



**New Mexico Environment Department**  
**DOE Oversight Bureau**

Federal Fiscal Year 2011  
Second Quarter Report  
January 1, 2011 to March 31, 2011



Environmental Oversight and Monitoring  
At Department of Energy Facilities in New Mexico

## Cover Photograph

Bureau staff harvested and planted approximately 1500 willows in the lower Pueblo Canyon wetlands. Up to three foot deep channels have incised within the reed canary grass wetlands, which threaten their ability to trap contaminated sediment carried in stormwater runoff. The Bureau teamed with LANS staff to thickly plant the incised channels with willow cuttings in the hopes that after a couple of seasons of growth, the willows would help to plug the channels and force stormwater flows over the banks to spread out across the wetlands. This would slow the stormwater flows and drop out contaminated sediments and reduce the offsite transport of plutonium and other contaminants from Pueblo Canyon.

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## LIST OF ACRONYMS

AIP	Agreement-In-Principle
AIRNET	Air Radioactive Particulate and Tritium Monitoring Network at LANL
AQB	Air Quality Bureau (NMED)
BMP	Best Management Practices
BSL-3	Bio-Safety Lab, Level Three
CBFO	Carlsbad Field Office (DOE)
CCNS	Concerned Citizens for Nuclear Safety
CDC	Centers for Disease Control and Prevention
CEMRC	Carlsbad Environmental Monitoring and Research Center (WIPP)
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980 (also known as “Superfund”)
CH Waste	Contact Handled Waste (WIPP)
COOC	Compliance Order on Consent
CRMG	Community Radiation Monitoring Group
CTAC	Carlsbad Technical Advisory Contractor
CWA	Clean Water Act
D & D	Decommissioning and Demolition
DARHT	Dual Access Radiographic Hydro Test Facility
DDT	DichloroDiphenylTrichloroethane
DOE	U.S. Department of Energy
DOE/NNSA	National Nuclear Security Administration of the DOE, operators of the LASO, SSO, and WSO
DOE OB	DOE Oversight Bureau (Bureau) of the NMED
DPR	Direct Penetrating Radiation
EA	Environmental Assessment
EMIG	Effluent Monitoring Improvement Group (WIPP)
EIS	Environmental Impact Statement
EES-6 Group	Earth and Environmental Sciences Division at LANL
EMSR	Environmental Monitoring, Surveillance and Remediation (Committee) (NNMCAB)
EPA	U.S. Environmental Protection Agency
EVEMG	Embudo Valley Environmental Monitoring Group
FFCA	Federal Facility Compliance Act
FFY	Federal Fiscal Year
GAP	Government Accountability Project
GIS	Geographic Information Systems
GNEP PEIS	Global Nuclear Energy Partnership Programmatic Environmental Impact Statement
GTCC LLW	Greater-Than-Class C Low-Level (Radioactive) Waste
HEPA	High Efficiency Particulate Air
HWB	Hazardous Waste Bureau (NMED)
IEER	Institute for Energy and Environmental Research
IWD	Integrated Work Document
LANL	Los Alamos National Laboratory, the physical location

LANs	LANs, LLC is the Los Alamos National Security, Limited Liability Corporation, the operator of the LANL facility
LANsCE	Los Alamos Neutron Science Center (LANL)
LASG	Los Alamos Study Group
LASO	Los Alamos Site Office (DOE)
LA-UR	Los Alamos – Unclassified Report (LANL)
LC/MS/MS	Liquid Chromatography/Mass Spectrometry/MS (Tandem MS)
LOS	Los Alamos Oversight Section (NMED/DOE OB)
LRRI	Lovelace Respiratory Research Institute (Formerly the Inhalation Toxicology Research Institute)
LVAS	Low-Volume Air Sampling
MDA	Material Disposal Area
MW	Monitoring Well
MWL	Mixed Waste Landfill (SNL)
NAS	National Academy of Sciences
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NMDOH	New Mexico Department of Health
NMDOT	New Mexico Department of Transportation
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
NNMC	Northern New Mexico College
NPDES	National Pollutant Discharge Elimination System
NNMCAB	Northern New Mexico Citizens’ Advisory Board
NNSA	National Nuclear Security Administration
NRC	Nuclear Regulatory Commission
PCB	Polychlorinated Biphenyl
PPE	Personal Protective Equipment
QAPP	Quality Assurance Project Plan
RAC	Risk Assessment Corporation
RACER	Risk Analysis Communication Evaluation Reduction
RCRA	Resource Conservation and Recovery Act
RH Waste	Remote Handled Waste (WIPP)
RSRL	Regional Statistical Reference Level
R-Well	Regional Aquifer Monitoring Well
Ri-Well	Intermediate Aquifer Monitoring Well
Sandia	Sandia Corporation, the operator of the SNL/NM facility
SAP	Sampling Analysis Plan
SCADA	Supervisory Control and Data Acquisition
SEIS	Site Environmental Impact Statement
Sandia	Sandia Corporation, the operator of the SNL/NM facility
SNL	Sandia National Laboratories/New Mexico, the physical location of the facility in Albuquerque
SOS	Sandia Oversight Section (NMED/DOE OB)
SSC	Suspended Sediment Concentration
SSO	Sandia Site Office (DOE)

SWMU	Solid Waste Management Unit
SWQB	Surface Water Quality Bureau (NMED)
TA	Technical Area
TLD	Thermoluminescent Dosimeter
TMDL	Total Maximum Daily Load
UNM	University of New Mexico
USGS	U.S. Geological Survey
VOC	Volatile Organic Compound
WIPP	Waste Isolation Pilot Plant, the physical location southeast of Carlsbad
WOS	WIPP Oversight Section (NMED/DOE OB)
WQH	Water Quality and Hydrology (LANL)
WRES	Washington Regulatory and Environmental Services
WTS	Washington Tru Solutions (WIPP), operators of the WIPP facility



## **DOE OVERSIGHT BUREAU SUMMARY**

### **ADMINISTRATION**

Bureau staff completed general training, managed personnel activities, coordinated analytical laboratory price agreement extension and budgeted for monitoring and oversight activities.

Bureau staff completed data compilations and activity summaries for inclusion in the 2009 Annual Report.

Bureau staff worked with administrative personnel to reconcile analytical sampling expenditures and to encumber funds for contract laboratories in support of 2011 winter and spring sampling activities.

### **PERSONNEL**

The Bureau was granted an exception to the hiring freeze to advertise for the vacant Environmental Scientist position in the Sandia Oversight Section.

### **FINANCE**

Approximately 36% (\$946,440) of the projected 2011 work plan amount (\$2,640,492) has been obligated or spent by the end of the second quarter. Within the three major budget groups, approximately 40% of budgeted labor expenses were recorded; approximately 34% of budgeted contract expenses were recorded; and approximately 19% of equipment expenses were recorded.

Grant modification #054 obligated \$1,408,000 on October 1, 2010.

### **TRAINING**

Bureau staff completed the LANL course # 13334 (TA-16, 11, 37 HE Areas Access Training)

Bureau staff completed the LANL course # 56433 (Personal Cell Phone Awareness for S/R Sites and Ancho Canyon)

Bureau staff attended the Environmental Radiation class hosted by LANS. The main topic of discussion was detecting radiation on the West Coast of the U.S. linked to the current radiation releases from the Fukushima power plant in Japan.

### **OUTREACH**

Bureau staff attended a public informational meeting on new LANL facilities, hosted the final CRMG meeting and attended the initial public outreach scoping meeting sponsored by the New Mexico Community Foundation (NMCF), and presented papers at a local conference.

Bureau staff attended a public update meeting at Fuller Lodge in Los Alamos hosted by the DOE for the Chemistry and Metallurgy Research Replacement (CMRR) Project.

Bureau staff attended the initial public outreach scoping meeting sponsored by the NMCF. The first NMCF planning and input meeting was held on Friday, March 18, 2011 at Johnson Control



Institute across from Northern New Mexico College campus. The NMCF plans to conduct monthly public meetings in Espanola at Northern New Mexico College.

Bureau staff attended the 10<sup>th</sup> Annual Española Basin Workshop held at Santa Fe Community College in February. Bureau Hydrologist, Dave Englert, presented his findings of a five-year study of stormwater measurements conducted in Lower Los Alamos Canyon and the Rio Grande titled, **“Los Alamos Canyon Watershed Stormwater Monitoring from 2003 to 2008; Contaminant Transport Assessment.”**

Bureau staff members were on hand to discuss two posters describing the collaborative efforts of staffs from LANS and NMED to determine regional and Buckman aquifer characteristics.

- **Radiocarbon Dating and Paleohydrology of Regional Aquifer Groundwater Beneath the Pajarito Plateau, New Mexico**
- **Hydrogeochemical and Stable Isotope Characteristics of the Upper Confined Aquifer, Buckman Well Field, New Mexico**

Bureau staff attended the open meeting of the Blue Ribbon Commission on America’s Nuclear Future in both Carlsbad and Albuquerque. The Commission is co-chaired by former Congressman Lee Hamilton and former National Security Advisor Brent Scowcroft. Another prominent member of the commission is former U.S. Senator Pete Domenici, of New Mexico.

Staff attended the public information meeting for the permit modification relating to TRUPACT-III in Carlsbad.

## LOS ALAMOS NATIONAL LABORATORY OVERSIGHT

### GENERAL ADMINISTRATION (LAD01)

Under this Activity ID, the Bureau manages, administers, and finances the overall activities of staff members in the Los Alamos and Santa Fe offices. Staff provides assistance to the Bureau and DOE developing workplans, budgets and training requirements.

**Quarterly Summary: During FFY11 Q-2,** Bureau staff attended required and optional trainings/classes, and attended the Health & Safety Committee meeting.

#### **Training:**

Bureau staff completed the LANL course # 13334 (TA-16, 11, 37 HE Areas Access Training)

Bureau staff completed the LANL course # 56433 (Personal Cell Phone Awareness for S/R Sites and Ancho Canyon)

Bureau staff attended the Environmental Radiation class hosted by LANS. The main topic of discussion was detecting radiation on the West Coast of the U.S. linked to the current radiation releases from the Fukushima power plant in Japan. Details of detected radionuclides as well as amounts and their locations near and outside the source, including the USA, were discussed.

Bureau staff completed data compilations and activity summaries for inclusion in the 2009 Annual Report.

Bureau staff worked with administrative personnel to reconcile analytical sampling expenditures and to encumber funds for contract laboratories in support of 2011 winter and spring sampling activities.

Bureau GIS staff researched computer specifications for replacement computer to be used for database and GIS applications and large storage capacity of GIS coverage.

Bureau staff attended the New Mexico Environment Department Health and Safety Committee meeting. No outstanding issues came up during the Agenda topics below:

- Department Safety Officer Update
- Training
- Health and Safety Webpage
- Building Issues
- Safety Tips
- Safety Liaison Issues
- Transportation of Equipment in State Vehicles
- Runnels Building HVAC Renovation Update
- Health and Safety Committee Secretary
- Loss Prevention and Control

## **PUBLIC OUTREACH (LPO02)**

Under this Activity ID, Bureau staff interacts with the public through meetings, listening sessions, website development, consultations, and reports.

**Quarterly Summary: During FFY11 Q-2,** Bureau staff attended a public informational meeting on new LANL facilities, hosted the final CRMG meeting and attended the initial public outreach scoping meeting sponsored by the New Mexico Community Foundation (NMCF), and presented papers at a local conference.

### **Chemistry and Metallurgy Research Replacement (CMRR) Project**

Bureau staff attended a public update meeting at Fuller Lodge in Los Alamos hosted by the DOE for the Chemistry and Metallurgy Research Replacement (CMRR) Project. The DOE focused only on the current Radiological Laboratory and Utility Office Building (RLUOB) although attendees expressed much interest in the status of the Nuclear Facility (NF). The DOE restricted its discussion of the NF to estimated time lines. The DOE gave an overview of the CMRR noting that it is not a (plutonium) pit manufacturing facility and stressed that the two-building project is replacing a 60-year-old facility (CMR). The final construction cost for the RLUOB should be \$199.4M with occupancy expected later this year. Estimates for the Nuclear Facility were “TBD” (to be determined). The Supplemental Environmental Impact Statement for the CMRR will be issued in April or May 2011. The DOE emphasized how the new facility would provide dramatic improvements in safety and security beyond that of the existing facility. The new complex will be “environmentally green” and the structures will be LEED-certified. The project will represent a major boost to the local economy. The DOE will continue with project public meetings every 6 months.

Nuclear Watch presented an alternate view of the project during the “Interested Parties” CMRR Presentation focusing on details not discussed by the DOE presentation:

- Increased Cost
- Decreased Size
- “TBD” – What are the plans for spending the money?
- Final Baseline Estimate for the NF is due in 2013
- Defense Nuclear Facility Safety Board (DNFSB) – Potential Changes Concerns Annual Report to Congress
- CMR Deferred Maintenance or Risk Management?
- Seismic concerns
- Lack of need (for facility)
- Cleanup of more radioactive rubbish

### **Community Radiation Monitoring Group (CRMG)**

Bureau staff hosted the Community Radiation Monitoring Group (CRMG) meeting on January 12 at the Northern New Mexico College. The LANS representative presented an overview and update of the LANL air-monitoring program at MDA B. He also discussed recent elevated plutonium findings collected by an AIRNET monitor adjacent to the MDA B Enclosure 2. This was the only monitor that showed elevated plutonium measured in air particulates in the vicinity (albeit remotely) of the commercial buildings on DP Road. He explained how his group calculated dose scenarios based on the AIRNET readings along DP Road and how those dose

calculations would affect the maximally exposed individual occupancy in the commercial buildings. For the detection of concern, the calculated dose based on the measured time duration to a public receptor was significantly below the 10-mrem NESHAPS standard. He further described how his group then worked with the MDA B cleanup staff to trace the source of the emission and mitigate it to prevent any further airborne particulates released along DP Road. Concerned Citizens for Nuclear Safety (CCNS) complimented the LANS monitoring program for its efforts at MDA B and referred to it as a “model program.” The remainder of the meeting was spent discussing agenda topics for 2011.

CRMG Action items:

- CCNS requested status and updates from LANS on how it monitors contaminant transport off-site from the demolition activities at TA-21 and whether the Oversight Bureau is also collecting samples at the site. Both LANS and the Bureau are monitoring particulates in air and the Bureau is monitoring erosion controls and stormwater flows in both canyons adjacent to the operations.
- CCNS also requested an update on a schedule for public meetings regarding ARRA activities at TA-21 (D&D and MDA B Cleanup).
- The Embudo Valley Environmental Monitoring Group (EVEMG) requested the status and an update from LANS of the Area 3 Final Report and a briefing on the LANL Zone of Impact Study Report.
- The HOPE representative voiced concern that DOE/LANS has not sufficiently responded to the request for transportation route information to off-site waste repository facilities used by LANS during decommissioning and demolition (D&D) activities.

The February CRMG meeting scheduled for February 12, 2011 at NNMC in Espanola was cancelled.

The Bureau notified members of the CRMG of its intention to cancel the CRMG on March 9, 2011. The Bureau had been a strong supporter since the mid-1990s and in more recent years, the host of the group. The overall reasoning supporting the Bureau’s decision to cancel the CRMG was clearly detailed in the notification bulletin that was transmitted to the CRMG, NMED, LANS and DOE in lieu of an agenda for the March 9 meeting. The bulletin stated:

*“The final Community Radiation Monitoring Group (CRMG) meeting will be held on Wednesday March 9, 2011. As we end the CRMG, the DOE Oversight Bureau (DOE OB) wishes to acknowledge and thank the many environmental groups, local Pueblos and government agencies we have worked with over the years, notably CCNS, EVEMG, HOPE, Cultural Energy, Santa Clara Pueblo, Pueblo de San Ildefonso, Cochiti Pueblo, LANL, DOE and EPA. We also extend our gratitude to the communities of Embudo and El Valle and notably to Northern New Mexico College for allowing CRMG to hold their meetings on their campus for many years. The decision to end the CRMG comes as the Oversight Bureau looks to expand the scope of interest, subject matter and broaden the base for community participation for its public outreach. As the CRMG ends, the Bureau also recognizes a promising opportunity to leverage its available resources for community participation. The Bureau is encouraged that the New Mexico Community Foundation (NMCF) will lead this opportunity. Part of their mission is to provide a forum for engaging the communities surrounding Los Alamos National Laboratory in dialogue about issues and concerns arising from activities at LANL. The Community Foundation outreach program is not limited to air emissions as was the CRMG, but is open to all areas of interest. The Community Foundation*

*has resources to provide an advance agenda and to provide a facilitated open forum. The Bureau will participate in the community meetings and will be available to make requested presentations and address topics of interest concerning all its environmental programs. In the end, we feel this is an evolution of the process and a fresh change for the DOE Oversight Bureau to make better use of its resources, broaden the scope of activities and information sharing, and to reach out to a larger community audience. We want to take advantage of this new forum for public outreach by supporting the Community Foundation as an active participant as they engage the community.”*

**FINAL CRMG MEETING:** The final CRMG meeting on March 9, 2011 was attended by approximately 20 participants. Bureau Chief, Tom Skibitski, discussed the NMED decision to end the Group and the reasons supporting his decision. As he addressed the Group, the questions, concerns and interjections became very emotional as several members equated ending of the CRMG by Bureau decision as a breach of trust, or as a door being closed to the public. Mr. Skibitski reassured all present that the Bureau decision was not one of closure to the public, but one of expanding communication opportunities in a new and more diverse direction, to simply move beyond air issues and include all the environmental programs monitored by the Bureau. He also provided an assurance and commitment to the Group that the Bureau would be a key participant in the new Community Foundation meetings. Sarah Wolters of the NMCF also assured the Group that transitional meetings hosted by her organization would address applicable issues previously raised in the CRMG meetings.

#### **New Mexico Community Foundation (NMCF)**

Bureau staff attended the initial public outreach scoping meeting sponsored by the NMCF. The first NMCF planning and input meeting was held on Friday, March 18, 2011 at Johnson Control Institute across from Northern New Mexico College campus. The NMCF plans to conduct monthly public meetings in Espanola at Northern New Mexico College. This initial meeting was held about a week following the final CRMG meeting with the intention of scoping the interests and concerns of the northern New Mexico public on environmental issues related to LANL. In addition, the leadership laid the groundwork for meeting structure, content, locations and scheduling. The Bureau representatives reiterated the contents of the last CRMG notification bulletin in response to several questions and concerns from former members of the CRMG over the abrupt cancellation of the CRMG and whether the Bureau would be an active participant in future NMCF meetings. The NMCF meetings will provide an open, monthly meeting accessible to all community members and focus on environmental conditions at LANL ([www.nmcf.org](http://www.nmcf.org)).

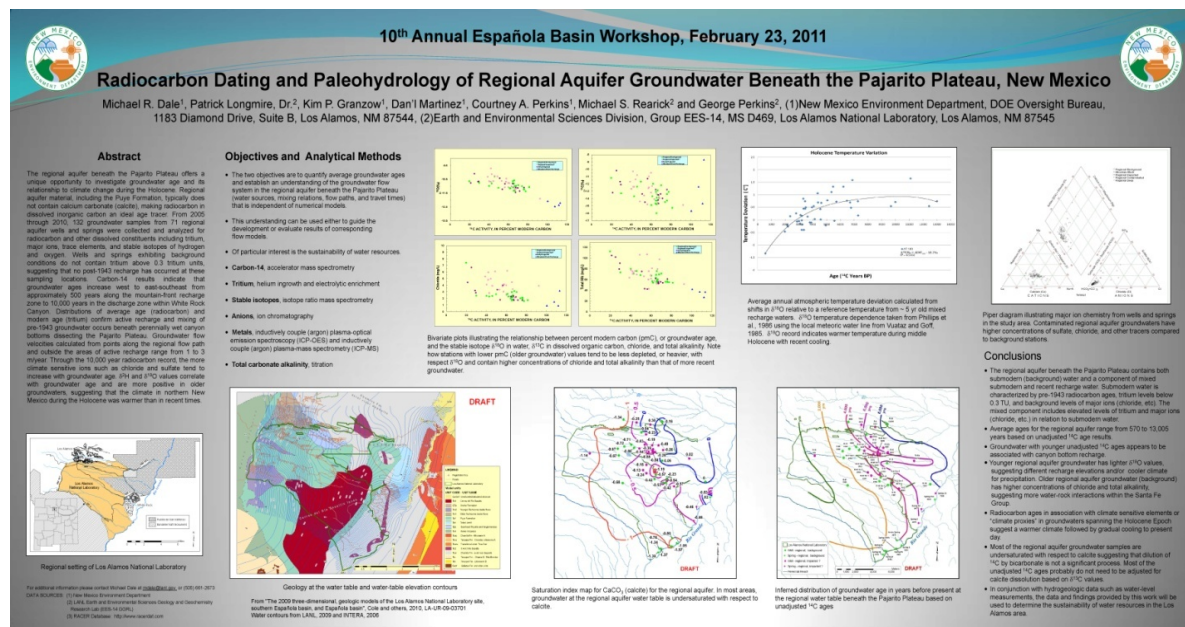
#### **Espanola Basin Technical Advisory Group (EBTAG)**

Bureau staff attended the 10<sup>th</sup> Annual Española Basin Workshop held at Santa Fe Community College on February 23, 2011. Bureau Hydrologist, Dave Englert, presented his findings of a five-year study of stormwater measurements conducted in Lower Los Alamos Canyon and the Rio Grande titled, “**Los Alamos Canyon Watershed Stormwater Monitoring from 2003 to 2008; Contaminant Transport Assessment.**” The study was conducted in collaboration with LANS staff members. It evaluated chemical and hydrological data and estimated mass transport of sediments and LANL legacy plutonium-239/240 (Pu<sup>239/240</sup>) in stormwater runoff. It described spatial and temporal trends in suspended sediment loads and contaminant levels, and compared results to applicable water quality criteria. It developed coefficients that identify stream function, relative channel stability, and sediment and contaminant availability at



stations monitored during this period. Use of these coefficients in future stormwater assessments may identify changes in the watershed that may reflect potential destabilization of the watercourses or watershed improvements made by LANL to reduce off-site contaminant migration.

A portion of the workshop was dedicated to poster presentations. Bureau staff members were on hand to discuss two posters (Figures LPO02-1/2) describing the collaborative efforts of staffs from LANS and NMED to determine regional and Buckman aquifer characteristics that are highlighted in the abstracts below.



**Figure LPO02-1:** Poster Presentation at EBTAG Workshop on February 23, 2011, of radiocarbon dating and paleohydrology of the regional aquifer beneath the Pajarito Plateau, New Mexico

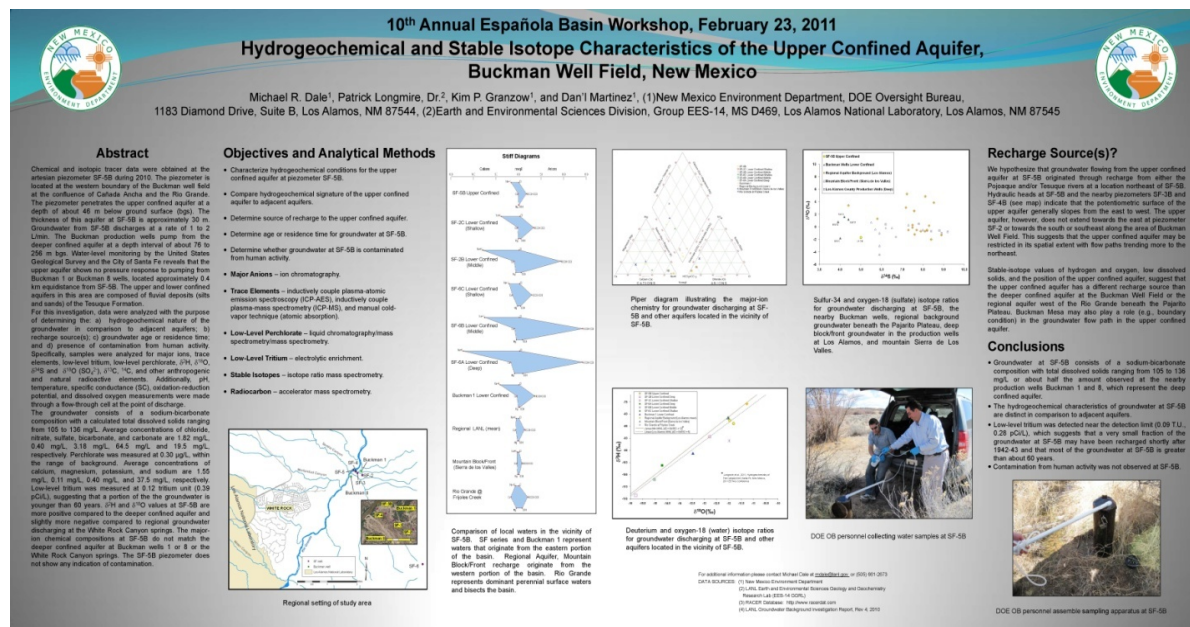
## “Radiocarbon Dating and Paleohydrology of Regional Aquifer Groundwater Beneath the Pajarito Plateau, New Mexico”

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### Abstract

The regional aquifer beneath the Pajarito Plateau offers a unique opportunity to investigate groundwater age and its relationship to climate change during the Holocene. Regional aquifer material, including the Puye Formation, typically does not contain calcium carbonate (calcite), making radiocarbon in dissolved inorganic carbon an ideal age tracer. From 2005 through 2010, 132 groundwater samples from 71 regional aquifer wells and springs were collected and analyzed for radiocarbon and other dissolved constituents including tritium, major ions, trace elements, and stable isotopes of hydrogen and oxygen. Wells and springs exhibiting background conditions do not contain tritium above 0.3 tritium units, suggesting that no post-1943 recharge has occurred at these sampling locations. Carbon-14 results indicate that groundwater ages increase west to east-southeast from approximately 500 years along the mountain-front recharge zone to 10,000 years in the discharge zone within White Rock

Canyon. Distributions of average age (radiocarbon) and modern age (tritium) confirm active recharge and mixing of pre-1943 groundwater occurs beneath perennially wet canyon bottoms dissecting the Pajarito Plateau. Groundwater flow velocities calculated from points along the regional flow path and outside the areas of active recharge range from 1 to 3 m/year. Through the 10,000 year radiocarbon record, the more climate sensitive ions such as chloride and sulfate tend to increase with groundwater age.  $\delta^2\text{H}$  and  $\delta^{18}\text{O}$  values correlate with groundwater age and are more positive in older groundwaters, suggesting that the climate in northern New Mexico during the Holocene was warmer than in recent times.



**Figure LPO02-2:** Poster Presentation at EBTAG Workshop on February 23, 2011, of hydrogeochemical and stable isotope characteristics of the upper confined aquifer, Buckman Well Field, New Mexico

## “Hydrogeochemical and Stable Isotope Characteristics of the Upper Confined Aquifer, Buckman Well Field, New Mexico”

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### Abstract

Chemical and isotopic tracer data were obtained at the artesian piezometer SF-5B during 2010. The piezometer is located at the western boundary of the Buckman well field at the confluence of Cañada Ancha and the Rio Grande. The piezometer penetrates the upper confined aquifer at a depth of about 46 m below ground surface (bgs). The thickness of this aquifer at SF-5B is approximately 30m. Groundwater from SF-5B discharges at a rate of 1 to 2 L/min. The Buckman production wells pump from the deeper confined aquifer at a depth interval of about 76 to 256 mbgs. Water-level monitoring by the United States Geological Survey and the City of Santa Fe reveals that the upper aquifer shows no pressure response to pumping from Buckman 1 or Buckman 8 wells, located approximately 0.4 km equidistance from SF-5B. The upper and lower confined aquifers in this area are composed of fluvial deposits (silts and sands) of the Tesuque Formation. For this investigation, data were analyzed with the purpose of determining the: a) Hydrogeochemical nature of the groundwater in comparison to adjacent



aquifers; b) recharge source(s); c) groundwater age or residence time; and, d) presence of contamination from human activity. Specifically, samples were analyzed for major ions, trace elements, low-level tritium, low-level perchlorate,  $\delta^2\text{H}$ ,  $\delta^{18}\text{O}$ ,  $\delta^{34}\text{S}$  and  $\delta^{18}\text{O}$  ( $\text{SO}_4^{2-}$ ),  $\delta^{13}\text{C}$ ,  $^{14}\text{C}$ , and other anthropogenic and natural radioactive elements. Additionally, pH, temperature, specific conductance (SC), oxidation-reduction potential, and dissolved oxygen measurements were made through a flow-through cell at the point of discharge. The groundwater consists of a sodium-bicarbonate composition with a calculated total dissolved solids ranging from 105 to 136 mg/L. Average concentrations of chloride, nitrate, sulfate, bicarbonate, and carbonate are 1.82 mg/L, 0.40 mg/L, 3.18 mg/L, 64.5 mg/L and 19.5 mg/L, respectively. Perchlorate was measured at 0.30  $\mu\text{g/L}$ , within the range of background. Average concentrations of calcium, magnesium, potassium, and sodium are 1.55 mg/L, 0.11 mg/L, 0.40 mg/L, and 37.5 mg/L, respectively. Low-level tritium was measured at 0.12 tritium unit (0.39 pCi/L), suggesting that a portion of the groundwater is younger than 60 years.  $\delta^2\text{H}$  and  $\delta^{18}\text{O}$  values at SF-5B are more positive compared to the deeper confined aquifer and slightly more negative compared to regional groundwater discharging at the White Rock Canyon springs. The major-ion chemical compositions at SF-5B do not match the deeper confined aquifer at Buckman wells 1 or 8 or the White Rock Canyon springs. The SF-5B piezometer does not show any indication of contamination.



**Figure LPO02-3:** Dennis McQuillan (GWQB), Kim Granzow (DOE OB) and Dave Englert (DOE OB) stand at the poster presentation for the 10<sup>th</sup> Annual Española Basin Workshop

### **GENERAL ER/EM PROJECTS (LGE03)**

Under this Activity ID, Bureau staff provides verification and validation of projects conducted by LANS to remediate environmental and human hazards from legacy waste and to monitor current activities for safe practices.

**Quarterly Summary: During FFY11 Q-2,** Bureau staff reported no activity.

### **DIRECT PENETRATING RADIATION PROJECT (LDP04)**

Under this Activity ID, Bureau staff monitors the environment at LANL and in the vicinity for gamma radiation that could be LANL-induced or ambient. The on-going program reads electrets at the end of each quarter, records data in field books, converts readings into quarterly dose values, and submits quarterly results for DOE, LANS and the public.

**Quarterly Summary: During FFY11 Q-2,** Bureau staff submitted a data report to DOE for quarters 1, 2, 3 and 4 of the 2010 calendar year.

### **PARTICULATES LOW-VOLUME AIR PROJECT (LPL05)**

Under this Activity ID, Bureau staff conducts continuous air monitoring for radioactive particles and tritium using low-volume air pumps. Filter samples and gel collectors are submitted and analyzed quarterly and results are provided for DOE, LANS and the public.

**Quarterly Summary: During FFY11 Q-2,** Bureau staff collected AIRNET particulate samples and archived them for analysis during FFY 2011 Q-3.

Bureau staff collected LANL perimeter AIRNET particulate samples for the 4<sup>th</sup> calendar quarter 2010 in early January 2011 and recorded Electret data for the direct penetrating radiation program. Particulate samples are currently being archived but will be analyzed by an independent analytical contract Laboratory during FFY 2011 Q-3 and the pending radionuclide results will be compiled with 2010 calendar quarters 1, 2, and 3 and released as a Bureau annual AIRNET data report. The Bureau solar-powered monitor located at the Los Alamos Airport will be re-deployed during Q-3. It serves to collect particulate data for radionuclides that will help to assess any potential concerns resulting from the demolition activities in-progress at TA-21.

### **PARTICULATES HIGH-VOLUME AIR PROJECT (LPH06)**

Under this Activity ID, Bureau staff conducts continuous air monitoring for radioactive particles, metals and organic compounds using high-volume air pumps to independently monitor environmental restoration clean-ups and D&D operations. Filter samples are submitted and analyzed quarterly and results are provided for DOE, LANS and the public.

**Quarterly Summary: During FFY11 Q-2,** Bureau staff reported no activity.

### **DRINKING WATER MONITORING (LPW07)**

Under this Activity ID, Bureau staff conducts annual sampling in a cooperative event with LANS Water Quality and Hydrology, Los Alamos County, and San Ildefonso Pueblo for supplemental and verification sampling of LA County and San Ildefonso Pueblo production wells. Generally, the analytes are substances not addressed under Safe Drinking Water Act.

**Quarterly Summary: During FFY11 Q-2,** Bureau staff reported no activity.

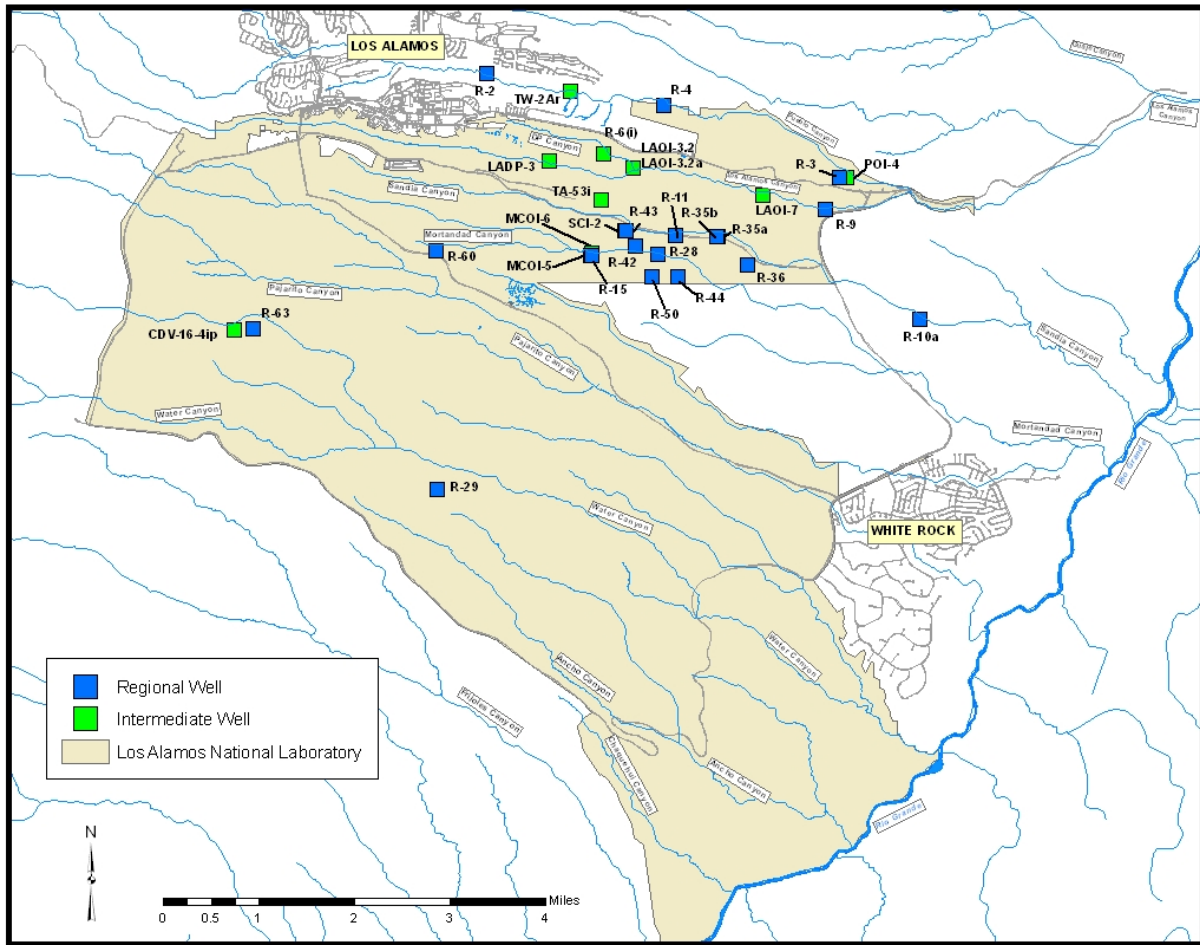
#### **GROUNDWATER MONITORING (LMW08)**

Under this Activity ID, Bureau staff conducts verification and supplemental sampling of the LANL Regional Wells in cooperation with LANS Water Quality and Hydrology, Los Alamos County, and Pueblos of San Ildefonso and Santa Clara.

**Quarterly Summary: During FFY11 Q-2,** Bureau staff conducted purge sampling, scoped an all-inclusive project to evaluate the Pajarito Aquifer, sampled various wells for S/O isotopes and oxyanions, conducted an inter-laboratory performance evaluation using well samples, and ended the ongoing oxalate project.

Bureau personnel participated in an extended purge sampling at R-29. Samples were analyzed over the course of the purge using a HACH kit on site for analysis of ferrous and total iron. The analyses were performed when unstable field parameters indicated that the chemistry of the water was changing during a standard 3 casing volume (CV) purge. The results indicated that the well still needed a recovery period for it to approach pre-drilling conditions (representative). Sampling for some analytes was postponed due to these conditions, but will continue during Q-3 as the well approaches stability for reliable and representative samples.

Bureau staff scoped a potential project involving USGS that would gather and evaluate a large amount of water quality and tracer data collected by LANL, USGS and NMED over the past 15+ years to form an all-inclusive picture of the Pajarito Aquifer. This project was to specifically include tracers sampled by NMED including: noble gasses, carbon 14 and stable isotopes. Unfortunately, recent federal budget considerations excluded DOE funding options for the near future. Staff will pursue this project again in FFY 2012.



**Figure LPW07-1:** Map of wells sampled during FFY11 Q-2 noting locations in the aquifer. Samples were generally taken around the TA-53 and Sandia/Mortandad monitoring network.

Sulfur and Oxygen (S/O) and oxyanion samples were collected at the request of LANS to assist in the facility evaluation of groundwater flow paths. This is a continuation of S/O and oxyanion sampling in regions of the laboratory where NMED has previously detected anthropogenic sulfate in the groundwater. The data will continue to fill in information gaps and corroborate the results produced by earlier rounds of sampling.

Staff sampled Well R-63 as part of an independent analytical laboratory performance evaluation. Previous samples were collected in 2010 at DP Spring, Buckman 8 and SCI-2, and they were analyzed for  $\text{Sr}^{90}$  and metals and high explosives (HE). Bureau and LANS staffs requested analysis of common constituents from the independent analytical laboratories for routine comparison and validation of results.

The Bureau completed the pilot phase of the Oxalate Project when it was determined that the contract laboratory was unable to establish a target MDL of  $<1 \mu\text{g/L}$  for oxalate analysis. Additionally, the sample results showed concentration variations that could not be attributed to reasonable or demonstrated hydrogeological interpretations. Because the laboratory could not achieve the necessary analytical sensitivity, oxalate will no longer be measured in samples nor



will it be considered as “tracer constituents” by either the Bureau or LANS. The desired outcome was to help investigators revise inputs for the improvement of the Pajarito Plateau (LANL) site hydrogeological conceptual model for recharge, discharge and flow pathways.

#### **WR SPRINGS MONITORING (LSM09)**

Under this Activity ID, Bureau staff conducts annual sampling in a cooperative event with LANS Water Quality and Hydrology and San Ildefonso Pueblo. The sampling includes approximately 25 groundwater springs off-site from LANL and on San Ildefonso Pueblo in White Rock Canyon along the Rio Grande.

**Quarterly Summary:** During FFY11 Q-2, Bureau staff had no activity to report.

#### **STORMWATER BELOW SWMUS PROJECT (LSF10)**

Under this Activity ID, Bureau staff conducts on-going sampling of storm water discharges from Solid Waste Management Units (SWMUs) for compliance verification and validation with the LANL Individual Storm Water Permit. Bureau staff evaluates BMP implementation at SWMUs that are intended to enhance contaminant transport reduction in accordance with the LANL Individual Storm Water Permit.

**Quarterly Summary:** During FFY11 Q-2, Bureau staff submitted data to DOE from 2010 sampling, began a proficiency test of laboratories for PCB analyses, and began to review two LANL reports related to the NPDES Individual Stormwater Permit.

The PCB data from twelve samples collected at TA-53 and two samples collected at TA-61 were compiled, reviewed and submitted to DOE. During the QA/QC evaluation, it was discovered that the analytical laboratory did not use a sample splitter to divide the samples into representative components, and instead, the laboratory decanted the samples, leaving the bulk of the suspended sediments behind. The remaining sediments were not distributed into each sample, and they were not analyzed. This introduced an unknown amount of bias into the data and rendered the results useless except for screening purposes. Additional archived samples from the same locations will be split by Bureau staff (instead of laboratory personnel) into representative samples and submitted in FFY 2011 Q-3 for analysis to obtain data of higher quality.

Staff acquired PCB congener proficiency testing (PT) mixtures from a certified commercial proficiency test provider. These mixtures will be diluted in one-liter volumes of high performance liquid chromatography water. The PT samples will be sent along with some of the split samples from TA-53 discussed above to each of NMED independent laboratories that are contracted for PCB congener analysis. Each laboratory will be evaluated on performance, precision, accuracy, turnaround time, data reporting (EDD) submittals and cost in order to help the Bureau optimize the choices of analytical laboratories designated to conduct congener PCB analyses. The PT will be completed in FFY 2011 Q-3.

Bureau staff started a review of two LANL reports related to the NPDES Individual Storm Water Permit No. NM0030759 including the Annual Report and the Compliance Status Reports (DMRs). The Annual Report presents activities and milestones accomplished by LANS during

January 1 through December 31, 2010 including site-specific compliance status, changes in compliance status, monitoring results during the reporting period, pollutants that exceeded applicable TALs, installed baseline control measures, and a summary of inspections performed.

### **STORMWATER WATERSHED PROJECT (LSW11)**

Under this Activity ID, Bureau staff conducts on-going sampling of LANL watersheds for water quality standards compliance verification. The focus is on post Cerro Grande fire plutonium inventory transport assessments in Pueblo and Los Alamos Canyons and cooperative watershed monitoring with San Ildefonso Pueblo.

**Quarterly Summary: During FFY11 Q-2,** Bureau staff received and evaluated comments on a report submitted to DOE/LANS and San Ildefonso Pueblo on contaminant transport in the Los Alamos Canyon watershed.

Staff received peer review comments from DOE/LANS and San Ildefonso Pueblo on the DRAFT report **“Los Alamos Canyon Watershed Stormwater Monitoring from 2003 through 2008: Contaminant Transport Assessment.”** Comments from both groups have been addressed in the final version, which will be published in early FFY 2011 Q-3 (April, 2011).

#### **Executive Summary from the report:**

During 2003 to 2008, the Department of Energy Oversight Bureau of the New Mexico Environment Department evaluated stormwater conditions in the Los Alamos watershed and prepared this report. The Los Alamos watershed heads in the Sierra de los Valles and extends eastward through the Los Alamos National Laboratory to the Rio Grande. This report quantifies the redistribution rates of legacy contaminant-bound sediments in stormwater after the Cerro Grande fire in 2000. The contaminant sources originate from Laboratory discharges during the period from 1943 to 1986 of treated and untreated industrial wastewater containing radioactive and other research derived contaminants. In 2000, the Cerro Grande fire burned through the mountains changing the canyon hydrology and ensuing floods began redistributing contaminant laden sediments downstream to and into the Rio Grande.

This summary presents two components of the report, among other assessments, which might be of interest;

1. Estimates of plutonium-239/240 and sediment transport at six stations within the watershed are made.
2. Concentration and Inventory Rating Coefficients are developed for individual stations to identify changing transport conditions across the watershed.

Both the inventory estimates and the metrics are based on assumptions that sediment and contaminant concentrations increase or decrease proportionately with changing flow. These assumptions were developed from empirical measurements and observations in previous reports and well characterized events during the period of this report. At individual stations strong relationships between discharge, suspended sediment concentrations and plutonium-239/240 measurements in water were observed in multiple samples collected from single events. Linear equations were developed that defined the relationships between concentrations and discharge. If that relationship is defined for an event, the “concentration slope coefficient” can be used to predict an instantaneous concentration throughout the event based on flow. Cumulative mass transport can then be estimated for the event.

Station specific relationships between inventory and peak discharge were then used to establish 'Inventory Rating Coefficients' and cumulative transport estimates over multiple events. It was not the intent of this report to fully characterize every event, but use the assumptions, rating coefficients, and samples collected from a representative set of events to estimate sediment and contaminant transport inventories for events not sampled. We made those estimates based on:

1. The preceding assumptions of proportional increases or decreases with changing discharge.
2. An additional observation that most storm flows in the ephemeral channels on the Pajarito Plateau are "flashy". Storm surges typically generate hydrographs that illustrate a quick rising limb of the flood bore to peak discharge, followed by a slower declining trailing limb.
3. Inventory Rating Coefficients based on contaminant and sediment transport-inventory linear correlations to peak discharge. These coefficients are relevant for specific stations. If the coefficients change over time or between stations, we can conclude that sediments and/or contaminants are being transported at different rates.
  - a. While the  $\text{Pu}^{239/240}$  concentrations in suspended sediments vary across the watershed, they are fairly consistent at individual stations.
  - b. Concentrations of sediments and contaminants in water measure these rates or availability as well. The difference we suggest is concentration values in water, pCi/L or mg/L, define the instantaneous mass relationship to volume of water. In our report, the rating coefficients also define the relationship of  $\text{Pu}^{239/240}$  or sediment concentrations to flow rates, L/s.
  - c. If the coefficients change over time or between reaches, we can conclude that sediments and/or contaminants are being transported at different rates. For example, in an improving watershed reach, not only does average peak discharge decline along with proportionate loads, but so does the flood capacities to carry sediment or contaminant loads relative to similar flood energies (e.g. 5000 mg/L SSC in a 100 cfs discharge relative to 500 mg/L measurement in a similar 100 cfs discharge).

Based on these methods we have estimated that approximately;

- 250 mCi of  $\text{Pu}^{239/240}$  in 36000 tons of sediment have been transported off Laboratory property since the Cerro Grande fire through 2008.
- From 2003 to 2008, 34 mCi of  $\text{Pu}^{239/240}$  in 7500 tons of sediment were transported to the Rio Grande.
- Over 30% of offsite transport and 80% of contaminant transport to the Rio Grande occurred during one storm event. On August 8<sup>th</sup>, 2006 flow was report at E060 and E050 as 1926 cfs and 252 cfs respectively. Farther downstream at E110 flow was reported at 1642 cfs.
- The rating coefficients identify low contaminant availability to stormwater transport in background reaches like Guaje Canyon or the headwaters of Pueblo Canyon, moderate contaminant availability in mid Los Alamos Canyon, followed by the largest levels of contaminants available in Pueblo Canyon downstream to lower Los Alamos Canyon.



- The sediment coefficients indicate Upper Pueblo and upper to mid Los Alamos Canyons develop smaller sediment loads than much larger sediment supplies in downstream Pueblo and Los Alamos Canyons.

In the context of this report, we demonstrate the relation between suspended sediment,  $\text{Pu}^{239/240}$  measurements in sediment, and  $\text{Pu}^{239/240}$  measurements in water. Of particular significance are the magnitudes of  $\text{Pu}^{239/240}$  values in sediment and the relation it bears on  $\text{Pu}^{239/240}$  transport availability. For example, stormwater from Acid Canyon typically contains suspended sediment that has large values of  $\text{Pu}^{239/240}$  measured in it; the average of 17 pCi/g was calculated from samples taken for this report. Yet because Acid Canyon contributes relatively small amounts of suspended sediment to stormwater, an average of 2000 mg/L, a relatively small downstream contribution of contaminants is made. The average  $\text{Pu}^{239/240}$  concentration in water from Acid Canyon is 29 pCi/L, while other stormwater at stations downstream in Pueblo Canyon contain lower  $\text{Pu}^{239/240}$  concentrations in sediment, much larger sediment loads, and consequently total  $\text{Pu}^{239/240}$  values in water that exceed 100 pCi/L.

#### **NPDES MONITORING ASSESSMENT PROJECT (LPN12)**

Under this Activity ID, Bureau staff conducts on-going sampling of National Pollution Discharge Elimination System (NPDES) outfalls and outfall closure verification. The focus is on stormwater management assessment at construction and Environmental Restoration remediation projects. Staff verifies that LANS has proper spill action plans, and staff provides closeout assessment and recommendations.

**Quarterly Summary:** During FFY11 Q-2, Bureau staff conducted site evaluations and coordinated closure of numerous spill/release reports.

The Bureau conducts site assessments at LANL and reviews 24-hour, 7- and 15-day notifications specific to its NPDES permit with regard to unplanned liquid releases (spills) and implementation of erosion safeguards during construction activities.

Bureau staff transmitted a revision of its report “NPDES Monitoring at Los Alamos National Laboratory/New Mexico Conducted by NMED/DOE OB FFY 2010 Q-1, November 2 and November 23, 2009.” The revised report summarizes NPDES outfall data collected during late fall 2009 that will be incorporated into the Bureau 2009 Annual Report to DOE. All sampling results were less than the monthly average and daily maximum effluent limits stated in the permit. However, concentrations of certain contaminants indicated a potential to exceed stream standards in receiving waters in several instances.

During this period, LANS reported the following Spill/Release Notifications to NMED and EPA:

**#290** - On December 22, 2010 at TA-54-39 a ruptured fire suppression line inside the building discharged approximately 4,000 gallons of potable water to secondary containment within the facility. Two subsequent releases of approximately 2,000 gallons each (total discharge: about 8,000 gallons) resulted in water reaching Canada del Buey with minimal erosion impacts observed. The fire suppression water line was taken out of service and repairs scheduled.

**#289** - On December 22, 2010 near structure TA-36-136 approximately 1,300,000 gallons of potable water discharged from a ruptured water main. Los Alamos County Utilities staff observed a water level drop at holding tank PB-2 and stopped flow to the tank. Erosion was observed at the release and water entered Pajarito Canyon flowing downstream for approximately 0.75 miles. LANS is assessing impacts to SWMU in the pathway of the discharge and flow. The watercourse is heavily vegetated and erosion impacts appeared minimal. The water main was shut down and repairs were completed by 10:30 am on the day of the release.

**#291** - On January 3, 2011 a break in a fire suppression line occurred within the building at TA-46-535. When Los Alamos Fire Department responded and entered the building approximately 1,500 gallons of potable water discharged. The water entered Canada del Buey and minimal erosion observed. The pipe failure was the result of freezing temperatures. Repairs to the fire suppression system are complete and corrective measures implemented to prevent future occurrences.

**#293** - On January 3, a potable water line break discharged approximately 20,000 gallons to the west of former structure TA-3-43 currently undergoing demolition. Approximately half of the water was contained on the TA-3-43 construction site with overflow to Sandia Canyon. There did not appear to be any erosion damage to the drainage or adverse impacts to SWMUs or AOCs.

**#294** - On January 4, a break in a heated potable water line was discovered in Building TA-3-1663. Approximately 10,000 gallons discharged outside the building and entered Twomile Canyon. The drainage area was covered with snow and ice and there did not appear to be any erosion or adverse impacts to SWMUs or AOCs because of the release.

**#295** - On January 4, a potable water line break was discovered in TA-16 Building 400. At the time of the release, the building was used as shelter for snow removal equipment. Water filled a sump within the building and discharged across PRS-16-003(b). The discharge caused minor erosion near Building 400 however, accumulation of snow and ice in Water Canyon appeared to prevent erosion within the watercourse. Approximately 4,400 gallons was captured within the building, was pumped out and taken to the water treatment plant.

**#296** - On January 18, a potable water line break was discovered near TA-46 Building 76. Approximately 9,000 gallons discharged through a stormwater culvert into a tributary to Canada del Buey. Minor erosion was observed near the break none was observed within the tributary. The water appeared to flow across SWMU 46-009(a) without impact. SWMU 46-009(a) is a surface disposal area located at the head of SWSC Canyon (a small tributary of Canada del Buey) near the southeastern corner of TA-46. The surface disposal area is just over an acre in size extending from the canyon rim to the floor of SWSC Canyon and contains a variety of materials including asphalt, concrete, plywood, pipe, and other construction materials. The surface disposal area appears in aerial photographs from 1958 and may predate the establishment of TA-46. The disposal area footprint appears similar to that described in the OU 1140 work plan that describes potential contaminants as radionuclides, inorganic chemicals, SVOCs, PCBs, and asbestos. Three additional characterization efforts were conducted since 1989 prompted by the construction of a nearby roadway.

**#297** - On February 2, a potable water line break was discovered near TA-54 Building 60. The break discharged less than 400 gallons of potable water through a stormwater culvert into a tributary to Canada del Buey. The discharge occurred on an asphalt area and no erosion was observed.

**#298** - On February 3, potable water discharged from a water tank at TA 35 Structure 129 because of a frozen altitude valve. Approximately 2,000 gallons of potable water was discharged to Effluent Canyon, a tributary to Mortandad Canyon. The release did not appear to cause erosion nor affect any SWMUs or AOCs.

**#299** - On February 8, a failed air relief valve is suspected in the release of 50,000 gallons of potable water from a water line north of State Road 4 approximately 1 mile east of the TA 49 entrance. The release, to a tributary of Frijoles Canyon, appeared to flow onto Bandelier National Monument property but did not appear to cause erosion nor affect any SWMUs or AOCs. The hillside was heavily vegetated and partly covered with snow and ice.

**#301** - On March 16, 2011 a potable water leak was discovered at TA 49 along State Road 4 during a preventive maintenance check. A failed air relief valve resulted in the release of an estimated 100,000 gallons of potable water. The water flowed across a heavily vegetated hillside and appeared to reach Ancho Canyon. Minimal erosion was observed where the water surfaced and there did not appear to be any impacts to SWMUs or AOCs. Seeding of a small-eroded area scheduled for the week of March 28.

The “Spill Response Assessment and Request for Administrative Closure” reports listed below were submitted to EPA, DOE and LANS by the Surface Water Quality Bureau (SWQB). The SWQB and EPA reviewed and considered on-site observations and recommendations for closure made by the Bureau before filing “closure” determinations. Bureau efforts helped expedite more than 90% of the LANS spill notifications last year.

“Spill Response Assessment and Suggestion for Closure of Potable Water Line Release at Technical Area (TA)-3, Building 43, January 1, 2011, LANL Discharge Notification Report **#293**.” The Bureau recommends no further action under the discharge notification and that actions taken by LANS were adequate under §20.6.2.1203 NMAC.

“Spill Response Assessment and Suggestion for Closure of Fire Suppression (Potable Water) Release at TA-46, Building 535, January 3, 2011, LANL Discharge Notification Report **#291**.” The letter noted that the DOE Oversight Bureau recommended no further action under the discharge notification and that actions taken by LANS were adequate under §20.6.2.1203 NMAC.

“Spill Response Assessment and Suggestion for Closure of Potable Water Line Release at Technical Area (TA)-46, Building 76, January 18, 2011, LANL Discharge Notification Report **#296**.” Bureau staff found the actions taken by LANS were adequate under §20.6.2.1203 NMAC.

“Spill Response Assessment and Suggestion for Closure of Potable Water Line Release at Technical Area (TA)-54, Building 60, February 2, 2011, LANL Discharge Notification Report **#297**.” Bureau staff found the actions taken by LANS were adequate under §20.6.2.1203 NMAC.

“Spill Response Assessment and Suggestion for Closure of Potable Water Line Release at Technical Area (TA)-35, Structure 129, February 3, 2011, LANL Discharge Notification Report **#298**.” Bureau staff found the actions taken by LANS were adequate under §20.6.2.1203 NMAC.

“Spill Response Assessment and Suggestion for Closure of Heated Potable Water Line Release at TA-49, State Road 4, February 8, 2011, LANL Discharge Notification Report **#299**.” Bureau staff found the actions taken by LANS were adequate under §20.6.2.1203 NMAC.

“Spill Response Assessment and Suggestion for Closure of Heated Potable Water Line Release at TA-3, Building 1663, January 4, 2011, LANL Discharge Notification Report # **294**.” The letter noted that Bureau staff found the actions taken by LANS adequate for protection of health and environment under §20.6.2.1203 NMAC of the Water Quality Control Commission.”

The Bureau submitted to DOE “NMED-DOE/OB Site Evaluation Report for Stormwater and Erosion Controls at Technical Area (TA) 55, the LANL Nuclear Safeguards and Security Upgrades Project (NMSSUP) on November 17, 2010.” The report documents Bureau participation in a site evaluation for stormwater and erosion controls. Activity was ongoing at the site during the assessment. All temporary Best Management Practices (BMPs) were properly installed and maintained in accordance with the Storm Water Pollution Prevention Plan (SWPPP). In addition general construction, site housekeeping and waste management were observed to be in good order. Due to the limited available space and an overlap with another construction company’s work area, challenges were created in managing this complex project (NMSSUP). Several areas with very steep grades provide the potential for erosion and sediment runoff in the event of heavy rainfall. The Bureau staff made recommendations to LANS and contractor (Kiewit) personnel to improve site stormwater, sediment, and erosion control. Considering the small envelope available for construction activities and proximity to another contractor, site management was good. During this site evaluation, all parties concerned seem to have a proactive attitude toward overall construction, stormwater control and permit compliance.

#### **REGIONAL PCB STUDY PROJECT (LPC13)**

Under this Activity ID, Bureau staff conducts a special study to characterize PCB concentrations in stormwater on a regional basis (upper & middle Rio Grande) to put LANL and SNL contributions to the Rio Grande in perspective.

**Quarterly Summary:** During FFY11 Q-2, Bureau staff submitted 2010 samples for analysis, recalculated blank-corrected PCB results and submitted those results to DOE for use in the joint LANL/DOE Oversight Bureau PCB baseline (background) study.

Bureau staff submitted five precipitation samples from Bandelier National Monument and four precipitation samples from the Los Alamos County Airport to an analytical laboratory for PCB analysis. The samples were collected from August through December 2010. Bureau staff also submitted 13 stormwater samples collected in August and September for PCB analysis.

Bureau staff recalculated blank-corrected PCB results in water from 2005 through 2010 using the latest blank correction procedures developed jointly between the Bureau and LANS. Stormwater (128), precipitation (32), snowpack (12), snowmelt runoff (11), groundwater (5) and QA/QC data (6) sets were included.

Bureau staff submitted all recalculated PCB-in-stormwater results from 2008 and 2009 along with the latest results from 2010 to DOE for use in the joint DOE/LANS Bureau PCB baseline (background) study. This study will be a cooperative effort, which evaluates NMED and LANS data results from stormwater samples collected over the past four years to determine what levels can be expected in stormwater from un-impacted canyons and urban influenced stormwater in the upper Rio Grande watershed. The report will also develop baseline levels of PCBs expected

in precipitation using the Bureau precipitation and snowpack data. The anticipated date of publication is in September 2011.

#### **FISH TISSUE PROJECT (LPC14)**

Under this Activity ID, Bureau staff conducts annual sampling of fish tissue in the Rio Grande and reservoirs under a cooperative sampling plan developed with Santa Clara Pueblo. A primary result of this effort is the fish consumption advisory development. During this year, staff participated on the steering committee for the EPA 2007 contaminant in fish forum.

**Quarterly Summary:** During FFY11 Q-2, Bureau staff reported no activity.

#### **MACROINVERTEBRATE PROJECT (LMI15)**

Under this Activity ID, Bureau staff conducts water quality assessments of LANL-area streams utilizing benthic macroinvertebrate population sampling. Macroinvertebrate populations (such as dragon flies, which begin the lifecycle at the bottom of lakes and streams) are long-term indicators of the chemical, biological and physical health of flowing waters. The numbers and diversity of species of macroinvertebrates reflect water quality stressors and/or water quality trends.

**Quarterly Summary:** During FFY11 Q-2, Bureau staff reported no activity.

#### **DEMOLITION AND DECOMM PROJECT (LDD16)**

Under this Activity ID, Bureau staff conducts site-specific monitoring of air quality downwind from ongoing demolition and decommissioning projects.

**Quarterly Summary:** During FFY11 Q-2, Bureau staff continued to split soil samples from MDA B with LANS and monitored the D&D progress at DP West (TA-21).

Staff assessed the current confirmation sampling data from both LANS and NMED and organized the data into tables for comparison. The MDA B project received a time extension from the HWB and work continues on excavating the old landfill at TA-21. For the week of March 28, 2011, excavation was reported at 68% complete. Bureau staff established new contacts and regular correspondence regarding upcoming confirmation sampling due to recent personnel changes.

Bureau staff provided an up-to-date split sample summary of RCRA metal and radionuclide data from MDA-B confirmatory sampling to LANS for review and record completeness.

Bureau staff coordinated with LANS and its sampling contractor (Northwind, LLC) to split another round of confirmation samples from enclosure #3 at MDA B. The Bureau sampling strategy remains unchanged with analyses for isotopic plutonium, isotopic uranium and TAL metals. At the end of the FFY 2011 Q-2 bureau staff had split a total of 13 samples from 5 enclosures during the project.

The following tables summarize the confirmation samples that the DOE OB has split with LANL since the project began.

**NMED/LANL Split Confirmatory Sampling from MDA-B (TA-21)**

Isotopic Plutonium and Uranium, Stanard UOM = pCi/g

Sample Date	Row/Location	Analyte Code	NMED Result	LANL Result	SAL	Sample Date	Row/Location	Analyte Code	NMED Result	LANL Result	SAL
8/11/2010	260 Floor	Pu-238	0.00	ND	37	10/11/2010	51 Floor	Pu-238	0.15	0.387	37
		Pu-242	1.88	not analyzed	NA			Pu-242	3.99	not analyzed	NA
		Pu-239/240	0.62	0.93	33			Pu-239/240	40	34.2	33
		U-232	1.73	not analyzed	NA			U-232	4.14	not analyzed	NA
		U-234	0.65	0.857	170			U-234	1.00	1.58	170
		U-235or/236*	0.04	0.0734	17*			U-235or/236*	0.08	0.112	17*
		U-238	0.67	0.859	86			U-238	0.95	1.54	86
8/11/2010	260 North Wall	Pu-238	0.29	0.328	37	11/23/2010	51 North Wall	Pu-238	0.01	0.0997	37
		Pu-242	15.80	not analyzed	NA			Pu-242	3.93	not analyzed	NA
		Pu-239/240	54	55.1	33			Pu-239/240	3	2.37	33
		U-232	1.66	not analyzed	NA			U-232	349	not analyzed	NA
		U-234	0.14	0.931	170			U-234	2900	2250	170
		U-235or/236*	0.04	0.0681	17*			U-235or/236*	140	148	17*
		U-238	0.78	1.08	86			U-238	3000	2260	86
8/11/2010	260 South Wall	Pu-238	0.02	0.0968	37	11/23/2010	51 South Wall	Pu-238	0.07	0.147	37
		Pu-242	1.30	not analyzed	NA			Pu-242	3.94	not analyzed	NA
		Pu-239/240	2	2.33	33			Pu-239/240	19	19.8	33
		U-232	1.74	not analyzed	NA			U-232	3.73	not analyzed	NA
		U-234	0.70	0.789	170			U-234	0.99	1.24	170
		U-235or/236*	0.04	ND	17*			U-235or/236*	0.04	0.0748	17*
		U-238	0.69	0.799	86			U-238	0.96	0.868	86
10/18/2010	155 Floor	Pu-238	0.02	ND	37	10/18/2010	160 Floor	Pu-238	0.11	0.426	37
		Pu-242	3.62	not analyzed	NA			Pu-242	3.79	not analyzed	NA
		Pu-239/240	5.30	4.99	33			Pu-239/240	29.00	21.3	33
		U-232	4.19	not analyzed	NA			U-232	3.67	not analyzed	NA
		U-234	0.76	1.12	170			U-234	0.92	1.08	170
		U-235or/236*	0.03	0.0888	17*			U-235or/236*	0.04	ND	17*
		U-238	0.74	1.12	86			U-238	0.78	0.945	86
10/18/2010	155 North Wall	Pu-238	0.00	ND	37	10/18/2010	160 North Wall	Pu-238	0.01	ND	37
		Pu-242	3.14	not analyzed	NA			Pu-242	3.93	not analyzed	NA
		Pu-239/240	0.07	0.844	33			Pu-239/240	0.03	ND	33
		U-232	3.94	not analyzed	NA			U-232	3.66	not analyzed	NA
		U-234	0.81	1.01	170			U-234	0.65	0.813	170
		U-235or/236*	0.03	ND	17*			U-235or/236*	0.06	0.0598	17*
		U-238	0.81	0.976	86			U-238	0.65	0.778	86
10/18/2010	155 South Wall	Pu-238	0.00	ND	37	10/18/2010	160 South Wall	Pu-238	0.01	ND	37
		Pu-242	3.83	not analyzed	NA			Pu-242	3.82	not analyzed	NA
		Pu-239/240	0.18	ND	33			Pu-239/240	2	1.88	33
		U-232	3.70	not analyzed	NA			U-232	3.49	not analyzed	NA
		U-234	0.73	0.817	170			U-234	0.73	0.8	170
		U-235or/236*	0.05	ND	17*			U-235or/236*	0.03	ND	17*
		U-238	0.80	0.928	86			U-238	0.77	0.859	86
10/19/2010	196 Floor	Pu-238	0.38	0.414	37	1/5/2011	255 Floor	Pu-238	0.02	--	37
		Pu-242	4.41	not analyzed	NA			Pu-239/240	2.30	2.52	33
		Pu-239/240	85	61	33			U-234	0.65	0.799	170
		U-232	4.03	not analyzed	NA			U-235/236	0.04	0.0723	17
		U-234	1.00	1.15	170			U-238	0.61	0.799	86
		U-235or/236*	0.07	0.0661	17*			Pu-238	0.02	--	37
		U-238	0.84	1.06	86			Pu-239/240	1.49	1.46	33
10/19/2010	196 North Wall	Pu-238	0.00	ND	37	1/10/2011	165 Floor	U-234	0.82	0.953	170
		Pu-242	3.66	not analyzed	NA			U-235/236	0.01	0.105	17
		Pu-239/240	0.57	0.653	33			U-238	0.85	0.972	86
		U-232	3.77	not analyzed	NA			Pu-238	0.12	--	37
		U-234	0.57	0.858	170			Pu-239/240	19.2	14	33
		U-235or/236*	0.03	ND	17*			U-234	0.81	0.993	170
		U-238	0.62	0.792	86			U-235/236	0.02	0.0813	17
10/19/2010	196 South Wall	Pu-238	0.02	ND	37	U-238	0.73	0.961	86		
		Pu-242	2.24	not analyzed	NA	* = LANL analysis is U-235/236, NMED Is U-235; SAL is for combined					
		Pu-239/240	1.8	2.74	33	NA = not available/applicable					
		U-232	3.99	not analyzed	NA	ND = Analyte NOT DETECTED at or above the reporting limit or MDL					
		U-234	0.66	0.837	170	not analyzed = this analyte was not analyzed					
		U-235or/236*	0.01	ND	17*	SAL = Residential Screening Action Level, from LANL (2005, 088493)					
		U-238	0.66	0.838	86	-- = analyte was analyzed for but no result was reported					

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**Figure LDD16-1:** Aerial view of enclosures along MDA B at TA-21, looking to the northeast.



**Figure LDD16-2:** End panels were installed on Enclosure 5 and removed from Enclosure 3 at MDA B (TA-21).





**Figure LDD16-3:** The trench behind moveable Enclosure 1 continues to progress with excavation. The trench will be backfilled when confirmation samples are received.



**Figure LDD16-4:** DP West prior to demolition in April 2010





**Figure LDD16-5:** DP West after demolition was complete in December 2010



**Figure LDD16-6:** DP West in February 2011 showing the concrete foundations on the right as the only hint of the former buildings

## **BACKGROUND PERCHLORATE REPORT (LTM17)**

Under this Activity ID, Bureau staff conducts a specialized study to evaluate perchlorate in groundwater in the northern Rio Grande Basin.

**Quarterly Summary: During FFY11 Q-2,** Bureau staff reported no activity.

## **GIS DATA AND REPORTS INFO PROJECT (LGD19)**

Under this Activity ID, Bureau staff provides map generation, internal database management and RACER database support.

**Quarterly Summary: During FFY11 Q-2,** Bureau staff responded to the RACER audit, worked with a work-study intern on legacy data entry for inclusion in RACER, updated existing C<sup>14</sup> data in the database, and completed routine data evaluation.

Bureau staff completed a draft review and response to the RACER audit conducted by the Risk Assessment Corporation (RAC) at the beginning of CY 2011. The audit process found that the completeness of Bureau data generally passed all the audit criteria. The Bureau addressed a few minor items identified in the audit.

The Bureau has uploaded 30,439 records to RACER in environmental media categories of groundwater, sediment, stormwater, surface water, suspended sediment, and “other” encompassing data back to September 8, 1992.

Bureau staff supervised the RACER work-study student on data entry of Oversight Bureau and SWQB legacy data and stable isotope data. Methods are under development to accommodate all non-routine data for eventual uploading into RACER.

Bureau staff completed a major update for existing C<sup>14</sup> data in the NMED OB environmental database, using a new algorithm, which accommodates different sampling dates. Values that changed were results for C<sup>14</sup> Percent Modern Carbon, De-normalized (Expressed in %) and C<sup>14</sup> Years (Expressed in years), Unadjusted, based on de-normalized fraction. Values in RACER were also updated.

Bureau staff updated maps to be presented as part of poster presentations at the 10th Annual Española Basin Workshop.

Bureau staff continues to attend the monthly RACER steering committee meeting. The major topics include responses to the RACER audit review, and migrating LANL and Oversight Bureau data to a Cloud-based server.

Bureau staff finished importing data from 2010 EPA sampling projects into the database and started drafting reports to be submitted to EPA.

Bureau staff continues to troubleshoot EDDs sent by analytical laboratories that are using the Bureau format for the first time.

### **TECHNICAL REVIEW (LMP23)**

Under this Activity ID, Bureau staff provides technical support to DOE and LANS, other bureaus in NMED, state and federal entities, and public interest and oversight groups.

**Quarterly Summary: During FFY11 Q-2,** Bureau staff prepared inputs for the FFY 2010 Annual Report.

Bureau staff prepared and compiled inputs for the FFY 2010 Annual Report, including figures, maps and charts.

## **SANDIA NATIONAL LABORATORIES/NEW MEXICO OVERSIGHT**

### **GENERAL ADMINISTRATION (SAD40)**

Under this Activity ID, the Bureau manages, administers, and finances the overall activities of staff members in the Albuquerque office. Staff provides assistance to the Bureau and DOE developing workplans, budgets and training requirements.

**Quarterly Summary: During FFY11 Q-1,** Bureau staff completed general training, managed personnel activities, coordinated analytical laboratory price agreement extension and budgeted for monitoring and oversight activities.

### **PUBLIC OUTREACH (SPO41)**

Under this Activity ID, Bureau staff interacts with the public through meetings, listening sessions, website development, consultations, and reports.

**Quarterly Summary: During FFY11 Q-1,** Bureau staff updated the Bureau website and prepared technical and periodic reports for publication.

### **GENERAL GROUNDWATER MONITORING (ER) (SGE42)**

Under this Activity ID, Bureau staff evaluates groundwater parameters to determine if there is any change in groundwater quality at SNL and also compares data results from the analytical laboratory used by Sandia to data results obtained by the analytical laboratory used by the Bureau as an independent verification.

**Quarterly Summary: During FFY11 Q-2,** Bureau staff collected groundwater samples from Burn Site, Tijeras Arroyo (TAG), Technical Area-V (TAV) and Groundwater Protection Program (GWPP) sites. Bureau staff worked on the 2010 Annual Groundwater Report.

During Q-2, Bureau staff collected groundwater samples from the following monitoring wells and natural spring: Coyote Spring, CTF-MW1, CTF-MW2, CTF-MW3, CYN-MW1D, CYN-MW3, CYN-MW4, CYN-MW5, CYN-MW6, CYN-MW7, CYN-MW8, CYN-MW9, CYN-MW10, CYN-MW11, CYN-MW12, TA2-SW1-320, TA2-W-01, TA2-W-19, TA2-W-26, TA2-W-27, TJA-2, TJA-3, TJA-4, TJA-6, TJA-7, TAV-MW11, TAV-MW12, TAV-MW13, and WYO-4. Samples were analyzed by a contract analytical laboratory for inorganics, organics, and metals.

**Burn Site Groundwater:** Bureau staff collected groundwater samples from Burn Site monitoring wells CYN-MW1D, CYN-MW3, CYN-MW4, CYN-MW6, CYN-MW7, CYN-MW8, CYN-MW9, CYN-MW10, CYN-MW11, and CYN-MW12. All samples were sent to an independent contract laboratory to be analyzed for volatile organic compounds (VOCs), diesel range organics, (DROs), gasoline range organics (GROs), nitrate-nitrite as Nitrogen, anions, perchlorate, high explosives, and semi-volatile organic compounds (SVOCs).

Bureau staff reviewed groundwater data collected during CY 2010 for input to the annual report.

Groundwater Protection Program (GWPP): Bureau staff forwarded a final draft data submittal to DOE titled, “Groundwater Monitoring at Sandia National Laboratories/New Mexico GWPP Conducted by NMED/DOE OB for FFY 2010 Q-2.” During March 2010, Bureau staff collected groundwater samples from GWPP monitoring wells CTF-MW2, SFR-2S, and TRE-1. The Bureau also collected a sample from Coyote Springs located in Arroyo del Coyote. Split samples were collected using standard Sandia sampling procedures and equipment. The samples were submitted for analysis to an independent contract laboratory to be analyzed for Target Analyte List (TAL) metals plus uranium, anions, nitrate plus nitrite as N (NPN), cyanide, volatile organic compounds (VOCs), high explosives (HE), gamma-emitting isotopes, gross alpha/beta, radium<sup>226/228</sup>, radon<sup>222</sup> and isotopic uranium<sup>234/235/238</sup>. All samples were filtered in the field prior to analysis, except for VOCs, HE and total mercury. Elevated concentrations of arsenic, beryllium, fluoride, RDX, and radium<sup>226/228</sup> were noted in several samples.

During FY11 Q-2 Bureau staff collected groundwater samples from monitoring wells CTF-MW1, CTF-MW2, CTF-MW3, and CYN-MW5. The Bureau also collected a groundwater sample from Coyote Springs. Samples were submitted for analysis to an independent analytical laboratory for TAL metals plus uranium, anions, nitrate plus nitrite as N (NPN), cyanide, volatile organic compounds (VOCs), high explosives (HE), gamma-emitting isotopes, gross alpha/beta, radium<sup>226/228</sup>, and isotopic uranium<sup>234/235/238</sup>. All samples were filtered in the field prior to analysis, except for VOCs, HE and total mercury.

Bureau staff is reviewing data results from samples collected during FY 2011 Q-2.

Mixed Waste Landfill Groundwater: Bureau staff reviewed groundwater data results from samples collected during FY 2010.

Technical Area-V (TA-V) Groundwater: Bureau staff reviewed groundwater data results from samples collected during FY 2010.

Bureau staff collected groundwater samples from the newly installed groundwater monitoring wells TAV-MW11, TAV-MW12, and TAV-MW13. Samples were collected to be analyzed for total TAL metals plus uranium, VOCs, nitrate-nitrite as N, anions and perchlorate.

Tijeras Arroyo Groundwater (TAG): Bureau staff collected groundwater samples from TAG monitoring wells TA2-SW1-320, TA2-W-01, TA2-W-19, TA2-W-26, TA2-W-27, TJA-2, TJA-3, TJA-4, TJA-6, TJA-7, and WYO-4. All samples were sent to an independent contract laboratory to be analyzed for VOCs, nitrate-nitrite as N.

Bureau staff reviewed groundwater data collected during FY 2010.

Chemical Waste Landfill (CWL) Groundwater: Bureau staff reviewed groundwater data results from samples collected during FY 2010.

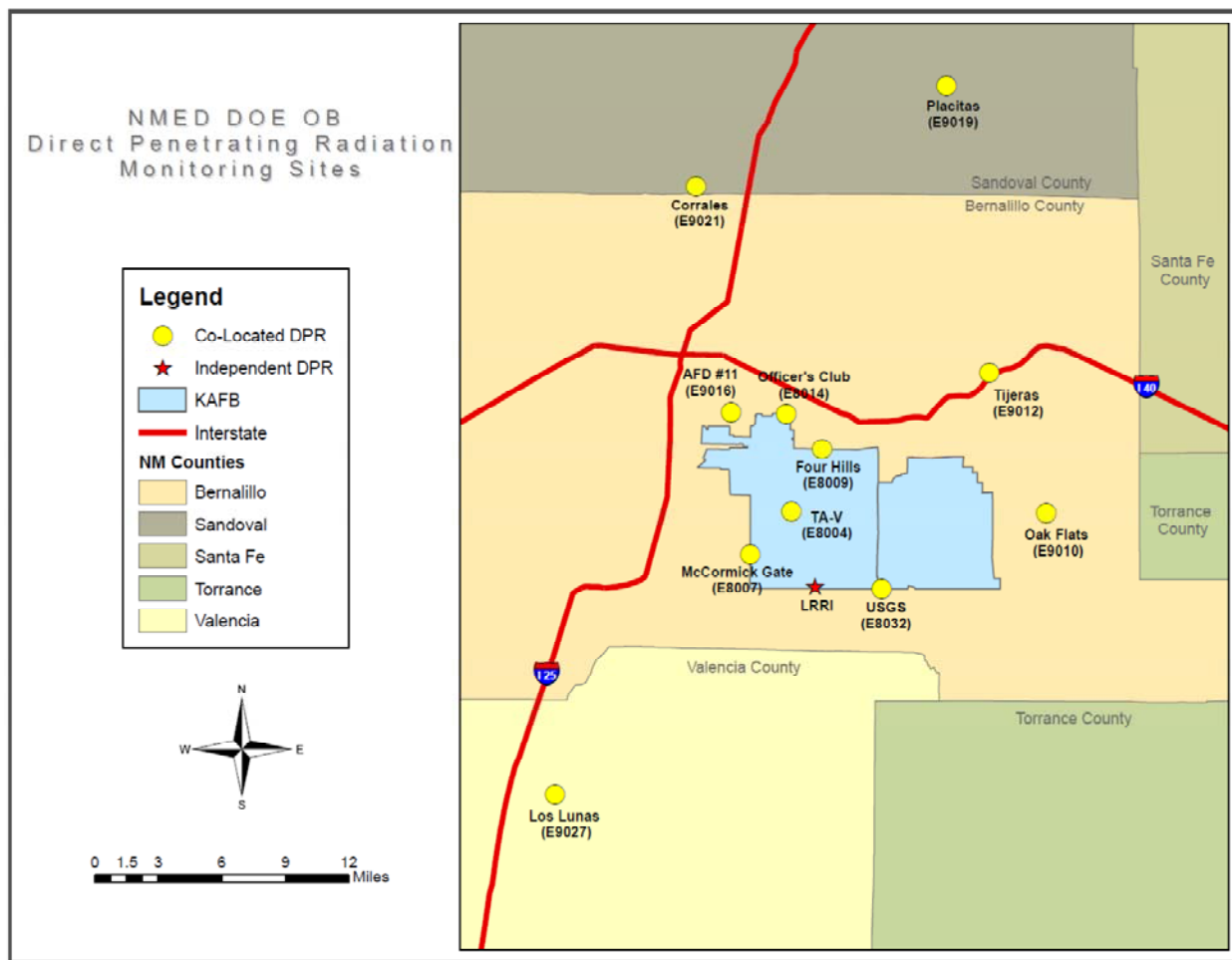
### **DIRECT PENETRATING RADIATION PROJECT (SDP43)**

Under this Activity ID, Bureau staff uses electret passive ion chambers to evaluate the ambient gamma radiation at SNL. The Electret passive ion chamber uses the principle of ion pair



production resulting from gamma photons interacting with air molecules to reduce the voltage of a charged Teflon™ disk. Using a predetermined formula, the voltage drop indicates the amount of radiation passing through the chamber.

**Quarterly Summary: During FFY11 Q-2,** Bureau staff conducted direct penetrating radiation measurements from all 12 electret stations located on-site and off-site. Results will be reported to DOE once data results have been received from SNL.



**Figure SDP43-1:** Map of Direct Penetrating Radiation sites on-site and off-site of Kirtland Air Force Base

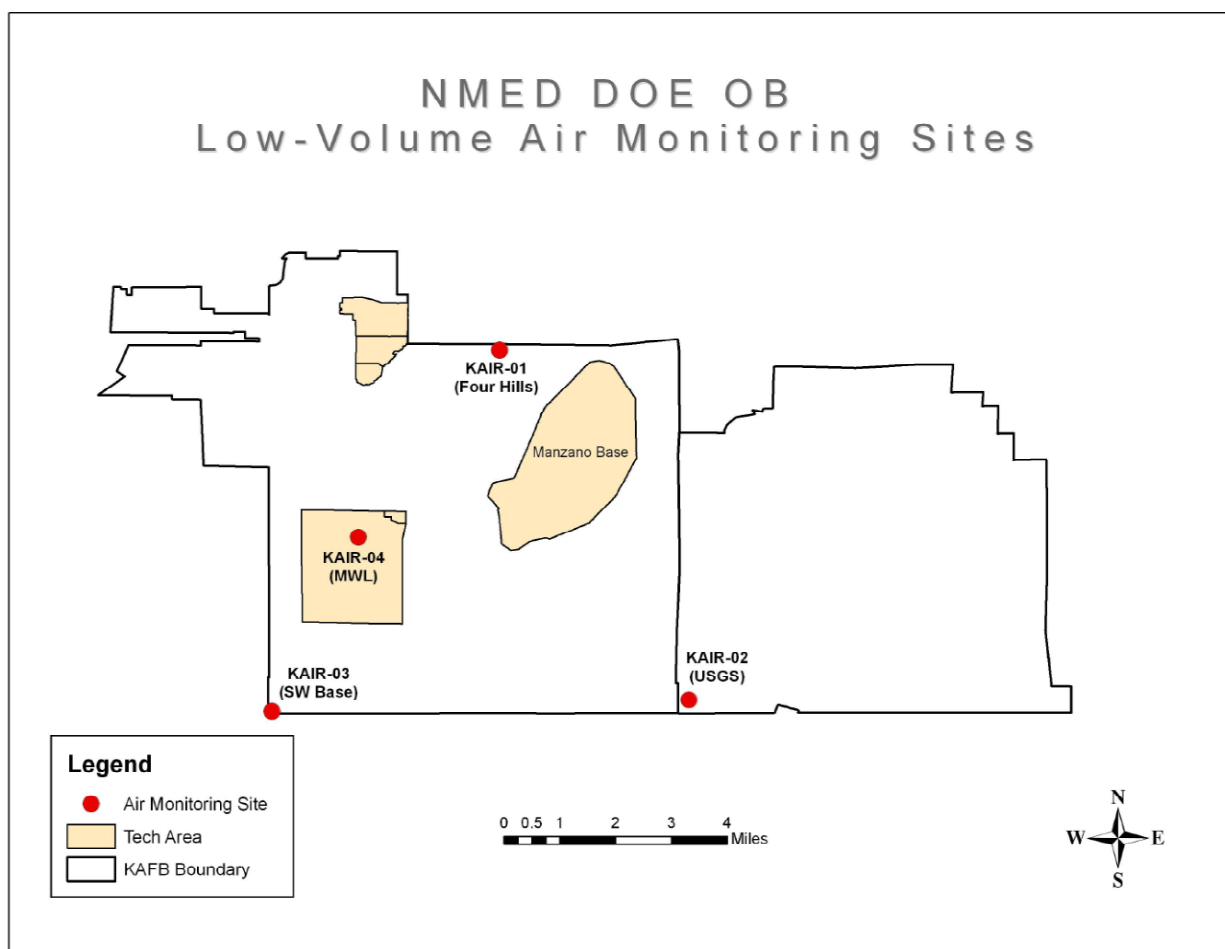
#### **PARTICULATES LOW-VOLUME AIR PROJECT (SPL44)**

Under this Activity ID, Bureau staff evaluates the ambient air concentrations of gross alpha/beta; isotopes of americium, plutonium, and uranium; gamma-emitting isotopes, and tritium at the SNL. The Bureau operates air monitoring stations to collect airborne particulate matter and water vapor at SNL using NMED sampling protocols and procedures. Air particulate matter consists of minute “dust” particles collected on a polypropylene particulate filter. Water vapor is collected by passing a known volume of air through a silica gel-filled cartridge, a hydrophilic compound that traps ambient air moisture.



**Quarterly Summary: During FFY11 Q-2,** Bureau staff continued to collect bi-weekly air particulate filters from 3 perimeter monitoring stations and 1 on-site station located at the Mixed Waste Landfill. Silica gel samples taken from the perimeter stations are collected bi-weekly and composited for the quarter. Silica gel samples taken from MWL are also collected bi-weekly, but are analyzed separately.

Bureau staff shipped CY 2010 Q-4 particulate filter samples to an independent contract laboratory to be analyzed for gross alpha/beta, gamma-emitting isotopes, and isotopes of americium, plutonium and uranium. Silica gel samples will be analyzed for the presence of tritium.



**Figure SPL44-1:** Map of AirNet sites on the perimeter of Kirtland Air Force Base and at the Mixed Waste Landfill

### **STORMWATER PROJECT (SSW45)**

Under this Activity ID, Bureau staff conducts stormwater monitoring at stations generally co-located with Sandia monitoring stations down gradient from Areas of Concern or Solid Waste Management Units.

**Quarterly Summary: During FFY11 Q-2,** Bureau staff reported no activity.

**TIJERAS ARROYO STUDY (STA47)**

Under this Activity ID, Bureau staff conducts stormwater monitoring by collecting samples from single-stage one-gallon containers located down gradient from Areas of Concern or Solid Waste Management Units along the Tijeras Arroyo.

**Quarterly Summary: During FFY11 Q-2,** Bureau staff collected grab samples from the Tijeras Arroyo-Sump located on the west side of Power Line Road, directly northwest of the KAFB Landfill. Samples were analyzed for total metals, cyanide, suspended sediment concentration, PCB congeners, VOCs, DROs, GROs, and pesticides. Data results are being compiled for submission to DOE for review and subsequent release to other federal and state agencies, the public and the NMED website.

**DEMOLITION AND DECOMMISSIONING PROJECT (SDD48)**

Under this Activity ID, Bureau staff conducts site evaluations and media monitoring during decommissioning and demolition operations.

**Quarterly Summary: During FFY11 Q-2,** Bureau staff released the final report of soil sampling at the Building 605 (the Steam Plant) demolition and decommissioning site. Samples were taken for analysis by an independent analytical laboratory for analysis of metals and VOCs concentrations. Analysis showed no anomalous concentration levels.

**BIOTA AND TERRESTRIAL PROJECT (STE49)**

Under this Activity ID, Bureau staff conducts annual sampling of soils and plants in a cooperative effort with Sandia on KAFB and the surrounding area.

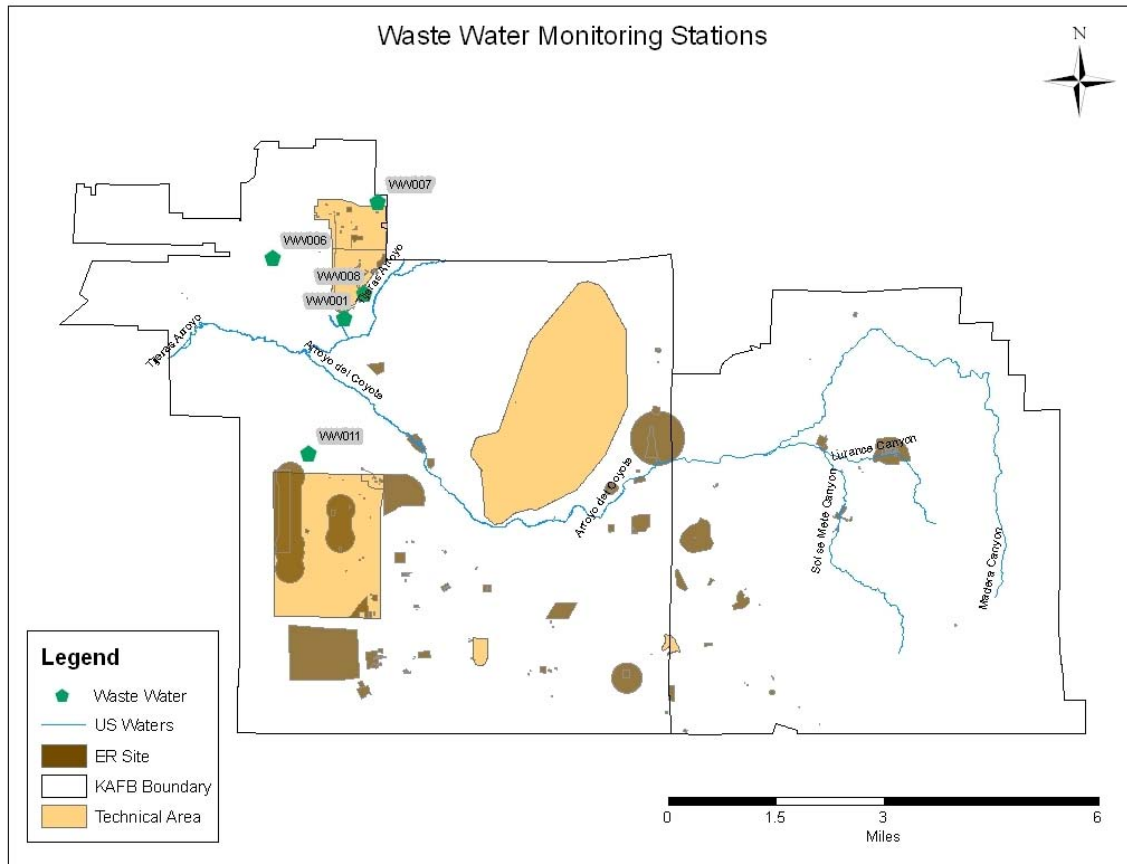
**Quarterly Summary: During FFY11 Q-2,** Bureau staff reported no activity.

**WASTEWATER PROJECT (SWW51)**

Under this Activity ID, Bureau staff conducts annual sampling of wastewater discharges from SNL operations in a cooperative effort with Sandia and the City of Albuquerque.

**Quarterly Summary: During FFY11 Q-2,** Bureau staff forwarded a draft data submittal to DOE for review titled, “Wastewater Monitoring at Sandia National Laboratories/New Mexico Conducted by NMED/DOE OB for October 2010.”

Bureau staff forwarded a draft data submittal to DOE for review titled, “Wastewater Monitoring at Sandia National Laboratories/New Mexico Conducted by NMED/DOE OB for October 2010.” Bureau staff collected split samples of wastewater with Sandia and ABCWUA staffs using standard SNL sampling procedures and equipment during October 2010. Samples were collected from wastewater monitoring stations WW001 (City of Albuquerque (CoA) permit number 2069A), WW006 (CoA permit number 2069F), WW008 (CoA permit number 2069I), and WW0011 (CoA permit number 2069K). Our samples were submitted to ALS Laboratory Group and Hall Environmental Analytical Laboratory for organics, total metals, inorganics, and radiological analyses. No analyte concentrations exceeded established criteria.



**Figure SWW51-1:** Map of Wastewater Monitoring Stations on Kirtland Air Force Base

### **SOIL AND SEDIMENT PROJECT (SSS53)**

Under this Activity ID, Bureau staff conducts annual soil sampling in a cooperative effort with Sandia to evaluate clean-up efforts by Sandia after open-air explosive experiments.

**Quarterly Summary:** During FFY11 Q-2, Bureau staff reported no activity.

### **TECHNICAL REVIEW (STR54)**

Under this Activity ID, Bureau staff provides technical support to DOE and Sandia, other bureaus in NMED, state and federal entities, and public interest and oversight groups.

**Quarterly Summary:** During FFY11 Q-2, Bureau staff compiled and edited the FFY 2011 Q-2 report and portions of the 2010 Annual Report.

### **NPDES MONITORING (SNP55)**

Under this Activity ID, Bureau staff conducts site evaluations in consultation with Sandia to determine compliance with facility-generated Stormwater Pollution Prevention Plans, and to monitor activities after reportable spills on SNL.

**Quarterly Summary:** During FFY11 Q-2, Bureau staff reported no activity.

## WASTE ISOLATION PILOT PLANT OVERSIGHT

### GENERAL ADMINISTRATION (WAD70)

Under this Activity ID, the Bureau manages, administers, and finances the overall activities of staff members in the Carlsbad office. Staff provides assistance to the Bureau and DOE developing workplans, budgets and training requirements.

**Quarterly Summary: During FFY11 Q-2,** Bureau staff participated in administrative, safety and radiation training and observed facility activities related to annual shut-down maintenance.

Working with the Permittees allows Oversight Bureau staff to take advantage of opportunities offered through the Washington TRU Solutions (WTS) Training Department. This quarter, staff scientist Thomas Kesterson completed “Safety -504, CPR Basic Life Support.” This course is in accordance with the standards set by the American Heart Association and covers basic life support for adults, children, and infants. Refresher training is offered yearly. He also completed General Employee Training (GET) yearly refresher. This class provides an introduction to essential knowledge to safely perform one’s job and is in compliance with all applicable regulations, orders, and policies at the Waste Isolation Pilot Plant (WIPP). Successful completion of this course is required for unescorted access to the WIPP site.

Staff scientist Julia Marple successfully completed the Radiological Worker II retraining required annually by WIPP. This class provides instruction for the radiological worker whose job requirements involve unescorted entry into a Controlled Area, Radiological Buffer Area, Radioactive Materials Area, Radiation Areas, and Contamination Areas.

As this quarter began, the WIPP was nearing completion of its yearly maintenance shut-down that began on December 1, 2010. The outage was scheduled to complete planned maintenance projects and facility upgrades to ensure long-term safety and reliability of the physical plant.

Essential projects completed during this outage include:

- Mining from S-400 to S-700. Approximately 300 feet of roof (“back”) were removed and two bulkhead doors were modified to increase clearance for remote-handled waste operations. Ground controls (back beams and chain-link mesh) were also installed to support the roof.
- Two waste hoist tails (the end weights on each of the waste hoist cables) were replaced due to normal wear and tear.
- Ventilation overcast was installed at the intersection of S-2180 and W-30. Ventilation overcasts are used to direct airflow ventilation in the mine.
- In E-300, mining crews removed at least four feet from the floor along 3,000 feet of drift. This operation will increase the ventilation throughout this area.
- The installation of hardware and software was completed in the hot cell complex as part of the transfer cell and hot cell upgrade.
- Facility modifications were made to the Waste Handling Building (WHB) to accommodate the TRUPACT-III shipping package. It is expected that several facility modifications will be necessary to safely handle the package and waste payloads.

The outage allowed facility upgrades without interfering with waste handling and disposal activities.

The South Access Road reconstruction was recently completed and the road was opened for travel. This 3.75 mile road connecting New Mexico Highway 128 to the North Access Road is used daily by WIPP employees and oilfield trucks. Prior to its reconstruction, the South Access Road had seriously deteriorated from the substantial traffic volume. As stated in a DOE press release, the reconstruction was funded through the America Recovery and Reinvestment Act (ARRA). Following the company recycling policy, WTS provided the contractor with 340,000 gallons of water from the WIPP evaporation ponds and approximately 4,800 yards of caliche from a WIPP salt storage evaporation pond to help build the roadbed.

The South Access Road is the final leg of the south transportation route over which pass shipments of transuranic (TRU) waste to WIPP from the Savannah River Site in South Carolina and Oak Ridge National Laboratory in Oak Ridge, Tennessee. This southern route enters New Mexico from Texas on US highway 285 passing through Loving, New Mexico. The route turns north on New Mexico Highway 31 and onto New Mexico 128-East toward Jal. The route then turns north onto the South Access Road, terminating at the WIPP site.

This quarter, Bureau staff accompanied a HWB representative on an inspection of the Waste Handling Building (WHB), Room 108 that is being refitted to accommodate the new TRUPACT III shipping container. This inspection is in response to a request for modification to the Hazardous Waste Facility Permit (HWFP).

In a letter dated September 16, 2010, the Permittees notified NMED of planned changes to the facility in accordance with the WIPP HWFP Condition I.E.11. These proposed changes support the TRUPACT-III project, and include:

- Installation of a new pallet-stand in the contact-handled (CH) waste bay.
- Removal of a concrete pad, and installation of a hood ventilation system; bolting the robot, bolt and cover/lid rack, the pallet dispenser and payload transfer stations; and installing a VOC monitoring system and electrical system in Room 108.
- Installation of an engineered insert to level the floor in the Conveyance Loading Room.

On January 10, 2011, the Permittees notified NMED of planned changes to the permitted facility in accordance with the WIPP HWFP, Part 1. These planned modifications were in addition to those listed above and included twenty-one wall penetrations necessary for conduit that will be used to connect the various components of the electrical, communications, and monitoring systems associated with the TRUPACT-III handling project.

On January 18, 2011, NMED received certification by a New Mexico Registered Professional Engineer (PE) in support of the TURPACT-III project stating that the four referenced projects were constructed in a manner that will allow waste handling operations to occur in the affected areas in compliance with WIPP's HWFP. On January 18, HWB inspected the following projects identified in the PE Certification:



- Leveling of the Conveyance Loading Room floor
- Pallet Stand 41-T-W4 installation in Room 103 (the CH Bay, Building 411)
- Damper installation between Room 103 and Room 108
- Installation of conduit wall penetrations in Building 411

At that time, NMED identified discrepancies between the number and size of installed penetrations and those previously listed in the table provided in the January 10, 2011 notification. These discrepancies were addressed in a subsequent letter dated January 19, 2011, including a revised “Table Listing of TRUPACT-III required penetrations”.

In a letter to the Permittees, dated January 21, 2011 NMED stated that it found the four referenced projects identified in the PE certification were constructed in compliance with the requirements of the Permit and that the Permittees may resume TRU mixed waste storage activities in the portions of the WHB that were affected by these modifications.

It should be noted that planned changes to Room 108, as stated in a letter to NMED dated September 16, 2010, have not been completed and that neither the PE certification nor this inspection evaluated compliance of those changes. The Permittees may not manage TRU mixed waste in Room 108 until final agency action on the pending Class 2 permit modification request is taken by NMED and the Permittees submit a PE certification for these changes. It is then incumbent upon NMED to either inspect the modified portion of the facility or waive the inspection; or, notify the Permittees of NMED’s intent to inspect within fifteen days of receipt of the PE certification.

### **PUBLIC OUTREACH (WPO71)**

Under this Activity ID, Bureau staff interacts with the public through meetings, listening sessions, website development, consultations, and reports.

**Quarterly Summary: During FFY11 Q-2,** Bureau staff attended the public meeting of the Blue Ribbon Commission and the WIPP Quarterly Meeting 113.

On January 31, 2011 Bureau staff attended the open meeting of the Blue Ribbon Commission (BRC) on America’s Nuclear Future held in Carlsbad. The BRC was established in accordance with the provisions of the Federal Advisory Committee Act (FACA) as amended, 5 U.S.C. App. 2, and as directed by Presidential Memorandum for the Secretary of Energy dated January 29, 2010.

The purpose of the BRC is to provide recommendations for developing a safe, long-term solution to managing the national used nuclear fuel and nuclear waste. The commission is co-chaired by former Congressman Lee Hamilton and former National Security Advisor Brent Scowcroft. Another prominent member of the commission is former U.S. Senator Pete Domenici, of New Mexico.

Staff also attended the public information meeting for the permit modification relating to TRUPACT-III held in Carlsbad on February 8.

## **EXHAUST AIR MONITORING PROJECT (WEA72)**

Under this Activity ID, Bureau staff monitors the air exiting the underground of the WIPP site. Staff collects air filters daily and attends weekly or bi-weekly preventative maintenance probe pulls.

**Quarterly Summary:** During FFY11 Q-2, Bureau staff continued to collect NESHAP-compliance air filter samples at WIPP stations A and B.

### Exhaust Air Monitoring

Air filters are collected from the Station A skid of reference (primary) and the back-up skid each morning (see Figures WEA72-1&2 below) with each responsible party (NMED, WTS and CEMRC) completing the individual chain of custody documents. Primary filters are compiled by month and shipped to the contract laboratory. The back-up filters are archived for future analysis, if required. Filters from Station B are collected on Wednesday mornings. Station A air flow data is forwarded monthly to the staff of the Oversight Bureau from Carlsbad Technical Advisor Contractor (CTAC). This data is compared to the chains of custody for any discrepancies. No issues were noted this quarter with the Station A air flow data.



**Figure WEA72-1:** Exterior view of the exhaust air chamber and the Station A monitoring location at the elbow. Three probes penetrate the exhaust chamber from the monitoring station above to measure salt accumulation and to direct representative air flows to filters



**Figure WEA72-2:** Interior view of one of three skids in the Station A exhaust air monitoring station. The pipe with the flange penetrating the floor carries air up through three lines to separate monitoring units housing filters above the table

Bureau staff shipped clean filters to a new contract laboratory to verify its analytical capabilities. This testing allows the laboratory to determine whether or not the acrylic copolymer filters used in the exhaust air project can be properly digested for analytical purposes.

Filters collected at Station A for July through December 2010 were shipped to a previously accepted contract laboratory to be analyzed for americium<sup>241</sup>, cesium<sup>137</sup>, plutonium<sup>238/ 239/240</sup>, uranium<sup>234/ 235/ 238</sup>. Results are pending.

Staff submitted a proposal to the NMED Information Technology Bureau to allow the installation of CAP88-PC, an EPA-developed software program, onto the computers at the WOS offices in Carlsbad. Under 40 CFR 61.93, WIPP currently uses CAP88-PC to demonstrate compliance with the standard established in 40 CFR 61.92 "...that emissions of radionuclides to the ambient air from Department of Energy facilities shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/yr." The proposal and justification were acceptable and CAP88-PC was installed on the office computers. This provides the Bureau to verify WOS compliance.

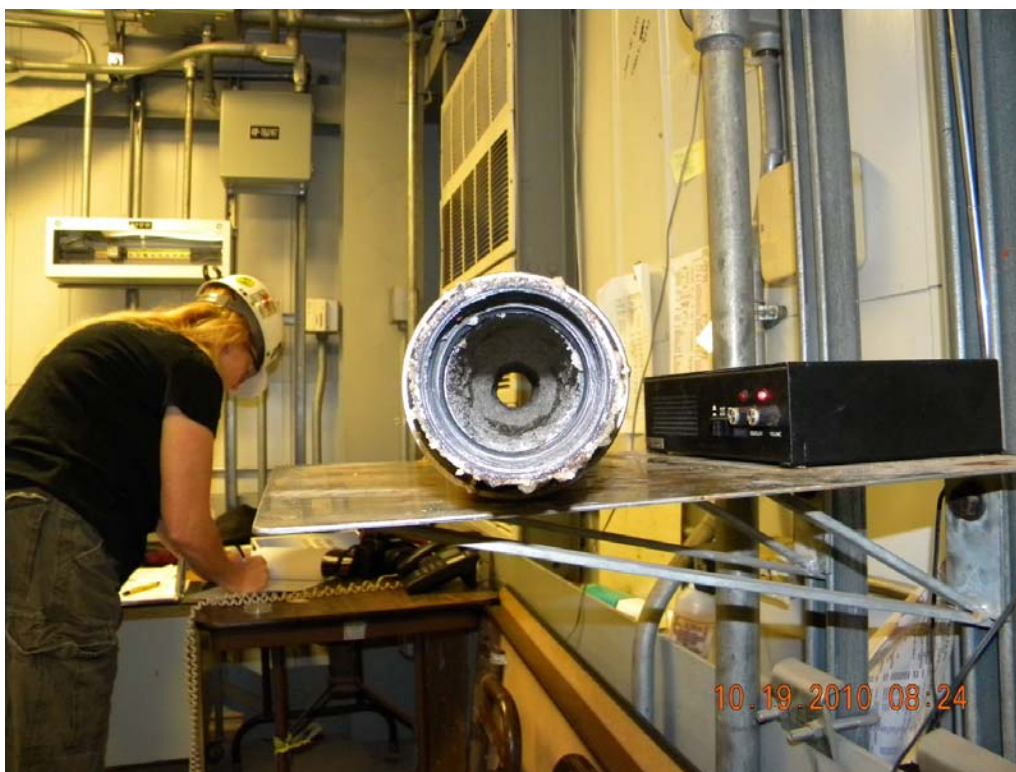


### Preventative Maintenance Probe Pulls

Staff members regularly attend preventative maintenance probe-pulls at Station A for the cleaning of the shrouds and nozzles (the probe). Also present are personnel from WTS, including the surface air monitor and cognizant engineer, the technician from CEMRC, US DOE, and CTAC. Regular removal and cleaning of the nozzles and shrouds minimizes the accumulation of salt and insures the collection of a representative sample of particulates on the filter. As the shrouds are removed, staff members photograph the probes and these photos are forwarded to the EPA in Dallas, Texas (see Figures WEA72-3&4 below).



**Figure WEA72-3:** WTS staff removing a probe from the exhaust air shaft



**Figure WEA72-4:** WTS technician documenting the condition of the exhaust air probe

After removal of the probes, the amount of salt occlusion is measured by WTS personnel and included in reports forwarded to the Bureau and to the EPA. An occlusion of 66.7% or more on the nozzle indicates that a representative air sample cannot be obtained from the effluent air stream and the nozzle fails. Thenozzles from all three skids passed at each preventative maintenance probe pull this quarter, while the shroud for A-1 failed at the January 4<sup>th</sup> and February 7<sup>th</sup> probe pulls.

At the beginning of this quarter, WTS engineering recommended scheduling preventative maintenance probe pulls every other week. Historical trends document that salt accumulation on Skids A-2 and A-3 are consistent throughout the year, while the probe on Skid A-1 tends to have higher occlusion rates when the weather is colder. It should be noted that Skid A-1 is seldom used and is usually shut down. The EPA agreed with this recommendation. As mining activities concluded at the end of the annual maintenance shut down and activities returned to normal, the preventative maintenance probe pull schedule switched to every other week with the understanding that there will be a return to weekly probe pulls if Skid A-1 is returned to service or if conditions warrant more frequent maintenance.

### **DIRECT PENETRATING RADIATION PROJECT (WDP73)**

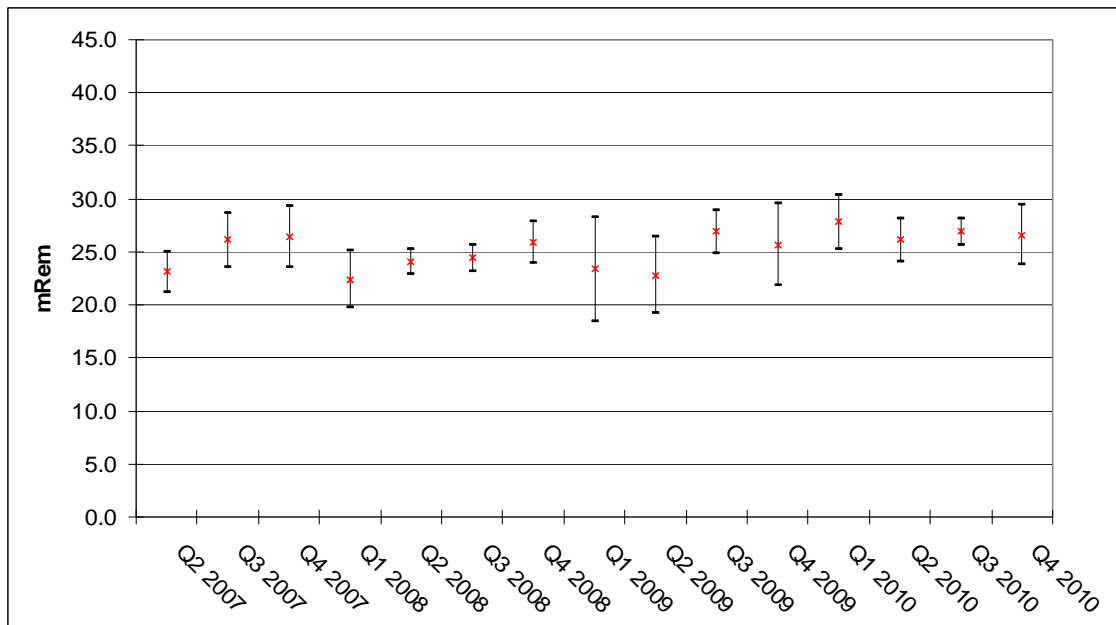
Under this Activity ID, Bureau staff uses electret passive ion chambers to evaluate the ambient gamma radiation at WIPP. The Electret passive ion chamber uses the principle of ion pair production resulting from gamma photons interacting with air molecules to reduce the voltage of a charged Teflon™ disk. Using a predetermined formula, the voltage drop indicates the amount of radiation passing through the chamber.



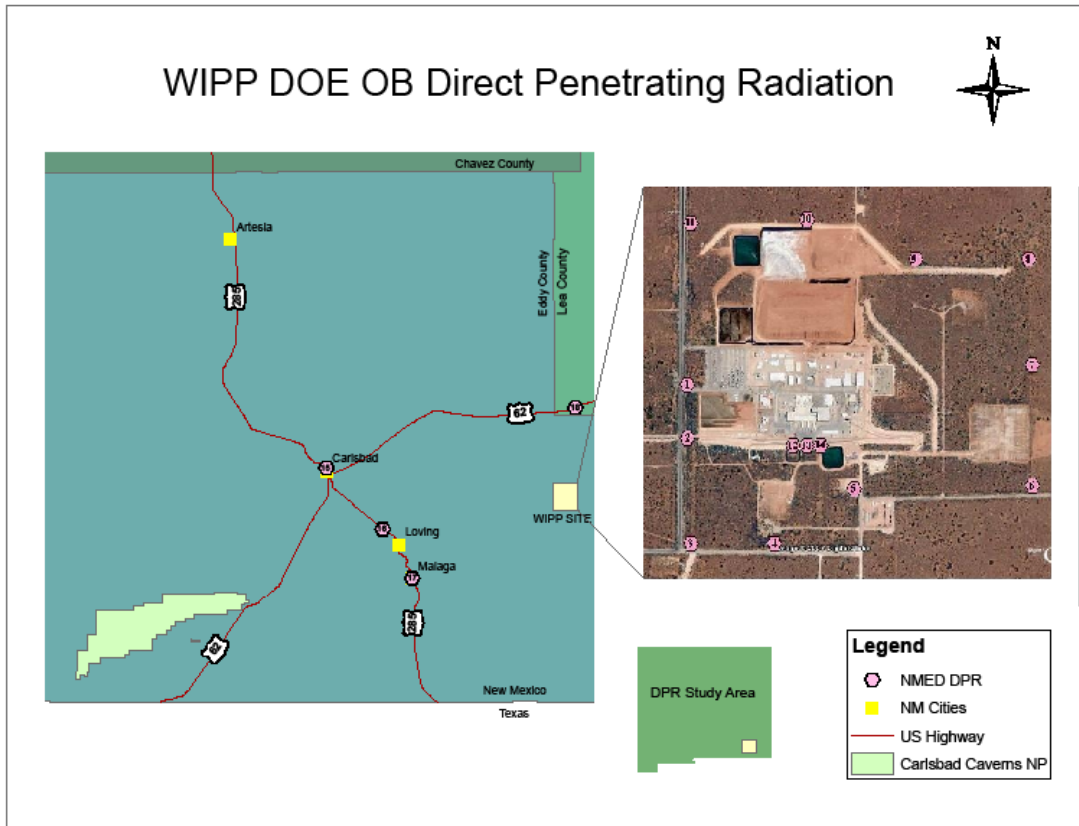
Quarterly Summary: During FFY11 Q- 2, Bureau staff collected quarterly readings of electrets around the WIPP area at the beginning of the quarter, performed data entry and maintenance of the DPR database, ordered replacement electrets from the supplier and submitted a draft report to the DOE titled “Direct Penetrating Radiation Monitoring at the Waste Isolation Pilot Plant Conducted by NMED /DOE OB for the CY 2010 Q-4.”

In January, staff submitted a draft report to the DOE entitled “Direct Penetrating Radiation Monitoring at the Waste Isolation Pilot Plant Conducted by NMED /DOE OB for the CY 2010 Q-4.”

DPR results ranged from a minimum average quarterly dose of 22.3 mrem at WIPP 6 (the southeast corner of the Exclusive Use Area) to a maximum average quarterly dose of 32.7 mrem at WIPP 16 (the weigh station on US 285 between Carlsbad and Loving).



**Figure WDP73- 1:** Average DPR results in the WIPP Exclusive Use Area by quarter



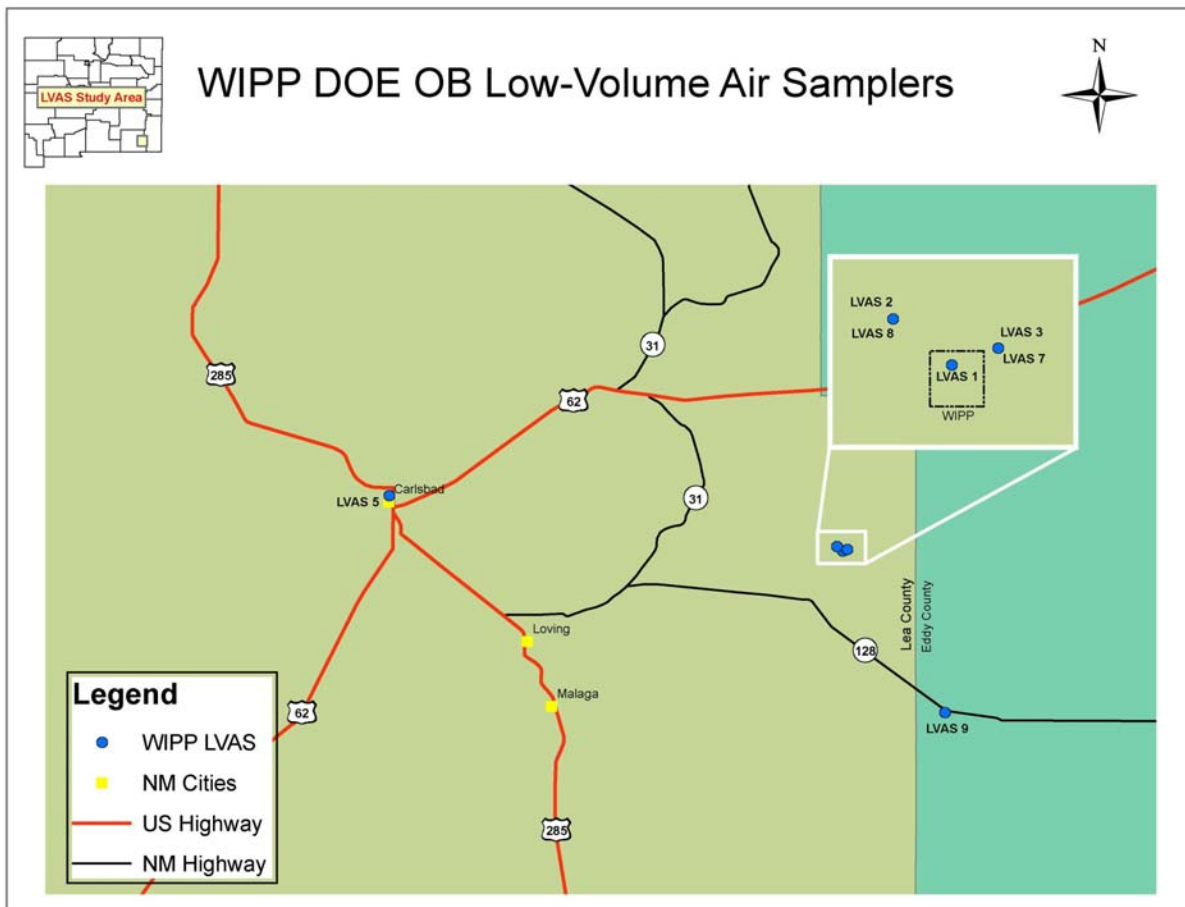
**Figure WPD73-2:** Map of DPR monitoring sites surrounding the WIPP and remote areas

### **PARTICULATES LOW-VOLUME AIR PROJECT (WPL74)**

Under this Activity ID, Bureau staff evaluates the presence of selected radionuclides as particulates in the ambient air near WIPP. Ambient air is sampled with continuously running, low-volume air samplers drawing air through glass fiber filters. The filters are analyzed for the presence of americium<sup>241</sup>, cesium<sup>137</sup>, plutonium<sup>238/239/240</sup>, and strontium<sup>90</sup>. Future analyses will include gross alpha/beta.

**Quarterly Summary:** During FFY11 Q-2, Bureau staff collected bi-weekly filter samples, performed data analysis on CY 2010 Q-3 analytical results and maintained five low-volume air monitoring stations.

The Bureau had 5 low-volume air samplers in operation during FFY 2011 Q-2. Four air samplers were located at the WIPP site, with an additional co-located sampler employed in a filter media study (see figures WPL74-1&2 below). The Bureau completed preparation of the southeast (SE) control site which will be used as a sampling location to represent the background levels in the environment associated with the WIPP. Sampling began at the SE control site however the filters will not be composited for analysis until the start of the new quarter.



**Figure WPL74-1:** Map of low-volume air monitoring stations around WIPP



**Figure WPL74-2:** The new SE control low-volume air monitoring station is co-located with a CEMRC unit south of WIPP

Bureau staff received CY 2010 Q-3 analytical results from an independent contract laboratory most frequently used for this purpose. All values for radionuclides were reported below the requested minimum detectable concentrations. Several results were above the margin of error and the sample-specific, minimum detectable concentration, including concentrations in some filter blanks and laboratory blanks. The results do not indicate a release of radionuclides from WIPP operations. An intensive review of the data resulted in the decision not to report the Q-3 data or send more samples to the laboratory in question until a comparison analysis can be done by another contract lab. Staff prepared test samples for shipment and discussed analytical details with the alternate contract laboratory staff.

Bureau staff from Los Alamos office met with Carlsbad staff in February to discuss error analysis of laboratory results and to troubleshoot electronic data deliverable (EDD) reporting issues. A short-term reassignment of a LAOS staff member to the Carlsbad office was proposed and approved with additional training opportunities involving all three Bureau sections.

## **GENERAL ER/EM PROJECTS (WGE75)**

Under this Activity ID, Bureau staff conducts multi-media environmental sampling on a periodic basis, and provides technical review services to the DOE, WIPP and public interest groups.

**Quarterly Summary: During FFY11 Q-2,** Bureau staff reported CY 2010 vegetation sampling and accompanied WTS staff on sediment surveillance.

Staff submitted its final report on CY 2010 vegetation sampling titled “Vegetation Sampling near the Waste Isolation Pilot Plant Conducted by NMED/DOE OB for CY 2010”.

Staff attended Surveillance S-11-09 of the WTS Quality Assurance Program with Respect to DP-831 Pond Activities. The surveillance evaluated and verified the implementation and effectiveness of WTS engineering processes of the liner coverings of the new Salt Storage Evaporation Pond. Engineering evaluations and data records were also evaluated.

The overall program adequacy of WTS documents were assessed on DOE/CBFO-94-1012, Revision 11, *Quality Assurance Program Document*, using the Discharge Plan/Permit, DP-831, as a reference. The WP 02-EC.06, *WIPP Site Effluent and Hazardous Materials Sampling Plan*, was also used for this surveillance. The surveillance identified no concerns at this time with this program.

Staff worked closely this quarter with the Permittees in developing plans to sample VOCs in the underground. Staff is drafting a Sampling and Analysis Plan (SAP), Job Hazard Analysis (JHA), and sampling procedures. Once these documents are completed, Bureau staff will begin sampling VOCs on monthly basis, providing verification of the results obtained by the Permittees.