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Waste Characterization Strategy Form

Project Title	**Regional Well for Chromium Investigation**
Regional Aquifer Well	**R-50 (Mortandad Canyon)**
Activity Type	**Regional Groundwater Well Installation and Corehole Drilling**
Project Leader	**Mark Everett**
Waste Management Coordinator	**Victor Garde**
Completed by	**Jocelyn Buckley**
Date	**November 2, 2009**

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 regional aquifer monitoring well R-50 located in Mortandad Canyon (Figure 1).

The following waste streams are anticipated for all wells:

- 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

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 documentation, the waste streams generated from R-50 will initially be managed as non-hazardous, pending analytical results, as no potential listed source(s) could be identified from operations, SWMUs, or nearby wells located near the vicinity of R-50 that may contaminate the well. 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.

Every effort will be made to recycle or reuse contact waste, concrete chips, and concrete slurry, if determined to be non-hazardous, non-radioactive.

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.

Relevant Site History and Description:

Regional well R-50 is being installed to satisfy requirements from the New Mexico Environment Department (NMED) in a letter dated August 31, 2009 to further define the southern extent of chromium contamination in the regional aquifer. R-50 is located to intersect potential pathways for chromium (Cr) migration from the vicinity of regional wells R-42 and R-28 (Figure 1). A secondary objective for drilling well R-50 is to test for hydrologic communication with wells R-42, R-28, R-44, R-45, and R-13.

Past analytical data indicates trace concentrations of polycyclic aromatic hydrocarbons (PAHs), most likely from asphalt run-off; volatile organic compounds (VOCs); semi-volatile organic compounds (SVOCs); and radionuclides in IDW from wells drilled in the vicinity of well R-50. However, there is no known documented listed source in the vicinity of the well and no evidence of a contaminant plume. Based upon acceptable historical documentation, the IDW generated from drilling of well R-50 should initially be managed as nonhazardous waste. Specific waste management requirements are described below.

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).

Based on available documentation (e.g., PMR reports, past due diligence reports, etc.), the IDW generated from drilling regional well R-50 is not expected to be listed and wastes will initially be managed as non-hazardous unless otherwise noted in this WCSF. The IDW from this well may be designated as radioactive. Once waste has been determined to be radioactive and does not meet land application standards, waste 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) can 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, 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).

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.

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-SOP-10.1, *Land Application of Groundwater*, May 2008)

- 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.
- 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 diversted 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: 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).

Sampling personnel must record all 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.

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 per well.

Anticipated Regulatory Status: Green is Clean, LLW, Hazardous, MLLW, Industrial, and Solid (Municipal)

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

Storage and Disposal Method: Contact waste will initially be stored as nonhazardous waste. The waste will ultimately be managed based upon the final regulatory classification of the waste. If the contact waste is determined to be nonhazardous/nonradioactive and approval is granted by ENV-RCRA, it may be recycled and reused via the Material Recycling Facility (MRF).

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 per well.

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

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 2002). 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.

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 on the analytical data, drill cuttings will be evaluated for land application in accordance with ENV-RCRA-SOP-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. 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. Any wastes that cannot be land applied will be excavated, containerized, and placed in an accumulation area appropriate for 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. It is estimated that 50,000 gallons of drilling fluids may be generated from each well.

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

Characterization Approach: Waste characterization will be based upon the analytical results obtained from the direct sampling of the drilling fluids. A representative sample 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 representatively 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.

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 as nonhazardous waste. 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 waste non-hazardous waste containers as a best management practice. Based on the analytical data, drilling fluids will be evaluated for land application in accordance with ENV-RCRA-SOP-10.1, *Land Application Groundwate*r. 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. If the hazardous waste fluids are containerized, they are subject to the 90-day accumulation limit and the "contained-in" approval must be obtained before the accumulation period is exceeded. A 30-day extension may be requested, if necessary. 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 #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 40,000 to 60,000 gallons per well.

***Anticipated Regulatory Status*:** LLW, Hazardous, MLLW, and Industrial

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 wastes dispositioned within 90 days, if necessary. To collect a representative waste sample 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. Samples will be submitted with a 21-day turnaround time for analyses.

Storage and Disposal Method: Development water will be containerized at the point of generation and initially managed as nonhazardous waste. 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 waste non-hazardous waste containers as a best management practice. If appropriate, and based on the analytical data, the development water will be evaluated for land application in accordance with ENV-RCRA-SOP-10.1, *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 be left in the container, pending a "contained-in" approval from the New Mexico Environment Department. Hazardous containerized waste is subject to the 90-day accumulation limit and the contained-in approval must be obtained before the accumulation period is exceeded. A 30-day extension may be requested, if necessary. 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 from each well.

Anticipated Regulatory Status: LLW, Hazardous, MLLW, and Sanitary Wastewater

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 prior to use or rinsing "clean" equipment prior to down-hole 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 based on Chapter 7 and operated in accordance with Appendix E of the RCRA Waste Sampling Draft Technical Guidance (EPA 530-D-02-002, August 2002).

Note: Decontamination fluids destined for the Sanitary Wastewater Plant must be sampled by Dustie Rich (ENV-RCRA), or an alternate sampler that is approved by the SWWS WAC Committee, for Microtox Analysis, TSS, TDS, and pH. Submit a request for analysis by going to https://esp-esh-as01-f5.lanl.gov/~esh19/databases/rfa_form.shtml.

Storage and Disposal Method: Decontamination water will be containerized at the point of generation and managed as nonhazardous waste. 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. Nonhazardous/nonradioactive decontamination water may be disposed of on-site at the Sanitary Wastewater Treatment Facility if WAC requirements are met. If the waste is hazardous, LLW, or MLLW, it will be managed as such and treated and/or disposed of at an authorized facility.

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 4 cubic yards of MSW will be generated for each well.

Anticipated Regulatory Status: MSW

Characterization Approach: MSW will be characterized based on acceptable knowledge.

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 an authorized 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 cubic yards of this waste stream will be produced per well.

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

Characterization Approach: The contaminated soil may either be sampled in-place or after containerization in accordance with SOP-06.10, Hand Auger and Thin-Wall Tube Sampler. If the spill is shallow (in-place sampling) or containers are small, Spade and Scoop Method for Collection of Soil Samples (SOP-06.11) may also be appropriate. 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 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.

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:

- NMSW PCS if the sum of benzene, toluene, ethylbenzene, and xylene isomer concentrations are greater than 50 mg/kg, if benzene individually is greater than 10 mg/kg (Note: If benzene concentrations exceed 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 area.
- Industrial waste if the contaminant levels are less than the NMSW and/or PCB regulatory levels.

If the PCS is suspect or known hazardous or mixed waste, it will initially be managed in a registered hazardous waste accumulation area until analytical data are available to make a waste determination. If the analytical data show that the waste is radioactive-only, the waste will be managed in a registered, posted radioactive waste staging or storage area. If the analytical data show that the soil is regulated PCB waste, it will be managed in a registered PCB area, hazardous waste accumulation area, or radioactive waste staging or storage area, as appropriate to the final waste classification. 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.

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 cubic yards of drilled out concrete chips or concrete slurry may be generated per well.

Anticipated Regulatory Status: Hazardous, LLW, Municipal Solid Waste, and Industrial

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 appropriately. 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.

TABLE 1- CHARACTERIZATION TABLE

Waste Description	Waste # 1 Contact Waste	Waste #2 Drill cuttings	Waste #3 Drilling Fluids	Waste #4 Development Water	Waste #5 Decontamination Fluids
Volume					
Packaging	Drums or roll-off bins	Lined pit or approved containers	Lined pit or approved containers	Approved Containers	Approved Containers
Regulatory Classification					
Radioactive (rad)	X	X	X	X	X
Solid	X	—	—	—	—
Hazardous	X	X	X	X	X
Mixed (hazardous and rad)	X	X	X	X	X
Toxic Substances Control Act	—	—	—	—	—
New Mexico Special Waste	—	—	—	—	—
Industrial	X	X	X	X	—
Sanitary Wastewater	—	—	—	—	X
Characterization Method					
Acceptable knowledge (AK): Existing Data/Documentation	X	—	—	—	X
AK: Site Characterization	—	—	—	—	—
Direct Sampling of Containerized 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	—
Total Metals (EPA 6010-B/7471-A)	—	X	X1	X1	X
Total Cyanide (EPA 9012-A)	—	X	X2	X2	X
General (NO3+NO2, F, Cl, SO4, pH, microtox/COD/TSS/TDS/TTO, Oil and Grease)	—	X (nitrates if land applied)	X	X	X3
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	—	—	—
TCLP Organics (EPA 1311/8260-B & 1311/8270-C)	—	—	—	—	—
TCLP Pest. & Herb. (EPA 1311/8081-A/1311/8151-A)	—	—	—	—	—
Radium 226 & 228 (EPA 9320)	—	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	—
Americium-241 (Separation/alpha spec.) (HASL-300)	—	X	X	X	—

TABLE 1- CHARACTERIZATION TABLE --CONTINUED

Waste Description	Waste #6 Municipal Solid Waste	Waste #7 PCS	Waste #8 Concrete Chips and Concrete Slurry
Volume			
Packaging	Approved Containers	Approved Containers	Approved Containers
Regulatory classification			
Radioactive	—	X	X
Solid	X	—	X
Hazardous	—	—	X
Mixed (hazardous and radioactive)	—	—	—
Toxic Substances Control Act (TSCA)	—	—	—
New Mexico Special Waste	—	X	—
Industrial	—	X	X
Characterization Method	—		
Acceptable knowledge (AK): Existing Data/Documentation	—	X	X
AK: Site Characterization	X	X (rad only)	X
Direct Sampling of Containerized Waste	—	X	X (as needed)
Analytical Testing	—		
Volatile Organic Compounds (EPA 8260-B)		X	—
Semivolatile Organic Compounds (EPA 8270-C)	—	X	—
Organic Pesticides (EPA 8081-A)	—	—	—
Organic Herbicides (EPA 8151-A)	—	—	—
PCBs (EPA 8082)	—	X	—
Total Metals (EPA 6010-B/7471-A)	—	—	X (if required by ENV-RCRA)
Total Cyanide (EPA 9012-A)	—	X	—
General (NO3+NO2, F, Cl, SO4, pH, microtox/COD/TSS/TDS/TTO, Oil and Grease)	—	—	—
Perchlorates	—	—	—
High Explosives Constituents (EPA 8330/8321-A)	—	—	—
Asbestos	—	—	—
BTEX (EPA-8021b)	—	—	—
Total petroleum hydrocarbon (TPH)-GRO (EPA 8015-M) TPH-DRO (EPA 8015-M)	—	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	—
Gamma spectroscopy (EPA 901.1)	—	X	—
Isotopic plutonium (ihem.. Separation/alpha spec.) (HASL-300)	—	X	—
Isotopic uranium (ihem.. Separation/alpha spec.) (HASL-300)	—	X	—
Total uranium (6020 inductively coupled plasma mass spectroscopy [ICPMS])	—	—	—
Strontium-90 (EPA 905)	—	X	—
Americium-241 (ihem. Separation/alpha spec.) (HASL-300)	—	X	—

1-FILTERED METALS REQUIRED FOR LAND APPLICATION (EXCEPT HG)
2-FILTERED CYANIDE FOR LAND APPLICATION
3-ANALYZE FOR MICROTOX//COD/TSS/TDS/Oil and Grease and pH for SWWS Plant, include TOC , Total Nitrogen, and Total Nitrates for RLWTF.
NOTE: Multiple sampling may be required to ensure WAC requirements are met.

Note: 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**

References

P-409, *Waste Management*
ADEP-SOP-5238, *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)
Drilling Work Plan for R-50 (Draft, September 2009)

Waste Characterization Strategy Form

Signatures	Date
WES-RS Project Leader (Print name and then sign below.) Mark Everett Mark Everett	11-4-09
WES-WA Waste Management Coordinator (Victor Garde) Larry P. Baker For Victor Garde L. P. Baker	11-6-09
ENV-RCRA Representative (Jocelyn Buckley)	
WES-WA Representative (Jose D. Ortega)	
WES-WA Representative (Jose D. Ortega)	
Waste Certification Program Representative (Michelle Coriz) Michelle Coriz	11/10/09

	Los Alamos National Laboratory EP

Note: 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;

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Waste Characterization Strategy Form

Signatures	**Date**
WES-RS Project Leader (Print name and then sign below.) Mark Everett	11-4-09
WES-WA Waste Management Coordinator (Victor Garde)	
ENV-RCRA Representative (Jocelyn Buckley)	11-3-09
WES-WA Representative (Jose D. Ortega)	11/10/09
WES-WA Representative (Jose D. Ortega)	
Waste Certification Program Representative (Michelle Coriz)	

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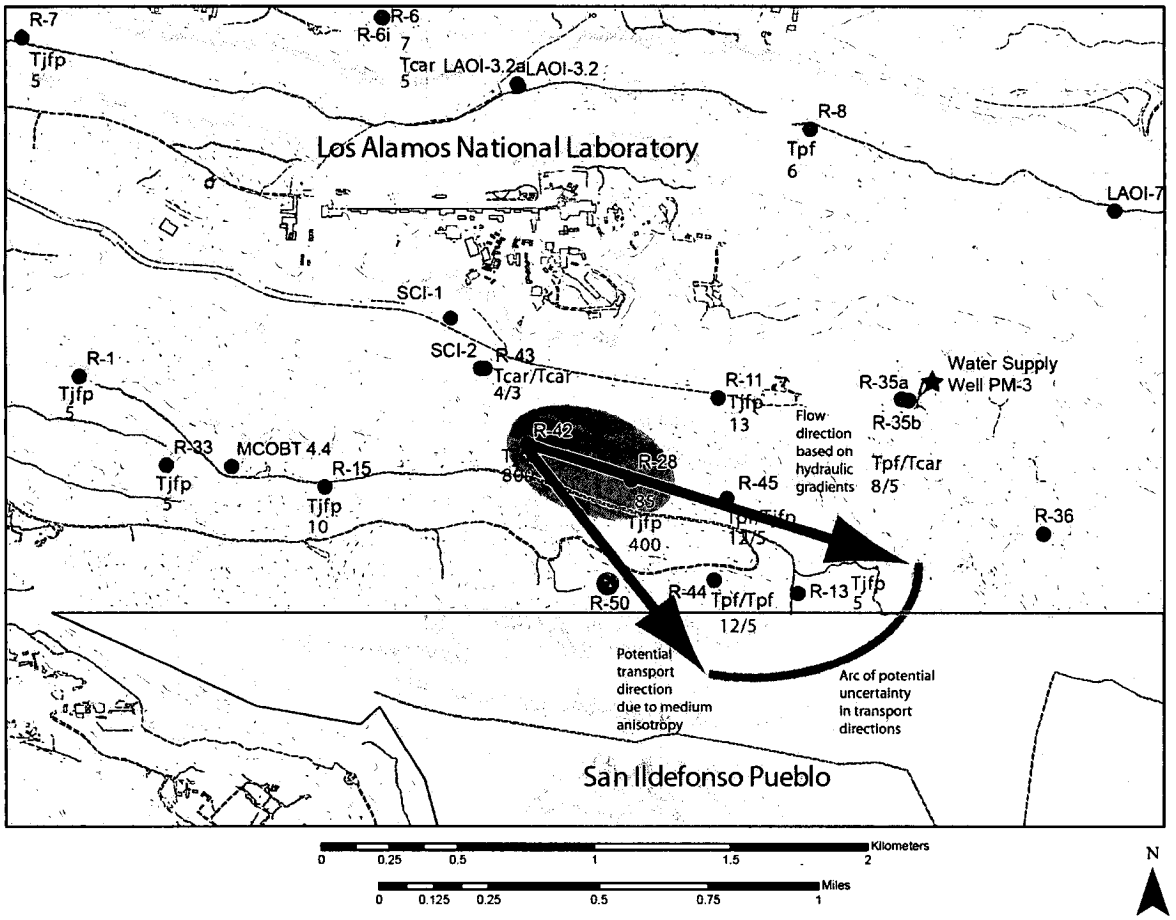
FIGURE 1


R-7
Tjfp
5
R-6
R-6i
7
Tcar
5
LAOI-3.2a
LAOI-3.2
Los Alamos National Laboratory
R-8
Tpf
6
LAOI-7
SCI-1
SCI-2
R-43
Tcar/Tcar
4/3
R-1
Tjfp
5
R-11
Tjfp
13
Flow direction based on hydraulic gradients
R-35a
Water Supply Well PM-3
R-35b
Tpf/Tcar
8/5
R-42
R-28
R-33
MCOBT 4.4
R-15
Tjfp
5
Tjfp
10
R-45
Tjfp
400
R-36
R-50
R-44
Tpf/Tpf
12/5
R-13
Tjfp
5
Potential transport direction due to medium anisotropy
Arc of potential uncertainty in transport directions
San Ildefonso Pueblo
Kilometers
0
0.25
0.5
1
1.5
2
Miles
0
0.125
0.25
0.5
0.75
1
N

Victor Garde

From: Saundra Martinez [saundra@lanl.gov]
Sent: Wednesday, October 28, 2009 10:04 AM
To: jbuckley@lanl.gov
Subject: Emailing: DocEditPrint_wconcur

Environmental Programs (EP)
Document Signature Form

Document Catalog Number: EP2009-0570
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PRSs: None **OUO Information: Y / N**
Associated Document Catalog Number(s): None
Author: Everett, Mark 667 5931 meverett@lanl.gov
Organization: EP: LANL Water Stewardship Program (LWSP) – PKG #1729
Document Team: None
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Record Title	Media Type	Document Date	Author/Originator	Other Doc. # (e.g. Doc. Catalog #)	Page Count	ERID (RPF only)
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