



**New Mexico Environment Department
DOE Oversight Bureau**



2005 Annual Report

**Environmental Oversight and Monitoring
at Department of Energy Facilities**

Cover Photograph

The Rio Grande located in the Wild River Area north of Taos, New Mexico. Hemmingway Spring, an Oversight Bureau sampling location used to represent groundwater “background conditions” is located in the brown patch of vegetation in upper left of picture.



EXECUTIVE SUMMARY

The mission of the New Mexico Environment Department (NMED) is to promote a safe, clean, and productive environment. The NMED, Department of Energy (DOE) Oversight Bureau mission is to help assure that activities at DOE facilities in New Mexico are protective of public health, safety, and the environment.

The DOE facilities are:

- Los Alamos National Laboratory (LANL)
- Sandia National Laboratories (SNL)
- Waste Isolation Pilot Plant (WIPP).

The DOE Oversight Bureau's activities are outlined in *Agreements-in-Principle (AIP) between the State of New Mexico and the U.S. Department of Energy for Environmental Oversight and Monitoring*. The AIP was renewed in October 2005 for a period of 5 years. The DOE Oversight Bureau receives 100% of its funding from the federal government in the form of a grant.

As part of the federal grant process, the DOE Oversight Bureau prepares and submits a work plan in support of the AIP objectives and outlines the specific projects to be funded at each site. The Oversight Bureau requested \$1,800,000 to support 2005 operations.

The DOE Oversight Bureau received \$340,000 National Nuclear Security

Administration (NNSA) money for specific monitoring projects at SNL and LANL and was informed that it would receive no more than \$1,200,000 additional funding for 2005 Environmental Management (EM) programs. New Mexico citizen activist groups began a concerted effort to lobby DOE for additional funding. Letters from DOE LANL, DOE Albuquerque, the New Mexico Environment Department's Cabinet Secretary Ron Curry, and New Mexico Senator Jeff Bingaman were sent to DOE Washington requesting additional funding for a robust Oversight Program. The DOE Oversight Bureau was informed in June that it would receive an additional \$600,000 to bring the total funding for 2005 to the full \$1,800,000 requested. The additional \$340,000 from NNSA brought the DOE Oversight Bureau's total funding level to \$2,140,000.

The augmented 2005 AIP budget of \$2.14 million enabled the DOE Oversight Bureau to dramatically expand storm water and groundwater monitoring efforts at both LANL and SNL in 2005. The DOE Oversight Bureau hired six interns for the 2005 field season and spent nearly \$430,000 on monitoring efforts (\$306,145 at LANL and \$123,652 at SNL).

In 2004, DOE and the State of New Mexico joined in discussions to establish a DOE Oversight Bureau office in Carlsbad, NM for the oversight of activities at the Waste Isolation Pilot Plant (WIPP). These

discussions were the result of the loss of the Environmental Evaluation Group (EEG). The EEG was established by federal law for the independent oversight of the design and disposal phases of the WIPP project. In 2004, DOE and NMED established a separate basic Agreement-In-Principle for WIPP. In late 2005, a revised and comprehensive AIP was developed between the State of New Mexico and the DOE,

along with a separate Scope of Work and Statement of Joint Objectives to further specify the roles of the new oversight office.

The WIPP Oversight Office funding for 2005 was \$600,000 from DOE sources and is exclusively for support of WIPP operations and is separate from other AIP funds. Funding for the WIPP Oversight Office is secured through July 2008.



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PUBLIC OUTREACH AND EDUCATION

The DOE Oversight Bureau interacts extensively with the public, local Pueblos, citizen activist groups, Citizen Advisory Boards at DOE facilities, other bureaus within NMED, and other government agencies (e.g., Environmental Protection Agency, United States Fish and Wildlife). The Bureau shares data and findings through poster and verbal presentations at public meetings, informal discussions, and posting data and reports on our web site:

http://www.nmenv.state.nm.us/DOE_Oversight/mondata.html

Citizen's Advisory Board (CAB) Environmental Monitoring and Surveillance Committee

The DOE Oversight Bureau continued to interact with the Northern New Mexico Citizen's Advisory Board Environmental Monitoring and Surveillance Committee. This committee works to ensure early and ongoing community access to LANL monitoring and surveillance information. In past years, the committee addressed ground water, air, and liquid discharge issues.

LANL Oversight staff reviewed and submitted comments for several LANL CAB documents, including "Comments on Public Meetings by the CAB" and "Draft Recommendation to the Department of Energy No. 2005-02 Regarding LANL's Water Quality Database Website." The DOE Oversight Bureau's recommendations to the DOE regarding LANL's Water Quality

Database website were generally favorable and supportive of LANL's effort that enables all interested parties to access LANL's historical environmental surveillance data.

Santa Fe Oversight staff presented polychlorinated biphenyls (PCB) findings along the Rio Grande corridor from below Taos to Albuquerque. The presentation summarized a 2-year joint effort with LANL to establish a baseline of low-level PCB results in northern New Mexico to help characterize levels of PCBs in the Upper Rio Grande watershed soils, sediments, and water and to differentiate sources at or below major municipalities along the Rio Grande.

DOE Oversight Bureau staff attended the Area G Forum at the Santa Fe Community College. Approximately 150 people attended the Area G Forum, sponsored by the Northern New Mexico Citizen's Advisory Board. Concerned Citizens for Nuclear Safety (CCNS), NMED, the Pueblo de San Ildefonso, and LANL presented posters prior to the Forum. Plans to expand Area G into Zone 4, increasing the size from 63 acres to 93 acres, were presented by LANL. NMED's Hazardous Waste Bureau indicated it would be issuing two draft permits under RCRA (and addressing final closure) within the next 9 months. Also discussed, was the history of the landfill, current operations, and risks posed to the workers and the surrounding communities from materials stored at Area G.

Interactions With Local Citizen Activist Groups

The DOE Oversight Bureau, through public outreach activities, routinely interacts with citizen and activist groups and the general public. Common ground can be found between the parties through the overlap of environmental issues concerning DOE

facilities in New Mexico. LANL Oversight staff assisted groups such as the Los Alamos Study Group (LASG); Concerned Citizens for Nuclear Safety (CCNS), Amigos Bravos (Friends of Wild Rivers) of Taos and the Embudo Valley Environmental Monitoring Group (EVEMG) on many DOE related environmental issues.



Figure 1. Citizen groups ready to disembark from Buckman Landing: From left to right, Rachel Conn of Amigos Bravos, Sheri Kotowski of EVMG and Joni Arends of CCNS during a Sampling Event on Rio Grande during May 2005

In 2005, the DOE Oversight Bureau provided information and GIS support on DOE facility historical releases that included detailed maps of the area's watersheds that ultimately drain to the Rio Grande. In May, the DOE Oversight Bureau provided CCNS with maps that were used to support a raft trip hosted jointly by CCNS, Amigos Bravos and EVEMG (Figure 1). The purpose of the raft trip was to measure any contamination

that may be present in the numerous springs discharging from White Rock Canyon below LANL. DOE Oversight Bureau staff accompanied these groups as site guides during their sampling event and collected several split-samples at springs, one of which showed a trace detection of high explosives. Follow-up samples collected several months later showed no detection of

high explosives, and the DOE Oversight Bureau will sample the spring again in 2006.

During January 2005, LANL Oversight staff discussed NMED's involvement in perchlorate issues at LANL with Tom Parker who is working for CCNS as an independent reviewer on Rio Grande water issues involving possible LANL impacts. He was provided with a DOE Oversight Bureau background perchlorate abstract in addition to recent background perchlorate posters that the Bureau had previously presented at professional conferences.

In December, several DOE Oversight Bureau staff attended the CCNS-sponsored "Forum to Promote Effective Cleanup at Los Alamos National Laboratory." The main topics of the Forum were radiation basics, epidemiology, RESRAD (the DOE code for calculation of dose), waste, plutonium, accountability and long-term stewardship issues, a summary of article entitled "Bad to the Bone" an Institute for Energy and Environmental Research (IEER) report detailing IEER's recommendations to EPA for lowering the plutonium standards in drinking water. Also discussed, was whether or not groundwater contaminants from Los Alamos have reached the Rio Grande (a report summary by George Rice), and an evaluation of the monitoring wells at LANL for the detection of contamination (presented by Bob Gilkeson, an ex-LANL contractor).

The LANL Risk Analysis, Communication, Evaluation, and Reduction (RACER) Project

The DOE Oversight Bureau continued to support the RACER project headed by Risk Assessment Corporation (RAC) under contract to Colorado State University. The project will bring all types of environmental data together that was collected at LANL over the past 5-years by different agencies.

The data will be integrated under a similar format for ease of use for large site-wide multi-media risk assessment tools. Upgrades to NMED's current database & GIS capabilities at the LANL and Santa Fe Oversight Bureau offices were made during the year to accommodate RACER's database design.

The DOE Oversight Bureau "beta tested" the latest version of the RACER integrated database and used the database to determine which contaminants should be monitored for below sites which may have been locations of potential releases in order to determine best management practice (BMP) performance. The DOE Oversight Bureau also used the database to provide storm water quality data for all watersheds on the Pajarito Plateau in preparation for the upcoming 2006 Surface Water Quality Bureau's Total Maximum Daily Load (TMDL) study. In addition, Oversight Bureau staff provided the RACER team with periodic descriptions of any problems and needed improvements to the database. This database is proving to be very user-friendly and useful to all parties involved in the oversight of LANL and its facilities.

DOE Oversight Bureau staff attended a public forum in February initiated by RACER and the New Mexico Community Foundation, administered by the Northern New Mexico Community College. The purpose of the meeting was to update the community on the progress of the RACER project and solicit public participation and comments.

RACER staff held a public demonstration of the on-line RACER database at Mesa Library in September. The DOE Oversight Bureau offered comments to make it user-friendly. The RACER Concentration Database can be found

at: <http://racerd.b.nmsu.edu/>.

Interactions with Local Pueblos

The DOE Oversight Bureau has a long-standing history of working with the 4 Accord Pueblos (Pueblo de San Ildefonso, Jemez Pueblo, Cochiti Pueblo and Santa Clara Pueblo) that surround Los Alamos National Laboratory. The Pueblo de San Ildefonso remains a significant player in the Bureau's monitoring scheme due to its location down gradient from LANL. In addition, the Pueblo de San Ildefonso's border with Los Alamos National Laboratory contains many of the canyons that have received much of the legacy wastes and current environmental releases from the LANL.

DOE Oversight Bureau staff took part in LANL's annual environmental surveillance sampling of surface and groundwater that also included many locations on Pueblo de San Ildefonso lands. Staff from both the Santa Fe and LANL Oversight Bureau offices teamed with Pueblo de San Ildefonso staff to collect split-samples of six wells and seven springs. Pine Rock Spring, located due north of the White Rock Overlook Park, was sampled for the first time by the Oversight Bureau and was found to have unique water chemistry. At the time of this report, Tribal, NMED and LANL investigators are still trying to track down the source of this spring's chemical signature. It is the policy of the DOE Oversight Bureau to not disclose data collected on Tribal lands as prescribed by the current Memorandum of Understanding (MOU) between NMED and the Pueblo of San Ildefonso. In addition, any subsequent data submittal to any state, federal, public or private entity only occurs under the strict discretion of the Pueblo.

The DOE Oversight Bureau coordinated with Pueblo de San Ildefonso to locate storm water sampling equipment in lower Los Alamos Canyon near its confluence with the Rio Grande. The Bureau collected samples during three events and analyzed them for polychlorinated biphenyls, metals, radioactivity and suspended sediment concentration.

LANL Oversight staff conducted a half-day workshop for staff of the Environmental Department of Pueblo de San Ildefonso in August 2005. The training consisted of field and classroom activities. A training manual written by DOE Oversight Bureau staff was provided to Pueblo staff attending the workshop. Field training involved site selection and placement of Environment Liquid Samplers (ELSSs) and rain gages. ELSSs are patented single stage sampling devices routinely used by DOE Oversight Bureau staff to collect storm water run-off.

Sandia Oversight staff have continued to interact with representatives of the Isleta Pueblo, specifically in the collection of groundwater samples from wells on Pueblo land.

Judging Local Science Fairs

Sandia Oversight staff judged several science fairs throughout the Albuquerque area including Cleveland Middle School, Rio Rancho High School, and the NM Regional Science Fair.

New Mexico State Fair

DOE Oversight Bureau staff from all offices helped operate a booth for NMED at the New Mexico State Fair. At this booth, staff handed out NMED information pamphlets and WIPP depository salt packets to the public as well as addressing questions from the public on the environmental impact of DOE activities at LANL, SNL, and WIPP. The DOE Oversight Bureau is evaluating

how to better use this venue to communicate with the public in 2006.

National Environmental Policy Act (NEPA)

All DOE facilities are subject to the National Environmental Policy Act (NEPA). NEPA establishes a national policy promoting awareness of the environmental consequences of human activity on the environment and consideration of environmental impacts during the planning and decision-making stages of a federally funded project. It requires federal agencies to prepare either an environmental assessment (EA) or environmental impact statement (EIS) for any federal actions that may have a potentially significant environmental impact on the environment. Because both Sandia National Laboratories and Los Alamos National Laboratory are large operational DOE facilities that routinely conduct major building, renovation or mission/national security-related projects, the Oversight Bureau frequently reviews and comments on significant EA or EIS documents that concern either LANL or SNL.

The LANL Oversight office staff reviewed and commented on the DOE National Nuclear Security Administration's (NNSA) pre-decisional draft "Environmental Assessment for the Proposed Closure of the Airport Landfills Within Technical Area 73 at Los Alamos National Laboratory, New Mexico (DOE/EA-1515)."

LANL and SNL Oversight staff also reviewed and commented on the "Environmental Assessment for the Proposed Consolidation of Neutron Generator Tritium Target Loading Production DOE/EA-1532 Pre-Decisional Draft Date Issued: May 11, 2005."

Interactions with Facilities and Regulatory Bureaus

The LANL Oversight Office maintained its close interactions with facility and regulatory officials on activities pertaining to the characterization, corrective action, and monitoring of groundwater beneath LANL. The implementation of the NMED Consent Order for LANL, 2005, marked the last year in which quarterly and annual meetings were held under LANL's Hydrogeologic Work Plan. All well drilling activities are now prioritized by canyon and material disposal area and directed by the Order and its requirements.

The DOE Oversight Bureau's participation in the final February quarterly and May annual meetings included the presentations of three abstracts on "works-in-progress." These presentations included a Cesium in Moss study of the Spring 4 Series in lower Pajarito Canyon, a background Perchlorate study of springs discharging to the Rio Grande within the vicinity of Taos south to Los Alamos, and a study of the Pajarito Fault Zone and its effect on a local shallow aquifer at the west boundary of LANL.

To better facilitate technical interactions concerning the NMED Consent Order, the DOE Oversight Bureau assisted with the development of the Laboratory's site-wide monitoring program. Additionally, the DOE Oversight Bureau provided document review and comment, data and information, evaluation and interpretation, suggestions on well construction, split sampling and sampling methodologies, along with field excursions to well locations.

The DOE Oversight Bureau assisted LANL in interpreting, evaluating, and reporting historical and recently collected water-quality data with respect to water quality impacts to the 4 Series Springs.

The DOE Oversight Bureau assisted the United States Geological Service (USGS) in studying the groundwater recharge and pathway project for the Española basin. The DOE Oversight Bureau provided field support to USGS for down-hole temperature logging, collection of samples, etc., at several wells and springs east of the Rio Grande and helped guide their sampling at several west-side stations including Water Canyon Gallery, Spring 4C and Pajarito Ski Basin #2 well.

Sandia Oversight staff attended several poster sessions presented by SNL explaining to the public requested changes to the upcoming RCRA permit to be issued by the NMED Hazardous Waste Bureau.

Technical Interactions Regarding LANL's Groundwater Management Program Plan & Hydrogeologic Work Plan

Throughout the year, DOE Oversight Bureau staff worked closely with LANL and NMED's Hazardous Waste Bureau staff on specific issues pertaining to the Laboratory's ongoing drilling activities and problems associated with past drilling operations. Activities included:

- Providing input on determining drill locations for several new characterization wells that were drilled in 2005;
- Providing real-time assistance and recommendations concerning well completions [e.g., screen depth(s)];
- Providing a written assessment, with recommendations, concerning improper well construction procedures applied at many of the multi-level Westbay characterization wells;
- Issuing documentation on pumping influences at the contaminated regional characterization well R-15;

- Performing a review and provided written comments on the LANL's document entitled, "Well Screen Analysis Report," dated November 2005; and
- Submitting a memorandum to DOE (background, possible sources, etc.) concerning the detection of dissolved chromium at regional aquifer characterization well R-28.

Spill Investigations at Los Alamos National Laboratory and Sandia National Laboratories

The Santa Fe Oversight office supports other Environment Department Bureaus by investigating spills at both LANL and SNL. DOE Oversight Bureau staff respond to spill notifications by the facilities and provide advice and recommendations to the facilities as well as supplemental information to NMED regulatory bureaus. The Bureau documents the site conditions and actions taken by the facilities and collects samples to identify potential contamination issues. The DOE Oversight Bureau conducts follow-up inspections to verify that corrective actions taken by the facilities meet regulatory requirements and if they do, will recommend closure of the spill to NMED regulatory bureaus.

The Santa Fe Oversight office investigated a spill of 18,000 gallons of storm water that occurred when the water was evacuated from the basement area of the pump house construction site at the TA-50 radioactive waste treatment facility into a temporary aboveground soil-bermed retention pond, which breached. The spill entered Ten Site Canyon, a tributary of Mortandad Canyon. LANL did remediate the site and replaced the retention pond with three 3,000-gallon holding tanks that will also be used for dust control at the site. Additional Best

Management Practices were placed and site stabilization work was initiated. Remedial actions taken by LANL to mitigate the spill were appropriate and adequate. The DOE Oversight Bureau sent a letter to the facility and the regulatory bureaus noting that the spill response has met all regulatory requirements and should be considered complete.

Santa Fe Oversight staff also investigated spills at SNL and recommended closure of these events to the regulatory bureaus. One spill involved the release of diesel fuel. SNL had performed a clean up of the area down to bedrock. While soil samples continued to show elevated diesel concentrations it was determined that further remediation efforts may not be effective. Another spill involved mineral oil leaking from equipment to be disposed. Remedial actions taken by SNL to mitigate the spill were appropriate and adequate. The DOE Oversight Bureau sent a letter to the facility and the regulatory bureaus noting that the spill response met all regulatory requirements and should be considered complete.

Data Releases and New Publications

The LANL Oversight Office provided all 2004 groundwater and surface water

monitoring results at the LANL facility to DOE.

The SNL Oversight Bureau office shared its 2004 environmental monitoring data with the following NMED Bureaus:

- Hazardous Waste Bureau
- Ground Water Quality Bureau
- Surface Water Quality Bureau.

The DOE Oversight Bureau published its 2004 Annual Report on environmental oversight and monitoring at DOE facilities in New Mexico. The reports can be found at http://www.nmenv.state.nm.us/DOE_Oversight/pubs.htm

The DOE Oversight Bureau began plans to revamp, update, and improve its website. The NMED website can be a valuable tool for disseminating information to the public. Key web development personnel have been selected and trained. In 2006, the DOE Oversight Bureau's web page will undergo significant changes and upgrades.



LOS ALAMOS NATIONAL LABORATORY

Environmental Monitoring

Site-Specific Storm Water Monitoring

A NPDES Federal Facility Compliance Agreement (FFCA) issued in 2004 requires LANL to evaluate storm water for contaminant parameters previously identified as part of Resource Conservation Restoration Act (RCRA) site investigations. Contaminated sites previously determined by LANL as having high erosion potential are priority sampling locations for 2006.

In June of 2005, DOE Oversight Bureau and LANL staff co-located 20 sampling stations in drainages that would collect storm water runoff from 58 high erosion potential sites listed in the FFCA. The sampling stations were located in 7 canyons within the LANL facility boundary. DOE Oversight Bureau staff used Environmental Liquid Samplers (ELSSs) to collect their storm water samples while LANL used a combination of “single-stage” samplers and Teledyne ISCO brand automatic liquid samplers. The DOE Oversight Bureau staff also recorded rainfall at rain gauges that were installed at 12 of the 20 sampling stations.

From July through September, DOE Oversight Bureau staff collected three storm water samples from ELSSs at each of the 20 sampling stations. LANL also collected three samples at these sampling stations, but because of FFCA requirements, LANL had

to continue collecting samples until the end of October. Stormwater monitoring in the arid southwest is unpredictable and not all rain events produce significant runoff volumes to sample, as evidenced by the fact that during the three months that the DOE Oversight Bureau collected samples, rain gage readings indicated it took an average of 7 rain events and an average rainfall of 0.7 inches in a canyon to collect the needed 3 samples per sampling station.

All DOE Oversight Bureau storm water samples collected were analyzed for suspended sediment concentration, radiological and/or 17 metal parameters. In addition, polychlorinated biphenyls were also analyzed for in samples collected at 18 of the 20 sampling stations. Due to the FFCA requirements, LANL samples were analyzed for additional parameters, but were always analyzed for the same parameters used by the DOE Oversight Bureau.

An evaluation of the DOE Oversight Bureau’s storm water data collected during this period indicated elevated levels of metals, radionuclides, PCBs, and suspended sediments are continuing to be released in storm water from many potential release sites. This data indicates that many site Best Management Practices require repair and/or up grading and some sites may require additional remediation.

Watershed Storm Water Monitoring

The DOE Oversight Bureau conducts watershed-scale storm water monitoring using automatic water samplers at established LANL gage stations. The Bureau focused the bulk of its watershed storm water monitoring efforts at five locations in Los Alamos and Pueblo Canyons. Additional samples were collected in Cañada del Buey, Sandia and Mortandad canyons. A total of six storm events at 10 stations were sampled. Multiple automatic samples were obtained per event as well as grab samples. Fifty-three samples were collected and submitted to analytical laboratories for suspended sediment concentration, radionuclides, metals, and PCBs.

Preliminary assessment of the PCB data indicates that high levels of PCBs are being found in storm water from Upper Pueblo and Los Alamos canyons. The samples showed a decrease in PCB levels, as they were collected further downstream but still exceeded the State water quality wildlife habitat and human health standards as they exited LANL property. Pueblo Canyon joins Los Alamos Canyon near the eastern boundary of LANL. PCBs remain above the State standards as they pass through lower Los Alamos Canyon and enter the Rio Grande. Elevated levels of PCBs were also found in Sandia and Mortandad canyons where the bulk of the runoff remained on Laboratory property.

At the time of this report, the remaining data from the analytical laboratories is still pending and will be evaluated upon receipt in 2006.

Plutonium Transport from Pueblo Canyon

The DOE Oversight Bureau estimated that 23.6-millicuries (mCi) of plutonium 239/240

were present in 6000 tons of suspended storm water sediments that were transported from Pueblo Canyon during 2004. The Bureau estimates that since the Cerro Grande fire, including the 2004 estimate, a total of 138.9-mCi of plutonium 239/240 has been transported from Pueblo Canyon. Figure 2 demonstrates the annual plutonium 239/240 inventory transported from Pueblo Canyon since the Cerro Grande fire.

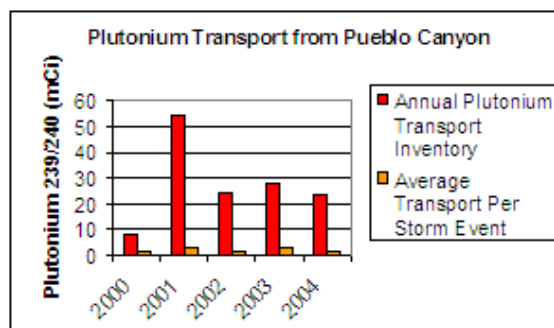


Figure 2. Annual plutonium 239/240 inventories transported from Pueblo Canyon and average plutonium 239/240 inventories transported during individual storm events.

The greatest plutonium mass transported, 54 mCi, occurred during 2001, while the Bureau saw approximately 25 mCi transported during each of the following years, 2002, 2003, and 2004. The average plutonium transported per event is fairly steady, although extraordinary storm events have occurred each year that carry the majority of contaminated sediments.

The 2000 Cerro Grande fire created conditions in watersheds where most rainfalls resulted in large runoff events. Before the fire, storm water flows in Pueblo Canyon rarely exceeded 10 cubic-feet-per-second (cfs). Since the fire, storm water flows have increased in frequency and intensity. These flows have destabilized the drainage channels and are transporting eroded sediments downstream. The Pueblo Canyon channel, impacted from past LANL radiochemical discharges, is continuing to

contribute contaminated sediments to frequent and regular storm water flows. In 2001, a 1440 cfs flood occurred in July, a 583 cfs flood occurred in 2002, a 749 cfs flood occurred in 2003, and a 504 cfs flood

occurred in July of 2004. Table 1 demonstrates annual storm water flows and associated plutonium 239/240 transported from Pueblo Canyon each year.

Annual Storm Flow and Plutonium 239/240 Transport						
Year	Number of storm flows greater than 10 cfs	Maximum flow (cfs)	Mean flow (cfs)	Median flow (cfs)	Total Plutonium transport (mCi)	Mean Plutonium transport per event (mCi)
2000	6	147	64	50	8.4	1.4
2001	17	1440	145	25	54.3	3.2
2002	17	583	65	16	24.4	1.4
2003	9	749	142	59	28.2	3.1
2004	15	504	71	21	23.6	1.6
Total	64				138.9	

Table 1. Annual Storm Water Flow and Plutonium 239/240 Transport From Pueblo Canyon, Los Alamos National Laboratory.

The Bureau has postulated that as the watershed and drainage channels stabilize, diminishing transport trends would develop. As of yet, these trends have not developed. As of the date of this report, the numbers of flows and plutonium transport rates are responding to the random nature of rainfall events.

Snowmelt Runoff Monitoring on the Rio Grande

The DOE Oversight Bureau collected samples of snowmelt runoff at four locations along the Rio Grande in 2005. These samples were collected on the day of peak runoff in 2005 at the City of Espanola, Otowi Bridge, Buckman Landing, and Frijoles Canyon below LANL. There was one exceedance of the lead chronic aquatic

life water quality standard at the Otowi Bridge. All other results were below applicable standards.

Confirmatory Sampling in Pueblo Canyon

The Hazardous Waste Bureau required that the LANL Environmental Characterization and Remediation (EC&R) group collect additional samples of Pueblo Canyon sediment deposits for dioxin and furan assessment. The DOE Oversight Bureau split four samples from various locations and depths with EC&R. These samples were analyzed for dioxins, furans, and PCBs. The DOE Oversight Bureau included PCBs during this analysis because some PCBs behave toxicologically the same way as dioxins and furans but have a lower strength. DOE Oversight Bureau Staff

convert those PCB data to equivalent dioxin concentrations. A similar process is used for all the different dioxin and furan congeners. All of those dioxin equivalents were summed up and compared to the LANL aquatic and terrestrial ecological screening levels for dioxin. DOE Oversight Bureau data indicate that the average dioxin equivalent values in sampled Pueblo Canyon sediments are approximately 13 and 16 times the aquatic and terrestrial screening levels, respectively. The DOE Oversight Bureau's results show that PCBs contribute approximately one-half of the total dioxin toxicity.

Embudo Valley Watershed Monitoring

In 2005, the Embudo Valley Watershed Monitoring Group requested that the Oversight Bureau collect samples to determine local conditions near Airnet stations in the Dixon area and as a way to verify exceptional values obtained in their area after the Cerro Grande Fire and establish current conditions for future comparisons. Ash and smoke from the Cerro Grande Fire heavily impacted areas in vicinities east-northeast of the fire. The Los Alamos National Laboratory and the DOE Oversight Bureau collected multiple samples after the fire and found multiple contaminants that exceeded background references established by the Laboratory. The particulates that originated from the fire potentially contained concentrated contaminants from global fallout as well as from past LANL operations.

The DOE Oversight Bureau collected 1 produce and 6 soil samples from the

Embudo watershed area September 21, 2005. The samples were analyzed for general chemistry, radionuclides, and trace metals.

Americium-241 in the produce sample and multiple trace metals in soils were measured above LANL background reference levels.

The measured americium-241 in the single plum sample from Llano de la Llegua was above the LANL 2000 and 2004 Regional Statistical Reference Levels (RSRL).

Several trace metals were measured above LANL's 2004 or 2000 RSRLs, 1 or more times in the 6 soil samples collected in the Embudo watershed. The metals that exceeded the RSRLs include beryllium, cadmium, cobalt, copper, iron, mercury, manganese, nickel, lead, and zinc. The DOE Oversight Bureau's results indicate that additional sampling in 2006 is warranted.

Direct Penetrating Radiation Monitoring

LANL Oversight Office staff submitted direct penetrating radiation data to DOE for each quarter of calendar year 2005. The data was obtained using Electrets™ at the DOE Oversight Bureau's locations in the vicinity of Los Alamos, Santa Fe and Espanola. The values may be qualitatively compared to LANL values from their thermal luminescent devices (TLDs) that share the same or similar locations as DOE Oversight Bureau's Electrets as shown in Figure 3.

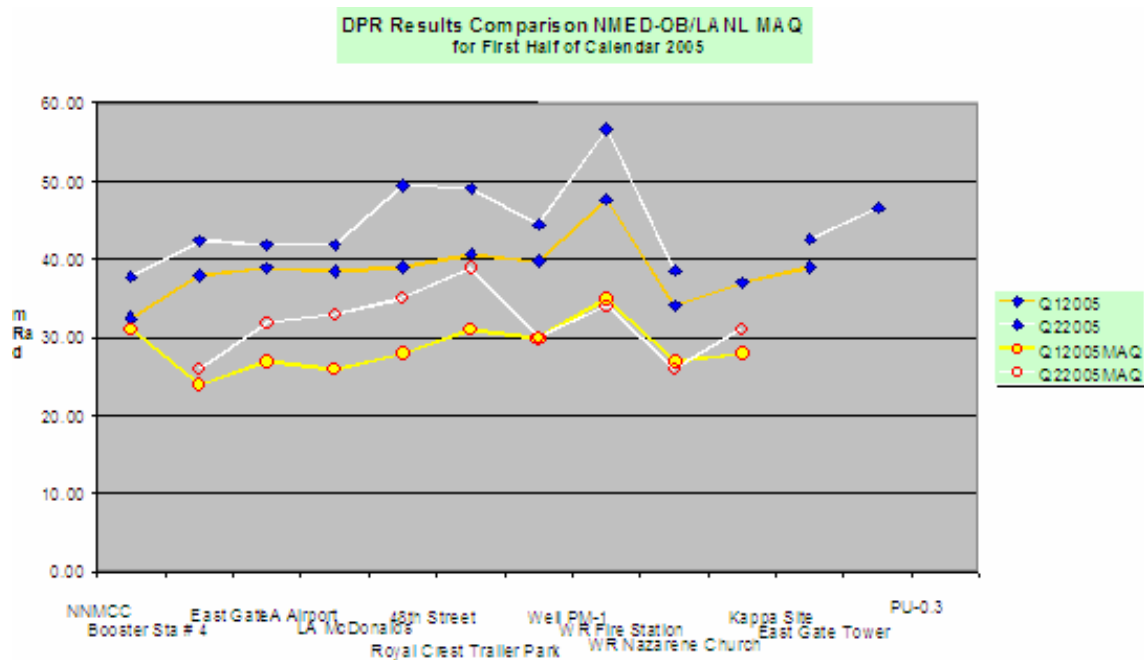


Figure 3. Direct Penetrating Radiation results Oversight Bureau vs LANL Meteorological & Air Quality (MAQ) data.

Oversight Bureau values are higher due in part to the sensitivity of our samplers to cosmic radiation. In general, the graph implies that the values track and LANL values are valid. A report will be done during 2006 that determines statistically if this is the case. The dose levels at these stations are consistent with natural background radiation values.

A non-perimeter station at the KAPPA NEWNET site was added during the 1st quarter of 2005. A twelfth site, at the East Gate Weather tower, a short distance from the AIRNET site at East Gate, was set up to determine if the landscape position of the sampling station is significant. Another station was installed at the DOE Oversight Bureau surface water sampling site, PU-0.3, in Pueblo Canyon as part of an effort to gather multi-media data at existing sampling stations. Two Electret™ stations that have

been maintained in the LANL Oversight Office were dropped from the program.

During the 4th quarter, temperature data loggers were purchased and received. These data loggers were deployed at select Electret™ stations in an effort to determine the actual temperature to which the Electrets™ are exposed in their canisters. These loggers are currently deployed at stations where the DOE Oversight Bureau does not have a representative LANL weather tower nearby.

Radioactive Particulates and Tritium Monitoring

The DOE Oversight Bureau did not have sufficient funds during FFY03 or 04 to maintain the AIRNET Project at LANL. During calendar year 2005, the program was reinstated. LANL Oversight Office staff collected samples from AIRNET site PM-1 (co-located with LANL AIRNET station #

11) near the intersection of State Route 4 and the Truck Route, during the 2nd quarter. The particulate filters collected bi-weekly were composited and submitted for analyses for isotopic americium, plutonium and uranium. Tritium samples were collected for each two-week period and sent to the laboratory for analysis at the end of the quarter.

The results of the particulate analyses were sent to DOE on October 25, 2005, within 30 days of our receipt of the results from the analytical laboratory. Tritium results were not sent until December 28 and were included with the third quarter results. This delay was due to a change in methodology for calculating air concentrations of tritium. The Oversight Bureau is now using the same absolute humidity method as used by LANL. This change in procedure will facilitate a better comparison of the results between the Bureau and LANL.

The remaining four DOE Oversight Bureau co-located AIRNET sampling stations at the White Rock Fire Station (LANL AIRNET # 15), Royal Crest Trailer Park (LANL # 12), above TA-41 behind the Los Alamos McDonalds parking lot (LANL # 08) and at the Los Alamos Airport (LANL # 09) were repaired and started in July 2005. PM-1 was upgraded and continues to collect samples. New control panels, making the DOE Oversight Bureau's air sampling systems equivalent to those used by LANL, were configured to the pumps. Five stations are currently in operation collecting low volume air particulates and water vapor. Samples will be analyzed for isotopic plutonium, americium, uranium and tritium quarterly. The re-start of the DOE Oversight Bureau's AIRNET monitoring program is significant in the public's eyes because past funding shortages from DOE caused the DOE

Oversight Bureau to completely shut down its program in early 2003.

The LANL Oversight Office made several important purchases in order to improve the air-monitoring program. These include a drying oven for the silica gel used to collect atmospheric moisture for tritium analyses and a scale with the proper weighing range and accuracy to improve the quality control of the AIRNET program. In addition, four pumps were purchased to allow a pump maintenance program to be implemented and sample collection efficiency goals to be established and maintained. Each operating air pump now has a scheduled maintenance date.

Temperature/humidity data loggers were purchased and deployed at the start of the fourth quarter. This purchase will allow individual absolute humidity values to be used in the tritium air concentration calculations. Because this is a collection of data, a submittal of the average absolute humidity and the atmospheric moisture content was collected for each sample and sent to the DOE point of contact on December 28, 2005 (the last sample ending date was December 20th for the 4th quarter).

Groundwater Monitoring

The LANL Oversight Office conducts data verification and validation through split sampling of groundwater, focusing on new regional wells, springs and monitoring wells on Pueblo de San Ildefonso and Santa Clara Pueblo, older Environmental Surveillance (ES) and R-Wells known to contain contaminants, and LANL area and White Rock Canyon springs. LANL Oversight Office staff split samples with LANL at 53 groundwater monitoring stations, including 15 springs sampled in September, as part of LANL's Annual White Rock Canyon raft trip.

The LANL Oversight staff participated in cooperative sampling with LANL collecting supplemental and verification by sampling of LA County production wells for substances not addressed under the federal Safe Drinking Water Act. These substances include perchlorate, strontium-90, uranium, tritium and high explosives. Five samples were collected with LANL from Los Alamos County drinking water production wells.

For the past 13 years, the DOE Oversight Bureau and LANL have collected split samples on Pueblo de San Ildefonso property in order to identify any LANL trends in contaminant concentrations that may be found during long-term monitoring. 10 samples were collected and analyzed from drinking water production wells, monitoring wells, and springs on Pueblo de San Ildefonso lands. To help accomplish this task, the LANL Oversight Office initiated a change to the notification protocol so that DOE Oversight Bureau staff could more easily accompany LANL environmental groups on Pueblo de San Ildefonso property in order to collect split- and independent water samples during annual Environmental Surveillance sampling. On July 7, 2005, the LANL Oversight office manager received approval from Governor Dale Martinez to make this protocol change.

There were no unexpected results in the DOE Oversight Bureau's split and independent sampling and when results were found higher than background, the values closely tracked LANL's results.

During 2005, significant portions of the DOE Oversight Bureau's groundwater monitoring efforts were focused on the dating of water within the regional (drinking water) aquifer using a Carbon-14 technique. Sixty-six samples were collected from wells

and springs within the drinking water aquifer. These data will be valuable to the County of Los Alamos and other stakeholders, when assessing the vulnerability of the areas production wells to possible Laboratory derived contamination (i.e., Cr at R-28). These data will also provide information concerning groundwater flow velocities, pumping influences, and recharge rates. During 2006, the Bureau, along with several Carbon-14 experts at the Laboratory, will be evaluating and interpreting these data with the hope of learning more about the flow of groundwater beneath the Pajarito Plateau.

High Explosives Detection at Spring 9

Spring 9 discharges to the Rio Grande from a location just north of Chaquehui Canyon in the extreme southeast portion of LANL. LANL's Water Quality and Hydrology (WQH) Group, in addition to the DOE Oversight Bureau, routinely test this spring each year with a special emphasis on high explosive compounds. Since 1995, trace amounts of high explosive compounds such as TNT, TNB, DNT and RDX have been sporadically detected in this spring. Among all the springs in the vicinity, these detections are specific to Spring 9 and this episodic situation underscores the continued need for the testing of this spring for these contaminants. In addition, high explosive compounds are listed as probable human carcinogens (cancer causing agents) and have a very low federal Drinking Water Act Maximum Contaminant Level. The most recent detection occurred in May 2005, when the DOE Oversight Bureau split a sample collected by Concerned Citizens for Nuclear Safety (CCNS) during an independent monitoring event and found DNT and RDX.

In September of 2005, a joint LANL and DOE Oversight Bureau effort sampled the

spring as part of the annual White Rock Canyon surveillance event and results from this follow-up sampling showed no detections even though the Bureau utilized the ultra low-level LC/MS/MS method to measure for high explosives. The DOE Oversight Bureau FFY06 Work Plan, calls for Spring 9 to be monitored twice during 2006. The DOE Oversight Bureau recommends that both itself and LANL continue to monitor Spring 9 at least annually.

Dating of Ground Waters at the Los Alamos National Laboratory

In addition to the Carbon-14 sampling, the DOE Oversight Bureau conducted a joint project with LANL to date contaminated and non-contaminated groundwater in Los Alamos and the surrounding area. This technique, utilizes the decay of tritium to helium (half life of 12.4 years) to date the lapse time interval since groundwater has been recharged. This interval is generally less than 60 years for “modern” ground water. This technique, also provides constraints on mixing fractions between shallow (e.g., young) and deeper (e.g., older) ground waters, dates the time at which the young fraction mixes with older fraction waters, and, in some cases, quantifies groundwater flow velocities. These parameters are important for understanding:

- Recharge/discharge relationships associated with groundwater management practices (quantity issues, etc.);
- Wellhead protection activities with respect to the susceptibility of drinking water wells to contamination;
- Hydraulic connections with the surface;
- The understanding of the fate and transport pathways of known subsurface contamination; and

- Providing support to numerical groundwater flow and transport models currently being implemented at LANL.

This joint project involved the collection of 161 water samples from wells and springs located in the Los Alamos area that tap shallow, intermediate, and regional aquifers. Samples were analyzed for total helium, helium-3, helium-4, neon, tritium, the stable isotopes of oxygen and hydrogen, and major-ionic chemicals. The DOE Oversight Bureau’s role was to take the lead on sample collection at springs and to assist in the collection of samples at wells. DOE Oversight staff also provided GIS and data management support during the year. Preliminary data suggest that ground water discharging via the many springs located in the Sierra de Los Valles west of LANL range in age from 1 to 33 years. Results also indicate that the age of the young fraction of ground water that has mixed with the regional aquifer ranges from 1 to 60 years. These data applied in conjunction with other geo/hydrochemical properties may prove to be of value for determining recharge rates and locations, ground-water flow velocities, contaminant fluxes, dispersion and diffusion, and delineating contaminant pathways. These data have been presented at several technical forums including a formal DOE/LANL symposium, one open-public meeting, and a meeting of the Sierra Club.

Background Perchlorate in Ground Water Project

In 2005, the DOE Oversight Bureau completed its field-data acquisition activities specific to determining background concentrations of perchlorate in local ground water. 18 background samples were collected in 2005 adding to the 76 samples collected during 2003 and 2004. The 94 low-level perchlorate results were obtained from samples collected at springs and wells

located in the Los Alamos, Espanola, and Taos areas. Sampling stations were selected based on technical considerations such as aquifer location, age, and water quality (i.e., lack of man-induced contaminants such as nitrate).

Data show that background concentrations of perchlorate in the shallow and

intermediate aquifers, and the regional aquifer beneath the Pajarito Plateau are virtually identical, averaging about 0.27 parts per billion (ppb) with a two standard deviation of 0.17 ppb. Samples collected in the Taos area contain lower levels of perchlorate – mean of 0.11 ppb +/- 0.04 ppb. A visual statistical representation of the data set is illustrated in Figure 4.

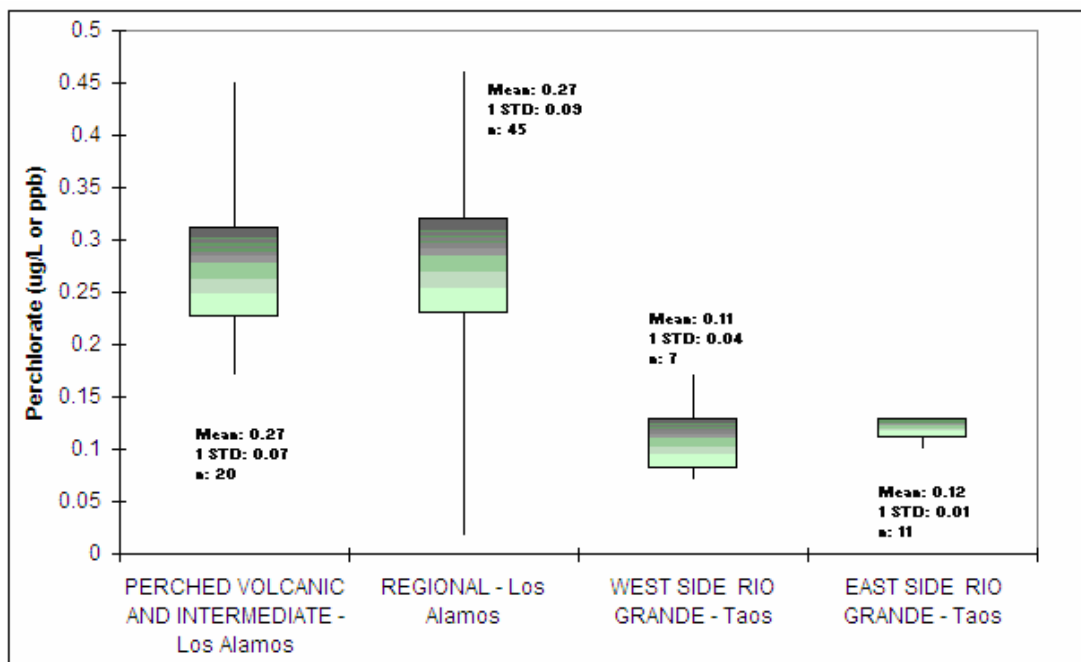


Figure 4. Whisker plots illustrating perchlorate concentrations derived from samples collected in the Los Alamos and Taos, New Mexico

The variability in concentration may be due to geology, biologic, and/or atmospheric (evaporation) controls. The hydrogen and oxygen composition data in the sampled waters indicate that perchlorate concentration decreases with more depleted (less oxygen-18 and hydrogen-2) waters. This project will be finalized through the production of a data result report during 2006.

Public Information and Outreach

Technical Reports

The LANL Oversight staff presented posters and gave formal talks at the following technical venues:

The International Erosion Control Association conference in Dallas, Texas, January 2005;

The 4th Annual Espanola Basin Workshop, Santa Fe, New Mexico, March 1-2, 2005;

The New Mexico Geological Society, 2005 Spring Meeting, Socorro, New Mexico, April 15, 2005; and

The Geological Society of America Annual Meeting and Exposition, Salt Lake City, Utah, October 16-19, 2005.

The following presentations were derived from completed and ongoing DOE Oversight Bureau projects:

A poster co-authored with staff from SHAW Environmental Inc. that displayed storm water sampling results obtained during 2004 from sampling below solid waste management units (SWMUs) at LANL;

A poster entitled, “An Update On The Surficial Water Resources In The Los Alamos Area, New Mexico”;

A poster entitled, “Contaminant Concentrations In Water And Bryophytes Found In Four Springs Located Along The Upper Rio Grande, New Mexico”;

A poster entitled, “Assessing Ground-Water Recharge Through The Pajarito Fault Zone, Upper Pajarito Canyon, Los Alamos, New Mexico”;

A poster entitled, “Hydrochemical Investigation And Statistical Analyses Of Background Waters Near Los Alamos National Laboratory”; and

An oral presentation entitled, “Aqueous Geochemistry And Environmental Fate Of Natural Perchlorate”.

Community Radiation Monitoring Group

The mission of the Community Radiation Monitoring Group (CMRG) is to understand and communicate public health issues relating to direct penetrating radiation and radiation from airborne radioactive materials that result from activities at LANL.

The LANL Oversight Office continued to facilitate monthly meetings of the Community Radiation Monitoring Group (CRMG), which focuses on issues related to the monitoring of radiation in the Los Alamos area. During the year, CRMG discussions included concerns involving existing monitoring, emergency preparedness and LANL open burn/open detonation permits.

The April meeting focused mainly on LANL presenting their logic for shutting down several AIRNET monitors located on LANL property within the high explosive corridor. Although representatives from activist groups were not satisfied with LANL’s reasoning, LANL representatives supported their decision through their interpretation of the facility’s regulatory requirements.

In September, LANL presented an overview of biota monitoring program with emphasis on data collected near the Laboratory’s firing sites. The presentation discussed the institutional, facility and special studies proposed for biota monitoring. The biota includes foodstuffs, such as the fillets of fish, and whole biota, such as the whole fish.

The function of the Laboratory's air-sampling and ecology programs were also outlined and described in the context of how data is collected and evaluated within the explosives corridor near active and non-active firing sites.

LANL granted the Embudo Valley Environmental Monitoring Group (EVEMG) and the Environment Department of Picuris Pueblo a contract extension to operate the AIRNET Station No.84 located in Picuris Pueblo near the community of Dixon.

LANL presented findings of their External Final 2004 Audit of the Laboratory's Radiological National Emission Standards for Hazardous Air Pollutants (RAD-NESHAP) Program. LANL's Meteorological & Air Quality staff described that the Laboratory sought an external, independent audit in order to avoid a potentially expensive and time-consuming

Technical Consultation to LANL for GIS Springs and Wells Feature Data Sets

LANL Oversight Office staff assisted LANL with an NMED Compliance Order deliverable related to the springs and wells inventory compilations (maps, database, etc.). LANL Oversight staff compiled and reviewed springs and wells consolidation tables consisting of all known data for springs and wells at and around LANL. Bureau staff then met with LANL's Office of Environmental Information Management (OEIM) to review springs and wells to be included in the GIS (Geographic Information System) consolidated feature data sets. The majority of the spring location coordinates used for the consolidation tables were from the DOE Oversight Bureau's database.

EPA required audit. This audit was not required, but is part of LANL's quality processes used by the program to assure that it is functioning correctly. These specific areas were targeted for the audit:

- High-level review, "Are all the pieces in place?";
- Integrated calculation review, "Follow the data" from sample collection to the report to EPA;
- ANSI N13.1-1999 implementation (design); and
- Follow-up to 2002 Risk Assessment Corporation (RAC) audit action items.

The October meeting held at Picuris Pueblo focused on an update provided by NMED's Chief of Emergency Preparedness on the planning of an upcoming drill "Los Alamos Region Multi-Hazard Exercise".

Regulatory Deliverables: Review & Comment

The LANL Oversight Office provided review and comment on several of LANL's regulatory deliverables including: "Los Alamos Canyon and Pueblo Canyon Intermediate and Regional Aquifer Groundwater Work Plan," "Mortandad Canyon Groundwater Work Plan Revision 1," and "Investigation Work Plan for Material Disposal Area B at Technical Area 21, Solid Waste Management Unit 21-015."

Evaluation of Erosion Control Measure At DOE-LANL Legacy Waste Sites

An NPDES Federal Facility Compliance Agreement (FFCA) issued by EPA in 2004, requires LANL to implement erosion control activities at legacy waste sites that have been identified as having high erosion potential. Typically, various types of erosion control structures or Best

Management Practices (BMPs) are used for slope stabilization and surface water run-on and runoff control.

The LANL Oversight Office evaluated site-specific erosion control structures established at 58 legacy waste sites located within 7 canyons at LANL. Combinations of 14 different types of BMP are located within the 58 sites evaluated.

The LANL Oversight Office evaluated the erosion control structures placed at the sites by using a BMP and maintenance inspection form used by DOE-LANL contractors. The form requires response to questions concerning visual evidence of BMP effectiveness. DOE Oversight Bureau staff assembled the evaluation data into a report that was submitted to DOE-LANL.

The report discussed BMPs that were working well at a particular site or for the

type of stabilization required, as well as deficiencies and maintenance requirements. The report also drew attention to sites impacted by urban run-on and suggested a need for DOE-LANL to work with Los Alamos County officials in order to address identified problems.

The LANL Oversight Office also presented a summary of the report findings at a Surface Water Assessment Team (SWAT) meeting held in September 2005. The SWAT consists of DOE, LANL, DOE Oversight Bureau, Surface Water Quality Bureau, and Hazardous Waste Bureau representatives who monitor DOE-LANL for NPDES and RCRA permit requirements. As a result of the presentation, LANL requested that DOE Oversight Bureau staff conduct field visits with LANL contractors at sites found to be directly in need of attention. LANL also committed to address the deficiencies found at any of the sites addressed in the report.



SANDIA NATIONAL LABORATORIES-ALBUQUERQUE

Environmental Monitoring

Airborne Radionuclide Monitoring

In 2005, the Sandia Oversight Office investigators continued to operate four independent continuous air-monitoring stations - one at the Mixed Waste Landfill and three near the perimeter of Kirtland Air Force Base. The particulate filters collected bi-weekly were composited and submitted for analyses for isotopic uranium, gross alpha and beta, and gamma. Tritium samples were collected quarterly.

SNL does not conduct ambient air monitoring for radionuclides, so the Bureau's efforts are the only airborne radionuclide monitoring conducted on-site.



Figure 5. Sandia staff member Tacy Van Cleave calibrates the air pump with the assistance of Bill Bartels of the LANL Oversight office.

The data collected by the Bureau showed values consistent with historical data. The Bureau will continue to operate and

maintain the stations and may expand the analyses to include metals. Depending on future funding, the Sandia air stations may be upgraded to match the equipment used at the LANL Oversight office. This will provide greater Bureau-wide consistency and will reduce operating costs through equipment standardization.

Perchlorate

During 2005, Sandia Oversight Bureau's planned sampling of perchlorate was reduced to comply with Air Force requirements. DOE Oversight Bureau staff continued sampling for perchlorate in monitoring wells that are within DOE technical areas and a few non-Kirtland wells.

There is currently no federal drinking water standard for perchlorate. The EPA has established a provisional reference dose range (RfD) based on assessments of recent studies by the National Academy of Science January 2005 Report. The EPA RfD is based on these studies where the National Research Council study committee calculated that a reference dose of 0.0007 mg/kg per day would not adversely affect human health. This level correlates to a concentration of 24.5 ppb. In the State of New Mexico, perchlorate is considered a "toxic pollutant" under NMAC 20.6.2.7 although no numeric standard has been established.

The bureau is currently collecting analytical data to establish a background perchlorate concentration for local ground waters. The

background concentration or upper tolerance limit (UTL) will be determined by calculating the mean or average of the available data pool plus two standard deviations. The UTL can be used to make determinations on whether an impact to ground water has occurred as well as aid in making decisions on health standards, risk assessments, etc.

Sampling will continue through 2006 in order to collect at least three years worth of data.

Direct Penetrating Radiation

Sandia Oversight Bureau continued using the Electret™ passive ion chamber system to measure gamma radiation. An Electret™

consists of an electrically charged Teflon disk that discharges voltage when gamma radiation interacts with it. The magnitude of the voltage drop is dependent on the quantity of radiation encountered.

Electrets™ provide real-time measurements and can be read in the field. TLDs have to be collected, then sent to an analytical laboratory for reading. By having immediate data, a faster response to a possible release can be reported.

The Electret™ passive ion chambers are co-located mostly with Sandia TLDs at all monitoring locations. An extra station is located between Inhalation Toxicology Research Institute and Isleta Pueblo.

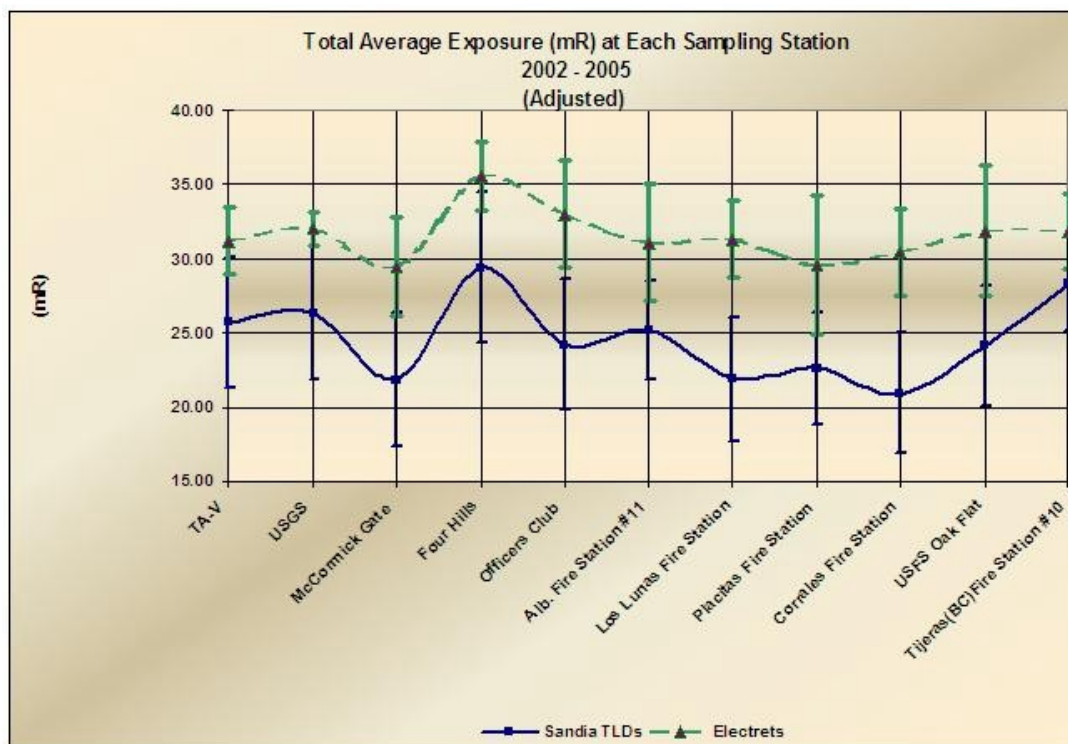


Figure 6. Comparison of Oversight Bureau electrets to SNL's TLDs

As Figure 6 shows, the electret values have trended well with Sandia's TLD values but on average are higher than the TLD values. The two-sigma error bars for all data overlapped at all locations. As a continuing

assessment of the two measurement methods, the data collected by the Electrets™ are compared to data collected by Sandia TLDs and previous DOE Oversight Bureau data.

Storm Water Monitoring

During 2005, Sandia Oversight Office staff performed follow-up sampling to the previous year's activities that showed elevated metals and radiological constituents at SMWU 28-2, 87 and the Burnsite. Sandia Oversight Office staff also started to look for additional contaminants such as dioxin and furans and PCB congeners. DOE Oversight Bureau staff also attempted to address whether or not storm water events are transporting contaminants by collecting storm water samples at SWMU 58/8.

In 2004, SWMU 28-2 (the Mine Site) showed elevated gross alpha and gross beta, along with Radium-226 and Radium-228. In 2005, SNL conducted voluntary corrective measures at the mine site by closing the opening of the mineshaft and implementing some water flow control measures. Sandia Oversight Office staff located samplers closer to the mine entrance and a short distance down the road that leads to the mine. The road was chosen for a sampling site because erosion of the road indicated it was a storm run-off path.

The 2005 data continues to show elevated gross alpha and gross beta with high Radium-226 and Radium-228. Additionally, the preliminary data shows elevated Polonium, which is a radioactive daughter in the Uranium-238 decay chain. The DOE Oversight Bureau is waiting on additional analytical data and will be able to provide a more detailed analysis after its receipt. Additional sampling at this site will be conducted in 2006 to verify these results and determine whether the corrective action work by SNL has helped in minimize the transport of contaminants off the SWMU.

The sample collected in 2004 from the north side of the Burn Site show elevated levels of

total metals, including aluminum, arsenic, lead, and vanadium. Sandia Oversight Office staff redeployed another single-stage environmental liquid sampler in the same location above the Burn Site to increase data for this site. Sandia Oversight Office staff also installed a sampler below the Burn Site to start monitoring what is coming off this site. Dissolved metals were included in the Burn Site analytical suite for comparisons to the New Mexico Water Quality Standards.

The 2005 data from the Burn Site continued to show elevated metal concentrations both above and below the site. Additional sampling needs to be conducted, particularly while SNL performs corrective action work at the Burn Site, and will be continued in 2006.

SWMU 87 data continued to show elevated radionuclide levels; however, the levels were less than in previous years' results. The DOE Oversight Bureau intends to re-sample at least once in 2006 for verification purpose.

SWMU 58/8 presented a challenge to collect stormwater data. Four single stage samplers were deployed in separate drainages. Only one waterway yielded samples. The sample collected showed elevated gross alpha and gross beta, with the gross alpha value being over ten times the State surface water standard of 15 pCi/L.

The other three waterways did not produce any samples, which may be due to the porosity of the riverbed in those channels. The DOE Oversight Bureau would like to attempt and collect samples at SWMU 58/8 again in 2006; however, this will be highly dependent on rainfall.

Terrestrial Monitoring

Soil samples were collected to ascertain the presence of pollutants that may have been transported by air or water and deposited on the ground surface and may be the result of operations at SNL over the years. The DOE Oversight Bureau collected split samples with SNL to evaluate their terrestrial sampling program.

Due to budgetary constraints, terrestrial sampling was not conducted in 2004. The DOE Oversight Bureau collected 31 samples on and off site in 2005. Some of the data revealed metal levels above the SNL background values. Vegetation samples were taken to determine the uptake of constituents. Data from the analytical laboratories is still pending at the time of this report.

A detailed data report of the results will be produced in 2006.

Public Outreach and Education

Technical Presentations

Sandia Oversight Office staff presented perchlorate data collected at SNL monitoring wells, City of Albuquerque Regional Aquifer monitoring wells, and NMED wells at the October DOE/DOD quarterly meeting. The DOE Oversight Bureau's data showed several detections below 4 parts-per-billion (ppb), a few detections between 4 and 10 ppb and one detection at 700 ppb, which is above the

proposed EPA maximum contaminant level of 24.5 ppb.

Community Presentations

Sandia Oversight Office staff conducted presentations at local community groups, such as the Lions, Rotary Club, and Shriners providing information on the activities of the Bureau.

Legacy Waste Cleanup and Waste Management

Long Term Environmental Stewardship

Sandia Oversight Bureau staff reviewed and commented on Sandia National Laboratories' Long Term Environmental Stewardship (LTES) Implementation Plan. The DOE Oversight Bureau participated in a number of meetings with DOE and Sandia National Laboratories on planning for this upcoming transition in operations.

Chemical Waste Landfill

During the summer and into the fall, Sandia National Laboratories placed the vegetative cover on the Chemical Waste Landfill (CWL). Because of un-seasonally high rainfall during those months, the grass seeds grew at a higher than expected rate which has allowed the cover to develop more rapidly than planned.

The DOE Oversight Bureau continues to collect groundwater samples at monitoring wells surrounding the CWL.



WASTE ISOLATION PILOT PLANT

Environmental Monitoring

Scope of Work

The Scope of Work developed between the DOE and State of New Mexico identified 10 program areas:

- monitor discharges and emissions from the WIPP facility;
- monitor water quality in the vicinity of the facility;
- monitor air quality in the vicinity of the facility;
- radiological surveillance in the vicinity of the facility;
- monitor soils, sediments, and biota;
- monitor transportation within New Mexico of transuranic waste to the WIPP repository;
- characterization of transuranic waste at sites intending to ship waste to WIPP and their preparations for shipment;
- review of submittals to NMED and other agencies (e.g. the US Environmental Protection Agency (EPA) and the Nuclear Regulatory Commission (NRC) relating to the WIPP program);
- review current and historical data to assess contaminant pathways and risk levels;
- provide information to Tribes, local governments and the public.

Staff of the WIPP Oversight Office will maintain the expertise to conduct relevant activities in these areas; extraordinary expertise (e.g., analysis of samples potentially containing radioactive materials) will be obtained through contracts with existing providers (e.g., the Carlsbad Environmental Monitoring and Research Center (CEMRC)).

To meet the first program area, the DOE Oversight Bureau began development of an air-monitoring program based upon the past environmental assessments of the WIPP. WIPP Oversight Office staff reviewed the WIPP Site Environmental Impact Statement (SEIS) and SEIS II and it was agreed that the primary pathway for exposure at the WIPP would be through an airborne release scenario. The primary air discharge points at the WIPP are Stations A, B and C.

Station A is at the top of the Exhaust Shaft from the underground. Station B resides in the exhaust duct work after the HEPA filtration units and confirms the effectiveness of the HEPA units should an airborne release occur. Station C resides upon the Waste Handling Building and samples the exhaust air from waste handling activities.

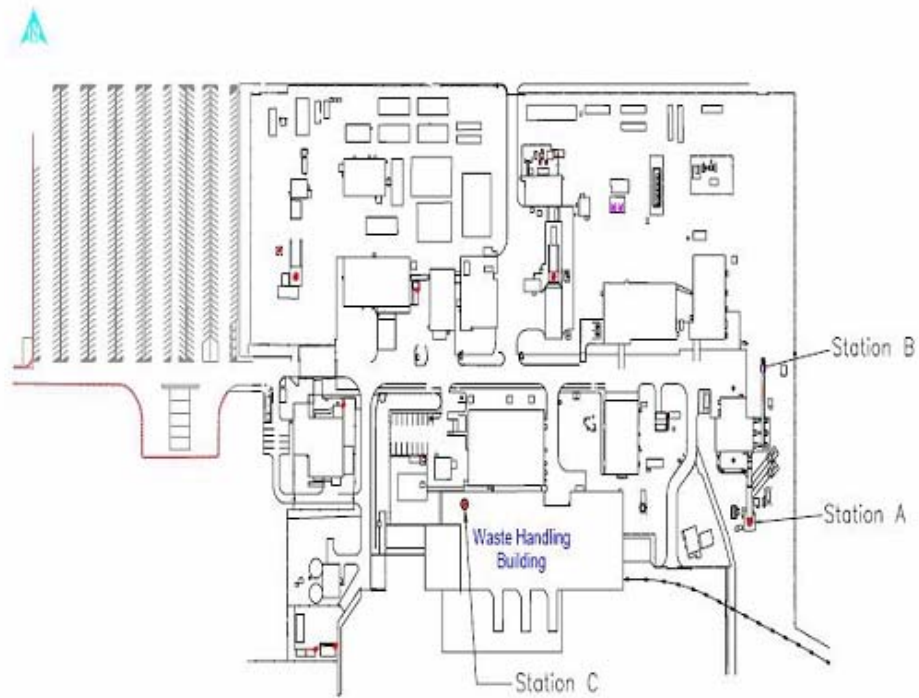


Figure 7. Aerial depiction of WIPP showing the location of Stations A, B, and C

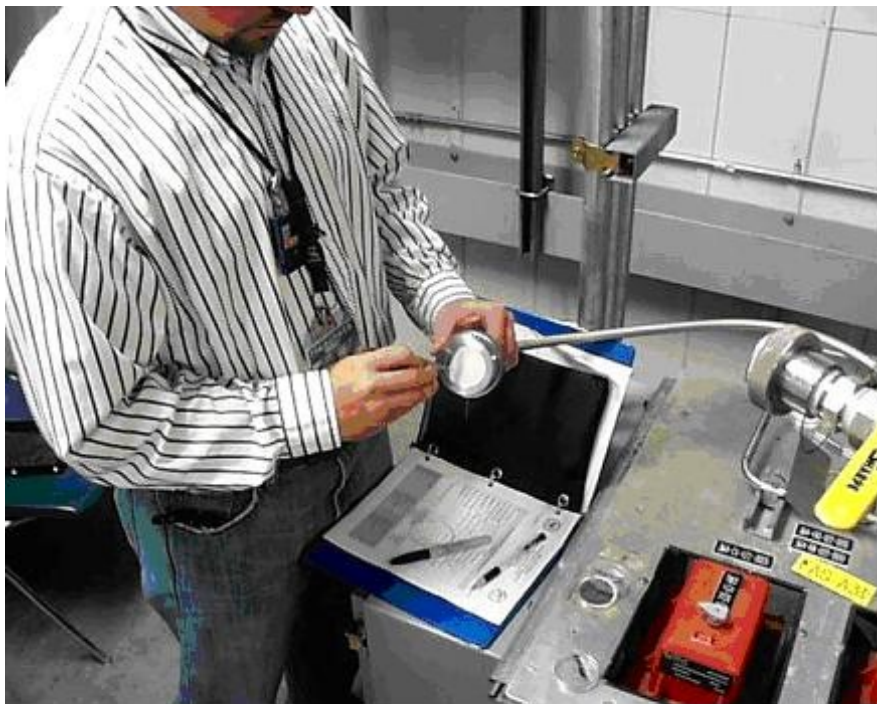


Figure 8. WIPP Oversight staff member, John Haschets, work with an air particulate filter.

To establish a monitoring program that is sound and reflects current standards, Bureau staff began development of a Quality Assurance Project Plan (QAPP), specific procedures for collection and handling of samples, and a Job Hazard Analysis (JHA) for the collection of air filters at Station A. Station A (specifically skid A-3) is the NESHAP's compliance sampling point. Collection of air filter samples by the DOE Oversight Bureau began on August 8th 2005. The QAPP, procedures and JHA for Station A were approved in September of 2005. At the time of this report, the samples are being composited monthly and are awaiting analysis once NMED has secured new contracts with laboratories for sample analysis expected to be complete in April of 2006. Draft QAPP's, JHA's, and procedures are currently being developed for air filter sample collection at the other exhaust stacks.

The second and third program areas involving area air monitoring and vicinity water quality is currently under development.

The Low-Volume Air Sampling (LVAS) program will validate and verify both the area low volume air sample results reported by Washington Tru Solutions (WTS) and the results reported by CEMRC. The Oversight Bureau is currently completing the QAPP, procedures and JHA for the LVAS program. Plans to purchase sampling equipment, which will be located alongside the DOE and CEMRC sampling equipment, are underway.

Some of the previous water quality research has been revisited recently due to water inflow into the Exhaust Shaft. The DOE Oversight Bureau's water quality monitoring program will be developed in 2006.

To meet the fourth program area, DOE Oversight Bureau staff have perimeter Electrets™ monitoring program. Electrets are passive radiation monitors used by the DOE Oversight Bureau at both SNL and LANL. Draft QAPP's, JHA's, and procedures are currently being developed.

Staffing of the WIPP Oversight office has been a primary focus of the DOE Oversight Bureau in 2005.

Additional administrative emphasis has been placed on securing an office for WIPP Oversight Office staff. As of November 2005, the staff had secured and received approval to lease office space at 604 B North Canal St. Carlsbad, NM.

Training has been another focus area for the WIPP Oversight Office staff, both for compliance to site requirements and compliance with State of New Mexico protocols and requirements.

To provide the best interface between the State of New Mexico programs and the programs of the DOE, specific detailed programs have had to be developed, assessed, and implemented. Below is a summary of the programs developed and/or reviewed by the DOE Oversight Bureau staff.

Memorandum of Understanding (MOU)

The MOU is for the synchronizing of sampling and analysis programs at Station A. The MOU is between the DOE, NMED, CEMRC and WTS. This is currently in negotiations for the initial draft document.

Site Users Guide (SUG)

The SUG is a document developed by WTS for the DOE to instill a minimum level of safety at the WIPP site. The Oversight Bureau was a party to the development of

the SUG to ensure that site health and safety requirements were incorporated into the WIPP Oversight Office's health and safety plan. The SUG has been completed and signed.

Site Specific Protocol (SSP)

The SSP is a document developed to guide the NMED and DOE in procedures for the implementation of the Agreement-In-Principle. This document is currently in draft form and being reviewed.

Hazardous Environment Assessment Team (HEAT)

Due to the events related to the 2005 hurricane season, the NMED is in the process of development of a HEAT to respond once any immediate danger to life and health has been abated at a major disaster. The Staff Manager of the WIPP Oversight Office is a member of this team and is assisting in the development of its program.

Effluent Monitoring Improvement Group (EMIG)

The EMIG is a group of all entities involved with effluent sample collection at the WIPP and is charged with the task of continually reviewing the effluent monitoring program for updating and coordination of sampling activities. This group consists of the DOE, WTS, CEMRC, DOE Oversight Bureau and on-site contractors. WIPP Oversight Office staff are members of this group and are currently involved with the evaluation of "coatings" to be placed on the probe tips at Station A to decrease the effects of salt encrustation.

WIPP Waste Information System (WISS)

The DOE Oversight Bureau is tasked with assisting in the review of the characterization and transportation of TRU waste to the WIPP. This is done primarily

through the WWIS developed by the DOE. However, due to NMED information technology constraints and changes to the WWIS program at DOE, access to the WWIS by the WIPP Oversight Bureau office has been limited. The interface between the state and the DOE WWIS system is currently being developed

Public Outreach and Education

Carlsbad Environmental Monitoring and Research Center (CEMRC)

The DOE Oversight Bureau has been involved with many of the aspects of CEMRC since most of the sampling activities are identical. In addition to environmental sampling, the DOE Oversight Bureau is involved with auditing training developed by CEMRC.

Alliance for Research, Evaluation and Advancement of WIPP Environmental Science and Technology (AREA WEST)

Late in 2005, the DOE awarded a contract to Pecos Management Services for the independent review and evaluation of the WIPP. AREA WEST replaces the Environmental Evaluation Group, which was disbanded in 2004. AREA WEST initially showed an interest in joining with the Bureau in obtaining the library developed by the EEG specifically for WIPP related activities. However, late in 2005, AREA WEST declined to be involved with obtaining the old EEG library. Establishment of this library is one of the DOE Oversight Bureau's tasks for 2006.

WIPP Quarterly Technical Meetings

The DOE Oversight Bureau has joined the DOE and the NMED Hazardous Waste Bureau in hosting one of the quarterly technical meetings mandated by the WIPP originating documents.



SUMMARY

The DOE Oversight Bureau provided the following activities during 2005.

The DOE Oversight Bureau's site-specific storm water monitoring efforts validate and enhance both LANL's and SNL's contaminated site monitoring programs. Polychlorinated biphenyls data set shows that PCB transport is more widespread than previously acknowledged and that despite much effort in controlling discharges from potential release sites, much more is needed.

The DOE Oversight Bureau's watershed monitoring program documents and quantifies continued releases of plutonium from Pueblo Canyon at LANL and highlights that Los Alamos Canyon watershed is a continuing source of PCBs to the Rio Grande.

The DOE Oversight Bureau's snowmelt runoff monitoring along the Rio Grande demonstrates that despite very high runoff volumes, the Rio Grande water quality, with the exception of one sample for dissolved lead, met all applicable standards for radioactivity, metals, and PCBs.

The DOE Oversight Bureau's groundwater monitoring program validates and supplements the DOE-LANL program. The DOE Oversight Bureau samples the regional aquifer characterization wells, Los Alamos County production wells, and springs both on facility property and regionally. The

DOE Oversight Bureau provides independent sampling results for Pueblo de San Ildefonso at both springs and wells on Pueblo lands. The Bureau's age-dating sampling provides information on groundwater flow velocities, pumping influences, recharge rates, and recharge elevations. The DOE Oversight Bureau's background perchlorate sampling supplies valuable information on the distribution of naturally occurring perchlorate in Northern New Mexico and provides a departure point for determining anthropogenic contributions.

The DOE Oversight Bureau's confirmatory sediment sampling in Pueblo Canyon provides verification of LANL's results and supplemental information on contaminants not sampled for by LANL.

The DOE Oversight Bureau's soil and produce sampling in the Embudo Valley Watershed provides baseline data on environmental contaminant distribution to help determine potential LANL air-shed influences.

The DOE Oversight Bureau's direct penetrating radiation monitoring provides an independent check on LANL's and SNL's monitoring programs.

The DOE Oversight Bureau's radioactive particulates and tritium monitoring verifies and validates air monitoring programs at LANL and is the sole source of airborne

radioactive particulates and tritium monitoring at SNL.

The DOE Oversight Bureau began its Station A exhaust-air sampling program at WIPP in August. The DOE Oversight Bureau will use its data to independently verify data reported by DOE/WTS.

The DOE Oversight Bureau's perchlorate sampling at SNL and Kirtland Air Force Base provides information on perchlorate distribution across the base and Laboratory. Little is currently known about perchlorate presence in this area.

The DOE Oversight Bureau's sampling of SNL site-wide monitoring wells provides both verification of SNL's monitoring program and independent sampling of constituents not analyzed by SNL.

The DOE Oversight Bureau's terrestrial sampling program at SNL provides both verification and independent assessment of SNL's monitoring program.

The DOE Oversight Bureau interacts extensively with the public, local Pueblos, citizen activist groups, the Citizen Advisory Boards at DOE facilities, other bureaus within NMED, and other government agencies (e.g., EPA, USF&W).

The Bureau's work with the LANL Citizens Advisory Board Environmental Monitoring and Surveillance Committee provides an independent, perspective on environmental monitoring programs at LANL. DOE Oversight Bureau technical presentations to the CAB offer insight into current and emerging contaminant transport issues.

The DOE Oversight Bureau's interactions with down-gradient Pueblos promote an open dialog and increased understanding of

contaminant transport issues that may affect those Pueblos.

The DOE Oversight Bureau's support of the Community Radiation Monitoring Group promotes dialog between LANL, NMED regulatory bureaus and the public.

The DOE Oversight Bureau's interactions with citizen activist and community watershed groups provide technical support, and independent monitoring results to address these group's issues of concern.

The DOE Oversight Bureau's technical interactions with LANL and NMED regulatory bureaus regarding LANL's Ground Water Management Program Plan & Hydrogeologic Work Plan resulted in open discussions of the DOE Oversight Bureau's concerns on a variety of important issues. These included locations for new characterization wells, screen depth placement, assessment of construction practices at multi-level Westbay wells, pumping influences at R-15, review of LANL's well screen analysis report, and recent elevated chromium detections at R-28.

The DOE Oversight Bureau's assessment of erosion control measures at LANL legacy waste sites help LANL determine how to improve erosion control and enhance storm water quality of discharges from those sites.

The DOE Oversight Bureau's assistance with the LANL Risk Analysis, Communication, Evaluation, and Reduction (RACER) Project enhances the performance and usability of this important data assessment tool.

The DOE Oversight Bureau's interactions with the Department of Defense at SNL promote cooperative agreements between

the State, SNL, and DOD. These agreements enhance monitoring efforts and our joint understanding of perchlorate.

The DOE Oversight Bureau's spill investigation program promotes effective spill control and clean up at DOE facilities and allows a mechanism to remove from the

books spills that have been effectively addressed.

The DOE Oversight Bureau's giving of presentations and technical talks at many different venues promotes the dissemination of data and understanding of current contaminant transport issues at DOE facilities.

