



New Mexico Environment Department
DOE Oversight Bureau

Federal Fiscal Year 2010
Fourth Quarter Report
July 1, 2010 to September 30, 2010



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

Cover Photograph

Bureau environmental scientist Kim Granzow collects GPS data for one of the eighteen sample locations along South Fork Acid Canyon as part of an EPA Project. The small yellow flag to Kim's left marks a sediment sample location. Another flag is visible upstream to Kim's right.

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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

LANNS	LANNS, LLC is the Los Alamos National Security, Limited Liability Corporation, the operator of the LANL facility
LANSCC	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
SAP	Sampling Analysis Plan
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 (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

An Invitation to Bid (ITB) for analytical laboratory services initiated by the Department requested minimum detection limits (MDL) that differed from those listed in the existing price agreement recently issued by the Oversight Bureau. The new price agreement has the potential to enhance Bureau flexibility by adding additional laboratory capability and alternate pricing for certain analytes.

The LANL oversight section manager met with DOE LASO Point-of-Contact to review and revise the LANL Site Specific Protocol (SSP). The SSP was last revised in 2005, just before the operational management of the laboratory was relinquished by the University Of California (UC) and assumed by Los Alamos National Security, LLC (LANS, LLC).

Bureau staff in the Sandia Oversight Section coordinated with DOE preparing inputs for a Letter of Agreement (LOA) between the DOE and the USAF at Kirtland AFB. The initial intent of the document was clarifying protocol for communication; however, the document's scope was expanded by the Air Force to include aspects more akin to property permit requirements. Elements of the agreement include environmental sampling restrictions that could affect the mission of the Bureau.

PERSONNEL

Environmental Scientist Ryan Channell left the Sandia Oversight Section to pursue an opportunity in the private sector. Under the requirements of the Executive's hiring freeze, all proposed hiring actions required advance approval on a case-by-case basis. The appropriate justification was prepared and an exception granted to allow filling the position. The job posting advertised and several candidates provided advance copies of their resume. Subsequent to interviewing candidates, all pending hiring actions were terminated by the Executive. The position will be re-advertised as soon as the hiring freeze is lifted or exceptions are once again permitted.

An environmental scientist position will be transferred from Carlsbad to Los Alamos. The position will require at least half time dedication to technical writing and report editing.

Barry Birch was appointed the new Staff Manager for the WIPP Oversight Section (WOS). He will also maintain his function as Staff Manager for the Sandia Oversight Section (SOS).

FINANCE

Administrative staff updated and revised budget spreadsheets to accommodate the new 2011 State and Federal Fiscal Years.

Approximately 67% (\$1,769,165) of the projected 2010 work plan amount has been obligated or spent by the end of the fourth quarter. Within the three major budget groups, approximately 81% of budgeted labor expenses was recorded; approximately 57% of budgeted contract expenses was recorded; and approximately 36% of equipment expenses was recorded. Contract spending was interrupted by the analytical laboratory award process and many invoices for analytical services

were not received by the close of the quarter. Fourth quarter expenditures for contracts were expected to increase following the increased sampling activity during the summer months and the submittal of archived samples collected during the contract transition period. Equipment purchases were lower than expected because large ticket items such as additional solar power air sampling units were not ordered and other replacement equipment has not been necessary. The manufacturer of the solar powered air samplers experienced a catastrophic fire at their facility in California.

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

TRAINING

Appropriate Bureau staff completed the LANL Annual Information Security Refresher Course (#47075) that reviews cyber security responsibilities and requirements, and highlights changes within the last year. Staff also completed the RadWorker II refresher, the annual 8-hour HAZWOPER refresher, and the LANL Semantic Security Test.

Administrative staff in the Sandia section are participating in continuing education. Ms. Mia Ortiz is pursuing a degree program and attending classes in business law, accounting, and management and Ms. Jennifer Brokaw is taking a course in mediation.

Administrative staff in the WIPP section is also participating in continuing education. Ms. Krissie Adams is taking classes in business and psychology.

OUTREACH

Bureau staff attended a public hearing in mid-August in Carlsbad to receive public input on the WIPP Hazardous Waste Permit renewal. Approximately 30 people spoke, including representatives from the cities of Carlsbad and Hobbs.

Bureau staff attended the public scoping meeting for the Surplus Plutonium Disposition (SPD) Supplemental Environmental Impact Statement (EIS) held in Carlsbad. The WIPP site is under consideration for disposal of some of the plutonium in question. The SPD waste is considered by some to be similar to waste already emplaced at the WIPP.

Bureau staff participated in the 111th WIPP quarterly meeting in Santa Fe on July 28 by providing an update on Bureau activities during the last quarter.

Bureau staff participated in various public meetings including the Pajarito Plateau Watershed Partnership (PPWP) and the Community Radiation Monitoring Group (CRMG), assisted in a hands-on educational event on watershed principles, and submitted two abstracts for the annual Geological Society of America meeting.

LOVELACE RESPIRATORY RESEARCH INSTITUTE (LRRI) GROUNDWATER

Bureau staff continues to conduct groundwater sampling at the Lovelace Respiratory Research Institute (LRRI). This research facility, located at the southern border of KAFB, is not affiliated with SNL and is currently operated by the Lovelace Medical Group. Until recently, the facility was managed under the auspices of the DOE, and the transfer of ownership is being negotiated. Under these circumstances, the Bureau continues split samples with LRRI personnel. The most recent Groundwater Discharge Permit was signed with the NMED in 2008, and the only constituent of concern is Total Dissolved Solids. Under the current discharge permit, LRRI is only required to sample total dissolved solids at monitoring wells ITRIMW4, -MW17, and -MW19.

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 LANL and Santa Fe offices. Staff assists the Bureau and DOE developing workplans, budgets and training requirements.

Quarterly Summary: During FFY10 Q-4, Bureau staff participated in trainings, procured field equipment to support the air and water programs, and revised the LANL Site Specific Protocol.

The Bureau took receipt and inventoried supplies and equipment purchased during the last weeks of State FY 2010. Items included a new (leased) XEROX multi-function document center, ISCO automated water samplers and components, AIRNET pumps and solar panels, and water filters and tubing used to support the air and water programs.

The LANL oversight section manager met with DOE LASO Point-of-Contact to review and revise the LANL Site Specific Protocol (SSP). The SSP was last revised in 2005, just before the operational management of the laboratory was relinquished by the University Of California (UC) and assumed by Los Alamos National Security, LLC (LANS, LLC). Revisions edited out the old UC references and management structure and addressed necessary modifications to reflect day-to-day interactions with the new operators. The revised draft SSP was forwarded to management of both agencies at the end of FFY 2010 Q-4 and is anticipated to be ready for final review during FFY11 Q-2.

Staff members completed the LANL Annual Information Security Refresher Course (#47075) that reviews cyber security responsibilities and requirements, and highlights changes within the last year. Staff also completed the RadWorker II refresher, the annual 8-hour HAZWOPER refresher, and the LANL Semantic Security Test.

Administrative staff updated and revised budget spreadsheets to accommodate the new 2011 State and Federal Fiscal Years.

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 FFY10 Q-4, Bureau staff participated in various public meetings including the Pajarito Plateau Watershed Partnership (PPWP) and the Community Radiation Monitoring Group (CRMG), assisted in a hands-on educational event on watershed principles, and submitted two abstracts for the annual Geological Society of America meeting.

Bureau staff hosted the July CRMG meeting at Northern New Mexico College in Espanola. The discussion topic was the recent NMED Invitation to Bid process to secure laboratory services to analyze environmental samples. Staff addressed questions from the public following a brief overview of the process.

Ralph Ford-Schmid, Dave Englert, and Courtney Perkins participated in the 2010 Valles Caldera Summer Environmental Science program for middle and high school teachers of Native American students from northern New Mexico. Teachers from the Jemez Day School, Tesuque Day School, Santa Fe Indian School, Santo Domingo School, Mescalero Apache School, Naaba Ani Elementary/Middle School (NM), Native American Community Academy, Sinte Gleska University (South Dakota) and Ramah High School participated. This was a two full day event, where teachers spend one day at Valles Caldera participating in hands-on environmental science activities involving data collection and field studies and another day at the Valles Caldera Science and Education Center, located in Jemez Springs, analyzing the data.

Bureau personnel assisted in teaching watershed principles using the Rolling Rivers Watershed demonstration trailer. Bureau staff also provided instruction in stream ecology and field techniques of macroinvertebrate community assessment. The following day Bureau staff assisted the Community Foundation in a presentation of the RACER database and its usefulness as a classroom resource. Staff also set up a “virtual stream” (flowing stream aquarium) in the laboratory to demonstrate basic stream habitat principles and macroinvertebrate response to sedimentation. Aquatic insects collected the previous day were then displayed under dissecting scopes along with aquatic insect identification keys, posters, and other literature.

Bureau and Los Alamos County staff attended the monthly PPWP meetings. The monthly meetings are held every second Tuesday at the Oversight Bureau office in Los Alamos. Discussions included storm water concerns of the current construction and demolition projects occurring downtown near Los Alamos High School (directly in front of the NMED office) and near DP mesa where Cold War era structures are being razed to make way for a mixed use industrial/residential complex.

The August CRMG meeting was cancelled and business was deferred until the next scheduled meeting on September 15, 2010.



Figure LPO02-1: Los Alamos County road and infrastructure improvements are in-progress during August 2010 in front of the NMED Los Alamos office on Diamond Drive (view is looking south toward the Los Alamos Medical Center).

The Geological Society of America (GSA) accepted two LANL-related abstracts from Courtney Perkins (DOE OB) and Michael Dale (HWB) for the fall GSA conference in Denver, Colorado in October 2010. The two presentations highlight independent studies conducted by NMED staff over the past year:

LEACHABILITY OF NATURAL PERCHLORATE FROM SOIL WITHIN THE SIERRA DE LOS VALLES, NEW MEXICO by DALE, Michael¹, LONGMIRE, Patrick², PERKINS, Courtney³, GRANZOW, Kim³, MARTINEZ, Dan'l³, ENGLERT, David³, and REARICK, Michael², (1) New Mexico Environment Department, Hazardous Waste Bureau, (2) Earth and Environmental Sciences Division, Los Alamos National Laboratory, (3) New Mexico Environment Department, Department of Energy Oversight Bureau.

Abstract

Melt-water from the 2009-2010 snowpack season was allowed to percolate through soil-core columns collected in a high mountainous, small catchment basin located in the Sierra de Los Valles, New Mexico. Leaching tests were performed to determine if naturally occurring perchlorate in soil could be solubilized by the melt-water at detectable concentrations greater than the analytical detection limit of 0.50 nM¹ (0.05 g/L) using liquid chromatography-mass spectrometry/mass spectrometry. Soil cores and snowpack-melt-water samples were collected at an elevation of 2,835 meters above sea level (m asl). Soil cores were collected in December 2009 and snowpack samples were collected in March 2010. The first set of cores was collected along the southwest-facing slope of the basin with the second set collected down-slope of the first set and near the drainage area. Cores collected along the slope represent approximately 57 cm of soil with 3 to 5 cm of weathered volcanics. The drainage cores represent approximately 61 cm of organic-rich soil. Samples were collected at a location that is considered an area of active groundwater recharge to bedrock. Historical snowpack data for the study area suggest that approximately 55 mL of melt-water passing through the core column reflects an average infiltration without evapotranspiration. Volumes of leachate obtained from the drainage and slope cores were 78 and 55 mL, respectively, and analyzed for low-level perchlorate. Analyses of major ions and trace elements were also performed on the acidic leachate samples. Natural perchlorate was detected in the drainage and slope leachate samples at 2.72 and 23.13 nM (0.27 and 2.3 g/L), respectively. These results suggest that natural perchlorate becomes mobile as snowmelt reacts with soil within the recharge area of the mountain block and that the ubiquitous presence of natural perchlorate in the local groundwater system may be a result of this process. Other soluble oxyanions (nitrate, oxalate, phosphate, and sulfate) and trace elements (aluminum, barium, boron, iron,

¹The unit nanomolar (nM) is seldom encountered outside the “chemistry community.” The SI units for [molar concentration](#) are mol/m³. However, most chemical literature traditionally uses mol/dm³, or mol dm⁻³, which is the same as mol/L. These traditional units are often denoted by a capital letter M (pronounced "molar"), sometimes preceded by an [SI prefix](#), for example millimoles per litre (mmol/L) or millimolar (mM), micromoles/litre (μmol/L) or micromolar (μM), or nanomoles/L (nmol/L) or nanomolar (nM).

manganese, nickel, and zinc) associated with mineral dissolution were also detected at varying concentrations in the leachate samples.

REDUCTION OF RADIONUCLIDE TRANSPORT IN STORMWATER IN DP CANYON, LOS ALAMOS, NEW MEXICO by PERKINS, Courtney A., New Mexico Environment Department, DOE Oversight Bureau, DALE, Michael, New Mexico Environment Department, Hazardous Waste Bureau, MARTINEZ, Dan'l, ENGLERT, David, GRANZOW, Kim, New Mexico Environment Department, DOE Oversight Bureau.

Abstract

Treated radioactive liquid waste was discharged into upper DP Canyon in Los Alamos, NM from 1952-1985, with prior discharges of untreated radioactive liquid waste at the same location. The majority of the radiological material remaining in the treated discharge water (Sr^{90} , Am^{241} , $\text{Pu}^{238\&239/240}$ and Cs^{137}) preferentially bound to sediment in the canyon and was then available for remobilization and transport by canyon flows from storm-water runoff. Small amounts of soluble contaminants, such as Sr^{90} , remained in solution and have impacted shallow groundwater. DP Canyon is a tributary of Los Alamos Canyon, which flows into the Rio Grande upstream of a newly constructed water intake intended to supplement the City of Santa Fe, New Mexico's drinking water supply. Remedial actions (soil/sediment/rock removal) were completed below the liquid waste outfall point in 1996-7 and again in 2002-3. A grade-control structure was installed slightly down-canyon of the outfall location in early 2010 to limit sediment flow. Data from DP Canyon just above the confluence with Los Alamos Canyon is available from 1967-8, 1996, 1998-2000, and 2006. Recent samples were collected in 2010. These data span the various remedial actions and demonstrate an overall decrease in the levels of radionuclides transported in the canyon by storm-water runoff. The gross beta activity in the suspended sediment portion of the storm-water samples shows an overall decrease through time from 537 pCi/g in 1968 to 19.0 pCi/g in 2006 (mean activity of time-series samples during single events). The Sr^{90} activity in solution also demonstrates an overall decrease through time from 852 pCi/L in 1968 to 8.1 pCi/L in 2006. The overall decrease in radiological contaminants being transported out of DP Canyon is likely the result of source term removal, dilution, and radioactive decay.

Bureau staff hosted the September CRMG meeting at Northern New Mexico College. Seven participants representing LANL, Pueblo de San Ildefonso, NMED, and the public attended the meeting.

- The main topic discussed was LANL plan to reduce tritium sampling at a number of AIRNET stations based on the facility's elimination of tritium sources over the years; predominance of non-detects at many stations; and overall budget concerns with program operations.
- A representative from the EVEMG raised concern noting it appeared that LANL was only closing down tritium monitoring in her area of concern (Station #84 at Picuris Pueblo).
- Staff from the NMED DOE OB noted that there were three monitors near Pueblo de San Ildefonso and El Rancho that were not being reduced and asked LANL to reconsider their

decision to close the Picuris station and instead consider closing one of the El Rancho vicinity stations instead.

- The next CRMG meeting will include a status report of the recent D&D projects as a main discussion topic.

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 FFY10 Q-4, Bureau staff completed seven U.S.EPA (EPA) – funded sampling projects, evaluated historical discharge effects on current storm water samples, and submitted a final data report on radionuclides and metals in soils in the Embudo and Trampas Valleys of northern New Mexico.

Bureau staff completed seven EPA sampling projects in the past 3-months that had analytical budgets of \$59K. The accrued total cost amounted to approximately \$55K, coming in just under the allowed budget. The projects were predominantly geared toward surface and ground water sampling efforts and included one cleanup verification project to analyze sediments along the South Fork of Acid Canyon for radionuclides and RCRA metals. The Acid Canyon effort looks at the amount of residual radionuclides in sediments along the length of the drainage remediated in 2001 by the Environmental Restoration Project under the University of California.

The following sampling projects with analytical costs funded by EPA were completed in August 2010:

- LGE03 - General EM/ER Projects
- South Fork Acid Canyon cleanup Verification Project (\$12,160)
- LMW08– Groundwater Monitoring projects (4) including a regional aquifer well purge study, an oxalate study, an oxyanion study and a TA-54 area regional well VOC monitoring study
 - The R-Well Purge Study (\$8,588)
 - Groundwater Oxalate Study \$14,536
 - Groundwater Oxyanions Study (\$10,602)
 - TA-54 Area R-Well VOC Monitoring Project (\$5,118)
- LSM09 - White Rock Canyon Springs HE Monitoring project
 - WRC Springs Monitoring (\$2,352)
- LSW11 - Stormwater in Watersheds Monitoring
- DP Canyon Storm Water Monitoring Project (\$3,940)



(Cover photo) Bureau staff Kim Granzow and Ralph Ford-Schmid (not visible) collect GPS data for the eighteen EPA Project sample locations along South Fork Acid Canyon. The small yellow flags (one is immediately to the left of Kim) indicate locations where DOE OB personnel collected sediment samples during the week of July 12.

Bureau staff continued researching and gathering historical data related to radiological contaminant transport in DP Canyon. The historical data, in conjunction with recent sampling, evaluates the sediment load and associated radiological contaminant transport in DP Canyon following two separate clean-up activities and the installation of a grade-control structure (early 2010) in upper DP Canyon. Additional results from this study will be presented at the Geological Society of America (GSA) Fall Conference in Denver.

Bureau staff distributed a final data report to DOE LASO and the EVEMG. Results will be uploaded to the RACER database, which may then be accessed by the public.

The report, titled “Embudo/Trampas Valley Soil Radionuclide and Metal Data at Sites in Northern New Mexico by NMED/DOE OB for Quarter 3 FFY 2009, June 7, 2010,” includes results from 12 soil samples from the Rio de las Trampas and Embudo Creek watersheds.

- Samples were measured for Pu^{238} , $\text{Pu}^{239/240}$, Sr^{90} , Cs^{137} , Am^{241} , and uranium isotopes 234, 235, 238, and 24 trace and heavy metals.
- Sample pairs were collected at 1,000 foot elevation intervals along the watersheds from near the Rio Grande to the montane (below tree line) Trampas Lake.
- One sample from each pair was collected from floodplains along the stream channel and one sample was collected from terraces above the channel.
- Analytical results for soils were compared to background references referred to as regional statistical reference levels (RSRL) developed by the Los Alamos National

Laboratory. The background references for soils represent the highest probable level expected to be measured in areas not affected by Laboratory operations at a 99.9% probability (mean plus 3 standard deviations from the data population set). The RSRL was established for conditions at regional locations near Rio Grande terrace elevations. Concentrations measured were also correlated to elevation above mean seal level.

- Results will be uploaded to the RACER database, which then may be accessed by the public.

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 FFY10 Q-4, Bureau staff continued to measure direct penetrating radiation (DPR) using electrets at LANL perimeter and off-site stations

The electrets used by the Bureau collect data side-by-side with LANL Thermoluminescent Dosimeters (TLDs). Although the collection technology differs between the two agencies, the overall effort is similar and yields quarterly results for DPR or (predominantly) gamma radiation. Electret technology requires no power source, offers a less costly, and labor intensive method for measuring DPR. The electrets are read each quarter by a technician with a portable apparatus that measures voltage drops in the electret media, a charged Teflon disc, caused by ionizing radiation reacting with air in a chamber of known volume. Voltage measurements are then readily converted to a DPR dose over the quarter for a given location. Although quarterly DPR dose results do vary from location to location, Bureau results have historically tracked well with LANL results and fall within the background DPR range for all on-site stations as well as those located in the Santa Fe and Espanola area.

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 silica gel collectors are submitted and analyzed quarterly and results are provided for DOE, LANS and the public.

Quarterly Summary: during FFY10 Q-4, Bureau staff continued to monitor for airborne radioactive particulate matter at the five AIRNET stations at LANL-perimeter locations.

Bureau staff maintains five site perimeter AIRNET stations that are co-located with LANL stations. Air particulate samplers at each location are replaced every two weeks and composited after three months and submitted for analysis of plutonium, uranium, americium, and tritium. The Bureau's AIRNET monitoring was supplemented by an additional air-monitoring project (LDD16) during this quarter using a low-volume solar-powered particulate collector at the Los Alamos County Airport. The solar-sampler currently resides in a location downwind from the D & D activities conducted at TA-21. Air particulate samples for all Bureau monitoring during this period are pending submittal for analysis during FFY11 Q-1.

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 to DOE, LANS and the public.

Quarterly Summary: During FFY10 Q-4, Bureau staff had no activity to report.

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. In general, the analytes are substances not addressed under the Safe Drinking Water Act.

Quarterly Summary: During FFY10 Q-4, Bureau staff collected samples from Los Alamos County and City of Santa Fe (Buckman) drinking water production wells for various analyses.

Bureau staff collected drinking water samples with LANL and Los Alamos County staff from Los Alamos Production Wells PM 3, PM 2 and O-4. The analysis suite included both Cl^{36} and perchlorate.

Bureau staff collected drinking water samples with LANL and City of Santa Fe staff from Buckman Production Wells 1, 6 and 8. The analysis suite included uranium, plutonium, tritium, TAL metals and perchlorate, and Cl^{36} .

Bureau efforts also included sampling a USGS piezometer located near the Buckman Diversion project. A full suite of water samples including tritium was obtained to characterize the well's chemical signature and to determine water age.

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 FFY10 Q-4, Bureau staff continued on-going monitoring projects aimed at characterizing groundwater from both background conditions and from known and suspected contaminated wells, including analyses for oxalate, oxyanions, VOCs, general water quality parameters, sulfur/oxygen isotopes, high explosives, tritium, and carbon-14 (C^{14}).

Bureau staff continued to monitor the perchlorate collection columns at Los Alamos County production wells O-4, PM-5, and PM-1. The information will supplement existing data for the joint DOE OB-LANL background perchlorate project.

Bureau staff continued to work with laboratory analysts from ALS to refine an experimental method for accurately measuring oxalate, a locally measurable trace anion in groundwater beneath the Pajarito Plateau. Sample degradation has been a problem and duplicate samples will

be collected into FFY11 Q-1 at locations where known groundwater contamination exists. Samples will then be archived through a freezing process that is thought to halt the degradation and ALS will conduct comparative tests on frozen and non-frozen samples. The Bureau intends the project to result in a publication (potentially in conjunction with LANS) on the use of oxalate (C_2O_4) as a ground water tracer to provide insight on the severity of impacts from poor well development processes.

The Bureau also continued to work on the following groundwater projects:

- Oxyanions (bromate, chlorate, chlorite, iodate), often associated with treated wastewater and suspected or known carcinogens at concentrations from 200-10 $\mu\text{g/L}$, were sampled from impacted and potentially impacted wells.
- Volatile Organic Compounds (VOCs) were analyzed in samples from monitoring wells around TA-54 where a known organic plume exists in the vadose (unsaturated) zone of the mesa.
- Purge Study - several wells in the TA-54 monitoring network with unusual behavior of field parameters (pH, ORP, DO) were analyzed for metals, alkalinity, and well-specific chemicals of concern throughout a standard 3-casing-volume purge. The intent of the project was to determine if three casing volumes of purging were sufficient to generate a representative water sample in these wells. Wells sampled include R40i, R-40 screen 1, R-49 screen 1 and 2.
- S/O isotopes - sulfate above background concentrations is strongly associated with major contamination plums (i.e. Mortandad Canyon). Sulfur and oxygen isotopes were analyzed from regional wells in order to make a determination about the source(s) of sulfate contamination. Findings from this study will be considered for a Bureau presentation at the March 2011 EBTAG conference in Santa Fe.
- HE - wells and springs were tested for high explosives (HE) in TA-16 and White Rock Canyon. This area has known or potential HE contamination resulting from historic HE manufacture and detonation. The Bureau collects split samples for HE in this area on a regular basis to verify LANS data and to ensure early detection of HE migration to monitoring wells or surface waters.
- Tritium (H^3) was sampled from a combination of wells and springs on either side of the Rio Grande in order to determine how the waters of the Pajarito Plateau interact with the waters of the Buckman well field.
- Carbon 14 (C^{14}) study: Archived samples from newly drilled monitoring wells in the Jemez Mountains and the new Cañada monitoring well in Santa Fe were analyzed for C^{14} to continue characterizing the relationship of waters on the Pajarito Plateau with neighboring waters.

Bureau staff shipped the remaining noble gas samples to the USGS Noble Gas Laboratory in Denver. The samples were collected between March and July 2010 and were archived for later analysis.

Bureau staff compiled the field and HACH Kit screening data for sulfate (SO_4) and total chromium (Cr) collected in May 2010 during the purging of well R-50 in Mortandad Canyon within 100 yards of the Pueblo de San Ildefonso border with LANL. The field test results

corroborated previous LANS fixed lab results showing R-50 with Cr contamination at levels of 60 ppb or more.

FIELD PARAMETER AND HACH KIT MEASUREMENTS

All Samples Filtered (aqueous dissolved)

Time (during purge)	9:51	10:01	10:03	10:11	10:21	10:31	10:41	10:51	11:01
Temp (°C)	16.67	17.70	17.93	18.63	20.56	21.26	21.65	21.95	22.05
Sp. Cond (uS/cm ³)	161	163	165	172	168	165	163	161	161
TDS (g/L)	0.105	0.106	0.108	0.112	0.109	0.107	0.106	0.105	0.104
DO (mg/L)	6.56	6.02	5.86	5.38	4.87	4.88	4.82	4.73	4.74
pH	7.93	7.80	7.66	7.61	7.72	7.80	7.82	7.86	7.87
ORP	88.8	88.9	92.3	82.6	72.0	60.8	54.0	47.8	43.1
SO ₄ (mg/L)	10	8	N/A	9	8 - 9	8 - 9	7 - 8	8 - 9	8
Cr (µg/L or ppb, Total Cr)	< 10	10 - 20	N/A	50	50 - 60	60	60 - 70	60 - 70	60 - 70

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 FFY10 Q-4, Bureau staff conducted the annual cooperative monitoring of the springs in White Rock Canyon below LANL with a focus on Chlorine-36 as an indicator of modern water recharge.

The White Rock Canyon springs are in major drainage confluences along the Rio Grande at the eastern border of LANL, Los Alamos County, and Pueblo de San Ildefonso property. The White Rock Canyon springs serve as an inferred facility boundary monitoring point, or early warning system, for testing groundwater beneath the Laboratory just before it passes into the Rio Grande. These springs have been sampled since 1992 by both LANL and NMED for general chemistry, organics, radionuclides, perchlorate, and metals to assess any Laboratory impacts.

The Chlorine-36 Project was the sample collection priority during the Bureau's annual monitoring of springs below LANL. Over the next 2-years, the Bureau will measure modern water recharge across the Pajarito Plateau with Cl³⁶. In the recent past, Bureau researchers have collected and analyzed for various environmental tracers (noble gasses, C¹⁴, O¹⁸, deuterium, etc) to aid in the characterization of the plateau's hydrologic system. Currently tritium (H³) is measured to determine if groundwater contains any fraction of modern (post-1950s) water. Tritium, however, is quickly reaching the end of its usable life span due to a half-life of ~12.3 years. With a half-life of approximately 301,000 years, Cl³⁶ is a natural replacement analyte as it shares a similar temporal signature in precipitation but does not suffer from the rapid decay effects of a short half-life. It has particular use in determining the contribution of recharge from canyon bottoms.

The Bureau project will analyze groundwater for Cl^{36} using local springs and the LANL groundwater-monitoring network that encompasses more than 100 monitoring wells and springs within the study area. A subset of these sources will be sampled with emphasis on wells with the highest information value. Examples of sample groups include:

- Wells and springs that exhibit chemistry within the range of background values will establish a background value for Cl^{36} in the regional aquifer.
- Wells with tritium and no other contamination will establish a tritium-chlorine relationship in waters with natural modern recharge conditions and assist in delineating infiltration pathways.
- Wells within and bounding contamination plumes will be used to determine if Cl^{36} has been produced during waste generation and if it is a viable predictor of waste migration; and
- Wells that show anomalously high chloride and no other contamination.



White Rock Canyon Spring Sampling Preparation: Dan'l Martinez of the DOE OB prepares to leave Buckman Landing to sample the Pajarito Canyon Spring Series that is further downstream (Photo by Steve Yanicak, DOE OB).



Spring 6 in Ancho Canyon at the Rio Grande: Several LANL contractors assigned to Team 1 (including NMED staff Dan'l Martinez and Steve Yanicak) prepare to sample the spring that discharges to the river at this location. The Bureau's analysis suite included tritium, high explosives, volatile organics, and Cl^{36} (a long-lived radionuclide). The water quality here is excellent with a supportive trend over the past 18-years. Contaminants linked to LANL have never been detected at Spring 6 (photo by Steve Yanicak, DOE OB).



White Rock Canyon Spring 5: Several LANL contractors collect samples at Spring 5, located about a quarter mile above the Rio Grande (Photo by Steve Yanicak, DOE OB).



White Rock Canyon: NMED DOE OB crew in transit below Frijoles Canyon during 3rd day of White Rock Canyon sampling event (Photo by Steve Yanicak, DOE OB).

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 verification monitoring of LANL Individual Storm Water Permit compliance. Bureau staff evaluates BMP implementation at SWMUs intended to enhance contaminant transport reduction in accordance with the LANL Individual Storm Water Permit.

Quarterly Summary: During FFY10 Q-4, Bureau staff collected samples from automated ISCO and single-stage samplers below SWMUs in relation to the new LANL NPDES Individual Storm Water Permit.

Bureau staff shipped storm water samples collected via automated ISCO samplers from DP Canyon for the EPA storm water project. This data will be compared with data from the late 1960's and the late 1990's to evaluate the effectiveness of prior clean-up activities and the grade-control structure in reducing contaminant transport in DP Canyon. Data from this event will be summarized in a poster presentation at the October 2010 Geological Society of America Annual meeting in Denver.

Bureau staff obtained excavation permits for and installed single-stage storm water samplers at TA-53 and TA-61 to monitor below SWMUs in relation to the NPDES Individual Storm Water Permit. These samples are for verification of LANL monitoring under the new NPDES Individual Storm Water permit.

Bureau staff collected four samples from TA-53 single-stage storm water samplers following a large rain event on August 23. The project monitors storm water below SWMUs as they relate to the new NPDES Individual Storm Water Permit.

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 FFY10 Q-4, Bureau staff collected storm water samples from 21 runoff events at Buckman Landing, along the Rio Grande, in the Los Alamos Canyon watershed, and at the Alameda station. Bureau staff also monitored storm event damage and repairs to sediment mitigation and flow monitoring structures in the Los Alamos Canyon watershed.

Fifty-four storm water samples from 21 runoff events were collected at Alameda, Buckman, and Otowi Rio Grande stations, and at Los Alamos Canyon watershed stations E040, E030, E110 during July, August, and September. The various analyses include suspended sediment concentrations, gross alpha/beta, plutonium isotopes-238, -239/240, Sr^{90} , uranium isotopes-234, -235, and -238 and Cs^{137} by gamma spectroscopy. These samples represent continuing efforts to monitor storm water runoff from LANL and identify any impacts to the Rio Grande.

The primary source of Laboratory legacy contaminants in Pueblo and lower Los Alamos Canyon was untreated and treated radioactive wastewater discharged into South Fork Acid Canyon from 1944 to 1964. Those contaminants bound to sediments are the major transport mechanism of contaminants into the Los Alamos watershed and then to the Rio Grande. Several cleanups by the Laboratory have occurred in South Fork Acid Canyon since the early days of operation, the latest during 2001. The Bureau returned to South Fork Acid Canyon in August, and collected 18 channel and bank sediment samples to confirm contaminant levels in sediments available for downstream transport are less than the $\text{Pu}^{239/240}$ Single Radionuclide Soil Guideline and clean-up concentration goal of 280 pCi/g. All $\text{Pu}^{239/240}$ measurements in sediment samples collected by the Bureau are less than 190 pCi/g.

Three storms on August 13, 15th, and 23rd produced the third and fourth largest runoff events within the Los Alamos watershed since the Cerro Grande fire in 2000. Samples were collected with both automated ISCO and single-stage samplers in Los Alamos, Pueblo, and Sandia Canyons for TAL metal, radionuclide and PCB/Dioxin analyses. The August 23 event caused significant damage to a grade control structure and three vane structures in Pueblo Canyon and the E110 gage in lower Los Alamos Canyon. The Bureau has reviewed and monitored the on-going activities by LANS to repair and improve this sediment mitigation and flow monitoring structures.



Damage to Retention Structure in Pueblo Canyon: Dave Englert assessing upstream undercut erosion damage to the Pueblo Canyon Retention Structure that occurred between 8/15 -16/2010. During the event, stormwater flowed over the top as designed, but several subsurface breaches caused substantial undercutting and break through at the structure margins.



Water “Piping” caused damage in Pueblo Canyon Low-Head Weir from 8-16-10 Flood Event (upstream of weir).



Water “Piping” caused damage in Pueblo Canyon Low-Head Weir from 8-16-10 Flood Event (downstream of weir)

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 FFY10 Q-4, Bureau staff submitted an erosion control review for TA-48 and TA-55. Staff forwarded several recommendation letters for Spill Response Assessment and Suggestion for Closure to DOE/LASO.

Bureau staff submitted an erosion control review for TA-48 and TA-55 in addition to several recommendation letters for Spill Response Assessment and Suggestion for Closure to DOE management. The letters were submitted to help facilitate the closeout of new and older spills that are still on the record. The Spill Report Numbers included:

- #266 – “Spill Response Assessment and Suggestion for Closure of Potable Water Release at TA-18, Building 138, June 29, 2010, LANL Discharge Notification Report # 266.” On June 29, 2010, NMED was notified of a 4,000-gallon potable discharge from a cut and capped water line near TA-18, Building 138. Water flowed into an excavated area and then into the Pajarito Canyon watercourse. The cause of the release appears to be a separated pipe joint that occurred during the night or early morning of June 29. The water line was taken out of service by 07:55 and repairs were completed the following day. Moderate erosion was observed near the excavation however, the Pajarito Canyon

watercourse is heavily vegetated and no erosion was observed in this area. A review of the site SWMU/AOC maps indicates SWMUs/or AOCs were not affected.

- #270 - “Spill Response Assessment and Suggestion for Closure of 1,100 Gallons Untreated Sewage Release at TA-55, Building 28, on July 13, 2010, LANL Report # 270.” The Bureau’s review of the action report received on July 21, 2010, found the response and clean up complete and recommends that no further action is required at this time. The report detailed that on July 14, 2010, NMED was notified of an untreated sanitary sewage release at TA 55, Building 28. The approximate discharge of 1,100 gallons of untreated sanitary waste occurred over approximately 2.5 hours and was first observed by a construction contractor working near TA-55. The release appeared to originate from a gravity sewer line serving TA-46, the Sanitary Wastewater System (SWWS). The discharge appears a result of existing damage to a vitrified clay pipe and may have been exacerbated by construction activities at the site. The discharge was confined within an excavated area and the release did not flow across any SWMUs and/or Areas of Concern (AOC). The flow did not enter storm drains or the nearest watercourse (Pajarito Canyon). There did not appear to be any erosion effects from the release. The release from the damaged pipe was shut down for repairs on July 13, 2010 and the area was disinfected by July 14, 2010.
- #272 - “Spill Response Assessment and Suggestion for Closure of Approximately 5,000 to 6,000 Gallons Potable Water Spill Release During a Fire Hydrant Flushing and Flow Test at TA-3, CMR Facility Building 216, LANL Report # 272.” The Bureau’s review of the action report received on August 23, 2010 found the response and clean up actions complete and recommend no further action is required for this discharge notification.
- “NMED-DOE/OB Site Evaluation Report for Stormwater and Erosion Controls at Technical Area (TA) 55, the Chemical, and Metallurgy Research Replacement Building (CMRR) and the TA-48 RULAB Project and Associated Building and Parking Area on May 10, 2010.” The letter summarized Bureau participation in a site evaluation of stormwater and erosion controls on May 10, 2010 at the CMRR and the TA-48 associated building and parking area. All previously recommended housekeeping issues had been addressed and the site appeared clean and orderly during construction activities even though recent rain events caused impacts to the site. Bureau staff noted that site management at TA-55 and TA-48 has done a very good job over the last three site evaluations. All parties concerned present a proactive attitude toward overall construction stormwater control and permit compliance. Previous recommendations have been implemented leading to better stormwater site management. The contractor (Austin-Commercial) in charge of current site management and stormwater control efforts has shown great initiative in their aggressive acquisition of necessary equipment and materials and implementation of stormwater related BMPs.

Of special note is that Mr. Galloway’s routine on-site spill assessment and reports have assisted the Surface Water Quality Bureau in several Department file closures for DOE LASO and LANL-EP-RS. The Spill Reports closed out included two recent reports including #257 from May 4, 2010, #242 from February 1, 2010, and #202 from July 4, 2008.

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 FFY10 Q-4, Bureau staff collected and submitted 24 storm water and precipitation samples for analysis in the continued effort to characterize regional PCB concentrations.

Twenty-four samples were submitted for PCB and other analyses under this project during the fourth quarter. Eight storm water samples from the Rio Grande and seven stormwater samples from Los Alamos Canyon collected in July and August were analyzed for PCBs and suspended sediment concentration. Six precipitation samples from April, July, and August were submitted along with an equipment rinsate blank. Three samples were submitted from retention basins and the surface water expression of alluvial groundwater below a PCB clean-up site in Los Alamos Canyon. Eleven stormwater and seven precipitation samples are held in storage for PCB analysis.

FISH TISSUE PROJECT (LPC14)

Under this Activity ID, Bureau staff conducts sampling of fish tissue in the Rio Grande and reservoirs under a cooperative sampling plan developed with Santa Clara Pueblo. A significant result of this effort is development of the fish consumption advisory.

Quarterly Summary: During FFY10 Q-4, Bureau staff had no activity to report.

MACROINVERTEBRATE PROJECT (LMI15)

Under this Activity ID, Bureau staff conducts LANL-area stream aquatic community assessment utilizing benthic macro-invertebrate population sampling and assessment methods. Macro-invertebrate populations are a long-term indicator of the chemical, biological, and physical health of flowing waters. Density and diversity of species, numbers of individual within taxa, and overall population numbers reflect water quality stressors and/or water quality trends.

Quarterly Summary: during FFY10 Q-4, Bureau staff had no activity to report.

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 FFY10 Q-4, Bureau staff continued low-volume particulate monitoring downwind of current D&D activities at TA-21 and split soil samples with LANS to confirm that clean-up levels are being met in the waste disposal trenches at TA-21's MDA-B.

The Bureau's AIRNET monitoring continued to be supplemented by an additional air-monitoring project during this quarter with the low-volume solar-powered particulate collector at the Los Alamos County Airport. The solar powered-sampler currently resides in a location

downwind from the D & D activities conducted at TA-21. Air particulate samples for all Bureau monitoring during this period is pending submittal for analysis during FFY11 Q-1.

Bureau staff attended the first confirmatory sampling event conducted in a completely excavated portion of a historic radiological waste disposal trench at Material Disposal Area (MDA) B at TA-21. Three samples were collected from the bottom and each side of the trench and the Bureau split samples with LANS for TAL metals, isotopic plutonium, and isotopic uranium. The purpose of confirmatory sampling is to ensure that residential soil screening levels (SSL) and Screening Action Levels (SALs) are met, and to determine if residual contamination poses a human health risk prior to backfilling the excavation with clean material. Due to site safety rules Bureau staff was unable to conduct the sampling directly, however staff did observe the LANS sampling team conduct the split sampling. Bureau staff coordinated with LANS and sample management staff and arranged to view the open-air sample procedure. Four technicians in Level C personal protective equipment (PPE) conducted the sampling with the assistance of an excavator. LANS full-suite analyses of samples includes: total/TAL metals, radionuclides (alpha and gamma spectroscopy), isotopic uranium, isotopic plutonium, tritium, strontium-90, VOCs, SVOCs, perchlorate, nitrate, cyanide, pesticides/herbicides, explosive compounds, and dioxins/furans. Bureau staff continue to coordinate with LANS regarding the progress/status of excavation at MDA-B. Excavation is continuing in multiple enclosures at this point and has resumed in enclosure #1 after a work stoppage to address unexpected levels of radiation. Additional split samples are anticipated as work progresses.



Constructions crews work on assembling stationary enclosures 9, 10 and 11 MDA B, with portable enclosures 1 and 2 in the background. Photo courtesy of LANL from LASO Weekly Report, 9/20 – 24/2010.

Recent Bureau involvement focused primarily on the MDA-B pit cleanup project adjacent to DP West at TA-21. Bureau staff has been observing the day-by-day demolition of Cold War-era facilities conducted concurrently with the MDA-B cleanup.

The following are images from the DP West demolition project:



Going... Going... Almost Gone! Looking south at the ARRA-funded demolition of TA-21, Delta Prime (DP) West and East facilities (former plutonium processing plants). The demolition project has been at full throttle since December 2009. These are the last buildings still standing at the DP West facility. This part of the facility also contains the last two north and south laboratory wings where Cold War plutonium purification and processing peaked during the 1950s and 1960s. It was at this site where a criticality incident tragically claimed the life of one worker in December 1958. (Photo by Steve Yanicak, DOE OB).



A closer view (looking south) of the last standing buildings of the TA-21, DP West facility on 9/15/2010. In the center of the image is a remaining north laboratory wing with its associated ventilation ductwork above. These

laboratory wings once hosted government-classified plutonium research projects in addition to housing dozens of stainless steel glove boxes that protected plutonium workers from occupational radiation hazards through the mid-1970s. (Photo by Steve Yanicak, DOE OB).



The remaining TA-21, DP West structures in a southeast view from the Bureau's Solar Powered Air Sampler at Los Alamos County Airport. In addition to air monitoring by LANS and NMED throughout the demolition of these structures, storm water runoff is monitored at several canyon bottom locations down-stream on either side of this facility (Los Alamos Canyon on the south, and DP Canyon on the north). Analytical suites monitored by both agencies include radionuclides, TAL metals, and PCBs. (Photo by Steve Yanicak, DOE OB).



On-going ARRA-funded activities where NMED staff is directly involved (MDA-B split sampling) or indirectly involved (storm water collection and erosion assessment in vicinity of LANS D & D activities). Crews work on the demolition of Building 21-152. Photos courtesy of LANS from LASO Weekly Report, 9/20 – 24/2010.

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 FFY10 Q-X, staff had no activity to report.

GIS DATA AND REPORTS INFO PROJECT (LGD19)

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

Quarterly Summary: During FFY10 Q-4, Bureau staff worked with the Pueblo de San Ildefonso on updating their database by re-submitting data collected on Pueblo property. Bureau staff also completed RACER uploads, worked with SWQB data for incorporation into RACER, and worked with an intern in evaluating Bureau legacy data for upload into RACER.

Bureau staff leant technical assistance to the Pueblo de San Ildefonso by providing data collected on tribal lands. Partly from this effort, staff of the Oversight Bureau Los Alamos section received a letter of gratitude from the governor of the Pueblo, thanking all parties involved for their excellent and continued collaboration.

Staff re-submitted to the tribe all analytical results collected in 2008 on Pueblo de San Ildefonso property.

The Bureau continued its support in the RACER database effort by attending steering committee meetings. Updates to the DOE OB and RACER database included new sampling locations and analytes. Additionally, EPA analytical results were imported into the DOE OB database in order to expedite a report for submittal to EPA Region 6. Bureau staff also began collaborating with and overseeing an intern provided by the New Mexico Community Foundation (RACER) through Northern New Mexico College. The intern is reviewing the legacy data collected by the Bureau between 1992 and 2000. Once the QA/QC process is complete the intern will upload the data to RACER.

Bureau staff continued working with SWQB data that requires QA/QC, formatting and corrected codes before incorporation into RACER. When complete, this effort will add a third data provider, in addition to LANL and the Bureau, to RACER.

Bureau staff created maps for display posters of Bureau work presented at the 2010 Geological Society of America annual meeting in Denver in October.

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 FFY10 Q-4, Bureau staff attended a RACER steering committee planning retreat and submitted several data reports to DOE for review and comment.

Bureau staff attended a RACER retreat in Santa Fe intended to provide an atmosphere conducive for technical participants to re-cap events and successes of 2010 and plan for the next phase of the project.

Bureau staff prepared and distributed several data reports. All data results in submittals are provided to DOE for review and comment prior to their release as final to other State of New Mexico and federal agencies, the Pueblos, the Bureau website and interested members of the public. Following a review and comment period, results are transmitted to the RACER database where they are available for public access.

- Data Submittal: 2008 Split- and Independent Water, Suspended Sediment and Fish Tissue Data collected by DOE Oversight Bureau on Pueblo Property.
- Submittal of AIP 2008 Ground Water, Surface Water, Storm Water, Effluent, Precipitation, Fish Tissue, Sediment, and Soil Monitoring Data. This submittal included data results the Bureau compiled from both co-located and independent samples with LANS Environmental Programs at sites located on and off DOE property. Completed data sets were provided for the following 2008 Projects:
 - LGE03 - General EM/ER Projects
 - LPW07 - Drinking Water Project
 - LMW08– Groundwater Monitoring
 - LSM09 - White Rock Canyon Springs Monitoring
 - LSF10 - Storm Water below SWMU Monitoring
 - LSW11 - Storm water in Watersheds Monitoring
 - LNP12 – NPDES Monitoring Assessment Project
 - LPC13 - Regional PCB Study Project
 - LFT14 - Fish Tissue Project
- Transmittal of 2009 NMED Embudo/Trampas Valley Soil Data. This submittal included results from 12 soil samples from the Rio de las Trampas and Embudo Creek watersheds that were measured for plutonium²³⁸, plutonium^{239/240}, strontium⁹⁰, cesium¹³⁷, americium²⁴¹, and uranium isotopes 234, 235, and 238, and 24 trace and heavy metals. (See LGE03)

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 assists to the Bureau and DOE developing workplans, budgets and training requirements.

Quarterly Summary: During FFY10 Q-4, Bureau staff continued to monitor work plan development and execution, to meet financial obligations, and to assess staff performance.

Bureau staff coordinated with DOE preparing inputs for a Letter of Agreement (LOA) between the DOE and the USAF at Kirtland AFB. The initial intent of the document was clarifying protocol for communication; however, the document has been expanded by the Air Force to include aspects more akin to property permit requirements and environmental sampling restrictions that could affect the mission of the Bureau. At issue is stormwater monitoring at sites located on land leased to the DOE or owned by the AF down gradient from DOE SWMUs or AOCs. If the LOA were executed as presently written, these sampling restrictions would affect the functions and responsibilities of the Bureau under the Agreement-in-Principle between the DOE and NMED.

PUBLIC OUTREACH (SPO41)

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

Quarterly Summary: During FFY10 Q-4, Bureau staff reported no activity.

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 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 FFY10 Q-4, Bureau staff collected groundwater samples from MWL, TAG, TAV, and Burn Site monitoring wells. Samples were analyzed for inorganics, organics, metals, and radionuclides.

During the Q-4 quarter Bureau staff collected groundwater samples from the following monitoring wells: (Mixed Waste Landfill) MWL-MW7, MWL-MW8, MWL-MW9, (Tijeras Arroyo) TA2-SW1-320, TA1-W-02, TA1-W-05, TA1-W-06, TA2-W-27, TA2-W-19, TJA-2, WYO-4, TJA-4, TJA-7, (Technical Area Five) TAV-MW7, AVN-1, TAV-MW6, TAV-MW10, LWDS-MW2, LWDS-MW1, (Canyon or Burnsite) CYN-MW6, CYN-MW9, CYN-MW10, CYN-MW11, and CYN-MW12. Samples were analyzed by contract analytical laboratories for inorganics, organics, metals, and radionuclides. Data values and trends will be compiled in the calendar year Annual Report published by the Bureau including comparative values obtained from Sandia where available.

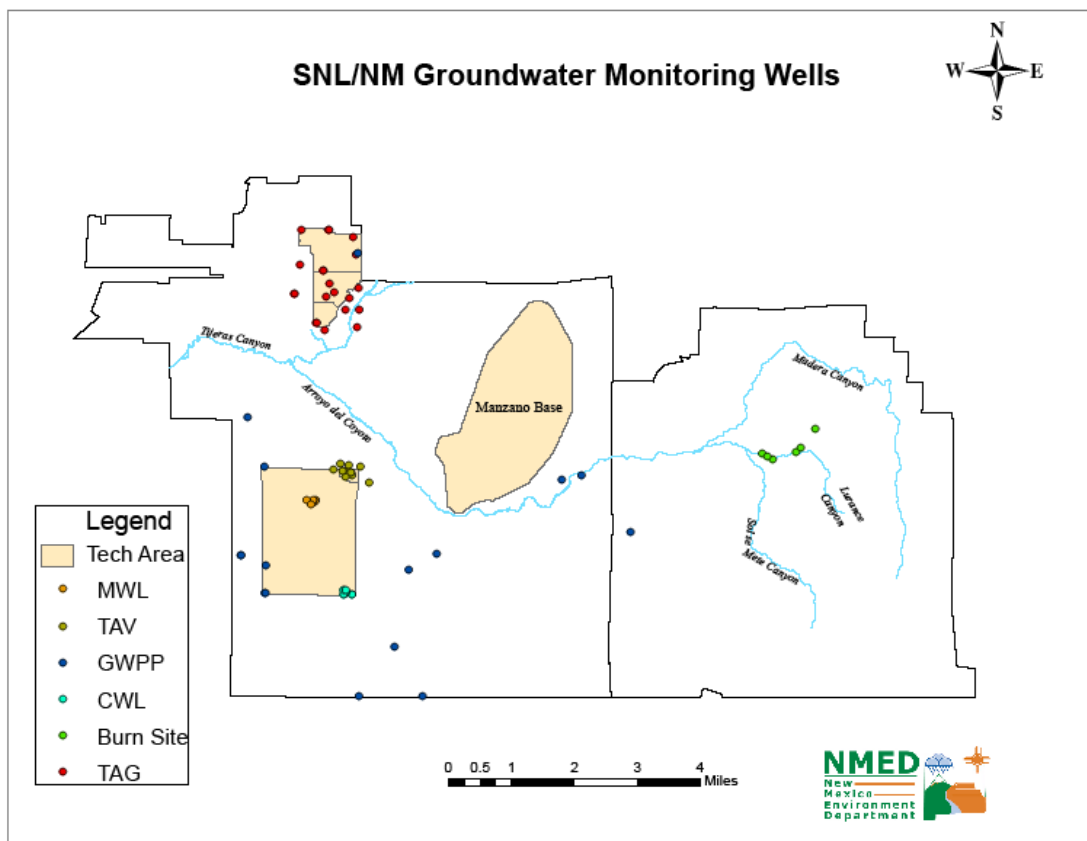


Figure SGE42-1: Map of SNL/NM monitoring wells at Kirtland Air Force Base. Each monitoring well group is separately depicted under the specific category

Burn Site Groundwater: Bureau staff collected groundwater samples from Burn Site monitoring wells CYN-MW6, CYN-MW9, CYN-MW10, CYN-MW11, and CYN-MW12. All non-radiological samples were analyzed at TestAmerica Phoenix for volatile organic compounds (VOCs), diesel range organics, (DROs), gasoline range organics (GROs), nitrate-nitrite as nitrogen, anions, perchlorate, target analyte list (TAL) metals plus uranium, high explosives, and semi-volatile organic compounds (SVOCs). All radiological samples were analyzed at ALS in Fort Collins, Colorado, under subcontract to Hall Environmental Analytical Laboratory, for gross alpha/beta, gamma-emitting isotopes, isotopic uranium, and tritium.

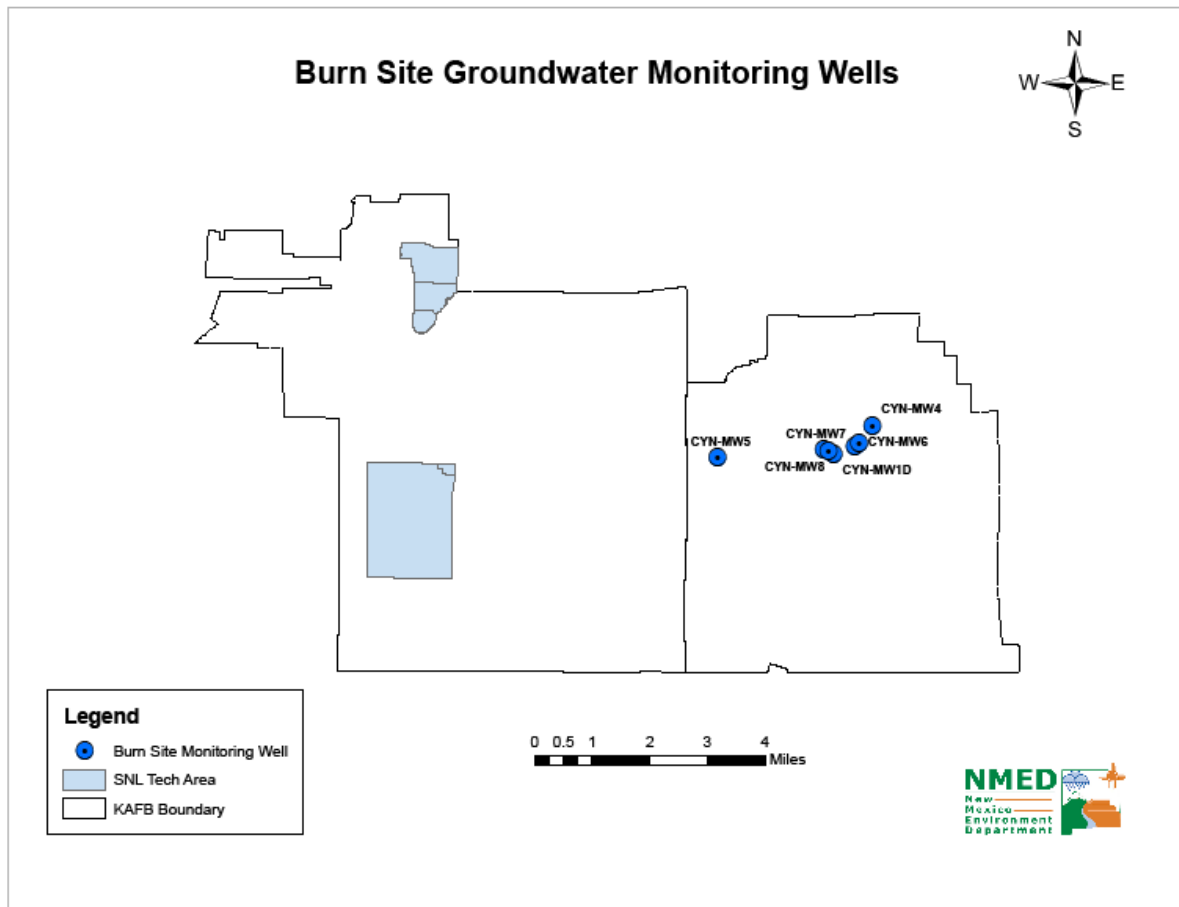


Figure SGE42-2: Map of SNL/NM Canyon/Burnsite monitoring wells at Kirtland Air Force Base

Groundwater Protection Program (GWPP): Bureau staff reported no sampling activity.

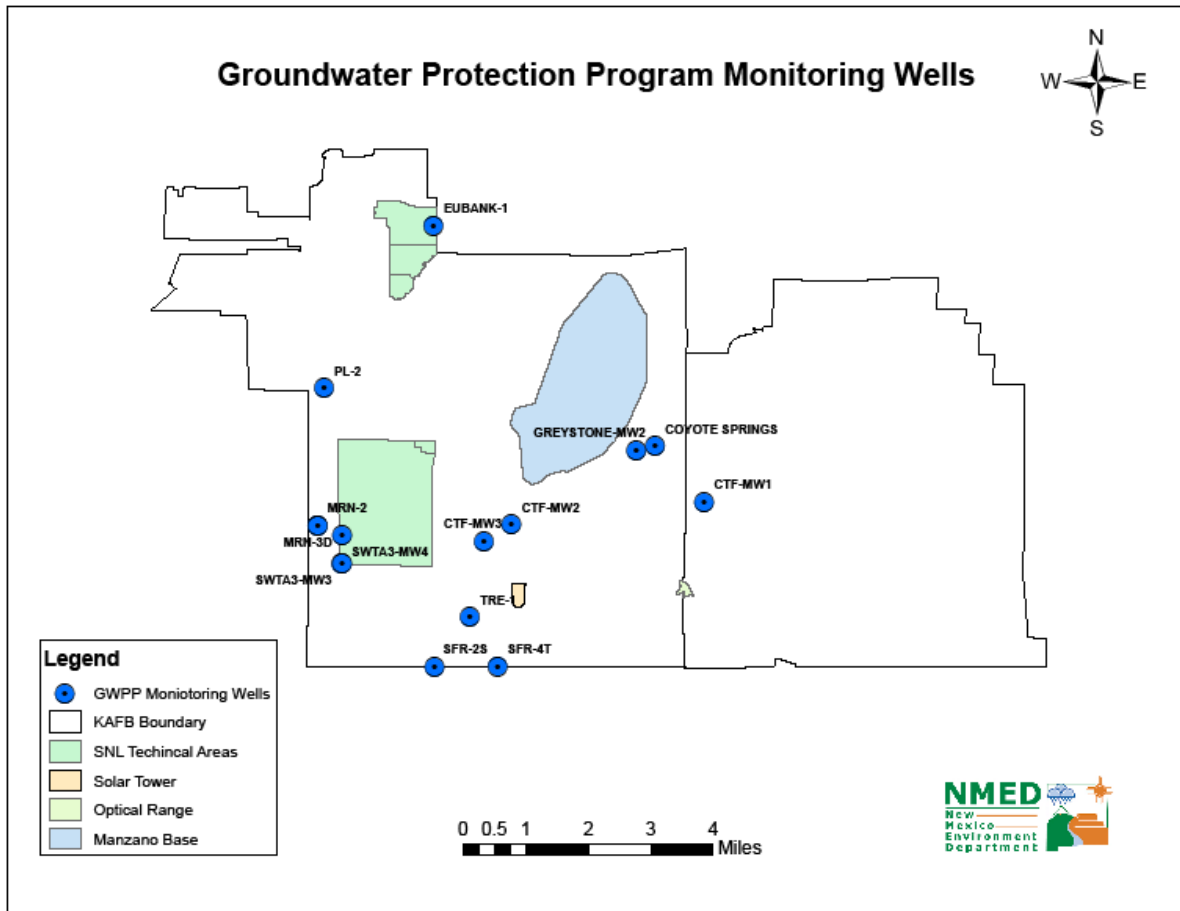


Figure SGE42-3: Map of SNL/NM GWPP monitoring wells at Kirtland Air Force Base

Mixed Waste Landfill (MWL) Groundwater: Bureau staff collected groundwater samples from MWL monitoring wells MWL-MW7, MWL-MW8, and MWL-MW9. Samples were analyzed for VOCs.

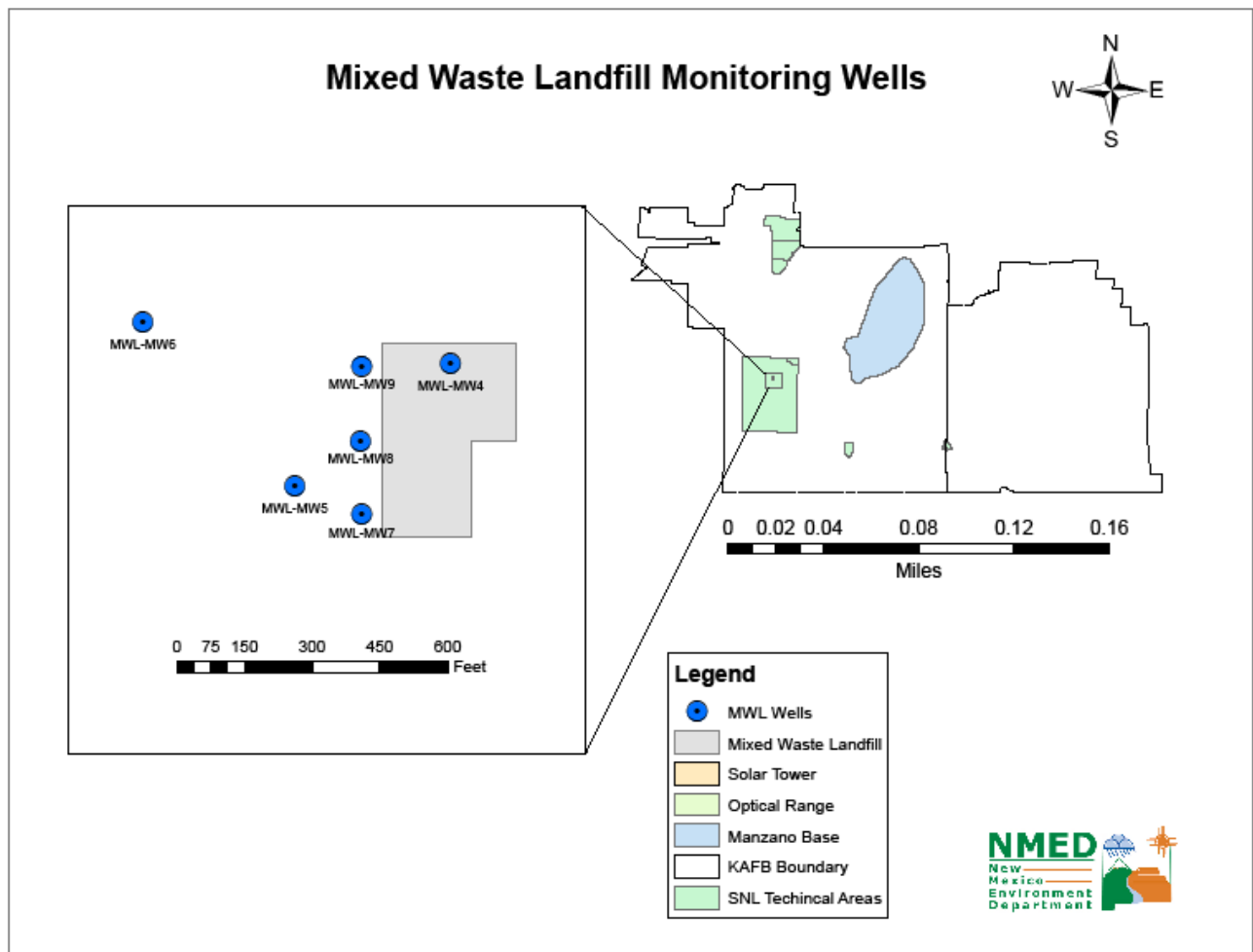


Figure SGE42-4: Map of SNL/NM Mixed Waste Landfill monitoring wells at Kirtland Air Force Base

During April 2010, the Bureau collected groundwater samples from MWL groundwater monitoring wells MWL-MW4, MWL-MW5, MWL-MW6, MWL-MW7, MWL-MW8, and MWL-MW9. Split samples were collected using standard Sandia sampling procedures and equipment. Bureau samples were analyzed at ALS in Fort Collins, Colorado, under a subcontract to Hall Environmental Analytical Laboratory for total and dissolved target analyte list (TAL) metals plus uranium, nitrate-nitrite as nitrogen, gamma-emitting isotopes, and gross alpha/beta. No anomalies were observed in the groundwater results from samples collected at MWL monitoring wells. Concentrations of all sample analytes were below relevant standards. Bureau staff forwarded a draft data submittal to DOE titled, "Groundwater Monitoring at Sandia National Laboratories/New Mexico MWL Conducted by NMED/DOE OB for FFY 2010 Q-3."

Technical Area-V (TA-V) Groundwater: Bureau staff collected groundwater samples from TA-V monitoring wells AVN-1, LWDS-MW1, LWDS-MW2, TAV-MW6, TAV-MW7 and TAV-MW10. All non-radiological samples were analyzed at TestAmerica Phoenix for VOCs, nitrate-nitrite as nitrogen, anions, and TAL metals plus uranium. All radiological samples were

analyzed at ALS in Fort Collins under a subcontract to Hall Environmental Analytical Laboratory for gross alpha/beta, gamma-emitting isotopes, and isotopic uranium.

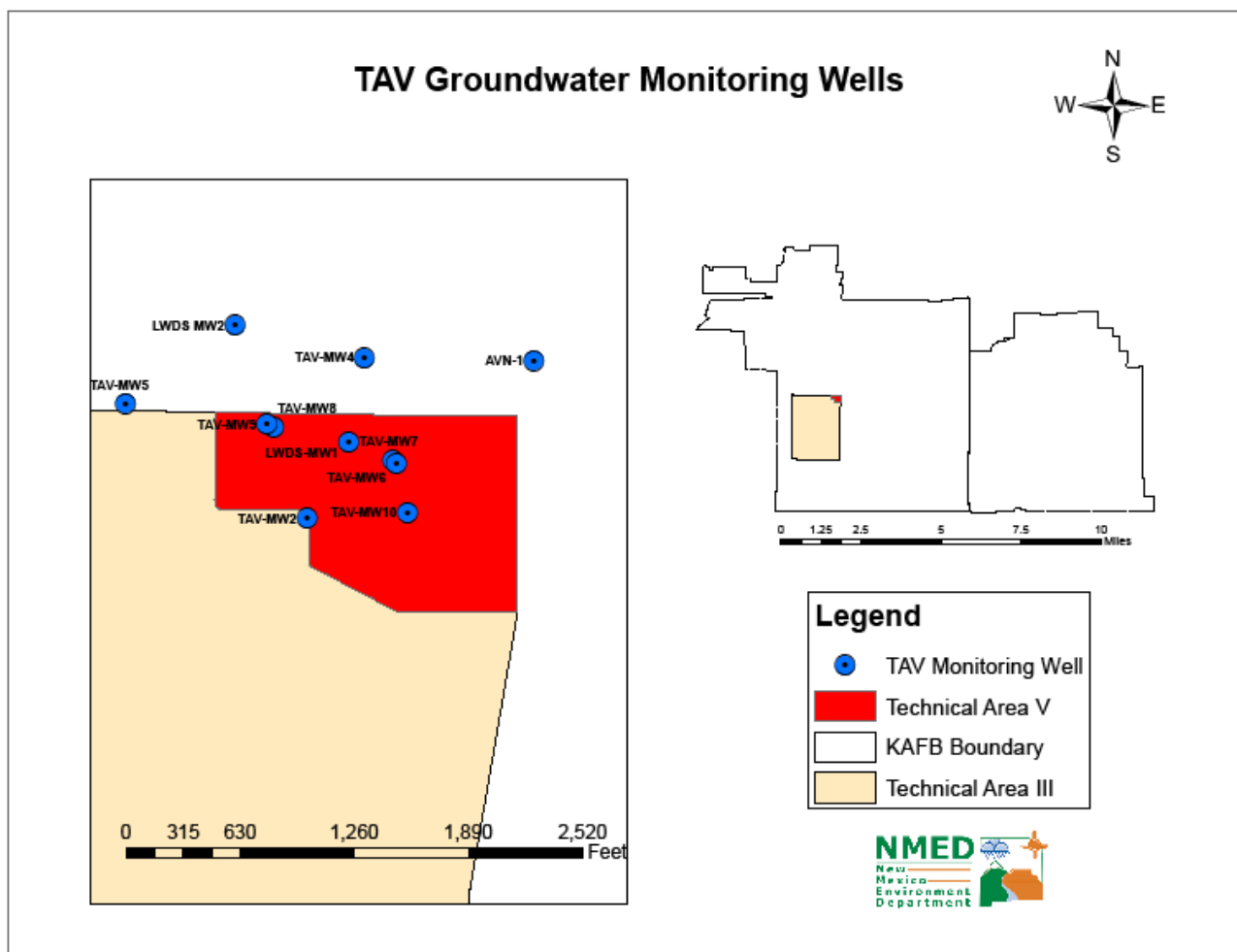


Figure SGE42-5: Map of SNL/NM TA-V monitoring wells at Kirtland Air Force Base

Tijeras Arroyo Groundwater (TAG): Bureau staff collected groundwater samples from TAG monitoring wells TA1-W-02, TA1-W-05, TA1-W-06, TA2-SW1-320, TA2-W-19, TA2-W-27, TJA-2, TJA-4, TJA-7, and WYO-4. All non-radiological samples were analyzed at TestAmerica Phoenix for VOCs, nitrate-nitrite as nitrogen, anions, and TAL metals plus uranium. All radiological samples were analyzed by an independent contract laboratory for gross alpha/beta, gamma-emitting isotopes, and isotopic uranium.

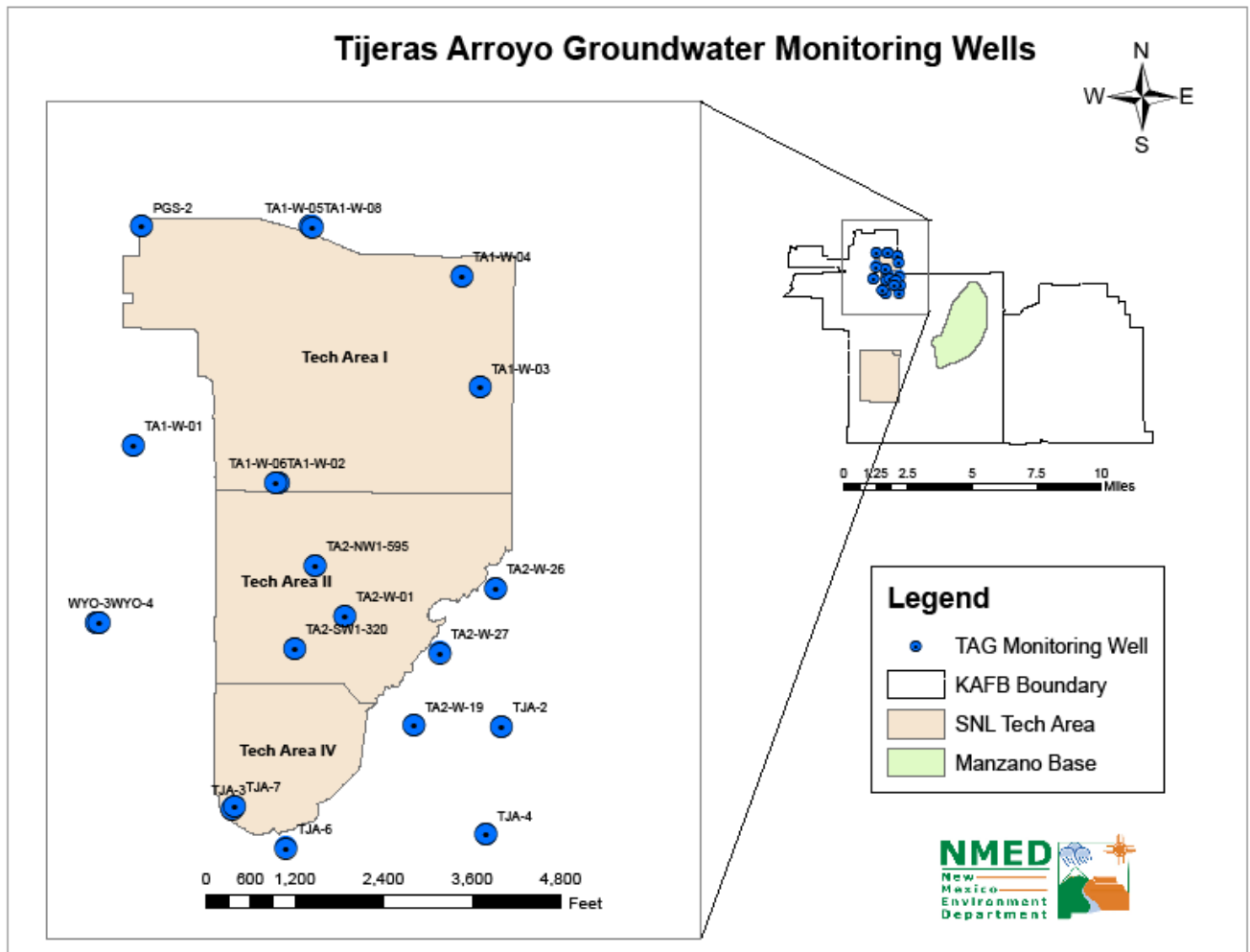


Figure SGE42-6: Map of SNL/NM Tijeras Arroyo monitoring wells at Kirtland Air Force Base

Chemical Waste Landfill (CWL) Groundwater: Bureau staff reported no sampling activity.

Bureau staff forwarded a draft data submittal to DOE titled, “Groundwater Monitoring at Sandia National Laboratories/New Mexico CWL Conducted by NMED/DOE OB for FFY 2010 Q-3.” The Bureau collected groundwater samples from CWL groundwater monitoring wells CWL-MW2BL, CWL-MW4, and CWL-MW5U. Split samples were collected using standard Sandia sampling procedures and equipment. Bureau samples were submitted to an independent analytical laboratory to be analyzed for TAL metals and VOCs. No anomalies were observed in the groundwater results from samples collected at CWL monitoring wells.

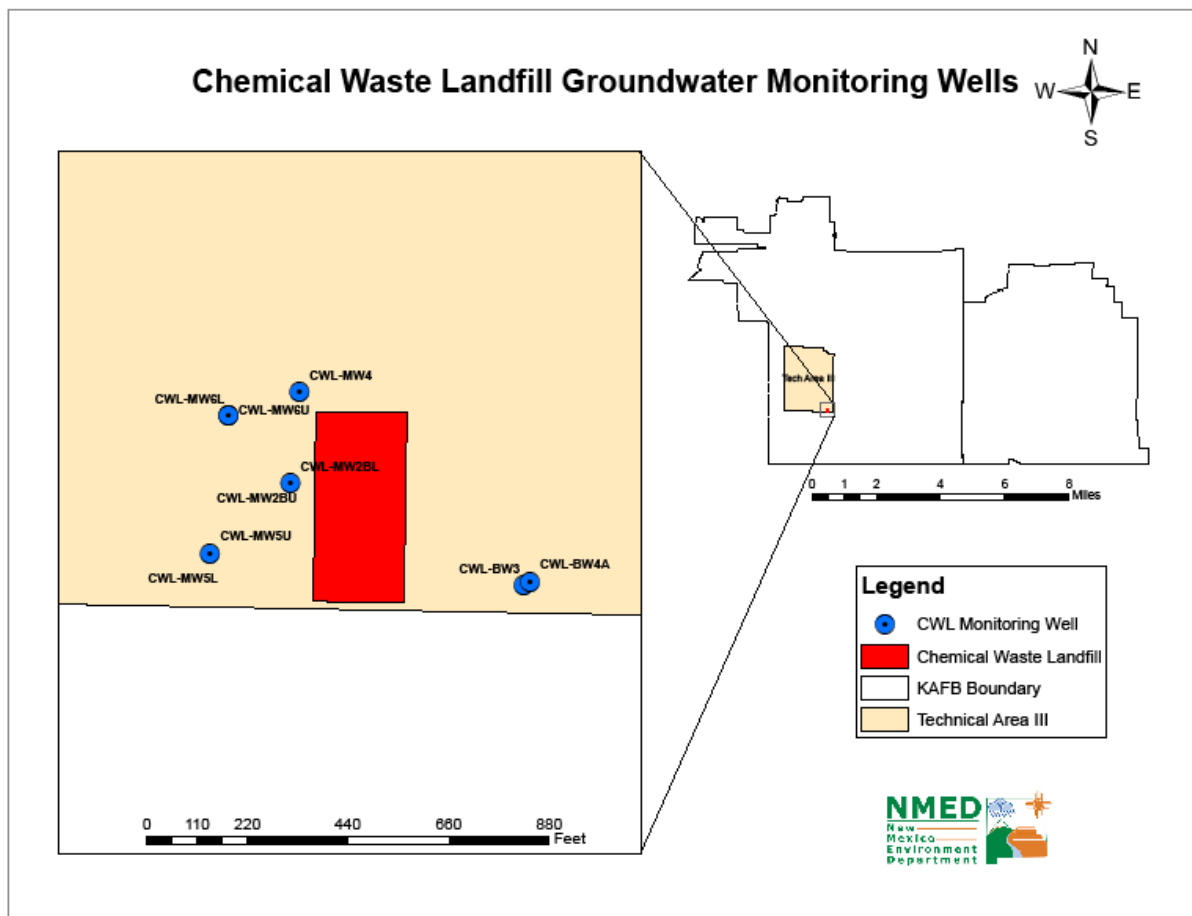


Figure SGE42-7: Map of SNL/NM Chemical Waste Landfill monitoring wells at Kirtland Air Force Base

DIRECT PENETRATING RADIATION PROJECT (SDP43)

Under this Activity ID, Bureau staff uses electret passive ion chambers to evaluate the ambient gamma radiation at SNL and surrounding areas. 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 FFY10 Q-4, Bureau staff collected direct penetrating radiation readings from all 12 electret stations located on-site and off-site. The Bureau will include results from Sandia for comparison in the report to DOE.

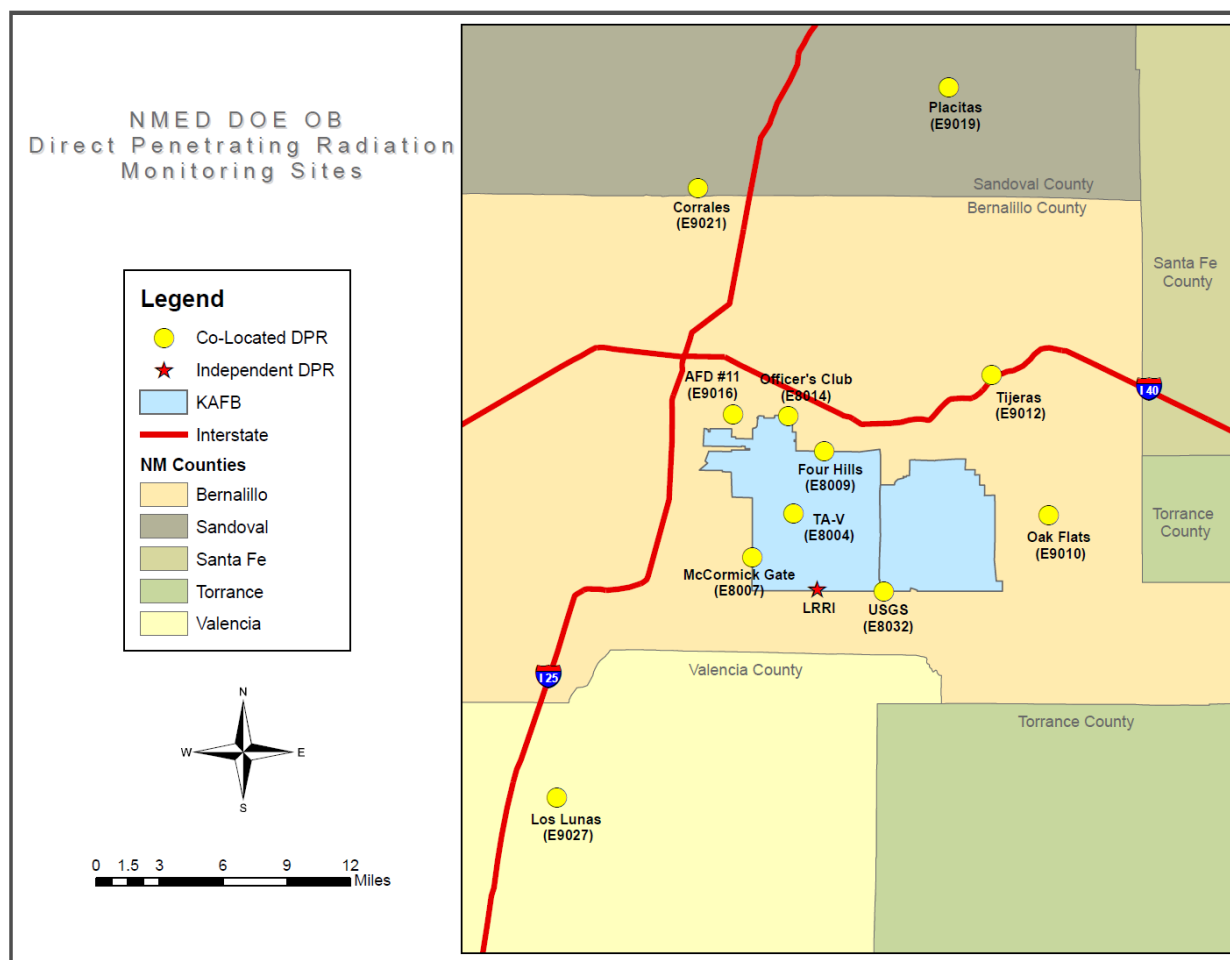


Figure SPD43-1: Location of on-site and off-site Direct Penetrating Radiation monitoring sites

PARTICULATES LOW-VOLUME AIR PROJECT (SPL44)

Under this Activity ID, Bureau staff evaluates the ambient air concentrations of gross alpha/beta, isotopic americium, isotopic plutonium, isotopic uranium, gamma-emitting isotopes, and tritium at 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 FFY10 Q-4, Bureau staff continued to collect bi-weekly air particulate filters from three perimeter-monitoring stations and one 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 and are analyzed separately.

Second calendar quarter 2010 samples were analyzed at an independent contract laboratory for gross alpha/beta, gamma-emitting isotopes, isotopic americium, plutonium, and uranium. Silica gel samples are analyzed for the presence of tritium.

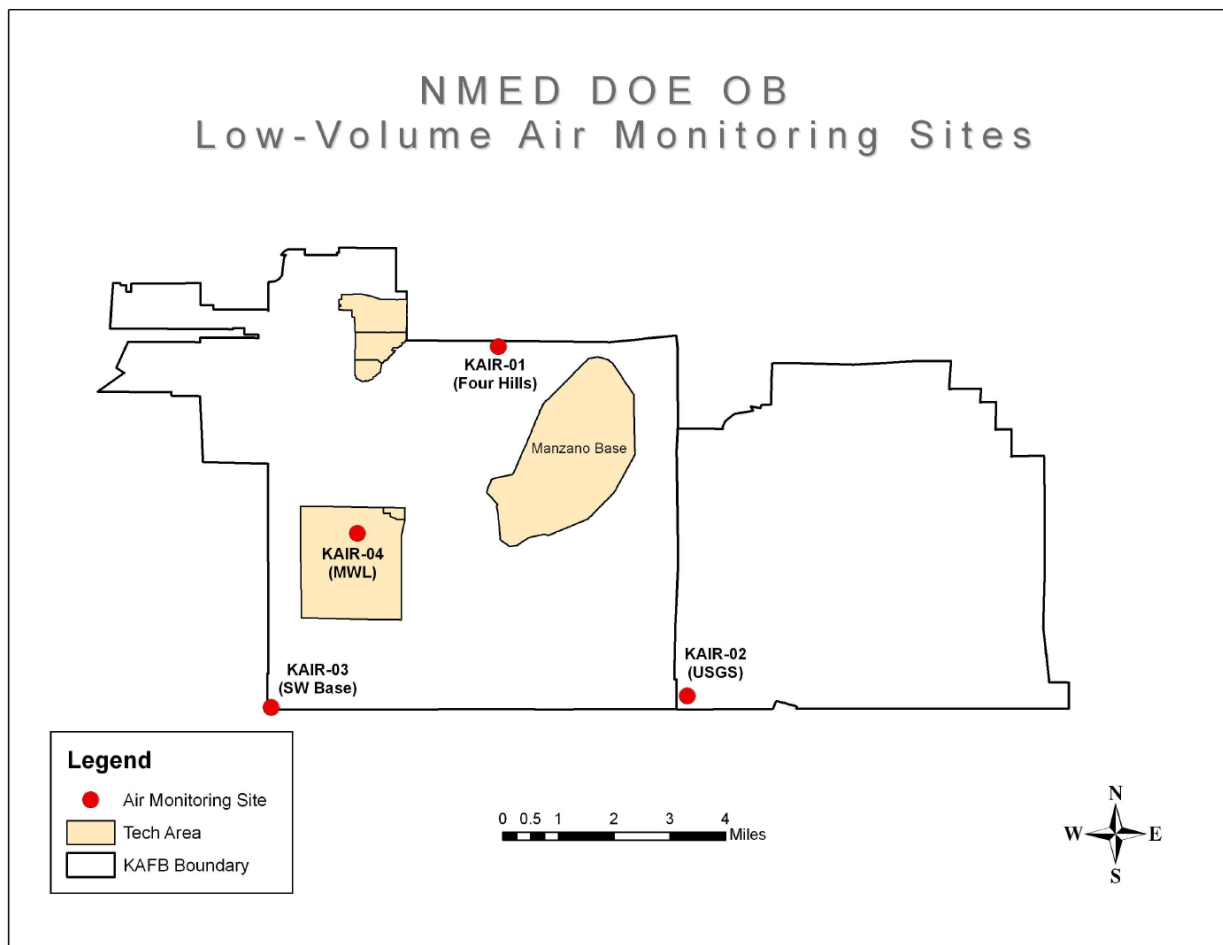


Figure SPL44-1: Location of the three perimeter and one Mixed Waste Landfill low-volume air monitoring sites

STORMWATER PROJECT (SSW45)

Under this Activity ID, Bureau staff conduct 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 FFY10 Q-4, Weather conditions and NEPA restrictions proposed in a Letter of Agreement between DOE and the USAF limited the Bureau staff from collecting stormwater runoff samples from previously approved DOE-leased property sites.

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 FFY10 Q-4, Bureau staff continued to collect stormwater runoff samples after rain events. Samples were analyzed for dissolved metals plus uranium, total cyanide, suspended sediment concentration, total oxygen concentration, PCB congeners, gross

alpha/beta, gamma-emitting isotopes, isotopic uranium, particle size, total suspended solids, and hardness.

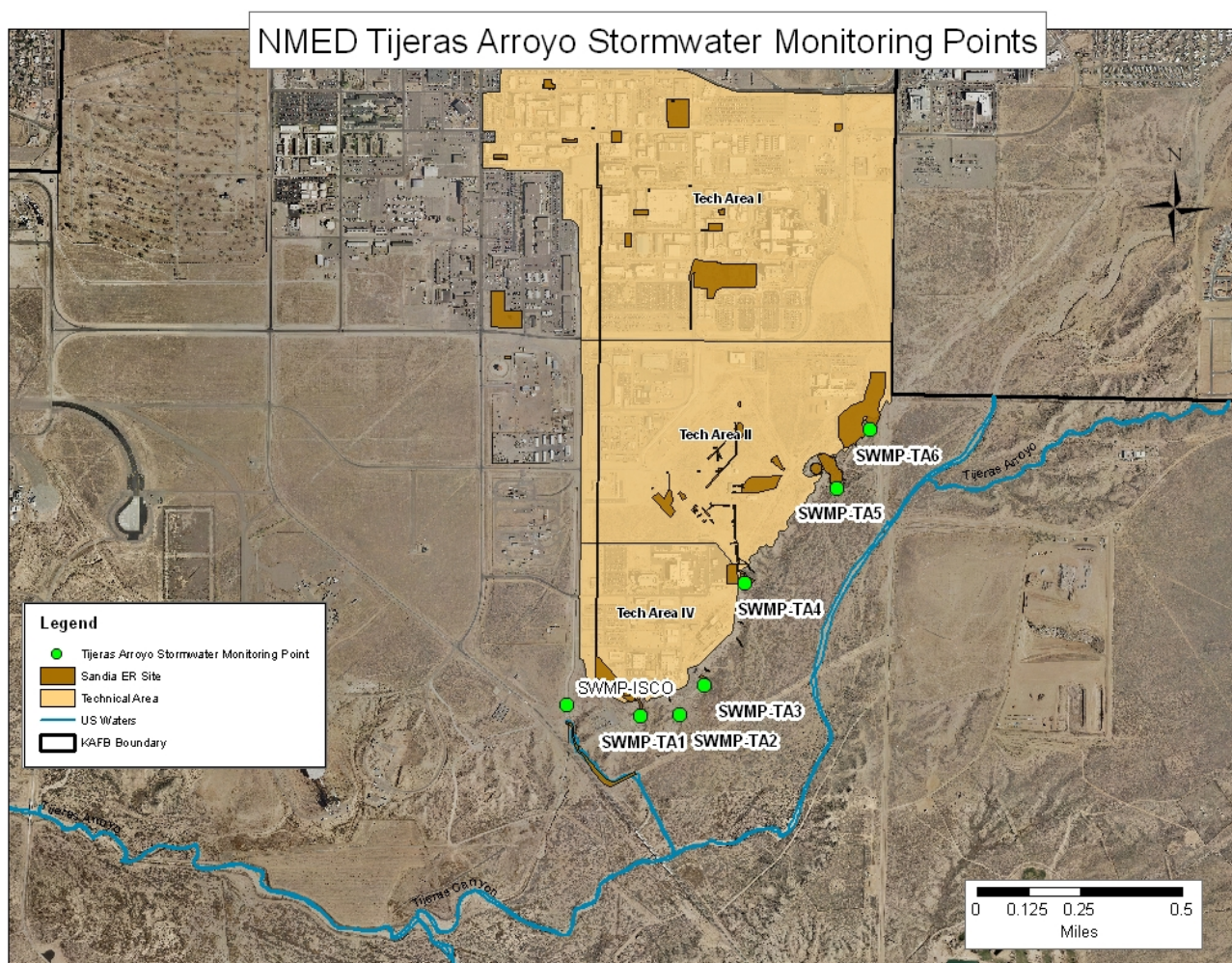


Figure STA47-1: Location of Tijeras Arroyo stormwater monitoring sites

On July 23, 2010, Bureau staff provided DOE/SSO a draft report for Tijeras Arroyo Stormwater Event 5.

The Bureau collected independent stormwater samples from SWMP-ISCO, SWMP-TA2, and SWMP-TA3. The samples were submitted to an independent contract laboratory for analysis of Target Analyte List (TAL) total recoverable metals (unfiltered), dissolved metals (filtered), gross alpha/beta (filtered & unfiltered), isotopic uranium (filtered & unfiltered), gamma-emitting isotopes (filtered & unfiltered), sediment load, total dissolved solids, and total suspended solids.

Bureau staff inspected all stormwater-monitoring stations after the collection of 1.1 inches of rainfall outside Building 803 (SOS office) during the week of July 26. The SWMP-ISCO automated sampler collected 8 liters of stormwater, SWMP-TA2 and SWMP-TA3 both collected one gallon of stormwater, and SWMP-TA6 collected approximately one half gallon of sample

stormwater. All samples were delivered to an independent contract laboratory for analysis of TAL dissolved metals, gross alpha/beta, gamma-emitting isotopes, isotopic uranium, total suspended solids, total dissolved solids, hardness, and PCB congeners.

Bureau staff inspected all stormwater monitoring stations after the collection of 1.15 inches of rainfall outside building 803 (SOS office) during the week of August 2. Samples were collected at SWMP-TA2, SWMP-TA3, and SWMP-ISCO. The samples were delivered to an independent contract laboratory for analysis of TAL dissolved metals, gross alpha/beta, gamma-emitting isotopes, isotopic uranium, hardness, suspended sediment concentration, total organic carbon, and PCB congeners.

Bureau staff inspected all stormwater-monitoring stations after the collection of 1.0 inches of rainfall outside Building 803 (SOS office) during the week of August 16. Samples were collected at SWMP-ISCO, SWMP-TA2, SWMP-TA3, and SWMP-TA6. Samples were delivered to an independent contract laboratory for analysis of TAL dissolved metals, gross alpha/beta, isotopic uranium, hardness, suspended sediment concentration, total organic carbon, and PCB congeners.

Bureau staff collected stormwater samples after a rainfall event during the week of September 6 from Tijeras Arroyo monitoring points SWMP-TA1, SWMP-TA2, SWMP-TA3, SWMP-TA4, SWMP-TA5, SWMP-TA6, and SWMP-ISCO. Bureau staff split the samples to be delivered to two independent contract laboratories for analysis of dissolved TAL metals, cyanide, suspended sediment concentration, hardness, low-level gross alpha/beta, isotopic uranium, PCB congeners, and total organic carbon.

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 FFY10 Q-4, Bureau staff conducted one site evaluation and split soil samples during the demolition and decommissioning of the Building 605 complex.

On July 15, 2010, Bureau staff provided DOE/SSO with a draft site evaluation report for the demolition and decommissioning (D&D) of Building 605. The initial site evaluation was conducted prior to commencement of operations on May 26, 2010. Building 605, the Steam Plant, had formerly provided steam to the entire SNL complex. Suggestions for minor corrections of best management practices were made by the Bureau evaluator, were accepted by the Project Manager, and were adopted during the remainder of the D&D process.

On August 11, and September 16, 2010 Bureau staff conducted split soil sampling with Sandia staff at four possibly contaminated locations on the 1.4-acre site that once surrounded Building 605. Samples were analyzed by an independent laboratory for volatile organic compounds and RCRA-listed metals. No evidence of contamination was observed or discovered.

BIOTA AND TERRESTRIAL PROJECT (STE49)

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

Quarterly Summary: During FFY10 Q-4, Bureau staff provided a draft report to DOE/SSO on joint soil, sediment, and vegetation samples collected in May 2010.

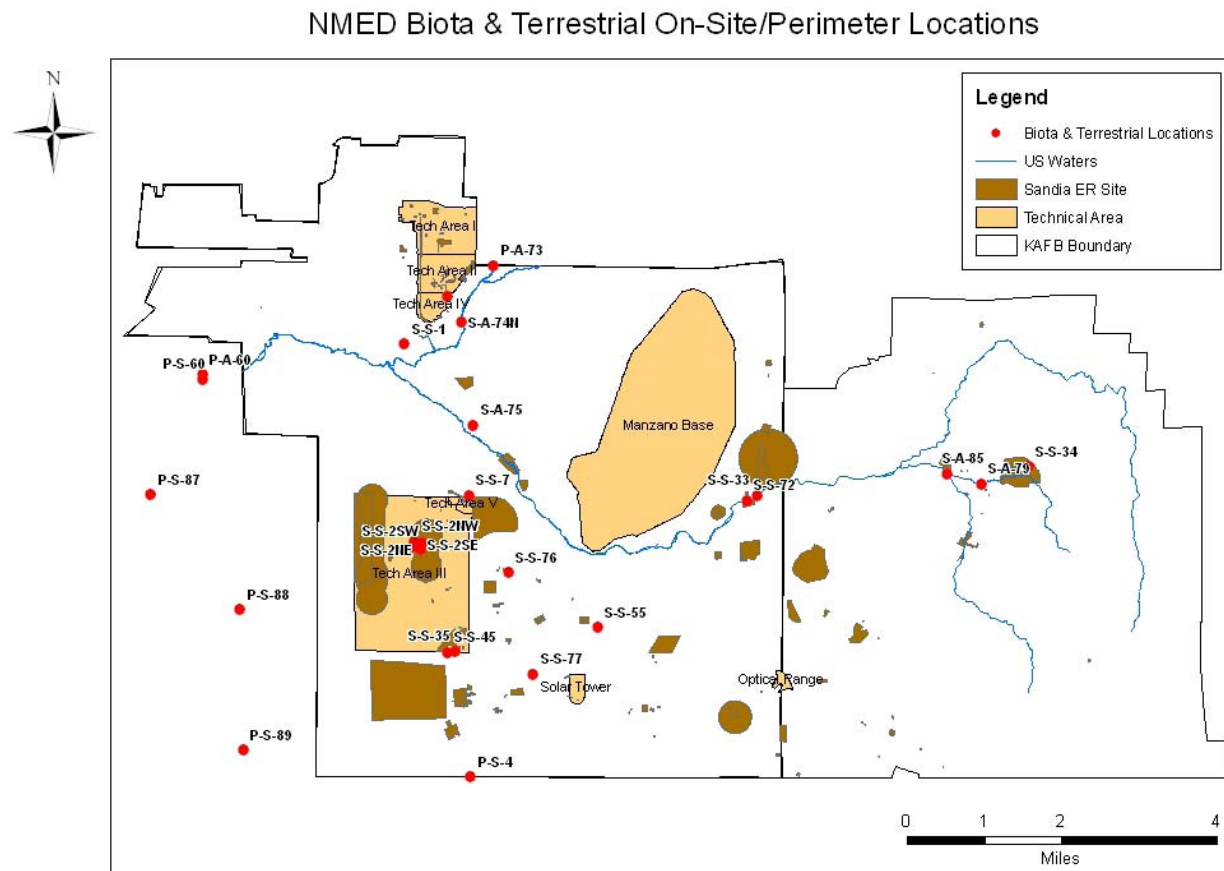


Figure STE49-1: On-site and Perimeter soil, sediment and vegetation sample sites

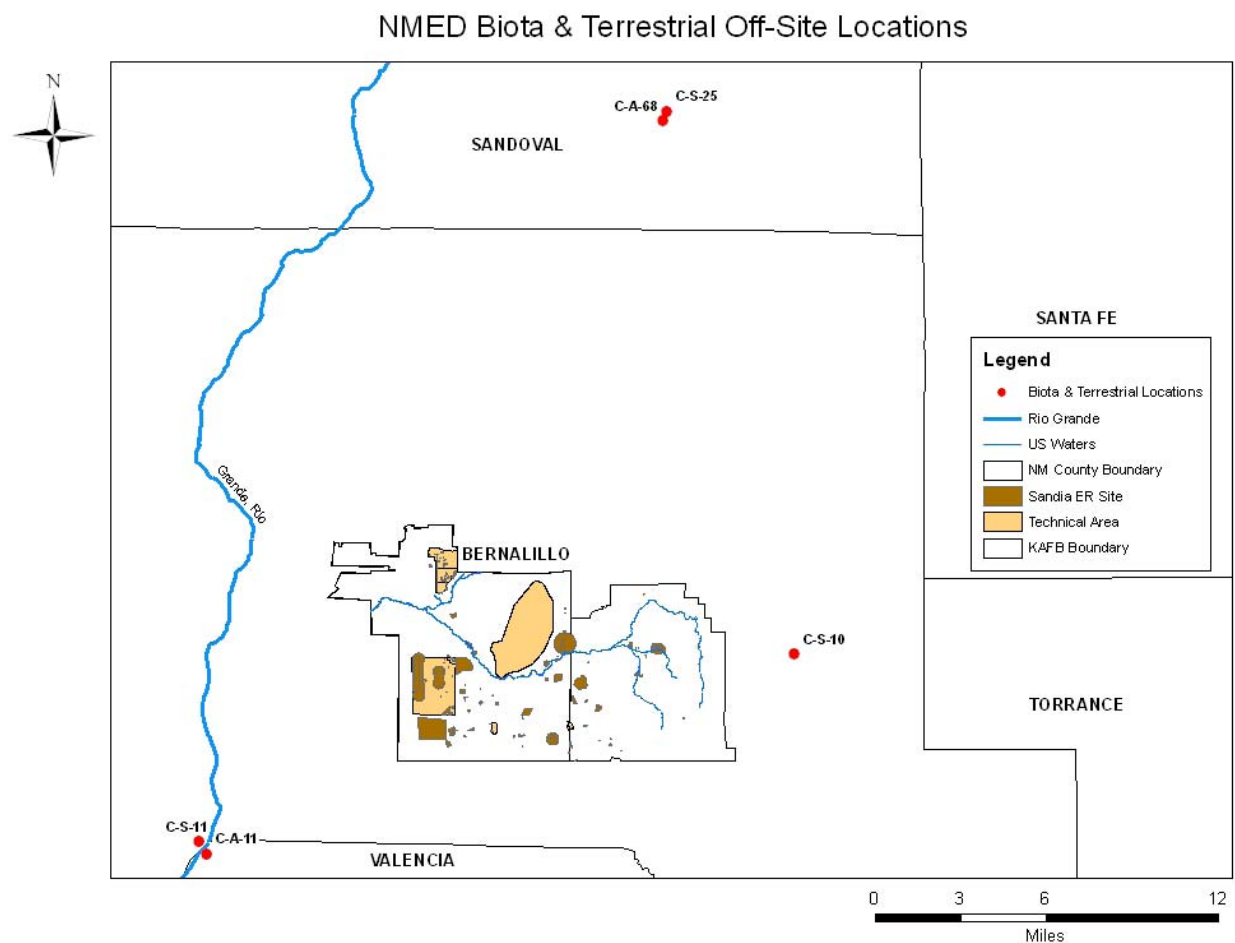


Figure STE49-2: Off-site soil, sediment, and vegetation sample sites

On August 12, 2010, Bureau staff provided DOE/SSO a draft data submittal for joint soil, sediment, and vegetation sampling conducted on May 11 and May 18 with Sandia staff. Together, the staffs collected 76 samples from 29 different locations both on and off KAFB. The Bureau samples were sent to four independent analytical laboratories for comparative analyses. The analyses requested recoverable metals, gamma-emitting isotopes, tritium, perchlorate, and high explosive compounds. Analyte concentrations were measured against background levels established in 1997 and the latest version of the NMED soil screening levels. All concentrations were below soil screening levels.

WASTEWATER PROJECT (SWW51)

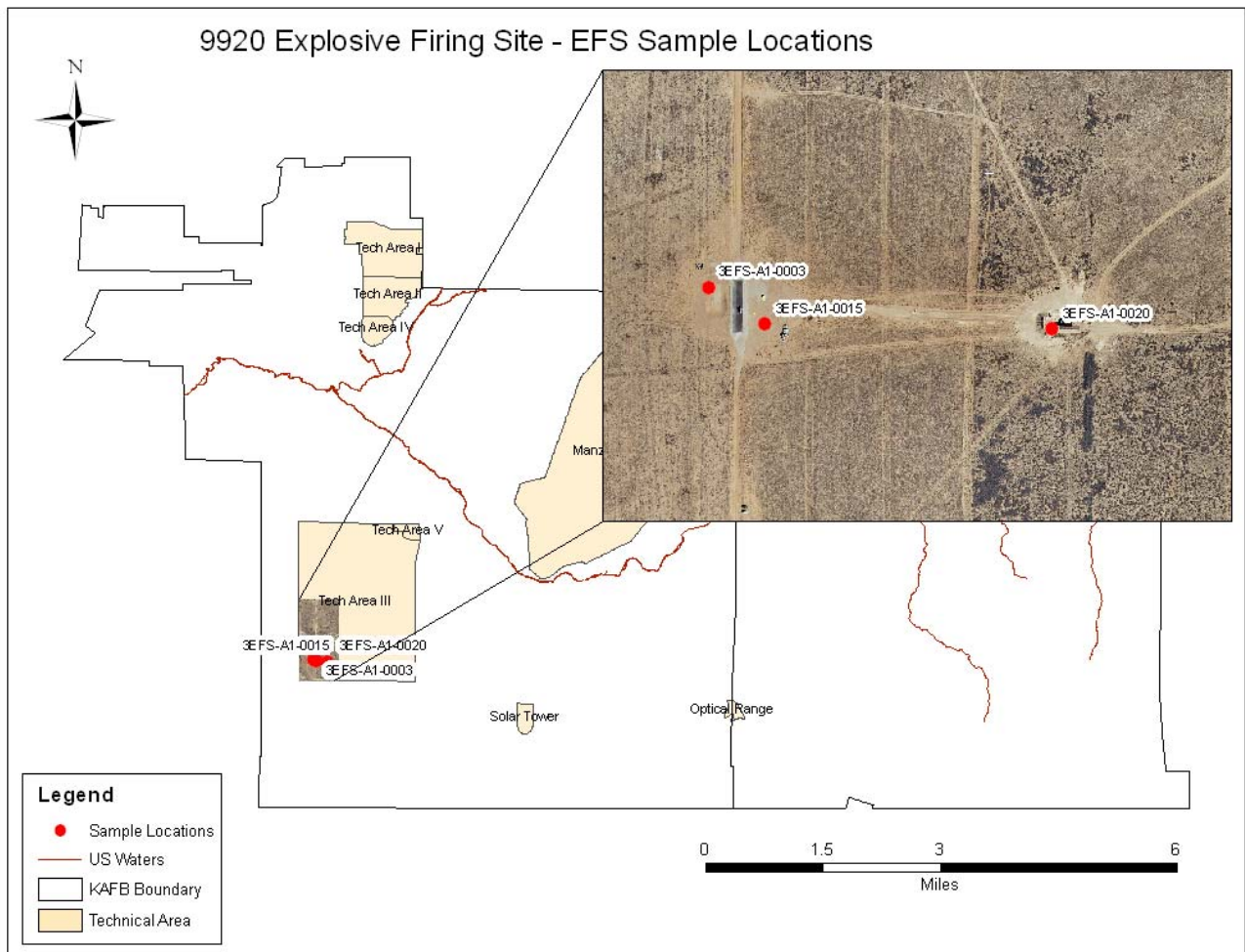
Under this Activity ID, Bureau staff conducts annual sampling of wastewater discharges from SNL operations in a cooperative effort with Sandia and the City of Albuquerque.

Quarterly Summary: During FFY10 Q-4, Bureau staff reported no activity.

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 FFY10 Q-4, Bureau staff reported no activity.



TECHNICAL REVIEW (STR54)

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

Quarterly Summary: During FFY10 Q-4, Bureau staff reviewed periodic documents for submission to DOE/SSO.

NPDES MONITORING (SNP55)

Under this Activity ID, Bureau staff conduct 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 FFY10 Q-4, 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 assists to the Bureau and DOE developing workplans, budgets and training requirements.

Quarterly Summary: During FFY10 Q-4, Bureau staff experienced some personnel changes, compiled FFY11 workplans, participated in required and educational training, and updated personnel and financial documents.

Barry Birch was appointed the new Staff Manager for the WIPP Oversight Section (WOS). He will also maintain his function as Staff Manager for the Sandia Oversight Section (SOS). He met with WOS staff, and he toured the facility, met with staff of CBFO and WTS, and reviewed workplans for the new federal fiscal year. While on the tour of the facility, Bureau staff received an update from the WTS Deputy Project Manager of the TRUPACT III shipping container project. The new container is designed to hold large objects, such as fume hoods, without having to be completely dismantled. Impact testing has already been conducted at SNL, and the container should be operational by June 30, 2011.

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 FFY10 Q-4, Bureau staff attended public meetings on the WIPP Hazardous Waste Permit renewal and Surplus Plutonium Disposition options.

Bureau staff attended a public hearing in mid-August in Carlsbad to receive public input on the WIPP Hazardous Waste Permit renewal. Approximately 30 people spoke, including representatives from the cities of Carlsbad and Hobbs. All speakers were in favor of the renewal, most citing the excellent safety record and the economic benefit of WIPP.

Bureau staff attended the public scoping meeting for the Surplus Plutonium Disposition (SPD) Supplemental Environmental Impact Statement (EIS) held in Carlsbad. Several changes have evolved during the history of the program to dispose of surplus, weapon-useable plutonium, allowing the DOE to announce its intent to modify the scope of the existing EIS issued in 1999. The WIPP site is under consideration for disposal of some of the plutonium in question. The SPD waste is considered by some to be similar to waste already emplaced at WIPP. Supporters stated that WIPP is the logical destination of choice, since WIPP is “ready” and has room to accommodate the SPD waste. According to the EIS, the maximum possible excess plutonium will be converted into mixed oxide (MOX) fuel, a nuclear fuel containing more than one oxide of fissile materials, for commercial power reactors and the remaining unacceptable waste would be disposed at WIPP or the Savannah River Site.

Bureau staff participated in the 111th WIPP quarterly meeting in Santa Fe on July 28 by providing an update on Bureau activities during the last quarter.

EXHAUST AIR MONITORING PROJECT (WEA72)

Under this Activity ID, Bureau staff monitor the exhaust air from the underground portion of WIPP (the salt mine) for radionuclides released during waste emplacement operations. Staff collects air filters daily and attends weekly or bi-weekly preventative maintenance probe pulls.

Quarterly Summary: During FFY10 Q-4, Bureau staff collected daily exhaust air filters and observed bi-weekly probe pulls and inspections at Station A.

Exhaust Air Monitoring Project: The Carlsbad staff continued NESHAP (National Emissions Standards for Hazardous Air Pollutants) air filter collection at WIPP Station A (both primary and back-up) and Station B (see Figures WEA72-1/2/3).



Figure WEA72-1: Monitoring Station A sits atop the 14-foot diameter main exhaust airshaft.



Figure WEA72-2: Inside Station A viewing one of the three filter sample sites (Skid A-2). Beneath the lower flange, a shrouded probe extends into the exhaust airshaft to focus the air stream up through the filter device above the table to collect particulates for radionuclide analysis.



Figure WEA72-3: Station B sits below the alternate exhaust airshaft used under abnormal conditions or for tests.

Station A monitors exhaust air under normal flow conditions. Station B monitors airflow under abnormal conditions. Filters are collected from the Station A skid of reference (primary) and its back up each morning. Primary filters are compiled monthly and shipped to an independent

contract laboratory for analysis of specific radio particulates. The filters from the back-up station are archived for future analysis, if required. Filters from Station B are collected on Wednesday mornings.

During this quarter, analytical results were received from the contract laboratory for sampling from January through March 2010. Staff provided DOE/CBFO with the final report titled “Station A Exhaust Air Monitoring at the Waste Isolation Pilot Plant / New Mexico Conducted by the NMED / DOE OB, January – March 2010.” Station A filters were analyzed for Am^{241} , Cs^{137} , $\text{Pu}^{238, 239/240}$, $\text{U}^{234, 235, 238}$. The result for Am^{241} was above the sample Minimum Detectable Concentration (MDC), but below the requested MDC. The remaining requested analyte concentrations were below each MDC.

Bureau staff shipped Station A filters for April through June to an independent contract laboratory this quarter.

Station A Probe Preventative Maintenance: Bureau staff has been present for all preventative maintenance probe-pulls at Station A during the inspection, photographing and cleaning of the shrouds and nozzles (the probe) (see Figures WEA72-4/5 below).



Figure WEA72-4: Probe at Station A, Skid A-1 as it is removed from the exhaust air monitoring station showing extensive salt accumulation. After removal from the hoist, it will be placed on the bench for photographing and cleaning before replacement into the shaft.



Figure WEA72-5: End view of probe extracted from Station A exhaust air monitoring point showing salt accumulation. Photos like this one are forwarded to EPA R-6, Dallas after each inspection.

This quarter, the preventative maintenance probe pull occurred every other Tuesday. Personnel from Washington Tru Solution (WTS), including the surface air monitor and cognizant engineer, the technician from Carlsbad Environmental Monitoring and Research Center (CEMRC), CBFO, and Carlsbad Technical Advisory Contractor (CTAC) are present, as well as Bureau staff. Regular removal and cleaning of the nozzles and shrouds minimizes the accumulation of salt and ensures collection of a representative sample of particulates on the filter. As the shrouds are removed, staff members photograph and document the condition of the probes for submission to the Environmental Protection Agency (EPA) Region 6 in Dallas, Texas.

After removal of the probes, the amount of salt occlusion is measured by WTS personnel for inclusion in reports submitted to the Bureau and to the EPA. An occlusion of 66.7% percent or more on the nozzle indicates that a representative air sample cannot be obtained from the effluent air stream, and therefore, the nozzle fails inspection. There were no reported failures this quarter.

DIRECT PENETRATING RADIATION PROJECT (WDP73)

Under this Activity ID, Bureau staff uses electret passive ion chambers to evaluate the ambient gamma radiation (direct penetrating radiation) at WIPP. Quarterly collections of readings from the units verify if operations at WIPP result in external radiation doses that exceed historical background levels.

Quarterly Summary: During FFY10 Q-4, Bureau staff read, calibrated and maintained the eighteen DPR monitoring units and reported results for CY 2010 Q-2.

Bureau staff recorded DPR results for this quarter that ranged from a minimum average quarterly dose of 25.0 mrem at WIPP 6 (adjacent to the WIPP) to a maximum average quarterly dose of 32.8 mrem at WIPP 16 (the rest area on US 285 between Carlsbad and Loving) (see Figures WPD73-1/2/3 for monitoring locations). Currently, WIPP 15 serves as a control for quality assurance, and it is located in the Bureau Office in Carlsbad. For this quarter, WIPP 15 showed an average quarterly dose of 29.0 mrem.

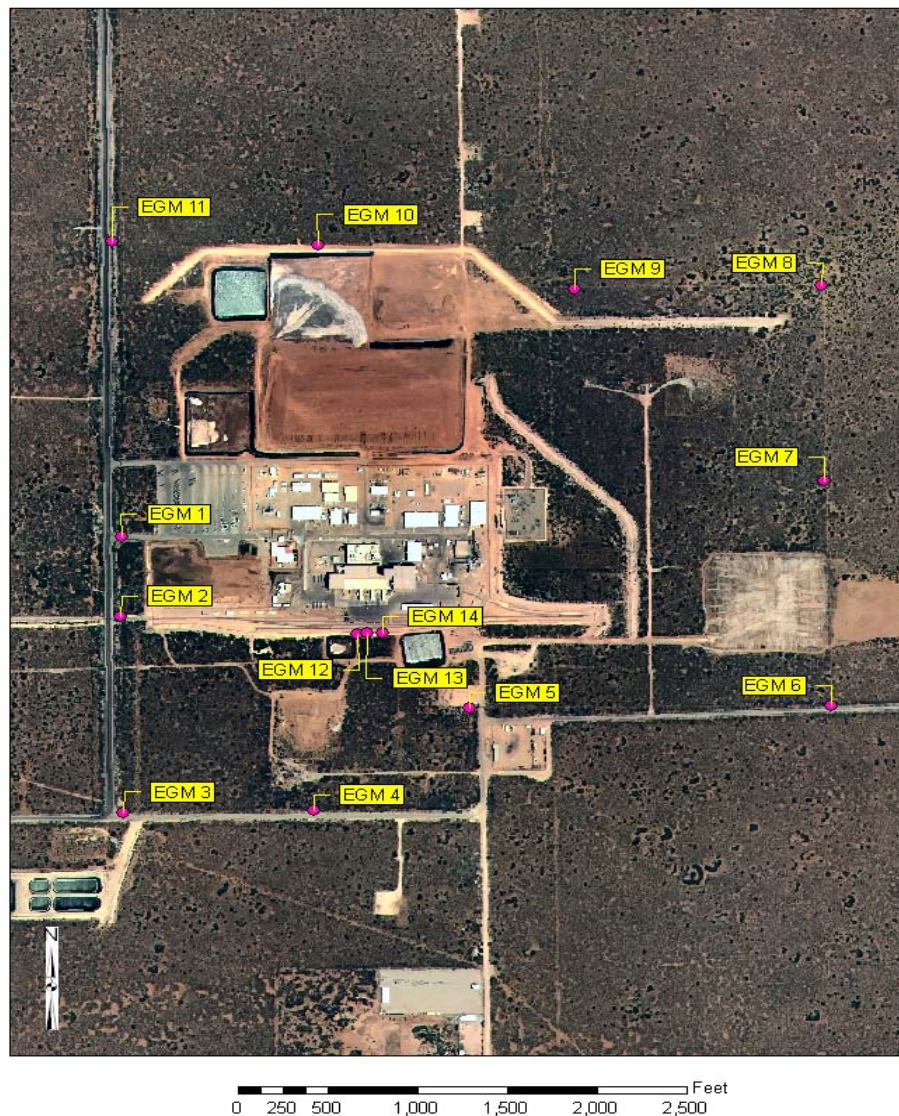


Figure WPD73-2: Map of DPR locations at or near the WIPP site.

Physical Location of the Oversight Bureau's Electret Gamma Monitors

WIPP 1 – Located on the Exclusive Use Area fence, east side of the North Access Road north of the cattle guard at the south driveway into the main parking lot at the WIPP.

WIPP 2 – Located south of the main parking lot at the WIPP, east side of the North Access Road on the backside of the gate in the Exclusive Use Area, north of the railroad track.

WIPP 3 – Located south of WIPP, east of the intersection of the North Access Road and WIPP Road. on the Exclusive Use Area fence, north of the cattle guard.

WIPP 4 – Located on the Exclusive Use Area fence, east of WIPP 3.

WIPP 5 – At the corner of the fence following WIPP Road beyond its intersection with the North Access Road at the “Tee”- intersection.

WIPP 6 – On the southeast corner of the Exclusive Use Area fence.

WIPP 7 – On the east side of the Exclusive Use Area fence, between WIPP 6 and WIPP 8.

WIPP 8 – On the northeast corner of the Exclusive Use Area fence.

WIPP 9 – On the north Exclusive Use Area fence, between WIPP 8 and WIPP 10.

WIPP 10 – On the fence of the Exclusive Use Area, north side of the salt pile, East of WIPP 11,

WIPP 11 – North of WIPP, east side of the North Access Road, at the north-west corner of the Exclusive Use Area fence (across the road from the Far Field ambient air monitoring station).

WIPP 12 – South of the loading dock, behind the Waste Handling Building (WHB), on the property protection area fence, south of the railroad track.

WIPP 13 - South of the loading dock, behind the WHB, on the property protection area fence, south of the railroad track.

WIPP 14 - South of the loading dock, behind the WHB, on the property protection area fence, south of the railroad track.

WIPP 15 - Outside the Oversight Bureau Office in Carlsbad.

WIPP 16 - At the rest area on US 285 between Loving and Carlsbad, on the fence behind the picnic tables.

WIPP 17 - Near the intersection of US 285 and Black River Village Rd, at the Malaga Volunteer Fire Department.

WIPP 18 – Near the intersection of the Hobbs Highway and the North Access Road, west of the cattle guard on the North Access Road.

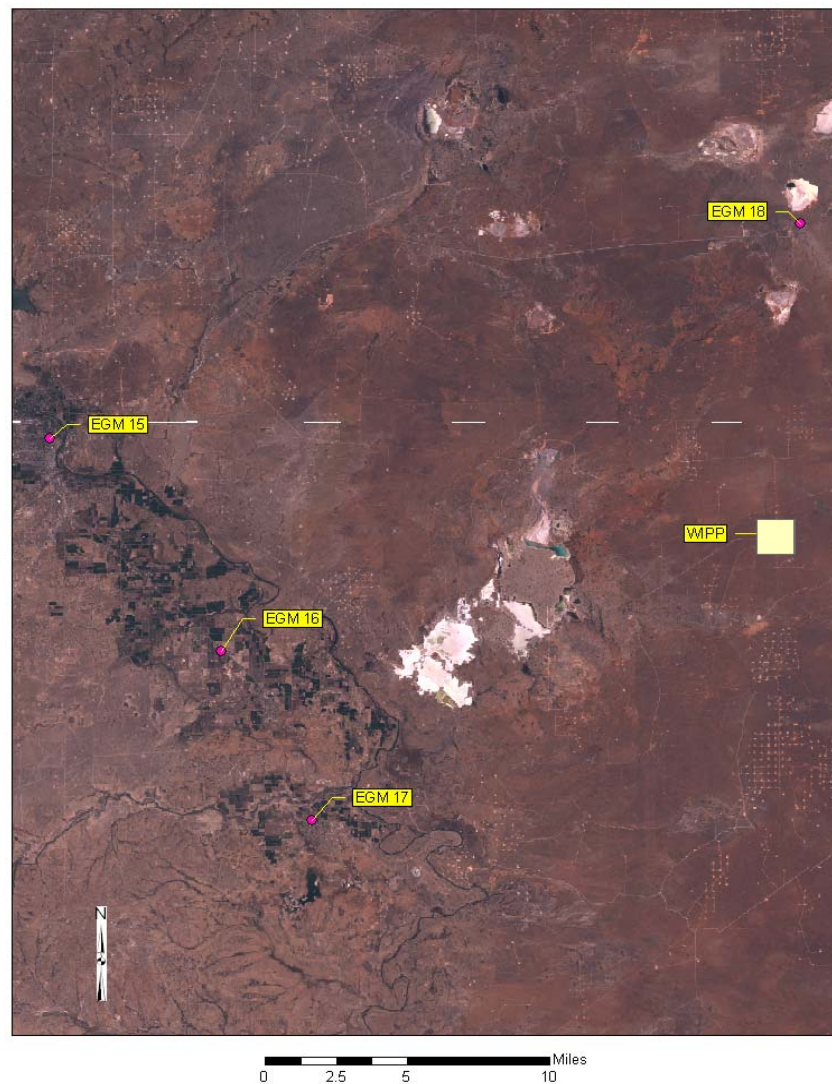


Figure WPD73-3: Map of PDR locations surrounding the WIPP site.

Bureau staff forwarded a draft data submittal to DOE titled “Direct Penetrating Radiation Monitoring at the Waste Isolation Pilot Plant Conducted by NMED /DOE OB for the CY 2010 Q-2.” The DPR results ranged from a minimum average quarterly dose of 22.6 mrem at WIPP 2 (adjacent to the WIPP) to a maximum average quarterly dose of 32.8 mrem at WIPP 16 (at the rest area on US 285 between Carlsbad and Loving). The averages are based on three readings at each station. (Figure WPD73-4 shows average values, with highs and lows at each of the eighteen stations since 2007.)

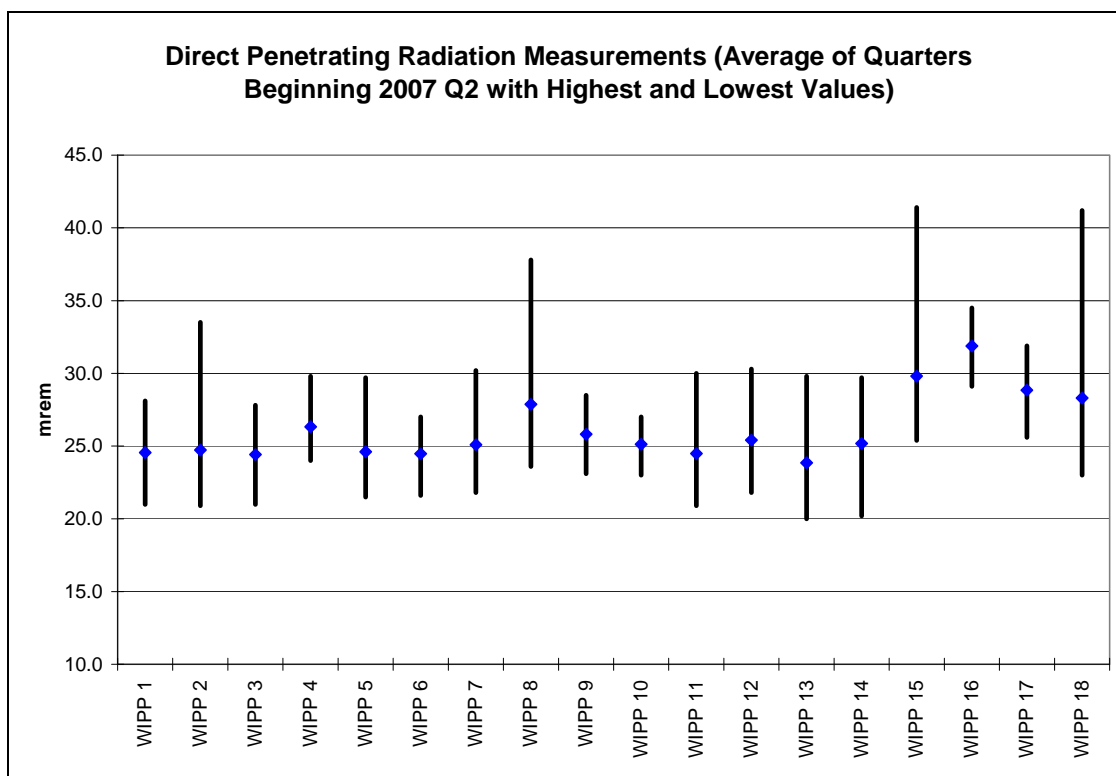


Figure WPD73-4: Plot of DPR average quarterly values from 2007 to 2010 at the 18 stations.

PARTICULATES LOW-VOLUME AIR PROJECT (WPL74)

Under this Activity ID, Bureau staff evaluates the presence of selected radionuclides as particulates in ambient air near WIPP. Ambient air is sampled with continuously running, low-volume air samplers drawing air through glass fiber filters at two cubic feet per minute (cfm). The filters are collected bi-weekly and composited by location quarterly. The filters are analyzed for the presence of Am^{241} , Cs^{137} , $\text{Pu}^{238, 239/240}$, and Sr^{90} .

Quarterly Summary: During FFY10 Q-4, Bureau staff collected bi-weekly filter samples and maintained the six low-volume air-monitoring stations, and reported CY 2010 Q-1 results to DOE/CBFO.

Bureau staff received CY 2010 Q-1 analytical results from the independent contract laboratory and provided a data submittal to DOE/CBFO titled, "Ambient Air Monitoring at the Waste Isolation Pilot Plant Conducted by NMED/DOE OB for CY2010 Q1." All values for the above listed radionuclides were reported below the requested minimum detectable concentrations.

Bureau staff shipped filters collected during CY 2010 Q-2 to an independent contract laboratory for analysis.

Bureau staff revised the Standard Operating Procedures (SOP) for low-volume air monitoring and submitted for review the document titled, "Procedure: Environmental Monitoring of Radio particulates in Ambient Air Using Low-Volume Air Samplers, Revision 1." Staff also updated the associated Job Hazard Analysis to the Bureau QA Officer. Both became effective on August

26. With the SOP approved, staff updated a draft of the Sampling and Analysis Plan (SAP) titled, “Sampling and Analysis Plan for Environmental Monitoring of Radio particulates in Ambient Air.”

Staff is considering relocating the baseline sampler, located behind the Bureau office in Carlsbad (Figure WPL74-1), to a proposed location southeast of WIPP to represent the background levels in the environment associated with the site. The proposed change would co-locate the Bureau sampler with a CEMRC monitoring station currently located to the southeast of WIPP (Figure WPL74-2).



Figure WPL74-1: Low-volume air monitoring station located outside the WOS office building.



Figure WPL74-2: A view of the proposed site for the Bureau background LVAS to be co-located with CEMRC units.

Staff regularly perform routine and preventative maintenance on all field equipment and manage a database for the ambient air program. During the past quarter staff maintained the five stations around the WIPP site and the baseline station at the Bureau office in Carlsbad (Figure WPL74-3), replacing components as needed. Staff shipped the airflow calibrator to the manufacturer's distributor for annual service and calibration. Based on experience to date staff prepared an estimate of equipment needs and total project costs for the FFY 2011 work plan.

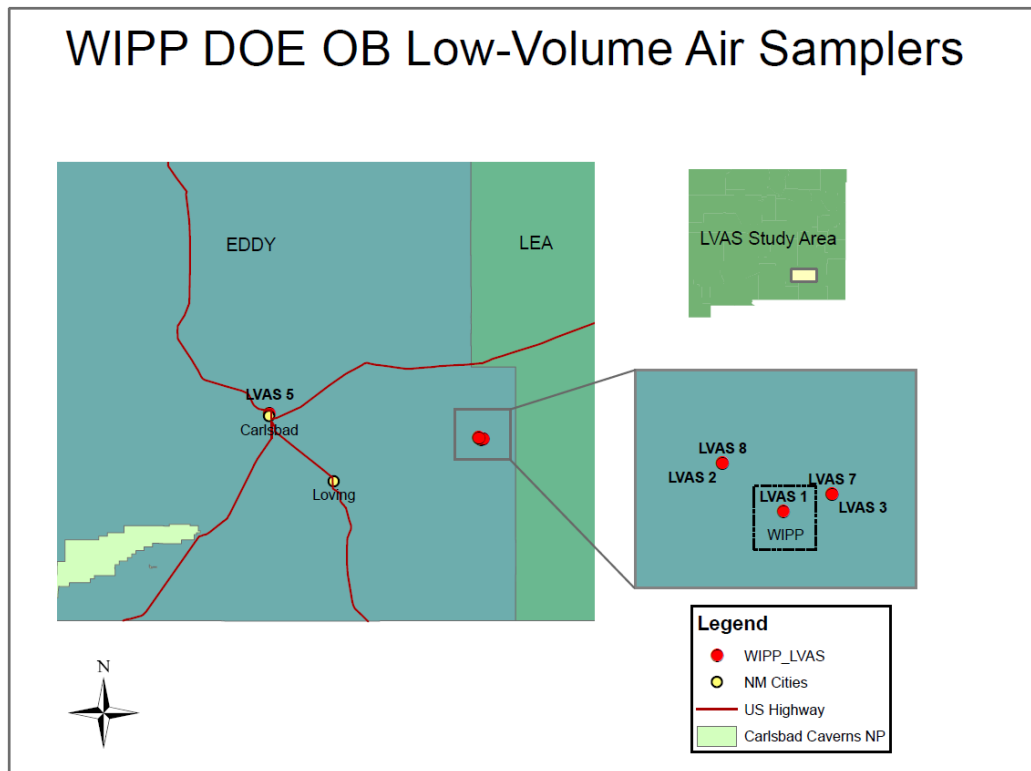


Figure WPL74-3: Map showing air-sampling stations near WIPP.

GENERAL ER/EM PROJECTS (WGE75)

Under this Activity ID, Bureau staff conduct multi-media environmental sampling, including soil, sediment, vegetation, surfacewater, and groundwater on a periodic basis and provides technical review services to the DOE, WIPP, and public interest groups.

Quarterly Summary: During FFY10 Q-4, Bureau staff collected vegetation samples from four locations, designated as Farfield, WIPP East, Mills Ranch, and WIPP South.

Soil Sampling: Bureau staff reported no activity.

Sediment Sampling: Bureau staff reported no activity.

Vegetation Sampling: Bureau staff shipped vegetation samples to an independent contract laboratory. The results are pending.

Bureau staff provided DOE a final data submittal titled, “Soil Sampling in the Vicinity of the Waste Isolation Pilot Plant Conducted by NMED / DOE OB, 2010.” For this sampling year, the report noted no findings above the requested minimum detectable concentration for the radionuclides of interest with the exception of uranium, which is a common element in soil of the surrounding area. The report noted no findings of U^{235} above the minimum detection concentration. The results for uranium-234 ranged from a minimum of 4.81 mBq/g at WIPP East (2-5 cm depth) to a maximum of 17.76 mBq/g at Smith Ranch (0-2 cm depth). The results for U^{238} ranged from a minimum of 5.55 mBq/g at both WIPP South (Duplicate) and WIPP East (both at the 2-5 cm depth) and a maximum of 19.24 mBq/g at Smith Ranch (0-2 cm depth). Please refer to Figure WGE75-1 for sample location sites).



Figure WGE75-1: Map showing vegetation sample location sites surrounding WIPP.

All uranium results were within the historical range of reported results around the WIPP site measured prior to waste emplacement activities and are consistent with the average range of

naturally occurring uranium found in soils (Waste Isolation Pilot Plant 1999 Site Environmental Report).

Surfacewater Sampling: Bureau staff reported no activity.

Groundwater Sampling: Bureau staff reported no activity.