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STATE OF NEVADA
Department of Conservation & Natural Resources
DIVISION OF ENVIRONMENTAL PROTECTION

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Re: **BMI Plant Sites and Common Areas Projects, Henderson, Nevada**
Guidance on Unified Chemical Electronic Data Deliverable Format

Dear Messrs.:

All of the parties listed above shall be referred to as "the Companies" for the purposes of this letter. Attachment A of this letter provides revised guidance regarding electronic data deliverables (EDDs). Please note that Attachment A is also posted on NDEP's website at http://ndep.nv.gov/bmi/technical.htm under "Regional Database".

Please contact the undersigned or James (JD) Dotchin with any questions at sharbour@ndep.nv.gov / 775-687-9332 or jdotchin@ndep.nv.gov / 702-486-2850 x235, respectively.

Sincerely,

Shannon Harbour, P.E.
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SH:s

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Attachment A

Unified Chemical Electronic Data Deliverable Format

The objective of this guidance is to specify the naming requirements of the data validation summary report (DVSR) and electronic data deliverable (EDD) as well as the format for the submission of chemical data EDDs from the Companies to the Nevada Division of Environmental Protection (NDEP). The goal is to streamline the uploading of the Companies' electronic data into the BMI Complex, Common Areas, and Vicinity Database ("the regional database") maintained by NDEP (http://ndep.gisdt.org). This task requires defining each element of the EDDs so they are submitted in a consistent format. Provided below are the required elements of the EDD format and descriptions of the elements. The field and table names of each element in the EDD should be exactly as described in this document. Slight variations to these result in inefficient uploading of the data to the regional database. Additions to the fields should be provided as comments to this guidance or in formal communications if they are developed later in the project.

DVSR and EDD Formats and Naming Requirements

The chemical EDD should be delivered as a Microsoft Access database (file format of Access 2000 or later) with the data organized into the tables and fields as described in Appendix A. Each DVSR must have an associated EDD, and the data in each EDD should match the DVSR exactly, with no extraneous data in either the DVSR or EDD. Extraneous data in an EDD results in confusion and inefficiency.

Both the DVSR document title and the EDD filename must incorporate the DVSR identifier (dvsr_id) defined in Appendix A. It is critical that the dvsr_id is unique and is associated with the data through to the decision stage report. For example, a human health risk assessment report should clearly identify the data used in the report by dvsr_id(s). This allows the data to be traced from origin, through validation, to the "final" report.

There may be instances where additional deliveries of revisions to the initial DVSR and/or EDD will be required after NDEP review. In these cases, the revised DVSR and/or EDD must retain the identical original DVSR document title or EDD filename with the revision appended to the end of the report or filename. For example, if an original EDD was entitled "Company X groundwater report 2011.mdb," revision 1 of the EDD should be entitled "Company X groundwater report 2011 rev1.mdb." Renaming reports and/or filenames in this manner is necessary for efficient and effective document tracking.

The EDD requires four standard tables as described in Appendix A: samples, results, locations, and validation_reason. Native samples, including field replicates, are required as part of the EDD and are uploaded into the regional database. Field quality control (QC) data other than replicates are required as part of the EDD but are not uploaded into the regional database. It is understood that field QC data (e.g., trip and equipment blanks, rinsates) may not necessarily have data for fields that are required for native samples, such as location, graphic classification, or sample depth information.

The database developed for the DVSR may include additional data (e.g., laboratory QC data). However, these additional data should be provided in a separate table(s) from the standard EDD tables described in Appendix A.

Not all fields will contain a value; empty fields will be represented as "NULLs" in the Microsoft Access database.

Appendix B provides sample matrix codes and descriptions. Appendix C provides sample type codes and descriptions. Appendix D provides guidance for populating the analytical method field in EDDs. Appendix E provides analytical suite codes and descriptions. Appendix F provides the acceptable flags for selected fields.

Non-Analytical Data

There are some data that will be stored in the regional database that do not fit into the same format as the analytical data. Examples of these data are hydraulic parameters and soil material properties as described in Appendices G and H.

Groundwater-level monitoring data will be delivered separately from the analytical data and will have its own EDD guidance document.

Obsolete Data

Over time some data may become obsolete as sampled soils are removed during remediation. The Companies must notify NDEP on a per-sample basis of all data that become obsolete. Obsolete samples should be provided in an auxiliary table named "obsolete_samples" and included in the first EDD delivery after the data have been rendered obsolete.

Parameters, Parameter Identifiers, Chemical Abstract Service Identifiers and Analyte Names

Assigning a unique identifier for each chemical reported is essential to developing a unified database. For purposes of the EDD, Chemical Abstract Service identifiers (CAS IDs) will be used to identify chemicals whenever possible. However, some substances, such as physical parameters, may not have a CAS ID. To address this issue, codes for these parameters as well as CAS IDs are provided in the official Parameter ID – Parameter list maintained by NDEP (available as a Microsoft Excel spreadsheet, which can be downloaded from http://ndep.gisdt.org; click on the "EDD Lookup Tables" link in the table of contents at the upper left of the homepage). All values reported in the EDD must be identified with a CAS ID or appropriate code in the "parameter_id" field.

Because there can be multiple variations of names associated with a single analyte CAS ID or code based on synonyms, spelling, capitalization, etc., analyte names included in the EDDs will be normalized to the parameter in the official Parameter ID – Parameter list. Additionally, codes for parameters that do not have an official CAS ID will be normalized to those contained in the official Parameter ID – Parameter list.

The official Parameter ID – Parameter list was developed based on the data that have been incorporated into the regional database to date. NDEP recognizes that this list will continue to be refined and expanded as new chemicals are introduced. If an EDD contains chemicals (or other parameters) that are not currently in the official Parameter ID – Parameterlist, a list of identifiers

and descriptions of those parameters must be provided in a table named "parameter_id_new" that contains two fields, "parameter_id" and "parameter" (see Appendix A).

Asbestos

NDEP has recently provided technical guidance surrounding the calculation of asbestos related risk (Asbestos Related Risk Assessment Guidance, dated April 24, 2009). The reporting of asbestos in the Company-supplied EDD should follow this guidance. The asbestos fibrous variety (chrysotile or amphibole), in addition to the size and shape, influences the asbestos-related risk. The modified elutriator method described in the guidance document, along with transmission electron microscopy (TEM) analysis, is the preferred technique for asbestos analysis associated with the BM1 Complex and Common Areas. The important laboratory reporting parameters for asbestos are soil concentrations (fibers or structures), analytical sensitivity (S/g), and asbestos sensitivity units. Note that the soil concentration is derived from the number of fibers observed (unitless) times the analytical sensitivity (f/g). The elutriator method provides sensitivity in units of structures per gram (S/g_{PM10}). It is critical that the laboratory report the biologically relevant structures—meaning those structures that are within the protocol dimensions of less than 0.4 µm in diameter and greater than 5 µm but less than 10 µm in length or are less than 0.4 µm in diameter and greater than 10 µm in length. These details are consistent with a report of both the long and total asbestos structures in each sample.

An example of the information that should be reported for an asbestos sample would include the following (subset shown here of all fields).

Field Name	Record (what is to be reported in the EDD)
sample_id_field	MC1-J07
cas_id	12001-29-5L
analyte_name	Long Chrysotile Protocol Structure*
result_reported	3
asbestos_analytical_sensitivity	2.400E+06**
asbestos_sensitivity_units	s/g_{PM10}

* Each sample should include results for all asbestos types: Total Chrysotile Protocol Structure, Long Chrysotile Protocol Structure, Long Amphibole Protocol Structure, Total Amphibole Protocol Structure, Long Asbestos Protocol Structure, and Total Asbestos Protocol Structure.

** This should be the mean value, not the 95% upper confidence limit.

Document Updates

Updates to this document are summarized in a change log provided in Appendix I.

Appendix A: Electronic Data Deliverable Database Tables and Fields

The electronic data deliverable (EDD) should be a Microsoft Access database containing at least four standard tables: a samples table, a results table, a locations table, and a validation_reason table. The field names, tables, detailed descriptions, data types, values required, field requirements, and database constraints are provided in the table below. Additional tables for non-analytical data and laboratory quality control data may be included if desired.

For convenience, the EDD database should also contain a query that links the samples, locations, and results tables, allowing a "flat-file" view of the data.

Not all fields will contain a value; empty fields will be represented as "NULLs" in the Microsoft Access database. However, certain fields should always have a value; these are identified in the "Value Required" column below.

Field Name	Table	Detailed Description	Data Type	Value Required	Field Requirements	Database Constraints
dvsr_id	samples	A unique ID for each data validation summary report (DVSR), from each Company. The ID should contain elements that make it clear which Company supplied the DVSR, the year of submittal, and a unique number designation. The dvsr_id must also be included within the title of the DVSR as well as the filename of the EDD.	text	yes		
sample_id_field	samples	The ID used on the chain of custody, or similar field record. This ID should be unique to the sample and also consistent (identical) for all records associated with that sample. For example, where multiple analytes are reported, the sample ID should be identical for all.	text	yes	The values in sample_id_field must not appear in other DVSRs.	Primary key (unique, not null)
location_id	samples	An identification of the well or location where the sample was taken. The ID should be unique to that well or location and should be used in all future reports and EDDs. For wells, the identifier should match the appropriate well name in the All Wells Database currently maintained by the Basic Remediation Company (BRC). Companies should edit the All Wells Database to ensure that identifiers for their wells match their current usage. For soil data, this identifier will be considered to be Company specific; as part of the development of the regional database, a location table will be developed that will allow locations to be uniquely identified across Companies.	text	yes		Foreign key, references locations (location_id)
sample_top_depth	samples	Sample top depth in feet. For Companies that only record a single sample depth, this value should go in both the sample_top_depth and sample_bottom_depth fields.	numeric	see field requirements	Not empty for matrix SO, SD, WG, AG	
sample_bottom_depth	samples	Sample bottom depth in feet. For Companies that only record a single sample depth, this value should go in both the sample_top_depth and sample_bottom_depth fields.	numeric	see field requirements	Not empty for matrix SO, SD, WG, AG	

Field Name	Table	Detailed Description	Data Type	Value Required	Field Requirements	Database Constraints
matrix	samples	A short code that designates the matrix of the sample. A list of codes is provided in Appendix B. Note, leachate (e.g., synthetic precipitation leaching procedure [SPLP] samples) should use the leachate code "LE."	text	yes	Value must be taken from Appendix B.	
sample_type	samples	A short code that designates the sample type (e.g., field duplicate as FD). A list of codes is provided in Appendix C.	text	yes	Value must be taken from Appendix C.	
sample_date	samples	The year, month, and day of sample collection. Requested format: YYYY-XX-ZZ, where YYYY = year, XX = month, and ZZ = day of month. This format should be used for all dates.	date	yes	Valid date	
sample_time	samples	The time a sample was collected in hour:minute:seconds format. A 24-hour format is required: 12:15:00 indicates 15 minutes after noon. One hour later would be 13:15:00.	time	yes	Valid time	
litho	samples	The designation of the lithologic nomenclature tags are Qal (Quaternary Alluvium), xMCf (transitional Muddy Creek formation), or UMCf (Upper Muddy Creek formation). Designations may also include Qal/xMCf, Qal/xMCf/UMCf, or xMCf/UMCf if wells cross these lithologies. This lithologic nomenclature is described in the January 6, 2009, letter (Hydrogeologic and Lithologic Nomenclature Unification) from the Nevada Division of Environmental Protection (NDEP) to the Companies.	text	see field requirements	Not empty for matrix SO, SD, WG, or AG	
hydro	samples	The designation of the water-bearing zone associated with the sample: Shallow, Middle, Deep. This hydrogeologic nomenclature is described in the January 6, 2009, letter (Hydrogeologic and Lithologic Nomenclature Unification) from NDEP to the Companies.	text	see field requirements	Not empty for matrix WG	

Field Name	Table	Detailed Description	Data Type	Value Required	Field Requirements	Database Constraints
sample_collection_comment	samples	Field for capturing information about how the sample was collected. For example, when groundwater samples have been collected from open boreholes using a bailer or from direct push equipment versus collecting the sample from a well using a submersible pump. This field should be populated only in cases where the sample was collected in a "non-standard" manner.	text	no		
sample_comment	samples	A field to include comments associated with a specific sample	text	no		
sample_id_field	results	The ID used on the chain of custody, or similar field record. This ID should be unique to the sample and also consistent (identical) for all records associated with that sample. For example, where multiple analytes are reported, the sample ID should be identical for all.	text	yes	Value must also be found in the samples table.	Foreign key, references samples (sample_id_field)
percent_moisture	results	The percentage of moisture of a solid sample. Provide this record as a whole number, such as 95 for 95% moisture (no decimal).	numeric	see field requirements	Not empty for matrix SO, SD, TA, or TP	
filtered_flag	results	A flag, Y (filtered) or N (unfiltered), indicating whether the sample was filtered. Y indicates the aqueous sample was filtered and is dissolved.	text	see field requirements	Not empty for matrix WG or WS	
analytical_method	results	An identifier for the analytical method used for that suite of analyses. The identifier should include the version of the method. For example, many of the SW-846 methods have a letter at the end to indicate the version (e.g., 8330B). A format is provided in Appendix D.	text	yes	Must follow guidance in Appendix D.	
preparation_method	results	An identifier for the preparation method used for the suite of analyses. Use the guidelines found in Appendix D.	text	see field requirements	This value must be populated for each record where the preparation method is distinct from the analytical method (e.g., preparation with 3050, analysis with 6010).	

Field Name	Table	Detailed Description	Data Type	Value Required	Field Requirements	Database Constraints
analytical_suite	results	A short code that designates the analytical suite, such as semivolatile organic compound (SVOC). A list of codes is provided in Appendix E.	text	yes	Value must be taken from Appendix E.	
analyst_name	results	The name or initials of the analyst that performed the analysis	text	see field requirements	Required for asbestos	
analysis_date	results	The year, month, and day of sample analysis. Format: YYYY-XX-ZZ, where YYYY = year, XX = month, and ZZ = day of month. This format should be used for all dates.	date	yes	Valid date	
analysis_time	results	The time the sample was analyzed in hour:minute:seconds format. A 24-hour format is required: 12:15:00 indicates 15 minutes after noon. One hour later would be 13:15;00.	time	see field requirements	Valid time; must be populated unless the analysis time is not recorded by the laboratory	
prep_date	results	The year, month, and day of laboratory sample preparation. Format: YYYY-XX-ZZ, where YYYY = year, XX = month, and ZZ = day of month. This format should be used for all dates.	date	see field requirements	Valid date. Data that have a preparation step that is separate from the analysis method must have this field populated if information is available.	
prep_time	results	The time the sample was prepared in hour:minute:seconds format. A 24-hour format is requested: 12:15:00 indicates 15 minutes after Noon. One hour later would be 13:15:00.	time	see field requirements	Valid time. Data that have a preparation step that is separate from the analysis method must have this field populated if information is available.	
parameter	results	A name for the analyte or parameter that corresponds to the code in the parameter_id field. This field will be normalized to the parameter contained in the list located at http://ndep.gisdt.org or from the NDEP website. This field is included in order to perform a quality assurance check for parameter_id.	text	yes		

Field Name	Table	Detailed Description	Data Type	Value Required	Field Requirements	Database Constraints
parameter_id	results	The Chemical Abstracts Service (CAS) designation for the analyte or a code if no CAS designation exists for the analyte/parameter in question. Asbestos types are treated as chemicals, in that each asbestos type (Total Chrysotile Protocol Structure, Long Chrysotile Protocol Structure, Long Amphibole Protocol Structure, Total Amphibole Protocol Structure, Long Asbestos Protocol Structure, Total Asbestos Protocol Structure) has its own code. Physical parameter codes will be normalized to the codes contained in the list located at http://ndep.gisdt.org or from the NDEP website.	text	yes		
result_type	results	A short code to indicate the type of result for this record. Acceptable values include TG (target), SURR (surrogate), IS (internal standard), SC (spike compound), and TIC (tentatively identified compound). Others should be recommended by the Companies during review of this EDD guidance.	text	yes		
reanalysis_flag	results	The field should contain either "Initial" or "Reanalysis." A sample that requires dilution and subsequent reanalysis would be designated in this manner as would a sample that required re-extraction.	text	yes		

Field Name	Table	Detailed Description	Data Type	Value Required	Field Requirements	Database Constraints
result_reported	results	*Non-radionuclides:* For detected non-radionuclide results, result_reported is the value reported by the laboratory and greater than or equal to the standard quantitation limit (SQL). For non-radionuclide non-detected results, the result_reported should equal the SQL, unless the value has been censored to a higher level because of mitigating factors (in this case, the reason for raising the reported value above the SQL should be very apparent from the final validation qualifier, reason code, and validation reason). For rejected non-radionuclide results, the result_reported should be the value reported by the laboratory. *Radionuclides:* For all radionuclides, result_reported is the positive or negative value reported by the laboratory. *Physical Parameters:* For physical parameters, the result_reported is the value reported by the laboratory. *Asbestos:* For asbestos, result_reported is the number of structures. Data are no longer censored because of blank contamination. *See detect_flag_fod and detect_flag_ra for assigning detect status.*	numeric	yes		
result_units	results	Units associated with the result_reported value. Identical units are required for the SQL, practical quantitation limit (PQL), and method detection limit (MDL).	text	yes	For leachate, the units should be associated with a liquid measurement.	
result_uncertainty	results	The uncertainty value associated with the laboratory reported results. This will apply to radionuclides and possibly other analytes (e.g., X-ray fluorescence (XRF] analysis results). This field is not applicable to asbestos. The DVSR (or laboratory report within the DVSR) should define the uncertainty (e.g., one sigma).	numeric	see field requirements	Not empty for radionuclides and XRF, otherwise optional (may be empty) at this time	

Field Name	Table	Detailed Description	Data Type	Value Required	Field Requirements	Database Constraints
asbestos_analytical_sensitivity	results	The analytical sensitivity associated with the asbestos results. This should be the mean value, not a 95% upper confidence limit.	numeric	see field requirements	Not empty for asbestos results, otherwise empty	
asbestos_sensitivity_units	results	The units associated with the asbestos sensitivity value (structures/gram, usually as S/g_{PM10})	text	see field requirements	Not empty for asbestos results, otherwise empty	
detect_flag_fod	results	*This field should be populated after final validation qualifiers have been applied.* A flag, D (detect), U (nondetect), or R (rejected), indicating whether the result_reported is considered a detected value for purposes of frequency of detection (FOD) reporting. Detected results should have a detect_flag_fod of "D." Asbestos is considered detected ("D") if counts are > 0. Rejected results should have a detect_flag_fod of "R." If the result_reported is considered not detected, the detect_flag_fod should be "U," and the result_reported should be equal to the SQL for non-radionuclides. For radionuclides, if the result_reported is less than the minimum detectable activity (MDA), the detect_flag_fod should be "U." The detect_flag_fod should be consistent with the final_validation_qualifier. Data are no longer censored because of blank contamination.	text	yes		
detect_flag_ra	results	*This field should be populated after final validation qualifiers have been applied.* A flag, D (detect), U (nondetect) or R (rejected), indicating whether the result_reported is considered a detected value for purposes of risk assessment (RA). Detect_flag_ra is equal to detect_flag_fod except in the case of radionuclides. For detect_flag_ra, all radionuclide results reported are considered detected values ("D"), regardless of the MDA and including negative results.	text	yes		

Field Name	Table	Detailed Description	Data Type	Value Required	Field Requirements	Database Constraints
method_detection_limit	results	The MDL for the analyte. This definition should follow the December 3, 2008, NDEP guidance entitled Detection Limits and Data Reporting.	numeric	no	Should be defined in the DVSR if used	
sample_quantitation_limit	results	The SQL for the analyte. This definition should follow the December 3, 2008, NDEP guidance entitled Detection Limits and Data Reporting.	numeric	see field requirements	This value should be populated, except for those analytes (e.g., pH) to which it does not apply.	
practical_quantitation_limit	results	The PQL for the analyte. This definition should follow the December 3, 2008, NDEP guidance entitled Detection Limits and Data Reporting.	numeric	see field requirements	This value should be populated except for those analytes (e.g., pH) to which it does not apply.	
minimum_detectable_activity	results	The MDA, also known as the minimum detectable concentration. This is used for radionuclide results.	numeric	see field requirements	This value must be populated for each radionuclide result.	
dilution_factor	results	Any dilution factor used to arrive at the final reported value	numeric	yes	This field has a default value of 1.	
sample_id_lab	results	The ID of the sample used at the laboratory. This ID should generally be unique to the sample and also consistent for all records associated with that sample. For example, where multiple analytes are reported, the sample ID should be identical for all. There are instances where a different name may be required (e.g., reanalysis), but the use of multiple names should be minimized as much as possible.	text	yes		
lab_id	results	An abbreviation of the name of the laboratory performing the analyses, down to the laboratory location. For example, TestAmerica-Richland, Washington, should have a designation that differs from other TestAmerica locations. Companies should provide a recommended ID for each laboratory currently used or expected. A designation for field analysis should be included.	text	yes		
sdg_id	results	The sample delivery group identification supplied by the laboratory	text	yes		

Field Name	Table	Detailed Description	Data Type	Value Required	Field Requirements	Database Constraints
batch_id	results	The analytical batch identification supplied by the laboratory	text	see field requirements	Must be populated if the laboratory assigns a batch ID in the laboratory report	
lab_qualifier	results	The qualifier that may have been assigned to a result_reported by the laboratory that performed the analysis	text	see field requirements	Must be populated if the lab provided a qualifier	
validation_flag	results	A flag, T (true) or F (false). T indicates the value was validated after the laboratory reported the value.	text	yes	If asbestos or general parameter results (e.g., pH) are not validated, this should equal F.	
validation_stage	results	The stage to which the data has been validated. This stage designation should be consistent with NDEP Supplemental Guidance on Data Validation dated April 13, 2009. Stage 2B or 4 are the anticipated values. The terms used need to be defined in the DVSR.	text	see field requirements	Must be populated if validation_flag = T	
final_validation_qualifier	results	The final non-laboratory qualifier applied to the value. If the laboratory qualifier is deemed appropriate during data validation, this value should be equal to or consistent with the lab_qualifier. Data associated with blank contamination are no longer censored but should have a qualifier.	text	see field requirements	Must be populated unless the result_reported requires no qualification. If final_validation_reason_codes has a value, this field cannot be empty; otherwise, it should be empty (either both final_validation_qualifier and final_validation_reason_codes should have a value or both should be empty). Also, if the lab qualifies a sample, and during the data validation there is concurrence with that qualification (especially censoring), there should also be a final_validation_qualifier and reason code.	

Field Name	Table	Detailed Description	Data Type	Value Required	Field Requirements	Database Constraints
final_validation_reason_codes	results	The reason code(s) that corresponds to the final validation qualifier (if more than one code, this should be represented as a comma-separated list of codes). At this point there is no specified set of values. The Companies may use their codes (and combination of codes) as long as all values are defined in the DVSR. All validation values should be consistent with the December 3, 2008, NDEP guidance entitled Detection Limits and Data Reporting. For example, any reference to a sensitivity indicator (SQL, PQL, etc.) should be consistent with that guidance, and only those sensitivity indicators should be used. Data associated with blank contamination are no longer censored but should have a reason code identifying this relationship.	text	see field requirements	Must be populated unless the result_reported requires no qualification. If final_validation_qualifier has a value, this field cannot be empty; otherwise, it should be empty (either both final_validation_qualifier and final_validation_reason_codes should have a value or both should be empty). Also, if the lab qualifies a sample, and during the data validation there is concurrence with that qualification (especially censoring), there should also be a final_validation_qualifier and reason code.	
result_comment	results	A field to include comments associated with a specific result	text	no		
location_id	locations	An identification of the well or location where the sample was taken. The ID should be unique to that well or location and should be used in all future reports and EDDs. For wells, the identifier should match the appropriate well name in the All Wells Database currently maintained by BRC. Companies are welcome to edit the All Wells Database to ensure that identifiers for their wells match their current usage. For soil data, this identifier will be considered to be Company specific; as part of the development of the regional database, a location table will be developed that will allow locations to be uniquely identified across Companies.	text	yes		Primary Key (unique, not null)
sub_area	locations	A unique designation for each sub-area or parcel	text	yes		

Field Name	Table	Detailed Description	Data Type	Value Required	Field Requirements	Database Constraints
lou	locations	An aerial designation for a location as described in a Letter of Understanding (LOU) between NDEP and the Company. If no LOU is associated with the sample, this field should be labeled as "NULL."	text	no		
northing	locations	Northing coordinate of the sample in North American Datum (NAD) 1983 State Plane Nevada East feet.	numeric	yes		
easting	locations	Easting coordinate of the sample in NAD 1983 State Plane Nevada East feet.	numeric	yes		
dvsr_id	validation_ reason	A unique ID for each DVSR, from each Company. The ID should contain elements that make it clear which Company supplied the DVSR, the year of submittal, and a unique number designation. The dvsr_id must also be included within the title of the DVSR as well as the filename of the EDD.	text	yes		Primary key in combination with validation_reason_code
validation_reason_code	validation_ reason	Individual validation reason code used in lookup table	numeric	yes		Primary key in combination with dvsr_id
validation_reason	validation_ reason	The description of the reason code. For example, "Holding time exceeded" or "Laboratory blank contamination." The description should be consistent with the validation and completely described in the DVSR	text	yes		

The following table lists fields for the two EDD data tables "obsolete_samples" and "cas_id_new":

Table	*Field Name*
obsolete_samples	sample_id_field obsolete_reason
parameter_id_new	parameter_id parameter

Appendix B: Matrix Code and Description

Matrix Code	Description
AO	Outdoor air
AI	Indoor air
AG	Soil gas
AF	Flux chamber air
SD	Sediment
SO	Soil
SW	Swab or wipe
TA	Animal tissue
TP	Plant tissue
WS	Surface water
WG	Ground water
NAPL	Non-aqueous phase liquid
BW	Blank water
LE	Leachate

Appendix C: Sample Type Code and Description

Sample Type Code	Description
AB	Ambient conditions blank
BD	Blank spike duplicate
BS	Blank spike
DIL	Diluted sample
EB	Equipment blank
ER	Equipment rinse
FB	Field blank
FD	Field duplicate sample
FDMS	A combination field duplicate matrix spike
FR	Field replicate
FS	Field spike
FLD	Field analyses such as pH, temperature, specific conductance
KD	Known (external reference material) duplicate
LB	Lab blank
LD	Lab duplicate
LCS	Lab control spike
LCSD	Lab control spike duplicate
LR	Lab replicate
MB	Material/method blank
MBD	Material/method blank duplicate
MS	Lab matrix spike
MSD	Lab matrix spike and spike duplicate pair considered as one sample
NORM	Normal environmental sample taken in field
ORIG	Original sample in laboratory
RD	Regulatory duplicate
RE	Re-analysis
RM	Known (external reference material) rinsate
RN	Rinsate
SD	Lab matrix spike duplicate considered as separate from spike
SPB	Soil prep blank
SPT	A field split sample
TB	Trip blank
TBD	Trip blank duplicate
WPB	Water prep blank
WT	Waste

Appendix D: Analytical Method Name/Code Guidance

Recommended format and guidance for analytical method names include the following:

- If the method is based on the United States Environmental Protection Agency (EPA) SW-846, start the name with "SW-," followed by the number and any applicable letter; e.g., SW-8260b.
- If the method is based on an EPA method that includes a digit after the period (e.g., Clean Water Act methods), be sure to include the digit, even if it is zero. Start the name with EPA; e.g., EPA 300.0
- If the method is based on an EPA document and citing that document is sufficient to understand the method used, include the document number; e.g., EPA-540-R97-028.
- If the method is based on an American Society for Testing and Materials (ASTM) method, include "ASTM-" before the letter and number designation; e.g., ASTM D5755-03. Be sure to include the base designation (D5755) and edition version (-03).
- If the method is based on Standard Methods for the Examination of Water and Wastewater, include "SM" before the number along with the base designation (7500) and the method version (-Ra); e.g.,SM7500-Ra. The data validation summary report (DVSR) should include the edition (e.g., 18th edition) or year the method was approved.
- Proprietary methods specific to a laboratory should have a designation that can be traced to the DVSR and method standard operating procedure. The version of the method needs be included in the DVSR and may also be incorporated into the EDD.

All preparation methods that are distinct from the determination method must be included in the DVSR report and EDD (preparation_method field).

A designation indicating that the method is a modified version (e.g., mod) is recommended but not required. However, the DVSR should indicate if the method is a modified version of a published method.

Appendix E: Analytical Suite Code and Description

Analytical Suite Code	Description
ALDH	Aldehydes
ASB	Asbestos
CRVL	Hexavalent chromium
CYAN	Cyanide
DIO_FUR	Dioxins and furans
FIELD	Field measurements
GENERAL	Wet chemistry type measurements: anions, hardness, bicarbonate, alkalinity, perchlorate, ammonia, bromide, total kjeldahl nitrogen, etc.
HERB	Herbicides
METALS	Metals and elements using inductively coupled plasma (ICP), atomic absorption, ICP-mass spectrometry
ORG_ACID	Organic acids
PCB	Polychlorinated biphenyls (PCBs), Aroclors or congeners.
WPH	pH of aqueous sample
OCPEST	Organo-chlorine pesticides
OPPEST	Organo-phosphate pesticides
SOLIDS	Total dissolved solids, total suspended solids
SVOC	Semivolatile organic compounds, exclusive of pesticides, PCBs, and polyaromatic hydrocarbons (PAHs)
TOC	Total organic carbon
TPH	Total petroleum hydrocarbons, all molecular weights
VOC	Volatile organic compounds
XRFMetals	Metals and elements using X-ray fluorescence (XRF)
RADS	Radionuclides
PAH	Polyaromatic hydrocarbons
TEM	Transmission electron microscopy (asbestos)
PLM	Polarized light microscopy (asbestos)
XRD	X-ray diffraction (asbestos and metals)

Appendix F: DVSR EDD Guidance Flags

Field Name	Possible Value	Meaning	Notes/Additional Guidance
litho	Qal	Quaternary Alluvium	See January 6, 2009, letter (Hydrogeologic and Lithologic Nomenclature Unification) from the Nevada Division of Environmental Protection (NDEP) to the Companies.
	xMCf	Transitional Muddy Creek formation	
	UMCf	Upper Muddy Creek formation	
	Qal/xMCf	Acceptable entries if wells cross these lithologies.	
	Qal/xMCf/UMCf		
	xMCf/UMCf		
hydro	Shallow	Shallow Zone	
	Middle	Middle Zone	
	Deep	Deep Zone	
filtered_flag	Y	Yes (Filtered)	Earlier version of the guidance used T and F (for true and false) but this was changed to avoid the potential confusion of having F interpreted as "Filtered".
	N	No (Unfiltered)	
result_type	TG	Target	Current guidance allows other values as proposed by individual companies.
	SURR	Surrogate	
	IS	Internal Standard	
	TIC	Tentatively Identified Compound	
reanalysis_flag	Initial	Initial analysis	
	Reanalysis	Reanalysis	
detect_flag_fod	D	Detect	
	U	Non-detect	
	R	Rejected data	
detect_flag_ra	D	Detect	For purposes of risk analysis, ALL RADS are considered detects.
	U	Non-detect	
	R	Rejected data	
validation_flag	T	True - indicates the value was validated after the laboratory reported the value.	
	F	False – value not validated	

Field Name	Possible Value	Meaning	Notes/Additional Guidance
validation_stage	Stage 2B	Verification and validation based on completeness and compliance checks of sample receipt conditions and BOTH sample-related and instrument-related QC results.	NDEP Supplemental Guidance on Data Validation dated April 13, 2009 says "all data collected at the BMI Complex and Common Areas should be validated at least to Stage 2B." The origin of the QC acceptance criteria used should be clearly documented in the data validation summary report (DVSR).
	Stage 3	A verification and validation based on completeness and compliance checks of sample receipt conditions, both sample-related and instrument-related QC results, AND recalculation checks against the laboratory reported results.	
	Stage 4	A verification and validation based on completeness and compliance checks of sample receipt conditions, both sample-related and instrument-related QC results, recalculation checks, AND the review of actual instrument outputs.	

Appendix G: Hydraulic Parameter ID and Description

Hydraulic Parameter ID	Description of Parameter
HYCO	Hydraulic conductivity
STOR	Storativity
TRANS	Transmissivity

Appendix H: Soil Material Properties Parameter ID and Description

Soil Material Properties Parameter ID	Description of Parameter
CEC	Cation exchange capacity
DBD	Dry bulk density
GSD	Grain size distribution
FOC	Fraction organic carbon
MSC	Munsell soil color
SGR	Specific gravity
SPH	Soil pH
TOP	Total porosity
USCS	Unified soil classification system description
VMC	Volumetric moisture content
VWC	Volumetric water content

Appendix I: Annotation of Updates to the Unified Chemical EDD Format Document

May, 2013

1. Added Appendix F (DVSR EDD Guidance Flags) and referenced this appendix in section "DVSR and EDD Formats and Naming Requirements".

2. Renamed Appendices F, G, and H to accommodate the additional appendix.
3. Removed the sentence in the "Non-Analytical Data" section that referenced separate data tables for the non-analytical data.
4. Added three additional entries for the litho field.
5. Noted that prep_date and prep_time are required only if the information is available.
6. Changed the text that referenced "analyte_name" and "cas_id" to "parameter" and "parameter ID" to better accommodate all of the data that is included in the database.

January, 2012

1. Main document text revisions:

a. General edits in the body of the document were made for clarity.

b. The dvsr_id must be included within the DVSR title as well as the EDD filename.

c. Revised DVSRs and/or EDDs must retain the original DVSR document title or EDD filename with the revision appended to the end of the report or filename. For example, if an original EDD was entitled "Company X groundwater report 2011.mdb," revision 1 of the EDD should be entitled "Company X groundwater report 2011 rev1.mdb."

d. Analyte_name will be normalized to those contained in the official CAS ID – analyte name list located at http://ndep.gisdt.org.

e. Physical parameter codes in the cas_id field will be normalized to those contained in the official CAS ID – analyte name list.

2. The EDD Data Fields table from the June, 2010 version was combined with Appendix A: EDD Database Tables and Field Requirements.

a. The "Short Description" column was deleted because it was redundant.

b. A "Value Required" column was added to indicate fields that must be populated.

c. A "Database Constraints" column was added to describe primary/foreign key relationships.

d. The "Field Requirements" column was edited for clarity.

e. EDD samples table:

- Added text indicating the dvsr_id must be included within the DVSR title as well as the EDD filename.
- A location_id field was added as a foreign key.
- The hydro field was moved from the locations table to the samples table.

f. EDD results table:

- The percent_moisture field was moved from the samples table to the results table.
- The filtered_flag field was moved from the samples table to the results table. The filtered_flag was changed to Y (filtered)/N (unfiltered) to avoid confusion associated with the previous T/F flag.
- Added text indicating analyte_name will be normalized to those contained in the official CAS ID – analyte name list located at http://ndep.gisdt.org.
- Added text indicating physical parameter codes in the cas_id field will be normalized to those contained in the official CAS ID – analyte name list.
- Reworded the result_reported detailed description for clarity.
- Detect_flag_fod and detect_flag_ra fields: changed flags to D (detect), U (nondetect) and R (rejected) for improved clarity instead of previous T/F flags. Updated detailed description.
- Dilution_factor: assigned a default value of 1 for all records.
- Lab_id: clarified this field should be an abbreviation of the lab name.
- Noted that data associated with blank contamination are no longer censored.

3. Appendix F: Field Measurements and Appendix I: CAS IDs/Analyte Codes in the June, 2010 version were deleted

because the information is now contained in the official CAS ID – analyte name list located at http://ndep.gisdt.org.

June, 2010
1. As of the previous version of the EDD guidance, the CAS ID/Analyte Code table was made available in electronic format as a Microsoft Excel spreadsheet. In this version, this table has been removed from the document because it is so large and unwieldy. Appendix I [H] now contains instructions for accessing the table in electronic form.
2. In the EDD Data Fields section, guidance was clarified for the following fields:
a. hydro
b. litho
c. result_reported
d. detect_flag_ra
3. The table in Appendix A was replaced with a new table containing more detailed information about data types and requirements (for example, which fields cannot be left empty) for each field in the EDD, in addition to the original information about which fields make up each of the four required EDD tables.
4. In Appendix B, added a new matrix code LE for leachate.

February, 2010
1. Clarified description of Well ID field.
2. Added this appendix.
3. Added section "Lookup Tables."
4. Updates to Appendix I, CAS IDS/ANALYTE CODES:
a. Replaced redundant/overlapping CAS IDs for TPH analytes with 5 new IDs: TPH_GRO, TPH_DRO, TPH_ORO, TPH_EFH, and TPH_HEMOG
b. Changed CAS ID Z7HEX to 35507-09-6 for [Z)-7-Hexadecene
c. Removed redundant or erroneous CAS IDs '163', DICBTOT, DPPT, 100022-54-1(Ethyl 2-chloro-2-[3-chlorobenzene]), OSOIL, 100021-66-2(Trans-2,3-dimethylthiophane)
d. There were duplicate CAS IDs for analytes 13C12-PCB 77, 13C12-PCB 81, 13C12-PCB 118, 13C12-PCB 126, and 13C12-PCB 169 – duplicates were removed.
e. Changed analyte name for CAS ID 608-73-1 from 1,2,3,4.5,6-Hexachlorocyclohexane to Lindane
f. Fixed misspelling of analyte name for CAS ID 126-98-7 (Methacrylonitrile was spelled Methylacrylonitrile)
g. Changed analyte name for CAS ID 7440-08-6 from Polonium-209 to Polonium; added new CAS ID PO-209 for Polonium 209
h. Changed analyte name for CAS ID 297-97-2 (incorrectly listed with analyte name TEPP) to Thionazin
i. Changed CAS ID for Thiophenol from 108-95-5 to 108-98-5
j. Added new CAS IDs
- 4376-18-5 "1,2-Benzenedicarboxylic acid, monomethyl"
- 544-25-2 "1,3,5-Cycloheptatriene"
- 628-41-1 "1,4-Cyclohexadiene"
- 109719-94-0 "13C-1,2,3,4,7,8,9-HpCDF"
- 109719-80-4 "13C-1,2,3,4,7,8-HxCDD"
- 116843-03-9 "13C-1,2,3,6,7,8-HxCDF"
- 116843-04-0 "13C-1,2,3,7,8,9-HxCDF"
- 116843-05-1 "13C-2,3,4,6,7,8-HxCDF"
- 116843-02-8 "13C-2,3,4,7,8-PeCDF"
- 2733-88-2 "15-Tetracosenoic acid, methyl"
- 1454-85-9 1-Heptadecanol
- 2642-82-2 "2,2-Bis[p-chlorophenyl]ethanol"
- 21854-95-5 "2,2'-Dichlorobenzil"
- 85-29-0 "2,4'-Dichlorobenzophenone"
- 563-80-4 "2-Butanone, 3-methyl-"
- 37777-76-7 2-Chloro-6-fluorophenylacetic acid
- 108-43-0 3-Chlorophenol
- 552-54-5 "4H-1-benzopyran-4-one, 3,5-dih"
- POROS_AIR Air Filled Porosity

14683-10-4 Antimony-124
14234-35-6 Antimony-125
13981-41-4 Barium-133
14798-08-4 Barium-140
100-66-3 "Benzene, methoxy-"
6320-03-2 "Benzenethiol, 2-chloro-"
51-44-5 "Benzoic acid, 3,4-dichloro-"
13966-02-4 Beryllium-7
62338-43-6 "Bicyclo[2.2.2]octa-2,5-diene,"
BULK_DENS Bulk Density
123-72-8 Butyraldehyde
13982-30-4 Cerium-139
13967-74-3 Cerium-141
14762-78-8 Cerium-144
14234-29-8 Cesium-136
13898-47-0 Chlorite
14392-02-0 Chromium-51
61568-43-2 cis-2,4-Dimethylthiane
CLAY CLAY
COARSE SAND COARSE SAND
14093-03-9 Cobalt-56
55963-79-6 "Cyclohexane, 1,2,3,4,5,6-hexachloro-, .g"
540-97-6 "Cyclohexasiloxane, dodecamethyl-"
822-50-4 "Cyclopentane, 1,2-dimethyl-, t"
1759-58-6 "Cyclopentane, 1,3-dimethyl-, t"
96-37-7 "Cyclopentane, methyl-"
Delta-D Delta-D
Delta-O Delta-O
542-88-1 Dichloromethyl ether
352-93-2 Diethyl sulfide
122-39-4 Diphenylamine
14683-23-9 Europium-152
15585-10-1 Europium-154
14391-16-3 Europium-155
FINE SAND FINE SAND
FOC Fraction organic Carbon
HYCO HYDRAULIC CONDUCTIVITY
14694-69-0 Iridium-192
14596-12-4 Iron-59LIQLIM LIQUID LIMIT13966-31-9 Manganese-54
MEDIUM SAND MEDIUM SAND
13982-78-0 Mercury-203
5162-3-08 "Methanone, [2-chlorophenyl]phenyl-"
112-40-3 n-Dodecane
14269-74-0 Neodymium-147
13968-59-7 Neptunium-239
14681-63-1 Niobium-94
13967-76-5 Niobium-9592-71-7 "Oxazole, 2,5-diphenyl-"
92-71-7 "Oxazole, 2,5-diphenyl-"
7440-05-3 Palladium
37680-73-2 PCB 101 [BZ]
68194-06-9 PCB 102 [BZ]
70362-41-3 PCB 108 [BZ]/107 [IUPAC]
18259-05-7 PCB 116 [BZ]
68194-11-6 PCB 117 [BZ]
74472-39-2 PCB 125 [BZ]

- 2974-90-5 PCB 13 [BZ]
- 35065-28-2 PCB 138 [BZ]
- 38380-04-0 PCB 149 [BZ]
- 74472-44-9 PCB 163 [BZ]
- 59291-65-5 PCB 168 [BZ]
- 38444-84-7 PCB 20 [BZ]
- 38444-86-9 PCB 33 [BZ]
- 52663-59-9 PCB 41 [BZ]
- 41464-40-8 PCB 49 [BZ]
- 33284-53-6 PCB 61 [BZ]
- 32598-12-2 PCB 75 [BZ]
- 55312-69-1 PCB 86 [BZ]
- 38380-02-8 PCB 87 [BZ]
- 55215-17-3 PCB 88 [BZ]
- 68194-07-0 PCB 90 [BZ]
- 73575-56-1 PCB 93 [BZ]
- 1560-93-6 "Pentadecane, 2-methyl-"
- %SAND_C Percent SAND - Coarse
- %SAND_F Percent SAND - Fine
- 119-47-1 "Phenol, 2,2'-methylenebis[6-[1"
- 1200-09-5 "Phenol, 4-[3-methyl-2-butenyl]"
- 14265-44-2 PHOSPHATE
- 85-44-9 Phthalic anhydride
- PLASLIM PLASTIC LIMIT
- PLASIND PLASTICITY INDEX
- POROSITY POROSITY
- 14834-73-2 Promethium-144
- Pm-146 Promethium-146
- 13967-48-1 Ruthenium-106
- SILT SILT
- 378784-24-8 Silver-110m
- 13966-32-0 Sodium-22
- 14808-79-8-Diss Soluble Sulfate
- PERM_AIR SPECIFIC PERMEABILITY TO AIR
- PERM_WATER SPECIFIC PERMEABILITY TO WATER
- 110-01-0 "Thiophene, tetrahydro-"
- 13966-06-8 Tin-113
- POROS_FLUID Total Pore Fluid Saturations
- TOP Total Porosity
- 10028-17-8 Tritium
- 13982-36-0 Yttrium-88
- 13982-39-3 Zinc-65
- 13967-71-0 Zirconium-95