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**Tank Characterization Database
(TCD)**

Data Dictionary - Version 4.0

April 1996

Prepared for the U.S. Department of Energy
under Contract DE-AC06-76RLO 1830

Pacific Northwest National Laboratory
Operated for the U.S. Department of Energy
by Battelle



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Pacific Northwest National Laboratory
Richland, Washington 99352

Introduction

This document is the Data Dictionary for the Tank Characterization Database (TCD) system, and contains information on the data model and SYBASE® database structure. The first two parts of this document are subject areas that are based on the two different areas of the TCD database: Sample Analysis and Waste Inventory. Within each subject area is an alphabetical list of all the database tables contained in the subject area. Within each table definition is a brief description of the table and a list of field names and attributes. Primary key fields are designated in each table with a "p"; alternate key fields are designated with an "a".

The third part, Field Descriptions, lists all field names in the database alphabetically, showing the format, size, a brief description of each field, and a list of the tables it is used in.

The fourth and final part, the Relational Model, presents diagrams that illustrate the database structure.

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TCD Data Dictionary

Sample Analysis Data

TCD Data Dictionary

Sample Analysis Data

Laboratory Sample Analysis data comprises the major volume of data in the TCD. There are three main sources of laboratory data:

- **Data from single-shell and double-shell tank core samples** - Core sampling analytical results include physical properties, radionuclides, major chemicals, and hazardous components. Waste analyses from single- and double-shell tank cores provide data to support resolution of data quality objectives for safe storage, retrieval, disposal, and closure planning, to satisfy State disposal permit application requirements and provide analytical acceptance criteria for storage and treatment of wastes.
- **Data from waste tank surface samples** - Surface solids are removed from the waste tanks and analyzed to provide additional characterization of tank contents. The primary method for removing the surface samples is via auger sampling, although a few surface samples are obtained from sludge weight sampling or scraping debris from instruments removed from the tanks.
- **Data from waste tank supernatant samples** - Supernatant samples are used to verify process knowledge and confirm Resource Conservation and Recovery Act (RCRA) waste designation. Samples are collected from the appropriate tanks, characterized, and evaluated. Laboratory characterization results are also used in design and safety analysis for pretreatment.

Database Tables**analysis_method**

(TWINS refers to this table as: Analysis Methods List)

Contains a description of all the analysis methods currently in use by the laboratories or analysts.

Field Name	Data Type	Size	Key Field
analysis_class	char	10	
analysis_method_id	char	10	p
analysis_procedure	char	20	
description	varchar	255	
lab_code	char	6	
method_group_id	varchar	30	
method_name	varchar	30	
preparation_procedure	char	20	

analysis_method_group

(TWINS refers to this table as: Analysis Method Group)

Provides the description for analysis method group codes.

Field Name	Data Type	Size	Key Field
description	varchar	255	
method_group_id	varchar	30	

change_action

(TWINS refers to this table as: Change Actions List)

Contains a list of the valid changes that can be or were performed on the analysis results or constituent inventory tables.

Field Name	Data Type	Size	Key Field
change_action	char	8	p
description	varchar	255	

con_analysis_method_group

(TWINS refers to this table as: Con Analysis Method Group)

Cross-reference between the constituent and the groups of analysis methods that are associated with it

Field Name	Data Type	Size	Key Field
con_id	char	15	p
method_group_id	varchar	30	

constituent

(TWINS refers to this table as: Constituents List)

This table contains a list of CAS numbers and the corresponding constituent or analyte abbreviations and molecular formulas. Some valid constituents have no assigned CAS numbers, and these are included as well.

Field Name	Data Type	Size	Key Field
alpha_beta_gamma_emitter	char	5	
comment	varchar	255	
con_id	char	15	p
con_name	varchar	60	
con_type	char	15	
half_life	float	8	
half_life_units	char	10	
heat_load_factor	float	8	
molecular_formula	varchar	50	
molecular_weight	float	8	
preferred_method_group_id	varchar	30	

laboratory

(TWINS refers to this table as: Laboratory List)

Contains detailed information about laboratories at the sites, i.e., Hanford, INEL and SRS, which perform analyses of samples.

Field Name	Data Type	Size	Key Field
address	varchar	50	
city	varchar	30	
contact_name	char	25	
lab_code	char	6	p
lab_name	char	25	
phone_num	char	25	
state	char	2	
zip_code	char	10	

sample_description

(TWINS refers to this table as: Sample Description)

Contains descriptive data about each sample consolidated into a single entry, regardless of whether supernates, surface or core samples.

Field Name	Data Type	Size	Key Field
access_level	tinyint	1	
agg_level	char	20	
description	varchar	255	
device_type	varchar	30	
doc_loc	varchar	150	
lab_received_date	datetime	8	
physical_state	char	6	
qa_type	char	20	
samp_num	char	12	p
sample_date_time	datetime	8	
sample_level	int	4	

Sample Description (contd)

Field Name	Data Type	Size	Key Field
sample_level_units	char	10	
sample_type	varchar	30	
sampling_begin_date	datetime	8	
sampling_end_date	datetime	8	
sampling_event_name	char	20	
segment_name	number	20	
subdivision_id	char	20	
tank_riser	char	12	
waste_site_id	char	15	p

source_sample

(TWINS refers to this table as: Samples and Sources)

Contains descriptive data about all samples and the waste site samples to which they relate, consolidated into a single table, regardless of whether supernates, surface or core samples.

Field Name	Data Type	Size	Key Field
access_level	tinyint	1	
agg_level	char	20	
comp_name	char	20	
description	varchar	255	
device_type	varchar	30	
doc_loc	varchar	150	
lab_received_date	datetime	8	
physical_state	char	6	
qa_type	char	20	
samp_num	char	12	p
sample_date_time	datetime	8	
sample_level	int	4	
sample_level_units	char	10	

Samples and Sources (contd)

Field Name	Data Type	Size	Key Field
sample_type	varchar	30	
sampling_begin_date	datetime	8	
sampling_end_date	datetime	8	
sampling_event_id	char	12	
segment_id	char	12	
source_samp_num	char	12	p
subdivision_id	char	20	
tank_riser	char	12	
waste_site_id	char	15	p

units

(TWINS refers to this table as: Units of Measure)

Descriptions of the different units of measure.

Field Name	Data Type	Size	Key Field
description	varchar	255	
units	char	10	p

v_analysis_result

(TWINS refers to this table as: Sample Results (w/QA))

Contains the analytical values obtained from laboratory analyses on samples for specific constituents, analytes or other information found from laboratory analysis.

Field Name	Data Type	Size	Key Field
access_level	tinyint	1	
analysis_date_time	datetime	8	a
analysis_method_id	char	10	a
analysis_result_id	int	4	
change_indicator	char	1	

Sample Results (w/QA) (contd)

Field Name	Data Type	Size	Key Field
comment	varchar	255	
con_id	char	15	a
lab_code	char	6	a
last_modified_date_time	datetime	8	
load_date_time	datetime	8	
qualifiers	char	6	
result_type	char	20	a
rpt_value	float	8	
rpt_value_units	char	10	
samp_num	char	12	a
sample_dilution_key	tinyint	1	
std_value	float	8	
std_value_units	char	10	
uncertainty_value	float	8	
uncertainty_value_units	char	10	
validation_status	varchar	30	
verification_process	varchar	30	

v_analysis_result_change

(TWINS refers to this table as: Sample Result Changes)

Keeps track of data that has been modified or deleted from the analysis results table.

Field Name	Data Type	Size	Key Field
access_level	tinyint	1	
analysis_date_time	datetime	8	a
analysis_method_id	char	10	a
analysis_result_id	int	4	
change_action	char	8	
change_date_time	datetime	8	
change_indicator	char	1	
change_reason	varchar	255	

Sample Result Changes (contd)

Field Name	Data Type	Size	Key Field
change_user_name	char	8	
comment	varchar	255	
con_id	char	15	a
lab_code	char	6	a
last_modified_date_time	datetime	8	
load_date_time	datetime	8	
qualifiers	char	6	
result_type	char	20	a
rpt_value	float	8	
rpt_value_units	char	10	
samp_num	char	12	a
sample_dilution_key	tinyint	1	
std_value	float	8	
std_value_units	char	10	
uncertainty_value	float	8	
uncertainty_value_units	char	10	
validation_status	varchar	30	
verification_process	varchar	30	

v_sample

(TWINS refers to this table as: Samples)

Contains general information about the core, supernate, surface or other samples taken from a waste site, including when the sampling took place and laboratory-generated information.

Field Name	Data Type	Size	Key Field
access_level	tinyint	1	
agg_level	char	20	
comment	varchar	255	
comp_name	char	20	

Samples (contd)

Field Name	Data Type	Size	Key Field
description	varchar	255	
doc_loc	varchar	150	
lab_received_date	datetime	8	
last_modified_date_time	datetime	8	
load_date_time	datetime	8	
log_id	char	20	p
log_page	char	10	
parent_table	varchar	30	
physical_state	char	6	
qa_type	char	20	
reporting_day	char	15	
samp_date_time	datetime	8	
samp_num	char	12	p
sampler	char	20	
subdivision_id	char	20	

v_sample_analysis

(TWINS refers to this table as: Sample Analyses)

Contains detailed information about the analysis performed on a particular sample, including analysis method, preparation type, and dilution factor.

Field Name	Data Type	Size	Key Field
access_level	tinyint	1	
analysis_method_id	char	10	p
analyst	char	20	
batch_id	char	20	p
comment	varchar	255	
dilut_factor	float	8	
doc_loc	varchar	150	

Sample Analyses (contd)

Field Name	Data Type	Size	Key Field
file_id	varchar	255	p
lab_code	char	6	
lab_samp_id	char	12	p
last_modified_date_time	datetime	8	
load_date_time	datetime	8	
samp_num	char	12	p
samp_prep_date_time	datetime	8	
sample_dilution_key	tinyint	1	p
secondary_samp_prep_type	char	20	

v_sample_relation

(TWINS refers to this table as: Related Samples)

Describes relationships between two samples. The first sample number corresponds to the sampling event while the second sample number pertains to the analysis performed.

Field Name	Data Type	Size	Key Field
access_level	tinyint	1	
last_modified_date_time	datetime	8	
load_date_time	datetime	8	
related_samp_num	char	12	p
samp_num	char	12	p

sample_event

(TWINS refers to this table as: Sampling Event)

Contains specific information pertaining to the core, supernate, or surface sampling event.

Field Name	Data Type	Size	Key Field
access_level	tinyint	1	
comment	varchar	255	
device_type	varchar	30	
sample_type	varchar	30	
sampling_begin_date	datetime	8	
sampling_end_date	datetime	8	
sampling_event_id	char	12	p
tank_riser	char	12	
waste_site_id	char	15	p

v_tank_core

(TWINS refers to this table as: Core Samples)

Contains information about the core sampling process that generates a set of core segments (see the core segment samples table for more information) taken from a waste tank.

Field Name	Data Type	Size	Key Field
access_level	tinyint	1	
sampling_event_id	char	12	p
serial_num	char	4	
waste_site_id	char	15	p

tank_core_segment

(TWINS refers to this table as: Core Segment Samples)

Contains data about the individual segments that make up a tank core. See the core sample table for more information.

Field Name	Data Type	Size	Key Field
access_level	tinyint	1	
appearance	varchar	255	
comment	varchar	255	
recovery_percent	tinyint	1	
samp_num	char	12	p
sample_level	int	4	
sample_level_units	char	10	
sampling_event_id	char	12	p
segment_id	char	12	
serial_num	char	7	
waste_site_id	char	15	p

v_tank_result

(TWINS refers to this table as: Tank Results (no QA))

Contains results of laboratory analyses on waste site samples, together with associated detection limit data and sample description data. This view is a join between the sample description, the sample analysis and the analysis result tables.

Field Name	Data Type	Size	Key Field
access_level	tinyint	1	
agg_level	char	20	
analysis_date_time	datetime	8	
analysis_method_id	char	10	a
analysis_result_id	char	4	
batch_id	char	20	
con_id	char	15	a
con_name	varchar	60	a

Tank Results (no QA) (contd)

Field Name	Data Type	Size	Key Field
description	varchar	255	
device_type	varchar	30	
dilut_factor	float	8	
doc_loc	varchar	150	
lab_code	char	6	
lab_received_date	datetime	8	
lab_samp_id	char	12	
method_group_id	varchar	30	
molecular_formula	varchar	50	
molecular_weight	float	8	
physical_state	char	6	
preferred_method_group_id	varchar	30	
qa_type	char	20	
qualifiers	char	6	
result_type	char	20	
rpt_value	float	8	
rpt_value_units	char	10	
samp_num	char	12	a
samp_prep_date_time	datetime	8	
sample_date_time	datetime	8	
sample_dilution_key	tinyint	1	
sample_level	int	4	
sample_level_units	char	10	
sample_type	varchar	30	
sampling_begin_date	datetime	8	
sampling_end_date	datetime	8	
sampling_event_name	char	20	
secondary_samp_prep_type	char	20	
segment_name	number	20	
std_value	float	8	

Tank Results (no QA) (contd)

Field Name	Data Type	Size	Key Field
std_value_units	char	10	
subdivision_id	char	20	
tank_riser	char	12	
uncertainty_value	float	8	
uncertainty_value_units	char	10	
waste_site_id	char	15	a

v_tank_supernate_sample

(TWINS refers to this table as: Supernate Samples)

Contains data about the supernate samples taken directly from the waste tanks.

Field Name	Data Type	Size	Key Field
access_level	tinyint	1	
appearance	varchar	255	
recovery_percent	tinyint	1	
samp_num	char	12	p
sample_level	int	4	
sample_level_units	char	10	
sampling_event_id	char	12	p
waste_site_id	char	15	p

v_tank_surface_sample

(TWINS refers to this table as: Surface Samples)

Contains data about the sampling process that generated a sample of surface solids from a waste site.

Field Name	Data Type	Size	Key Field
access_level	tinyint	1	
appearance	varchar	255	
recovery_percent	tinyint	1	
samp_num	char	12	p
sample_level	int	4	
sample_level_units	char	10	
sampling_event_id	char	12	
waste_site_id	char	15	a

v_waste_site

(TWINS refers to this table as: Waste Site Physical Char)

Contains information about the waste site construction, dates, elevation, type.

Field Name	Data Type	Size	Key Field
access_level	tinyint	1	
area_name	varchar	30	
construc_end_yr	int	4	
construc_start_yr	int	4	
in_service_month	number	2	
in_service_year	number	2	
operable_unit_name	varchar	30	
owner_id	char	8	
site_abbrev	char	4	p
waste_site_id	char	10	p
waste_site_set	char	3	
waste_site_type	char	3	
ws_elevation_ft	number	5	

TCD Data Dictionary

Waste Inventory Data

TCD Data Dictionary

Waste Inventory Data

Data from Waste Inventory estimates are estimates of tank inventories developed over the years based on simulation programs, historical process knowledge, and evaluation of laboratory analyses of tank samples. These estimates are tank safety and disposal requirements. The sources identified as the primary inventory estimates of record are Tank Characterization Reports (TCRs), Historical Tank Content Estimates (HTCEs), Safety Analysis Reports (SARs), and Track Radioactive Constituents (TRAC). These inventory data sources are of various qualities and are briefly described below.

- **TCRs** - The waste tank inventories contained in the TCRs represent the final result of the tank characterization process, which relies on many sources of information. Historical data in the form of process knowledge, effluent discharges, and waste tank transfers form an initial basis. The scope of historical data is rather narrowly defined. There were only a select type and number of processes used on the Hanford Site and, in most cases, a handful of processes contributed to the majority of the waste generated. The historical information is coupled with several general assumptions regarding the physical behavior of the slurries discharged to the tanks and the on-going processes occurring inside the tanks. The result of the historical review is a detailed estimate of the contents of each waste tank based on historical process information and detailed transaction records. Once the historical characterization estimates are presented in a TCR, the results of the sampling and analysis effort are summarized and interpreted both qualitatively and statistically. Several strategies, depending on the particular tank and its historical operations, are then used to arrive at a final estimate of the tank contents given the available historical and analytical data.
- **HTCEs** - An HTCE is an estimate of the contents of the waste tanks based on waste processing history and on waste transfer knowledge. The contents of the tanks have been estimated by creating a record of waste transfers called the waste status and transaction record summary. This transfer record was used to develop a model of the solids accumulated in the tank called the tank layering model. The tank layering model estimates the types of waste that have accumulated in each of the tanks as well as the volume of these wastes. By combining the tank layering model with a waste composition list called the defined waste document, the tank inventory estimate is created. HTCEs are based on previous data sources and model-based estimates, including TRAC, described below.
- **SARs** - The SAR data were extracted from appendices of the two documents, WHC-SD-WM-TI-543, Rev 1, and WHC-SD-WM-TI-565, Rev 1. The data provide estimated inventories in each double-shell and single-shell tank for which laboratory sample data were available. The most current laboratory analysis data were selected in an attempt to provide values which

would approximate the current tank contents. The concentration and inventory values may not be representative of the actual tank status for a number of reasons including the following:

1. The sample locations within the tanks were not used to qualify the data.
2. Use of the most current data may not reflect the present status of the tank waste.

Consequently, the estimated inventories must be viewed with caution when performing any accident analyses or making any decisions which might impact worker or public safety. In order to provide a bounding envelope for safety analysis purposes, the largest radionuclide concentration values were normally used when multiple analyses from the same sample were available. No information was available to evaluate the quality of this data due to its historic nature at the time the two reports referenced above were compiled.

- **TRAC** - The TRAC system estimates the amounts of selected radionuclides and stable chemicals in the total waste management system and how they are distributed among underground tanks. Input data are based upon historical records. Models of reactor, chemical process, and waste management operations were created. All computer codes except isotope generation and depletion were written within the scope of the project. These inventories are preliminary. Data, particularly process chemicals added and waste management transactions, have not been satisfactorily audited. Computer codes have not been verified. Sampling and sample analysis have not been performed to validate predictions. Prudent application of the information developed in this study is recommended. The simulation spans 37 years of complex operational history and is untested. The TRAC data stored in TCD has been normalized to account for the inventories determined by the HDW-EIS. An explanation of this procedure is contained in WHC-EP-0616. The radionuclide TRAC results have been decayed to 12/31/1990.

Database Tables

constituent

(TWINS refers to this table as: Constituents List)

This table contains a list of CAS numbers and the corresponding constituent or analyte abbreviations and molecular formulas. Some valid constituents have no assigned CAS numbers, and these are included as well.

Field Name	Data Type	Size	Key Field
alpha_beta_gamma_emitter	char	5	
comment	varchar	255	
con_id	char	15	p
con_name	varchar	60	
con_type	char	15	
half_life	float	8	
half_life_units	char	10	
heat_load_factor	float	8	
molecular_formula	varchar	50	
molecular_weight	float	8	
preferred_method_group_id	varchar	30	

media

(TWINS refers to this table as: Reference Media)

Contains basic bibliographic information about reference items, such as published documents, photographs, and so on. This table is included for reference in this subject area but is primarily used by the TWINS References subject area.

Field Name	Data Type	Size	Key Field
RHA_box_number	char	6	
access_level	tinyint	1	
compression_type	char	15	
create_dt	datetime	8	
descr_ref_location	varchar	50	

Reference Media (contd)

Field Name	Data Type	Size	Key Field
file_size	int	4	
filename	varchar	32	
format	char	12	
host_name	varchar	32	
media_ref_avail	char	3	
no_of_media_ref	tinyint	1	
owner_id	char	8	
path	varchar	64	
phys_loc	varchar	100	
primary_author	varchar	45	
ref_campaign	char	25	
ref_sub_type	char	25	
ref_title	varchar	30	
ref_type	char	25	
reference_id	int	4	p
reference_no	char	26	

units

(TWINS refers to this table as: Units of Measure)

Descriptions of the different units of measure.

Field Name	Data Type	Size	Key Field
description	varchar	255	
units	char	10	p

v_constituent_inventory

(TWINS refers to this table as: Inventory Estimates)

Estimates of chemical and radiochemical inventories.

Field Name	Data Type	Size	Key Field
access_level	tinyint	1	
change_indicator	char	1	
comment	varchar	255	
con_id	char	15	a
con_name	varchar	60	a
inventory_rec_num	int	4	p
inventory_type	varchar	30	
last_modified_date_time	datetime	8	
load_date_time	datetime	8	
release_date	datetime	8	
rpt_value	float	8	
rpt_value_units	char	10	
source_id	varchar	30	a
std_value	float	8	
std_value_units	char	10	
unit_category	char	15	
waste_site_id	char	15	p

v_constituent_inventory_change

(TWINS refers to this table as: Inv. Estimate Changes)

Change log containing the original version of the inventory estimate record before it was modified.
Provides a log of the changes made to constituent inventory data.

Field Name	Data Type	Size	Key Field
access_level	tinyint	1	
change_action	char	8	
change_date_time	datetime	8	
change_indicator	char	1	
change_reason	varchar	255	
change_user_name	char	8	
comment	varchar	255	
con_id	char	15	a
con_name	varchar	60	a
inventory_rec_num	int	4	p
inventory_type	varchar	30	
last_modified_date_time	datetime	8	
load_date_time	datetime	8	
release_date	datetime	8	
rpt_value	float	8	
rpt_value_units	char	10	
source_id	varchar	30	a
std_value	float	8	
std_value_units	char	10	
unit_category	char	15	
waste_site_id	char	15	p

v_inventory_source

(TWINS refers to this table as: Inventory Sources)

Entry describing each source of waste inventory estimates, along with the appropriate person to contact for more information on the inventory source.

Field Name	Data Type	Size	Key Field
access_level	tinyint	1	
contact_address	varchar	60	
contact_city	varchar	30	
contact_company	varchar	60	
contact_name	char	25	
contact_phone_num	char	25	
contact_state	char	2	
contact_zip_code	char	10	
description	varchar	255	
source_id	varchar	30	p

v_inventory_summary

(TWINS refers to this table as: Inventory Summary)

Summary of the constituent inventory estimates resulting from four different efforts at estimating the contents of the Hanford waste tanks.

Field Name	Data Type	Size	Key Field
access_level	tinyint	1	
con_id	char	15	a
con_name	varchar	40	a
con_type	char	15	a
htce_rec_num	int	4	
htce_value	float	8	
populate_date_time	datetime	8	
sar_rec_num	int	4	

Inventory Summary (contd)

Field Name	Data Type	Size	Key Field
sar_value	float	8	
Field Name	Data Type	Size	Key Field
std_value_units	char	10	
tcr_rec_num	int	4	
tcr_value	float	8	
trac_rec_num	int	4	
trac_value	float	8	
waste_site_id	char	15	p

v_tank_inventory

(TWINS refers to this table as: Tank Inventory)

Describes the inventory estimate sources available for a specific waste site.

Field Name	Data Type	Size	Key Field
access_level	tinyint	1	
basis	char	15	
comment	varchar	255	
reference_id	int	4	a
release_date	datetime	8	p
source_id	varchar	30	p
waste_site_id	char	15	p

waste_site

(TWINS refers to this table as: Waste Site Physical Char)

Contains information about the waste site construction, dates, elevation, type.

Field Name	Data Type	Size	Key Field
access_level	tinyint	1	
area_name	varchar	30	
construc_end_yr	int	4	
construc_start_yr	int	4	
in_service_month	number	2	
in_service_year	number	2	
operable_unit_name	varchar	30	
owner_id	char	8	
site_abbrev	char	4	p
waste_site_id	char	10	p
waste_site_set	char	3	
waste_site_type	char	3	
ws_elevation_ft	number	5	

TCD Data Dictionary

Field Descriptions

Field Name	Format	Size	Description	Table
access_level	tinyint	1	Access control mechanism for data in database table. Access levels are assigned to both data and users, and these levels range from 0 to 9. Data: 0 -- Default access level for data entered into the system; only the owner has access until the data is verified and validated. 9 -- The most open data. Users: 9 -- Users with a level nine access can access data with an access level of nine. 5 -- Users with a level five access can see data with access levels five through nine. 0 -- Users with a level zero access can see all data.	media sample_description source_sample v_analysis_result v_analysis_result_change v_constituent_inventory v_constituent_inventory_change v_inventory_source v_inventory_summary v_sample v_sample_analysis v_sample_relation v_sampling_event v_tank_core v_tank_core_segment v_tank_inventory v_tank_result v_tank_supernate_sample v_tank_surface_sample waste_site
address	varchar	50	Street address of the laboratory.	laboratory
agg_level	char	20	Level of aggregation or separation done to obtain the sample. Current values are: CORE COMPOSITE which is a composite of sample data from several segments within a single core, TANK COMPOSITE which is a composite of sample data from several core/surface/supernate samples, SEGMENT which is segment sample data, SUBDIVISION which is sample data for part of a segment, and TANK SAMPLE which is a single sample of surface or supernate data.	sample_description source_sample v_sample v_tank_result
alpha_beta_gamma_emitter	char	5	Alpha, Beta, or Gamma, indicating what the constituent emits.	constituent
analysis_class	char	10	The name or acronym of a major analysis grouping. Groupings are based on the characteristics of the compounds. Examples include: VOA for volatile organic and INORG for inorganic.	analysis_method
analysis_date_time	datetime	8	The date and time the sample was analyzed, in mm/dd/yyyy hh:mm format (24-hour clock).	v_analysis_result v_analysis_result_change v_tank_result
analysis_method_id	char	10	The analysis method id includes those properties that identify the class, procedure, and preparation that describe how the results were obtained and analyzed for the sample. Analysis method ids trace back to lab procedures such as LA-505-101 or PNL-ALO-103.	analysis_method v_analysis_result v_analysis_result_change v_sample_analysis v_tank_result
analysis_procedure	char	20	A unique identifier (within a specific 'analysis preparation' and 'analysis class') for a particular procedure used in analyzing a sample for a certain constituent. Examples include: LA-505-105 and PNL-ALO-214.	analysis_method

Field Description

Field Name	Format	Size	Description	Table
analysis_result_id	int	4	A unique, computer generated integer that is used as the primary key in the analysis_result tables. The number has no meaning other than that.	v_analysis_result v_analysis_result_change v_tank_result
analyst	char	20	Name of the person who analyzed the sample.	v_sample_analysis
appearance	varchar	255	Description of the physical appearance of the sample.	v_tank_core_segment v_tank_supernate_sample v_tank_surface_sample
area_name	varchar	30	A unique code name that identifies a geographic area within the perimeter of a DOE site.	waste_site
basis	char	15	Basis for the inventory estimates with respect to actual tank sampling data. Inventory estimates can be either based on samples of the tank or based on extrapolation from other data.	v_tank_inventory
batch_id	char	20	An identification of a group of analyses that were performed together and having something in common such as time of analysis or instrument.	v_sample_analysis v_tank_result
change_action	char	8	The action taken when a record was changed. Examples are MODIFY and DELETE.	change_action v_analysis_result_change v_constituent_inventory_change
change_date_time	datetime	8	Date and time the change was made to the record.	v_analysis_result_change v_constituent_inventory_change
change_indicator	char	1	Flag used to indicate that the record has been changed. Set to 'Y' (yes) if a change has been made to the record. Blank if never been modified. A previous copy of the record is recorded in the analysis result change or constituent inventory change table.	v_analysis_result v_analysis_result_change v_constituent_inventory v_constituent_inventory_change
change_reason	varchar	255	A user-supplied explanation of why the record was changed.	v_analysis_result_change v_constituent_inventory_change
change_user_name	char	8	User account name of the user who made the change.	v_analysis_result_change v_constituent_inventory_change
city	varchar	30	City name as related to given address for a laboratory.	laboratory

Field Name	Format	Size	Description	Table
comment	varchar	255	Further information to clarify the information in the table.	constituent v_analysis_result v_analysis_result_change v_constituent_inventory v_constituent_inventory_change v_sample v_sample_analysis v_sampling_event v_tank_core_segment v_tank_inventory
comp_name	char	20	Unique name assigned to a composite.	source_sample v_sample
compression_type	char	15	Name of the compression algorithm used.	media
con_id	char	15	The ID for a specific chemical or radiological compound or physical property. Most are designated by their Chemical Abstract Services (CAS) Number, while others are assigned by TCD. For instance, silver has a CAS number of 7440-22-4 while PU-237 does not have an assigned CAS number -- it has been assigned a con_id of 'PU-237'.	con_analysis_method_group constituent v_analysis_result v_analysis_result_change v_constituent_inventory v_constituent_inventory_change v_inventory_summary v_tank_result
con_name	varchar	60	The name of the constituent used for reporting purposes. Typically, the name comes from the Chemical Abstract Services (CAS) listing.	constituent v_constituent_inventory v_constituent_inventory_change v_inventory_summary v_tank_result
con_type	char	15	The general type or classification: chemical constituent, radiochemical constituent, or physical property.	constituent v_inventory_summary
construc_end_yr	int	4	The year construction of the waste site was completed. Format is yyyy.	waste_site
construc_start_yr	int	4	The year that construction began on the waste site. Format is yyyy.	waste_site
contact_address	varchar	60	Street address for the inventory contact.	v_inventory_source
contact_city	varchar	30	City name as related to given address for the inventory contact.	v_inventory_source
contact_company	varchar	60	Company to contact with inquiries or comments about the inventory.	v_inventory_source
contact_name	char	25	Name of the person to be contacted with questions about analysis result data from a laboratory or inventory data.	laboratory v_inventory_source

Field Description

Field Name	Format	Size	Description	Table
contact_phone_num	char	25	Telephone number, including area code and extension for the contact for inventory data.	v_inventory_source
contact_state	char	2	Official abbreviation of one of the 50 states in the United States. Examples include: Washington and New Mexico.	v_inventory_source
contact_zip_code	char	10	The zip code in the postal address.	v_inventory_source
create_dt	datetime	8	Date on which the item was created	media
descr_ref_location	varchar	50	Location of the reference	media
description	varchar	255	Brief narrative describing a specific instance in this database table.	analysis_method analysis_method_group change_action sample_description source_sample units v_inventory_source v_sample v_tank_result
device_type	varchar	30	Type of sampling device used.	sample_description source_sample v_sampling_event v_tank_result
dilut_factor	float	8	If a sample has been diluted for analysis, the dilution factor is entered as a single number. The number 100 is for a 1 to 100 dilution of the sample, a 0.1 is entered for a 10 to 1, and if a sample was not diluted, either the field is left blank or a 1 is entered.	v_sample_analysis v_tank_result
doc_loc	varchar	150	Indicates where the analysis result documentation is located.	sample_description source_sample v_sample v_sample_analysis v_tank_result
file_id	varchar	255	The identification of the disk file where the analysis data is stored. This can include full path name such as network node name, directory hierarchy, file name and type.	v_sample_analysis
file_size	int	4	Size of the electronic file in bytes.	media
filename	varchar	32	Name of the media file (on the media server).	media

Field Name	Format	Size	Description	Table
format	char	12	For each media type (photo, video, etc.) there are different file formats that can be specified. For example, photos can be in bitmap (.BMP) or Graphic Interchange Format (.GIF), etc. Documents can be Word Documents (.DOC), text files (.TXT), etc.	media
half_life	float	8	The half-life of the constituent.	constituent
half_life_units	char	10	The units associated with the constituent's half-life	constituent
heat_load_factor	float	8	The constituent's heat load factor	constituent
host_name	varchar	32	Name of the host machine where the media is stored electronically.	media
htce_rec_num	int	4	Unique identifier associated with the HTCE inventory estimate value	v_inventory_summary
htce_value	float	8	Inventory estimate from Historical Tank Contents Estimate Report, converted to common units.	v_inventory_summary
in_service_month	number	2	The month that the waste site was placed in service. Entered as a number.	waste_site
in_service_year	number	2	The year that the waste site was placed in service. Format is yyyy.	waste_site
inventory_rec_num	int	4	Unique identifier associated with an individual inventory estimate value.	v_constituent_inventory v_constituent_inventory_change
inventory_type	varchar	30	Kind of inventory estimate - a bulk estimate representing the contents of the entire tank; or an estimate for a particular phase or layer in the tank. Examples include: BULK and SLURRY.	v_constituent_inventory v_constituent_inventory_change
lab_code	char	6	A name or acronym of a code defined by an agency or other group. Current values are: 222-S and 325.	analysis_method laboratory v_analysis_result v_analysis_result_change v_sample_analysis v_tank_result
lab_name	char	25	Name of laboratory performing analyses.	laboratory
lab_received_date	datetime	8	Date sample was received at laboratory. Format is mm/dd/yyyy.	sample_description source_sample v_sample v_tank_result

Field Description

Field Name	Format	Size	Description	Table
lab_samp_id	char	12	Internal lab identifier assigned by the lab that analyzed the sample.	v_sample_analysis v_tank_result
last_modified_date_time	datetime	8	The date and time this record was most recently changed in the database. Format is mm/dd/yyyy hh:mi:ss.	v_analysis_result v_analysis_result_change v_constituent_inventory v_constituent_inventory_change v_sample v_sample_analysis v_sample_relation
load_date_time	datetime	8	The date and time this record was originally added to the database. Format is mm/dd/yyyy.	v_analysis_result v_analysis_result_change v_constituent_inventory v_constituent_inventory_change v_sample v_sample_analysis v_sample_relation
log_id	char	20	The identifier for the log book in which notes were recorded for this sample.	v_sample
log_page	char	10	The page of the log book that contains the log book entry of information related to this sample.	v_sample
media_ref_avail	char	3	Indicates where or not a document formally refers to other documents. Default is "no" in the case of documents, blank for photographs.	media
method_group_id	varchar	30	Name assigned to the general group of laboratory analytical methods to which the current method belongs. Examples include: ICP:A and AA:F.	analysis_method analysis_method_group con_analysis_method_group v_tank_result
method_name	varchar	30	A descriptive name of the methods, procedures, and/or protocols used to obtain the analytical results.	analysis_method
molecular_formula	varchar	50	Molecular formula of the constituent, analyte, radiological compound.	constituent v_tank_result
molecular_weight	float	8	Sum of the naturally occurring isotopic atomic weights of all the atoms in a molecule (units are gram/mole)	constituent v_tank_result
no_of_media_ref	tinyint	1	Numeric value indicating how many other reference media are referred to by this specific reference. Maximum is 99.	media
operable_unit_name	varchar	30	Name of operable_unit that the waste_site is included in. Work sites are grouped according to similarities and location.	waste_site

Field Name	Format	Size	Description	Table
owner_id	char	8	The unique name which identifies the owner of the data or responsible user account.	media waste_site
parent_table	varchar	30	The table in which the source sample is described.	v_sample
path	varchar	64	The computer path name to where the media is stored on the host machine (host name).	media
phone_num	char	25	Phone number and extension.	laboratory
phys_loc	varchar	100	Physical location or address where the reference is stored.	media
physical_state	char	6	Physical state a sample is in, usually only liquid or solid.	sample_description source_sample v_sample v_tank_result
populate_date_time	datetime	8	Date the record was populated in the current database table. Format is mm/dd/yyyy hh:mi:ss.	v_inventory_summary
preferred_method_group_id	varchar	30	Name of the group of laboratory analytical methods preferred for analysis for the current constituent.	constituent v_tank_result
preparation_procedure	char	20	Specific preparation procedure. This is a lab procedure number such as LA-549-141 or PNL-ALO-102. The common preparations are fusion, acid digestion, and water digestion.	analysis_method
primary_author	varchar	45	Name of the primary author	media
qa_type	char	20	Type of quality assurance sample, if any, represented by the current sample number. Current values include: HOT CELL BLANK, FIELD BLANK, SYNTHETIC, and NONE.	sample_description source_sample v_sample v_tank_result
qualifiers	char	6	Indicators of the quality of the value. These codes can include data qualifiers, report flags, and validation flags. For Tank Characterization Data (TCD), the field holds a string of distinct qualifiers. Some of them are: 'U' -- measurement was below detection limit, there may or may not be an associated value; 'J' -- value is an estimated quantity; 'Q' -- associated results are qualitative; 'O' -- measurement was over the range for this instrument; 'N' -- material was not analyzed for since the sample preparation made such measurement inappropriate (e.g., potassium in a KOH/Ni fusion preparation.); 'R' -- data are unusable; 'D' -- analysis was performed on a diluted sample; 'B' -- compound was found in the blank.	v_analysis_result v_analysis_result_change v_tank_result
recovery_percent	tinyint	1	The percentage of the expected sample size that was recovered during removal from the tank.	v_tank_core_segment v_tank_supernate_sample v_tank_surface_sample

Field Description

Field Name	Format	Size	Description	Table
ref_campaign	char	25	Grouping of photographs that has meaning within the database. This group has some common property; for example, constituting a single photograph session at a particular locality.	media
ref_sub_type	char	25	Further type of classification of references in the database. For example, photograph and video subtypes include black-and-white or color; document subtypes include articles, books, etc.	media
ref_title	varchar	30	Title of the reference	media
ref_type	char	25	Type of medium, such as text or proto	media
reference_id	int	4	Unique identification number associated with a reference.	media v_tank_inventory
reference_no	char	26	Alphanumeric identifier associated with a reference	media
related_samp_num	char	12	Sample number of the sample which has been derived from the segment, supernate, or surface sample indicated in samp_num or is related to the segment, supernate, or surface sample by virtue of being a qa sample or core/tank composite.	v_sample_relation
release_date	datetime	8	The date of publication or release. Format is mm/dd/yyyy.	v_constituent_inventory v_constituent_inventory_change v_tank_inventory
reporting_day	char	15	TPA requires lab reports to be released at specified times following a sampling event. (e.g. 45 day, 90 day, 216 day reports) This field indicates which report this sample data is associated with.	v_sample
result_type	char	20	Description of the type of results the analysis produced. Examples include: PRIMARY_RESULT and STANDARD_RECOVERY.	v_analysis_result v_analysis_result_change v_tank_result
RHA_box_number	char	6	Unique number that appears on each box that has been processed at the Records Holding Area (RHA). It is assigned by the RHA. Format is nnnnnn where n is any integer.	media
rpt_value	float	8	Reported value of the result which may be recorded in different units than the TCD standard units for this constituent or result type.	v_analysis_result v_analysis_result_change v_constituent_inventory v_constituent_inventory_change v_tank_result
rpt_value_units	char	10	The units in which the value was originally reported, which may or may not be the same as the TCD standard units for this constituent or result type.	v_analysis_result v_analysis_result_change v_constituent_inventory v_constituent_inventory_change v_tank_result

Field Name	Format	Size	Description	Table
samp_date_time	datetime	8	Date and time the sample was collected or created. Format is mm/dd/yyyy hh:mm (24-hour clock).	v_sample
samp_num	char	12	Unique alpha-numeric ID assigned to identify a sample in the database.	sample_description source_sample v_analysis_result v_analysis_result_change v_sample v_sample_analysis v_sample_relation v_tank_core_segment v_tank_result v_tank_supernate_sample v_tank_surface_sample
samp_prep_date_time	datetime	8	Date and time the sample preparation took place. Format is mm/dd/yyyy hh:mm.	v_sample_analysis v_tank_result
sample_date_time	datetime	8	Date and time the sample was collected or created. Format is mm/dd/yyyy hh:mm (24-hour clock).	sample_description source_sample v_tank_result
sample_dilution_key	tinyint	1	Unique sequential identifier of an analysis on a specific sample. Each analysis of the sample at a different dilution is assigned a unique sample dilution key value.	v_analysis_result v_analysis_result_change v_sample_analysis v_tank_result
sample_level	int	4	Height at which the sample was taken, measured from the bottom of the waste site.	sample_description source_sample v_tank_core_segment v_tank_result v_tank_supernate_sample v_tank_surface_sample
sample_level_units	char	10	Units of measure associated with the sample level.	sample_description source_sample v_tank_core_segment v_tank_result v_tank_supernate_sample v_tank_surface_sample
sample_type	varchar	30	Type of sample. Current values are: CORE, SUPERNATE, and SURFACE	sample_description source_sample v_sampling_event v_tank_result
sampler	char	20	Person who took or will be held responsible for the taking of the sample.	v_sample

Field Description

Field Name	Format	Size	Description	Table
sampling_begin_date	datetime	8	Date the sampling started. Format is mm/dd/yyyy.	sample_description source_sample v_sampling_event v_tank_result
sampling_end_date	datetime	8	Date the sampling was completed. Format is mm/dd/yyyy.	sample_description source_sample v_sampling_event v_tank_result
sampling_event_id	char	12	The identification number of a sampling event collected from a waste site. For cores, this will be a core number, for supernate samples, this will be a supernate sample number, and for surface samples, this will be a surface sample number.	source_sample v_sampling_event v_tank_core v_tank_core_segment v_tank_supernate_sample v_tank_surface_sample
sampling_event_name	char	20	Core ID, supernate sample ID, surface sample ID, tank composite name, or core composite name.	sample_description v_tank_result
sar_rec_num	int	4	Unique identifier associated with the Safety Analysis Report inventory estimate value	v_inventory_summary
sar_value	float	8	Inventory estimate from the Safety Analysis Report, converted to common units	v_inventory_summary
secondary_samp_prep_type	char	20	Includes types of sample preparation that may be useful in understanding the analysis and associated results. In TCD data, this usually refers to a secondary preparation type, if any. The primary preparation type is embedded in the analysis method table, specifically the analysis technique field.	v_sample_analysis v_tank_result
segment_id	char	12	Unique identifier for a segment of a core.	source_sample v_tank_core_segment
segment_name	number	20	Segment ID or core composite name.	sample_description v_tank_result
serial_num	char	4	Log number of the waste site core from which the sample was obtained. The first number identifies the year, followed by a dash, followed by an ascending number beginning with the very first segment obtained in any given year.	v_tank_core v_tank_core_segment
site_abbrev	char	4	The abbreviated name of the DOE site or DOE regulatory agency.	waste_site
source_id	varchar	30	Abbreviated name for the source of the inventory estimate. Current values are HTCE, SAR, TCR, and TRAC.	v_constituent_inventory v_constituent_inventory_change v_inventory_source v_tank_inventory

Field Name	Format	Size	Description	Table
source_samp_num	char	12	Unique sample number assigned to a sample removed from the waste site.	source_sample
state	char	2	Official abbreviation of one of the 50 States in the United States. Examples include Washington and New Mexico.	laboratory
std_value	float	8	Reported value converted to standard units.	v_analysis_result v_analysis_result_change v_constituent_inventory v_constituent_inventory_change v_tank_result
std_value_units	char	10	Common units of measure.	v_analysis_result v_analysis_result_change v_constituent_inventory v_constituent_inventory_change v_inventory_summary v_tank_result
subdivision_id	char	20	Description of the portion of the original tank sample represented by the current sample. Examples include: TOP, TOTAL, and SUBSEGMENT A.	sample_description source_sample v_sample v_tank_result
tank_riser	char	12	Fixed Sample Space Identifier. This identifier will uniquely identify a sample space for a given waste site, but is not unique across an entire DOE site. For example, '17C' uniquely identifies a riser in Hanford's tank 241-SY-101, but does not uniquely identify a riser for the Hanford site. Some fixed sample spaces which are associated with a single waste site have identifiers in the form of '241-XX-NNN'. An example of this would be a sump pit connected to a tank.	sample_description source_sample v_sampling_event v_tank_result
ter_rec_num	int	4	Unique identifier associated with the Tank Characterization Report inventory estimate value	v_inventory_summary
ter_value	float	8	Inventory estimate from Tank Characterization Report, converted to common units.	v_inventory_summary
trac_rec_num	int	4	Unique identifier associated with the TRAC inventory estimate value	v_inventory_summary
trac_value	float	8	Inventory estimate from TRAC, converted to common units.	v_inventory_summary
uncertainty_value	float	8	Numerical measure of uncertainty the owner associated with the value.	v_analysis_result v_analysis_result_change v_tank_result
uncertainty_value_units	char	10	Engineering units of the uncertainty value.	v_analysis_result v_analysis_result_change v_tank_result

Field Description

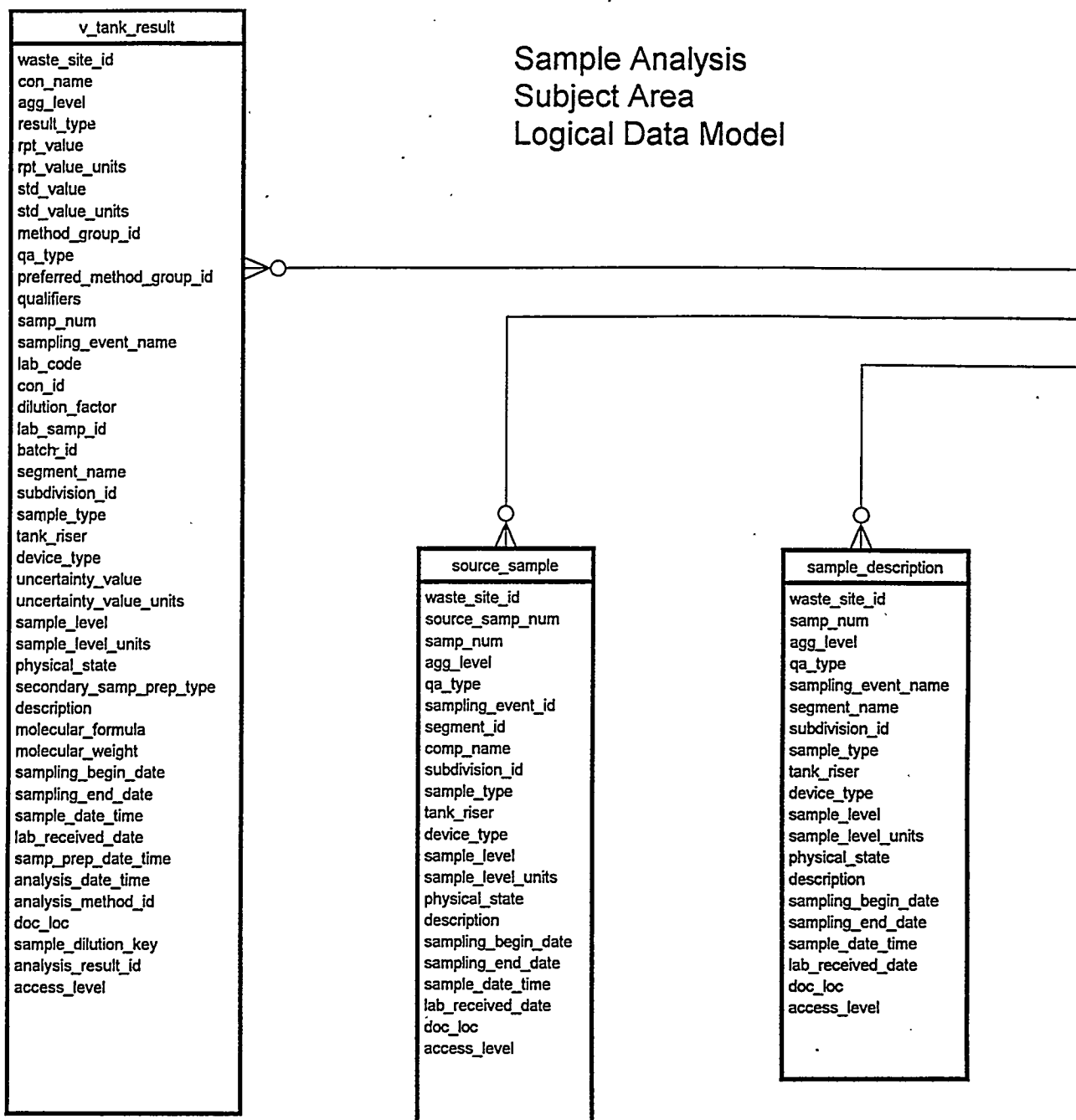
Field Name	Format	Size	Description	Table
unit_category	char	15	Type of units of measure associated with a value.	v_constituent_inventory v_constituent_inventory_change
units	char	10	Engineering units used in the sample analyses, waste inventories, and physical descriptions of tank characterization data. Examples include: g, J/g, in, unitless, and %.	units
validation_status	varchar	30	Indicator as to whether the data has been independently reviewed and assigned data qualifiers. Current values are: UNVALIDATED and VALIDATED.	v_analysis_result v_analysis_result_change
verification_process	varchar	30	Process by which the data entry was verified as to its data entry accuracy. Refers to documentation kept by the TCD staff. Current values are: TCDPROC01 and TCDPROC02.	v_analysis_result v_analysis_result_change
waste_site_id	char	15	Unique identifier of the waste site. The format is 241-XX-nnn.	sample_description source_sample v_constituent_inventory v_constituent_inventory_change v_inventory_summary v_sampling_event v_tank_core v_tank_core_segment v_tank_inventory v_tank_result v_tank_supernate_sample v_tank_surface_sample waste_site
waste_site_set	char	3	The name of the set that groups the waste site for a specific purpose. Tanks are in tank farms, bins are in bin sets.	waste_site
waste_site_type	char	3	The type of waste management unit.	waste_site
ws_elevation_ft	number	5	Elevation of the reference point for the waste site measured from mean sea level. A positive (+) value indicates above mean sea level while a negative(-) value indicates below mean sea level.	waste_site
zip_code	char	10	Zip code in the postal address.	laboratory

TCD Data Dictionary

Relational Models

Sample Analysis

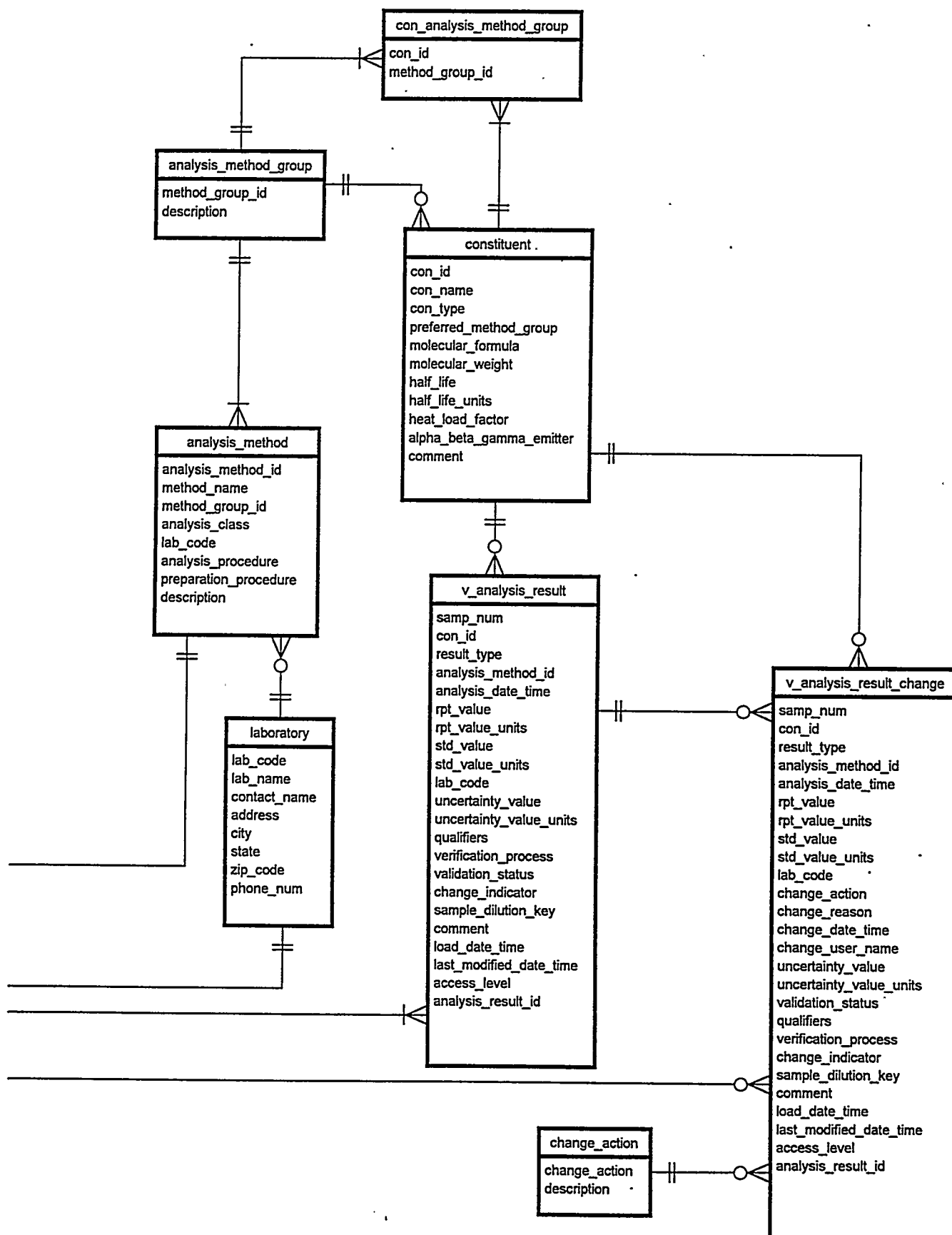
Sample Analysis Subject Area Logical Data Model



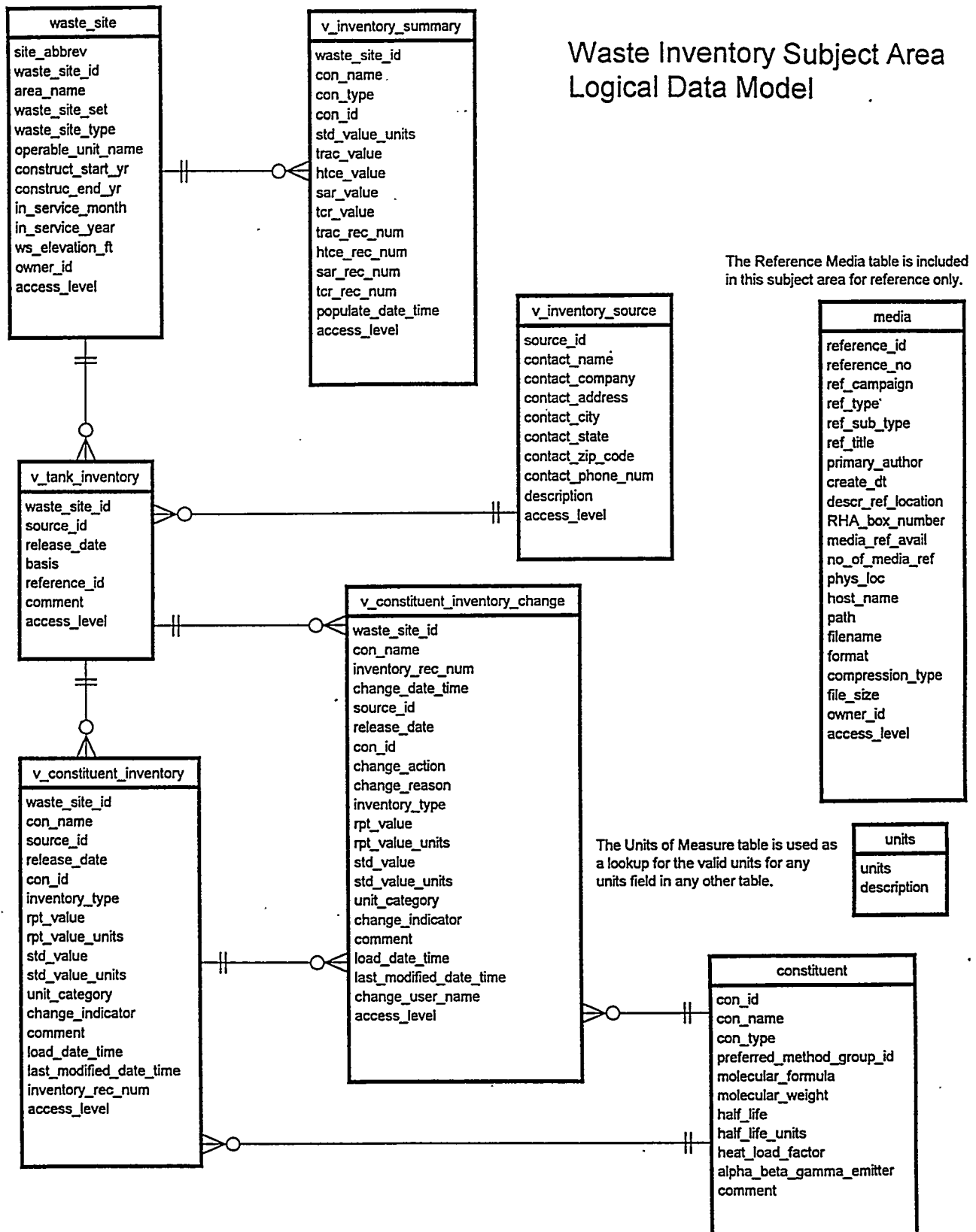
units
units
description

The Units of Measure table is used as a lookup for the valid units for any units field in any other table.





Waste Inventory Subject Area Logical Data Model



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