Buckman Direct Diversion

A joint regional project of the City of Santa Fe and Santa Fe County to build a reliable and sustainable water supply.

Memorandum

Date: December 22, 2014

To: Buckman Direct Diversion Board

From: Shannon Jones and Kyle Harwood, via Charles Vokes

ITEM AND ISSUE:

Request approval of a Memorandum of Understanding between the Buckman Direct Diversion Board and the US Department of Energy regarding Water Quality Monitoring.

BACKGROUND AND SUMMARY:

On May 13, 2010, the Buckman Direct Diversion Board (BDDB) and the United States Department of Energy (DOE) entered into a five (5) year Memorandum of Understanding (MOU) regarding Water Quality Monitoring. The purpose of the MOU was "to establish roles and responsibilities with regard to coordination of monitoring activities by Los Alamos National Laboratory (LANL) and the Department of Energy (DOE) in Los Alamos Canyon, Pueblo Canyon, and the Rio Grande in relation to operation of the Buckman Direct Diversion Project (BDD Project)." The current MOU will expire on May 13, 2015, before the upcoming storm water season.

At the direction of the BDDB, staff has negotiated the attached draft MOU as a replacement agreement that will add three (3) years of coordination, sampling and review (2015, 2016, and 2017). The new replacement agreement proposes to have the DOE directly fund the BDDB's expenses for sample analysis, it explicitly integrates the new relationship between the BDDB and the Pueblo de San Ildefonso for access and information sharing, and makes technical changes to the Appendix A Sampling and Analysis Plan.

ACTION REQUESTED:

Request approval of a Memorandum of Understanding between the Buckman Direct Diversion Board and the US Department of Energy regarding Water Quality Monitoring.

MEMORANDUM OF UNDERSTANDING BETWEEN THE U.S. DEPARTMENT OF ENERGY AND THE BUCKMAN DIRECT DIVERSION BOARD REGARDING WATER QUALITY MONITORING

A. Parties

The Parties to this MOU are the Buckman Direct Diversion Board (BDD Board) and the U.S. Department of Energy (DOE).

B. Background

The Buckman Direct Diversion (BDD) is designed to divert water from the Rio Grande for use by the City and County of Santa Fe water utilities in the Santa Fe area and to provide a source for the water supply systems of Santa Fe County, the City of Santa Fe, Las Campanas Club, and Las Campanas Cooperative. The water to be diverted is San Juan-Chama Project water (a U.S. Bureau of reclamation interbasin water transfer project) and native New Mexico state waters regulated by the State of New Mexico.

The point of diversion for the BDD is on the east bank of the Rio Grande in northern New Mexico, near the historic Buckman townsite. The point of diversion is approximately 15 miles northwest of the City of Santa Fe and is located about three miles downstream from the confluence of the Rio Grande and Los Alamos Canyon (where Route 502 crosses the Rio Grande at Otowi Bridge).

LANL is located on the Pajarito Plateau above the Los Alamos/Pueblo Canyon watershed. The Los Alamos/Pueblo Canyon system intermittently and infrequently flows to the Rio Grande just below the Otowi Bridge and upstream of the BDD Project point of diversion. The Los Alamos/Pueblo Canyon watershed contains sediments with LANL-origin contamination from historic releases from LANL. Rain events may cause the transport of sediments, and these sediments have in the past and may in the future be transported to the Rio Grande and then to the BDD intake. The Los Alamos/Pueblo system has been investigated under the Compliance Order on Consent between LANL and the State of New Mexico Environment Department, and measures (including infrastructure) to reduce the transport of contaminated sediment have been implemented.

The New Mexico legislature encouraged the BDD Board and DOE to memorialize their agreement to certain activities relating to the mitigation and monitoring of LANL-origin water quality contaminants. The BDD Board requested a written agreement with LANL and DOE in 2007 and the New Mexico legislature passed resolutions in 2009 and 2010 that ultimately resulted in the Memorandum of Understanding that was executed on May 13, 2010 (the 2010 MOU). The 2010 MOU represented an agreement between the Parties that water quality management and monitoring are mutual priorities and that the activities described were consistent with, and would be carried out subject to, the policies, regulations, and applicable laws that pertain to the Parties.

This MOU will be utilized by the public and the BDD Board to inform the operations of the BDD Project, and will provide information that will guide the future water quality policies and priorities of the Parties.

Upon the execution of this MOU, the 2010 MOU will be terminated in accordance with Section G.3 of that 2010 MOU and this MOU shall evidence the consent of the Parties to the termination.

C. Objective

This MOU establishes roles and responsibilities with regard to coordination of monitoring activities by the Los Alamos National Laboratory (LANL) and the Department of Energy (DOE) in Los Alamos and Pueblo Canyons in relation to operation of the BDD Project. The primary objectives of this MOU include the following:

1. To continue the relationship developed between DOE and the BDD, and
2. To determine whether LANL legacy contaminants from Los Alamos and Pueblo Canyons into the Rio Grande warrants operational constraints for diversion at the BDD intake. This determination will be made relative to regional storm water events and/or to base flow in the Rio Grande, with the goal of reducing the long-term need for the Early Notification System (ENS).

D. Authorities

The Parties represent that they have the authority to enter into this MOU and are able to meet the respective commitments herein to the extent permitted by law.

1. Department of Energy. The U.S. Department of Energy is authorized to enter into this MOU pursuant to the Atomic Energy Act, as amended (Title 42 U.S.C. 2011, et seq.).
2. BDD Board. The BDD Board is authorized to enter into this MOU pursuant to the March 7, 2005, Joint Powers Agreement between Santa Fe County and the City of Santa Fe and associated state, county, and municipal laws related thereto.

E. Agreement Principles

E.1 Memorandum of Agreement and Protocols between DOE and the Pueblo de San Ildefonso

The Parties recognize that DOE must comply with the requirements of the 2014 Memorandum of Agreement between DOE and the Pueblo, and the associated *Protocols for Access to Pueblo Lands and for Protecting Confidential Pueblo Information* pertaining to activities on, and information gathered by, DOE on Pueblo de San Ildefonso property. DOE will consult with the Pueblo as necessary regarding the use of information gathered pursuant to this MOU.

E.2 Los Alamos / Pueblo Canyons Early Notification System

The Early Notification System is to provide real time stream flow data to the BDD at the following locations to enable the BDD staff to make decisions regarding facility operations, including temporarily ceasing diversion of water from the Rio Grande. The system includes the following parts:

- LANL Gage Station E050.1 in Los Alamos Canyon above the Pueblo Canyon confluence,
- LANL Gage Station E060.1 in Pueblo Canyon above the Los Alamos Canyon confluence,
- Station E062.1 in the narrow canyon below the confluence of Los Alamos and Pueblo Canyons, and
- Station E099 in Guaje Canyon.

LANL ENS stations E050.1 and E060.1 will be equipped with gaging (flow measurement) capabilities, real-time conveyance of stream-flow data (telemetry), camera capability to act as a backup for the gaging capabilities, and automated storm water samplers. Flows at the LANL gaging stations E060.1 and E050.1 shall be measured within a trapezoidal supercritical-flow flume design as reported in "Techniques of Water-resources Investigations of the United States Geological Survey, Chapter A14, Use of Flumes in Measuring Discharge" (F.A. Kilpatrick and V.R. Snyder, 1983), and between approximately 1 and 350 cubic feet per second (cfs). The system shall be capable of a low flow trigger stage of 5 cfs (adjustable).

Flow indication at all stations will consist of either a visual (camera) or transducer signal as confirmation of storm water flows at the locations to provide for better time studies on storm water flow travel from gage stations to the Rio Grande and to the point of diversion at the BDD. Maintenance of the flow indication equipment shall be the responsibility of DOE.

The BDD Board will, at its discretion, consult with the Pueblo de San Ildefonso regarding the installation of a real-time flow indicator(s) at the lower Los Alamos Canyon and the Rio Grande.

E.3 Los Alamos / Pueblo Canyons Storm Water Quality Sampling System

The sample collection system will provide water quality contaminant sampling data from storm water flow events at the LANL ENS gage stations to characterize and quantify the relationship of LANL contaminants in Los Alamos/Pueblo Canyon storm water flows into the Rio Grande in relation to the base flows and regional storm water flows. Gage stations E050.1 and E060.1 shall be equipped with automated samplers that will be triggered by the occurrence of runoff at these stations. DOE funds all sampling activities for this water quality system as part of monitoring pursuant to Section VII of the Compliance Order on Consent to evaluate contaminant transport mitigation measures within the LA/P watershed.

The samplers shall be capable of collecting samples from flow events greater than 5 cfs such that samples can be correlated with samples collected at the BDD intake through hydrograph comparison. The analyte list for these samplers is contained in Appendix A of this MOU and is generally consistent with, but contains negotiated changes to, the NMED-approved Los Alamos and Pueblo Canyon Sediment Transport Monitoring Plan for storm water monitoring in Los Alamos and Pueblo Canyons. Sampling shall be conducted from June through October of each year.

The Parties will review the available data, the analyte list, and the sampling protocols (e.g., trigger stage, sample collection process, etc.) during the Biannual Review. DOE will notify the BDD Board of any

changes in the NMED-approved workplan. The collection and processing of samples will be in accordance with the LANL standard operating procedures (SOP) listed in Appendix A. The analytical methods are listed in Appendix A and will follow EPA guidelines and methods.

DOE shall maintain the sampling system as necessary, with samplers to be inspected weekly from June through October and after each flow event, in accordance with LANL SOPs listed in Appendix A. Samples will be collected after each flow event or within 72 hours of the event. In the event any station is not functioning, DOE shall notify the BDD and repair the station so the time period of inoperability is as short as possible. Inspection and repair schedules will be contingent on safe working conditions. If the period of operability is expected to exceed 48 hours, the DOE will communicate as quickly as practicable with the BDD staff via telephone call and/or email.

The Parties acknowledge that the inoperability of any ENS station during subsequent flow events and the inability to collect another set of samples is not an invalidation of the sampling program. Every event is not necessary to be sampled to contribute to the contaminant fate analysis and the evaluation of LANL contaminant contributions to the samples collected at the BDD intake location.

E.4 Rio Grande at BDD Project Location Sampling Program

The purpose is to provide both base-flow and event-based sampling of the Rio Grande when triggered by notification of flows in Los Alamos and/or Pueblo Canyons or as determined by the BDD Board for the purpose of water quality sampling at the Rio Grande at BDD in the search for operational criteria for ceasing diversion.

The sampling system includes a dedicated sampling station equipped with automated samplers that can be triggered by notification of Los Alamos and Pueblo Canyons' flows from the ENS gage stations, or by the BDD staff. The BDD Board shall retain title to the sampling equipment and shall own and operate the equipment at the BDD intake.

DOE shall pay up to $96,000 in sampling and analytical costs per year for each of the three (3) years under this MOU (2015, 2016, and 2017). The BDD Board shall be responsible for any additional sampling costs, and the BDD Board is responsible for all maintenance, inspection and repair of the sampling station located at the BDD intake. DOE will seek funding via a grant to the BDD Board for the sampling and analytical costs. If such a grant is not available by March 31, 2015, DOE will be directly responsible for all sampling and analytical costs until an alternative funding mechanism is implemented.

The analyte list for these samplers is contained in Appendix A of this MOU. Sampling shall be conducted from June through October of each year. The Parties will review the available data, the analyte list, and the sampling protocols (e.g., trigger stage, sample collection process, etc.) during the Biannual Review. The collection and processing of samples will be in accordance with BDD sampling procedures listed in Appendix A of this MOU and that are consistent with the LANL standard operating procedures (SOP) listed in Appendix A. The analytical methods are listed in Appendix A and will follow EPA guidelines and methods.

The BDD Board shall fund the maintenance, inspection, and repair of the BDD intake sampling system as necessary effective July 1, 2015. Samplers shall be inspected weekly from June through October and after each flow event. Samples will be collected after each flow event or within 72 hours of the event. In the event the station is not functioning, BDD staff shall notify DOE and repair the station so the time period of inoperability is as short as possible. Inspection and repair schedules will be contingent on safe working conditions. If the period of operability is expected to exceed 48 hours, BDD staff will communicate as quickly as practicable with the DOE via telephone call and/or email.

The Parties acknowledge that the inoperability of the BDD intake station during subsequent flow events and the inability to collect another set of samples is not an invalidation of the sampling program. It is not necessary that every event be sampled to contribute to the contaminant fate analysis and the evaluation of LANL contaminant contributions to the samples collected at the BDD Project location.

E.5 TREAT Study

BDD Board will fund a continuation of the Contaminant Fate Analysis that was started under the 2010 MOU under "The Removal Efficiency and Assessment of Treatments" (TREAT) Study. The TREAT Study will examine the treatment efficiency of the conventional and advanced treatments at the BDD with respect to contaminants in order to help determine the BDD operational criteria for diversion from the Rio Grande. The TREAT Study will focus on the capabilities of the BDD with respect to removal of contaminants as they are found to occur in the Rio Grande at BDD intake.

E.6 Analysis

The BDD Board will fund and BDD staff will be the lead on an annual report on the analysis of the data collected under this MOU. DOE will provide input and comments to the BDD report. Each annual report will be updated with the data from the latest monitoring period. The objective of the report is to summarize and present the collected data in the search for BDD operational criteria that determines the operational criteria for diversions from the Rio Grande. The report shall be reviewed and comments provided by DOE by May 31 of each year with the goal of revising the Appendix A sampling plan before the next storm season.

The BDD Board will conduct an evaluation of the water quality monitoring results and TREAT data and make a determination on operational parameters or criteria on whether or when to cease diverting from the Rio Grande. DOE will provide technical input on the report and shall be afforded an opportunity to review and comment on the report.

F. BDD Project Data Sharing

DOE shall be responsible for the costs associated with the sampling and analyses from the primary ENS components listed in Section E.2 in Los Alamos and Pueblo Canyons. Analytical results from E060.1 and E050.1 sampling will be made available to the BDD staff via the Intellus database within 30-60 calendar days after DOE receives sampling results from the analytical laboratory. Paper copies of the results will

not be provided. Flow results from the secondary locations listed in Section E.1 shall be transmitted to the BDD staff no later than concurrently with the primary sample results.

DOE will, on at least an annual basis, update the transit time for storm water flows (from meteorological tower reports, the E050.1 and E060.1 gage stations, E062.1, and E099 flow indicators) between Lower Los Alamos Canyon at Rio Grande flow indication location and the BDD intake to determine transit time for various storm intensities and flows. BDD staff will provide technical input on the report and shall be afforded an opportunity to review and comment on the information.

Analytical results from the BDD intake will be made available to both the BDD Board and DOE via the Intellus database as soon as they are available.

The BDD Board will make records available to the DOE consistent with this MOU and that are generally available to the public, and this information shall be used in the Biannual Review process.

G. Coordination

DOE and the BDD Board will coordinate as necessary with the Pueblo de San Ildefonso and the New Mexico Environment Department on any issues related to the implementation of this MOU, and will engage in any consultation required to accomplish the purposes of this MOU.

Coordination between the Parties shall be to the mutual benefit of both parties and shall include data sharing (as above), technical assistance, and data and analysis reviews. Both parties should allow at least one week for response when requesting technical assistance or data and for analysis reviews, and should strive for more time to meet needs.

H. Biannual Review

The Parties shall meet twice annually to discuss issues related to this MOU. The meeting target months shall be October and April each year.

I. Contacts

All notices, correspondence, and communications arising under this MOU shall be provided to the representatives listed below, and any notice, demand, request, or information authorized of related to this MOU shall be deemed to have been given if mailed (return receipt requested), hand-delivered, or faxed (with confirmation of transmission) as follows:

- **DOE**
  Peter Maggiore
  Assistant Manager, Environmental Projects Office
  Los Alamos Field Office / NNSA / DOE
  3747 West Jemez Road, MS-A316

Los Alamos, NM 87544
Phone: 505-665-05925
Cell: 505-695-5109
Email: Peter.Maggiore@nnsa.doe.gov

With copy to:
DOE Counsel
Silas Deroma
Phone: 505-667-4668
Email: Silas.Deroma@nnsa.doe.gov

- **BDD Board**

Charles Vokes
BDD Facility Manager
Buckman Direct Diversion
341 Caja De Rio Road
Santa Fe, NM 87506
Phone: 505-955-4507
Email: cmvokes@ci.santa-fe.nm.us

With copy to:
BDD Board Counsel
Nancy Long
Long and Komer
2200 Brothers Road
P.O. Box 5098
Santa Fe, NM 87502
Cell: 505-470-2158
Email: nlong@nm.net

J. Period of Agreement, Modification, or Termination

This MOU is effective upon the signature of the BDD Board and DOE as shown below. This agreement is intended to address 2015, 2016 and 2017 and shall expire on December 1, 2017, UNLESS both Parties agree to extend this MOU for an optional three (3) year period. This optional extension may be executed by a re-signed copy of the signature page by the respective authorized parties to this MOU.

The Parties may modify this MOU by written amendment and in the same manner as this MOU was executed. Either Party may unilaterally terminate this MOU before the date of expiration, provided the party seeking termination provides written notice to the other party's representative 90 days before the intended termination date.

K. Dispute Resolution

If the Parties disagree over how to interpret this MOU, representatives of the Parties shall present their differences in writing to the Points of Contact for the other Party. If the Parties fail to resolve their differences within 30 days, the BDD Project Facility Manager and the Los Alamos Field Office Environmental Projects Office Assistant Manager shall prepare a written description of the dispute and the BDD Board Chair and the DOE Los Alamos Field Office Manager shall meet to reconcile the dispute. These representatives shall use efforts such as negotiation, facilitation, and mediation to resolve the dispute.

L. Other Provisions

Nothing in this MOU is intended to conflict with requirements of the Parties or applicable laws. Any such conflicting terms shall be invalid, but the remainder of this MOU shall remain in effect. If a term is deemed invalid, the Parties shall take appropriate action, including amendment or termination. The activities described in this MOU are consistent with, and will be carried out subject to, all known policies, regulations, and applicable laws that pertain to the parties.

This MOU in no way restricts the Parties from participating in any activity with other public or private agencies, organizations, or individuals.

Activities described in this MOU are subject to the availability of appropriated fund. Both the BDD Board and Los Alamos Field Office Environmental Projects Office Assistant Manager shall make the appropriations of funds for the activities described in this MOU a priority when seeking regular or project specific funding requests.

This MOU describes the basis on which the parties will cooperate on the topics described herein. This MOU is NOT a financial obligation that serves as a basis for expenditures, and any financial obligations necessary to carry out the activities described herein shall be addressed in other documents internal to each party. Expenditure of funds, human resources, equipment, supplies, facilities, training, public information, and technical expertise will be provided by each party as necessary to fulfill its obligations under this MOU.

This MOU is neither a fiscal nor a funds obligation document. Nothing in this MOU authorizes or is intended to obligate the parties to expend, exchange, or reimburse funds, services, or supplies, or transfer or receive anything of value. Any requirement for the payment or obligation of funds by DOE established by the terms of this MOU shall be subject to availability of funds and Secretarial discretion, and no provision herein shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act, 31 U.S.C. §1341.

This MOU is not legally enforceable and shall not be construed to create any legal obligation n the part of either party. This MOU shall not be construed to provide a private right, or cause of action, for or by any person or entity.

M. Signatures

NOW, each of the BDD Board and DOE has caused this MOU to be executed and delivered by its duly authorized representatives as of the last date shown below,

BDD Board

_____ _____

Joseph Maestas, BDD Board Chair Date

DOE

_____ _____

Kimberly Davis Lebak, Manager, Los Alamos Field Office Date

This Memorandum of Understanding is valid for three years from the date of the last signature.

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Appendix A
Sampling and Analysis Plan

The tables that follow the text below contain the analytes for the water quality sampling in accordance with this Memorandum.

Regarding LA/Pueblo Canyon Telemetry:

1. Telemetry used to communicate flow data from the gaging stations to the BDD shall provide a received signal level at each receiver with a fade margin of no less than 25 dBm above the equipment receiver threshold. Telemetry equipment shall include battery backup sized to provide a minimum 12 hour operation after failure of primary power. Battery run time shall be calculated in a mode of operation consistent with frequent data transmission during a slow event.

2. The amount of time between a station trigger and when notification is available to the BDD will be as short as is practical, with a goal not to exceed 1minute.

Regarding LA/Pueblo Canyon Water Quality Sampling:

1. The goals of the sampling strategy are to collect data that represent variations in contaminant concentrations and suspended sediment concentration (SSC) within runoff events across a typical hydrograph for each location (Monitoring Plan for LA/P Canyon Sediment Transport Mitigation Project (LA-UR-09-6563)).

2. Each of the gages will be monitored continuously for stage. Samples at E050 and E060 will be triggered by 5-cfs flows to ensure sampling at flows that may extend to the Rio Grande (Monitoring Plan for LA/P Canyon Sediment Transport Mitigation Project (LA-UR-09-6563)).

3. Prioritization of analytes if water volume is insufficient to fulfill suite is unfiltered, then filtered, and by constituents: SSC, Isotopic Plutonium, Am-241 (HASL-300), Sr-90, Isotopic Uranium, Radium-226/228, Gross alpha/beta, radionuclides by gamma spec, target analyte list metals, PCBs, dioxin/furans, perchlorates, cyanide, TOC.

4. All events exceeding 5cfs at E050.1 and E060.1 will be analyzed for the parameters in Table 2.

Regarding Detection Limits in the Analyte Tables:

Method reporting limits for sample analyses for each medium shall be established at the lowest level practicable for the method and analyte concentrations and shall not exceed soil, groundwater, surface water, or vapor emissions background levels, cleanup standards, and screening levels. The preferred method detection limits are a maximum of 20 percent of the background, screening, or cleanup levels. Detection limits that exceed established soil, groundwater, surface water, or air emissions cleanup standards, screening levels, or background levels and are reported as "not detected" shall be considered data quality exceptions and an explanation for the exceedance and its acceptability for use shall be provided. (Section IX.C.3.c Method Reporting Limits from the Consent Order).

Regarding BDD Intake Water Quality Sampling:

The sampler set up at the BDD intake contains 4 autosamplers. The samplers installed at the BDD intake are ISCO Model 3700. The BDD staff maintains the equipment of these samplers.

The samplers can communicate remotely with the BDD Treatment Plant. The samplers can be started or stopped at any time during storm events, and can be programmed to sample at any frequency and order. Sample collection timing and bottle fill sequence for each sampler can be programmed as well.

Sampling Strategy at BDD Intake

The early notification for BDD to stop diverting and start sampling is a 5 cfs flow in the LA/P canyon system. Consequently, the time for this flow's arrival at the BDD is programmed into the software program or estimated the BDD operators, and at that time the "storm event" procedure is triggered: stop diversion, start sampling. The sampling sequence may be triggered by change in stage of the Rio Grande as well.

Automated Storm Event Sample Collection at BDD Intake

When a flow greater than 5 cfs is detected by a sensor at E050.1 and/or E060.1, a signal is automatically transmitted electronically to the BDD's Supervisory Control and Data Acquisition system (SCADA). Usually, 75 minutes (or as determined by the BDD operator) after the transmission of the signal from either E050.1 or E060.1, SCADA will automatically transmit a start signal to autosamplers located near the BDD's diversion structure, and it would fill out the pre-loaded collection containers at programmed intervals Signals are automatically transmitted electronically to the BDD's Supervisory Control and Data Acquisition system (SCADA). When a flow greater than 5 cfs is detected by the SCADA at E050.1 and/or E060.1 or a combined flow of the two stations is greater than 5 cfs, the ENS sequencing will begin. After time calculated delays have expired (or as determined by the BDD operator), SCADA will automatically transmit a start signal to autosamplers located near the BDD's diversion structure, and it would fill out the pre-loaded collection containers at programmed intervals

Deviations from Pre-Programmed Sample Collection

The LANL gauging stations are equipped with cameras which may help in estimating the LA/P canyon flow arrival or whether to determine if any false alarm is triggered. The BDD operators do not rely exclusively on the early 5cfs notification. After the notification is received at the BDD, the storm event is verified by the video cameras at the gauging stations, or evaluated from weather point of view and/or timing in the season, in order to correct the flow arrival in determining the best time to stop diversion and start sampling. The BDD operator may correct or change the pre-programmed trigger times listed earlier. Sometimes, equipment may be malfunctioning, or in case of very strong flash floods, sensors

may be out of service. At such times the cameras become the sole tool for estimating flow arrival, or verification of a storm event.

Notification to Partners

Storm events and sampling during events is communicated to the BDD partners via email.

Analytes and Methods

Samples collected during stormwater sampling will be screened at BDD in order to determine the best representatives of before, during, and after the event. Then, the samples will be sent to a lab and analyzed for the following analytes using the methods listed in Table 3.

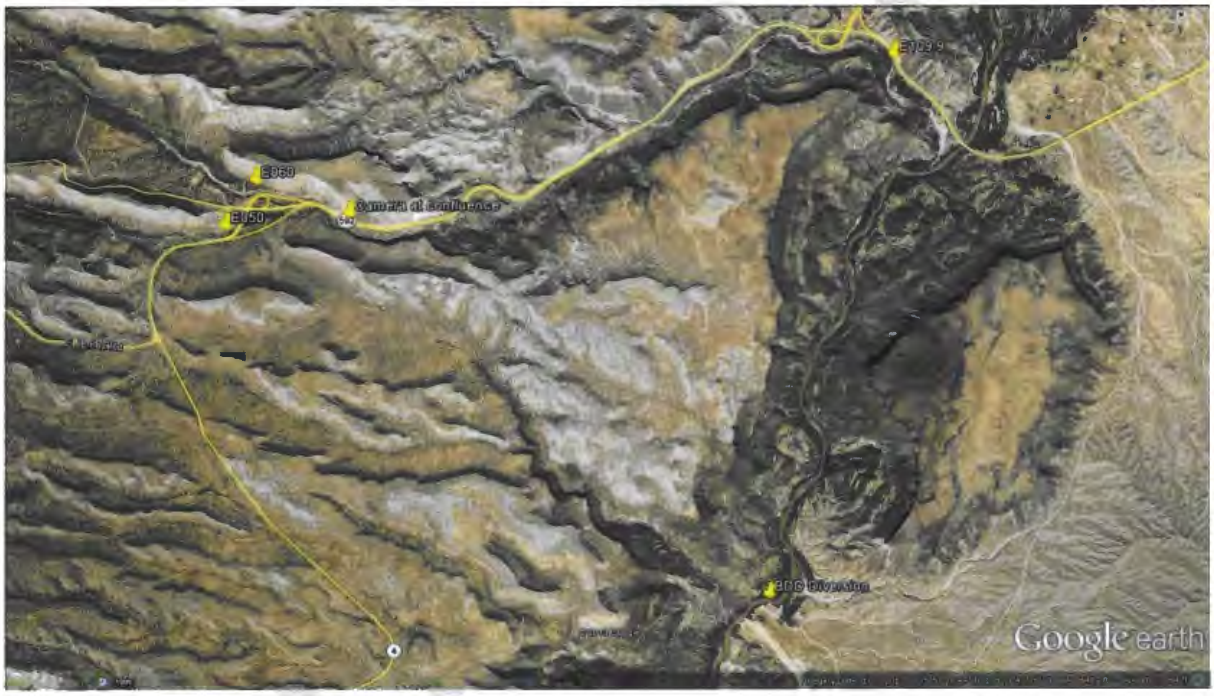

Table 1: Standard Operating Procedures

SOP Number/Title	Application			
LANL Procedures	**Stream Gage/Sampler Maintenance**	**LA/P Canyon Storm Water Quality Data**	**Rio Grande above Otowi Location**	**Rio Grande at BDD Diversion Location**
SOP-5213 Collecting Storm Water Runoff Samples and Inspecting Samplers	✖	✖	✖	
SOP-5214 Installation, Setup and Maintenance of ISCO Samplers		✖	✖	
SOP-5215 Processing Storm Water Samples		✖	✖	
EP-ERSS-SOP-5057 Handling, Packaging and Transporting Field Samples		✖	✖	
SOP-5255 Shipping of Environmental Samples by the WES Sample Management Office (SMO)		✖	✖	
ENV-WQH-SOP-009.3 Operation and Maintenance of Stream Gaging Stations	✖	✖	✖	
BDD Procedures				
BDD SOP				✖

Table 2: Los Alamos/Pueblo Canyon Storm Water Quality Sampling

Analytes	Method	Detection Limit	Field Prep Code
Suspended Sediment Concentration	ASTM:D3977-97	3 mg/L	UF
TAL metals (23) plus Hg	EPA:200.7, EPA: 200.8, EPA:245.2	0.2-300 mg/L	UF
Hardness	SM:A2340B	2 mg/l	UF
Gross alpha	EPA:900	3 pCi/L	F, UF
Gross beta	EPA:900	3 pCi/L	F, UF
Strontium-90	EPA:905.0	0.5 pCi/L	UF
Americium-241	HASL-300:AM-241	0.05 pCi/L	UF
Gross gamma	EPA:901.1	15 pCi/L	UF
Cesium-137	EPA:901.1	5 pCi/L	UF
Cobalt-60	EPA:901.1	5 pCi/L	UF
Sodium-22	EPA:901.1	10 pCi/L	UF
Neptunium-237	EPA:901.1	40 pCi/L	UF
Potasium-40	EPA:901.1	75 pCi/L	UF
Radionuclides by gamma spec	EPA:901.1	varies	UF
Plutonium (isotopic)	HASL-300:ISOPU	0.05 pCi/L	UF
Uranium (isotopic)	HASL-300:ISOU	0.05 pCi/L	UF
Dioxin/Furans	SW-846:8290	0.2-0.5 pCi/L	UF
PCBs	EPA 1668A	20-150 pCi/L	UF
Radium-226 & 228	EPA:903.1 & EPA:904.4	1 pCi/L	UF

Table 3: Rio Grande at BDD Diversion Sampling Program

Analytes	Method	Detection Limit	Field Prep Code
Suspended Sediment Concentration	ASTM:D3977-97	3 mg/L	UF
TAL metal (23) plus Hg	EPA:200.7, EPA: 200.8, EPA:245.2	0.2-300 mg/L	F, UF
Hardness	SM:A2340B	2 mg/l	UF
Gross alpha	EPA:900	3 pCi/L	F, UF
Gross beta	EPA:900	3 pCi/L	F, UF
Strontium-90	EPA:905.0	0.5 pCi/L	F, UF
Americium-241	HASL-300:AM-241	0.05 pCi/L	F, UF
Gross gamma	EPA:901.1	15 pCi/L	UF
Cesium-137	EPA:901.1	5 pCi/L	F, UF
Cobalt-60	EPA:901.1	5 pCi/L	F, UF
Sodium-22	EPA:901.1	10 pCi/L	F, UF
Neptunium-237	EPA:901.1	40 pCi/L	F, UF
Potasium-40	EPA:901.1	75 pCi/L	F, UF
Radionuclides by gamma spec	EPA:901.1	varies	UF
Plutonium (isotopic)	HASL-300:ISOPU	0.05 pCi/L	F, UF
Uranium (isotopic)	HASL-300:ISOU	0.05 pCi/L	F, UF
Dioxin/Furans	SW-846:8290	0.2-0.5 pCi/L	UF
PCBs	EPA 1668A	20-150 pCi/L	UF
Radium-226 & 228	EPA:903.1 & EPA:904.4	1 pCi/L	F, UF
TDS	EPA:160.1	10 pCi/L	F
TOC	SW-846:9060	1 mg/L	UF
PADS-particle size analysis	ASTM C-1070-01	0.1 %	UF
Perchlorate	SW846 6850 Modified	0.02 mg/l	UF