Montana Waste Management and Remediation Division Electronic Data Deliverable (MT-WMRD EDD) Guidance Manual

Waste Management and Remediation Division
Montana Department of Environmental Quality

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1 INTRODUCTION

1.1 About This Document

The purpose of this guidance manual is to provide instructions on how to report environmental data electronically to the Montana Department of Environmental Quality (MTDEQ) Contaminated Site Cleanup, Federal Superfund, Abandoned Mine Lands, and Underground Storage Tank (UST) programs. Data submitted to these programs will be stored in MTDEQ's Montana EQuIS database. Montana EQuIS is DEQ's primary repository for all field and sample data. Some of the types of data that can be reported electronically to Montana EQuIS include:

- Data generated during site characterization and investigation phases
- Data recorded when installing monitoring wells
- Data generated during long term monitoring events and treatment system performance samples
- analytical and field data routinely collected from a variety of media.

This manual describes both the procedural and formatting requirements for creating and submitting MT-WMRD Electronic Data Deliverables (EDDs) to Montana EQuIS and consists of four key sections. An overview of the EDD submittal process is shown in Figure 1-1.

1) **Initial Set-up** – This section covers the initial steps that data providers need to take to get established in our database before submitting data.

2) **EDD Development** – This section focuses on formatting EDDs. It covers general reporting requirements and includes tables that describe each EDD worksheet in detail.

3) **EDD Verification** – This section covers EDD verification and focuses on the EQuIS Data Processor (EDP), which each data provider will be required to use prior to submitting an EDD.

4) **EDD Submittal Process** – This section introduces the MT-WMRD Validation Form and the data package required for each submittal to Montana EQuIS.

➔ All EQuIS materials referenced in this guidance manual are available from MTDEQ's MT-WMRD Support webpage located at: https://deq.mt.gov/cleanupandrec/resources.

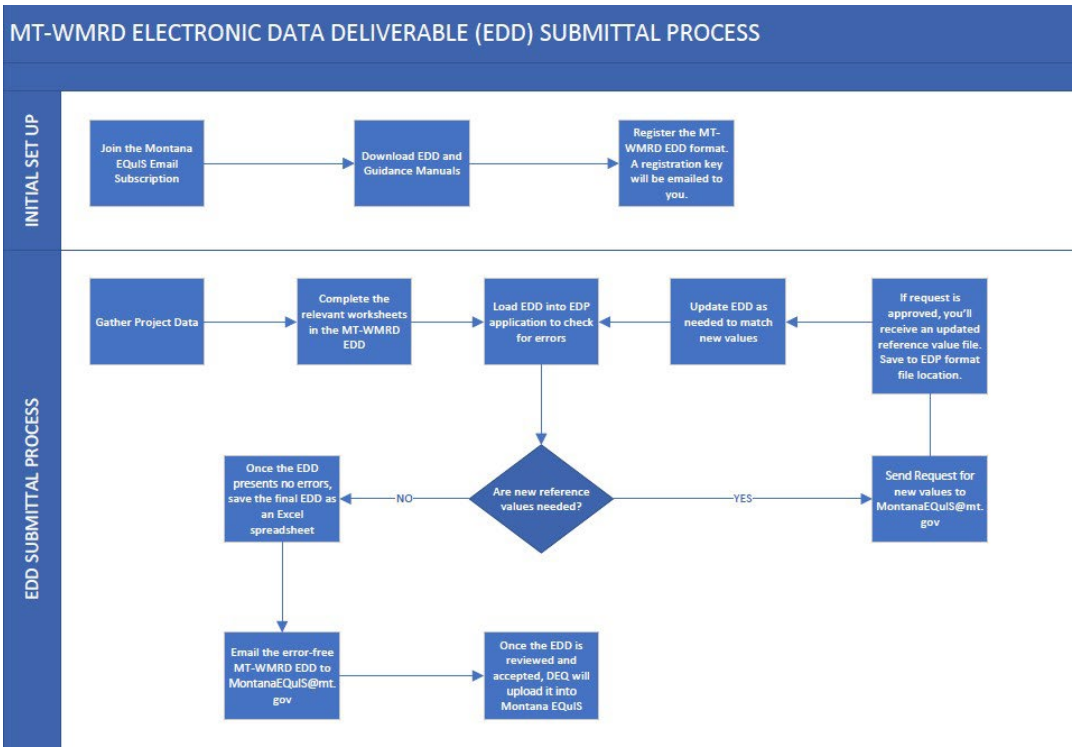

Figure 1.1: Electronic Data Deliverable (EDD) Submittal Process

1.2 Revision History

Version	Date	Name	Description
0.1	02/02/2016	Staci Stolp	Initial document
0.2	10/05/2016	Staci Stolp	Revised based on feedback received from Kim Wells.
0.3	06/12/2017	Staci Stolp	Revised based on revised workflows
0.4	07/26/2017	Staci Stolp	Revised test regarding use of qualifiers
0.5	07/31/2017	Staci Stolp	Revised table 3.13 adding RPD for MS/MSD
1.0	8/31/2020	Jolene McQuillan	Revised document due to EQuIS database consolidation
2.0	07/28/2023	Cathy Culver	Revised based on revised workflows
2.1	09/15/2023	Cathy Culver	Updated Links on 1.1, 2.1, 2.2 Updated reference value table
2.2	09/28/2021	Cathy Culver	EDD Submittal Process Workflow. Added links to EDD groups.

1.3 Terms and Acronyms

Term	Definition
DEQ	Montana Department of Environmental Quality
EDD	Electronic Data Deliverable
EDP	EQuIS Data Processor
MT-WMRD	Montana Waste Management & Remediation Division (EDD Format)
QA	Quality Assurance
SAP	Sampling and Analysis Plan
TREADS	Tracking Remedial and Environmental Actions Data System
UST	Underground Storage Tank
WMRD	Waste Management and Remediation Division

2 INITIAL COORDINATION AND SETUP

The four steps at the top of Figure 1-1 are required for initial set-up only. These are important steps that will register you with the Montana EQuIS system and save you time when you're ready to validate and submit your EDDs.

2.1 Join Montana EQuIS Email Subscription

It's important to stay informed about Montana EQuIS. Sign-up for the email subscription and receive important updates about Montana EQuIS, including when updated reference value lists are posted, anticipated outages for maintenance, and training opportunities. To register for the Montana EQuIS Email Subscription:

1. Click the 'Montana EQuIS Email Subscription' link on DEQ's MT-WMRD Support webpage: https://deq.mt.gov/cleanupandrec/resources.
2. Enter your email address and select 'Submit'.
3. Check the 'Montana EQuIS' box, located in the Other section, and select 'Submit'.
4. You should receive an email confirming your subscription.

2.2 Download and Install the EQuIS Data Processor (EDP)

The EQuIS Data Processor (EDP) is a standalone application that must be used by data providers to check their EDD files prior to submission to Montana EQuIS. The EDP performs a series of formatting checks on the EDD and then identifies any records that have errors.

To use the EDP application, the following steps must be completed in the order shown:

1. Download and install the EDP application
2. Download the MT-WMRD EDD Format
3. Register the EDD format

Detailed guidance for the above steps can be found in the EDP Quick Start Guide, available from the https://deq.mt.gov/cleanupandrec/resources under 'Step 2: Verify Your EDD'.

3 EDD Data Tables Organization & Requirements

The MT-WMRD EDD and EDD Description file each consist of multiple worksheets that comprise the individual sections within an EDD. Worksheets can be grouped into the following categories:

1. Initial
2. Field
3. Vapor Intrusion
4. Lab

Data providers and project managers should discuss what specific information is required for each project's specific needs. The following sections provide a high-level description for each worksheet. Detailed instructions for each worksheet and the included fields are presented in Section 4. MTDEQ will continue to reevaluate the EDD requirements and update both the format and guidance documents as needed.

3.1 Initial EDD Group

The "Initial" EDD group provides information about the data provider, the subfacility (area within a site), and its monitoring locations. The Initial EDD group needs to be submitted prior to, or in conjunction with, the first field, vapor intrusion, or lab EDDs. Only information that has not been previously submitted to Montana EQuIS needs to be submitted. The Initial EDD group consists of 10 tables represented as worksheets in the MS Excel version of the MT-WMRD EDD (Table 3.1):

1. Data Provider_v1
2. Subfacility_v1
3. Location_v1
4. SubfacilityLocation_v1
5. Task_v1
6. COC_v1
7. SDG_v1
8. Equipment_v1
9. EquipmentParameter_v1
10. Files_v1

Table 3.1: General Information on Initial EDD Group

Table Name Format	Description	Completed By	Submission Frequency	Data Requirements
Data Provider_v1	Provides general information about the data provider and the organization's site contact. This table must only be submitted once for each data provider. All subsequent EDD submissions to MTDEQ for any site by the same data provider will reference the Data Provider information originally submitted.	Data Provider	Initial	The following fields in this section are needed for the EDD to load: • **company_code** – A code to be added to MTDEQ valid value table rt_company • **company_type** – Lookup value describing the type of company (e.g., Laboratory, consultant) • **company_name** – Full company or organization name of the data provider • **contact_name** – Name of site contact at the data provider organization

Table 3.1: General Information on Initial EDD Group

Table Name Format	Description	Completed By	Submission Frequency	Data Requirements
	If a data provider is submitting an EDD with data from a site that is influenced by or is influencing the groundwater of another site (i.e., the plume is a result of multiple releases from more than one site), then refer to Section 7 for additional guidance regarding data reporting.			• **address1** – Address of contact at data provider organization • **city** – City of contact at data provider organization • **state** – State of contact at data provider organization • **postal_code** – Zip code of contact at data provider organization • **phone_number** – Phone number of contact at data provider organization • **email_address** – e-mail address of contact at data provider organization
Subfacility_ v1	Includes information about a site (site code, type of facility, and location address). In the EQuIS relational database, the term "facility" is analogous to "site," and "subfacility" is analogous with a site Operable unit (OU), Area of concern (AOC), Release, etc., if one has been specified for the site. If a site/facility has multiple OUs or subfacilities, then a separate record must be created in the subfacility data file for each. A typical subfacility code for a site is "OU1" to designate operable unit. Note: Subfacility is required only to describe collection at a subfacility level such as buildings for vapor intrusion. The table can be left blank if this level of detail is not required for a sampling event	Non-laboratory Data Provider	Initial and if appropriate	The following fields in this section are needed for the EDD to load: • **subfacility_code** – A code representing the subfacility such as "OU1" or "Site-wide" if no subfacility exists. • **subfacility_type** – Lookup value describing the type of subfacility such as: Building, Basin, Operable Unit, Area of Concern, Release, etc. The appropriate subfacility names and task codes for the subfacility should be discussed with the MTDEQ PM.
Location_v1	Contains a record for each of the sampling locations for a Subfacility. A location table needs to be submitted for any and all locations that will have samples, water levels, well information, or any other EDD section requiring the use of a location ID. This section may be submitted multiple times for a site if new locations are added to the site, or if additional information is added for existing locations.	Data Provider Field Personnel	Initial and for all NEW sample locations	The location term is defined as a unique point on the surface of the earth. Each location is a distinct point defined by longitude and latitude. Examples of locations include soil borings, monitoring wells, and other sampling locations. Each subfacility can contain one or more locations. Each location identifier (sys_loc_code) must be unique for a location in the subfacility. Location codes cannot be the same as sample codes. Please do not use special characters (e.g. #, ', ", @!). Inclusion of such characters in the sys_loc_codes can be problematic for the database. The location (sys_loc_code) field should be left null for samples that are not associated with a specific location. Examples include equipment blanks (EB), field blanks (FB) and trip blanks (TB). It is beneficial to place enough leading zeros in the sys_loc_code in order for them to sort numerically and prevent MW-1 and MW-11 from lining up in order alphabetically in the database. If the data provider is also providing alternative coordinates in state plane or some other coordinate system, those should be included in the alt_x_coord and alt_y_coord coordinate fields and also include PRIMARY as the alt_identifier_code and SP as the alt_coord_type_code for State Plane. If working with historical data, and the coordinates are not available for the sampling locations, contact the MTDEQ PM to determine a method to record the locations.
SubfacilityLocation_v1	Associates each subfacility to sampling locations.	Data Provider	Initial and for all NEW sample locations	The following fields in this section are needed for the EDD to load: • **sys_loc_code** – A code representing the subfacility such as "OU1" or "Site-wide." • **subfacility_code** – Unique identifier for the subfacility or building at the facility.
Task_v1	Provides details regarding the task(s) under which samples were collected. This field should identify the DEQ-approved sampling plan that was followed to collect the samples.	Data Provider	Initial and for all new tasks.	
COC_v1	Lists the various chains of custody used when describing field samples.	Data Provider	Used for every sampling event.	If there are 5 different COC associated with a sampling event the numbering could be 1 – 5 for the COC code
SDG_v1	Contains information associated with each sample delivery group (SDG). A SDG is a group of samples associated with a COC. There may be multiple SDG's associated with a COC or all the samples can be in one SDG. An SDG is also referred to as a Work Order.	Data Provider	Used for every sampling event.	

Table 3.1: General Information on Initial EDD Group

Table Name Format	Description	Completed By	Submission Frequency	Data Requirements
Equipment_v1	Contains attributes associated with equipment used during a sampling event.	Data Provider	Used for every sampling event.	The following fields are needed for the EDD to load: • **equipment_code** – unique identifier for the equipment • **equipment_type** – type of equipment (provided by reference values file)
EquipmentParameter_v1	Contains parameters collected by each piece of equipment and information on who collected the data.	Data Provider	Used for every sampling event.	The following fields in this section are needed for the EDD to load: • **equipment_code** – unique identifier for the equipment • **param_code** – the equipment parameter • **measurement_date** – The date and time of the parameter measurement • **param_value** – The value of the parameter measured • **person_name** – The name of the person measuring the parameter
Files_ v1	Allows for multiple documents to be attached to the EDD as supplemental information. When attaching documents, please use the following naming convention: site acronym, abbreviated document description, and date of document (YYYYMMDD). Examples include: ABCsite_SAP_20170601; and ABCsite_COC_SamplesMW01-MW10_20170705.	Data Provider	Initial	

A detailed description of the data fields in each of the Initial EDD Group Sections can be found in Appendix A.

3.2 Field EDD Group

The field EDD group consists of data tables for data obtained during subsurface investigations and other field activities at a site. The field EDD consists of 10 data tables (Table 3.2):

1. DrillActivity_v1
2. DownholePoint_v1
3. Lithology_v1
4. Well_v1
5. WellConstruction_v1
6. WaterLevel_v1
7. WaterTable_v1
8. ExtractionInjectionWells_v1
9. FieldSample_v1
10. FieldResults_v1

Table 3.2: General Information on Field EDD Group

Table Name	Description	Completed By	Submission Frequency	Data Requirements
DrillActivity_v1	Contains general information pertaining to all drilling activities (well construction, soil borings, or other) that take place at a project site.	Data Providers	Once per location	The sys_loc_code and drill_event fields need to be populated for each drilling activity event.

Table 3.2: General Information on Field EDD Group

Table Name	Description	Completed By	Submission Frequency	Data Requirements
		Field Personnel		
DownholePoint_v1	Contains data consisting of a depth, a parameter, and a reading, which are collected during drilling, direct push sampling, borehole logging, or some other means of downhole data collection. Examples of downhole point data include photoionization detector (PID) readings from soil samples, cone penetrometer test data, direct push electrical conductivity logs, membrane interface probe readings and borehole geophysical logs such as natural gamma, fluid conductivity and fluid temperature.	Data Providers Field Personnel	Once per location or when subsequent logs are run in a well installed at the location	All fields in this EDD section are needed for the EDD to load (sys_loc_code, depth, param, param_value, param_unit, and measurement date).
Lithology_v1	Contains lithologic data collected from soil samples, rock core, or drill cuttings generated during drilling of borings or collection of rock cores. For soil classification, please use the Unified Soil Classification System (USCS). Rock should be described using standard geologic terms for the rock type encountered in the borehole.	Data Providers Field Personnel	Once per location	The sys_loc_code and start_depth fields are needed for the EDD to load in this section.
Well_ v1	Contains basic information for each well and is required if the location EDD contains wells. Important information captured in this EDD include the well owner, measuring point elevation, depth of the well, whether or not the well includes a pump, pump information, stickup height, driller, and installation date.	Data Providers Field Personnel	Once per location	This EDD will include all wells installed at the site and should be submitted when well installation is complete and when the datum value of the well is changed. For example, if a well is converted from stickup to flush-mount and the inside casing is cut down, then the datum value (top of casing elevation in this case) has been changed and the Well EDD would be submitted to document this change. Following is a description of the fields in this section:
WellConstruction_v1	Contains well construction information, such as casing length, screened interval, backfill information, and other construction details.	Data Providers Field Personnel	Once per location or when the surface completion or top of casing elevation or datum value is changed	For each well on the Well_v1 EDD section multiple records describing the components of a well, such as the collar, casing, screen and materials used can be placed in the WellConstruction_v1 EDD section at their respective depths for each well. The following fields are needed for documenting well construction details in the WellConstruction_v1 EDD section so that the EDD will load: • **sys_loc_code** – Sample location id for a well that must be unique within a facility • **segment_type** – A code from the rt_well_segment_type valid value table describing the individual section of the well, such as “FILTER PACK”. • **material_type_code** – A code from rt_well_segment_type valid value table describing the material used in an individual section of a well, such as “SAND PACK”. • **start_depth** – The depth, in feet below ground surface (bgs) for the top of the well segment. • **end_depth** – The depth, in feet bgs for the bottom of the well segment. • **depth_unit** – The unit of depth measurement for start and end depth in feet. • **inner_diameter** – A value representing the inner diameter of the segment_type. • **outer_diameter** – A value representing the outer diameter of the segment_type. • **diameter_unit** – The unit of measure for the inner and outer diameter measurements. • **slot_type** – The type of well screen slots in the well screen such as bridge, shutter, and continuous. • **slot_size** – The width of the slots in the well screen. • **slot_size_unit** – The unit of measure for the slot size measurement. • **perf_length** – The length of the well screen. • **screen_type** – The type of well screen used such as pipe based screen, rod based screen, “v” wire, slotted, or perforated plate.
WaterLevel_v1	Contains information on groundwater levels measured during sampling activities, synoptic rounds of water level measurements, or other groundwater monitoring events.	Data Providers Field Personnel		The fields listed below need to be populated for the EDD to load: • **sys_loc_code** – Sample location ID for a well that must be unique within a facility. • **measurement_date** – The date and time a water level measurement was collected at a well. • **historical_reference_elev** – The elevation of the reference point from which water level depth measurements were taken. • **water_level_depth** – The depth of water below the reference point. • **water_level_elev** – The elevation of the water level calculated by subtracting the water_level_depth from the historic_reference_elev. • **measured_depth_of_well** – The depth, in feet, of the bottom of the well. • **depth_unit** – The units used for measuring the water_level_depth, water_level_elev, and depth of a well. • **Technician** – The name of person collecting the water level measurements.

Table 3.2: General Information on Field EDD Group

Table Name	Description	Completed By	Submission Frequency	Data Requirements
				• **dry_indicator_yn** – Enter "N" if you are able to obtain a water level measurement or "Y" if the well is dry. • **measurement_method** – The method of measuring the water table depth (e.g. water level indicator). Note: feet msl is the preferred elevation unit for elevation data provided to DEQ.
WaterTable_v1	Contains information to document the first encounter with the water table and subsequent stabilization during drilling of a boring.	Data Providers Field Personnel	Once per location	The fields listed below need to be populated for the EDD to load: • **sys_loc_code** – Sample location ID for a well that must be unique within a facility • **type** – The type of aquifer encountered such as "upper," "lower," "unconfined" etc. • **sequence** – Enter either "Stabilized" or "Unstabilized" depending on the water level conditions at the time of measurement. • **depth** – The depth, in feet, of the water table below the reference point • **flowing_yn** – Enter "Y" for yes, water is flowing (artesian), or "N" for no, water is not flowing. • **measurement_method** – The method of measuring the water table depth (e.g. water level indicator) • **reference point** - Description of the reference point from which the water table depth was taken. (e.g. "ground surface elevation") • **reference elevation** – The elevation of the reference point from which depth measurements were taken. Note: feet msl is the preferred elevation unit for elevation data provided to DEQ. Depth measurements should be taken to the nearest 100th (e.g., 15.10 feet).
ExtractionInjection Wells_v1	Contains data specific to extraction and injection wells, such as pumping rates, period of pumping, and volume pumped. These data relate to any extraction wells operating as part of an interim or remedial action, and the information is used to track the operations and maintenance (O&M) of treatment systems.	Data Providers Field Personnel	Whenever well extraction or injection data are collected and provided to MTDEQ.	The fields listed below need to be populated for the EDD to load: • **sys_loc_code** – Sample location ID for a well that must be unique within a facility. • **start_measure_date** – Date and time that the extraction/injection measurements began. • **end_measure_**date – Date and time that the extraction/injection measurements concluded. • **ave_pump_rate** – Average extraction/injection rate. • **pump_rate_unit** – Unit of measure for the extraction/injection rate. • **operating_mode** – Mode in which the well was operating during the reported interval. • **design_rate** – Extraction/injection rate specified in the DEQ-approved remedial design to fully capture the site's contamination. • **design_rate_unit** – Unit of measure for the design extraction/injection rate.
FieldSample_v1	Contains detailed information on the samples collected during a sampling event including types of samples, sample matrix, date and location of the sample.	Data Providers Field Personnel	Whenever sample data are collected and provided to MTDEQ.	The fields listed below need to be populated for the EDD to load: • **sys_sample_code -** The unique identifier of the sample. Each sample at a facility needs a unique value, including spikes and duplicates. • **sample_matrix_code** - Matrix code representing the sample matrix as defined in the field. • **sample_type_code -** The code which distinguishes between different types of samples. For example, normal field samples should be distinguished from laboratory method blank samples, etc. • **sample_source** – This fild identifies where the sample came from, either Field or Lab. In this section of the EDD, this value should always be Field. • **sample_date -** The date and time the sample was collected (in MM/DD/YYYY HH:MM:SS format). • **composite_yn** – "Y" if the sample is a composite sample, "N" if not.
FieldResults_v1	Contains field parameters collected during sampling events, such as groundwater quality parameters, including turbidity, temperature, specific conductance, pH, Eh, and dissolved oxygen. Field test kit results for parameters, such as ferrous iron, which are analyzed in the field, may also be entered into this EDD.	Data Providers Field Personnel	Whenever field investigation data are collected and provided to MTDEQ.	The fields listed below need to be populated for the EDD to load: • **data_provider** – Valid value from rt_company or data provider EDD section for organization collecting the field results. • **sys_loc_code** – The sample location ID where field results were taken. • **sys_sample_code** – The sample that is associated with the field results collected. • **field_parameter** – The CAS number code from rt_analyte representing the field parameter collected.

Table 3.2: General Information on Field EDD Group

Table Name	Description	Completed By	Submission Frequency	Data Requirements
				• **start_depth** – The start depth below ground surface or water surface of the sample interval. Typically this field is only used for soil samples. In the event that the data provider has a multilevel groundwater sample see Appendix A • **end_depth** – The end depth below ground surface or water surface of the sample interval. Typically this field is only used for soil samples. Typically this field is only used for soil samples. In the event that the data provider has a multilevel groundwater sample see Appendix A • **depth_unit** – The sample start and end depth unit. • **result_date** – The date the field parameter measurement was taken. • **result_time** – The time the field parameter measurement was taken. • **result_value** – The numeric value of the field parameter result or reading. Or a text value indicating NR for no reading or ND for non-detect. • **result_unit** – The unit of measurement pertaining to the field parameter result collected. • **quantitation_limit or reporting limit** – The concentration level above which results can be measured by the instrument. • **task_code** –. This field should identify the DEQ-approved sampling plan that was followed to collect the samples. • **sample_matrix_code** – The matrix valid value code representing the field sample matrix. • **qualifier** – A field parameter qualifier to denote detections and non-detects. • **sampling_company_code** – Company code for company collecting the sample. • **sampling_method** – The sampling method used when collecting the field parameter reading. • **reportable_result** – Enter “Yes” for usable results considered reportable and “No” for results collected that are not useable and not reportable. Non-reportable results for field parameters may be caused by equipment malfunction or improper field procedures. • **value_type** – Enter how the final field parameter result was derived as either “Actual,” “Calculated,” or “Estimated.” • **detect_flag** - May be either "Y" for detected analytes or "N" for non_detects or "TR" for trace. Use "Y" for estimated values (above detection limit but below the quantitation limit). • **fraction** - Must be either "D" for dissolved or filtered [metal] concentration, "T" for total or undissolved, or "N" for anything else. It is expected that in most cases this field will be N. • **analytical_method** - The analytic method used to obtain the result value. • **analysis_location** - Must be either "FI" for field instrument or probe, "FL" for mobile field laboratory analysis, or "LB" for fixed_based laboratory analysis. • **column_number** - Values include either "1C" for first column analyses, "2C" for second column analyses or "NA" for tests for which this distinction is not applicable. • **result_type_code** - The type of result. 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. • **test_type** - The type of test. Valid values include "INITIAL", "REEXTRACT1", "REEXTRACT2", "REEXTRACT3", "REANALYSIS", "DILUTION1", "DILUTIONS2", and "DILUTIONS3".

A detailed description of the data fields in each of the Field EDD Group sections can be found in Appendix A.

3.3 Vapor Intrusion EDD Group

The vapor intrusion EDD group consists of data tables for inventorying buildings and structures; cataloging factors that impact air quality within structures and for the location; and sample and chemistry results for soil vapor, indoor air and ambient outdoor air samples collected. The vapor intrusion EDD consists of three data tables (Table 3.3):

1. VI_BuildingInspection_v1
2. VI_TaskParameters_v1

3. VI_Samples_v1

Table 3.3: General Information on Vapor Intrusion EDD Group

Table Name	Description	Completed By	Submission Frequency	Data Requirements
VI_BuildingInspection_v1	Contains data that inventories buildings and structures, and cataloging factors that impact air quality within structures.	Data Providers Vapor Intrusion Team	Once per building inspection	The fields listed below need to be populated for the EDD to load: • **building_code**– For each building, this building code must be unique • **building_name**– This can be a more descriptive name for the building. • **inspection_date** – The date the building inspection was conducted. • **task_code** – This field should identify the DEQ-approved sampling plan that was followed to collect the samples.
VI_TaskParameters_v1	Contains data specific to the VI task, for example start/end weather, start/end atmospheric pressure, etc.	Data Providers Vapor Intrusion Team	Anytime structure sampling data are collected and provided to MTDEQ	The fields listed below need to be populated for the EDD to load: • **task_code** – This field should identify the DEQ-approved sampling plan that was followed to collect the samples. • **parameter_code** – The task parameter.
VI_Samples_v1	Contains sample information collected from ambient air, indoor air, and subslab soil vapor sampling forms	Data Providers Vapor Intrusion Team	Anytime structure sampling data are collected and provided to MTDEQ	The fields listed below need to be populated for the EDD to load: • **data_provider** - The unique identifier of the company or agency submitting the data. • **sys_sample_code** - The unique identifier of the sample. Each sample at a facility must have a unique value, including spikes and duplicates. You have considerable flexibility in the methods used to derive and assign unique sample identifiers, but uniqueness throughout the database is the only restriction enforced by EQuIS®. • **sample_name** - Additional sample identification information as necessary. Is not required to be unique (i.e. duplicates are OK). • **sample_matrix_code** - The code which distinguishes between different types of sample matrix. For example, subslab soil vapor samples must be distinguished from indoor samples, etc. • **sample_type_code** - The code which distinguishes between different types of samples. For example, normal field samples must be distinguished from laboratory method blank samples, etc. • **sample_source** - This field identifies where the sample came from, either Field or Lab. • **sample_start_date** - The beginning date and time of sample collection (in MM/DD/YYYY HH:MM:SS format). • **sample_end_date** - The end date and time of sample collection (in MM/DD/YYYY HH:MM:SS format). • **sys_loc_code** - The unique identifier of the location at which the sample was collected. Must be a valid code for the facility and reported value in the sys_loc_code field of the Location section. • **sampler** - The name or initials of the sampler. • **sampling_company_code** - The unique identifier of the sampling company.

A detailed description of the data fields in each of the vapor intrusion EDD group sections can be found in Appendix A. Guidance for conducting vapor intrusion investigations can be found at: http://deq.mt.gov/Land/StateSuperfund/resources under guidance.

3.4 Lab EDD Group

The lab EDD group consists of data tables for analytical samples collected at a subfacility and associated locations. The lab EDD consists of three data tables (Table 3.4):

1. Sample_v1
2. TestResultsQC_v1
3. Batch_v1

Table 3.4: General Information on Lab EDD Group

Table Name	Description	Completed By	Submission Frequency	Data Requirements
Sample_v1	Contains sample matrix, collection date and time, sample type, etc.	Data Providers with input from Field Personnel	Whenever analytical data are collected and provided to MTDEQ	The fields listed below need to be populated for the EDD to load: • **data_provider** - The unique identifier of the company or agency submitting the data. • **sys_sample_code** - The unique identifier of the sample. Each sample at a facility must have a unique value, including spikes and duplicates. You have considerable flexibility in the methods used to derive and assign unique sample identifiers, but uniqueness throughout the database is the only restriction enforced by EQuIS®. • **sample_matrix_code** - The code which distinguishes between different types of sample matrix. For example, soil samples must be distinguished from ground water samples, etc. • **sample_type_code** - The code which distinguishes between different types of samples. For example, normal field samples must be distinguished from laboratory method blank samples, etc. • **sample_source** - This field identifies where the sample came from, either Field or Lab. • **sample_date** - The date and time sample was collected (in MM/DD/YYYY HH:MM:SS format) • **sampling_company_code** - The unique identifier of the sampling company. • **sample_method** - The method of sample collection. • **task_code** - This field should identify the DEQ-approved sampling plan that was followed to collect the samples. • **composite_yn** - Y" if the sample is a composite sample, "N" if not. For Soil and Groundwater samples, the following fields are also required as part of the Sample section: • start_depth • end_depth • depth_unit
TestResultsQC_v1	Contains analytical results, methods, detection limits, reporting limits, etc. This table also contains laboratory and validator quality control (QC) data.	Data Providers with input from Analytical Laboratory and Data Validators	Whenever analytical data are collected and provided to MTDEQ	The fields listed below need to be populated for the EDD to load: • **sys_sample_code** - The unique identifier of the sample. • **lab_anl_method_name** - The laboratory analytical method name or description, for example "SW8260B", "E130.1", etc. • **analysis_date** - The date and time of sample analysis in "MM/DD/YYYY HH:MM:SS" format. May refer to either beginning or end of the analysis as required. • **fraction** – Please refer to reference values file. Examples of valid values include: “Dissolved”, “Filterable”, “TCLP” and “SPLP.” • **column_number** - Values include either "1C" for first column analyses, "2C" for second column analyses or "NA" for tests for which this distinction is not applicable. • **test_type** - The type of test. Valid values include "INITIAL", "REEXTRACT1", "REEXTRACT2", "REEXTRACT3", "REANALYSIS", "DILUTION1", "DILUTIONS2", and "DILUTIONS3". • **lab_matrix_code** - The code which distinguishes between different types of sample matrix. For example, soil samples must be distinguished from ground water samples, etc. The matrix of the sample as analyzed may be different from the matrix of the sample as retrieved (e.g. leachates), so this field is available at both the sample and test level. • **analysis_location** - Must be either "FI" for field instrument or probe, "FL" for mobile field laboratory analysis, or "LB" for fixed_based laboratory analysis. • **basis** - Denotes reporting basis. Must be either “Dry" for dry weight basis reporting, or "NA" for tests for which this distinction is not applicable. • **dilution_factor** - The effective test dilution factor, for example "5", "10", "50". If no dilution, enter "1". • **lab_name_code** - The unique identifier of the laboratory. • **qc_level** - The analysis type. For screening analysis input "SCREEN"; for quantitative analysis input "QUANT". • **lab_sample_id** - The LIMS sample identifier. If necessary, a field sample may have more than one LIMS lab_sample_id (maximum one per each test event) • **cas_rn** - The unique identifier of the analyte being measured. • **chemical_name** - The name of the analyte being measured. • **result_type_code** - 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. • **reportable_result** - Must be either "Yes" for results which are considered to be reportable, or "No" for other results. This field has many purposes. For example, it can be used to distinguish between multiple results where a sample is retested after dilution. It can also be used to indicate which of the first or second column result should be considered primary. The proper value of this field in both of these two examples should be provided by the laboratory (only one result should be flagged as reportable). • **detect_flag** - May be either "Y" for detected analytes or "N" for non_detects or "TR" for trace. Use "Y" for estimated values (above detection limit but below the quantitation limit). • **validated_yn** - Y" if the result has been validated, "N" if not.

Table 3.4: General Information on Lab EDD Group

Table Name	Description	Completed By	Submission Frequency	Data Requirements
				• **lab_sdg** - The unique identifier of the sample delivery group (SDG) or work order. A single sample may be assigned to multiple SDGs based on different analysis.
Batch_v1	Contains data that relate the individual samples to their laboratory sample batch identifiers and laboratory sample delivery groups. The fields in this section need to match the data entered in corresponding fields in the TestResultQC_v1 section.	Data Provider's Analytical Laboratory	Whenever analytical data are collected and provided to MTDEQ	The fields listed below need to be populated for the EDD to load: • **sys_sample_code** - The unique identifier of the sample. • **lab_anl_method_name** - The laboratory analytical method name or description, for example "SW8260B", "E130.1", etc. • **analysis_date** - The date and time of sample analysis in "MM/DD/YYYY HH:MM:SS" format. May refer to either beginning or end of the analysis as required. • **fraction** - Please refer to reference values file. Examples of valid values include: "Dissolved", "Filterable", "TCLP" and "SPLP." • **column_number** - Values include either "1C" for first column analyses, "2C" for second column analyses or "NA" for tests for which this distinction is not applicable. • **test_type** - The type of test. Valid values include "INITIAL", "REEXTRACT1", "REEXTRACT2", "REEXTRACT3", "REANALYSIS", "DILUTION1", "DILUTIONS2", and "DILUTIONS3". • **test_batch_type** - The analysis batch type. Valid values include "Prep", "Analysis", "Leach", and "Run". This is a required field for all batches. • **test_batch_id** - The unique identifier of the analysis batch.

A detailed description of the data fields in each of the lab EDD group sections can be found in Appendix A

3.4.1 Reporting Re-Tests

All analytes for initial tests and subsequent retests should be reported. When a retest is performed on a sample, the result that is considered the reportable result should be indicated with a “Yes” in the reportable_result field. The initial test result, or any retest result not considered reportable, will have “No” in the reportable_result field. Table 3.5 provides an example of reporting a re-tested result.

Table 3.5: Example of Reporting Re-Test Results

Test Type	Analyte	CAS No.	Result Value	Detect Flag	Lab Qualifiers	Reportable Results	Result Comments
Initial	Benzene	71-43-2	1000	Y	E	No	Exceeds Calibration
Initial	Toluene	108-88-3	8.2	N		Yes	Not detected
Dilution1	Benzene	71-43-2	650	Y		Yes	Quantitated

Y = yes N = no E= Exceeds the calibration range of the instrument

3.4.2 Reporting Selected Ion Monitoring Results

In order to attain lower detection limits some samples may be analyzed using selected ion monitoring (SIM) analyses. SIM is a method where the mass spectrometer is programmed to scan for only those ions significant for the identification of compounds of interest while ignoring unrelated ions. Samples, therefore, may have two results that the laboratories considers reportable (reportable_result yes/no flag = “Yes”).

The following guidance is suggested for determining which result should be identified as reportable when both a standard and SIM result in provided:

- If the standard method has a detected reportable result above the reporting detection or quantitation limit then a SIM result does not need to be reported because the standard method produced a usable result.
- If a standard result was detected but below the reporting detection or quantitation limit and a SIM result is present, the standard result should be flagged as not reportable and the SIM result will be reportable and used.
- If the standard result is a non-detect and a SIM result is present either as a detected result or non-detect, then the standard result is not reportable and the SIM result is reportable. In each of these cases only one result should be reportable (reportable result flag Yes/No = “Yes”).

In all cases, the data provider should determine the best result to identify as reportable.

3.4.3 Reporting Results Analyzed From Multiple Columns

Samples analyzed by gas chromatography-mass spectrometry may produce results from multiple columns. The column_number data field is required for this purpose. The default value for column number is NA, for not applicable, and results analyzed under multiple columns will have 1C and 2C, respectively, to denote first column or second column analyses results. Data providers must indicate which result is to be considered the reportable result.

Version 1 of the MTDEQ EDD format has a check to find samples that contain more than one reportable result for the same chemical. In these instances, one result must have the reportable result flag set to “No.”

3.4.4 Reporting Non-Detects

When reporting non-detect results, the detect flag field should be populated with an “N” and the Lab_Qualifier or Validation_Qualifier field should be populated with a “U”, whichever is applicable. The reporting detection limit field is the primary field used by EQuIS to report non detect results and, therefore, the reporting detection limit and detection unit field must be populated with actual reporting limit values. The result value field must be null for non-detect results.

The EDD includes three sets of “limit” values: the reporting detection limit, method detection limit, and the quantitation limit.

- The method detection limit (MDL) is the lowest concentration that can be detected by an instrument with correction for the effects of sample matrix and method-specific parameters such as sample preparation. MDLs are explicitly determined as set forth in 40 CFR Part 136. They are defined as three times the standard deviation of replicate spiked analyses. This represents 99% confidence that the analyte concentration is greater than zero.

  The organic methods in the EPA 500 series, EPA 600 series, and standard methods all give typical MDLs for clean water samples. Generally these clean-water MDLs are used for reporting limits, but the laboratory may use MDLs that it has generated. MDLs generated by the laboratory using the sample matrix of interest are the most reliable. If the clean-water MDLs are used, remember that they do not include all of the upward correction necessary to account for the effects of sample matrix.

- The reporting detection limit is the concentration level above which results can be quantified with confidence. It must reflect conditions such as dilution factors and moisture content, and is required for all results for which such a limit is appropriate. The reporting_detection_limit column needs to be reported as the sample specific detection limit. This is the primary field used by EQuIS to report non-detect results with a U qualifier.

- The quantitation limit refers to a minimum concentration of an analyte that can be measured within specified limits of precision and accuracy. They are generally 5-10 times the detection limit. Thus, when quantitation limits are used as reporting limits, the laboratory is saying that the analyte is not present in a sufficient amount to be reliably quantified (i.e., at a concentration above the quantitation limit). It may be present and even positively identified or "seen" at a lower concentration.

If the detect flag is “N” (No), indicating that the chemical was non-detect, then the result field should be null and the reporting limit field populated. In contrast, if the detect flag is “Y” (Yes), indicating that the chemical is detected, then the result field would be populated.

Should a detected result provided in the result field need to be adjusted to a non-detect as a result of data validation, the detect Y/N flag should be changed from a “Y” to a “N”, the result removed from the result field (result field to become null), the appropriate reporting limit provided in the reporting limit field (if not already present), and a “U" (and any other relevant qualifiers) provided in the validator field by the data provider. To negate a result at the value detected and reported by the laboratory, when that result is changed to a non-detect during review or validation, the result value must be removed and may be placed as the reporting detection limit so that when reported the non-detect value will be reported at the value detected instead of the original detection limit.

In the event that the validator qualifies a result, a summary of the rationale should be provided in the Result Comment field. Populating the method detection limit, reporting limit and quantitation limit fields ensures that the original limits are presented and MTDEQ or other end users of the data may understand the results of the validation process in the database. The data provider is responsible for ensuring these fields are populated correctly. The changes to the data that should be identified in an EDD resulting from data validation are described in more detail in Section 3.5.11.2 Table 3.6 is an example of reporting non-detected results.

Table 3.6: Example of Reporting Non-Detects

CAS No.	Result Value	Detect Flag	Reporting Detection Limit	Detection Limit Unit	Result Comment	Laboratory qualifiers
71-43-2	0.15	Y	0.005	ug/ml		
71-43-2		N	0.005	ug/ml	non-detect	U

Y = yes N = no ug/ml = micrograms per milliliter U = not detected

3.4.5 Toxicity Characteristic Leaching Procedure (TCLP)/Synthetic Precipitation Leaching Procedure (SPLP) Result Reporting

For soil samples that go through toxicity characteristic leaching procedure (TCLP) or synthetic precipitation leaching procedure (SPLP) analysis and are changed from a solid matrix to an aqueous matrix in the laboratory, a fraction code should be applied - “TCLP” or “SPLP.” This helps distinguish results from soil samples that are reported out in an aqueous unit rather than a solid unit. Table 3.7 is an example of reporting TCLP/SPLP results.

Table 3.7: Example of Reporting TCLP/SPLP Results

Method Code	Fraction	Test Type	CAS No.	Result	Detect Flag	Reporting Detection Limit	Unit	Laboratory qualifiers
SW6010	T	INITIAL	7439-92-1	510	Y	500	ug/kg	
SW6010	TCLP	INITIAL	7439-92-1		N	0.050	ug/ml	U

Y = yes N = no ug/ml = micrograms per milliliter ug/kg micrograms per kilogram U = not detected T = total TCLP = toxicity characteristic leaching potential

3.4.6 Ignitability Result Reporting

Ignitable and non-ignitable results should be reported in the EDD. Depending upon the laboratory analytical method used, results may be reported at the temperature at which the media became ignitable or the amount of combustion that propagates along a 200 millimeter (mm) strip of material within a specified time. For positively ignitable results, the result value should indicate the temperature at which the sample became ignitable or the distance at which combustion propagated along the burning strip. For non-detect results (non-ignitable), data providers should provide a “U” qualifier, leaving the result value blank and setting the reporting detection limit to the temperature at which the media was tested or use 200 mm to indicate the burning strip method was used during testing. Results and reporting detection limits for ignitability should have units indicating degrees (deg) Centigrade (C) or deg Fahrenheit (F), respectively for temperature or mm for burning strip distance.

3.4.7 Tentatively Identified Compounds (TIC) Reporting

TICs detected by the laboratory should be reported in the EDD. The naming of TICs should be applied in a cascade fashion. The TIC should be identified to analyte name if possible. If this is not possible, then the class, such as isomer or functional groups of the TIC, should be entered. The goal is to identify or define the TIC to the extent possible. If neither an analyte name nor a class can be identified, the TIC should be identified as Unknown. The MTDEQ EDD only allows for reporting up to 10 TICs. Only the 10 with the highest detected concentrations, or the most relevant TICs should be reported. Table 3.9 shows examples of the nomenclature for TICs. As an example, if a sample has three unknown hydrocarbons, then the TICs are labeled UnkHydrocarb1, UnkHydrocarb2, and UnkHydrocarb3. TIC names are to be reported in the cas_rn field, Pos #28, of the TestResultQC_v1 EDD section (Appendix A). In addition, the result_type_code, Pos # 32 in the TestResultQC_v1 EDD section should have “TIC” for all TIC records and tic_retention_time, Pos #44 in the TestResultsQC_v1 EDD sections need to be populated.

Table 3.9: Example of Nomenclature for Unknown TIC Reporting

TIC Name	Reported Name in cas_rn
Unknown	Unknown1 – Unknown10
Unknown Hydrocarbon	UnkHydrocarb1 - UnkHydrocarb10
Unknown PAHs	UnkPAH1 - UnkPAH10
Unknown Aromatics	UnkAromatic1 - UnkAromatic10
Unknown VOC	UnkVOC1 - UnkVOC10
Unknown SV	UnkSV1 - UnkSV10

PAH = polycyclic aromatic hydrocarbon VOC = volatile organic compound
SV = semi-volatile

3.4.8 QC Reporting for Analytical Data

The TestResultsQC_v1 EDD Section contains fields for laboratories to report quality control information regarding industry standards, surrogate results, duplicate results, and spiked compounds pertaining to certain analytical methods. The following subsections define the format and data fields required when reporting QC data for analytical data.

QC fields for a normal sample (e.g., Sample_type_code = N, TB, equipment blank (EB), etc.) would all be left blank (Null) because they are only applicable for laboratory quality control samples. Table 3.10 provides a partial list of the QC fields in a TestResultsQC_v1 EDD section for a normal field sample.

Table 3.10: Quality Control Fields for a Normal Sample

CAS No.	Result value	result unit	result type code	qc spike measured	qc spike recovery	qc dup original conc	qc dup spike added	qc dup spike measured	qc dup spike recovery
93-76-5	1.56	mg/L	TRG						
94-75-7	3.17	mg/L	TRG						
94-82-6	2.31	mg/L	TRG						

mg/L = milligrams per liter TRG = target

QC fields for a normal sample with surrogates (e.g. Sample_type_code = N, TB, EB, etc.) are left blank (Null) except on surrogate rows designated by the result type “SUR” because they are only applicable for laboratory quality control samples Data providers will need to complete the qc_spike_added, qc_spike_ measured, and qc_spike_recovery data fields. Table 3.11 provides a partial list of the fields in a TestResultQC_v1 EDD section for a normal sample with surrogates.

Table 3.11: Quality Control Fields in a Normal Sample with Surrogates

CAS No.	result value	result unit	result type code	qc original conc	qc spike added	qc spike measured	qc spike recovery
93-76-5	1.56	mg/L	TRG				
94-75-7	3.17	mg/L	TRG				
PHEN2BR246	12.9	mg/L	SUR		12.5	12.9	103

mg/L = milligrams per liter TRG = target SUR = surrogate

QC fields for a MS (i.e., Sample_type_code = MS) required to be completed by data providers are the qc_original_conc, qc_spike_added, qc_spike_measured, and the qc_spike_recovery fields. Table 3.12 provides a partial list of the QC fields in a TestResultsQC_v1 EDD section for a MS.

Table 3.12: Quality Control Fields for a Matrix Spike (MS)

CAS No.	result value	result unit	qc original conc	qc spike added	qc spike measured	qc spike recovery	qc dup original conc	qc dup spike added	qc dup spike measured	qc dup spike recovery
93-76-5	5.36	mg/L	1.56	4.18	5.36	90.9				
94-75-7	7.15	mg/L	3.17	4.18	7.15	95.2				
94-82-6	5.66	mg/L	2.31	4.22	5.66	79.3				

mg/L = milligrams per liter

QC fields for a MSD (i.e., Sample_type_code = MSD) required to be completed by data providers are the qc_dup_original conc, qc_dup_spike_conc, qc_dup_spike_measured, qc_dup_spike_recovery and qc_rpd fields. Table 3.13 provides a partial list of the QC fields in a TestResultsQC_v1 EDD section file for a MSD.

Table 3.13: Quality Control Fields for a Matrix Spike Duplicate (MSD)

CAS No.	result value	result unit	qc original conc.	qc spike added	qc spike measured	qc spike recovery	qc dup original conc.	qc dup spike added	qc dup spike measured	qc dup spike recovery	RPD for MS/MSD[1]
93-76-5	5.7	mg/L					1.56	4.23	5.70	97.8	6.15%
94-75-7	7.62	mg/L					3.17	4.23	7.62	105	6.36%
94-82-6	5.33	mg/L					2.31	4.13	5.33	73.1	6.01%

mg/L = milligrams per liter

QC fields for a Laboratory Control Sample (LCS) (e.g. Sample_type_code = BS, BD, LB etc.) follow MS and MSD reporting procedures described previously. LCS blank spike samples (i.e., sample_type_code = BS) require the same fields as QC fields for a MS. LCS blank spike duplicate samples (i.e., Sample_type_code = BD) require the same fields as QC fields for a MSD.

3.4.9 QC Spike Status

QC spikes, spike duplicates, surrogate compounds, LCS and any spiked sample results can sometimes be outside the control limits. An asterisk (*) is used to indicate that the QC spike recovery, QC duplicate spike recovery, and/or QC relative percent difference were outside control limits. The asterisk should be placed in the qc_spike_status, qc_dup_spike_status, and qc_rpd_status fields of the EDD respectively. It should not be used as an interpreted qualifier. Table 3.14 provides a partial list of the QC fields in a TestResultsQC_v1 EDD section showing the QC status fields.

Table 3.14: Quality Control Status Fields for a Matrix Spike Duplicate

CAS No.	result value	qc spike status	qc dup spike status	qc rpd status
93-76-5	5.36	*		
93-76-5	5.7		*	
94-75-7	7.62			*

3.4.10 Data Validation Fields for Analytical Data

Data validation results can be reported and qualified in the EDD using the validator_qualifiers field. The lab_qualifier field should be filled out for all results with qualifiers as originally reported by the laboratory. The validator field should be used when applicable. When the laboratory qualifier is an asterisk (*), the validator must resolve the * by placing the correct qualifier in the validator qualifier field; this will most likely be a J. The * indicating the sample has a QC result outside the control limits should have the * placed in the appropriate QC status field as described in section 3.5.10 above. All qualifiers populated in the validator qualifiers field must match one of the MTDEQ valid values on the rt_qualifier reference table for the EDD to load, and the rationale for the qualifier should be provided in the validators result remark field. The table below displays the only qualifiers that should be used in the validator qualifier and the interpreted qualifier fields of the EDD, labs may have additional qualifiers that they may use.

qualifier	status_flag	organic_desc	organic_hit	organic_reject	inorganic_desc	inorganic_hit	inorganic_reject	flag_position
C	A	Confirmed by GC/MS.	Y	N		N	N	after
J	A	Estimated value.	Y	N	Estimated value.	Y	N	after
J*	A	LCS/LCSD recovery outside the control limit or RPD value outside the control limit; estimated value						
J+	A	Estimated value, may be biased high	N	N	Estimated value, may be biased high	N	N	after

[1] MS Result = QC spike measured obtained from Table 3.12

qualifier	status_flag	organic_desc	organic_hit	organic_reject	inorganic_desc	inorganic_hit	inorganic_reject	flag_position
J-	A	Estimated value, may be biased low	N	N	Estimated value, may be biased low	N	N	after
NJ	A	Tentatively Identified, poor resolution, est.	Y	N	combination.	Y	N	after
R	A	Rejected.	Y	Y	Rejected.	Y	Y	after
U	A	Compound was analyzed but not detected.	N	N	Analyte was analyzed for but not detected.	N	N	after
UJ	A	Not Detected, Limit is estimated.	N	N	Not detected, estimated quantitation limit.	N	N	after
X	A	Pesticide and Arachlor results attempted using GC/MS, but unsuccessful	N	N		N	N	after

Category B deliverables and the validated results provided in a data usability summary report (DUSR) would include the validator_qualifier and interpreted_qualifier fields entered. Data providers are required to populate the validated_yn field with a “Y” for yes if the data have been validated or “N” for no the data have not been validated. For each result where the validated_yn field is populated with a “Y,” the validation_level field must also be populated using one of the following validation levels:

Validation Level	Definition
Raw	Screening level analysis, not QC’d by the lab
DUSR	Checked/validated against on-going laboratory precision and recovery analyses; is within lab QC (typically what should be provided to DEQ) – Check on the difference between DUSR and Category A with EarthSoft
Category A	Laboratory deliverable with limited data and only a data review is possible. No calibration data are provided.
Category B	Laboratory deliverable with all data necessary for a full data validation.

The result value field should be left null when data validation qualifiers indicate non-detect (U) and may be left null when data are rejected (R). When laboratory or validator qualifiers (or both) are reported in an EDD, additional fields on the dt_result tab should be populated. The MTDEQ PM will review the data validation report and may re-assign the interpreted qualifier results. MTDEQ will communicate any changes made to the Interpreted Qualifiers for an EDD submission.

If it is determined that the data will be submitted into the database, the data provider should provide the rationale for the validator qualification in the Result Comment field. The following subsections describe examples of validation qualifiers that can be presented in EDDs.

3.4.10.1 R (Rejected) Qualified Data

If an R value is provided as a qualifier based on the results of data validation (from the validator qualifier result field), then the reportable result column should be populated appropriately. The use of rejected data is determined by the MTDEQ PM on a case-by-case basis. This may also require discussion with the validator as these results typically are considered to be not reportable (NO in the reportable result = YES/NO field), but project-specific information may indicate the result should remain YES, reportable.

The R qualified data can be provided a number of different ways in the EDD, including the following:

1) No value in the result field, an R in one or more of the qualifier fields, and reportable (YES in the reportable result field). If the value was detected, the detect flag will be Y for Yes; the original detected value was provided in the result field by the laboratory but removed so the data would be reported as rejected but not impact data analysis, since the result value is removed.
2) No value in the result field, an R in one or more of the qualifier fields, and not reportable (NO in the reportable result field) indicates a non-detect that is rejected and won’t be considered usable.

3.4.10.2 Validation Data Qualifiers

If data validation confirms that qualification provided in the laboratory can remain as provided, then the same qualifier presented in the lab qualifier field is presented in the validator qualifier field (Example 1 in Table 3.15 below).

If the validation confirms that qualification provided in the laboratory can remain as provided but additional qualification is necessary, then the qualifier is presented in the lab qualifier field and in the validator qualifier field (Example 7 in Table 3.15 below).

If the MTDEQ PM provides a U or UJ as the Interpreted Qualifiers, then the detect flag should be N, indicating that No, the chemical was not detected. If a chemical is not detected, then the result field should be null and the reporting limit field populated (Example 3 in Table 3.15 below).

3.4.10.3 Qualification Action Based on Blank Contamination

The following are examples of qualification that may be required as a result of contamination of the blank.

- If a chemical is reported as an estimated value below the reporting limit (a value is present in the result field and is qualified with a J value by the laboratory) and it is not detected in the blank, then the value remains a value in the result field and is estimated below the reporting limit (J qualifier remains in the laboratory qualifier column and is added to the Validator Qualifier column) (Example 4 in Table 3.15 below).
- If a chemical is detected in the blank, then a blank action limit (BAL) is calculated by the validator. The BAL is calculated and applied based on the requirements of the data validation protocol for example a BAL might be set at 5 or 10 times the concentration reported in the associated blank. If the reported value (value in the result field) is an estimated value below the reporting limit (J value in the laboratory qualifier column) and below the BAL, then the result is qualified as non-detect (value is removed from the results field) and raised to the reporting limit (reporting limit field is populated and U is placed in Interpreted Qualifier field). For example: BAL = 12 micrograms per Liter (ug/L) and Reporting Limit = 5 ug/L, a reported value of 2 J ug/L becomes 5 U ug/L (Example 5 in Table 3.15 below).
- If a chemical is detected in the blank and the reported concentration (value in result field) is greater than the reporting limit, but less than the BAL, then the result becomes non-detect at the reported concentration. Thus, the result is moved to the reporting limit field, the result field is null, and a U is entered in the Validator Qualifier and Interpreted Qualifier fields. For example: BAL = 12 ug/L and Reporting Limit = 5 ug/L, a reported value of 8 ug/L becomes 8 U ug/L (Example 6 in Table 3.15 below).
- If a chemical is detected in the blank and the reported concentration is greater than the BAL, then no qualification is required. Thus, the data provided in the result and qualifier fields remain unchanged (Example 2 in Table 3.15 below).

Table 3.15 provides an additional example of validated and non-validated data.

Table 3.15: Data Validation Fields for Analytical Data

CAS No.	Chemical name (example number)	Result value	Result type	Reportable result	Detect flag	Method detection limit	Reporting Detection Limit	Quantitation Limit	Lab qualifiers	Validator qualifiers	Interpreted qualifier	Validated yn
93-76-5	Benzene (1)	2.0	TRG	Yes	Y	1.00	5.00	5.0	J	J	J	Y
94-75-7	Toluene(2)	81	TRG	Yes	Y	1.00	5.00	5.0				Y
94-82-6	Xylenes (3)		TRG	Yes	N	1.00	5.00	5.0	U		U	N
93-76-5	Benzene (4)	3.1	TRG	Yes	Y	1.00	5.00	5.0	J	J	J	Y
94-75-7	Toluene (5)		TRG	Yes	N	1.00	5.00	5.0	J	U	U	Y
94-82-6	Xylenes (6)		TRG	Yes	N	1.00	8.00	5.0		U	U	Y

Table 3.15: Data Validation Fields for Analytical Data

CAS No.	Chemical name (example number)	Result value	Result type	Reportable result	Detect flag	Method detection limit	Reporting Detection Limit	Quantitation Limit	Lab qualifiers	Validator qualifiers	Interpreted qualifier	Validated yn
UNKVOC1	Unknown VOC (7)	1.1	TRG	Yes	Y	1.00	5.00	5.0	J	N	NJ	Y

VOC = volatile organic compound TRG = target
Y = yes N = no
U = not detected J = estimated
N = Indicates presumptive evidence of a compound. Usually associated with a TIC.

Note: the superscripted values provided in the chemical name column of the table above reference the example number described above in Sections 3.5.11.2 and 3.5.11.3.

If the analytical data results within an EDD are validated, then the laboratory qualifiers become the Validator Qualifier unless revised by the validator. If the validator provides additional qualification or revisions to the laboratory qualification, then the validator's rationale should be included in the comments field and the data validation report. MTDEQ will review the validation report and may re-assign the Interpreted Qualifiers for reporting and evaluation. MTDEQ will communicate any changes made to the Interpreted Qualifiers for an EDD submission.

4 EDD VERIFICATION

To ensure accurate data is being migrated into Montana EQuIS, data providers are required to check their data prior to submittal. There are two main data checks that must occur, first a quality control step that reviews the raw data and then a verification step that ensures the EDD is formatted correctly.

4.1 Quality Control (QC)

Prior to import, all location metadata should be verified for correct latitude and longitude.

The raw analytical data should go through a complete quality control process to verify the EDD matches the hardcopy results and appropriate result qualifiers have been added. The minimum QC requirements to follow are:

1) Perform a QC data overview and check for obvious errors.
2) Are reported values within reason for each method?
3) Ensure reported values have the same number of decimal places as the detection limit and limit the result to three significant figures.
4) Ensure analytical units are correct.
5) Ensure detection limits are correct and reported.
6) Ensure correct analytical methods are reported.
7) Ensure analysis dates are reported.
8) Ensure results less than the detection limit are reported as less than the method detection limit. Exception is when lab uses J flag reporting for results between the MDL and detection limit (reporting limit).
9) Check for holding time exceedance.
10) Calculate field duplicate precision (RPD's). J flag associated samples with exceedances.
11) Determine if field blanks are reported =/> the detection limit (method detection limit). A B flag is associated with data that is =/< 10x the blank hit.
12) Compare lab reports to reported data.
    a) Ensure lab sample IDs match the sys_sample_code
    b) Compare reported results with EDD results.
13) Review lab generated QC. Flag appropriate data if lab controls are exceeded.

For questions associated with quality control, contact the DEQ Project Manager.

4.2 The EQuIS Data Processor

After all the appropriate worksheets in the MT-WMRD EDD have been populated with data, the EDD is ready for data checking using the EQuIS Data Processor (EDP). The EDP is a standalone application that data providers use to check their EDD files prior to submission to ensure they are formatted as described in this guidance manual. If the EDP detects errors, the errors will be identified and can be corrected directly within the EDP. After the errors are corrected, the EDP needs to be re-run to ensure that no errors remain. An EDD will not load into Montana EQuIS unless it is error free.

Information on using the EDP can be found within the EDP Quick Start Guide available from the MT-WMRD Support webpage.

5 EDD SUBMITTAL PROCESS

After an EDD has passed through the EDP application error-free, it is ready to be submitted to MTDEQ. As of August 2020, DEQ is currently processing EDDs through an alternate method until the final data submittal process is fully set-up. For now, when an EDD is ready to be submitted to MTDEQ, please email the EDD and any associated files to Cathy Culver (MontanaEquis@mt.gov). For larger files, please use the Montana FileTransfer Service. Check back for future update to the MT-WMRD Guidance Manual and EDD submittal process.

The Montana File Transfer Service (FTS) will be used to support the data submittal process when issues arise with a dataset and large files need to be sent back and forth. FTS requires an ePass Montana account. If you do not yet have an ePass Montana account, you must create one.

1. Go to transfer.mt.gov
2. Select ‘Create an ePass Account’.
3. Select the link to create a new account if you do not have one.
4. Enter all required information including a username and password.

6 VALID VALUES REQUESTS

6.1 Valid Values

Valid values, also known as reference or look-up values, govern the content of some fields in the data files. In other words, some fields may only be populated with data that exactly match one of the choices listed in the MT-WMRD Valid Values file available on the EarthSoft MT-WMRD Format website: https://earthsoft.com/products/edp/edp-wmrd-format-for-mtdeq/.

Each data field in the MTDEQ format description file requiring a valid value is denoted by blue text in the field name column, and the ‘Lookup’ column references the valid value table (and the field within the table) where the actual valid values can be found. For example, cas_rn is in column A (Field Name), row 29 of the TestResultsQC_v1 format description table. In that same row, under the Lookup column (column G), is rt_analyte.cas_rn. In this example, “rt_analyte” refers to the “RT_ANALYTE” valid value table, and “cas_rn” refers to the specific field (CAS_RN) in the “RT_ANALYTE” valid value table. The CAS_RN field contains the actual list of acceptable valid values that should be used to populate the cas_rn field (column AB) in the TestResultsQC_v1 table in the EDD.

If data providers cannot find an appropriate matching value in the current MTDEQ valid value list, they can request an addition to the valid values list by sending an email to the Montana EQuIS Administrator at MontanaEQuIS@mt.gov. If accepted, MTDEQ will update the appropriate reference value table and notify data providers when an updated version of the EDP format file has been posted. This updated reference value file will

allow the EDP to recognize the new value as valid. Since valid values are updated periodically, data providers should download the MTDEQ valid value file frequently.

7 PROCESS FOR SUBMITTING DATA FOR PLUMES WITH MULTIPLE CONTRIBUTING SITES OR AREAS

Many sites within MTDEQ's environmental remediation programs are located next to each other and may have co-mingled plumes or source areas. These sites may also have multiple potentially responsible parties conducting different investigations or collecting environmental data simultaneously. MTDEQ needs to ensure that the data collected by multiple parties or in a co-mingled plume is properly managed and not duplicated within the EQuIS database. Therefore, EDDs that contain data for multiple sites or co-mingled areas need to include the information contained in the following sections.

It is the responsibility of the data provider to coordinate with the MTDEQ PM to ensure that the data collected are submitted under the correct Facility ID.

7.1 Samples Collected on a Neighboring Remedial Program Site

If data are collected within the actual site boundary of a neighboring remedial program site, the data should be submitted using the Facility ID associated with the sampling event. For example, Site A is located next to Site B and Site A collects a sample on Site B. The data associated with the Site B sample will be submitted under the Facility ID for Site A. The data provider will clarify that the specific sample location is associated with a neighboring remedial program site, and will specify which site in the remark field. The Site A data provider will use the latitude and longitude information that is recorded for the Site B sample location. In the event that the Site A data provider believes that the Site B location information is inaccurate, the data provider will notify the MTDEQ PM and MTDEQ will resolve the issue.

- **Example 1** – In the well_v1 section of the MTDEQ EDD format, the well owner listed is the party financially responsible for the monitoring well installation regardless of the facility/property on which the well was installed. An example of this would be if Site A pays to install a well on Site B. The data collected from this well would be submitted under Site A's Facility ID, and the owner of the well would be listed as Site A as they are financially responsible for the well. The sample location information will geospatially place the well within Site B's property, and the Site A data provider will clarify in the remark field that the well was placed within Site B's property.

- **Example 2** – Another example may be where Site A coordinates a sampling event with Site B. Site B is conducting a quarterly groundwater monitoring event for a petroleum release, and Site A wants to collect samples from the same wells but analyze for a different substance. The Site A samples should be handled in the same way as split samples; however, the analyses will be different from the Site B petroleum analyses. When Site A is ready to load its laboratory EDD, it will rely on the Site B field results EDD to populate the data for the field and location information at the Site B wells. Site A will indicate in the remark field that it collected the samples concurrently with the specific Site B sampling event. The sample location and sample date will be the same; however, the sample number and sample time will be different and that will distinguish it from the Site B data set. The sample number should include an identifier indicating it is a Site B well. For instance, a typical naming convention for monitoring wells is to label them according to the order in which they were installed at a site. Site A may have a monitoring well labelled MW-01, and Site B may have a monitoring well labelled MW-01. When Site A collects a sample from Site B's MW-01, it should include a sample number that carries a Site B identifier; for example, SBMW-01.

  The examples above also apply to location and geophysical sections of the EDD format, including the initial, field activities, and subsurface field investigation EDD as outlined in subsequent sections of this Manual.

Sample location based queries will allow data from both Site A and Site B investigations to be retrieved and evaluated as appropriate.

NOTE: In the Well_v1 section of the MTDEQ EDD format the well owner listed is the party financially responsible for the monitoring well installation regardless of the facility/property on which the well was installed.

8 APPENDIX A: MT-WMRD EDD TABLES

8.1 Definition of the Data Format tables

- Field names cannot be omitted and their order cannot change.
- Field Name: the name of the data element for each column of the data table.
- Required Field: Indicates if a data element is required to be entered into the field.
- Description: Explains the data elements for each column.
- Data Type:
  - DateTime: Date format is MM/DD/YYYY Time format is 24-hour (military) HH:MM
  - Numeric: Decimal number.
  - Text: characters and numbers. Length restrictions are indicated in parentheses
- Valid Values: Indicates data requirement either described as text or is a required valid value from the valid value file indicated by <worksheet name>.<column name>.
- The header row for each table is color-coded as follows:
  - **Red, Bold**: Required
  - Red, Underlined: Required, Part of the primary key
  - Blue, Bold: Look-up table

8.2 Custom EDD Checks

Check Description	Section and Field
If a coordinate field is populated then coord_identifier and coord_type_code are required.	Location_v1.coord_type_code Location_v1.coord_identifier Location_v1.x_coord Location_v1.y_coord Location_v1.observation_date Location_v1.surf_elev Location_v1.elev_unit Location_v1.source_scale Location_v1.subcontractor_name_code Location_v1.horz_accuracy_value Location_v1.horz_accuracy_unit Location_v1.horz_datum_code Location_v1.horz_collect_method_code Location_v1.elev_accuracy_value Location_v1.elev_accuracy_unit Location_v1.elev_datum_code Location_v1.elev_collect_method_code Location_v1.verification_code Location_v1.reference_point Location_v1.geometric_type_code Location_v1.rank
If param value = 'Other' then remark field is required.	VI_BuildingInspection_v1.occupant_status VI_BuildingInspection_v1.occupant_status_remark VI_BuildingInspection_v1.building_type VI_BuildingInspection_v1.building_type_remark VI_BuildingInspection_v1.foundation_type VI_BuildingInspection_v1.foundation_type_remark VI_BuildingInspection_v1.building_const VI_BuildingInspection_v1.building_const_remark VI_BuildingInspection_v1.foundation_const VI_BuildingInspection_v1.foundation_const_remark VI_BuildingInspection_v1.basement_room_use VI_BuildingInspection_v1.basement_room_use_remark VI_BuildingInspection_v1.basement_floor_const VI_BuildingInspection_v1.basement_floor_const_remark VI_BuildingInspection_v1.basement_wall_const VI_BuildingInspection_v1.basement_wall_const_remark VI_BuildingInspection_v1.basement_other VI_BuildingInspection_v1.basement_other_remark VI_BuildingInspection_v1.basement_moisture VI_BuildingInspection_v1.basement_moisture_remark VI_BuildingInspection_v1.wash_dry_loc VI_BuildingInspection_v1.wash_dry_loc_remark VI_BuildingInspection_v1.heat_fuel_type VI_BuildingInspection_v1.heat_fuel_type_remark VI_BuildingInspection_v1.heat_system_type

Check Description	Section and Field
	VI_BuildingInspection_v1.heat_system_type_remark VI_BuildingInspection_v1.air_cond_type VI_BuildingInspection_v1.air_cond_remark VI_BuildingInspection_v1.pesticide_use VI_BuildingInspection_v1.pesticide_use_remark VI_BuildingInspection_v1.water_heat_type VI_BuildingInspection_v1.water_heat_remark VI_BuildingInspection_v1.water_heat_loc VI_BuildingInspection_v1.water_heat_loc_remark VI_BuildingInspection_v1.cook_type VI_BuildingInspection_v1.cook_type_remark VI_BuildingInspection_v1.indoor_hobby VI_BuildingInspection_v1.indoor_hobby_remark VI_BuildingInspection_v1.weekly_cleaning VI_BuildingInspection_v1.weekly_cleaning_remark
If param value = 'Y' then remark is required.	VI_BuildingInspection_v1.recent_remodel_yn VI_BuildingInspection_v1.recent_remodel_remark VI_BuildingInspection_v1.recent_carpet_yn VI_BuildingInspection_v1.recent_carpet_remark
Reporting_detection_limit cannot be negative unless one of the radiological fields (minimum_detectable_conc, counting_error, uncertainty, critical_value) are populated.	TestResultQC_v1.reporting_detection_limit TestResultQC_v1.minimum_detectable_conc TestResultQC_v1.counting_error TestResultQC_v1.uncertainty TestResultQC_v1.critical_value
If x_coord or y_coord is populated then the other are required.	Location_v1.x_coord Location_v1.y_coord
If the value or unit is populated then the other is required.	Location_v1.surf_elev Location_v1.elev_unit Location_v1.horz_accuracy_value Location_v1.horz_accuracy_unit Location_v1.elev_accuracy_value Location_v1.elev_accuracy_unit Location_v1.total_depth Location_v1.depth_unit
Date cannot precede sample_date.	TestResultQC_v1.analysis_date TestResultQC_v1.prep_date TestResultQC_v1.leachate_date
If method_detection_limit, reporting_detection_limit, or quantitation_limit is populated then detection_limit_unit is required.	TestResultQC_v1.method_detection_limit TestResultQC_v1.reporting_detection_limit TestResultQC_v1.quantitation_limit TestResultQC_v1.detection_limit_unit
Parent record must exist in the TestResultsQC section.	Batch_v1
If validated_yn='Y' then validation_level is required.	TestResultQC_v1.validated_yn TestResultQC_v1.validation_level
If result_value is populated then result_unit is required.	TestResultQC_v1.result_value TestResultQC_v1.result_unit
Samples with more than one result with the same cas_rn cannot have reportable_result='Yes'.	TestResultQC_v1.reportable_result TestResultQC_v1.sys_sample_code TestResultQC_v1.lab_anl_method_name TestResultQC_v1.fraction TestResultQC_v1.cas_rn
Allow value to exist in either the VI section or Equipment section.	Equipment_v1.equipment_code EquipmentParameter_v1.equipment_code VI_Samples_v1.canister_id VI_Samples_v1.flow_controller_id VI_Samples_v1.vac_gauge_id
If result_type_code='TIC' then tic_retention_time is required.	TestResultQC_v1.result_type_code TestResultQC_v1.tic_retention_time
Sys_loc_code is required where sample_type_code=N.	VI_Samples_v1.sys_loc_code VI_Samples_v1.sample_type_code
Parent_sample_code is required where sample_type_code=BD, FD, FR, FS, LR, SD, SPD, RD, or MSD.	Sample_v1.parent_sample_code Sample_v1.sample_type_code
If detect_flag='Y' and result_type_code='TRG' or 'TIC' then result_value is required.	TestResultQC_v1.detect_flag TestResultQC_v1.result_type_code TestResultQC_v1.result_value
If detect_flag='N' and result_type_code='SC', 'TRG' or 'TIC' then reporting_detection_limit is required.	TestResultQC_v1.result_type_code TestResultQC_v1.detect_flag TestResultQC_v1.reporting_detection_limit
If analysis_location does not equal 'FI', then lab_name_code, qc_level, lab_sample_id, lab_matrix_code and dilution_factor are required.	TestResultQC_v1.analysis_location TestResultQC_v1.lab_name_code TestResultQC_v1.qc_level TestResultQC_v1.lab_sample_id TestResultQC_v1.lab_matrix_code TestResultQC_v1.dilution_factor

Check Description	Section and Field
If detect_flag='N' then result_value should be null.	TestResultQC_v1.detect_flag TestResultQC_v1.result_value
If any of the fields datum_value, datum_unit, step_or_linear, datum_collection_method_code or datum_desc are populated then datum_start_date is made a required field.	Location_v1.datum_value Location_v1.datum_unit Location_v1.step_or_linear Location_v1.datum_collection_method_code Location_v1.datum_desc Location_v1.datum_start_date
Interpreted_qualifiers is required if validator_qualifiers is populated or if lab_qualifiers is populated, validator_qualifier is null and validated_yn='N'. If lab_qualifiers is populated and interpreted_qualifiers is populated and validated_yn='Y' then validator_qualifiers is required.	TestResultQC_v1.lab_qualifiers TestResultQC_v1.validator_qualifiers TestResultQC_v1.interpreted_qualifiers TestResultQC_v1.validated_yn
If counting_error is populated then uncertainty (1 sigma or 2 sigma) is required.	TestResultQC_v1.counting_error TestResultQC_v1.uncertainty
Populate chemical_name when cas_rn is changed	TestResultQC_v1.cas_rn TestResultQC_v1.chemical_name

8.3 DataProvider_v1

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
company_code	Text(40)	PK	Y			rt_company.company_code		The unique identifier of the company or agency responsible for completion and submittal of any part of this EDD.	
company_type	Text(20)		Y	SUBCONTRACTOR		rt_company_type.company_type	rt_company.company_type	The type of company.	
company_name	Text(255)		Y				rt_company.company_name	The name of the data provider. May be more descriptive than company_code.	
contact_name	Text(50)						rt_company.contact_name	The name of the data provider contact.	
license_nbr	Text(50)						rt_company.license_nbr	The license number held by the data provider. Not required.	
address_1	Text(40)						rt_company.address_1	The street address of the data provider, line one.	
address_2	Text(40)						rt_company.address_2	The street address of the data provider, line two.	
city	Text(30)						rt_company.city	The city of the data provider.	
county	Text(50)						rt_company.county	The county of the data provider.	
state	Text(10)			MT		rt_state.state_code	rt_company.state	The state of the data provider.	
country	Text(50)			USA			rt_company.country	The country of the data provider.	
postal_code	Text(30)						rt_company.postal_code	The zip code of the data provider.	
phone_number	Text(30)						rt_company.phone_number	The phone number of the data provider.	
alt_phone_number	Text(30)						rt_company.alt_phone_number	The alternate phone number of the data provider.	
email_address	Text(100)						rt_company.email_address	The email address of the data provider.	
custom_field_1	Text(255)						rt_company.custom_field_1	A custom field.	
custom_field_2	Text(255)						rt_company.custom_field_2	A custom field.	
custom_field_3	Text(255)						rt_company.custom_field_3	A custom field.	
custom_field_4	Text(255)						rt_company.custom_field_4	A custom field.	
custom_field_5	Text(255)						rt_company.custom_field_5	A custom field.	
remark	Text(2000)						rt_company.remark	Any additional information about the data provider.	
timezone_code	Text(10)					rt_timezone.timezone_code	rt_company.timezone_code	The timezone of the data provider.	

8.4 Subfacility_v1

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
subfacility_code	Text(20)	PK	Y				dt_subfacility.subfacility_code	The unique identifier of the subfacility. For vapor instrusion sampling, this represents the building in which the sampling is conducted.	
subfacility_type	Text(20)					rt_subfacility_type.subfacility_type	dt_subfacility.subfacility_type	The type of subfacility.	
subfacility_name	Text(60)						dt_subfacility.subfacility_name	The name of the subfacility. May be more descriptive than subfacility_code.	
task_code	Text(40)						dt_subfacility.task_code	The task associated with the subfacility, if any. Leave null if the subfacility will be involved in multiple tasks.	
remark_1	Text(2000)						dt_subfacility.remark_1	The description of the subfacility.	
remark_2	Text(2000)						dt_subfacility.remark_2	Any additional information about the subfacility.	
contact_name	Text(50)						dt_subfacility.contact_name	The name of the subfacility contact.	
address_1	Text(40)						dt_subfacility.address_1	The street address of the subfacility, line one.	
address_2	Text(40)						dt_subfacility.address_2	The street address of the subfacility, line two.	
city	Text(30)						dt_subfacility.city	The city of the subfacility.	
county	Text(50)						dt_subfacility.county	The county of the subfacility.	
state	Text(10)					rt_state.state_code	dt_subfacility.state	The state of the subfacility.	
country	Text(50)						dt_subfacility.country	The country of the subfacility.	
postal_code	Text(230)						dt_subfacility.postal_code	The postal code of the subfacility.	
phone_number	Text(30)						dt_subfacility.phone_number	The phone number of the subfacility.	
alt_phone_number	Text(30)						dt_subfacility.alt_phone_number	The alternate phone number of the subfacility.	
fax_number	Text(30)						dt_subfacility.fax_number	The fax number of the subfacility.	
email_address	Text(100)						dt_subfacility.email_address	The email address of the subfacility.	
parent_subfacility_code	Text(20)						dt_subfacility.parent_subfacility_code	The unique identifier of the parent subfacility, if applicable.	
custom_field_1	Text(255)						dt_subfacility.custom_field_1	A custom field.	
custom_field_2	Text(255)						dt_subfacility.custom_field_2	A custom field.	
custom_field_3	Text(255)						dt_subfacility.custom_field_3	A custom field.	
custom_field_4	Text(255)						dt_subfacility.custom_field_4	A custom field.	
custom_field_5	Text(255)						dt_subfacility.custom_field_5	A custom field.	

8.5 Location_v1

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
data_provider	Text(20)					rt_company.company_code	rt_company.company_name dt_location.data_provider	The unique identifier of the company or agency submitting the data.	
sys_loc_code	Text(20)	PK	Y				dt_location.sys_loc_code dt_coordinate.sys_loc_code dt_measure_datum.sys_loc_code	The unique identifier of the location.	
x_coord	Numeric						dt_coordinate.x_coord	The X coordinate of the location.	If a coordinate field is populated then coord_identifier and coord_type_code are required. If x_coord or y_coord is populated then the other are required.
y_coord	Numeric						dt_coordinate.y_coord	The Y coordinate of the location.	If a coordinate field is populated then coord_identifier and coord_type_code are required. If x_coord or y_coord is populated then the other are required.
surf_elev	Numeric						dt_coordinate.elev	The ground surface elevation of the location.	If a coordinate field is populated then coord_identifier and coord_type_code are required. If the value or unit is populated then the other is required.
elev_unit	Text(15)					rt_unit.unit_code	dt_coordinate.elev_unit	The unit of measurement of the elevation of the location.	If a coordinate field is populated then coord_identifier and coord_type_code are required. If the value or unit is populated then the other is required.
coord_type_code	Text(20)					rt_coord_type.coord_type_code	dt_coordinate.coord_type_code	The type of the location coordinates.	If a coordinate field is populated then coord_identifier and coord_type_code are required.
observation_date	DateTime						dt_coordinate.observation_date	The coordinate observation date and time.	If a coordinate field is populated then coord_identifier and coord_type_code are required.
coord_identifier	Text(20)			PRIMARY			dt_coordinate.identifier	The identifier of the coordinates. Typical values include "PRIMARY", "SECONDARY" or "1", "2"	If a coordinate field is populated then coord_identifier and coord_type_code are required.
horz_collect_method_code	Text(20)					rt_coord_horz_method.horz_collect_method_code	dt_coordinate.horz_collect_method_code	The method used to collect the coordinates.	If a coordinate field is populated then coord_identifier and coord_type_code are required.
horz_accuracy_value	Text(20)						dt_coordinate.horz_accuracy_value	The horizontal accuracy range (+/-) of the coordinates.	If a coordinate field is populated then coord_identifier and coord_type_code are required. If the value or unit is populated then the other is required.
horz_accuracy_unit	Text(15)					rt_unit.unit_code	dt_coordinate.horz_accuracy_unit	The unit of measurement of the horizontal accuracy of the coordinates.	If a coordinate field is populated then coord_identifier and coord_type_code are required. If the value or unit is populated then the other is required.
horz_datum_code	Text(20)					rt_coord_horz_datum.horz_datum_code	dt_coordinate.horz_datum_code	The reference datum of the coordinates.	If a coordinate field is populated then coord_identifier and coord_type_code are required.

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
elev_collect_method_code	Text(20)					rt_coord_elev_method.elev_collect_method_code	dt_coordinate.elev_collect_method_code	The method used to collect the ground surface elevation.	If a coordinate field is populated then coord_identifier and coord_type_code are required.
elev_accuracy_value	Text(20)						dt_coordinate.elev_accuracy_value	The vertical accuracy range (+/-) of the ground surface elevation.	If a coordinate field is populated then coord_identifier and coord_type_code are required. If the value or unit is populated then the other is required.
elev_accuracy_unit	Text(15)					rt_unit.unit_code	dt_coordinate.elev_accuracy_unit	The unit of measurement of the vertical accuracy of the ground surface elevation.	If a coordinate field is populated then coord_identifier and coord_type_code are required. If the value or unit is populated then the other is required.
elev_datum_code	Text(20)					rt_coord_elev_datum.elev_datum_code	dt_coordinate.elev_datum_code	The reference datum of the ground surface elevation.	If a coordinate field is populated then coord_identifier and coord_type_code are required.
source_scale	Text(1)					(Enumeration: source_scale)	dt_coordinate.source_scale	The scale of the source used to determine the coordinates, if derived from a hard or soft copy source.	If a coordinate field is populated then coord_identifier and coord_type_code are required.
subcontractor_name_code	Text(20)					rt_company.company_code	rt_company.company_name dt_coordinate.company_code	The unique identifier of the company or agency collecting the coordinates.	If a coordinate field is populated then coord_identifier and coord_type_code are required.
verification_code	Text(20)						dt_coordinate.verification_code	The verification code of the coordinates.	If a coordinate field is populated then coord_identifier and coord_type_code are required.
reference_point	Text(50)						dt_coordinate.reference_point	The reference point used to collect the coordinates.	If a coordinate field is populated then coord_identifier and coord_type_code are required.
geometric_type_code	Text(20)					rt_coord_geometric_type.geometric_type_code	dt_coordinate.geometric_type_code	The geometric type code of the coordinates.	If a coordinate field is populated then coord_identifier and coord_type_code are required.
rank	Numeric						dt_coordinate.rank	Rank	If a coordinate field is populated then coord_identifier and coord_type_code are required.
loc_name	Text(40)						dt_location.loc_name	The name of the location.	
loc_desc	Text(255)						dt_location.loc_desc	The description of the location.	
loc_type	Text(20)					rt_location_type.location_type_code	dt_location.loc_type	The type of location.	
loc_purpose	Text(19)					(Enumeration: loc_purpose)	dt_location.loc_purpose	The purpose of the location.	
subfacility_code	Text(20)				Subfacility_v1.subfacility_code		dt_subfacility.subfacility_code dt_location.subfacility_code	The unique identifier of the subfacility or building in which the location resides, if only one. If more than one, use the SubfacilityLocation section.	
within_facility_yn	Text(1)			Y		(Enumeration: yes_no_values)	dt_location.within_facility_yn	Indicates whether this location is within facility boundaries, "Y" for yes or "N" for no.	
loc_county_code	Text(30)						dt_location.loc_county_code	The county of the location.	
loc_district_code	Text(20)						dt_location.loc_district_code	The district of the location.	
loc_state_code	Text(10)					rt_state.state_code	dt_location.loc_state_code	The state of the location.	
loc_major_basin	Text(20)					rt_basin.basin_code	dt_location.loc_major_basin	The major basin of the location.	
loc_minor_basin	Text(20)						dt_location.loc_minor_basin	The minor basin of the location.	

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
remark_1	Text(2000)						dt_location.remark_1	Any additional information about the location.	
remark_2	Text(2000)						dt_location.remark_2	Any additional information about the location.	
total_depth	Numeric						dt_location.total_depth	The total depth below ground surface of the location.	If the value or unit is populated then the other is required.
depth_unit	Text(15)					rt_unit.unit_code	dt_location.units	The unit of measurement of the depth.	If the value or unit is populated then the other is required.
datum_value	Numeric						dt_measure_datum.datum_value	The measured elevation of datum used to reference water level measurements.	If any of the fields datum_value, datum_unit, step_or_linear, datum_collection_method_code or datum_desc are populated then datum_start_date is made a required field.
datum_unit	Text(15)					rt_unit.unit_code	dt_measure_datum.datum_unit	The unit of measure of the datum value.	If any of the fields datum_value, datum_unit, step_or_linear, datum_collection_method_code or datum_desc are populated then datum_start_date is made a required field.
step_or_linear	Text(6)					(Enumeration: step_or_linear)	dt_measure_datum.step_or_linear	Denotes whether the measure datum has been added or removed ("step") or if nothing has changed since the previous survey ("linear").	If any of the fields datum_value, datum_unit, step_or_linear, datum_collection_method_code or datum_desc are populated then datum_start_date is made a required field.
datum_collection_method_code	Text(20)						dt_measure_datum.datum_collect_method_code	The identifying code that specifies the method in which the datum was collected, for example "GPS".	If any of the fields datum_value, datum_unit, step_or_linear, datum_collection_method_code or datum_desc are populated then datum_start_date is made a required field.
datum_desc	Text(255)						dt_measure_datum.datum_desc	A brief description of the purpose of the datum collection, for example "Initial Observation."	If any of the fields datum_value, datum_unit, step_or_linear, datum_collection_method_code or datum_desc are populated then datum_start_date is made a required field.
datum_start_date	DateTime						dt_measure_datum.start_date	The date and time from which the datum applies.	If any of the fields datum_value, datum_unit, step_or_linear, datum_collection_method_code or datum_desc are populated then datum_start_date is made a required field.
geologist	Text(50)						dt_location.geologist	The geologist associated with the location.	
inspector	Text(50)						dt_location.inspector	The inspector of the location.	
Method Mappings									
				CompanyType_SUBCONTRACTOR			rt_company.company_type		
				CompanyType_SUBCONTRACTOR			rt_company.company_type		

8.6 SubfacilityLocation_v1

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
sys_loc_code	Text(20)	PK	Y		Location_v1.sys_loc_code		at_subfacility_location.sys_loc_code	The unique identifier of the location.	
subfacility_code	Text(20)	PK	Y		Subfacility_v1.subfacility_code		at_subfacility_location.subfacility_code	The unique identifier of the subfacility or building.	

8.7 Task_v1

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
task_code	Text(40)	PK	Y				dt_task.task_code	The unique identifier of the task.	
task_desc	Text(255)						dt_task.task_desc	The description of the task.	
start_date	DateTime						dt_task.start_date	The start date and time of the task.	
end_date	DateTime						dt_task.end_date	The end date and time of the task.	
delivery_order	Text(20)						dt_task.delivery_order	The delivery order associated with the task.	
client	Text(50)						dt_task.client	The client associated with the task.	
custom_field_1	Text(255)						dt_task.custom_field_1	A custom field.	
custom_field_2	Text(255)						dt_task.custom_field_2	A custom field.	
custom_field_3	Text(255)						dt_task.custom_field_3	A custom field.	
custom_field_4	Text(255)						dt_task.custom_field_4	A custom field.	
custom_field_5	Text(255)						dt_task.custom_field_5	A custom field.	

8.8 COC_v1

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
chain_of_custody	Text(40)	PK	Y				dt_chain_of_custody.chain_of_custody	The unique identifier of the COC.	
lab_code	Text(40)					rt_company.company_code	dt_chain_of_custody.lab_code	The name of the laboratory processing the COC.	
shipping_date	DateTime						dt_chain_of_custody.shipping_date	The shipping date.	
shipping_company	Text(40)					rt_company.company_code	dt_chain_of_custody.shipping_company	The shipping company.	
shipping_tracking_number	Text(50)						dt_chain_of_custody.shipping_tracking_number	The shipping tracking number.	
project_manager	Text(50)						dt_chain_of_custody.project_manager	The manager of the project associated with the COC.	
project_ID	Text(50)						dt_chain_of_custody.project_ID	The ID of the project associated with the COC.	
po_number	Text(50)						dt_chain_of_custody.po_number	The purchase order number associated with the COC.	

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
quote_number	Text(50)						dt_chain_of_custody.quote_number	The quote number associated with the COC.	
department	Text(50)						dt_chain_of_custody.department	The department or company associated with the COC.	
sampler_1	Text(50)						dt_chain_of_custody.sampler_1	The name of the sampler.	
sampler_2	Text(50)						dt_chain_of_custody.sampler_2	The name of the sampler.	
sampler_3	Text(50)						dt_chain_of_custody.sampler_3	The name of the sampler.	
relinquished_by	Text(100)						dt_chain_of_custody.relinquished_by	The relinquishing party.	
relinquished_date	DateTime						dt_chain_of_custody.relinquished_date	The date relinquished.	
email_invoice_to	Text(100)						dt_chain_of_custody.email_invoice_to	The party to receive emailed invoices pertaining to the COC.	
email_report_to	Text(100)						dt_chain_of_custody.email_report_to	The party to receive emailed reports pertaining to the COC.	
turnaround_time	Text(50)						dt_chain_of_custody.turn_around_time	The turnaround time for the samples associated with the COC.	
cooler_id	Text(10)						dt_chain_of_custody.cooler_id	The identifier of the cooler.	
cooler_count	Numeric						dt_chain_of_custody.cooler_count	The number of coolers associated with the COC.	
cooler_desc	Text(255)						dt_chain_of_custody.cooler_desc	The description of the coolers associated with the COC.	
cooler_temp	Numeric						dt_chain_of_custody.cooler_temp	The temperature of the cooler when sealed.	
lab_receipt_date	DateTime						dt_chain_of_custody.lab_receipt_date	The date the COC is received by the laboratory.	
lab_cooler_count	Numeric						dt_chain_of_custody.lab_cooler_count	The number of coolers received by the laboratory.	
lab_cooler_desc	Text(255)						dt_chain_of_custody.lab_cooler_desc	The description of the coolers received by the laboratory.	
lab_cooler_temp	Text(50)						dt_chain_of_custody.lab_cooler_temp	The temperature of the cooler when received by the laboratory.	
lab_security_seal	Text(20)						dt_chain_of_custody.lab_security_seal	The state of the security seal when received by the laboratory.	
contact_name_1	Text(50)						dt_chain_of_custody.contact_name_1	The party to contact regarding the COC.	
contact_name_2	Text(50)						dt_chain_of_custody.contact_name_2	The party to contact regarding the COC.	
complete_yn	Text(1)					(Enumeration: yes_no_values)	dt_chain_of_custody.complete_yn	Y if the COC is complete, N if the COC is not complete.	
custom_field_1	Text(255)						dt_chain_of_custody.custom_field_1	A custom field.	
custom_field_2	Text(255)						dt_chain_of_custody.custom_field_2	A custom field.	
custom_field_3	Text(255)						dt_chain_of_custody.custom_field_3	A custom field.	
custom_field_4	Text(255)						dt_chain_of_custody.custom_field_4	A custom field.	
custom_field_5	Text(255)						dt_chain_of_custody.custom_field_5	A custom field.	
remark	Text(2000)						dt_chain_of_custody.remark	Any additional information about the COC.	

8.9 SDG_v1

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
sdg_name	Text(20)	PK	Y				dt_sdg.sdg_name	The unique identifier of the sample delivery group (SDG) or work order.	
sdg_desc	Text(255)						dt_sdg.sdg_desc	The description of the SDG.	
sdg_date	DateTime						dt_sdg.sdg_date	The date and time the SDG was generated.	
lab_code	Text(40)					rt_company.company_code	dt_sdg.lab_code	The laboratory processing the SDG.	
lab_contact	Text(50)						dt_sdg.lab_contact	The laboratory contact for the SDG.	
sdg_status	Text(9)			NEW		(Enumeration: sdg_status)	dt_sdg.sdg_status	The status of the SDG.	
data_review_date	Text(255)						dt_sdg.data_review_date	The review date for the data associated with the SDG.	
data_review_company	Text(40)						dt_sdg.data_review_company	The review company for the data associated with the SDG.	

8.10 Equipment_v1

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
equipment_code	Text(60)	PK	Y				dt_equipment.equipment_code	The unique identifier of the equipment.	Allow value to exist in either the VI Section or Equipment section.
equipment_type	Text(30)					rt_equipment_type.equipment_type	dt_equipment.equipment_type	The type of equipment.	
equipment_desc	Text(255)						dt_equipment.equipment_desc	The description of the equipment.	
sys_loc_code	Text(20)						dt_equipment.sys_loc_code	The location at which the equipment is permanently installed, used, or with which it is associated, if applicable.	
model_number	Text(50)						dt_equipment.model_number	The model number of the equipment.	
catalog_number	Text(50)						dt_equipment.catalog_number	The catalog number of the equipment.	
manufacturer	Text(50)						dt_equipment.manufacturer	The manufacturer of the equipment.	
owner	Text(50)						dt_equipment.owner	The owner of the equipment.	
operation_status	Text(20)						dt_equipment.operation_status	The operational status of the equipment.	
install_date	DateTime						dt_equipment.install_date	The date and time of equipment installation.	
last_service_date	DateTime						dt_equipment.last_service_date	The date and time the equipment was last serviced.	
next_service_date	DateTime						dt_equipment.next_service_date	The date and time the equipment is scheduled to be serviced next.	
purchase_date	DateTime						dt_equipment.purchase_date	The date and time of equipment purchase.	
purchase_price	Text(20)						dt_equipment.purchase_price	The cost of the equipment.	
material	Text(50)						dt_equipment.material	The main material of the equipment.	
size	Text(20)						dt_equipment.size	The size of the equipment.	
size_unit	Text(15)					rt_unit.unit_code	dt_equipment.size_unit	The unit of measure of the equipment size.	
remark	Text(2000)						dt_equipment.remark	Any additional information about the equipment.	

8.11 EquipmentParameter_v1

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
equipment_code	Text(60)	PK	Y			dt_equipment.equipment_code	dt_equipment_parameter.equipment_code	The unique identifier of the equipment.	Allow value to exist in either the database or Equipment section.
param_code	Text(20)	PK	Y			rt_equipment_param_type.param_code	dt_equipment_parameter.param_code	The equipment parameter.	
measurement_date	DateTime	PK					dt_equipment_parameter.measurement_date	The date and time of parameter measurement.	
param_value	Text(20)						dt_equipment_parameter.param_value	The value of the parameter measured.	
person_name	Text(20)						dt_equipment_parameter.person_name	The name of the person measuring the parameter.	
remark	Text(2000)						dt_equipment_parameter.remark	Any additional information if necessary.	
fld_qualifier	Text(20)						dt_equipment_parameter.fld_qualifier	Field qualifier if required.	
fld_qualifier_note	Text(255)						dt_equipment_parameter.fld_qualifier_note	Field qualifier note if required.	

8.12 Files

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
file_name	Text(255)	PK	Y				dt_file.file_name	The name of the file.	
file_type	Text(20)		Y			rt_file_type.file_type	dt_file.file_type	The type of the file, for example ".jpg" or ".pdf".	
file_date	DateTime							The date and time of the file.	
title	Text(255)						dt_file.title	The title of the file.	
author	Text(255)						dt_file.author	The author of the file.	
confidential_yn	Text(1)					(Enumeration: yes_no_values)	dt_file.confidential_yn	Y" if the file is confidential, "N" if the file is not confidential.	
remark	Text(255)						dt_file.remark	Any additional information about the file.	
place_type	Text(15)					(Enumeration: place_type)	dt_file.place_type	The type of identifier associated with this file, for example "sys_loc_code" for files associated with locations or "sys_sample_code" for files associated with samples.	
place_code	Text(50)						dt_file.place_code	The unique identifier associated with the file. This may be a specific sys_loc_code for files associated with locations or a specific sys_sample_code for files associated with samples.	
place_subcode	Text(50)						dt_file.place_subcode	The subcode/identifier of associated with the file if applicable.	
content							dt_file.content	The file content.	
Method Mappings									
				GetFileDate			dt_file.file_date		

8.13 DrillActivity_v1

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
sys_loc_code	Text(20)	PK	Y		Location_v1.sys_loc_code		dt_drill_activity.sys_loc_code	The unique identifier of the location. Must be a valid code for the facility and reported value in the sys_loc_code field of the Location section.	
drill_event	Text(20)	PK	Y				dt_drill_activity.drill_event	The identifier of the drilling event at this location. Examples of drilling events could be "INITIAL" for initial drilling or "SECOND" for a subsequent drilling at the same location.	
start_depth	Numeric						dt_drill_activity.start_depth	The start depth below ground surface of the drilling activity.	
end_depth	Numeric						dt_drill_activity.end_depth	The end depth below ground surface of the drilling activity.	
drill_start_date	DateTime						dt_drill_activity.start_date	The date and time the drilling activity began.	
drill_end_date	DateTime						dt_drill_activity.end_date	The date and time the drilling activity ended.	
diameter	Numeric						dt_drill_activity.diameter	The diameter of the boring.	
diameter_unit	Text(15)					rt_unit.unit_code	dt_drill_activity.diameter_unit	The unit of measure of the diameter.	
drill_method	Text(50)						dt_drill_activity.drill_method	The drilling method used.	
fluid	Text(50)						dt_drill_activity.fluid	The description of fluid used during the drilling activity.	
viscosity	Text(50)						dt_drill_activity.viscosity	The viscosity of the drilling fluid.	
hammer_wt	Text(50)						dt_drill_activity.hammer_wt	The weight of hammer used during the drilling activity.	
hammer_fall	Text(50)						dt_drill_activity.hammer_fall	The distance of hammer fall during the drilling activity.	
hammer_desc	Text(50)						dt_drill_activity.hammer_desc	The description of the hammer used during the drilling activity.	
lift_mechanism	Text(50)						dt_drill_activity.lift_mechanism	The type of mechanism used to lift the hammer.	
new_yn	Text(1)					(Enumeration: yes_no_values)	dt_drill_activity.new_yn	Y" if this is a new drilling activity at the location or boring, "N" if not.	
repair_yn	Text(1)					(Enumeration: yes_no_values)	dt_drill_activity.repair_yn	Y" if the purpose of the drilling activity is to repair an existing boring, "N" if not.	
deepen_yn	Text(1)					(Enumeration: yes_no_values)	dt_drill_activity.deepen_yn	Y" if the purpose of the drilling activity is to deepen an existing boring, "N" if not.	
abandon_yn	Text(1)					(Enumeration: yes_no_values)	dt_drill_activity.abandon_yn	Y" if the boring has been abandoned, "N" if not.	
replace_yn	Text(1)					(Enumeration: yes_no_values)	dt_drill_activity.replace_yn	Y" if the purpose of the drilling activity is to replace an existing boring, "N" if not.	
public_yn	Text(1)					(Enumeration: yes_no_values)	dt_drill_activity.public_yn	Y" if the drilled location is for public use, "N" if not.	
purpose	Text(70)						dt_drill_activity.purpose	The descriptive purpose of the drilling activity.	
rig_desc	Text(50)						dt_drill_activity.rig_desc	The description of the drilling rig.	
auger_desc	Text(50)						dt_drill_activity.auger_desc	The description of the auger used during the drilling activity.	
rod_desc	Text(50)						dt_drill_activity.rod_desc	The description of the rod used during the drilling activity.	
bit_desc	Text(50)						dt_drill_activity.bit_desc	The description of the bit used during the drilling activity.	
drilling_pressure	Text(50)						dt_drill_activity.drilling_pressure	The drilling pressure.	
sampler_desc	Text(50)						dt_drill_activity.sampler_desc	The description of the sampling equipment used.	

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
drilling_subcontractor	Text(40)					rt_company.company_code	dt_drill_activity.custom_field_1	The unique identifier of the drilling company.	
driller	Text(50)						dt_drill_activity.custom_field_2	The name of the driller.	
remark	Text(2000)						dt_drill_activity.remark	Any additional information about the drilling activity.	
custom_field_3	Text(255)						dt_drill_activity.custom_field_3	A custom field.	
custom_field_4	Text(255)						dt_drill_activity.custom_field_4	A custom field.	
custom_field_5	Text(255)						dt_drill_activity.custom_field_5	A custom field.	
task_code	Text(40)						dt_task.task_code dt_drill_activity.task_code	The unique identifier of the task associated with the drilling activity.	

8.14 DownholePoint_v1

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
sys_loc_code	Text(20)	PK	Y		Location_v1.sys_loc_code		dt_downhole_point_data.sys_loc_code	The unique identifier of the location. Must be a valid code for the facility and reported value in the sys_loc_code field of the Location section.	
depth	Numeric	PK	Y				dt_downhole_point_data.depth	The measurement depth below ground surface.	
param	Text(20)	PK	Y			rt_downhole_point_param_type.param	dt_downhole_point_data.param	The parameter being measured such as tip stress, resistivity, or pore pressure.	
param_value	Text(255)						dt_downhole_point_data.param_value	The measured value of the parameter.	
param_unit	Text(15)					rt_unit.unit_code	dt_downhole_point_data.param_unit	The unit of measure of the parameter.	
measurement_date	DateTime						dt_downhole_point_data.measurement_date	The date and time of parameter measurement.	
measurement_method	Text(50)						dt_downhole_point_data.measurement_method	The method of parameter measurement.	
remark	Text(2000)						dt_downhole_point_data.remark	Any additional information about the downhole point data.	
custom_field_1	Text(255)						dt_downhole_point_data.custom_field_1	A custom field.	
custom_field_2	Text(255)						dt_downhole_point_data.custom_field_2	A custom field.	
custom_field_3	Text(255)						dt_downhole_point_data.custom_field_3	A custom field.	
custom_field_4	Text(255)						dt_downhole_point_data.custom_field_4	A custom field.	
custom_field_5	Text(255)						dt_downhole_point_data.custom_field_5	A custom field.	

8.15 Lithology_v1

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
sys_loc_code	Text(20)	PK	Y		Location_v1.sys_loc_code		dt_lithology.sys_loc_code	The unique identifier of the location. Must be a valid code for the facility and reported value in the sys_loc_code field of the Location section.	
start_depth	Numeric	PK	Y				dt_lithology.start_depth	The start depth of the lithologic layer.	
material_name	Text(40)					rt_material.material_name	dt_lithology.material_name	The type of material that composes the lithologic unit. Must be used in all cases except when a depth specific comment is being made.	

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
geo_unit_code_1	Text(20)					rt_geologic_unit.geologic_unit_code	dt_lithology.geo_unit_code_1	The interpretation of the hydrogeologic unit present at this lithologic unit, for example "aquifer 1", "aquitard 1", "aquifer 2", "upper clay unit", etc.	
geo_unit_code_2	Text(20)					rt_geologic_unit.geologic_unit_code	dt_lithology.geo_unit_code_2	The alternate geologic unit grouping if applicable. This can be a sub-classification of geologic_unit_code_1 or a layer used for groundwater flow/transport computer modelling that contains the lithologic unit.	
remark1	Text(2000)						dt_lithology.remark_1	Any additional information about the lithologic unit.	
remark2	Text(2000)						dt_lithology.remark_2	Any additional information about the lithologic unit.	
moisture	Text(9)					(Enumeration: moisture)	dt_lithology.moisture	The amount of water observed in the lithologic unit.	
permeable	Text(20)						dt_lithology.permeable	The permeability of the lithologic unit, such as "impervious", "semi", "pervious," or "very".	
consolidated_yn	Text(1)					(Enumeration: yes_no_values)	dt_lithology.consolidated_yn	Y" if the lithologic unit was consolidated, "N" if not.	
color	Text(13)					(Enumeration: color)	dt_lithology.color	The color of the lithologic unit.	
observation	Text(255)						dt_lithology.observation	General observations of the lithologic unit.	
consistency	Text(20)						dt_lithology.consistency	The consistency of the lithologic unit such as "very soft", "soft, "firm", "hard" or "very hard".	
sorting	Text(4)					(Enumeration: sorting)	dt_lithology.sorting	The grain size distribution of the lithologic unit. Use "poor" for soil with a wide range of particle sizes or "well" for soil with a narrow range of particle sizes.	
angularity	Text(20)						dt_lithology.angularity	The angularity of the lithologic unit.	
cementation	Text(20)						dt_lithology.cementation	The cementation of the lithologic unit.	
grainsize	Text(20)						dt_lithology.grainsize	The grain size of the lithologic unit.	
odor	Text(9)					(Enumeration: odor)	dt_lithology.odor	The odor of the lithologic unit.	
density	Text(7)					(Enumeration: density)	dt_lithology.custom_field_1	The density of the lithologic unit.	
custom_field_2	Text(255)						dt_lithology.custom_field_2	A custom field.	
custom_field_3	Text(255)						dt_lithology.custom_field_3	A custom field.	
custom_field_4	Text(255)						dt_lithology.custom_field_4	A custom field.	
custom_field_5	Text(255)						dt_lithology.custom_field_5	A custom field.	

8.16 Well_v1

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
sys_loc_code	Text(20)	PK	Y		Location_v1.sys_loc_code		dt_well.sys_loc_code	The unique identifier of the location. Must be a valid code for the facility and reported value in the sys_loc_code field of the Location section.	
well_id	Text(30)						dt_well.well_id	The ID of the well.	
well_desc	Text(255)						dt_well.custom_field_1	The description of the well.	
well_owner	Text(50)						dt_well.well_owner	The name of the well owner.	
well_purpose	Text(20)						dt_well.well_purpose	The purpose of the well.	
well_status	Text(20)						dt_well.well_status	The status of the well.	
top_casing_elev	Numeric						dt_well.top_casing_elev	The top of casing elevation of the well.	
depth_of_well	Numeric						dt_well.depth_of_well	The total depth of the well below ground surface.	
depth_unit	Text(15)					rt_unit.unit_code	dt_well.depth_unit	The unit of measurement of the depth.	
depth_measure_method	Text(20)						dt_well.depth_measure_method	The method of depth measurement.	
stickup_height	Text(8)						dt_well.stickup_height	The height of the casing above ground surface.	

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
stickup_unit	Text(15)					rt_unit.unit_code	dt_well.stickup_unit	The unit of measure of the stickup height.	
sump_length	Text(20)						dt_well.sump_length	The length of the sump.	
sump_unit	Text(15)					rt_unit.unit_code	dt_well.sump_unit	The unit of measure of the sump length.	
installation_date	DateTime						dt_well.installation_date	The date and time of well installation.	
construct_start_date	DateTime						dt_well.construct_start_date	The date and time the well construction began.	
construct_complete_date	DateTime						dt_well.construct_complete_date	The date and time the well construction finished.	
construct_contractor	Text(40)					rt_company.company_code	rt_company.company_name dt_well.construct_contractor	The name of the contractor that installed well.	
pump_type	Text(20)						dt_well.pump_type	The type of pump used at the well, such as centrifugal, propeller, jet, helical, rotary, etc.	
pump_capacity	Text(6)						dt_well.pump_capacity	The capacity of the pump.	
pump_unit	Text(15)					rt_unit.unit_code	dt_well.pump_unit	The unit of measure of the pump capacity and yield.	
pump_yield	Text(6)						dt_well.pump_yield	The yield of the pump.	
pump_yield_method	Text(20)						dt_well.pump_yield_method	The method used for the pump yield.	
weep_hole	Text(1)					(Enumeration: yes_no_values)	dt_well.weep_hole	Y" if the well has a weep hole, "N" if not.	
head_configuration	Text(50)						dt_well.head_configuration	The well head configuration.	
access_port_yn	Text(1)					(Enumeration: yes_no_values)	dt_well.access_port_yn	Y" if the well has an access port, "N" if not.	
casing_joint_type	Text(50)						dt_well.casing_joint_type	The type of casing joint, such as threaded, flush, or solvent welded.	
perforator_used	Text(50)						dt_well.perforator_used	The description of well perforation, such as slotted, drilled, or wound.	
intake_depth	Numeric						dt_well.intake_depth	The depth of the well intake below ground surface.	
disinfected_yn	Text(1)					(Enumeration: yes_no_values)	dt_well.disinfected_yn	Y" if the well was disinfected, "N" if not.	
historical_reference_elev	Numeric						dt_well.historical_reference_elev	The historical reference elevation.	
geologic_unit_code	Text(20)						rt_geologic_unit.geologic_unit_code dt_well.geologic_unit_code	The geologic unit in which the well intake is installed.	
remark	Text(2000)						dt_well.remark	Any additional information about the well.	
custom_field_2	Text(255)						dt_well.custom_field_2	A custom field.	
custom_field_3	Text(255)						dt_well.custom_field_3	A custom field.	
custom_field_4	Text(255)						dt_well.custom_field_4	A custom field.	
custom_field_5	Text(255)						dt_well.custom_field_5	A custom field.	

8.17 Well Construction

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
sys_loc_code	Text(20)	PK	Y		Location_v1.sys_loc_code		dt_well_segment.sys_loc_code	The unique identifier of the location. Must be a valid code for the facility and reported value in the sys_loc_code field of the Location section.	
segment_type	Text(20)	PK	Y			rt_well_segment_type.segment_type	rt_well_segment_type.segment_type dt_well_segment.segment_type	The type of well segment, such as protective casing, well casing, screen, etc.	
material_type_code	Text(20)	PK	Y			rt_well_segment_type.material_type_code	rt_well_segment_type.material_type_code dt_well_segment.material_type_code	The material of the well segment.	
start_depth	Numeric	PK	Y				dt_well_segment.start_depth	The depth of the top of the well segment below ground surface.	
end_depth	Numeric		Y				dt_well_segment.end_depth	The depth of the bottom of the well segment below ground surface.	
depth_unit	Text(15)		Y	ft		rt_unit.unit_code	dt_well_segment.depth_unit	The unit of measurement of the depth.	
inner_diameter	Numeric						dt_well_segment.inner_diameter	The inner diameter of the well segment.	
outer_diameter	Numeric						dt_well_segment.outer_diameter	The outer diameter of the well segment.	
diameter_unit	Text(15)					rt_unit.unit_code	dt_well_segment.diameter_unit	The unit of measurement of the diameter.	

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
thickness	Numeric						dt_well_segment.thickness	The thickness of the well segment.	
thickness_unit	Text(15)					rt_unit.unit_code	dt_well_segment.thickness_unit	The unit of measurement of the thickness.	
slot_type	Text(20)						dt_well_segment.slot_type	The type of slots in the well segment, such as bridge, shutter, and continuous.	
slot_size	Numeric						dt_well_segment.slot_size	The width of the slots.	
slot_size_unit	Text(15)					rt_unit.unit_code	dt_well_segment.slot_size_unit	The unit of measurement of the slot size.	
perf_length	Numeric						dt_well_segment.perf_length	The length of the perforated portion of the screen.	
screen_type	Text(15)						dt_well_segment.screen_type	The type of screen.	
material_quantity	Text(20)						dt_well_segment.material_quantity	The quantity of material used. Applicable to annular seal/fill material.	
material_density	Text(20)						dt_well_segment.material_density	The density of the material used.	
remark	Text(2000)						dt_well_segment.remark	Any additional information about the well segment.	

8.18 WaterLevel_v1

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
sys_loc_code	Text(20)	PK	Y		Location_v1.sys_loc_code		dt_water_level.sys_loc_code	The unique identifier of the location. Must be a valid code for the facility and reported value in the sys_loc_code field of the Location section.	
measurement_date	DateTime	PK	Y				dt_water_level.measurement_date	The date and time of the water level measurement.	
equipment_code	Text(60)						dt_equipment.equipment_code dt_water_level.equipment_code	The unique identifier of the equipment used to measure the water level.	
historical_reference_elev	Numeric						dt_water_level.historical_reference_elev	The historical reference elevation value. Used for the elevation of past reference points.	
water_level_depth	Numeric						dt_water_level.water_level_depth	The depth of the water level.	
water_level_elev	Numeric						dt_water_level.water_level_elev	The elevation of the water level.	
corrected_depth	Numeric						dt_water_level.corrected_depth	The depth of the water level after any necessary corrections. For example, corrections may be necessary if free product was encountered.	
corrected_elev	Numeric						dt_water_level.corrected_elevation	The elevation of the water level after any necessary corrections. For example, corrections may be necessary if free product was encountered.	
measured_depth_of_well	Numeric						dt_water_level.measured_depth_of_well	The depth below ground surface to the bottom of the well.	
depth_unit	Text(15)					rt_unit.unit_code	dt_water_level.depth_unit	The unit of measure of the depths.	
technician	Text(50)						dt_water_level.technician	The name of the technician measuring the water level.	
dry_indicator_yn	Text(1)					(Enumeration: yes_no_values)	dt_water_level.dry_indicator_yn	Y" if the well is dry, "N" if not.	
measurement_method	Text(20)						dt_water_level.measurement_method	The method used to measure the water level.	
batch_number	Text(10)						dt_water_level.batch_number	The batch of the water level measurement.	
dip_or_elevation	Text(9)		Y	dip		(Enumeration: dip_or_elevation)	dt_water_level.dip_or_elevation	dip" if the water level is below the measurement datum, "elevation" if the water level is above the measurement datum (i.e. an artesian well).	
remark	Text(2000)						dt_water_level.remark	Any additional information about the water level measurement.	
lnapl_cas_rn	Text(15)					rt_analyte.cas_rn	dt_water_level.lnapl_cas_rn	The identifier of the LNAPL analyte.	

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
lnapl_depth	Numeric						dt_water_level.lnapl_depth	The depth to LNAPL.	
dnapl_cas_rn	Text(15)					rt_analyte.cas_rn	dt_water_level.dnapl_cas_rn	The identifier of the DNAPL analyte.	
dnapl_depth	Numeric						dt_water_level.dnapl_depth	The depth to DNAPL.	
task_code	Text(40)						dt_task.task_code dt_water_level.task_code	The unique identifier of the task associated with the water level measurement.	
approval_code	Text(10)					rt_valid_code.accept_code	dt_water_level.approval_code	The approval code for the water level measurement.	
custom_field_1	Text(255)						dt_water_level.custom_field_1	A custom field.	
custom_field_2	Text(255)						dt_water_level.custom_field_2	A custom field.	
custom_field_3	Text(255)						dt_water_level.custom_field_3	A custom field.	
custom_field_4	Text(255)						dt_water_level.custom_field_4	A custom field.	
custom_field_5	Text(255)						dt_water_level.custom_field_5	A custom field.	
reportable_yn	Text(1)		Y	Y		(Enumeration: yes_no_values)	dt_water_level.reportable_yn	Y" if the water level measurement is reportable, "N" if not. This field can be used to distinguish between multiple water level readings where only the final reading would be used for reporting.	

8.19 WaterTable_v1

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
sys_loc_code	Text(20)	PK	Y		Location_v1.sys_loc_code		dt_water_table.sys_loc_code	The unique identifier of the location. Must be a valid code for the facility and reported value in the sys_loc_code field of the Location section.	
type	Text(20)	PK	Y				dt_water_table.type	The aquifer designation, such as unconfined1, confined1, or confined2.	
sequence	Text(12)	PK	Y			(Enumeration: sequence)	dt_water_table.sequence	The designation of when the water level measurement was taken. For example, measurement taken before water stabilized would be "unstabilized" and measurement taken after stabilization would be "stabilized".	
depth	Numeric		Y				dt_water_table.depth	The depth of the water table below the reference point.	
flowing_yn	Text(1)					(Enumeration: yes_no_values)	dt_water_table.flowing_yn	Y" if water is flowing, "N" if not.	
measurement_method	Text(50)						dt_water_table.measurement_method	The method of water table depth measurement.	
capped_pressure	Numeric						dt_water_table.capped_pressure	The hydrostatic pressure of the confined aquifer.	
capped_pressure_unit	Text(15)					rt_unit.unit_code	dt_water_table.capped_pressure_unit	The unit of measure of the capped pressure.	
reference_point	Text(50)						dt_water_table.reference_point	The reference point from which depth was measured.	
reference_elevation	Numeric						dt_water_table.reference_elevation	The elevation of the reference point.	
temperature	Numeric						dt_water_table.temperature	The temperature of the water in the water table.	
temperature_unit	Text(15)					rt_unit.unit_code	dt_water_table.temperature_unit	The unit of measure of the temperature.	

8.20 ExtractionInjectionWells_v1

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
sys_loc_code	Text(20)	PK	Y		Location_v1.sys_loc_code		dt_location.sys_loc_code dt_well.sys_loc_code dt_pump_rate.sys_loc_code	The unique identifier of the location. Must be a valid code for the facility and reported value in the sys_loc_code field of the Location section.	
start_measure_date	DateTime	PK	Y				dt_pump_rate.start_measure_date	The date and time that the measurement begain.	
end_measure_date	DateTime						dt_pump_rate.end_measure_date	The date and time that the measurement ended.	
pump_rate	Numeric						dt_pump_rate.pump_rate	The average pumping rate. This can be calculated by dividing the total volume pumped by the difference between end_measure_date and start_measure_date.	
pump_rate_unit	Text(15)					rt_unit.unit_code	dt_pump_rate.pump_rate_unit	The unit of measure of the pump rate.	
pct_operating_time	Numeric						dt_pump_rate.pct_operating_time	The numeric percentage of the measurement time interval that the well was operating, from 0 to 100. Can include decimals. Do not enter a % symbol.	
operating_mode	Text(13)					(Enumeration: operating_mode)	dt_pump_rate.operating_mode	The mode in which well was operating during the measurement time interval.	
design_rate	Numeric						dt_pump_rate.expected_pump_rate	The pumping rate specified in the design document or work plan to fully capture the site's contamination.	
design_rate_unit	Text(15)					rt_unit.unit_code	dt_pump_rate.expected_pump_rate_unit	The unit of measure of the expected pump rate.	
rate_measurement_type	Text(9)					(Enumeration: rate_measurement_type)	dt_pump_rate.rate_measurement_type	The type of measurement used for calculating the pump rate.	
static_depth	Text(14)						dt_pump_rate.static_depth	The static depth.	
pump_depth	Text(14)						dt_pump_rate.pump_depth	The pump depth.	
recovery_depth	Text(14)						dt_pump_rate.recovery_depth	The recovery depth.	
recovery_time	Text(10)						dt_pump_rate.recovery_time	The recovery time.	
sounding	Text(14)						dt_pump_rate.sounding	The echo-sounding value.	
suction	Numeric						dt_pump_rate.suction	The vacuum in the well or well casing in equivalent feet of water.	
measured_by	Text(50)						dt_pump_rate.measured_by	The name of the person collecting the measurement.	
remark	Text(2000)						dt_pump_rate.remark	Any additional information about the pumping.	

8.21 FieldSample_v1

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
sys_sample_code	Text(40)	PK	Y				dt_sample.sys_sample_code dt_static_props.sys_sample_code	The unique identifier of the sample. Each sample at a facility must have a unique value, including spikes and duplicates. You have considerable flexibility in the methods used to derive and assign unique sample identifiers, but uniqueness throughout the database is the only restriction enforced by EQuIS®.	
sample_name	Text(50)						dt_sample.sample_name	Additional sample identification information as necessary. Is not required to be unique (i.e. duplicates are OK).	
sample_matrix_code	Text(10)		Y			rt_matrix.matrix_code	rt_matrix.matrix_desc dt_sample.matrix_code	The code which distinguishes between different types of sample matrix. For example, soil samples must be distinguished from ground water samples, etc.	
sample_type_code	Text(20)		Y			rt_sample_type.sample_type_code	rt_sample_type.sample_type_desc dt_sample.sample_type_code	The code which distinguishes between different types of samples. For example, normal field samples must be distinguished from laboratory method blank samples, etc.	
sample_source	Text(5)		Y	FIELD		(Enumeration: sample_source)	dt_sample.sample_source	This field identifies where the sample came from, either Field or Lab. In this section this value should always be Field.	
parent_sample_code	Text(40)				FieldSample_v1.sys_sample_code		dt_sample.parent_sample_code	The unique identifier (sys_sample_code) that uniquely identifies the sample from which this sample was derived or to which this sample is associated. For example, the value of this field for a duplicate sample would identify the normal sample of which this sample is a duplicate.	
sample_delivery_group	Text(20)						dt_SDG.sdg_name dt_field_sample.field_sdg	The unique identifier of the sample delivery group (SDG) or work order.	
sample_date	DateTime		Y				dt_sample.sample_date	The date and time the sample was collected (in MM/DD/YYYY HH:MM:SS format).	
sys_loc_code	Text(20)				Location_v1.sys_loc_code		dt_sample.sys_loc_code	The unique identifier of the location at which the sample was collected. Must be a valid code for the facility and reported value in the sys_loc_code field of the Location section.	
start_depth	Numeric						dt_sample.start_depth	The beginning depth (top) of the sample below ground surface. Leave null for most ground water samples from monitoring wells, as the database will derive this information from the start/end depth of the well screen field located in another data table. Only enter as value for groundwater samples if discrete samples are taken at different depth elevations from a single well (i.e. multiple well packer samples).	
end_depth	Numeric						dt_sample.end_depth	The end depth (bottom) of sample below ground surface. Leave null for most ground water samples from monitoring wells, as the database will derive this information from the start/end depth of the well screen field located in another data table. Only enter as value for groundwater samples if discrete samples are taken at different depth elevations from a single well, i.e. multiple well packer samples.	
depth_unit	Text(15)					rt_unit.unit_code	dt_sample.depth_unit	The unit of measurement of the depth.	
geologic_unit_code	Text(20)					rt_geologic_unit.geologic_unit_code	dt_static_props.geologic_unit_code	The geologic unit (e.g. stratigraphy) from which the sample was taken.	
chain_of_custody	Text(40)						dt_chain_of_custody.chain_of_custody dt_field_sample.chain_of_custody	The chain of custody identifier. A single sample may be assigned to only one chain of custody.	
sent_to_lab_date	DateTime						dt_field_sample.sent_to_lab_date	The date and time that the sample was sent to the laboratory.	
sample_receipt_date	DateTime						dt_field_sample.sample_receipt_date	The date and time that the sample was received by the laboratory.	
sampler	Text(50)						dt_field_sample.sampler	The name or initials of the sampler.	
sampling_company_code	Text(40)					rt_company.company_code	rt_company.company_name dt_field_sample.sampling_company_code	The unique identifier of the sampling company.	
sampling_reason	Text(30)						dt_field_sample.sampling_reason	The reason for the sampling event.	

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
sampling_method	Text(40)					rt_sample_method.method_code	dt_sample.sample_method	The method of sample collection.	
task_code	Text(40)						dt_task.task_code dt_sample.task_code	The unique identifier of the SAP/work plan under which the field sample was collected.	
collection_quarter	Text(5)						dt_field_sample.collection_quarter	Enter the quarter of the year for samples collected (i.e. Q1, Q2, Q3, or Q4).	
composite_yn	Text(1)		Y			(Enumeration: yes_no_values)	dt_field_sample.composite_yn	Y" if the sample is a composite sample, "N" if not.	
composite_desc	Text(255)						dt_field_sample.composite_desc	The description of composite sample (if composite_yn is "Yes"). Example: "Composite sample from soil stock pile." or "Composite sample from individual samples SB-001, SB-005, and SB-009."	
sample_class	Text(10)						dt_sample.sample_class	The class code for the sample type: NF - Normal Field Sample, FQ - Field Quality Control Sample, or LQ - Lab Quality Control Sample.	
medium	Text(20)					rt_medium.medium_code	dt_sample.medium_code	The medium of the sample. This is typically more general than matrix, for example "soil" or "water".	
sample_desc	Text(255)						dt_sample.sample_desc	Additional sample description information as necessary. Is not required to be unique (i.e. duplicates are OK).	
filter_type	Text(20)						dt_field_sample.filter_type	The filter type.	
equipment_code	Text(60)						dt_equipment.equipment_code dt_field_sample.equipment_code	The unique identifier of the equipment used to collect the sample.	
equipment_cal_date	DateTime						dt_field_sample.equipment_cal_date	The date and time the equipment was calibrated.	
air_volume	Numeric						dt_field_sample.air_volume	The volume of air collected with the sample.	
air_volume_unit	Text(15)					rt_unit.unit_code	dt_field_sample.air_volume_unit	The unit of measurement of the air volume.	
custom_field_1	Text(255)						dt_sample.custom_field_1	A custom field.	
custom_field_2	Text(255)						dt_sample.custom_field_2	A custom field.	
custom_field_3	Text(255)						dt_sample.custom_field_3	A custom field.	
custom_field_4	Text(255)						dt_sample.custom_field_4	A custom field.	
custom_field_5	Text(255)						dt_sample.custom_field_5	A custom field.	
remark	Text(2000)						dt_sample.remark dt_field_sample.remark	Any additional information about the sample.	

8.22 FieldResults_v1

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
data_provider	Text(40)					rt_company.company_code	dt_sample.data_provider	The unique identifier of the company or agency submitting the data.	
sys_loc_code	Text(20)		Y		Location_v1.sys_loc_code		dt_sample.sys_loc_code	The unique identifier of the location at which the sample was collected. Must be a valid code for the facility and reported value in the sys_loc_code field of the Location section.	
sys_sample_code	Text(40)	PK	Y		FieldSample_v1.sys_sample_code		dt_sample.sys_sample_code dt_sample.sample_name	The unique identifier of the sample.	
cas_rn	Text(15)	PK	Y			rt_analyte.cas_rn	dt_result.cas_rn	The unique identifier of the analyte being measured.	
chemical_name	Text(255)						rt_analyte.chemical_name	The name of the analyte being measured.	
start_depth	Numeric						dt_sample.start_depth	The beginning (top) of the sample below ground surface.	
end_depth	Numeric						dt_sample.end_depth	The end (bottom) of the sample below ground surface.	
depth_unit	Text(15)						dt_sample.depth_unit	The unit of measurement of the depth.	
result_date	DateTime	PK	Y				dt_sample.sample_date dt_test.analysis_date	The date and time the sample was collected.	
result_value	Text(19)		Y				dt_result.result_text	The measured value of the analyte in appropriate significant digits.	
result_unit	Text(15)		Y			rt_unit.unit_code	dt_result.result_unit	The unit of measurement of the result value.	
quantitation_limit	Text(20)						dt_result.quantitation_limit	The quantitation limit of the result value.	
task_code	Text(40)						dt_task.task_code dt_task.task_desc dt_sample.task_code	The unique identifier of the SAP/work plan under which the field sample was collected.	
sample_matrix_code	Text(10)		Y			rt_matrix.matrix_code	rt_matrix.matrix_desc dt_sample.matrix_code	The code which distinguishes between different types of sample matrix. For example, soil samples must be distinguished from ground water samples, etc.	
qualifier	Text(20)					rt_qualifier.qualifier	dt_result.interpreted_qualifiers	The unique identifier of the sampling company.	
sampling_company_code	Text(40)					rt_company.company_code	dt_field_sample.sampling_company_code	The reason for the sampling event.	
sampling_reason	Text(30)						dt_field_sample.sampling_reason	The reason for the sampling event.	
sampling_method	Text(40)						rt_sample_method.method_code dt_sample.sample_method	The method of sample collection.	
reportable_result	Text(3)		Y	Yes		(Enumeration: reportable_result)	dt_result.reportable_result	Y" if the result value is reportable, "N" if not.	
value_type	Text(10)			ACTUAL		(Enumeration: value_type)	dt_result.value_type	The type of value, either ACTUAL, CALCULATED, or ESTIMATED.	
remark	Text(2000)						dt_result.remark	Any additional information about the result value.	
detect_flag	Text(2)		Y	Y		(Enumeration: detect_flag)	dt_result.detect_flag	May be either "Y" for detected analytes or "N" for non_detects or "TR" for trace. Use "Y" for estimated values (above detection limit but below the quantitation limit).	
fraction	Text(10)	PK	Y	NA			dt_test.fraction	Must be either "D" for dissolved or filtered [metal] concentration, "T" for total or undissolved, or "N" for anything else.	
analytic_method	Text(20)		Y	Field Measure			dt_test.analytic_method	The analytic method used to obtain the result value.	
analysis_location	Text(2)		Y	FI		(Enumeration: analysis_location)	dt_test.analysis_location	Must be either "FI" for field instrument or probe, "FL" for mobile field laboratory analysis, or "LB" for fixed_based laboratory analysis.	

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
column_number	Text(2)	PK	Y	NA			dt_test.column_number	Values include either "1C" for first column analyses, "2C" for second column analyses or "NA" for tests for which this distinction is not applicable.	
result_type_code	Text(10)		Y	TRG			dt_result.result_type_code	The type of result. 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.	
test_type	Text(10)	PK	Y	INITIAL			dt_test.test_type	The type of test. Valid values include "INITIAL", "REEXTRACT1", "REEXTRACT2", "REEXTRACT3", "REANALYSIS", "DILUTION1", "DILUTIONS2", and "DILUTIONS3".	
field_lab_name_code	Text(20)						dt_test.lab_name_code	The name or initials of the on-site field lab (not controlled vocabulary).	
Default Mappings									
				N			dt_sample.sample_type_code		
				FIELD			dt_sample.sample_source		
Method Mappings									
				GetSampleId			dt_field_sample.sample_id		

8.23 VI_BuildingInspection_v1

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
building_code	Text(20)	PK	Y				dt_subfacility.subfacility_code dt_subfacility_parameter.subfacility_code	The unique identifier of the building.	
building_name	Text(60)		Y				dt_subfacility.subfacility_name	The name of the building.	
inspection_date	DateTime	PK	Y				dt_subfacility_parameter.measurement_date	The date the building inspection was conducted.	
task_code	Text(40)		Y				dt_task.task_code dt_subfacility_parameter.param_value	The Task Code associated with the building inspection.	
contact_name	Text(50)						dt_subfacility.contact_name	The primary occupant of the building.	
address1	Text(40)						dt_subfacility.address_1	Building street address line 1.	
address2	Text(40)						dt_subfacility.address_2	Building street address line 2.	
city	Text(30)						dt_subfacility.city	Building city.	
state	Text(2)			MT		rt_state.state_code	dt_subfacility.state	Building state.	
zip_code	Text(10)						dt_subfacility.postal_code	Building postal code.	
county	Text(50)					rt_county.county_code	dt_subfacility.county	Building county.	
phone_number	Text(30)						dt_subfacility.phone_number	Occupant home phone number.	
alt_phone_number	Text(30)						dt_subfacility.alt_phone_number	Occupant work/alternate phone number.	
email_address	Text(100)						dt_subfacility.email_address	Occupant email address.	
fax_number	Text(30)						dt_subfacility.fax_number	Occupant fax number.	

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
building_remark_1	Text(2000)						dt_subfacility.remark_1	Additional information about the building or occupant.	
building_remark_2	Text(2000)						dt_subfacility.remark_2	Additional information about the building or occupant.	
best_contact_time	Text(255)						dt_subfacility_parameter.param_value	The best time to contact the occupant.	
best_contact_number	Text(14)					(Enumeration: best_contact_number)	dt_subfacility_parameter.param_value	The best phone number to use to contact the occupant.	
occupant_status	Text(6)					(Enumeration: occupant_status)	dt_subfacility_parameter.param_value	The status of the occupant, for example "Owner" or "Renter". If "Other", please provide details in occupant_status_remark.	If param value = 'Other' then remark field is required.
occupant_status_remark	Text(2000)						dt_subfacility_parameter.remark	Additional information about the occupant status.	If param value = 'Other' then remark field is required.
owner_contact_details	Text(255)						dt_subfacility_parameter.param_value	Building owner contact details, if different from occupant contact details.	
nb_of_occupants	Numeric						dt_subfacility_parameter.param_value	The number of individuals occupying the building.	
nb_of_children	Numeric						dt_subfacility_parameter.param_value	The number of children occupying the building.	
occupant_ages	Text(255)						dt_subfacility_parameter.param_value	The ages of the building occupants.	
occupant_duration	Text(255)						dt_subfacility_parameter.param_value	Duration of current occupancy.	
building_type	Text(18)					(Enumeration: building_type)	dt_subfacility_parameter.param_value	The type of building. If "Other", please provide details in building_type_remark.	If param value = 'Other' then remark field is required.
building_type_remark	Text(2000)						dt_subfacility_parameter.remark	Additional information about the building type.	If param value = 'Other' then remark field is required.
building_size	Text(6)					(Enumeration: building_size)	dt_subfacility_parameter.param_value	The size of the building.	
nb_floors	Numeric						dt_subfacility_parameter.param_value	The number of floors in the building.	
attached_garage_yn	Text(1)					(Enumeration: yes_no_values)	dt_subfacility_parameter.param_value	Does the building have an attached garage?	
foundation_type	Text(39)					(Enumeration: foundation_type)	dt_subfacility_parameter.param_value	The foundation type, for example "Basement", "Crawlspace", etc. If "Other", please provide details in foundation_type_remark.	If param value = 'Other' then remark field is required.
foundation_type_remark	Text(2000)						dt_subfacility_parameter.remark	Additional information about the foundation type, including % of each type if multiple.	If param value = 'Other' then remark field is required.
structure_age	Text(255)						dt_subfacility_parameter.param_value	The age of the structure.	
building_const	Text(38)					(Enumeration: building_construction)	dt_subfacility_parameter.param_value	The general above-ground home/structure construction material. If "Other", please provide details in building_const_remark.	If param value = 'Other' then remark field is required.
building_const_remark	Text(2000)						dt_subfacility_parameter.remark	Additional information about the building construction.	If param value = 'Other' then remark field is required.

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
foundation_const	Text(73)					(Enumeration: foundation_construction)	dt_subfacility_parameter.param_value	The foundation construction material, for example "Concrete Slab", "Fieldstone", etc. If "Other", please provide details in foundation_const_remark.	If param value = 'Other' then remark field is required.
foundation_const_remark	Text(2000)						dt_subfacility_parameter.remark	Additional information about the foundation construction.	If param value = 'Other' then remark field is required.
water_source	Text(20)					(Enumeration: water_source)	dt_subfacility_parameter.param_value	The water source for the building.	
water_source_remark	Text(2000)						dt_subfacility_parameter.remark	Location, use, current condition, and additional information regarding the water source.	
septic_system	Text(8)					(Enumeration: septic_system)	dt_subfacility_parameter.param_value	Does the building have a septic system?	
septic_const	Text(255)						dt_subfacility_parameter.param_value	If the building has a septic system, indicate the construction type.	
septic_location	Text(255)						dt_subfacility_parameter.param_value	If the building has a septic system, indicate the location.	
septic_last_svc_date	DateTime						dt_subfacility_parameter.param_value	If the building has a septic system, indicate the date it was last serviced.	
septic_degreaser_yn	Text(1)					(Enumeration: yes_no_values)	dt_subfacility_parameter.param_value	If the building has a septic system, indicate whether or not degreaser is used or has ever been used for the septic system.	
standing_water_yn	Text(1)					(Enumeration: yes_no_values)	dt_subfacility_parameter.param_value	Is there standing water outside of the home, for example a pond or ditch?	
basement_finished_yn	Text(1)					(Enumeration: yes_no_values)	dt_subfacility_parameter.param_value	Is the basement finished?	
basement_nb_rooms	Numeric						dt_subfacility_parameter.param_value	If finished, indicate the number of rooms in the basement.	
basement_room_use	Text(34)					(Enumeration: basement_room_use)	dt_subfacility_parameter.param_value	If finished, indicate the use of the rooms. If "Other", please provide details in basement_room_use_remark.	If param value = 'Other' then remark field is required.
basement_room_use_remark	Text(2000)						dt_subfacility_parameter.remark	Additional information about the basement room use.	If param value = 'Other' then remark field is required.
basement_floor_const	Text(28)					(Enumeration: basement_floor)	dt_subfacility_parameter.param_value	The basement floor construction material, for example "Concrete", "Tile", etc. If "Other", please provide details in basement_floor_const_remark.	If param value = 'Other' then remark field is required.
basement_floor_const_remark	Text(2000)						dt_subfacility_parameter.remark	Additional information about the basement floor construction.	If param value = 'Other' then remark field is required.
basement_wall_const	Text(51)					(Enumeration: basement_wall_construction)	dt_subfacility_parameter.param_value	The basement wall construction material, for example "Poured Concrete", "Cement Block", etc. If "Other", please provide details in basement_wall_const_remark.	If param value = 'Other' then remark field is required.
basement_wall_const_remark	Text(2000)						dt_subfacility_parameter.remark	Additional information about the basement wall construction.	If param value = 'Other' then remark field is required.
basement_moisture	Text(33)					(Enumeration: basement_frequency)	dt_subfacility_parameter.param_value	Does the basement have a moisture problem?	If param value = 'Other' then

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
									remark field is required.
basement_moisture_remark	Text(2000)						dt_subfacility_parameter.remark	The description of the basement moisture problem, if any.	If param value = 'Other' then remark field is required.
basement_flood	Text(33)					(Enumeration: basement_frequency)	dt_subfacility_parameter.param_value	Does the basement ever flood?	
sump_yn	Text(1)					(Enumeration: yes_no_values)	dt_subfacility_parameter.param_value	Does the building have a sump?	
basement_other	Text(64)					(Enumeration: basement_other)	dt_subfacility_parameter.param_value	Indicate if any of the following are present in the basement: Floor Cracks, Wall Cracks, Sump, Floor Drain, Other Hole/Opening in the Floor. If other, please provide details in basement_other_remark.	If param value = 'Other' then remark field is required.
basement_other_remark	Text(2000)						dt_subfacility_parameter.remark	Additional information about other basement details.	If param value = 'Other' then remark field is required.
basement_material_storage	Text(181)					(Enumeration: basement_material_storage)	dt_subfacility_parameter.param_value	Indicate if any of the following are stored in the basement: Paint, Paint Stripper/Remover, Paint Thinner, Metal Degreaser/Cleaner, Gasoline, Diesel Fuel, Solvents, Glue, Laundry Spot Removers, Drain Cleaners, Pesticides, Other Equipment with Fuel Tanks.	
recent_remodel_yn	Text(1)					(Enumeration: yes_no_values)	dt_subfacility_parameter.param_value	Has any painting or remodeling been done in the building within the last six months? If yes, please provide details in recent_remodel_remark.	If param value = 'Y' then remark is required.
recent_remodel_remark	Text(2000)						dt_subfacility_parameter.remark	Additional information about any recent remodeling.	If param value = 'Y' then remark is required.
recent_carpet_yn	Text(1)					(Enumeration: yes_no_values)	dt_subfacility_parameter.param_value	Has new carpeting been installed in the building within the last year? If yes, indicate when and where in recent_carpet_remark.	If param value = 'Y' then remark is required.
recent_carpet_remark	Text(2000)						dt_subfacility_parameter.remark	Additional information about any recent carpeting.	If param value = 'Y' then remark is required.
dry_cleaning	Text(33)					(Enumeration: dry_cleaning)	dt_subfacility_parameter.param_value	Do you regularly use or work in a dry cleaning service?	
solvents_at_work_yn	Text(1)					(Enumeration: yes_no_values)	dt_subfacility_parameter.param_value	Does anyone in the building use solvents at work?	
solvents_at_work_nb	Numeric						dt_subfacility_parameter.param_value	The number of occupants who use solvents at work, if any.	
work_clothes_wash_home_yn	Text(1)					(Enumeration: yes_no_values)	dt_subfacility_parameter.param_value	If occupants use solvents at work, are the work clothes washed at home?	
wash_dry_loc	Text(62)					(Enumeration: wash_dry_loc)	dt_subfacility_parameter.param_value	The location of the washer and dryer. If "Other", please provide details in wash_dry_loc_remark.	If param value = 'Other' then remark field is required.
wash_dry_loc_remark	Text(2000)						dt_subfacility_parameter.remark	Additional information about the washer and dryer location.	If param value = 'Other' then remark field is required.
dryer_vented_yn	Text(1)					(Enumeration: yes_no_values)	dt_subfacility_parameter.param_value	If you have a dryer, is it vented to the outdoors?	
heat_fuel_type	Text(32)					(Enumeration: heat_fuel_type)	dt_subfacility_parameter.param_value	The type of heating fuel used in the building. Check all that apply. If "Other", please provide details in heat_fuel_type_remark.	If param value = 'Other' then

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
									remark field is required.
heat_fuel_type_remark	Text(2000)						dt_subfacility_parameter.remark	Additional information about the heating fuel used in the building.	If param value = 'Other' then remark field is required.
heat_system_type	Text(96)					(Enumeration: heat_system_type)	dt_subfacility_parameter.param_value	The type of heating conveyance in the building. If "Other", please provide details in heat_system_type_remark.	If param value = 'Other' then remark field is required.
heat_system_type_remark	Text(2000)						dt_subfacility_parameter.remark	Additional information about the heating conveyance in the building.	If param value = 'Other' then remark field is required.
fuel_storage	Text(25)					(Enumeration: fuel_storage)	dt_subfacility_parameter.param_value	Indicate types of fuel storage tanks currently or formerly present at the building, if any.	
fuel_storage_loc	Text(255)						dt_subfacility_parameter.param_value	If fuel storage tanks are currently or were formerly present at the building, indicate the location(s).	
fuel_storage_fill	Text(255)						dt_subfacility_parameter.param_value	If fuel storage tanks are currently or were formerly present at the building, indicate the fill method(s).	
fuel_storage_stain_yn	Text(1)					(Enumeration: yes_no_values)	dt_subfacility_parameter.param_value	If fuel storage tanks are currently or were formerly present at the building, indicate "Y" if there is staining near the tank.	
air_cond_yn	Text(1)					(Enumeration: yes_no_values)	dt_subfacility_parameter.param_value	Does the building have air conditioning?	
air_cond_type	Text(20)					(Enumeration: air_cond_type)	dt_subfacility_parameter.param_value	The type(s) of air conditioning in the building, if any. If "Other", please provide details in air_cond_remark.	If param value = 'Other' then remark field is required.
air_cond_remark	Text(2000)						dt_subfacility_parameter.remark	Additional information about the air conditioning in the building.	If param value = 'Other' then remark field is required.
fan_usage	Text(32)					(Enumeration: fan_usage)	dt_subfacility_parameter.param_value	The type(s) of fan used in the building, if any.	
fan_only_vent_yn	Text(1)					(Enumeration: yes_no_values)	dt_subfacility_parameter.param_value	Do you ventilate using the fan-only mode of your central air conditioning or forced air heating system?	
pesticide_use	Text(7)					(Enumeration: pesticide_use)	dt_subfacility_parameter.param_value	Has the building had termite or other pesticide treatment?	If param value = 'Other' then remark field is required.
pesticide_use_remark	Text(2000)						dt_subfacility_parameter.remark	If the building has had termite or other pesticide treatment, indicate the type of pest control.	If param value = 'Other' then remark field is required.
pesticide_use_date	DateTime						dt_subfacility_parameter.param_value	If the building has had termite or other pesticide treatment, indicate the approximate date of last service.	
radon_mitigation_yn	Text(1)					(Enumeration: yes_no_values)	dt_subfacility_parameter.param_value	Has there been any radon mitigation in the building?	
water_heat_type	Text(26)					(Enumeration: water_heat_type)	dt_subfacility_parameter.param_value	The type of water heater in the building, if any. If "Other", please provide details in water_heat_remark.	If param value = 'Other' then

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
									remark field is required.
water_heat_remark	Text(2000)						dt_subfacility_parameter.remark	Additional information about the water heater in the building.	If param value = 'Other' then remark field is required.
water_heat_loc	Text(43)					(Enumeration: water_heat_loc)	dt_subfacility_parameter.param_value	The location of the water heater. If "Other", please provide details in water_heater_loc_remark.	If param value = 'Other' then remark field is required.
water_heat_loc_remark	Text(2000)						dt_subfacility_parameter.remark	Additional inforamtion about the water heater location.	If param value = 'Other' then remark field is required.
cook_type	Text(18)					(Enumeration: cook_type)	dt_subfacility_parameter.param_value	The type of cooking appliance(s) in the building, if any. If "Other", please provide details in cook_type_remark.	If param value = 'Other' then remark field is required.
cook_type_remark	Text(2000)						dt_subfacility_parameter.remark	Additional information about the cooking appliances in the building.	If param value = 'Other' then remark field is required.
exhaust_hood_yn	Text(1)					(Enumeration: yes_no_values)	dt_subfacility_parameter.param_value	Is there a stove exhaust hood present?	
exhaust_hood_vent_yn	Text(1)					(Enumeration: yes_no_values)	dt_subfacility_parameter.param_value	If there is a stove exhaust hood present, does it vent to the outdoors?	
smoking	Text(40)					(Enumeration: smoking_frequency)	dt_subfacility_parameter.param_value	Indicate the amount of smoking in the home.	
smoking_type	Text(28)					(Enumeration: smoking_type)	dt_subfacility_parameter.param_value	If there is smoking in the home, indicate the type(s) of smoke.	
air_freshener_yn	Text(1)					(Enumeration: yes_no_values)	dt_subfacility_parameter.param_value	Do you regularly use air fresheners?	
indoor_hobby	Text(76)					(Enumeration: indoor_hobby)	dt_subfacility_parameter.param_value	Indicate if any of the following materials or activities are used for indoor home hobbies or crafts: Heating, Soldering, Welding, Model Glues, Paints, Spray Paint, Wood Finishing, Other. If "Other", please provide details in indoor_hobby_remark.	If param value = 'Other' then remark field is required.
indoor_hobby_remark	Text(2000)						dt_subfacility_parameter.remark	Additional information about the materials and activities used for indoor home hobbies or crafts.	If param value = 'Other' then remark field is required.
spray_deoderant	Text(12)					(Enumeration: product_frequency)	dt_subfacility_parameter.param_value	How often are spray-on deoderants used in the building?	
aerosol_deodorizer	Text(12)					(Enumeration: product_frequency)	dt_subfacility_parameter.param_value	How often are aerosol deodorizers used in the building?	
insecticide	Text(12)					(Enumeration: product_frequency)	dt_subfacility_parameter.param_value	How often are insecticides used in the building?	
disinfectant	Text(12)					(Enumeration: product_frequency)	dt_subfacility_parameter.param_value	How often are disinfectants used in the building?	
window_cleaner	Text(12)					(Enumeration: product_frequency)	dt_subfacility_parameter.param_value	How often are window cleaners used in the building?	
nail_polish_remover	Text(12)					(Enumeration: product_frequency)	dt_subfacility_parameter.param_value	How often is nail polish remover used in the building?	
hair_spray	Text(12)					(Enumeration: product_frequency)	dt_subfacility_parameter.param_value	How often are hair sprays used in the building?	
candle	Text(12)					(Enumeration: product_frequency)	dt_subfacility_parameter.param_value	How often are candles used in the building?	
incense	Text(12)					(Enumeration: product_frequency)	dt_subfacility_parameter.param_value	How often is incense used in the building?	

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
weekly_cleaning	Text(86)					(Enumeration: weekly_cleaning)	dt_subfacility_parameter.param_value	Indicate the weekly household cleaning practices, if any. If "Other", please provide details in weekly_cleaning_remark.	If param value = 'Other' then remark field is required.
weekly_cleaning_remark	Text(2000)						dt_subfacility_parameter.remark	Additional information about weekly household cleaning practices.	If param value = 'Other' then remark field is required.
remark	Text(2000)						dt_subfacility_parameter.remark	Other comments.	
chemical_inventory	Text(2000)						dt_subfacility_parameter.remark	Indicate any chemicals or chemical products (consumer name) in the building and the amount present of each.	
custom_field_1	Text(255)						dt_subfacility_parameter.param_value	A custom field.	
custom_field_2	Text(255)						dt_subfacility_parameter.param_value	A custom field.	
custom_field_3	Text(255)						dt_subfacility_parameter.param_value	A custom field.	
custom_field_4	Text(255)						dt_subfacility_parameter.param_value	A custom field.	
custom_field_5	Text(255)						dt_subfacility_parameter.param_value	A custom field.	

8.24 VI_TaskParameters_v1

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
task_code	Text(40)	PK	Y				dt_task.task_code dt_task_parameter.task_code	The unique identifier of the SAP/workplan.	
param_code	Text(20)	PK	Y			rt_task_param_type.param_code	dt_task_parameter.param_code	The task parameter.	
task_desc	Text(255)						dt_task.task_desc	The description of the task.	
measurement_date	DateTime						dt_task_parameter.measurement_date	The date and time of parameter measurement.	
param_value	Text(255)						dt_task_parameter.param_value	The value of the parameter measured.	
param_unit	Text(15)					rt_unit.unit_code	dt_task_parameter.param_unit	The unit of measure of the parameter.	
remark	Text(2000)						dt_task_parameter.remark	Any additional information about the task.	

8.25 VI_Samples_v1

Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
Text(40)		Y			rt_company.company_code	rt_company.company_name dt_sample.data_provider	The unique identifier of the the company or agency submitting the data.	
Text(40)	PK	Y				dt_sample.sys_sample_code	The unique identifier of the sample. Each sample at a facility must have a unique value, including spikes and duplicates. You have considerable flexibility in the methods used to derive and assign unique sample identifiers, but uniqueness throughout the database is the only restriction enforced by EQuIS®.	

Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
Text(50)		Y				dt_sample.sample_name	Additional sample identification information as necessary. Is not required to be unique (i.e. duplicates are OK).	
Text(10)		Y			rt_matrix.matrix_code	rt_matrix.matrix_desc dt_sample.matrix_code	The code which distinguishes between different types of sample matrix. For example, soil samples must be distinguished from ground water samples, etc.	
Text(20)		Y			rt_sample_type.sample_type_code	rt_sample_type.sample_type_desc dt_sample.sample_type_code	The code which distinguishes between different types of samples. For example, normal field samples must be distinguished from laboratory method blank samples, etc.	Sys_loc_code is required where sample_type_code=N.
Text(5)		Y			(Enumeration: sample_source)	dt_sample.sample_source	This field identifies where the sample came from, either Field or Lab.	
Text(40)						dt_sample.parent_sample_code	The unique identifier (sys_sample_code) that uniquely identifies the sample from which this sample was derived or to which this sample is associated. For example, the value of this field for a duplicate sample would identify the normal sample of which this sample is a duplicate.	
Text(20)						dt_SDG.sdg_name dt_field_sample.field_sdg	The unique identifier of the sample delivery group (SDG) or work order.	
DateTime		Y				dt_sample.sample_date	The beginning date and time of sample collection (in MM/DD/YYYY HH:MM:SS format).	
DateTime						dt_sample.sample_end_date	The end date and time of sample collection (in MM/DD/YYYY HH:MM:SS format).	
Text(20)						dt_sample.sys_loc_code	The unique identifier of the location at which the sample was collected. Must be a valid code for the facility and reported value in the sys_loc_code field of the Location section.	Sys_loc_code is required where sample_type_code=N.
Text(100)						dt_field_sample.sampler	The name or initials of the sampler.	
Text(20)		Y			rt_company.company_code	rt_company.company_name dt_field_sample.sampling_company_code	The unique identifier of the sampling company.	
Text(30)						dt_field_sample.sampling_reason	The reason for the sampling event.	
Text(40)					rt_sample_method.method_code	dt_sample.sample_method	The method of sample collection.	
Text(40)						dt_task.task_code dt_sample.task_code	The unique identifier of the task under which the field sample was collected.	
Text(60)					dt_equipment.equipment_code	dt_field_sample.canister_id	The ID of the canister used.	Allow value to exist in either the database or Equipment section.
Text(60)					dt_equipment.equipment_code	dt_field_sample.flow_controller_id	The ID of the flow controller used.	Allow value to exist in either the database or Equipment section.
Text(60)					dt_equipment.equipment_code	dt_field_sample.vac_gauge_id	The ID of the vacuum gauge used.	Allow value to exist in either the database or Equipment section.
Numeric						dt_field_sample.vac_gauge_initial	The initial vacuum gauge reading.	
Numeric						dt_field_sample.vac_gauge_final	The final vacuum gauge reading.	
Text(15)						dt_field_sample.vac_gauge_unit	The unit of vacuum gauge reading.	
Text(20)						dt_field_sample.pre_sample_indoor_air_temp	The indoor air temperature immediately prior to the sampling event.	
Text(20)						dt_field_sample.post_sample_indoor_air_temp	The indoor air temperature immediately following the sampling event.	
Text(40)						dt_chain_of_custody.chain_of_custody dt_field_sample.chain_of_custody	The chain of custody identifier. A single sample may be assigned to only one chain of custody.	
DateTime						dt_field_sample.sent_to_lab_date	The date and time that the sample was sent to the laboratory.	
DateTime						dt_field_sample.sample_receipt_date	The date and time that the sample was received by the laboratory.	
Text(2000)						dt_field_sample.remark	Any additional information about the sample.	

Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
			N			dt_field_sample.composite_yn		
			CompanyType_SUBCONTRACTOR			rt_company.company_type		
			CompanyType_SUBCONTRACTOR			rt_company.company_type		

8.26 Sample_v1

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
data_provider	Text(40)		Y			rt_company.company_code	rt_company.company_name dt_sample.data_provider	The unique identifier of the the company or agency submitting the data.	
sys_sample_code	Text(40)	PK	Y				dt_sample.sys_sample_code	The unique identifier of the sample. Each sample at a facility must have a unique value, including spikes and duplicates. You have considerable flexibility in the methods used to derive and assign unique sample identifiers, but uniqueness throughout the database is the only restriction enforced by EQuIS®.	
sample_name	Text(50)						dt_sample.sample_name	Additional sample identification information as necessary. Is not required to be unique (i.e. duplicates are OK).	
sample_matrix_code	Text(10)		Y			rt_matrix.matrix_code	rt_matrix.matrix_desc dt_sample.matrix_code	The code which distinguishes between different types of sample matrix. For example, soil samples must be distinguished from ground water samples, etc.	
sample_type_code	Text(20)		Y			rt_sample_type.sample_type_code	rt_sample_type.sample_type_desc dt_sample.sample_type_code	The code which distinguishes between different types of samples. For example, normal field samples must be distinguished from laboratory method blank samples, etc.	Parent_sample_code is required where sample_type_code=BD, FD, FR, FS, LR, SD, SPD, RD, or MSD.
sample_source	Text(5)		Y			(Enumeration: sample_source)	dt_sample.sample_source	This field identifies where the sample came from, either Field or Lab.	
parent_sample_code	Text(40)				Sample_v1.sys_sample_code		dt_sample.parent_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.	Parent_sample_code is required where sample_type_code=BD, FD, FR, FS, LR, SD, SPD, RD, or MSD.
sample_date	DateTime		Y				dt_sample.sample_date	The date and time sample was collected (in MM/DD/YYYY HH:MM:SS format)	
sys_loc_code	Text(20)				Location_v1.sys_loc_code		dt_sample.sys_loc_code	The unique identifier of the location at which the sample was collected. Must be	

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
								a valid code for the facility and reported value in the sys_loc_code field of the Location section.	
start_depth	Numeric						dt_sample.start_depth	The beginning depth (top) of the sample below ground surface. Leave null for most ground water samples from monitoring wells, as the database will derive this information from the start/end depth of the well screen field located in another data table. Only enter as value for groundwater samples if discrete samples are taken at different depth elevations from a single well (i.e. multiple well packer samples).	
end_depth	Numeric						dt_sample.end_depth	The end depth (bottom) of sample below ground surface. Leave null for most ground water samples from monitoring wells, as the database will derive this information from the start/end depth of the well screen field located in another data table. Only enter as value for groundwater samples if discrete samples are taken at different depth elevations from a single well, i.e. multiple well packer samples.	
depth_unit	Text(15)					rt_unit.unit_code	dt_sample.depth_unit	Unit of measurement for the sample begin and end depths	
sampler	Text(100)						dt_field_sample.sampler	The name or initials of the sampler.	
sampling_company_code	Text(40)		Y			rt_company.company_code	rt_company.company_name dt_field_sample.sampling_company_code	The unique identifier of the sampling company.	
sampling_reason	Text(30)						dt_field_sample.sampling_reason	The reason for the sampling event.	
sample_method	Text(40)		Y			rt_sample_method.method_code	dt_sample.sample_method	The method of sample collection.	
task_code	Text(40)		Y				dt_task.task_code dt_sample.task_code	The unique identifier of the task under which the field sample was collected.	
collection_quarter	Text(5)						dt_field_sample.collection_quarter	Enter the quarter of the year for samples collected (i.e. Q1, Q2, Q3, or Q4).	
composite_yn	Text(1)		Y	N		(Enumeration: yes_no_values)	dt_field_sample.composite_yn	Y" if the sample is a composite sample, "N" if not.	
composite_desc	Text(255)						dt_field_sample.composite_desc	The description of composite sample (if composite_yn is "Yes"). Example: "Composite sample from soil stock pile." or "Composite sample from individual samples SB-001, SB-005, and SB-009."	
sample_class	Text(10)						dt_sample.sample_class	The class code for the sample type: NF - Normal Field Sample, FQ - Field Quality Control Sample, or LQ - Lab Quality Control Sample.	
chain_of_custody	Text(40)						dt_chain_of_custody.chain_of_custody dt_field_sample.chain_of_custody	The chain of custody identifier. A single sample may be assigned to only one chain of custody.	

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
sent_to_lab_date	DateTime						dt_field_sample.sent_to_lab_date	The date and time that the sample was sent to the laboratory.	
sample_receipt_date	DateTime						dt_field_sample.sample_receipt_date	The date and time that the sample was received by the laboratory.	
sample_delivery_group	Text(20)						dt_SDG.sdg_name dt_field_sample.field_sdg	The laboratory sample delivery group or work order.	
custom_field_1	Text(255)						dt_sample.custom_field_1	A custom field.	
custom_field_2	Text(255)						dt_sample.custom_field_2	A custom field.	
custom_field_3	Text(255)						dt_sample.custom_field_3	A custom field.	
custom_field_4	Text(255)						dt_sample.custom_field_4	A custom field.	
custom_field_5	Text(255)						dt_sample.custom_field_5	A custom field.	
remark	Text(2000)						dt_sample.remark dt_field_sample.remark	Any additional information pertaining to the sample.	
Method Mappings									
				CompanyType_SUBCONTRACTOR			rt_company.company_type		
				CompanyType_SUBCONTRACTOR			rt_company.company_type		
				MatrixClass_FIELD			rt_matrix.matrix_class		

8.27 TestResultQC_v1

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
sys_sample_code	Text(40)	PK	Y		Sample_v1.sys_sample_code			The unique identifier of the sample.	Samples with more than one result with the same cas_rn cannot have reportable_result='Yes'.
lab_anl_method_name	Text(35)	PK	Y			rt_analytic_method.analytic_method	dt_test.analytic_method	The laboratory analytical method name or description, for example "SW8260B", "E130.1", etc.	Samples with more than one result with the same cas_rn cannot have reportable_result='Yes'.
analysis_date	DateTime	PK	Y				dt_test.analysis_date	The date and time of sample analysis in "MM/DD/YYYY HH:MM:SS" format. May refer to either beginning or end of the analysis as required.	Date cannot precede sample_date.
fraction	Text(10)	PK	Y			rt_fraction.fraction	dt_test.fraction	Please refer to reference values file. Examples of valid values include: “Dissolved”, “Filterable”, “TCLP” and “SPLP.”	Samples with more than one result with the same cas_rn cannot have reportable_result='Yes'.
column_number	Text(2)	PK	Y	NA		(Enumeration: column_number)	dt_test.column_number	Values include either "1C" for first column analyses, "2C" for second column analyses or "NA" for tests for which this distinction is not applicable.	
test_type	Text(10)	PK	Y	INITIAL		rt_test_type.test_type	dt_test.test_type	The type of test. Valid values include "INITIAL", "REEXTRACT1", "REEXTRACT2", "REEXTRACT3", "REANALYSIS", "DILUTION1", "DILUTIONS2", and "DILUTIONS3".	

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
lab_matrix_code	Text(10)		Y			rt_matrix.matrix_code	rt_matrix.matrix_desc dt_test.lab_matrix_code	The code which distinguishes between different type of sample matrix. For example, soil samples must be distinguished from ground water samples, etc. The matrix of the sample as analyzed may be different from the matrix of the sample as retrieved (e.g. leachates), so this field is available at both the sample and test level.	If analysis_location does not equal 'FI', then lab_name_code, qc_level, lab_sample_id, lab_matrix_code and dilution_factor are required.
analysis_location	Text(2)		Y			(Enumeration: analysis_location)	dt_test.analysis_location	Must be either "FI" for field instrument or probe, "FL" for mobile field laboratory analysis, or "LB" for fixed_based laboratory analysis.	If analysis_location does not equal 'FI', then lab_name_code, qc_level, lab_sample_id, lab_matrix_code and dilution_factor are required.
basis	Text(3)		Y	NA		(Enumeration: basis)	dt_test.basis	Denotes reporting basis. Must be either "Dry" for dry_weight basis reporting, or "NA" for tests for which this distinction is not applicable.	
container_id	Text(30)						dt_test.container_id	Laboratories can report individual container IDs for samples that are in multiple containers. Only one container ID can be provided per analytical method code.	
dilution_factor	Numeric		Y				dt_test.dilution_factor	The effective test dilution factor, for example "5", "10", "50". If no dilution, enter "1".	If analysis_location does not equal 'FI', then lab_name_code, qc_level, lab_sample_id, lab_matrix_code and dilution_factor are required.
prep_method	Text(20)					rt_prep_method.prep_method	dt_test.prep_method	The sample preparation method name or description.	
prep_date	DateTime						dt_test.prep_date	The beginning date and time of sample preparation in MM/DD/YYYY HH:MM:SS format.	Date cannot precede sample_date.
leachate_method	Text(15)						dt_test.leachate_method	The leachate generation method name or description. The method name should be sufficient to reflect operation of the laboratory.	
leachate_date	DateTime						dt_test.leachate_date	The beginning date and time of leachate preparation in MM/DD/YYYY HH:MM:SS format.	Date cannot precede sample_date.
lab_name_code	Text(20)		Y			rt_company.company_code	rt_company.company_name dt_test.lab_name_code	The unique identifier of the laboratory.	If analysis_location does not equal 'FI', then lab_name_code, qc_level, lab_sample_id, lab_matrix_code and dilution_factor are required.
qc_level	Text(6)		Y			(Enumeration: qc_level)	dt_test.qc_level	The analysis type. For screening analysis input "SCREEN" ; for quantitaive analysis input "QUANT".	If analysis_location does not equal 'FI', then lab_name_code, qc_level, lab_sample_id, lab_matrix_code and dilution_factor are required.
lab_sample_id	Text(40)		Y				dt_test.lab_sample_id	The LIMS sample identifier. If necessary, a field sample may have more than one LIMS lab_sample_id (maximum one per each test event)	If analysis_location does not equal 'FI', then lab_name_code, qc_level, lab_sample_id, lab_matrix_code and dilution_factor are required.
percent_moisture	Text(5)						dt_test.percent_moisture	The numeric percentage of moisture in the sample portion used in this test, from 0 to 100. This value may vary from test to test for any sample. Can include decimals. Do not enter a % symbol.	
subsample_amount	Text(14)						dt_test.subsample_amount	The amount of the sample used for the analysis.	
subsample_amount_unit	Text(15)					rt_unit.unit_code	dt_test.subsample_amount_unit	The unit of measure of the subsample amount.	
analyst_name	Text(30)						dt_test.analyst_name	The name or initials of the laboratory technician conducting the analysis.	

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
instrument_id	Text(50)						dt_test.instrument_id	The ID or name of the instrument used to conduct the analysis.	
remark	Text(255)						dt_test.remark	Any additional information about the test.	
preservative	Text(20)					rt_preservative.preservative	dt_test.preservative	The sample preservative used.	
final_volume	Numeric						dt_test.final_volume	The final volume of the sample after sample preparation. Include all dilution factors.	
final_volume_unit	Text(15)					rt_unit.unit_code	dt_test.final_volume_unit	The unit of measure of the final sample volume.	
cas_rn	Text(15)	PK	Y			rt_analyte.cas_rn	rt_analyte.cas_rn dt_result.cas_rn dt_result_qc.cas_rn	The unique identifier of the analyte being measured.	Samples with more than one result with the same cas_rn cannot have reportable_result='Yes'. Populate chemical_name when cas_rn is changed
chemical_name	Text(75)		Y			rt_analyte.chemical_name	rt_analyte.chemical_name dt_result.custom_field_1	The name of the analyte being measured.	Populate chemical_name when cas_rn is changed
result_value	Numeric						dt_result.result_text dt_result.result_numeric	The measured value of the analyte in appropriate significant digits. May be null for non-detects only.	If result_value is populated then result_unit is required. If detect_flag='Y' and result_type_code='TRG' or 'TIC' then result_value is required. If detect_flag='N' then result_value should be null.
result_error_delta	Text(20)						dt_result.result_error_delta	The error range applicable to the result value; typically used only for radiochemistry results.	
result_type_code	Text(10)		Y	TRG		rt_result_type.result_type_code	dt_result.result_type_code	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.	If result_type_code='TIC' then tic_retention_time is required. If detect_flag='Y' and result_type_code='TRG' or 'TIC' then result_value is required. If detect_flag='N' and result_type_code='SC', 'TRG' or 'TIC' then reporting_detection_limit is required.
reportable_result	Text(3)		Y	Yes		(Enumeration: reportable_result)	dt_result.reportable_result	Must be either "Yes" for results which are considered to be reportable, or "No" for other results. This field has many purposes. For example, it can be used to distinguish between multiple results where a sample is retested after dilution. It can also be used to indicate which of the first or second column result should be considered primary. The proper value of this field in both of these two examples should be provided by the laboratory (only one result should be flagged as reportable).	Samples with more than one result with the same cas_rn cannot have reportable_result='Yes'.
detect_flag	Text(2)		Y	Y		(Enumeration: detect_flag)	dt_result.detect_flag	May be either "Y" for detected analytes or "N" for non_detects or "TR" for trace. Use "Y" for estimated values (above detection limit but below the quantitation limit).	If detect_flag='Y' and result_type_code='TRG' or 'TIC' then result_value is required.

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
									If detect_flag='N' and result_type_code='SC', 'TRG' or 'TIC' then reporting_detection_limit is required. If detect_flag='N' then result_value should be null.
lab_qualifiers	Text(10)						dt_result.lab_qualifiers	Qualifier flags assigned by the laboratory.	Interpreted_qualifiers is required if validator_qualifiers is populated or if lab_qualifiers is populated, validator_qualifier is null and validated_yn='N'. If lab_qualifiers is populated and interpreted_qualifiers is populated and validated_yn='Y' then validator_qualifiers is required.
validator_qualifiers	Text(10)						dt_result.validator_qualifiers	Qualifier flags assigned by the validator.	Interpreted_qualifiers is required if validator_qualifiers is populated or if lab_qualifiers is populated, validator_qualifier is null and validated_yn='N'. If lab_qualifiers is populated and interpreted_qualifiers is populated and validated_yn='Y' then validator_qualifiers is required.
interpreted_qualifiers	Text(10)					rt_qualifier.qualifier	dt_result.interpreted_qualifiers	Final qualifier flags assigned by the validator, for example, if the validator adds a "J" flag to a sample result that is laboratory qualified as "D", "DJ" would be the value entered. DEQ may adjust the interpreted qualifier as part of their review.	Interpreted_qualifiers is required if validator_qualifiers is populated or if lab_qualifiers is populated, validator_qualifier is null and validated_yn='N'. If lab_qualifiers is populated and interpreted_qualifiers is populated and validated_yn='Y' then validator_qualifiers is required.
validated_yn	Text(1)		Y	N		(Enumeration: yes_no_values)	dt_result.validated_yn	Y" if the result has been validated, "N" if not.	If validated_yn='Y' then validation_level is required. Interpreted_qualifiers is required if validator_qualifiers is populated or if lab_qualifiers is populated, validator_qualifier is null and validated_yn='N'. If lab_qualifiers is populated and interpreted_qualifiers is populated and validated_yn='Y' then validator_qualifiers is required.
method_detection_limit	Text(20)						dt_result.method_detection_limit	The lowest concentration that can be detected by an instrument with correction for the effects of sample matrix and method-specific parameters such as sample preparation. Method detection limits (MDLs) are explicitly determined as set forth in 40 CFR Part 136. They are defined as three times the standard deviation of replicate spiked analyses. This represents 99% confidence that the analyte concentration is greater than zero. The organic methods in the EPA 500 series, EPA 600 series, and Standard Methods all give typical MDLs for clean water samples. Generally these clean-water MDLs	If method_detection_limit, reporting_detection_limit, or quantitation_limit is populated then detection_limit_unit is required.

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
								(corrected for %moisture, sample size, and dilution) are used for reporting limits, but the laboratory may use MDLs that they have generated. MDLs generated by the laboratory using the sample matrix of interest are the most reliable. If the clean-water MDLs are used, remember that they do not include all of the upward correction necessary to account for the effects of sample matrix. This is important to remember especially for risk assessments and highly contaminated samples.	
reporting_detection_limit	Numeric						dt_result.reporting_detection_limit	The concentration level above which results can be quantified with confidence. It must reflect conditions such as dilution factors and moisture content. Required for all results for which such a limit is appropriate. The reporting_detection_limit column must be reported as the sample-specific detection limit.	Reporting_detection_limit cannot be negative unless one of the radiological fields (minimum_detectable_conc, counting_error, uncertainty, critical_value) are populated. If method_detection_limit, reporting_detection_limit, or quantitation_limit is populated then detection_limit_unit is required. If detect_flag='N' and result_type_code='SC', 'TRG' or 'TIC' then reporting_detection_limit is required.
quantitation_limit	Text(20)						dt_result.quantitation_limit	The quantitation limit refers to a minimum concentration of an analyte that can be measured within specified limits of precision and accuracy. It is generally 5-10 times the detection limit. Thus, when quantitation limits are used as reporting limits, the laboratory is saying that the analyte is not present in a sufficient amount to be reliably quantified (i.e. at a concentration above the quantitation limit). It may be present and even positively identified or "seen" at a lower concentration.	If method_detection_limit, reporting_detection_limit, or quantitation_limit is populated then detection_limit_unit is required.
result_unit	Text(15)					rt_unit.unit_code	dt_result.result_unit	The unit of measurement of the result value.	If result_value is populated then result_unit is required.
detection_limit_unit	Text(15)					rt_unit.unit_code	dt_result.detection_limit_unit	The unit of measurement of the the detection limit(s). This field is required if a reporting_detection_limit is reported.	If method_detection_limit, reporting_detection_limit, or quantitation_limit is populated then detection_limit_unit is required.
tic_retention_time	Text(8)						dt_result.tic_retention_time	The retention time, in seconds, for tentatively identified compounds.	If result_type_code='TIC' then tic_retention_time is required.
minimum_detectable_conc	Numeric						dt_result.minimum_detectable_conc	For radiological results: Minimum detectable concentration or activity. This value must be in the same units as the result_value.	Reporting_detection_limit cannot be negative unless one of the radiological fields (minimum_detectable_conc, counting_error, uncertainty, critical_value) are populated.
counting_error	Numeric						dt_result.counting_error	For radiological results: Counting error as reported by the laboratory. This value must be in the same units as the result_value.	Reporting_detection_limit cannot be negative unless one of the radiological fields (minimum_detectable_conc, counting_error, uncertainty, critical_value) are populated.

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
									If counting_error is populated then uncertainty is required.
uncertainty	Text(7)					(Enumeration: uncertainty)	dt_result.uncertainty	For radiological results: The uncertainty of the counting error, valid values include "1 sigma" or "2 sigma". This field is required if the counting_error field is populated.	Reporting_detection_limit cannot be negative unless one of the radiological fields (minimum_detectable_conc, counting_error, uncertainty, critical_value) are populated. If counting_error is populated then uncertainty is required.
critical_value	Numeric						dt_result.critical_value	For radiological results: The critical value.	Reporting_detection_limit cannot be negative unless one of the radiological fields (minimum_detectable_conc, counting_error, uncertainty, critical_value) are populated.
validation_level	Text(10)					(Enumeration: validation_level)	dt_result.custom_field_2	Validation level. Use one of the following: Raw, DUSR, Category A, Category B, or Unknown.	If validated_yn='Y' then validation_level is required.
custom_field_3	Text(255)						dt_result.custom_field_3	A custom field.	
custom_field_4	Text(255)						dt_result.custom_field_4	A custom field.	
custom_field_5	Text(255)						dt_result.custom_field_5	A custom field.	
result_remark	Text(255)						dt_result.remark	Any additional information about the result.	
qc_original_conc	Numeric						dt_result_qc.qc_original_conc	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	Numeric						dt_result_qc.qc_spike_added	The concentration of the analyte added to the original sample. Might be required for spikes, spike duplicates, surrogate compounds, LCS and any spiked sample (depending on user needs).	
qc_spike_measured	Numeric						dt_result_qc.qc_spike_measured	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 and any spiked sample (depending on user needs).	
qc_spike_recovery	Numeric						dt_result_qc.qc_spike_recovery	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	Numeric						dt_result_qc.qc_dup_original_conc	The concentration of the analyte in the original (unspiked) sample. Might 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	Numeric						dt_result_qc.qc_dup_spike_added	The concentration of the analyte added to the original sample. Might be required for spike or LCS duplicates, surrogate compounds, and any spiked and duplicated sample (depending on user needs). Use zero for spiked	

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
								compounds that were not detected in the sample. Required for spikes, spike duplicates, surrogate compounds, LCS and any spiked sample. Also complete the qc-spike-added field.	
qc_dup_spike_measured	Numeric						dt_result_qc.qc_dup_spike_measured	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 (depending on user needs). Also complete the qc-spike-measured field.	
qc_dup_spike_recovery	Numeric						dt_result_qc.qc_dup_spike_recovery	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. Also complete the qc-spike-recovery field. Report as percentage multiplied by 100 (e.g., report "120%" as "120").	
qc_rpd	Text(8)						dt_result_qc.qc_rpd	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)						dt_result_qc.qc_spike_lcl	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)						dt_result_qc.qc_spike_ucl	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 "60%" as "60").	
qc_rpd_cl	Text(8)						dt_result_qc.qc_rpd_cl	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(1)					(Enumeration: spike_status)	dt_result_qc.qc_spike_status	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(1)					(Enumeration: spike_status)	dt_result_qc.qc_dup_spike_status	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(1)					(Enumeration: spike_status)	dt_result_qc.qc_rpd_status	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.	
lab_sdg	Text(20)		Y				dt_sdg.sdg_name dt_test.lab_sdg	The unique identifier of the sample delivery group (SDG) or work order. A single sample may be assigned to multiple SDGs based on different analysis.	
Method Mappings									

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
				CompanyType_SUBCONTRACTOR			rt_company.company_type		
				GetSampleId			dt_test.sample_id		
				GetTestID			dt_result.test_id		
				GetTestID			dt_result_qc.test_id		

8.28 Batch_v1

Field Name	Data Type	Key	Required	Default	Parent	Lookup	Database Mapping(s)	Comment	Checks
sys_sample_code	Text(40)	PK	Y					The unique identifier of the sample.	
lab_anl_method_name	Text(35)	PK	Y			rt_analytic_method.analytic_method		The laboratory analytical method name or description, for example "SW8260B", "E130.1", etc.	
analysis_date	DateTime	PK	Y					The date and time of sample analysis in "MM/DD/YYYY HH:MM:SS" format. May refer to either beginning or end of the analysis as required.	
fraction	Text(10)	PK	Y			rt_fraction.fraction		Please refer to reference values file. Examples of valid values include: “Dissolved”, “Filterable”, “TCLP” and “SPLP.”	
column_number	Text(2)	PK	Y					Values include either "1C" for first column analyses, "2C" for second column analyses or "NA" for tests for which this distinction is not applicable.	
test_type	Text(10)	PK	Y	INITIAL		rt_test_type.test_type		The type of test. Valid values include "INITIAL", "REEXTRACT1", "REEXTRACT2", "REEXTRACT3", "REANALYSIS", "DILUTION1", "DILUTIONS2", and "DILUTIONS3".	
test_batch_type	Text(10)	PK	Y			rt_test_batch_type.test_batch_type	rt_test_batch_type.test_batch_desc dt_test_batch.test_batch_type at_test_batch_assign.test_batch_type	The analysis batch type. Valid values include "Prep", "Analysis", "Leach", and "Run". This is a required field for all batches.	
test_batch_id	Text(20)		Y				dt_test_batch.test_batch_id at_test_batch_assign.test_batch_id	The unique identifier of the analysis batch.	
Section Checks									
Parent record must exist in the TestResultQC section.									
Method Mappings									
				GetTestID			at_test_batch_assign.test_id		

9 Appendix B: Final Checklist for Submissions of EDDs to Montana EQuIS

In order to reduce the amount of resubmittals, e-mails, and phone calls required to obtain the correct information in EDD's, this checklist was created in attempt to clearly state what data is necessary for the data providers to submit in an EDD submittal.

9.1 Initial EDD Section

9.1.1 Subfacility_v1

- Be sure to include subfacility address information that references key parcel information for operable units and areas of concern.

9.1.2 Location_v1

- Locations for field and laboratory quality samples should not be present in the Location_v1 tab. For example, trip blanks, and equipment blanks do not require a sys_loc_code in the Sample_v1 EDD section and therefore shouldn't have a sys_loc_code designated on the Location_v1 tab.
- No special characters, with the exception of the hyphen (-) or underscore (_) are to be used in the sys_loc_code. For example, $, #, ', ", / are not acceptable. The x- and y- coordinates should have as many digits as available in order to output the sample location properly using ArcGIS.
- Confirm horizontal collection method code, horizontal accuracy value, horizontal accuracy unit, and horizontal datum codes are all populated correctly and consistently per valid values in the database.
- The horizontal_accuracy_value should be numeric. The EDP format states the following values:
  - "Accuracy range (+/-) of the latitude and longitude. Use '0.1' for professional survey, '100' for site centroid, and '10' for all other methods."
- For samples from which the elevation was collected, confirm elevation collection method code, elevation accuracy value, elevation accuracy unit, and elevation datum codes are all populated correctly and consistently per valid values in the database.
- The elevation_accuracy_value should be numeric. The EDP contains the following guidance:
  - "Accuracy range (+/-) of the ground elevation. Use '0.1' for professional survey, '1' for all other methods."
- The Subcontractor_Name_Code should contain the code of the surveying company who collected the coordinates and elevation data. Company codes are available in rt_company table and can be added to the database per request to MontanaEQuIS@mt.gov.
- Any soil boring location type should have the total_depth field populated.
- Any well location type is required to populate the Well_v1 and WellConstruction_v1 EDD sections with all required fields in the EDD Manual. This includes: depth_to_top_of_screen, depth_to_bottom_of_screen, top_casing_elev, datum_value, datum_unit, step_or_linear, datum_collect_method_code and datum_desc fields.
- Although not required by EDP also populate the following columns: loc_county_code, loc_state_code, loc_basin_code, loc_minor_basin, remark, and, MT_drainage_basin_code.
- Source scale, verification point, and reference point fields are required if coordinates were generated from an existing map or surveyed in the field using a benchmark survey.

9.2 Lab EDD Section

9.2.1 Sample_v1

- Sample matrix codes should be populated with appropriate valid values based on sample_type_code and sample_source. Please see rt_matrix for more information on matrices.
- Confirm that sample type codes correspond to the sample source. For example sample type of N, FB, FD, RB, EB, and TB would have a sample source of “FIELD” if generated by the field sampling team and submitted with field sample results.
- Confirm that all laboratory QC samples (sample_type_codes IB, LCS, PE, BD, BS, KD, LB, LR, MS, MSD, RM, and SD, SPD, RD or MSD) have a sample source of “LAB.
- The sample_type_class in rt_sample_type indicates the sample_source: FQ = FIELD, LQ= LAB.
- Confirm MS, MSD, FD, FR, SD, BD, FS, and LR sample types have parent sample codes. The table rt_sample_type contains a column “needs_parent_sample” for your reference. Soil matrix samples and groundwater samples (if available) should have start depths, end depths, and depth units populated.
- The composite_yn field needs to be flagged as “Y” for composite samples.
- Although not required by EDP also populate the following columns provided you have the information: sampler, sampling reason, sampling technique, and collection quarter.

9.2.2 TestResultsQC_v1

- Confirm that the fraction column is populated with Total, Dissolved, SPLP, TCLP, or NA (Not Applicable) as appropriate.
- Confirm that column number is populated with a default value of NA if multiple columns are not used in the analyses. Use 1C and 2C for column numbers to differentiate the results if two columns were used.
- Test type is populated correctly per rt_test_type.
- Where the test type is “DILUTION#”, “REEXTRACT#”, or “REANALYSIS”, confirm that only one test type’s results are flagged Reportable Result “Yes”. All other test types shall be Reportable Result “No”.
- Lab matrix code is populated correctly.
- Confirm that analysis location is populated with LB for lab or FI for field. Typically, the analysis location is lab for TestResultsQC_v1 and field for FieldResults_v1.
- Confirm that the basis is populated with either Dry, or NA (Not Applicable).
- Confirm that dilution factors are present for all samples. Please use a dilution factor of 1 for samples not diluted.
- Confirm the lab name code is populated with valid values from the rt_company table.
- Confirm that the qc_level column is populated with either “QUANT” for quantifiable or “SCREEN” for screening level results.
- Confirm that the lab sample id column is populated consistently.
- Confirm CAS numbers match values in the valid value list of rt_analyte and that chemical names are spelled correctly.
- Confirm that the result value column is not populated where detect flag is set to No.
- Confirm that the result value column is populated where the detect flag is set to Y for the result_type_codes TRG and TIC. Verify that the result_unit is populated where the result value is populated.
- Confirm that reportable result (Yes/No) column is populated consistently to identify which results should be reported when samples are reanalyzed or diluted.
- Confirm the detect Y/N flag is correctly set to N where the interpreted qualifier contains “U”. Otherwise, the detect Y/N should be set to Y and a value should be present in the result value column.
- Confirm that lab qualifiers and validator qualifiers (For Validated Y) are populated consistently. Confirm that reporting_detection_limit is consistently populated for samples flagged detect N. Verify that the detect_limit_unit is also populated. Confirm that the validation level is populated with “RAW”, “DUSR”, “CATEGORY A”, “CATEGORY B”, or “UNKNOWN” for results flagged validated Y.

- Confirm that the qc sections are populated for the result_type_codes SC and SUR. Confirm that the TIC retention time is populated when reporting TICs