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Waste Characterization Strategy Form

Project Title	**Perched-intermediate well CdV-16-4ip**
Perched-Intermediate Well	**CdV-16-4ip**
Activity Type	**Perched-Intermediate Well Installation and Corehole Drilling**
Drilling Project Technical Lead	**Theodore T. Ball**
Waste Management Coordinator	**David E. Mikkelson**
Completed by	**Jocelyn Buckley**
Date	**May 19, 2010**

Description of Activity:

The waste-generating activities addressed in this Waste Characterization Strategy Form (WCSF) consist of the installation (i.e., drilling, collecting chip and core samples, development, groundwater sampling and aquifer testing) of perched-intermediate well CdV-16-4ip. This well is located in Technical Area 16 in the southwest corner of LANL, east of the main cluster of observation wells R-25, R-25b, R-25c, and CdV-16-1(i). See Figure 1 for the map of well location.

The following waste streams are anticipated for this well:

- Waste Stream #1-Contact Waste
- Waste Stream #2-Drill Cuttings
- Waste Stream #3-Drilling Fluids
- Waste Stream #4-Development Water
- Waste Stream #5-Decontamination Fluids
- Waste Stream #6-Municipal Solid Waste (MSW)
- Waste Stream #7-Petroleum Contaminated Soils (PCS)
- Waste Stream #8-Drilled out Concrete Chips or Concrete Slurry
- Waste Stream #9-Residual Concrete from Concrete Washout Water
- Waste Stream #10-Contaminated Storm-water

All wastes will be managed in accordance with P-409, *Waste Management*; EP-SOP-5238, *Characterization and Management of Environmental Program Waste*; P-930-1, *LANL Waste Acceptance Criteria*; P-930-2, *Waste Certification Program*, and approved work plans.

Trained and qualified Field Waste Management Technician(s)(FWMT), Waste Sampling Personnel (SP), and Hazardous Materials Packaging and Transportation (HMPT) personnel will be assigned to perform the duties outlined in EP-SOP-5238, *Characterization and Management of Environmental Program Waste*.

This WCSF will be implemented before any waste generating activity is undertaken. An amendment to this strategy form will be prepared and submitted for review and approval if any of the waste streams change in description or characterization approach or unanticipated waste streams are generated. The generation of no path forward wastes must be approved by Department of Energy (DOE) prior to generation of the waste.

Investigation activities will be conducted in a manner that minimizes the generation of waste. Waste minimization will be accomplished by implementing the most recent version of the "Los Alamos National Laboratory Hazardous Waste Minimization Report" (LANL 2008, 104174). Waste streams will be recycled/reused, as appropriate.

Relevant Site History and Description:

Well CdV-16-4ip is a pumping well that is being installed as part of a hydrologic testing program to evaluate properties of the deep-perched groundwater zone at Consolidated Unit 16-021(c)-99 (TA-16-260 Outfall), located in Technical Area 16 in the southwest corner of the Laboratory. The tests will provide field-scale measurements of aquifer parameters for the deep-perched system that will be used to assess the potential for pumping and treatment of contaminated deep-perched groundwater associated with the TA-16-260 Outfall. Based upon historical information associated with activities conducted in Building TA-16-260, there is a potential for F-listed solvent contamination at well CdV-16-4ip. According to past due diligence efforts associated with groundwater monitoring wells R-25b, R-25c, and R-25, and remediation sites near the well location, TA-16-260 (260 Outfall) is a known solvent source. Also, past analytical data from nearby wells have shown solvent detections (i.e., butanone [2-], toluene, tetrachloroethylene, and trichloroethylene) in the drilling waters. RDX, Iron and Manganese have also been detected in drilling waters in the area and have exceeded New Mexico groundwater standards for land application. Since there is a potential for F-listed solvent contamination at well CdV-16-4ip from TA-16-260 activities, the IDW will initially be handled as hazardous waste, unless otherwise indicated for each anticipated waste stream.

CHARACTERIZATION STRATEGY

The characterization strategy for investigation derived waste (IDW) generated during well installation is based upon direct sampling of the containerized waste and acceptable knowledge (AK) data/documentation associated with well location (i.e., within or near an Area or Concern [AOC] or Solid Waste Management Unit [SWMU]). AK includes review of existing analytical (i.e., soil, sediment, cuttings, groundwater, etc.) data in the vicinity of the wells, historical documentation associated with nearby AOCs or SWMUs, and may also include source term/process identification performed to identify whether listed hazardous waste may be present (i.e., due diligence reviews). Refer to Table 1 for the characterization method and analytical testing method to be applied to each waste stream.

The initial management of each waste stream will be based upon existing acceptable knowledge (AK) data/documentation or by direct sampling of the IDW. Based upon previous AK data/ documentation [See Relevant Site History and Description], the waste streams generated from well CdV-16-4ip will initially be managed as hazardous. For waste that is initially stored as non-hazardous (e.g., decontamination fluids generated prior to down-hole use), the non-hazardous waste label, date of generation (i.e., initial placement in the container), as well as the generator's name and container contents will be placed on the non-hazardous waste containers as a best management practice. A final waste determination will be made within 45 days from the date of generation so that if the waste is determined to be hazardous, it can be managed expeditiously. Returned samples and associated PPE may be included with a waste stream at the time of disposal, if appropriate.

Based upon historical data/documentation, the IDW from this well is not believed to contain LANL-added radioactive constituents. However if the waste is determined to be radioactive and does not meet land application standards, it must be managed in a registered radioactive waste staging or storage area. Waste determinations will be made in a timely manner so that if the waste is determined to be hazardous, radioactive, or mixed low-level, it can be managed expeditiously. A Waste Acceptance Criteria (WAC) exception form (WEF) will be used if the generator does not make a waste determination within 45 days of the generation date of the waste.

If analytical data or AK documentation indicate the presence of listed constituents that are not associated with a listed source, a due diligence review of available documentation may be performed to support the position that the constituents are not from a listed source (i.e., a listed process or spill or disposal of an unused/unspent chemical). If the due diligence does not identify a listed source, the waste will not carry the listed waste number. If a listed constituent is identified and is from a listed source (i.e., TA-16-260), but the levels are below groundwater standards or soil screening levels and land disposal restrictions (LDRs), a "contained-in" request may be made to New Mexico Environment Department (NMED) in order to remove the listed waste number from the waste stream. A copy of either the ENV-RCRA approved due

diligence or the NMED "contained-in" approval must accompany all waste profiles prepared for the subject waste(s).

Sampling Waters in Pits and Tanks:

Groundwater produced during well drilling, development, and rehabilitation must be containerized on-site in a lined pit or tank(s). A representative sample(s) will be collected from each pit or tank in order to accurately characterize the water quality to determine compliance with the NOI Decision Tree. Representative samples shall be collected in accordance with the following requirements (Reference: ENV-RCRA-QP-10, *Land Application of Groundwater*)

- A composite sample shall be collected from each pit and tank at intervals across the entire water column—surface, middle, and bottom. Stratified, vertical sampling is necessary to address NMED's concerns about stratification of contaminants in the pit or tank. Note: If the water freezes, leaving a thin film of ice at the top, a composite sample may still be taken by breaking through the thin film, as long as the stratified vertical composite sampling is maintained.

- The methods available to sample a pit or tank at varying depths include the following:

  - Geotech pump with tubing attached to a weight or pole
  - Bomb sampler
  - Coliwasa liquid waste sampler
  - Thief sampler
  - Bailer depending upon depth of container

- Alternately, an aliquot may be collected during water production and diverted to a smaller container (e.g., clean 55-gallon drum) that can then be sampled. For example, while filling a 21,000 gallon frac tank, a one-gallon sample is collected every 500 gallons and placed in a clean, 55-gallon drum. Note: This sampling method (incremental sampling) may also be applied to drill cuttings going into a pit, as long as the collected sample is representative of the waste stream.

Note: Select the appropriate sampling method, and operate the device in accordance with Appendix E of the RCRA Waste Sampling Draft Technical Guidance (EPA 530-D-02-002, August 2002, http://www.epa.gov/osw/hazard/testmethods/sw846/pdfs/rwsdtg.pdf).

Sampling personnel must record IDW sampling information in accordance with EP-ERSS-SOP-5058, *Sample Control and Field Documentation* and EP-ERSS-SOP-5181, *Documentation for Waste and Environmental Services Technical Field Activities*. The field notebook or sample collection sheet must be used to document sample collection activities (e.g., equipment and sampling methods used, number and location of samples, etc.). Sampling personnel must also record field conditions, problems encountered, local sources of contamination (e.g., operating generators or vehicles), the personnel involved, equipment and supplies used, wastes generated, and field observations. Refer to Table 2 for a list of LANL Sampling and Analysis Procedures.

Discharging Containerized Secondary Containment Storm water:

Potentially contaminated storm water will be managed in accordance with the requirements in 20.6.2.1201, NMAC of the New Mexico Water Quality Control Commission (NMWQCC) Regulations; 40 CFR §112, Oil Pollution Prevention Regulations (Spill Prevention, Control, and Countermeasure [SPCC] Plan); 40 CFR §122, Construction General Permit Regulations, and applicable Storm Water Pollution Prevention (SWPP) Plan requirements. Department of Energy (DOE), LANL Engineering Standards, and state and federal policies/regulations may also apply.

To determine if storm water discharges from secondary containment systems are permitted on LANL property under LANL's discharge policy, the following steps are mandatory:

1) Check for oil sheen. If oil sheen exists, contact Jake Meadows, at 606-0185, for handling requirements.

2) Check for pH. The pH must be between 6 and 9.

3) Notify ENV-RCRA (Jake Meadows 606-0185) prior to proposed discharge.

4) If discharge is not granted by ENV-RCRA, the contaminated storm water must be managed in accordance with this WCSF (See Waste Stream #10).

For unintentional releases or discharges of potentially contaminated storm water to the environment, the following actions must be taken:

5) Document the volume of waste released; time, date, and location of discharge; and other conditions on the Liquid Discharge Form (See Attachment 1).

6) Submit the Liquid Discharge Form to Jacob Meadows via FAX to 505-665-9344.

7) Document the discharge in the SPCC Plan or SWPP Plan, when applicable.

For questions, please contact Jake Meadows, 606-0185 or the ENV-RCRA Group Office, 667-0666.

Waste #1: Contact Waste- This waste stream is comprised of solid waste generated during well installation activities that has come into contact with contaminated environmental media and equipment. This includes, but is not limited to: PPE (primarily gloves); plastic sheeting (e.g., tarps and liners); plastic and glass sample bottles; disposable sampling supplies (e.g., filters, tubing, plastic bags); and dry decontamination wastes, such as paper items. It is estimated that less than 30 cubic yards of contact waste may be generated.

Anticipated Regulatory Status: Green is Clean, Hazardous, Industrial (Non-Hazardous), LLW, or MLLW

Characterization Approach: Contact IDW will be characterized using acceptable knowledge (AK) of the environmental media (i.e., drill cuttings and drilling fluids) with which it came into contact.

Storage and Disposal Method: Contact waste will initially be stored as hazardous waste in a satellite accumulation area (SAA). If the contact waste is determined to be nonhazardous/nonradioactive, and approval is granted by ENV-RCRA, it may be recycled or reused via the Material Recycling Facility (MRF).

Note: Every effort will be made to recycle or reuse contact waste, if determined to be non-hazardous, non-radioactive. Otherwise, it will be treated and/or disposed of at an authorized facility.

Waste # 2: Drill Cuttings – This waste stream is comprised of borehole cuttings and core, soil, and rock sediments produced from drilling. The cuttings may or may not contain residue of drilling additives. It is estimated that 80 cubic yards of drill cuttings may be generated.

Anticipated Regulatory Status: Hazardous, Industrial (Non-Hazardous), LLW, or MLLW

Characterization Approach: Waste characterization will be based upon the analytical results obtained from the direct sampling of the cuttings. A representative sample of the cuttings will be taken within 10 days of well completion. A waste determination will be made within 45 days of waste generation (i.e., the date the cuttings were removed from the pit and first placed into a container, or the date of initial placement into an approved container). A 21-day turnaround time will be requested for analysis.

Sampling Approach: After fluids have been removed from the pit, samples of the drill cuttings will be collected in accordance with LANL SOP-06.10, *Hand Auger and Thin-Wall Tube Sampler,* using systematic grid sampling (minimum of 20 grids) as described in Section 5.2 of the RCRA Waste Sampling Draft Technical Guidance (EPA 530-D-02-002, August 200, http://www.epa.gov/osw/hazard/testmethods/sw846/pdfs/rwsdtg.pdf). Collect an incremental sample from each grid, boring through the entire depth of the cuttings. Combine the increments into a single sample for the pit. If a hand auger or thin-wall tube sampler is not an appropriate sampling device, select the appropriate tools described in Table 8 of Section 7.1.3 of the EPA guidance, and operate the

sampling device in accordance with Appendix E of the guidance. Alternately, incremental samples may be collected during production and diverted to a smaller container (e.g., clean 55-gallon drum) that can then be sample for analysis; however, this method must not be used for VOC analysis. After samples are collected from the smaller container, the residual cuttings may be placed into the pit with the rest of the cuttings produced during drilling.

Sampling personnel must record IDW sampling information in accordance with EP-ERSS-SOP-5058, *Sample Control and Field Documentation* and EP-ERSS-SOP-5181, *Documentation for Waste and Environmental Services Technical Field Activities*. The field notebook or sample collection sheet must be used to document sample collection activities (e.g., equipment and sampling methods used, number and location of samples, etc.). Sampling personnel must also record field conditions, problems encountered, local sources of contamination (e.g., operating generators or vehicles), the personnel involved, equipment and supplies used, wastes generated, and field observations.

Storage and Disposal Method: Drill cuttings will initially be stored in lined pits within the project controlled area at each well, pending review of analytical results to determine final waste characterization. Specifications for the cuttings pit will be in accordance with the approved Storm Water Pollution Prevention Plan. Based upon validated analytical data, drill cuttings will be evaluated, using the Automated Waste Determination (AWD) Program, for land application in accordance with ENV-RCRA-QP-011.1, *Land Application of Drill Cuttings*. If the cuttings meet the criteria for land application, the pit liner will be removed and managed as contact waste and the drill cuttings will be land applied in accordance with the procedure (ENV-RCRA-QP-11.1). If analytical data and documentation show the cuttings are hazardous wastes (i.e., contain constituents from a listed source) that meet all of the land application criteria, they will be left in the pit pending a "contained-in" approval from the New Mexico Environment Department for the potentially listed constituent(s).

If the cuttings are containerized, they are subject to the 90-day accumulation limit and ENV-RCRA must be notified on or before day 70 of the "contained-in" request so that approval may be obtained from NMED before the accumulation period (90-days) is exceeded. Any wastes that cannot be land applied will be managed and disposed of based upon the regulatory classification of the waste. Wastes with a 90-day accumulation limit (NMSW or hazardous waste) will be sent to an authorized facility for treatment, storage, or disposal within 90-days of containerization.

Waste # 3: Drilling Fluids – This waste stream is comprised of potable water, from a municipal water well, that is introduced into and retrieved from the borehole during drilling; mixing with groundwater may occur if water bearing formations are encountered. Drilling fluids may or may not contain drilling additives. It is estimated that 50,000 gallons of drilling fluids may be generated.

Anticipated Regulatory Status: Hazardous, LLW, MLLW, or Industrial

Characterization Approach: Waste characterization will be based upon the analytical results obtained from the direct sampling of the drilling fluids. Representative samples of the fluids will be taken within 10 days of well completion. If for any reason drilling fluids cannot be placed in pits, they will be containerized and sampled within 10 days of containerization. A waste determination will be made within 45 days of waste generation (i.e., the date the fluids were removed from the pit and first placed into a container, or the date of initial placement into an approved container). A 21-day turnaround time will be requested for analysis.

Sampling Approach: See Sampling Waters from Pits and Tanks section of this WCSF.

Storage and Disposal Method: Drilling fluids will initially be stored in lined pits pending review of analytical results to determine final waste characterization. If, for any reason, the fluids cannot be placed in pits, they will be containerized and stored in a 90-day accumulation area as hazardous waste, pending analysis. Based on validated analytical data, drilling fluids will be evaluated, using the Automated Waste Determination (AWD) Program, for land application in accordance with ENV-RCRA-QP-10, *Land Application of Groundwater*. If the drilling fluids meet the criteria for land application, they will be land applied in accordance with the procedure. If analytical data and documentation show the fluids are hazardous wastes (i.e., contain constituents from a listed source) that meet all of the land application

criteria, they will be left in pit or container, pending a "contained-in" approval from the New Mexico Environment Department for the potentially listed constituent(s).

If the fluids are containerized, the IDW becomes subject to the 90-day accumulation limit at the time of placement. ENV-RCRA must be notified within 70 days of generation (i.e., containerization) that a "contained-in" is needed. Any wastes that cannot be land applied will be managed and disposed of based upon the regulatory classification of the waste. Wastes with a 90-day accumulation limit (NMSW or hazardous waste) will be sent to an authorized facility for treatment, storage, or disposal within 90 days of generation (i.e., initial placement in the container).

Waste #4: Development Water- This waste stream consists of groundwater generated during development of the well and aquifer testing. The anticipated volume of development water that will be generated is approximately 50,000 gallons.

Anticipated Regulatory Status: Hazardous, LLW, MLLW, SWWS, or RLWTF

Characterization Approach: Waste characterization will be based upon the analytical results obtained from the direct sampling of containerized waste. A representative sample will be taken within 10 days of generation (i.e., date of initial placement into the container) so that a waste determination can be made within 45 days of generation and the waste dispositioned within 90 days, if necessary. Samples will be submitted with a 21-day turnaround time for analyses.

Sampling Approach: See Sampling Waters from Pits and Tanks section of this WCSF. **Note:** To collect representative waste samples, either a composite sample will be collected after well development or sample aliquots will be collected periodically during development and stored in a clean 55-gallon drum.

Storage and Disposal Method: Development water will be containerized at the point of generation and initially managed in a 90-day accumulation area as hazardous waste, pending analysis. Based on validated analytical data, development water will be evaluated, using the Automated Waste Determination (AWD) Program, for land application in accordance with ENV-RCRA-QP-10, *Land Application of Groundwater*. If the development water meets the criteria for land application, it will be land applied in accordance with the procedure. If analytical data and documentation show the development waters are hazardous wastes (i.e., contain constituents from a listed source) that meet all of the land application criteria, they will continue to be managed in a 90-day accumulation area, pending a "contained-in" approval from the New Mexico Environment Department for the potentially listed constituent(s).

In order to ensure approval from NMED for the "contained-in" before the accumulation period (90-days) is exceeded, ENV-RCRA must be notified within 70 days of generation (i.e., containerization) that a "contained-in" is needed. Any wastes that cannot be land applied will be managed and disposed of based upon the regulatory classification of the waste. Wastes with a 90-day accumulation limit (NMSW or hazardous waste) will be sent to an authorized facility for treatment, storage, or disposal within 90 days of generation (i.e., initial placement in the container).

Waste #5: Decontamination Water - Consistent with waste minimization practices, the Laboratory employs dry decontamination methods to the extent possible. However, if dry decontamination cannot be performed, liquid decontamination is used. Decontamination water consists of liquid wastes generated from the decontamination of excavation, sampling, and drilling equipment. It is estimated that approximately 500 gallons of decontamination water will be generated.

Anticipated Regulatory Status: Hazardous, LLW, MLLW, SWWS, or RLWTF

Characterization Approach: Decontamination water used on down hole equipment and materials will be characterized using acceptable knowledge (AK) of the media with which it came into contact. All other decontamination water generated from this project (i.e., decontamination water from rinsing a frac tank or drilling equipment prior to use) must be segregated from the decontamination water used on down-hole equipment and analyzed separately. The characterization approach for decontamination water used on down-hole equipment and materials may be augmented, as needed, by direct sampling of containerized waste to fulfill a treatment, storage, or disposal facility's waste acceptance criteria (WAC). A representative sample will be taken within 10 days of generation (i.e., date of initial placement into the

container) so that a waste determination can be made within 45 days of generation and wastes dispositioned within 90 days, if necessary. Samples will be submitted with a 21-day turnaround time for analyses. Multiple sampling may be required to ensure WAC requirements are met.

Sampling Approach: Samples will be collected from the storage container in accordance with LANL SOP-06.15, *COLIWASA Sampler for Liquids and Slurries.* If the container does not permit COLIWASA or bailer sampling, the type of sampling equipment used will be appropriate for the waste container and properly operated in accordance with Chapter 7 and Appendix E of the RCRA Waste Sampling Draft Technical Guidance (EPA 530-D-02-002, August 2002, http://www.epa.gov/osw/hazard/testmethods/sw846/pdfs/rwsdtg.pdf).

Sampling personnel must record IDW sampling information in accordance with EP-ERSS-SOP-5058, *Sample Control and Field Documentation* and EP-ERSS-SOP-5181, *Documentation for Waste and Environmental Services Technical Field Activities*. The field notebook or sample collection sheet must be used to document sample collection activities (e.g., equipment and sampling methods used, number and location of samples, etc.). Sampling personnel must also record field conditions, problems encountered, local sources of contamination (e.g., operating generators or vehicles), the personnel involved, equipment and supplies used, wastes generated, and field observations.

Storage and Disposal Method: Decontamination water will be containerized at the point of generation and managed as hazardous waste, pending analysis. Nonhazardous/nonradioactive decontamination water may be disposed of on-site at the Sanitary Wastewater Treatment Facility if WAC requirements are met. If the waste cannot be disposed of at the Sanitary Wastewater Treatment Facility, due to operational limitations or inability to meet the WAC, it will be sent to an authorized facility for treatment, storage, and disposal.

Waste #6: Municipal Solid Waste (MSW) – This waste stream primarily consists of non-contact trash, including, but not limited to, paper, cardboard, wood, plastic, food and beverage containers. It is estimated that 2 yd^3 of MSW will be generated.

***Anticipated Regulatory Status*:** MSW

Characterization Approach: MSW will be characterized based on acceptable knowledge of the waste materials (including Material Safety Data Sheets) and methods of generation.

Storage and Disposal Method: MSW will be segregated from all other waste streams. It is anticipated that the waste will be stored in plastic trash bags or other appropriate containers and transferred/disposed of at the County of Los Alamos solid waste transfer station or other authorized off-site solid waste facility.

Waste #7: Petroleum Contaminated Soils (PCS) – PCS may be generated from the accidental release of commercial products such as hydraulic fluid, motor oil, unleaded gasoline, or diesel fuel (e.g. from the rupture of hydraulic or fuel hoses, or spills during maintenance, etc.). Absorbent padding, paper towels, spill pillows or other absorbent material used to contain the released material may be added to the PCS waste for storage and disposal. It is estimated that <1 yd^3 of this waste stream will be produced.

Anticipated Regulatory Status: New Mexico Special Waste (NMSW), Hazardous, Industrial

Characterization and Sampling Approach: The PCS may be sampled in place if sampling and containerization can occur the same day as the spill. If samples cannot occur the same day as the spill, the PCS should immediately be containerized. Samples should be collected in accordance with SOP-06.10, *Hand Auger and Thin-Wall Tube Sampler* (containerized or deeper spills) or, if the spill is shallow and being sampled in place or the waste container is small, in accordance with SOP-06.11, *Spade and Scoop Method for Collection of Soil Samples.* The analysis of the samples will be dependent on where the spill occurred:

- If the spill occurred on clean soil, samples will be analyzed for VOCs, total petroleum hydrocarbons (TPH), gasoline-range and diesel-range (DRO/GRO), and total metals, at a minimum. These analytical suites are required to determine whether the waste is NMSW. Other constituents must be analyzed as needed to meet the receiving disposal facility's WAC.

- If the spill occurs on soils with known hazardous contaminants or soils with no available information, samples will be analyzed, at a minimum, for VOCs, SVOCs, total metals, and TCLP metals, if necessary, as well as any analytes needed to meet the WAC of the anticipated receiving treatment or disposal facility. If radioactive or explosives operations occurred in the vicinity, samples may also need to be analyzed for explosives, gross alpha, gross beta, and isotopic radionuclides, as appropriate.

Samples will be submitted with 21-day turnaround time for analysis so that a waste determination can be made within 45 days of generation. The date of generation for NMSW is the date the container is completely full or the date in which no additional NMSW will be added to the container. Do not sample NMSW if additional waste will be added to the container.

Storage and Disposal Method: PCS will be stored in clearly marked and appropriately constructed waste accumulation areas. Waste accumulation area postings, regulated storage duration, and inspection requirements will be based on the waste classification.

If the PCS is not contaminated with radioactive or hazardous materials, it will be classified as:

- New Mexico Special Waste PCS if the sum of benzene, toluene, ethylbenzene, and xylene isomer concentrations are greater than 50 mg/kg, if benzene individually is equal to or greater than 10 mg/kg (Note: If benzene concentrations are equal to or greater than 0.5 mg/liter, based upon TCLP, it is a hazardous waste, not a NMSW), or if TPH (DRO+GRO) concentration is greater than 100 mg/kg. NMSW will be managed in a registered NMSW areal
- Industrial waste if the contaminant levels are less than the NMSW and/or PCB regulatory levels.

All PCS will be treated/disposed at an authorized off-site treatment or disposal facility appropriate to the waste classification.

Waste #8: Drilled-out Concrete Chips and Concrete Slurry- This waste stream consists of concrete chips from drilling out plug used to seal off perched groundwater or stabilize the borehole to facilitate drilling. It is estimated that 60 yd^3 of drilled out concrete chips or concrete slurry may be generated.

Anticipated Regulatory Status: Hazardous, Industrial, Reusable Material/Recycle, LLW , or MLLW

Characterization Approach: The concrete waste will be characterized based on AK from the MSDS for the cement and/or the surrounding soil. If concrete is generated from within a potential release site (PRS), and AK data/documentation is not available, a total metal analysis will be used to determine if the material can be recycled or reused. Additional sampling may be required depending on contaminants of concern in a PRS or the presence of radionuclides. A representative sample will be taken within 10 days of generation (i.e., date of initial placement into the container) so that a waste determination can be made within 45 days of generation and wastes dispositioned within 90 days, if necessary. Samples will be submitted with a 21-day turnaround time for analyses.

Storage and Disposal Method: Concrete waste will be managed in a roll-off container or other suitable container as nonhazardous, initially. If concrete is not contaminated, it may be sent to the county landfill for reuse but the waste must have ENV-RCRA approval for release. If it is contaminated, it must be managed as waste and managed in accordance with the regulatory classification of the waste. For concrete generated from within a PRS, analyses for total metal and contaminants associated with the PRS will be conducted to determine if the material can be recycled or reused, if AK documentation is not available. Every effort will be made to recycle or reuse these materials, if possible.

Waste #9: Residual Concrete from Concrete Washout Water – This waste stream consists of residual cement generated from the evaporation of concrete wash-out water. It is estimated that 1yd^3 of residual concrete may be generated.

In July 2006, NMED approved a Notice of Intent (NOI), submitted by LANL, to discharge no more than 300 gallons per day of concrete/cement mortar mixture without a Discharge Permit as long as certain conditions were met: 1) A maximum of 300 gallons per day of a concrete/cement mortar mixture will be discharge onto the land, 2) Potable water will be used to wash out the mixers and equipment, 3) The washout material will be captured in on-site containment areas for dewatering/evaporation and hardening of material, 4) Best Management Practices will be implemented to contain the washout material and minimize erosion and transport of potential pollutants, 5) Containment will not be constructed in or on solid waste management areas, areas of contamination, watercourses, treatment, storage, and disposal facilities, or storm water drainages, and will remain on the construction site.

Anticipated Regulatory Status: Reusable Material/Recycle or Industrial

Characterization Approach: The concrete waste will be characterized based on AK from the MSDS for the cement and/or the surrounding soil.

Storage and Disposal: The residual concrete will remain in an on-site containment area until final disposition. If the concrete is not contaminated, it may be sent to the county landfill for reuse but the waste must have ENV-RCRA approval for release. Note: LA county landfill will not accept containerized concrete. Every effort will be made to recycle or reuse these materials, if possible.

Waste #10: Contaminated Stormwater - This waste stream consists of contaminated storm water precipitation collected within a secondary containment unit. If the storm water cannot be released under the current ENV-RCRA discharge policy (See Characterization Strategy, Discharging Containerized Secondary Containment Storm Water), there are two potential waste management disposition options for which this waste shall be managed. It is estimated that 50 gallons of contaminated storm water may be generated.

Waste 10a: Containerize storm water tainted with petroleum or non-hazardous glycol-based coolants (antifreeze) products in DOT approved containers and disposing of drummed liquid as used oil providing it meets the following:

The criteria for recycling oil, used oil, and coolant is as follows:

- Acceptable Oil, Used Oil and Coolant
  - Used and unused petroleum oils
  - Oil filters for non-prohibited oils
  - Non-hazardous glycol-based coolants (antifreeze)
  - Oily water
  - Used and unused synthetic oils
  - Non-hazardous used oil absorbents
  - Mineral Oil

- Unacceptable Oil, Used Oil and Coolant
  - Oil with >1000 ppm halogens (oils mixed with solvents)
  - Freon-contaminated oil
  - Oils containing chlorinated compounds
  - Degreasers containing chlorinated compounds
  - Radiation-contaminated oils
  - Any oils containing >2ppm PCB
  - Hazardous glycol-based coolants (i.e.. those failing TCLP like selenium or other metals)
  - Vegetable and other food oils

Anticipated Regulatory Status: Used Oil for Recycle

Characterization Approach: This waste will be characterized based on AK from the MSDS or direct sampling. A representative sample will be taken within 10 days of generation (i.e., date of initial placement into the container) so that a waste determination can be made within 45 days of generation and wastes dispositioned within 90 days, if necessary. Samples will be submitted with a 21-day turnaround time for analyses.

Storage and Disposal Method: This waste stream will be stored in accordance with the regulatory classification of the waste and disposed of at an authorized treatment, storage, and disposal facility.

Waste 10b: Any containerization of secondary storm waters not otherwise dispositioned in 10a above.

Anticipated Regulatory Status: Hazardous, LLW, MLLW, SWWS, or RLWTF

Characterization Approach: This waste will be characterized based on AK from the MSDS or direct sampling. A representative sample will be taken within 10 days of generation (i.e., date of initial placement into the container) so that a waste determination can be made within 45 days of generation and wastes dispositioned within 90 days, if necessary. Samples will be submitted with a 21-day turnaround time for analyses.

Storage and Disposal Method: This waste stream will be stored in accordance with the regulatory classification of the waste and disposed of at an authorized treatment, storage, and disposal facility.

TABLE 1- CHARACTERIZATION TABLE

NOTE: Multiple sampling may be required to ensure WAC requirements are met.

Waste Description	Waste # 1 Contact Waste	Waste #2 Drill cuttings	Waste #3 Drilling Fluids	Waste #4 Development Water	Waste #5 Decontamination Fluids
Estimated Volume	30 cy	80 cy	50,000 gal	50,000 gal	500 gal
Packaging	Drums or roll-off bins	Lined pit or approved containers	Lined pit or approved containers	Approved Containers	Approved Containers
Regulatory Classification					
Radioactive Waste	X	—	X	X	X
Reusable Material/Recycle	—	—	—	—	—
Municipal Solid Waste (MSW)	—	—	—	—	—
Hazardous Waste	X	X	X	X	X
Mixed (hazardous and radioactive) Waste	X	—	X	X	X
Polychlorinated Biphenyls-Contaminated Waste	—	—	—	—	—
New Mexico Special Waste (NMSW)	—	—	—	—	—
Industrial	X	X	X	—	—
Waste destined for LANL's SWWS or RLWTF[1]	—	—	—	X	X
Characterization Method					
Acceptable knowledge (AK): Existing Data/Documentation	X	—	—	—	X
AK: Site Characterization	—	—	—	—	—
Direct Sampling of Waste	—	X	X	X	X
Analytical Testing					
Volatile Organic Compounds (EPA 8260-B)	—	X	X	X	X
Semi volatile Organic Compounds (EPA 8270-C)	—	X	X	X	X
Organic Pesticides (EPA 8081-A)	—	X	X	X	X
Organic Herbicides (EPA 8151-A)	—	X	X	X	X
PCBs (EPA 8082)	—	—	X	X	X
Total Metals (EPA 6010-B/7471-A or EPA 6020)[2]	—	X	X	X	X
Total Cyanide (EPA 9012-A)[2]	—	X	X	X	X
Nitrates/Nitrites (EPA 300.09-soil or 343.2-water)	—	X	X	X	X
Dioxins/Furans (EPA 1613 B)	—	—	—	—	—
Oil/Grease (EPA 1665)	—	—	—	X	X
Fluorene, Chlorine, Sulfate (EPA 300)	—	—	X	X	X
TTO (EPA 8260-B and EPA 8270-C)[3]	Request VOCs and SVOCs above				
Total Suspended Solids (TSS) and Total Dissolved Solids (TDS) (EPA 160.1 and 160.2)	—	—	X	X	X
Chemical Oxygen Demand (COD) (EPA 410.4)	—	—	—	X	X
pH (EPA 904c)	—	—	X	X	X
Microtox or Biological Oxygen Demand (BOD)[4]	—	—	—	X	X
Perchlorates	—	X	X	X	X
High Explosives Constituents (EPA 8330/8321-A)	—	—	X	X	X
Asbestos	—	—	—	—	—
BTEX (EPA-8021b)	—	—	—	—	—
Tot. pet. hydrocarbon (TPH)-GRO (EPA 8015-M) TPH-DRO (EPA-8015-M)	—	X (if visible stain)	—	—	—
Toxicity characteristic leaching procedure (TCLP) Metals (EPA 1311/6010-B)	—	X (As Needed)	—	—	—
TCLP Organics (EPA 1311/8260-B & 1311/8270-C)	—	X (As Needed)	—	—	—
TCLP Pest. & Herb. (EPA 1311/8081-A/1311/8151-A)	—	X (As Needed)	—	—	—
Radium 226 & 228 (EPA 9320)	—	X	X	X	X
Gross Alpha (alpha counting) (EPA 900)	—	X	X	X	X
Gross Beta (beta counting) (EPA 900)	—	X	X	X	X
Tritium (liquid scintillation) (EPA 906.0)	—	X	X	X	X
Gamma spectroscopy (EPA 901.1)	—	—	X	X	X
Isotopic plutonium (chem. separation/alpha spec.) (HASL-300)	—	X	X	X	X
Isotopic uranium (chem. separation/alpha spec.) (HASL-300)	—	X	X	X	X
Total uranium (6020 inductively coupled plasma mass spectroscopy [ICPMS])	—	—	—	—	—
Strontium-90 (EPA 905)	—	X	X	X	X
Americium-241 (Separation/alpha spec.) (HASL-300)	—	X	X	X	X

TABLE 1- CHARACTERIZATION TABLE—CONTINUED NOTE: Multiple sampling may be required to ensure WAC requirements are met.

Waste Description	Waste #6 Municipal Solid Waste	Waste #7 PCS	Waste #8 Concrete Chips and Concrete Slurry	Waste #9 Residual Concrete	Waste #10 Potentially Contaminated Storm water	
					Waste 10a Used Oil (recycled)	Waste #10b Other
Volume	2 cy	<1 cy	60 cy	1cy	50 gallons	
Packaging	Approved Containers	Approved Containers	Approved Containers	Approved Earthen Berm	Approved Containers	Approved Containers
Regulatory classification						
Radioactive	—	—	X	—	—	X
Reusable Material/Recycle	—	—	X	X	X	—
Municipal Solid Waste	X	—	—	—	—	—
Hazardous	—	—	X	—	—	X
Mixed (hazardous and radioactive) Waste	—	—	X	—	—	X
Polychlorinated-Biphenyls –Contaminated Waste	—	—	—	—	—	—
New Mexico Special Waste	—	X	—	—	—	—
Industrial	—	X	X	X	—	—
Waste destined for LANL's SWWS or RLWTF[1]	—	—	—	—	—	X
Characterization Method	—					
Acceptable knowledge (AK): Existing Data/Documentation	X	—	X	X	—	X
AK: Site Characterization	—	—	X	X	—	—
Direct Sampling of Containerized Waste	—	X	X As Needed	X As Needed	X	X
Analytical Testing	—					
Volatile Organic Compounds (EPA 8260-B)	—	X	—	—	X	X
Semivolatile Organic Compounds (EPA 8270-C)	—	X	—	—	X	X
Organic Pesticides (EPA 8081-A)	—	X	—	—	—	X
Organic Herbicides (EPA 8151-A)	—	X	—	—	—	X
PCBs (EPA 8082)	—	X	—	—	X	—
Total Metals (EPA 6010-B/7471-A)[2]	—	X	X As Needed	X As Needed	X	X
Total Cyanide (EPA 9012-A)[2]	—	X	—	—	—	X
Nitrates/Nitrites (EPA 300.09-soil or 343.2-water)	—	X	—	—	—	X
Oil/Grease (EPA 1665)	—	—	—	—	—	X
Fluorine, Chlorine, Sulfate (EPA 300)	—	—	—	—	—	X
TTO (EPA 8260-B and EPA 8270-C)[3]	Request VOCs and SVOCs above					
Total Suspended Solids (TSS) and Total Dissolved Solids (TDS) (EPA 160.1 and 160.2)	—	—	—	—	—	X
Chemical Oxygen Demand (COD) (EPA 410.4)	—	—	—	—	—	X
pH (EPA 904c)	—	—	X	—	—	X
Microtox or Biological Oxygen Demand (BOD)[4]	—	—	—	—	—	X
Perchlorates	—	X	—	—	—	X
High Explosives Constituents (EPA 8330/8321-A)	—	X	—	—	—	—
Asbestos	—	—	—	—	—	—
BTEX (EPA-8021b)	—	—	—	—	—	—
Total petroleum hydrocarbon (TPH)-GRO (EPA 8015-M) TPH-DRO (EPA 8015-M)	—	X	—	—	X	—
TCLP Metals (EPA 1311/6010-B)	—	X	—	—	—	—
TCLP Organics (EPA 1311/8260-B & 1311/8270-C)	—	X	—	—	—	—
TCLP Pest. & Herb. (EPA 1311/8081-A/1311/8151-A)	—	X	—	—	—	—
Radium 226 & 228 (EPA 9320)	—	—	—	—	—	—
Gross Alpha (alpha counting) (EPA 900)	—	X	—	—	—	—
Gross Beta (beta counting) (EPA 900)	—	X	—	—	—	—
Tritium (liquid scintillation) (EPA 906.0)	—	X	X	X	—	—
Gamma spectroscopy (EPA 901.1)	—	X	—	—	—	—
Isotopic plutonium (Chem.. Separation/alpha spec.) (HASL-300)	—	X	—	—	—	—
Isotopic uranium (Chem.. Separation/alpha spec.) (HASL-300)	—	X	—	—	—	—
Total uranium (6020 inductively coupled plasma mass spectroscopy [ICPMS])	—	—	—	—	—	—
Strontium-90 (EPA 905)	—	X	—	—	—	—
Americium-241 (Chem. Separation/alpha spec.) (HASL-300)	—	X	—	—	—	—

TABLE 1- CHARACTERIZATION TABLE –CONTINUED

[1]In addition to other analytes needed to characterize the waste (e.g., VOC, SVOC, total metals), analyze for TSS, TDS, Oil and Grease, gross alpha, gross beta, tritium, and pH for liquids destined for the LANL sanitary waste water system (SWWS). For wastes destined for the RLWTF additional constituents include TTO,TSS, COD, pH, total nitrates/nitrites, and gross alpha, gross beta (not including tritium), and gross gamma or the sum of individual alpha-, beta-, and gamma-emitting nuclides.

[2]Filtered metals and filtered Cyanide are required for land application, with the exception of Mercury (Hg).

[3]TTO is the total of volatile organic and semi-volatile organic compound contaminants. Request methods EPA 8260-B (VOCs) and EPA 8270-C (SVOCs).

[4]If Microtox analysis is not available, request BOD.

Note 1: If data is insufficient to make a definitive regulatory classification at the time of WCSF completion, more than one box on the characterization table may be checked, along with an explanation in the text section. The final regulatory classification will be reflected on the WPF. Ensure that the table identifies the suite of analyses required based on site knowledge, information needed by the anticipated receiving facility, or for land application, if applicable.

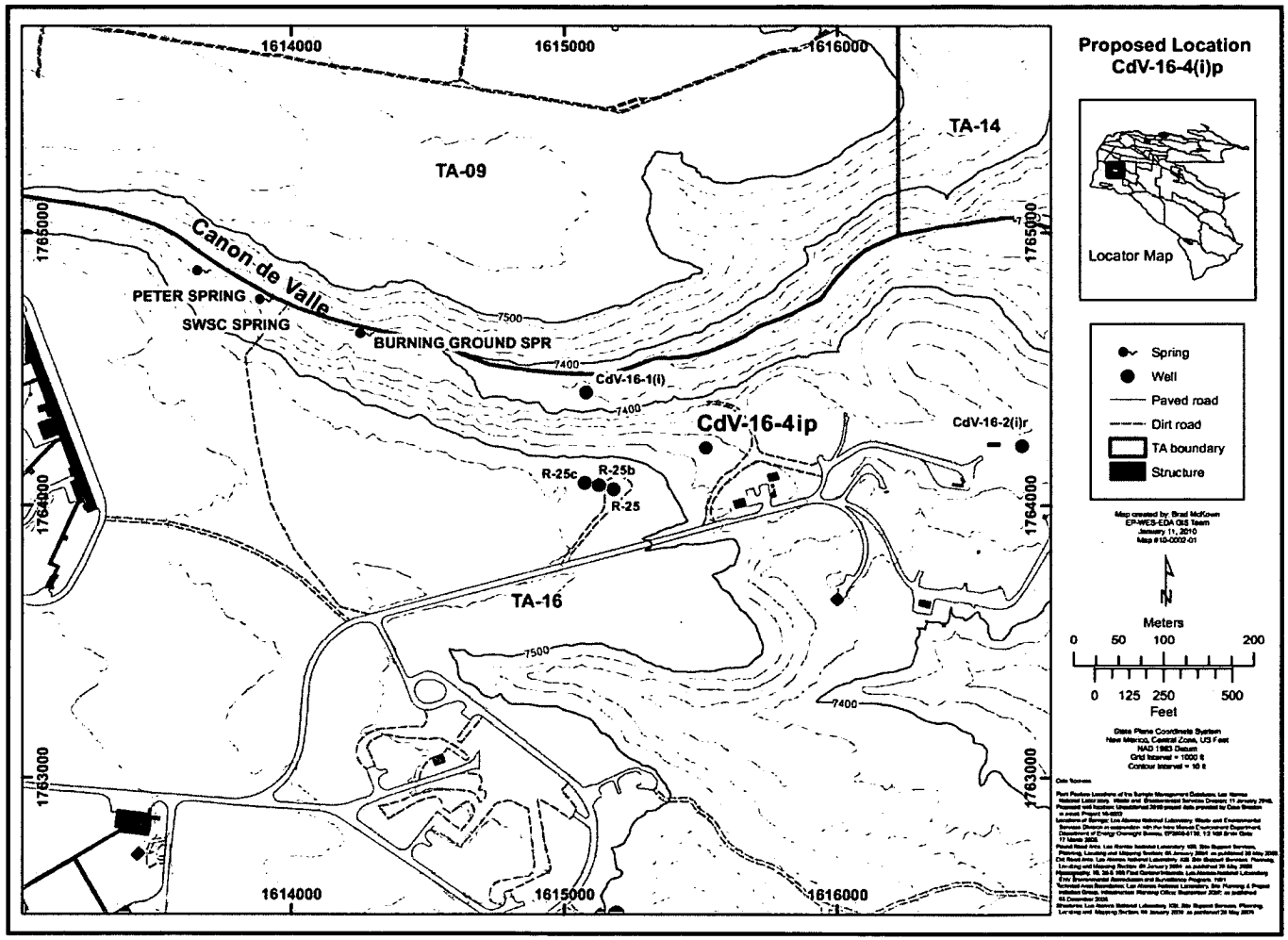
Note 2: Section 1.2 of the TCLP method 1311 states "If a total analysis of the waste demonstrates that individual analytes are not present in the waste, or that they are present but at such low concentrations that the appropriate regulatory levels could not possibly be exceeded, the TCLP need not be run." The methodology for using total waste analyses determination for the 40 TC constituents is as follows:

> **Liquids** – Wastes containing less than 0.5% filterable solids do not require extraction and therefore by filtering the waste and measuring the total constituent levels of the filtrate and comparing those levels to regulatory levels is appropriate.
>
> **Solids** – Constituent concentrations from the extraction fluid of wastes that are 100% physical solids are divided by 20 (reflecting the 20 to 1 ratio of TCLP extraction) and then compared to the regulatory levels. If the theoretical levels do not equal or exceed the regulatory levels, the TCLP need not be run. If the levels do equal or exceed the regulatory levels, the generator may either declare the waste hazardous or run TCLP analyses.

Table 2- LANL SAMPLING AND ANALYSIS PROCEDURES

Procedure Number	Title
EP-ERSS-SOP-5056	Sample Containers and Preservation
EP-ERSS-SOP-5057	Handling, Packaging, and Transporting Field Samples
EP-ERSS-SOP-5058	Sample Control and Field Documentation
EP-ERSS-SOP-5060	Operational Guidelines for Taking Soils and Water Samples in Explosive Areas
EP-ERSS-SOP-5061	Field Decontamination of Equipment.
EP-ERSS-SOP-5181	Documentation for Waste and Environmental Services Technical Field Activities
P-121	Radiation Protection
SOP-06.09	Spade and Scoop Method for Collection of Soil Samples
SOP-6.10	Hand auger and Thin-Wall Tube Sampler
SOP-06.15	Coliwasa Sampler for Liquids and Slurries.
SOP-06.19	Weighted Bottle Sampler for Liquids and Slurries in Tanks
EP-ERSS-SOP-5059	Field Quality Control Samples
SOP-5139	Sampling Soil and Vegetation at Facility Sites
SOP-5194	Chip Sampling of Porous Surfaces

FIGURE 1


Proposed Location
CdV-16-4(i)p
Locator Map
Spring
Well
Paved road
Dirt road
TA boundary
Structure
Meters
0 50 100 200
0 125 250 500
Feet
1614000
1615000
1616000
1765000
1764000
1763000
TA-09
TA-14
TA-16
Canon de Valle
PETER SPRING
SWSC SPRING
BURNING GROUND SPR
CdV-16-1(i)
CdV-16-4ip
CdV-16-2(i)r
R-25c
R-25b
R-25
7500
7400

Attachment 1: LANL LIQUID DISCHARGE FORM

ENV-RCRA Los Alamos National Laboratory

LOCATION: TA: _____ **BLDG:** _____

FIRE HYDRANT / PIPE / MANHOLE / TRANSFORMER /OTHER #: _____

USER GROUP: _____ **CONTACT PERSON:** _____

PHONE: _____ **PAGER:** _____

PERSON CONDUCTING SECONDARY CONTAINMENT DRAINAGE ACTIVITY: _____

DATE and TIME of DISCHARGE: _____ / _____

DURATION of DISCHARGE: _____ / _____

ENV-RCRA CONTACT: Jacob Meadows, 606-0185 **Please FAX to 665-9344**

DESCRIPTION of DISCHARGE: _____

VOLUME of DISCHARGE: _____

CANYON AFFECTED: _____

SAMPLES TAKEN: **YES:** _____ **NO:** _____

COMMENTS: _____

REVIEWED BY: _____ **DATE:** _____

ENV-RCRA

Revised 01/28/2010

References

P-409, *Waste Management*
ADEP-SOP-5238, *Characterization and Management of Environmental Program Waste* (September 2009)
ENV-RCRA-SOP-10.1, *Land Application of Groundwater* (May 2008)
ENV-RCRA-QP-11.1, *Land Application of Drill Cuttings* (August 2008
Water Quality and PRS Databases
Drilling Work Plan for CdV-16-4ip
Due Diligence Reports for R-25b and R-25c

Waste Characterization Strategy Form

Signatures	Date
EP Project Leader (Theodore T. Ball)	5/20/10
EP Waste Management Coordinator (David E. Mikkelson)	5/20/10
ENV-RCRA Representative (Jocelyn Buckley)	5/19/10
WPD-LLWD Representative (Jose D. Ortega)	5/20/10
Waste Certification Program Representative (Michelle L. Coriz)	5/20/10

Los Alamos National Laboratory
EP