

# 'Underground oven' bakes soil in Area 3 landfill

## Labs puts soil-heating technology to the test

By John German

Lab News Staff

While many Sandians are heating up their ovens for the holiday season, a group of researchers is checking the temperature inside a rather large, unusual "oven" in Area 3.

The underground "oven," called the Thermal Enhanced Vapor Extraction System (TEVES), is being used to show that heating the ground can help clean up soil contaminated with various types of liquid hazardous wastes.

If successful, the TEVES project, a field-scale test now under way at a chemical waste landfill in Area 3, could make environmental remediation projects at industrial disposal sites across the country faster and less expensive.

"We know the technology works," says Jim Phelan of Environmental Restoration Technologies Dept. 6621, project leader for the TEVES demonstration. "The question is whether or not it's competitive with competing technologies."

*"We know the technology works. The question is whether or not it's competitive with competing technologies."*

TEVES is one of several promising environmental restoration (ER) technologies being studied as part of Sandia's Mixed Waste Landfill Integrated Demonstration (MWLID) project, funded by DOE's Office of Technology Development. The MWLID's purpose is to demonstrate and transfer to private industry ER technologies that can be used routinely throughout the DOE complex.

The demonstration is being conducted at a former disposal pit in Sandia's Chemical Waste Landfill in Area 3, where Sandia dumped various chemical contaminants for more than 20 years. (See "Sandia's Chemical Waste Landfill in Area 3" on page 4.)

### Heating by electricity, microwave

Much like the microwave-convection ovens available in appliance stores, TEVES uses both electrical and microwave energy to heat up its contents, in this case soil containing various liquid organic wastes, oils, and water.

Three parallel rows of electrodes buried across the landfill provide electrical energy. Water in the soil conducts the current between the rows of electrodes and, like the heating elements in a conventional oven, heats up as a result of electrical resistance.

Next, TEVES blasts the soil with radio-frequency (RF) energy similar to that from a

*(Continued on page 4)*



CAN HEATING the ground help clean up soil contaminated with various types of liquid hazardous wastes? Here Jim Phelan (6621) checks electrodes submerged at either side of a chemical waste landfill in Area 3.

## Monitoring stations across KAFB provide air quality readings never before available

By Howard Kercheval

Lab News Staff

Considering the size and topographical variety of Sandia's vast Kirtland AFB site, trying to characterize the air flowing over and through Labs property with official National Weather Service readings from the airport hasn't been much better than sticking a wet finger in the air.

But that has changed since Air Quality Dept. 7575 established the Clean Air Network (CAN) and started sampling and recording air movement and content at nine locations throughout the Labs early this year. The "wet finger" in this case is nine metal towers bristling with meteorological gauges, filters, sensors, and antennas.

The CAN is a combination of two programs — the Meteorological Monitoring Network and the Ambient Air Monitoring Network. The latter includes eight particulate matter monitors that measure particles 10 microns or less in diameter (PM10 monitors), four volatile organic compound (VOC) monitors, and a criteria pollutant monitoring station (CPMS) that records sulfur dioxide, carbon monoxide, nitrous oxides, and ozone concentrations.

*The new air monitoring network covers more than 50 square miles.*

### Terrain complicates air 'averaging'

The new network covers more than 50 square miles, with the longest distance between monitors approximately eight miles.

The system's main purposes, says Gina Deola, a meteorologist in Dept. 7575, are to monitor air quality and provide the information

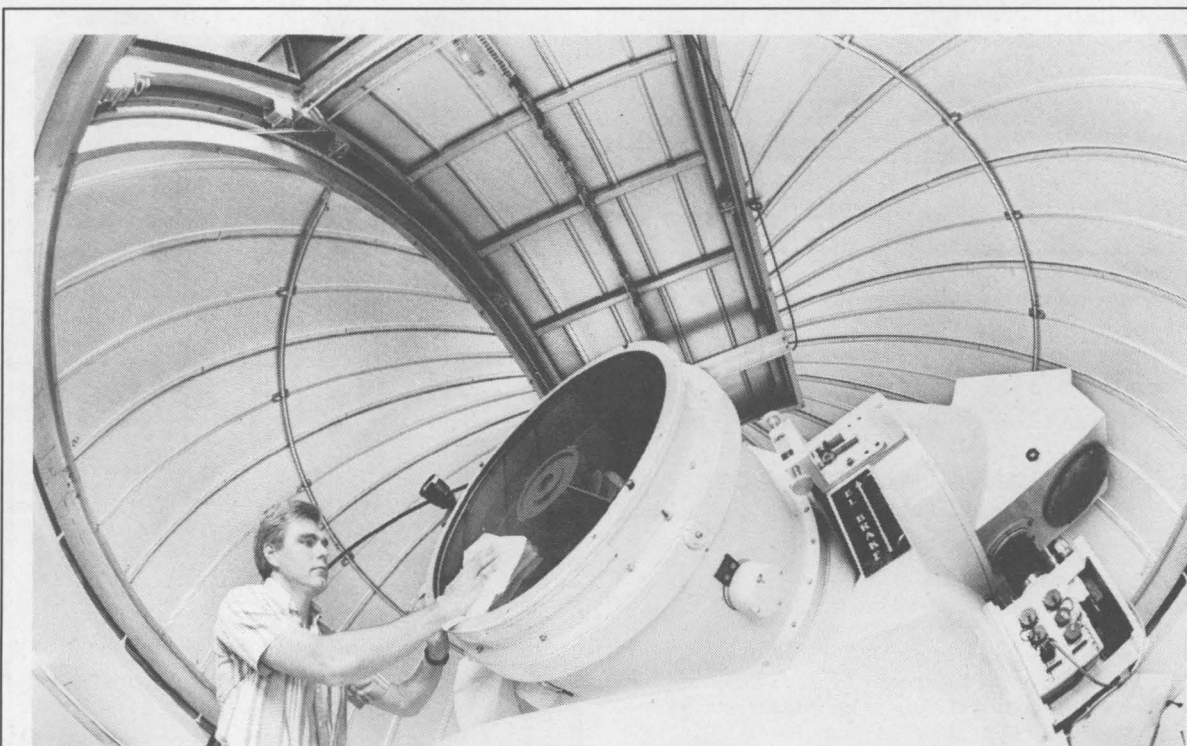
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# Sandia LabNews

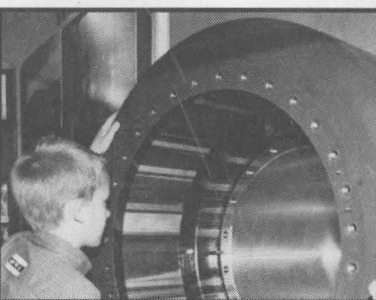
Vol. 46, No. 23 November 11, 1994



Sandia National Laboratories



CLEAR VIEW — Dave Denning of Integration and Operations Dept. 9216 polishes the lens of a large Cassegrain beam director/telescope that can track satellites from low earth to geosynchronous orbits. It is part of the equipment at Sandia's Laser Applications (LAZAP) facility. See story about LAZAP and other Sandia "user facilities" on page 6. (Photo by Randy Montoya)



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Sandia Day '94 — Families, friends of California Sandians visit site

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Sandia/Sonora agreement will bring solar and wind energy to rural Mexico



# This & That

On some days, I think she's right - Amy Tapia (6900) brought her 3-year-old daughter Elena to the Labs on Sandia Day (Oct. 22) to show her where mommy works. Amy reports that, as they were approaching the big tent sheltering the displays east of the Tech Transfer Center, Elena said, "Oh Mommy, you work at the circus!"

\* \* \*

Reengineering: no joke - Mike Rex (3030) called recently to tell me a new ending to the old story about how different people describe a glass that contains half water and half air. A pessimist, of course, says the glass is half empty, and an optimist says it's half full. A reengineering specialist, according to Mike, says, "I think your glass is probably too big!"

This new ending probably illustrates what lots of us think whenever we hear the word reengineering. Well, it's becoming clear that we all need a better understanding about it because Sandia is getting serious about reengineering. Executive VP Jim Tegnalia is hosting a series of Sandia town meetings in Livermore and Albuquerque to discuss the Laboratory Process Reengineering effort (see announcement at right). The *Lab News* will report the meetings, but you'll probably want to attend if you have the time. Should be very interesting.

\* \* \*

Southern signs - About every time I make a trip to southern New Mexico, I come across an amusing sign. I saw this several months back in the clubhouse at The Lodge Golf Course in Cloudcroft: "If profanity had an influence on the flight of the ball, the game would be played far better than it is." The nice folks there said that was written many years ago by Horace Hutchinson, a turn-of-the-century golfer who once won the British Amateur Open. My experiences confirm Horace's thought. Another favorite sign of mine is the one I mentioned in this column several years ago - a sign in a small Carlsbad store: "Our credit manager is Helen Waite. If you want credit here, go to Helen Waite."

\* \* \*

Check this out - Here's a new Sandia report I think lots of employees will want to read: the "Operating Plan for Sandia National Laboratories, 1995-1999." Several folks in Strategic Planning Program Office 4514 led a Labs-wide effort to gather information and put this plan together. It's full of interesting information presented in an easy-to-read format about where Sandia is headed and how it plans to get there. You can learn a lot in an hour or less. Copies have been sent to directors' offices and to Sandia's libraries. See more on page eight.

\* \* \*

Maybe he needs new lenses - Our *Lab News* proofreader, Eddie "Eagle Eyes" Redumgood, had a bad day when we were putting our last issue together. One of his errors was minor; he just overlooked a wrong number in a subhead in our story about the Sandia budget, but the number was correct in the text. The other one was a little worse (see correction item below). Please call if you have ideas about how I can get the usually reliable Mr. Redumgood back on track. I tried taking his coffee away, but he started falling asleep at his desk and almost poked out an eye when he fell on his editing pencil.

- Larry Perrine

## Sandia LabNews

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MARTIN MARIETTA

### Correction to Caremark Drug Plan article in Oct. 28 issue

Information was inadvertently omitted from the final part of the "Caremark Drug Plan changes and reminders" article on page 12 of the Oct. 28 *Lab News*. The incorrect information - from the end of the story, beginning with item 3 under the subhead "Reminders" - has caused some confusion for participants in the Sandia Medical Care Plan (MCP). Here is the corrected end of the story:

3. When purchasing prescription drugs from a Select Pharmacy, participants are required to pay the full amount of the purchase, including tax, at the time of purchase. Claims are filed electronically and reimbursed according to the MCP guidelines.

#### Non-Select pharmacies

If you use a pharmacy other than a Select Pharmacy or a Caremark Mail Services pharmacy, file your claim using the MCP claim form and send it to the address shown on the claim form. All prescription drug claims are mailed to Caremark, not to Mutual of Omaha.

The *Lab News* regrets the omission and any confusion it may have caused.

## Tegnalia, Ebben to dispel reengineering myths at town meetings

### New Mexico sessions postponed

Executive VP Jim Tegnalia will host the first of several town meetings for Labs employees next Wednesday at Sandia/California to discuss the Laboratory Process Reengineering effort; similar meetings originally scheduled for Monday, Nov. 14, at Sandia/New Mexico have been postponed until next month.

All Sandia/California employees are invited to attend the first meeting on Wednesday, Nov. 16, 9-11 a.m. in the Bldg. 904 auditorium.

Reengineering is defined as the fundamental rethinking and radical redesign of an entire business system to achieve dramatic improvements in critical measures of performance, such as cost, quality, service, and speed. Sandia senior management announced its intent to reengineer the Labs in the April 29, 1994, *Lab News*.

During the meetings, Jim and Mike Ebben, Director of Treasury, Corporate Policy, and Process Reengineering Center 10600, will explain reengineering and discuss why and how Sandia is reengineering itself.

They also plan to dispel certain myths about reengineering, including the common beliefs that reengineering is synonymous with layoffs or that it's just a management fad that will go away with time.

In addition, Jim and Mike will answer the following questions: How will reengineering affect employees and how can they help? How can employees stay informed about reengineering? What's the Chief Information Office doing? What's the Laboratory Process Reengineering Plan? And how will employees know when Sandia's reengineering process is complete?

The Sandia/New Mexico meetings originally scheduled for next week and announced in the Nov. 7 *Weekly Bulletin* have been rescheduled for Tuesday, Dec. 13, in the Technology Transfer Center (Bldg. 825). Employees with last names beginning A-L are asked to attend the 8:30-10 a.m. session; employees with last names beginning M-Z should attend the 10:30 a.m.-noon session.

Look for coverage of the town meetings in the *Lab News*.

## Former Sandian Ellen Ochoa makes second space shuttle flight

Former Sandian Ellen Ochoa began her second flight into space Nov. 3 on the 11-day "Atlas 3" mission as payload commander - lead mission specialist - aboard the space shuttle *Atlantis*.

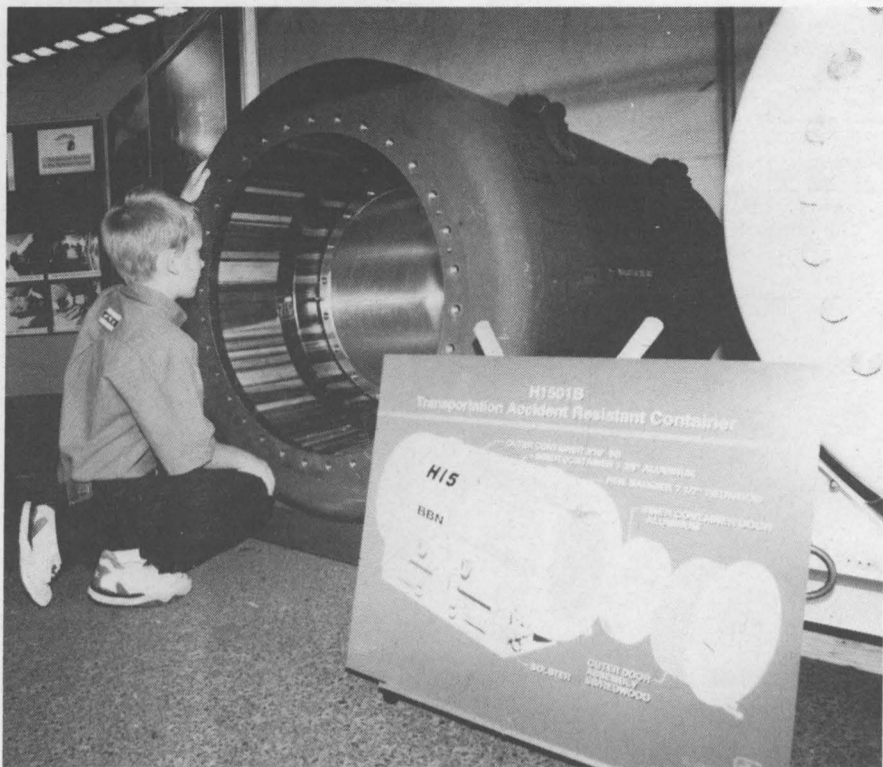
This was the third in the "Atlas" series of flights, whose purpose is to study Earth's atmosphere - including ozone depletion and other changes - and the effect of the sun on the atmosphere. Her first flight, aboard *Discovery* in April 1993, was "Atlas 2."

Ochoa joined the Sandia/California staff in 1985 after earning her doctorate in electrical engineering from Stanford, and worked mostly in the fields of optics and imaging. She left Sandia in 1988 to join NASA at its Ames Research Center, and was accepted as an astronaut trainee in 1990.

She visited Sandia/California in June 1993, after returning from her first space flight, to describe that mission to former fellow employees. At that visit, she also presented California Programs VP John Crawford (8000) with a photo collection from the Atlas 2 mission and a Sandia flag she had taken along on the flight.



# California site hosts nearly 2,000 Sandia Day '94 visitors



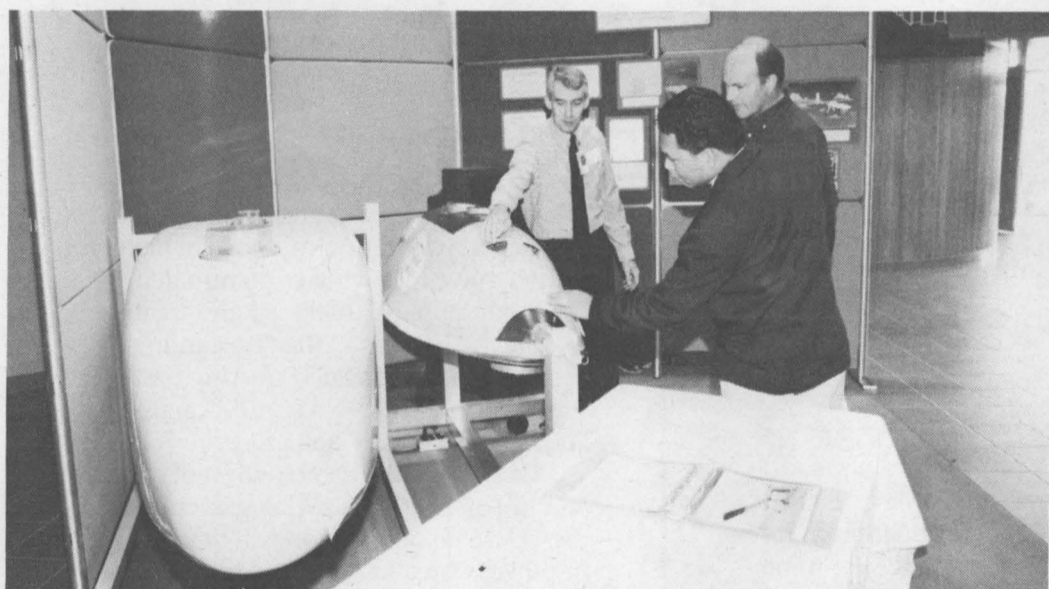
Chris Lamee, son of Tracey Lamee (8526), gets a closeup look at the Accident Resistant Container for the safe transport of nuclear weapons on display in the tent at Sandia/California. Nearly 2,000 Sandians, family members, and friends came to the Sandia Day '94 open house Oct. 22.



Mark Allendorf (8361) explains synthesis of new materials in his Combustion Research Lab as (from left) Karen Magnuson and David Rounds of the *Valley Times* and Tim Hunt of the *Tri-Valley Herald* get a close look.



"Surfing the Internet" was offered visitors in a Building 912 computer lab, where Rita Hoak (8910-1) showed a youngster how to use the information superhighway to communicate with the White House.



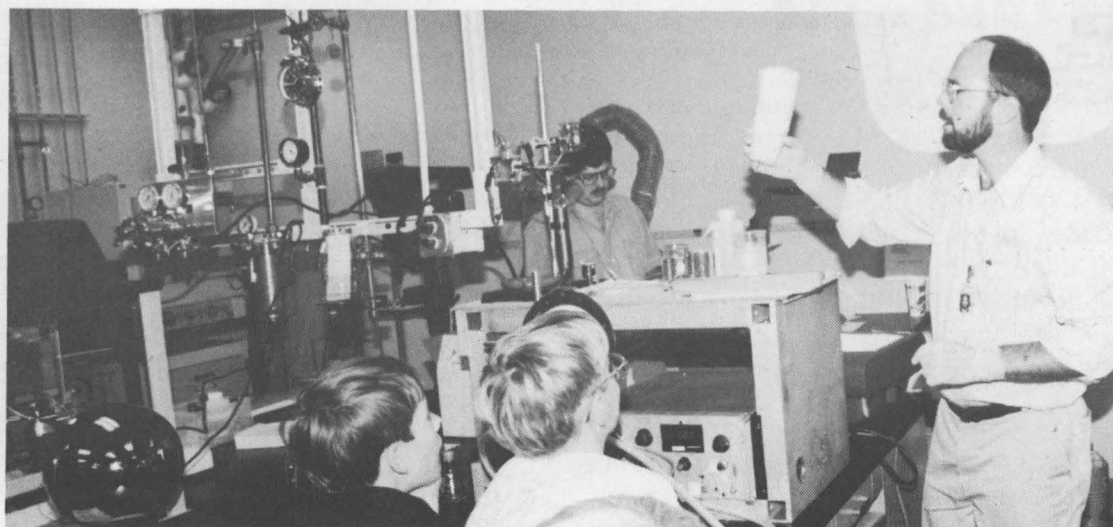
Unmanned Aerospace Vehicle used for atmospheric radiation measurements was displayed in the lobby of Building 940. Will Bolton (left, 8102) describes the vehicle.



Congressman Bill Baker (left), his administrative aide Erlene DeMarcus, and VP John Crawford (8000) chat at the reception for VIPs after the site tour. More than 100 civic, business, education, and political leaders showed up for the guided tours Oct. 21-22.



## **Sandia** California News



As part of the Fun with Chemistry program, Leroy Whinnery (8716) and others in the IMTL show kids a beaker of polyurethane foam while explaining the properties of polymers.



## Underground oven

(Continued from page 1)

microwave oven. The RF waves, originating from "exciter electrodes" buried at the center of the landfill, excite water molecules in the soil. (See box: "Sandia, IITRI, and Martin Marietta cooperate on TEVES demo.")

As the water heats up it vaporizes, causing a temperature rise in the surrounding soil. Overlying soil acts as an insulator, trapping most of the heat underground. Over a 90-day period, the researchers say, the underground temperature should rise from about 60°F to 400°F.

As the ground gets hotter, volatile liquid wastes occupying the soil's pore spaces also

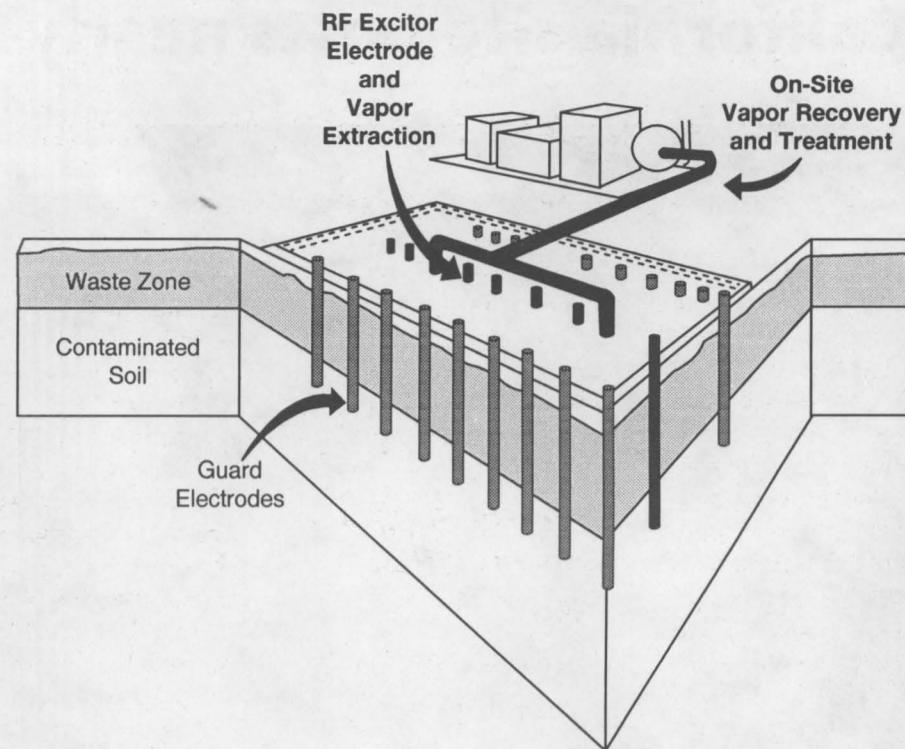
begin to vaporize and separate from the soil. Once vaporized, the gaseous contaminants can literally be vacuumed from the ground, along with steam, through slotted pipes buried in the landfill.

The researchers expect a removal rate of about 99 percent of the soil's hazardous contaminants, says Jim. "It literally bakes the soil dry," he says. "What's left in the soil isn't much of a threat."

On the surface, a catalytic oxidation off-gas treatment system, similar to the catalytic converter on a car, burns the contaminant vapors and separates them into their constituent parts: carbon dioxide, water, and simple acids. Exhaust gases from the system, with hazardous chemicals removed, are monitored as they are emitted into the air.

Jim says residual water from the system will be treated and discharged into the city's sewer system. Researchers estimate the treated water will be about 1,000 times cleaner than city standards. Only a very small amount of residual material will have to be disposed of as hazardous waste, he says.

The cleanup process should take about 12



PIPES SUBMERGED in the Area 3 landfill as part of the TEVES project do double duty. The pipes along the center of the landfill act as "excitor electrodes" that conduct electrical and radiofrequency (RF) energy; two of the center pipes also serve as conduits for vapor contaminants extracted from the soil. Pipes submerged along either side of the landfill are "guard electrodes" that keep electrical and RF energy inside the landfill. A corrugated aluminum structure covering the landfill (seen in photo on page 1) is required to keep radiofrequency energy from interfering with radio communications in the area.

weeks, he says.

Permits to conduct the demonstration have been granted by the New Mexico Environment Department and the City of Albuquerque.

### 'Hog and haul'

Jim says TEVES' in-situ approach to landfill cleanup is a departure from conventional environmental restoration methods, which typically involve removing contaminated soil from the ground by the truckload and treating it at a remote incinerator — the "hog and haul" method, he calls it. Such cleanup methods for a site like Sandia's Area 3 landfill can take years and cost millions of dollars.

He believes the combination of electrical and RF soil-heating technologies employed in the TEVES demonstration will dramatically improve waste recovery rates in landfills contaminated with a mixture of liquid hazardous wastes and oils, especially those in dry, alluvial soil such as that in Area 3.

"I think there's a niche for this technology as a specialty remediation technology," says Jim. "But to take it to market, you must make it faster, safer, and cheaper than other available ER technologies."

During the demonstration, TEVES researchers are monitoring the temperature of the soil as well as the types and amounts of contaminants that remain in the soil. They hope experimenting with different combinations of electrical and RF heating will lead to more uniform temperature increases and better evaporation rates.

The demonstration is also being conducted with collaboration from Dick Fate and Cindy Ardito of Environmental Restoration Dept. 7585. If successful, the project could help identify technologies useful for cleanup of other Sandia sites.

"The environmental restoration industry is used to digging things up," says Jim. "I think by demonstrating this technology, we can show that there are better ways."

### Sandia, IITRI, and Martin Marietta cooperate on TEVES demo

While electrical soil heating is being studied widely in industry and government as a way to recover chemical wastes from soil, the radiofrequency (microwave) soil-heating concept employed in the TEVES demonstration is patented by IIT Research Institute (IITRI), a private research organization based at the Illinois Institute of Technology.

IITRI originally studied RF soil heating during the world oil crisis of the 1970s as a way to recover oil from tar sands and oil shale. The TEVES demonstration project is a cooperative effort between Sandia and IITRI.

Martin Marietta Government Electronic Systems has expressed interest in commercializing the TEVES technology and has begun working with Sandia and IITRI.

## Sandia's Chemical Waste Landfill in Area 3

Demonstration of Sandia's Thermal Enhanced Vapor Extraction System (TEVES) is being conducted at Sandia's Chemical Waste Landfill in Tech Area 3. The landfill is being cleaned up under the direction of the Labs' Environmental Restoration program.

The landfill was created in the early 1960s for various chemical and mixed wastes produced as byproducts of weapons research and development. Originally the site was selected for disposal purposes because of a thick layer of alluvial deposits that overlay the groundwater 480 feet below the landfills, which promised to serve as a

natural barrier between the landfill and groundwater. Today additional precautions are taken at chemical disposal sites to prevent groundwater contamination.

Between 1962 and 1985, various chemicals were dumped into several 15x45-ft, 15-ft-deep pits located at the site. Each pit received different chemical combinations.

The TEVES pit primarily contains liquid volatile organic compounds (VOCs), such as chlorinated solvents like perchloroethylene and trichloroethylene, mixed with various petroleum byproducts like pump oils and motor oils.

## Take Note

The Central Rio Grande Chapter of the New Mexico Network for Women in Science and Engineering will meet on Wednesday, Nov. 16, at 6 p.m. at the home of Beulah Woodfin (5004 Northern Trail NW). Krista Edmonds, president of Synthesis International, will present a talk ("VictimSpeak or PowerSpeak?") that describes how women use language to disempower themselves. For more information, contact Carol Skinner (9215) on 844-8901.

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Energy and Environment Div. 6000 is sponsoring a food drive Nov. 7-18 to help alleviate the shortage that always occurs around the holidays. All food collected will be sent to the Roadrunner Food Bank. Boxes for donating food will be set up in various locations in Bldg.

823, Areas 3, 4, and 5, and the BDM Building. If you need more information, call Nancy Clise (6000) on 844-1586.

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Handcrafted items created by more than 100 participants will be for sale at Cleveland Middle School's holiday arts and crafts bazaar on Saturday, Nov. 12, 9 a.m.-4 p.m., at the school (6910 Natalie NE, near Louisiana and Montgomery). For more information, call Madeline Edgar on 884-8567.

## Sympathy

To Mark Poulsen (12622) on the death of his mother-in-law in Kearney, Neb., Oct. 24.

To Sarah Hammond (10407) on the death of her father in Albuquerque, Oct. 25.



# Firm investigated for possibly providing inaccurate radiation exposure data to Sandia

**Other types of monitoring indicate no adverse health impacts**

A Santa Fe company, Controls for Environmental Pollution (CEP), is being investigated for possibly providing inaccurate data on urinalysis bioassays for employees and contractors at Sandia between August 1992 and April 1994.

CEP is being investigated by the US Attorney's office after allegations were made that the contractor provides unreliable and inaccurate data. CEP performed bioassays for about 650 Sandia employees and contractors during this time. Federal officials impounded the company's records early Monday, Nov. 7, to learn more about the situation after an affidavit was filed in federal court last Friday.

Bioassays, performed with urine samples, are conducted to determine whether individuals have been exposed to radioactive materials and, if so, whether such exposures are within acceptable DOE limits.

About 600 of the 650 bioassays were baseline surveys or termination surveys, about 40 individuals were tested as a result of possible exposures to radioactive materials, and about 10 people who routinely work with some types of radioactive materials were tested as a part of regular procedures. Baseline bioassays are routinely performed for employees and contractors — new hires and on-roll individuals — who have been identified as individuals who may work with radioactive materials or who may have worked with them before coming to Sandia. Termination surveys are performed when an employee leaves Sandia or transfers to a job that does not require a bioassay.

## Employees and contractors briefed

Employees and contractors who had been tested as a result of possible exposure to radioactive materials were briefed at meetings this Monday and Wednesday. VP for Laboratories Services Lynn Jones (7000), Medical Director Dr. Larry Clevenger (3300), and Safety and Health Director Joe Stiegler (7700) emphasized to the employees that, despite the allegations

and the US Attorney's investigation, currently available information indicates there is no reason to believe there are any adverse health impacts on employees or contractors. Whole body counts, dosimeter readings, and workplace surveys including air monitoring support this view, says Joe.

Most of the bioassays for these individuals were for workers who were possibly exposed to slightly elevated levels of depleted uranium. Ten Labs employees were tested after they returned from visiting a former Soviet Union nuclear facility where officials believed a minor accident could have occurred. Two tests were done because employees tore protective gloves while working with radioactive materials.

Sandia is conducting its own internal investigation and has formed a special team to address the entire matter and to conduct a root cause analysis. Dick Schwoebel, Director of Surety Assessment Center 12300, heads the team, which includes the Sandia medical director, other Sandia employees, and people from outside the Labs.

## Individuals can request new tests

The team will determine whether to recommend repeat bioassays for any of the employees and contractors whose bioassays were done by CEP, but Sandia will give all of these individuals an opportunity to have new tests done if they so desire.

Sandia stopped using CEP in April after discovering problems with bioassay results. The Labs had sent some urine samples to CEP with predetermined quantities of radiation and some samples known to be radiation free. Some of the results that came back from CEP did not match the known data, according to Joe Stiegler.

Since Sandia stopped using CEP this spring, bioassays for Sandia employees and contractors have been done by REECO at DOE's Nevada Test Site.

DOE is investigating whether other DOE sites and employees may be affected. DOE's Mound (Ohio) plant used CEP's services for special projects last year, but stopped sending samples to the company after questions arose about its capabilities. The department has directed all of its sites to report instances in which CEP's services have been used.

*Sandia stopped using CEP in April after discovering problems with bioassay results.*

A DOE news release on Monday said the department will review its policies and standards for collecting and recording bioassay samples and that guidance will be provided to DOE sites. "The Department has been developing an accreditation program for bioassay laboratories to provide quality and performance standards for contractors that conduct bioassay analysis for the Department," it said.

Anyone needing more information about this matter can contact Joe Stiegler on 845-3484.

— Larry Perrine

## Supervisory appointments

REBECCA HORTON to Manager of On-Site Monitoring Applications Dept. 9208.

Rebecca joined Sandia in 1984 as an electrical engineer in the Intrusion Detection Systems Department. Other departments she's worked for include Advanced Technology, Safeguards Technology, and Imaging Technology and Systems.

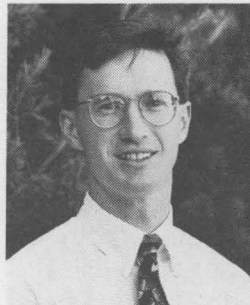
She has spent her Sandia career in safeguards and security work, primarily

on applied research and development in the area of digital image processing for safeguards and security applications. Past projects involved developing enhanced video assessment and surveillance systems for both domestic and international safeguards applications. For one year ending October 1993, Rebecca was on temporary assignment at DOE Headquarters in Washington, working as a technical adviser to the International Safeguards Division, Office of Arms Control and Nonproliferation.

She has a BS in electrical engineering from New Mexico State University and an MS in electrical engineering from Stanford University, obtained through Sandia's One-Year-On-Campus program. She is a member of the Institute of Nuclear Materials Management and Phi Kappa Phi Engineering Honor Society.

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TIM KNEWITZ to Manager of Program Management Office 10606 for Treasury, Corporate Policy, and Process Reengineering Center 10600.



TIM KNEWITZ

Support Department in 1991, and became financial officer for the Laboratory Directed Research and Development Program in 1992.

Tim has bachelor of accountancy and master of accountancy degrees from New Mexico State University. He is a Certified Public Accountant. Before coming to the Labs, he was a tax and financial planning consultant in Tucson.

## Sandia WIPP employees assist with O'Leary visit to Carlsbad Area Office

Sandia Waste Isolation Pilot Plant (WIPP) employees provided support during DOE Secretary Hazel O'Leary's recent visit to the DOE Carlsbad Area Office.

Sandia/WIPP people, working with the WIPP In-house Energy Management Program Committee (IHEM), assisted in the construction of an energy conservation information booth for the TeleFEMP Broadcast I, a satellite link sponsored by the Office of Federal Energy Management Programs (FEMP) in Washington.

The satellite broadcast kicked off Energy Awareness Month, with O'Leary, from Carlsbad, as the first speaker.

Sandia/WIPP employees assisted in providing her the information booth during the Oct. 4 satellite uplink.



HAZEL O'LEARY

Paul Brewer, Director of Carlsbad Operations Center 6700, says FEMP officials and Secretary O'Leary's staff praised the IHEM Committee for a "great" information booth.

Carlsbad Area Office WIPP employees previewed the booth Oct. 3. The next day the public viewed it for the first time. The booth and all displays were then relocated to the WIPP site to allow employees there to view them.



# Sandia 'user facilities' open Labs to US industry

**Facilities allow businesses, universities to tap into Labs' expertise**

By Chris Miller

Media Relations Dept. 12621

Sandia is providing US industry — including small businesses — even greater access to its world-class equipment and expertise through a program that entails the creation of "user facilities."

The Combustion Research Facility at Sandia/California was the Labs' first user facility, but only now are many other parts of Sandia being opened to outside users.

Also called "technology deployment centers," user facilities expand on the concept of technology transfer in that they allow businesses quick and easy access to a wide variety of unique capabilities at the Labs in such diverse areas as solar thermal energy R&D, combustion and materials sciences, laser applications, electronics reliability, and robotics.

"It's a fast, inexpensive way of doing something for industry," says Ted Dellin (2203) of the Electronics Quality/Reliability Center (EQRC), one of Sandia's user facilities. "We've

*"We've built up this national treasure, but by and large, it's been behind a fence. We now can use the facilities to really open up the Labs."*

built up this national treasure, but by and large, it's been behind a fence. We now can use the facilities to really open up the Labs."

DOE defines a user facility as a physical facility, or a collection of interrelated facilities, that have the capability or resources to conduct scientific and technical research. The facility's primary function is to satisfy the needs of DOE, which approves each user facility. The capabilities of the user facility must not be readily available elsewhere in the US, to ensure there is no direct competition with the domestic private sector. Also, the use of the facility by industry must not interfere with the facility's programmatic mission.

## Two dozen by end of year

Outside users can be private industry, universities, and other laboratories.

Sandia currently has 10 user facilities, is adding more every month, and could have up to two dozen by the end of 1994, says Jerry Hanks of Industrial Partnership Development Dept. 4211, who oversees the user-facility program at Sandia.

Jerry anticipates Sandia will sign more than 100 user-facility agreements during the next year. DOE requires that outside users pay the full cost of the services before any work is done. Sandia, however, can waive part of the fee for small businesses and nonprofit organizations.

"The key to user facilities is technology transfer to industry and rapid response time," says Jerry. "We can get a contract in place in as

little as four days."

It took General Motors only about two weeks in June to put together a \$181,000 agreement to use Sandia's EQRC, a world leader in electronics reliability and failure analysis. The agreement lets the automaker use the facility to help improve the design for a GM electronic emissions device that will be used on 1998 model vehicles. GM discovered the need to optimize the materials when it moved the device from the design concept phase to the preproduction stage.

"They were immediately able to understand the failure mechanisms," says T.J. Allard of Industrial Programs Dept. 2205, a member of the EQRC staff. "They're continuing to make corrections to the design, and the final product will be a much more cost-effective design."

Carl Miller, manager of technical assessment for General Motors, says Sandia's facilities are "superb," adding, "T.J. Allard and the group just bent over backward to make things happen. We now have the scope of our work well defined."

## Small company happy with help

Novus Technologies, a small Albuquerque company, has used Sandia's Nuclear Facilities Resource Center over the past nine months. The company helps design and produce components for commercial satellites and uses Sandia's facilities to test the effects of space radiation on the components.

"We couldn't buy these kinds of resources," Novus President Earl Fuller says of Sandia's facilities. "Having access to the facilities, as well as to the people resources, is proving to be a tremendous relationship."

Fuller says he anticipates developing long-term relationships with Sandia that branch into related endeavors.

"Traditionally, small business has looked at Sandia strictly as a funding source, a place to sell their products," he says. "The way I look at it today, Sandia is a business resource, a place I can access world-class technical facilities."

"The user-facility program has added a degree of freedom to our ability to partner with industry," says Ted. "It just increases our robustness, our ability to interact with industry."

"Users will be able to come in and access our equipment and perform measurements and characterizations that are not available elsewhere," he adds. "They will take back to their companies new techniques on failure analysis and reliability that we have developed here."

## Sandia's current user facilities

**National Solar Thermal Test Facility and Design Assistance Center:** Used for tests requiring intense heat and for collecting light with large-scale optics. Specific high-thermal flux applications include investigating the thermophysical properties of materials and testing various solar applications. Contact: Dave Menicucci, Solar Thermal Technology Dept. 6216.

**Combustion Research Facility (California):** Used to improve the understanding and control of combustion processes. Projects include studies of combustion-generated pollutants to applied studies of processes in internal-combustion engines. Contact: Bill McLean, Combustion/Materials Science/Tech Center 8300.

**Electronics Quality/Reliability Center (EQRC):** A world leader in electronics reliability and failure analysis. The EQRC deals with all electronic components from cables and connectors to high-speed integrated circuits. Contact: Ted Dellin, NCURE Dept. 2203.

**Laser Applications (LAZAP):** Consists of a large Cassegrain beam director/telescope, and several high-power lasers. LAZAP also includes control, tracking, and safety equipment. The telescope can track satellites from low earth to geosynchronous orbits, as well as perform fixed pointing and sidereal rate tracking. Contact: Norm Blocker, Operational Satellite Payloads Dept. 9206.

**Nuclear Facilities Resource Center (NUFAC):** This comprises several facilities. The Hot Cell Facility provides a means of handling and examining radioactive materials, usually following exposure in one of the reactors. The center also includes the Gamma Irradiation Facility and the Radiation Metrology

Laboratory. Contact: Ted Luera, Business Planning and Development Dept. 6504.

**Intelligent Systems & Robotics Center (IS&RC):** A research and development facility that applies intelligent systems and robotics technologies to areas such as manufacturing, environmental cleanup, weapons production, weapons dismantlement, and biomedicine. Contact: Pat Eicker, Intelligent Systems and Robotics Center 2100.

**Explosives Components Facility (ECF):** Has the full range of capabilities necessary to support the understanding of energetic materials and components. Contact: Lloyd Bonzon, Explosive Projects and Diagnostics Dept. 2654.

**The Technology Information Environment for Industry (TIE-IN):** Using TIE-IN, industry partners obtain technical solutions by directly accessing Sandia's computers, software, databases, rapid prototyping equipment, and test and diagnostic equipment. Contact: Jim Ang, Program Development Office 1404.

**Materials and Process Diagnostics Facility:** Offers expertise in microscopy, microprobe, metallography, plasma spray, liquid metal, and joining capabilities. Process sensor, polymer degradation, and sol-gel processing are also strong capabilities. Contact: Tom Headley, Electron Microscopy/Metallography Dept. 1822.

**Primary Standards Laboratory:** Administers the Department of Energy's standards and calibration program for the entire nuclear weapons complex. Metrology supported by the laboratory covers three broad areas: radiation standards, physical standards, and electrical standards. Contact: Ralph Johnson, Measurement Standards

## Retiree deaths

Max Gonzales (79)	.....3422	.....Aug. 21
Samuel DeHaan (77)	.....7631	.....Aug. 31
Harry Clay (85)	.....4514	.....Sept. 3
Leroy Foster (96)	.....2563	.....Sept. 7
Geoffrey Lynch (76)	.....1411	.....Sept. 8
Robert Orr (82)	.....9712	.....Sept. 13
Orbra Phelps (81)	.....9481	.....Sept. 20
John Ludington (83)	.....8433	.....Sept. 21
Eldon Upchurch (68)	.....5213	.....Sept. 22
James Harrison (72)	.....2452	.....Sept. 27
John Armijo (71)	.....7474	.....Sept. 28
William Lewis (58)	.....1137	.....Sept. 29
Rosanna Latham (62)	.....3414	.....Sept. 29
Henry Moleculeski (74)	.....9372	.....Sept. 30
Edward Heath (80)	.....1556	.....Sept. 30

Organization numbers indicate retirees' positions at the time of retirement and may not correspond to present-day organizations.



## Clean Air Network

(Continued from page 1)

needed to evaluate transport and dispersion patterns across the Labs.

"When you take a look around Sandia," she says, "you see mountains rising at our immediate east, a mesa area sloping gently downward toward the west, and the whole area criss-crossed by arroyos and dotted with low-lying hills. Also, there are concentrations of large and small buildings, which complicate airflow."

And, she adds, "Using airport data doesn't tell you which way is downwind because the airport data doesn't represent many of Sandia's areas, and knowing downwind from upwind could be critical in certain emergencies."

### Network integral to compliance

The CAN comprises six 10-meter towers, one 50-meter tower, and two 60-meter towers, all of which are instrumented at the 3- and 10-meter levels. Instrument clusters also are installed at the tops of the three taller towers.

Meteorological data collected from all nine towers includes wind speed and direction,

temperature, and relative humidity; three stations include rain gauges; and barometric pressure is reported from two stations.

PM10 monitors are set up in areas prone to have dust kicked up, such as landfills, where metals or other potentially harmful substances might be found. The four VOC monitoring locations are analyzed for 25 different compounds, Gina says, such as components found in gasoline.

She says the program is integral to compliance with DOE orders and guidelines, and with state and local air-quality regulations.

"There are three reasons we have put these air quality stations into place," she says: "to establish background levels for Sandia, to be able to show that we are complying with National Ambient Air Quality Standards, and to be able to detect and evaluate any changes in air quality."

The weather stations' purpose is to collect site-specific meteorological data, to support other environmental monitoring programs, and to provide real-time information for use in emergencies.

Data from the meteorological monitoring stations is transmitted to a central location and Gina says her department has developed a system for making that information available to other Sandians who need it. Beginning next spring, Dept. 7575 will generate quarterly reports of Sandia's meteorology and air quality.



WEATHER REPORT — Danielle Nieto (7575) downloads data from a monitoring station called Schoolhouse Site 1, near the entrance to Coyote Canyon. It is one of nine meteorological/ambient air monitoring stations that make up Sandia's new Clean Air Network.

### Checking air quality key to defining allowable emissions for operating permit

Sandia/New Mexico's Clean Air Network will play a role in helping the Labs prepare its application for an emissions-to-the-air operating permit, which will define its Allowable Emissions (AE) under terms of the Clean Air Act.

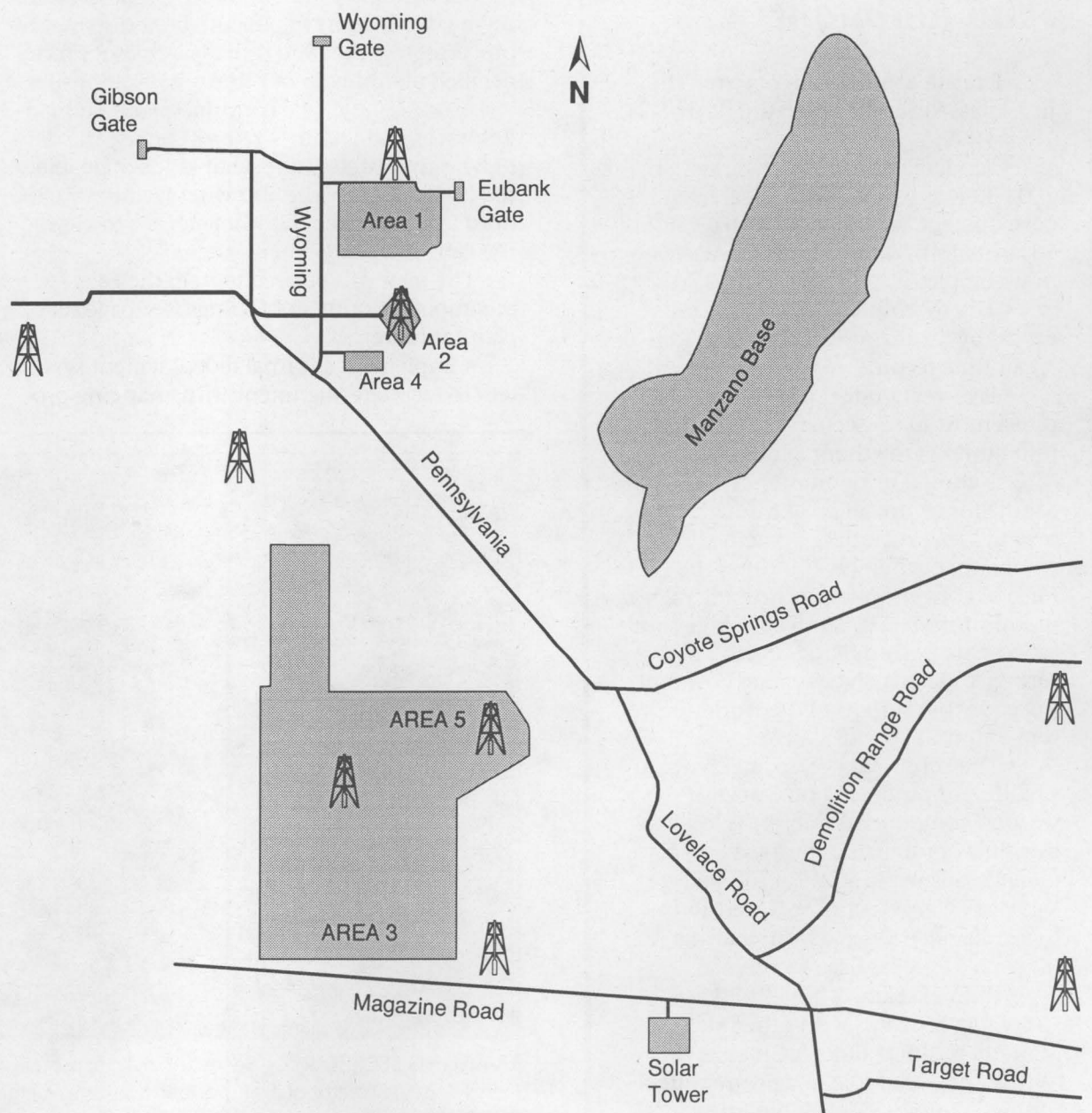
Sandia's application will be made to the Albuquerque-Bernalillo County Air Quality Control Board (A-BC/AQCB), whose own local operating permit regulation is expected to gain Environmental Protection Agency approval this month. Sandia's application to the A-BC/AQCB would then be due no later than November 1995.

The application requires a detailed inventory of emission units (e.g., each generator, steam plant, chemical users, etc.), process descriptions, and quantities of emissions, and must include records of any existing air regulation violations and plans for correcting them.

Operating permits are issued for five years and require submission of annual compliance certifications. The annual permit fee of \$20.89 per ton is based on the amount of Allowable Emissions.

Chui Fan Cheng and Mike Du Mond of Air Quality Dept. 7575 say consequences of noncompliance with the permit can range from negative publicity through lawsuits and fines, criminal prosecution, and even shutdown of the entire facility.

The Labs' goal is to be in compliance before its AE plan takes effect, says Chui, comparing clean air regulations with driving. "In the early days of cars, nobody needed a driver's license, but now everybody has to have one," she says. "It's the same with clean air: For many years there was almost no concern with air quality, but now we all have to be concerned with it."



APPROXIMATE LOCATIONS of nine towers that monitor air movement and content as part of Sandia's Clean Air Network. The new network covers more than 50 square miles, with the longest distance between monitors approximately eight miles.



# New Operating Plan peers into Sandia's future

## Employees encouraged to give it a look

Employees who want to know what Sandia hopes to accomplish this year, where the Labs is headed in the next five years, and how Sandia's mix of work skills may change are encouraged to examine the new Operating Plan for 1995-1999, distributed to Sandia Large Staff (directors and above) last week.

Prepared for Sandia operating contractor Martin Marietta, the plan also includes major Sandia accomplishments during FY94, operating budget projections for the next five years for the Labs as a whole and for each of the three business sectors, business strategies, government and social issues affecting the Labs, information about how the Labs will respond to the changing needs of DOE, and much more.

### In directors' offices and libraries

Employees who are interested in reviewing the plan can check with their director's office or with the Sandia/New Mexico and Sandia/California libraries, where several copies have been placed.

The plan was presented to Martin Marietta President and Chief Operating Officer Tom Young and other senior company officers Oct. 19 by Sandia Executive VP Jim Tegnalia and Joel Weiss, Director of Strategic and Operational Planning Center 4500. Martin Marietta requires all of its business units to produce operating plans annually. This was Sandia's first opportunity since the company assumed its Sandia management responsibilities Oct. 1, 1993.

## Plan highlights

Here are a few highlights from the just-released Sandia Operating Plan, 1995-1999:

- Sandia has established more than 200 CRADAs (cooperative research and development agreements), with a value of \$615 million. Some of these CRADAs are now complete.

- The seven R&D 100 awards received by Sandia researchers this fall is an all-time record.

- Five-year budget projections indicate a most-likely scenario of less-than-inflationary growth for Sandia.

- National recognition has come to Sandia for technical breakthroughs in several areas, including a micro-steam engine that generates 100 times the force of conventional electrostatic micro-motors, infrared sensor technologies for blood-glucose and blood-alcohol monitoring, and a massively parallel computing code that surpassed the world record for computing performance.

- The Labs is taking on larger responsibilities for producing non-nuclear weapon components and plans to establish a new production business unit to manage this work. Some of the staff for this work will be employees transferring to Sandia/New Mexico from Martin Marietta's Pinellas, Fla., facility.

- In FY95, Sandia hopes to develop closer relationships with other Martin Marietta business units, gain acceptance for the Labs' lead role in agile manufacturing technology development, and increase industry and university participation in all Sandia programs.

Joel describes the Operating Plan as the "implementation plan" for the Sandia Strategic Plan. "Our Strategic Plan sets our broad objectives. Our Operating Plan is a look at how we're going to get there — what we're going to do in the next five years to move in the directions spelled out in the Strategic Plan."

The new Sandia Strategic Plan is nearing completion. The Labs provided a review copy to Vic Reis, DOE Assistant Secretary for Defense Programs, during the Institutional Site Review at Sandia last week. The final version should be ready in six weeks or so.

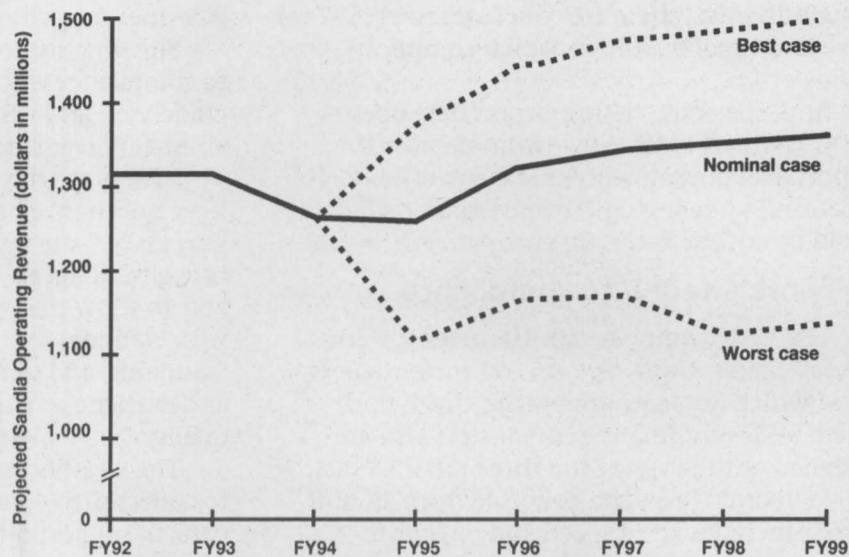
The Operating Plan is not the culmination of operational planning at the Labs, Joel emphasizes, but more of a beginning point for Sandia line organizations. "By putting all of this data in one place and having it be market-driven, it allows us to pull all of our disparate processes together and provide a basis for more detailed planning in our line organizations.

"For example," he continues, "our Human Resources and Facilities groups can use the data to help them determine what kinds of people the Labs needs to hire and what facilities we'll need in the future. The whole idea is to view the Labs as an integrated system."

The plan will be used to help the Labs accomplish a number of things (see page six of plan for more):

- Implement a formal redeployment system to facilitate alignment with changing pro-

## Sandia National Labs 5-year operating budget projection



NEW OPERATING PLAN includes this five-year Sandia operating budget projection. The solid line (nominal case) indicates that the budget is expected to grow but perhaps not keep pace with inflation. The projection does not reflect any carryover money from year to year, but only the "new money" expected each fiscal year. The Oct. 28 *Lab News* said the Labs' FY95 operating budget, including carryover money from last year, is expected to total nearly \$1.362 billion.

grammatic mix.

- Prioritize existing work and investment opportunities.
- Reassess support of R&D capabilities to align with future business needs.
- Adjust recruiting and retraining needs based on strategic skills needed.

Joel says much of the credit for the Operating Plan goes to a Sandia team that put it together, led by Tana Calvin and Sheryl Hingorani of Strategic Planning Program Office 4514. Many other employees throughout the Labs contributed input.

Employees who have questions about the Operating Plan or who want additional information can contact Tana on 844-9730 or Sheryl on 844-2721.

— Larry Perrine



TRAVELING SECRETARY — Secretary of Transportation Federico Peña (second from right) talks with (from left) James Kelsey, Director of Transportation Systems Center 9500; Steve Roehrig, Manager of Advanced Transportation Programs Dept. 9604; and (far right) Gerry Yonas, VP for Systems Applications 9000, during a quick visit to Sandia Oct. 18. Peña received briefings on how DOE-developed national security technologies are being applied to national transportation needs. He toured the STARBASE security tracking and response base, was briefed on sensors/information management, and saw a demonstration of robotic vehicles.



# Mexican connection: Sonora signing a milestone for Sandia's renewable energy program in Mexico

**DOE, USAID help fund effort to bring productive energy to remote regions**

By Ken Frazier

*Lab News Managing Editor*

Two documents signed recently in the Mexican State of Sonora mark a major milestone for a Sandia program intended to bring solar and wind energy to rural sites in Mexico.

Dan Arvizu, Director of Advanced Energy Technology Center 6200, signed a coordination agreement for Sandia, while the Governor of the State of Sonora and the Director General of the Mexican federal agency FIRCO (*Fideicomiso de Riesgo Compartido*), a shared-risk trust fund under the Secretariat of Agriculture and Hydraulic Resources, signed for their entities.

This agreement was proposed by FIRCO and indicates a mutual interest in expanding the use of renewable energy technologies in Sonora. In addition, the Director General of FIRCO also signed the first contract between Sandia and a Mexican organization under the program, facilitating the transfer of \$90,000 to FIRCO to support program goals.

The ceremonies took place Oct. 27 in Hermosillo, Sonora.

## Agreements open Sandia assistance

The agreement and the contract enable Sandia, on behalf of DOE, to provide technical advice, training, and financial resources for renewable energy (solar and wind) projects in Sonora, particularly toward providing electricity for "productive purposes," such as water-pumping for agriculture, in rural and remote areas without access to electric power grids.

Earlier this year, members of Sandia's Solar Thermal program concluded a similar agreement between Sandia and the University of Sonora.

Sometime in December another agreement is expected to be completed with the State of Chihuahua, and still others may be forthcoming after that. Several similar contracts will also be implemented.

These agreements mark an important milestone in Sandia's Mexico program in renewable energy, says Charles Hanley of Renewable Energy Program Development Dept. 6201, who joined Dan in Hermosillo for the signing.

"We also have major activities with the State of Chihuahua and with conservation organizations working in Mexico, such as the Nature Conservancy, the World Wildlife Fund, and Conservation International," says Charles.

Sandia's Mexico program effort in renewable energy began in 1991 and since then has been cultivating relationships with a number

of Mexican government and private organizations and conducting workshops and other training activities in Mexico. Recently, Sandia conducted two one-week water-pumping workshops in Sonora and Chihuahua during which photovoltaic systems were installed.

Sandia's Mexico program supports both DOE and US Agency for International Development (USAID) strategic objectives: The theme is that by increasing use of renewable energy technologies, markets for US industry suppliers of solar energy equipment will be expanded. There is already high-level government policy motivation, in that part of the US global climate change effort encourages the use of renewable energy technologies as a mechanism for curbing greenhouse gas emissions.

The Sandia program involves shared funding. From the US side, funds come from USAID and DOE. On the Mexican side, federal and state agencies and rural users all contribute.

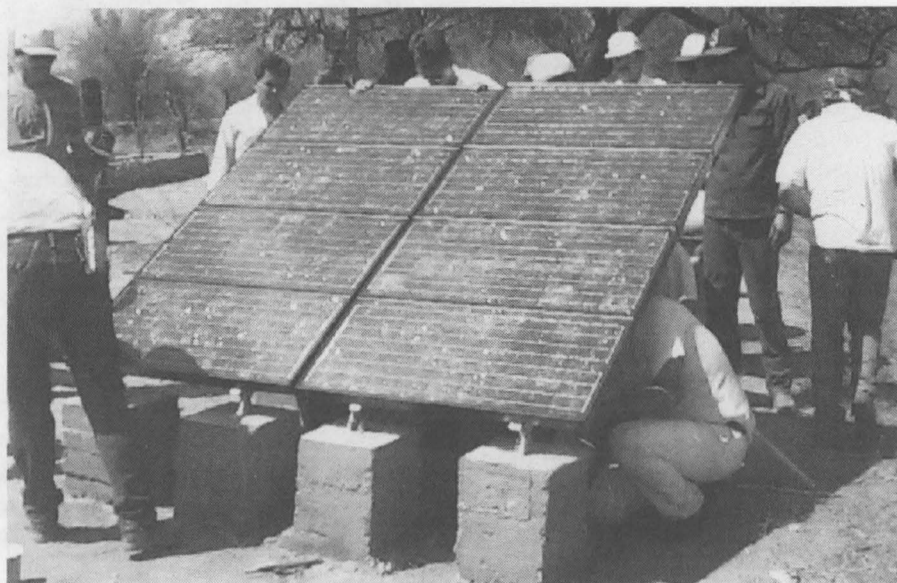
## Electricity for remote areas

Although Mexico has one of the most electrified economies in all of Latin America, it is estimated that 7 million Mexicans still have no access to electricity, says Ron Pate (6218), who was leader of Sandia's Mexico program in renewable energy for its first three years (now succeeded by Beth Richards, 6201).

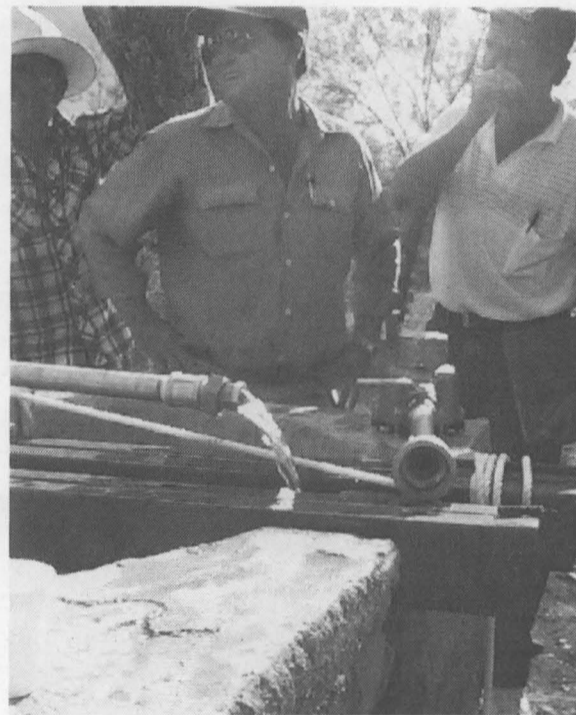
"There are a great many people in Mexico who are beyond the access of the electrical grid," says Ron. This is especially true of very remote areas, which include a lot of places where indigenous people live.

He says the Mexican government has been investing heavily in rural development and is receptive to the use of renewable energy but has no comprehensive federal program in the area.

"They can use help in better understanding the technologies, training and staffing, improving systems, bolstering the infrastructure,



**SOLAR IN SONORA** — Workers and officials, most from the Mexico federal agency FIRCO, install a solar photovoltaic system on a remote ranch about 50 miles outside of Hermosillo, Sonora, during a Sandia-sponsored workshop in September. The electricity produced is being used to pump water (below).



**WATER FLOWS** after solar photovoltaic panels are installed on the remote Sonoran ranch.

and forming stronger links with US industry," says Ron.

Productive-use applications in addition to water pumping include producing electricity for refrigerating vaccines at remote health clinics, communicating by radio from remote sites, operating milking machines for small dairy operations, and powering small-scale ecotourism enterprises.

The Sandia program, on behalf of DOE and USAID, works with established Mexican organizations. It functions within established and funded programs and heavily emphasizes sustainability, says Charles. And, he says, human and institutional infrastructure (training, strengthening institutions, and access to financing) is considered at least as important as technology and hardware.

Sandia's co-funded partner organizations in the program are the National Renewable Energy Laboratory (NREL), Pacific Northwest Laboratory, and the Institute of International Education (IIE). IIE contributes to training activities (most in Spanish) under USAID funding.

Four subcontractors to Sandia are assisting in the effort: the National Rural Electric Cooperative Association, the Southwest Technology Development Institute, Meridian Corp., and Enersol Associates.

## Mexico program 'unique opportunity' for success

Sandia's Mexico program in renewable energy is a good way for the Labs to gain experience if we are to expand such efforts to other countries, says Dan Arvizu, Director of Advanced Energy Technology Center 6200.

"I believe that Mexico offers us a unique opportunity to have a fairly quick success in incorporating renewable energy technologies into applications that both offer economic growth and help mitigate environmental impacts," he says. "The reason is that Mexico's capability to promote and maintain advanced technologies is better established than that of many countries

with significant energy needs. The opportunity is mature for government-to-government interactions to develop a working framework within which private industry can operate.

"This offers us an excellent opportunity to get our renewable energy goals accomplished in an international setting."

He also says the North American Free Trade Agreement allows the US to act more as partners with Mexico than ever before. "It gives competitive advantage to US manufacturers of renewable energy products," he says. "That's a major incentive for us to work these relationships aggressively."

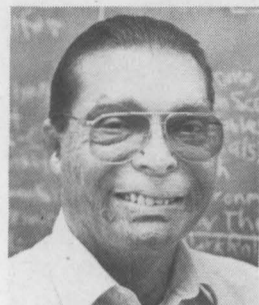


# Sandia, American Indian businesses collaborate to transfer technology for tribal development

By Bob Goetsch

Laboratory Communications Dept. 12610

Laguna Pueblo is a name familiar to most New Mexicans. Laguna Industries, a tribal-owned corporation located on the pueblo, is making a name for itself as an electronics manufacturer. Recently, Sandia, Laguna Industries, and the University of New Mexico's Research Institute for Assistive and Training Technologies joined in a collaborative project to develop next-generation assistive devices for disabled persons. The project is one example of



DEAN PERSHALL

Sandia's effort to transfer technology from the Labs to American Indian businesses, helping tribal economies and showing how the Labs' defense technologies can benefit the nation. "Both as tribes and individuals, American Indians are often among our nation's poorest people," notes Dean Pershall (9216), Sandia's American Indian Technical Liaison. "If we can move our technology into American Indian businesses, we may be able to attract jobs and money to a very disadvantaged part of our economy." Dean, who is Cherokee, is matrixed to Sandia's Regional Economic Development Office (Dept. 4221) in the Technology Transfer Center. His job is to build alliances between Sandia, American Indian businesses, and other businesses and agencies.

"Sandia and Laguna have had a good relationship for some time," says Dean. "We want to build on that experience to support other American Indian businesses." For instance, SunMart, Inc., is a Navajo-owned company that is using Sandia expertise to develop an electrical cogeneration power grid using multiple renewable energy sources. Part of SunMart's goal is to be an incubator for other American Indian businesses, helping these new businesses take advantage of the technology available at Sandia and other national laboratories.

Sandia has also supported tribes outside New Mexico, through the work of Patricia Knighten (4221). "We've been coordinating with the Council of Energy Resource Tribes to identify energy projects that can be funded by government agencies," she says. "Sandia teamed with the Lower Brule Sioux on a renewable energy project that was funded by DOE." Knighten is also the diversity program coordinator for Tech Transfer, and notes that cooperation with American Indian tribes and compa-



AT LAGUNA INDUSTRIES, Phyllis Sarracino solders circuits together. The tribally owned corporation makes electronics and other equipment. (Photo by Randy Montoya)

nies is just part of Tech Transfer's diversity work. "We also support other minority-owned businesses, and we are part of Sandia's overall diversity effort."

Dean has a broad vision for the future of Sandia's work with American Indian businesses. Too often, he says, when American Indians become successful in school and business, they find that there is no place for their skills in the tribal economies. "I want to see Sandia help American Indians become economically self-sufficient on the reservations," Dean declares. "We hope that someday American Indian technical graduates will be able to find work on the reservations that

uses their skills and provides financial compensation that is competitive with the larger economy. Our technology transfer projects are one way we can make that happen."

—Summer science writer Dawn Hipsch contributed to this report.

## Recent Retirees



Clorinda Berryman 10 7615



Don Benoist 33 5513



Gilbert Lovato 37 2412



Marvin Bauder 38 2663



George Wright 33 9814



Wayne Gravning 36 13417

## ESOP dividend checks to be mailed in December

Annual dividend checks for employees and retirees who have balances in the Employee Stock Ownership Plan (ESOP) will be mailed in December with the dividend statement (an annual statement of account) and tax form 1099-DIV for 1994 taxes.

Dave Medina of Pension Fund and Savings Plan Dept. 10510 says the annual statement shows the total of whole and fractional shares.

In addition, Dave says ESOP participants should call him on 844-0997 if they need to make address or benefits records changes. Those who have moved recently, he adds, should call him to request a temporary address for the December mailing.

To ensure receipt of future mailings, participants must request permanent address changes by forwarding requests to:  
Sandia National Laboratories  
Mail Stop 1026  
P.O. Box 5800  
Albuquerque, N.M. 87185  
ATTN: David Medina, 10510

## ★ Congratulations

To Denise (10406) Krupka-Andersen and Don Andersen, a son, Erik Christian Andersen, June 29.

To Michele and Carter (9225) Grotbeck, a son, Alexander Carter, Oct. 5.

To Jill (2654) and Jeffery (1433) Miller, a son, Jay Monroe, Oct. 25.

To Debbie (5838) and Barry Fitzgerald, a son, Connor Edward, Oct. 29.





# Sandia Classified Ads Sandia Classified Ads Sandia Classified Ads Sandia Classified Ads

## MISCELLANEOUS

BICYCLE U-LOCK, Nashbar "ATB," hardened steel under thick black vinyl, double locking, 9-5/8" x 5-1/4", w/nylon bracket, never used, \$20. Schkade, 292-5126.

RECLINER, wall-hugger, brown tweed, nice condition, \$50; Canon FD lens, 28-80, 70-150, \$40 ea., \$75 both. Duvall, 881-4406.

FOUR STEEL RIMS/HUBCAPS, standard, from 1/2-ton '94 Ford truck, removed the day truck was purchased, make an offer. McDonald, 255-9986.

STUDENT CORNER DESK, 3-piece; two cabinets, cash. Lowe, 299-7725.

AQUARIUM, 55-gallon, w/stand and accessories, \$50. Haid, 292-0159.

SIERRA WOOD-BURNING STOVE, '25 antique coal stove, two twin brass beds w/mattresses and box springs; TV stand. Garcia, 343-8207.

POULTRY FENCING, 3' x 77' roll, \$20; wheelbarrow, 3 cu. ft., \$20; BMX-200 all-graphite woods, \$150; Ping-Eye irons, \$250. Stang, 256-7793.

BROYHILL CRIB, Little Tykes high chair, crib set, clothes (infant to 4T), lots more, excellent condition. Monette, 345-0404.

AT&T 6300+ COMPUTER, 80286, 3MB RAM, 80MB external disk, Centronix keyboard, color monitor, 5.25-in. 1.2 MB floppy, \$400 OBO. Cabe, 857-0639.

ALUMINUM SCREEN DOOR, w/jamb, plunger for 36-in. door, \$15; full Somma waterbed, mattress, box frame, \$45. Peterson, 256-7514.

INFANT/TODDLER CAR SEAT, 2 months old, \$55; port-a-crib, \$30; Starkraft wood crib & changing table. Grant, 271-1449.

COMPOUND BOW, w/arrows, Pro-line, left-handed, sights, case, forearm guard, max draw weight 85 lbs., excellent condition, \$220. Standridge, 294-3026.

BUNK BED FRAME SET, solid wood, \$100; exercycle, combination bike, stair step, jogger, digital readout, \$125. Sturgeon, 281-9035 after 5 p.m.

B/D DRILL MOTOR, 1/2-in., heavy-duty, \$50; Sears industrial-quality circular saw, almost new, \$40. Wright, 296-3850.

REFRIGERATOR/FREEZER, large, Amana, freezer above refrigerator, almond, \$250; 15-cu.-ft. upright freezer, \$125, both run well. Crine, 292-5321.

WATERBED, Somma, queen-size, good condition, complete system, including tubes & frame, \$250 OBO. Fleetwood, 822-0026.

WEIGHT MACHINE, DP GYMPCAP 1500, w/additional weights & leg-curl attachment, \$75. Naylor, 293-0866.

REFRIGERATOR, 18 cu. ft., Frigidaire, good condition, \$100; electric range, Frigidaire, 30-in., copper color, good condition, \$100. Fields, 883-9789.

STEPPER/CLIMBER, new, electronic, great Christmas present, \$75. Jordan, 293-4117.

CUSTOM CARPET INSERT, fits SWB Ford, w/2-in. covered foam mattress included, \$200. Bailey, 821-2471.

SEGA GENESIS, w/paddles, pro pad, includes Battleship, Ice Hockey, Mortal Kombat, Championship Street Fighter 2, \$110. Ennis, 836-0504.

TEAK TRUNDLE BED, w/mattresses, \$250; honey-oak dresser, \$125; dark brown leather chair, \$175; Lil Tykes clothes giraffe, \$10. Cashwell, 856-1968.

BATHROOM VANITY CABINET, white, new, 19" wide x 36" long, \$120 OBO. Ritchey, 299-7082.

CAMPER SHELL for long-wheel-base pickup, \$100; trailer, gooseneck, low-boy, heavy-duty, \$1,200. Sena, 865-4360.

SKI/TRAM SEASON PASSES, for Sandia Peak, \$350 OBO for set. Schultz, 821-5158 or 291-1600 days.

COFFEE/LAMP TABLE, antique, round, burl walnut, \$225; luggage carrier, used once, 48" x 36" x 22", \$75; two vertical blinds, cream, \$25 ea. Castillo, 294-5182.

CASSETTE CAR STEREO, Sony XR-55, auto-reverse, 20W/channel, complete manuals, \$250 new, sell for \$50. Wayland, 299-2587.

APPLE IMAGEWRITER II, manual, Kensington print muffler, \$250 all OBO. George, 292-5368.

KING-SIZE BEDDING SET, Royal Sateen, gold, unopened packages won as prize, fitted & flat sheets, bed skirt, pillowcases, \$200. Wagner, 823-9323.

PARROT, orange-wing Amazon, w/cage, \$650. Babcock, 296-2729 leave short message & phone number.

CROSS-COUNTRY SKIS, Kneissel, 215cm, 3-pin bindings, \$60; belt-drive turntable, Technics SL-B2, \$30; guitar, \$80. Heffelfinger, 281-1733.

COMPUTER, Tandy 1000TL, color monitor, 20MB hard drive, mouse, printer, Deskmate, Memory Mate, WP, \$700. Maupin, 821-9695.

COMPUTER PARTS, 386/33DX motherboard, 40MB disk/controller, \$120; VGA mono monitor, \$50; all good shape. Wood, 823-1965.

GARAGE SALE: baby/child's furniture, clothes, toys; women's clothes; appliances, etc., 7405 San Francisco NE, Nov. 18-19, 9 a.m.-4 p.m. Ferrell, 883-8595.

FUR COAT, silver fox, 3/4 length, excellent condition, worn only 5 times, \$450 OBO. Huff, 296-3788.

ALLOY WHEELS, three, 6.5 x 14-in., for BMW, \$75 ea. Gough, 822-0090.

CROSS-COUNTRY SKIS, very good condition, 170cm., size 37 boots, poles, \$70; 215cm, size 44 boots, \$65; 190cm waxable Rossignols, \$50. Phillips, 898-2565.

BALDWIN ORGAN, \$1,500; Sony 14-in. B/W TV, \$75; couch, \$100; 4 wooden chairs, \$50; end table & lamp, \$25. Beatty, 299-3429.

TWO TICKETS for Dec. 12 Redskins/Cardinals game at Phoenix, \$40; Time/Life Wild Animals, complete 20-book set, \$50. Mitchell, 281-6841.

DOWNHILL SKIS, w/bindings, 120cm child's, \$25; 180cm, \$60; 190cm, \$75. Wernicke, 237-9332.

MEN'S/WOMEN'S SKI TOGS, size 4-6, beautiful, like new Carole Little, Lloyd Williams, Argenta, Liz, max price, \$30. Pitts, 293-5481.

DINING ROOM TABLE, Spanish style, 6 chairs, good condition, \$375. Barton, 268-7349.

WHEELCHAIR, folding, good condition, \$125; man-sized walker; shower chair. Schamaun, 298-5192 after 5 p.m.

SOLID-OAK BAR, like new, \$100. Carter, 881-4976.

LIGHT OAK CHAIRS, 6, high-back, \$30 ea.; daybed, \$75; king-size bed, \$50; sofa sleeper, Southwest colors, \$125. Chavez, 883-6271.

BUNK BED, red metal, twin overfull, frame only, \$100 OBO; men's heavy leather dress jacket, older style, large, \$25. Koepf, 294-7136.

TWO STUDDERED SNOW TIRES, P205/75R14, w/6-bolt rims, used less than 2K miles, \$150; four 15-in. racing-disc hubcaps, \$40. Greer, 281-4688.

COKE MACHINE, waterbed, recliner, highback chair, end tables, computer, dining table w/2 chairs, stereo receiver, cassette player, tandem trailer. Jagdmann, 271-1316.

GOLF CLUBS: 3 drivers, graphite, metal, persimmon/graphite shafts; 2-wood persimmon, 3-wood persimmon/graphite shaft; \$25/ea. Dwyer, 271-0741.

GIFT CERTIFICATE valued at \$100, to be used toward purchase of airline tickets, a cruise, or a tour, \$80 OBO. O'Brien, 892-2498.

COLOR TV, 19-in.; lawn mower; good buys; moving boxes, 50¢ ea. Nash, 292-7086.

TOASTER OVEN, seldom used, \$20; range exhaust hood, complete w/duct, never used, \$525 new, asking \$100 OBO. Cocain, 281-2282.

SHOP MANUALS: '93 Grand Caravan, \$40; '84 Isuzu Impulse, \$20; electric leaf blower, \$40; 150cm Edsbyn cross-country skis, \$25; shop vacuum, \$20. Axness, 296-4691.

**Deadline: Friday noon before week of publication unless changed by holiday. Mail to Dept. 12622, MS 0413, or fax to 844-0645.**

### Ad Rules

1. Limit 20 words, including last name and home phone (the *Lab News* will edit longer ads).
2. Include organization and full name with each ad submission.
3. Submit each ad in writing. No phone-ins.
4. Use 8 1/2- by 11-inch paper.
5. Use separate sheet for each ad category.
6. Type or print ads legibly; use only accepted abbreviations.
7. One ad per category per issue.
8. No more than two insertions of same "for sale" or "wanted" item.
9. No "for rent" ads except for employees on temporary assignment.
10. No commercial ads.
11. For active and retired Sandians and DOE employees.
12. Housing listed for sale is available for occupancy without regard to race, creed, color, or national origin.
13. "Work wanted" ads limited to student-aged children of employees.

ROSSIGNOL 4S SKIS, 200cm, good condition, just tuned, \$175 OBO; Munari and Raichle boots, 7-8, \$10. Kerschen, 821-2848.

KING-SIZE WATERBED, 6-drawer pedestal, maple finish, no headboard. Flanigan, 299-0049.

PELLA FIXED WINDOW, wood, 36" x 48", brown clad, \$95; brown storm door, 30-in., \$45; glass-panel door, 30-in., \$20. Biffle, 293-7043.

### Deadline change

The next *Lab News* will be published Dec. 2. Deadline for ads and other submissions is 4:30 p.m., Tuesday, Nov. 22.

B-FLAT TRUMPET, new, Bach student model TR300, hand-lapped valves, \$595 list, \$400 firm. Guthrie, 299-7182.

SIMMONS MAPLE CRIB, changing table, mattress, \$200; car seat, \$40; high chair, \$30; push toys, more. Lott, 856-5956.

SIDE-BY-SIDE REFRIGERATOR, 22 cu. ft., gold, Kenmore, good condition, \$250. Giesler, 832-4496.

FURNITURE: full-size bed w/shelf headboard, box spring, mattress; dresser w/mirror; 5-drawer dresser, \$300. Raymond, 243-4817.

ANTIQUA OAK DESK, lift-up top, \$300. Martino, 243-3025.

MINIATURE SCHNAUZERS, 3 S&P males, 1 black female, from a good home, parents on premises, \$135. Schafer, 821-0673.

RUGER MARK II, government target model, .22LR, 7-in. barrel, blue, 3 mags, case, manual, 100-percent reliable, \$300. Rackley, 275-1276.

TABLE, w/4 armchairs & buffet, medium wood color, \$475; washer & dryer, almond, \$300; refrigerator, 2 yrs. old, 23 cu. ft., \$575. Salazar, 281-0560.

GOURMET MAGAZINES, all issues 1964 to present, \$30; 17 years of *Bon Appetit* magazines, \$20. Dillon, 881-3843.

FLEXSTEEL SOFA, beige, 97-in., excellent condition. Bentz, 299-3448.

STUDENT-SIZE DESK, dark oak, white Formica top, 3 drawers plus shallow drawer, matching chair, \$45. Stump, 344-9340.

GAS STOVE, pilotless, \$150; Apple IIe computer, ImageWriter II printer, \$350 OBO. Daniels, 299-0136.

303 BRITISH ENFIELD RIFLE, very good condition, \$115 OBO; also SKS and a few other guns, sell or trade. Pryor, 294-6980.

DINING ROOM TABLE, dark oak, 41" x 66", w/18-in. expansion leaf, 6 padded chairs, \$400. James, 294-6837.

GLASS FIREPLACE DOORS, \$60; grate, \$15; old storm door w/self-storing glass, \$25; large window air conditioner, \$100. Ernest, 293-1757, leave message.

ANTIQUA TRUNK, \$80; 6 harp-back chairs \$80; porta-crib, \$20. King, 294-3125.

HANGING LIGHT FIXTURE, black, 6 tall translucent globes, \$25. Hunter, 294-2877.

## TRANSPORTATION

'79 CADILLAC COUPE DE VILLE, gorgeous, lots of recent work, 14 mpg in town (honest!), \$3,000 OBO. Bridgers, 296-4218.

MAN'S FUJI 12-SPD., 21-in. frame, new tires, cycle computer, rear rack, chain, waterbottle cage, many extras, just overhauled. Harrington, 899-1277.

BOY'S BIKE, 19-in., red, very good condition, \$40. Hunter, 294-2877.

'87 MOTORHOME, Class A Southwind, 27 ft., 44K miles, excellent shape, tires, electric step, air, awning, microwave, \$22,000. Houser, 538-0551.

'93 NISSAN MAXIMA SE, Bose CD, power sunroof, ABS, security system, tinted glass, 21K miles, \$21,995. Branstetter, 292-5978.

'74 GOLD SUPER BEETLE SUN BUG, second owner, excellent condition, 1K miles on rebuilt 1641cc engine, 30-mpg, \$2,700. Sturgeon, 281-9035 after 5 p.m.

'87 BMW 325IS, very low mileage, like new condition, red w/tan leather interior, 6-cyl. AT, \$11,250. Bisbee, 293-0356.

'90 BUICK CENTURY, brand new engine, new tires, clean interior, \$7,000 OBO. Barr, 898-4865 after 5:30 p.m.

'73 ALFA-ROMEO BERLINA, 4-dr. sedan, some rust, needs engine rebuild, restorable or use as parts car, \$400 OBO. Bishop, 294-4745.

'92 TOYOTA CELICA GTS, has all options, excellent condition, 14K miles, must see. Nelson, 250-1120.

'87 TAURUS LX, station wagon, AC, AT, three seats, cruise, power everything, high mileage, reconditioned, runs great, \$3,200. Cooper, 888-0967.

'85 HONDA ACCORD, loaded, cassette, runs, looks great, \$2,700 OBO; Sandhawk sandrail, towable, needs engine, finishing, \$750. Jones, 836-5179.

'85 CHRYSLER FIFTH AVENUE, 55K miles, one owner, gold, clean, runs great, loaded, tinted windows, excellent condition, \$5,100 OBO. Sanchez, 898-9598.

'86 CHEV. S-10 PICKUP, 4WD, Crager wheels, Goodrich tires, Rancho shocks, bedliner, truck box, pull-out radio, much more, \$3,000. Plummer, 823-1619.

'72 FORD LTD, 2-dr., good rubber, runs well, low mileage, \$1,500. Jagdmann, 271-1316.

'88 NISSAN 300 ZX, excellent condition, AT, burgundy color, loaded, one owner. Lester, 271-9311.

BICYCLE, 21-in., like new, \$150. Nash, 292-7086.

'76 SAAB 99GL, won't start, fuel-injection problem, body good, radio/cassette player, AC, 4-cyl., \$500. Axness, 296-4691.

'63 CHEV. CARRYALL, white/blue, clean, 327 V8, 4-sp., chrome mags, \$2,500; '65 Chev. panel truck, 84K miles, 307 V8, 3-sp., \$2,500 OBO. Guerin, 877-2726.

'88 ITASCA WINDCRUISER, 33-ft., 23K miles, 6.5-kilowatt generator, TVs, VCR, air conditioners, air-boats, microwave oven, standard equipment, garaged, \$30,000. Morris, 293-1588.

10-SPD. BICYCLE, \$75. Daniels, 299-0136.

'79 MERCEDES 300SD, original motor totally rebuilt, excellent condition, new tires, cream w/buckskin interior, \$5,750. Salazar, 281-0560.

'88 KTM 250MX, new tires, ignition, sprockets, O-ring chain, and more, \$1,100; Bianchi Premio road bike, 19-in., \$200. Bentz, 299-3448.

'76 CADILLAC, only 75K miles, great engine, \$2,500; two bicycles, one 10-sp. mountain bike, \$50; one child's banana-seat bike, \$20. Simon, 299-8468.

'88 FORD ESCORT GT, wagon, red, AT, AC, 39K miles, very clean, \$3,900 OBO. Dobrian, 856-7396.

12-FT. PORTABOAT, 2 yrs. old, '92 Mercury 5-hp outboard, like new, \$1,575; Eagle fish finder, \$175. Upchurch, 296-8591.

## REAL ESTATE

3-BDR. MOUNTAIN HOME, everything you've wanted, 1,800 sq. ft., 2 baths, mature landscaping, fruit trees, decks and more. Pierce, 250-0280.

2-BDR. PATIO HOME, 2 baths, 10 yrs. old, 2-car garage, 1,380 sq. ft., huge yard w/dog run, Juan Tabo/Menaul area, \$123,000. Garrity, 275-3044.

1-BDR. TIMESHARE CONDO, sleeps 4, full kitchen, Las Vegas, NV, week of Nov. 20, \$75/night, or \$500/week. Castillo, 294-5182.

4-BDR. CUSTOM HOME, NE Heights, 1-3/4 baths, 60-ft. covered porch, exceptional condition & landscaping, auto sprinklers, gas logs, extras. Caskey, 294-3218.

TIMESHARE CONDO, Winterpark, Colo., week 48 (Nov. 26-Dec. 2), \$75/night, Ski Maryjane. Guerin, 877-2726.

## WANTED

RIVER RUNNERS, for 8th annual Grand Canyon, Colorado River trip, May 28-June 5, Lee's Ferry to Lake Mead, 280 miles, \$1,390 fare, includes all meals, amenities. Shunney, 265-1620.

DREMEL TOOL, hand-held size, with bits, and other accessories. Kercheval, 864-6549.

CHOP SAW, prefer 14-in., plasma cutting torch. Strip, 292-7490.

SOMEONE TO SHARE HOME, non-smoker, nice area, mountain views, convenient, restaurants, shopping, private room & bath, \$325, includes utilities. Smith, 298-7365 or 292-1976.

USED VCR, prefer a newer model w/remote control. Harrington, 899-1277.

WORLD'S OF WONDER "LAZER TAG" SETS, 3-4 sets, includes gun, belt, harness, holster and sensor. Polito, 281-3953.

LAPIDARY EQUIPMENT. Stefanov, 299-7009.

ARTIST, for "Cherished Creations" Thanksgiving craft show preview, 6 p.m.-9 p.m., Wyoming Mall, Fri.-Sun., Nov. 25-27. Self, 296-4137.

WOMEN, with little or no knowledge of stock investments, forming lunchtime educational investment club to meet at Coronado Club. Frye, 294-7357.

TANDEM BICYCLE, good shape, reasonable. Potter, 292-3989.

METRONOME for beginning musician. Hartwigsen, 865-7836.

NORDICTRACK ski machine. Woodall, 821-1736.

ROLLAWAY BED, single or 3/4 size, mattress must be clean and comfortable. Perrine, 293-1429.

CROSS-COUNTRY SKI EQUIPMENT, children's or youth sizes. Cocain, 281-2282.

WHEELS AND TIRES, size 20.5" x 8", used, in good condition, for trailer. Trujillo, 865-0253.

'37 WESTERN ELECTRIC SCR-268 RADAR, transmitter and antennas; pre-1950 table radios, old tubes; pre-1960 transistor radios. Roose, 296-4129.

## LOST & FOUND

LOST, watch with sapphires/diamonds, lost on Oct. 14, in DOE or Sandia parking lots. Winter, 821-6590.



## Sandia News Briefs

### Sandians honored for 'The Impact of Comet Shoemaker-Levy 9 on Jupiter' paper

David Crawford, Mark Boslough (both 1433), Tim Trucano, and Allen Robinson (both 1431) received the Best Paper Award from the Hypervelocity Impact Society for their paper "The Impact of Comet Shoemaker-Levy 9 on Jupiter" at the Hypervelocity Impact Symposium in Santa Fe last month. The group's computational simulations successfully predicted the visible fireballs that astronomers observed from the comet fragments' series of collisions with Jupiter July 17-22 (*Lab News*, April 15, July 22, Aug. 5, and Oct. 28). In his keynote address at the conference, comet co-discoverer Eugene Shoemaker said the group's simulations had been responsible for alerting astronomers to look for fireball plumes. Before this work, it was generally thought that the impact phenomena would be hidden from earth observers because the impacts occurred on the far side of the planet. The award is a repeat for David, who also received the Best Paper Award at the previous Hypervelocity Impact Symposium held in Austin in 1992.

### Workshop aims to stimulate basic research for future cars

University, government laboratory, and industry scientists and engineers will meet in New Orleans Jan. 5-7 for a workshop, "Basic Research Needs for Vehicles of the Future," that will explore how their long-term research can help US automobile companies develop better generations of automobiles. The workshop aim is to stimulate basic research toward more fuel-efficient vehicles that have a significantly reduced impact on the environment. Sandia is conducting the workshop for DOE in conjunction with other DOE national laboratories, Princeton University, the National Science Foundation, Chrysler, Ford, and General Motors. Workshop results will be communicated to the science and engineering communities at universities and government laboratories so that researchers can contribute to future innovations in this critical area. Workshop results are also expected to guide future funding from the federal government. For more information, contact Steve Binkley, Strategic Planning Dept. 6908, Sandia National Laboratories, MS 0725, Albuquerque, NM 87185.

### Ron Iman named Emporia State University Distinguished Alumnus

Ron Iman (6613) has been selected by Emporia State University, Emporia, Kansas, to receive a Distinguished Alumni award. The award recognizes outstanding professional accomplishments. Ron was cited for his technical contributions in risk assessment and environmentally conscious soldering, his publication of technical papers and textbooks, and professional leadership as president of the American Statistical Association. Ron earned an MA in mathematics from Emporia State and has a BS, an MS, and a PhD in statistics from Kansas State University. He was named a Sandia distinguished member of the technical staff in 1989 "for his distinguished research in both applied and theoretical statistics and contributions to reactor safety and waste management through development and application of state-of-the-art sensitivity and uncertainty analysis techniques." Ron is currently project leader and organizer of a multi-organizational effort to evaluate low-residue soldering for military and commercial applications.

Send potential Sandia News Briefs to Lab News, Dept. 12622, MS 0413, fax 844-0645.

## Community Focus series ends 1994 with colorful La Tules

The Community Focus Lecture Series' final quarterly presentation for the year will bring to life for an entertaining hour one of New Mexico's most colorful characters — Doña Maria Gertrudes Barcelio, better known as Doña Tules or La Tules.

"La Tules" will be presented for Sandians at noon on Tuesday, Nov. 22, in the Technology Transfer Center (TTC, Bldg. 825). Actress and singer VanAnn Moore combines traditional music and dramatic monologue in her portrayal.

La Tules was a skilled card dealer who operated an elaborate gaming establishment in Santa Fe more than a century ago and became rich gambling with residents and travelers as colorful as herself. She also dominated Santa Fe society, serving as hostess at parties and balls for the elite.

"La Tules" is part of the New Mexico Endowment for the Arts Chataqua Series.

The Community Focus Lecture Series provides Sandians the opportunity to hear New Mexicans give informative quarterly presentations on a variety of topics. Presentations are free, usually held during the noon hour at the TTC, and are available on videotape from the library for those unable to attend in person.

The series is coordinated by Redd Torres Eakin of Community Relations Dept. 12651. She can be reached on 844-4124 for questions or suggestions.



## Coronado Club

Nov. 11 (tonight) — Friday night dinner/dance. Dinner served 6-9 p.m. Filet mignon, \$11.95; grilled halibut, \$10.95; all-you-can-eat buffet (baked ham, beef, roast turkey breast, poached fish), \$6.95. Music by Isleta Poorboys, 7-11 p.m.

Nov. 18 — Member Appreciation Night. Dinner served 6-9 p.m. All-you-can-eat buffet (baked ham, roast turkey breast, fish, baron of beef, potatoes, vegetables, salad, desert), \$5.95 members, \$7.95 guests. Music by Nite Rider, 7-11 p.m.

Nov. 20 — Sunday brunch/tea dance. Buffet 10 a.m.-2 p.m., tea dance 1-4 p.m., music by Los Gatos. \$6.95 for members, \$7.95 for guests, \$1 for children 4-12.

Nov. 22 (Tuesday) — Thanksgiving luncheon, 11 a.m.-1:30 p.m. Turkey and dressing or baked ham or roast beef, and all the trimmings, \$4.25. Regular lunch line also available.

Coronado Club members who recruit a new member will receive complimentary food tickets for themselves and the new member. The current member must be present at the sign-up, and the new member must meet eligibility requirements.



## Welcome

Albuquerque — Barbara Alkis (7575), Matthew Henry (2274), Frances Kanipe (6641), Stephen Robischon (7907), Kenneth Smith (13214), Warren Strong (7584), Chad Twitchell (10246); Darlene Benton, Tina Driggers, Bernadette Fulton, Jean Gollan, Kelly Gomez, Deanna Gomez-Dalton, Teri Kinloch, Patsy McCutcheon, Joyce McKenzie, Wilma Sample, Kristine Sanchez, and Kathy Stitzel (all 12111)

Other New Mexico — Deirdre Boak (6308), Marcy Martinez (12111), Lynn Twyeffort (7909), Patrice Sanchez (2901)

California — Darryl Sasaki (1811)



INTERNATIONAL HONOR — *Sandia Capabilities*, a color magazine covering research programs and facilities at the Labs, won a 1994 Award of Achievement in an international technical publications competition sponsored by the Society for Technical Communication. Discussing magazine graphics are (from left) lead graphic designer Jim Bolton (contractor), editor Linda Doran (12610), and photographer Randy Montoya (12630). *Sandia Capabilities* was produced by Laboratory Communications Dept. 12610. Several other Labs writers, illustrators, and photographers contributed to the 40-page publication.