the number of blows in a Liquid Limit test.

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
plasticity_index	Text (10)				Difference between the liquid limit and the plastic limit (LL-PL).
liquidity_index	Text (10)				Ratio of in situ moisture content, plastic limit to plasticity index, (wn-PL) / (LL-PL).
activity	Text (10)				Slope of line correlating PI and % finer than 2 um.
atterberg_moisture	Text (10)				Arbitrary moisture content for sample defined by sys_sample_code.

3.20 Static Properties EDD File

Additional static information recorded as a part of a drilling activity and related to a geologic sample such as porosity, void ratios, moisture contents, etc., that have not been recorded elsewhere may be recorded here. This EDD also contains 5 custom fields that may be used for recording additional information.

Static Properties EDD files for should be named according to the following convention: **EPAR4_StaticProps_v1.csv or .txt for tab-delimited files.**

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
geo_sample_code	Text (40)		current/historical	Chemistry Sample EDD, sys_sample_code	Unique Sample ID.
sample_desc	Text (255)				Sample description.
material_name	Text (40)				Material name. Refer to Valid Values.
geologic_unit_code	Text (20)				Geologic unit code. Refer to Valid Values.
e	Numeric				Void ratio.
e_max	Numeric				Maximum void ratio.
e_min	Numeric				Minimum void ratio.
n	Numeric				Porosity.
specific_gravity	Numeric				Specific gravity.
w	Numeric				Moisture content.

Field Name	Data Type	Key	Required *current/historical*	Parent	Description
opt_w	Numeric				Optimum moisture content.
S	Numeric				Saturation.
K	Numeric				Hydraulic conductivity.
K_unit	Text (15)				Unit of measurement for hydraulic conductivity. Refer to Valid Values.
unit_wt	Numeric				Unit weight.
sat_unit_wt	Numeric				Saturated unit weight.
dry_unit_wt	Numeric				Dry unit weight.
dry_unit_wt_max	Numeric				Maximum dry unit weight.
dry_unit_wt_min	Numeric				Minimum dry unit weight.
density_unit	Text (15)				Unit of measure for density (unit weight). Refer to Valid Values.
rel_density	Numeric				Relative density.
rel_compaction	Numeric				Relative compaction.
consistency	Text (20)				Consistency.
organic_carbon	Numeric				Organic carbon content.
organic_carbon_unit	Text (15)				Unit of measure for organic carbon. Refer to Valid Values.
custom_field_1	Text (255)				Custom field 1.
custom_field_2	Text (255)				Custom field 2.
custom_field_3	Text (255)				Custom field 3.
custom_field_4	Text (255)				Custom field 4.
custom_field_5	Text (255)				Custom field 5.

3.21 Working with Data

It must be assumed that persons working with EDDs have a working understanding of data bases and some fundamental knowledge of data base structure. Data base managers will need to work in conjunction with environmental management in order to properly process and format this data. It is crucial to the EQuIS project that the data provided be of the highest standard and that every effort to properly format the data be made prior to submittal to EPA Region 4.