

# Report: LANL's buried waste outdoes WIPP

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S.F.  
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► *Anti-nuclear group says that 17.5 million cubic feet of radioactive waste is stored or buried at Los Alamos lab*

By **BARBARA FERRY**  
The New Mexican

Los Alamos National Laboratory has nearly three times as much radioactive waste stored or buried on site than will be buried at WIPP when it is full, a report by a local anti-nuclear group contends.

However, laboratory spokesman James Rickman said the report is an "apples and oranges comparison" because most of the waste buried at the lab is less dangerous than the waste slated for WIPP.

The Los Alamos Study Group of Santa Fe examined 24 waste sites at the lab, including Area G — which has been used as the lab's main dump for waste since the 1950s.

The report says there is 17.5 million cubic feet stored or buried at the lab sites, compared to the 6.2 million cubic feet which is slated to end up at the Waste Isolation Pilot Plant near Carlsbad. WIPP, which

opened in March, is the Department of Energy's planned repository for transuranic waste from the weapons complex sites around the country. DOE expects it will take 35 years to fill up WIPP.

At WIPP, waste is buried 2,150 underground in salt beds believed by DOE to be impervious to outside elements, while waste at Area G is buried in shallow pits, the report states.

The lab's waste sites contain at least 100 pounds of plutonium, a million curies of tritium, tons of hazardous waste and other contaminants and a variety of other radionuclides and contaminants, according to the study group's report.

The waste going to WIPP is called transuranic waste, which is uranium-or plutonium-contaminated waste that, because of its long half-life, must be isolated for many years. Rickman said that since 1970, all transuranic waste at the lab has been kept in retrievable storage, to be held there until a repository opened.

Most waste buried at Area G and other LANL sites is low-level waste. Most low-level waste is short-lived and has low levels of radioactivity. However, environmental groups say some waste in this category presents a greater radiation hazard than

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## WASTE

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transuranic waste.

Transuranic waste generated prior to 1970 is buried at Area G, Rickman said. Area G is reaching capacity and the lab plans to expand the 63-acre site by 30 to 66 acres, Rickman said.

The lab will continue to bury waste at the site until 2044 when it will be covered with 6 to 10 feet of earth, he said.

The study group also criticizes the lab's efforts to clean up dump sites, saying that despite spending \$500 million during the past 10 years, the lab has done little to actually clean up any waste.

The report says there are no plans to clean up or stabilize waste sites at the lab and that 16 of the dumps are classified by the New Mexico Environment Department to pose a moderate or high risk of long-term groundwater contamination.

But Rickman said the lab is negotiating with the New Mexico Environment Department on how to remediate waste sites.

"That's absolutely incorrect that we have no plans to remove or stabilize these sites," he said. "But until the environment department approves plans for corrective actions, it's not appropriate for us to go in there and start digging them up."

High explosives which contaminate one dump site are being removed, he said.

"I think the lab would say it has made substantial progress on (clean up)," Rickman said.

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# Los Alamos drinking wells test radioactive

► *Trace amounts  
of tritium and  
strontium-90  
found are too low  
to harm humans*

*1/4/00*

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By **KRISTEN DAVENPORT**  
The New Mexican

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The New Mexico Environment Department has found low levels of radioactive chemicals in two drinking wells near Los Alamos.

Greg Mello, head of a Los Alamos National Laboratory watchdog group, says this is the first time the chemicals — tritium and strontium-90 — have been found in the area's drinking water, as opposed to monitoring wells.

On a visit to about a dozen wells on March 9 and June 6 of last year, Environment Department records show, investigators found trace amounts of the radioactive materials in two wells.

Neither of the wells contained enough of the radionuclides to cause harm to humans according to U.S. Environmental Protection Agency standards.

At a well known as Otowi-1 — in Los Alamos canyon just upstream from the turnoff to White Rock — environmental oversight agents found tritium levels at 40 picocuries per liter. Dangerous levels aren't reached until about 20,000 picocuries per liter.

At another well called PM-1, on Jemez Road, Strontium-90 was found at about 1.14 picocuries per liter. The EPA says eight picocuries per liter would be dangerous to humans.

Department of Energy environmental contact Joe Vozella could not comment Thursday night, saying he needed to look again at the data, and Los Alamos National Laboratory officials could not be reached.

Although the levels of the radioactive chemicals are low and were not found in several other drinking wells in the Los Alamos area, Mello said the finding is significant because it proves radioactive chemicals can penetrate as much as 1,000 feet beneath the hard bedrock of the area — something scientists have been skeptical could happen.

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## WELLS

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"Contaminated water does flow downhill even at Los Alamos," Mello said.

Tritium is a radioactive, colorless gas with a half-life of about 10 years used to boost the power of nuclear bombs.

Strontium-90, a byproduct of weapons testing, has a half-life of about 28 years and concentrates in high doses in humans' bones and teeth because of its similar structure to calcium.

Radioactive materials are known to cause some cancers in humans at high concentrations.

About a year ago, lab officials found that water in a monitoring well was contaminated with high explosives.

The well was near a building that was used during the Cold War to produce high explosives for nuclear warheads.

The high explosive was found ranging from 4.2 parts per billion to 50 parts per billion; the safe levels according to EPA standards are about 2 parts per billion.

The explosive can cause seizures in humans, although long-term effects are unknown.

That contamination was not found in the city's municipal water supply at the time.

Along with the state testing of drinking wells, LANL is involved in its own \$50 million groundwater project, drilling 32 deep monitoring wells.

# Evidence Points to Contamination

■ *Scientists report.*

*finding signs of radioactive pollutants in Los Alamos water wells*

BY IAN HOFFMAN  
*Journal Staff Writer*

1/14/60

State scientists have found the strongest evidence ever that Los Alamos' drinking-water wells are tainted by radioactive contaminants.

The pollutants — tritium and strontium-90 — tested at levels below federal standards to protect human health. But if confirmed, their existence shores up other evidence that the leavings of Cold War nuclear weapons work are reaching the drinking water of Los Alamos County residents.

Hydrologists for the state and Los

Alamos National Laboratory plan to retest two water-supply wells in which the state reports detecting the two contaminants.

One well, called Otowi-1, produced a single sample of tritium last June at two thousandths of the federal drinking-water standard. In a second well called Pajarito Mesa-1, state hydrologists found strontium-90 at about an eighth of the federal standard.

Both discoveries were beyond the margins of error for laboratory analyses, according to the state's reports.

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# Evidence Points to Well-Water Contamination

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"We believe it's the first defensible tritium detection in a production well," said hydrologist Michael Dale of the New Mexico Environment Department.

Still, Dale said, "it's only one sample, and we have to go back and verify it. We have to see if it's reproducible."

Los Alamos lab officials said they still are studying the state's reports.

"It's been known that there's tritium in the deep aquifer" that supplies drinking water to Los Alamos County, said lab spokesman James Rickman. "And this is well below drinking-water standards."

"This argues for continued monitoring and surveillance," he said.

Tritium, a radioactive form of hydrogen that travels through soil and rock as readily as water, is a common byproduct of nuclear research. But it can be created naturally by the interaction of cosmic radiation with atmospheric moisture. It also exists as a remnant of above-ground nuclear testing that is slowly deposited back to Earth.

But the detection of strictly made strontium-90 is stronger evidence that the contamination is emerging from past operations at Los Alamos lab.

Lab and state scientists are finding a growing array of contaminants in water hundreds of feet below the lab. They range from meager concentrations of tritium to high-explosive compounds at levels several times beyond federal

health advisories. But all those samples came from environmental monitoring wells.

The public water-supply wells where the latest contaminants were detected are designed to pump millions of gallons of water from a thick swathe of saturated rock and soil. Because of the heavy dilution and the large zone from which water-supply wells draw, Dale said, "to see any tritium in a production well is very significant."

"What it shows us is there is some source — whether atmospheric or the lab — and tritium is getting down there. And with dilution, it shouldn't be that high," said Steve Yanicak, manager of the White Rock-based state environmental office that oversees LANL.

Environmentalists and arms-con-

trol advocates point to the new data as backing for their criticism that the U.S. Department of Energy and Los Alamos lab should direct money they spend most heavily on studies to actually removing contaminants.

"I don't think the implications of these findings can be quickly understood or dismissed," said Greg Mello, head of the Santa Fe-based Los Alamos Study Group, a private arms-control organization. "But when you've got contaminants in the deep aquifer above health advisory levels in one place and now you have contaminants in production wells in two other canyons, the idea that Los Alamos can just leave tons and tons of radioactive and toxic wastes in the ground forever needs to be seriously reevaluated."

05/09/00



JOSH STEPHENSON/JOURNAL

**HEAT OF BATTLE:** Members of the Gila Hotshots isolate a hot spot on N.M. 4 in the Cerro Grande Fire near Los Alamos early Monday morning. Prior to this, the crew lit a back burn on N.M. 501 near areas of Los Alamos National Laboratory that contained explosive materials.

## Waste Areas Threatened

BY LAN HOFFMAN  
*Journal Staff Writer*

Even if a wildfire skirts the Atomic City, the blaze is tending toward canyons rich in trees and the contaminants of nuclear-weapons research.

Scientists fear a fire there will set the stage for heavy summer flooding that ultimately could flush radioactive and hazardous toxins into the Rio Grande — or bury them in tons of mud.

The prospect of post-fire flush exposes a vulnerability of Los Alamos' practice of pumping radioactive waste water into canyons and, in earlier years, of burying

toxins close to canyon walls that can erode.

So far, the U.S. Department of Energy plans no cleanup of the canyons that drain its Los Alamos National Laboratory, in part because only low levels of contaminants have been detected outside the lab boundary.

"The question is: Are they going to let it stay contaminated and let this forest fire or the next forest fire washes it out for them?" said Greg Mello, head of the Los Alamos Study Group, a nuclear disarmament and environmental organiza-

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**ON THE MOVE:** Riley Sievers, 9, left, and his brother Jesse Sievers, 17, load their family truck with belongings from their Los Alamos home.

# Waste Worries LANL Experts

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tion in Santa Fe.

"In effect, because the lab has no firm plans to clean up these canyons, they are leaving them in the hands of God, who is flushing them down to Cochiti Reservoir, which is becoming the dump of last resort," he said.

The fire, dubbed Cerro Grande, swept Sunday across one canyon where state scientists have detected toxic metals in rainstorm runoff. If firefighters cannot stop the blaze from moving northward, scientists fear Pajarito and Los Alamos canyons could be primed for a succession of intense fire and flooding.

"It's safe to say we will be watchful for potential increases in runoff," said Mathew Johansen, a U.S. Department of Energy environmental scientist. "We don't know yet if that will affect contaminant transport in our canyons."

A lab computer model suggests soils in the two canyons, if they are burned heavily, could fuse and not absorb storm water or erode at

rates at least nine times greater than normal. A U.S. Forest Service scientist suggests the erosion could run as high as 50 times normal, to 100 tons an acre. One scientist plans to press the federal government to shore up the blackened mountainsides once the fire is gone.

"As soon as we take a deep breath, that's one of my first e-mails," said Randy Balice, a LANL forest ecologist and statistician. "My recommendations will be that we start stabilizing those areas."

Los Alamos executives said Monday they are confident the Cerro Grande Fire won't ignite explosives or release chemicals and radioactive materials. Storage and research facilities tend to be hardened against fires, and, since the 1996 Dome Fire, lab contractors have aggressively cut back the forests around them.

Lab workers dropped even more trees Monday around the Weapons Engineering Tritium Facility, a masonry building where lab scien-

tists handle the highly radioactive form of hydrogen that fuels thermonuclear bombs. Lab officials said most tritium there is stored in tanks designed to withstand flames.

The same branch of the laboratory also fashions and stores explosives at Technical Area 16, across N.M. 501 from the Cerro Grande Fire. The fire tossed at least one ember into the lab site Sunday evening, but it was extinguished. The lab's explosives are primarily stored in concrete bunkers covered in dirt; the 1977 La Mesa Fire burned over several of these, and lab officials say they can safely store explosives inside for a few hours of intense heat.

Lab guards and employees on Monday patrolled other areas where hazardous materials are stored to watch for fire, lab director John C. Browne said. Most are inside Technical Area 3, the lab's focal point, where there are few trees to catch fire.

Yet lab officials have taken few

steps to guard against the possibility of massive erosion and flooding after a wildfire. The lands scorched by the Cerro Grande blaze so far contain no known spill sites or waste disposal areas. But sediments a few miles down Los Alamos Canyon are contaminated by plutonium, other radioactive materials and toxic metals such as mercury. If Los Alamos Canyon is hit by a high-intensity burn, as the Cerro Grande Fire produced farther south on Sunday, the magnitude of stormwater runoff during northern New Mexico's "monsoon" season will jump significantly, scientists predict. It's unclear whether that runoff would pick up the pollutants downstream and whether it will bury them in mud or carry them in diluted form to the Rio Grande.

"A lot of people have said that if Los Alamos canyon had a big flood, it could be a big problem, it could go all the way to the Rio Grande," said LANL's Balice. "I'm hoping it's just mud and sediments. Who knows? We're going to find out."

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Title: N.M. fires ignite fears about nuclear wastes  
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SANTA FE, N.M. -- The fires that consumed nearly 50,000 acres of northern New Mexico, including parts of the Los Alamos National Laboratory, have raised new concerns over the buildup of nuclear and hazardous waste stored at the laboratory.

State and federal officials have insisted that the fires, which were 70 percent under control by late Friday, did not get close enough to threaten thousands of containers filled with used gloves, rags, booties and other combustible items contaminated by low-level radioactive waste, like plutonium. By some estimates, the nearest flames remained half a mile away. But scientists and environmentalists said Friday that dry conditions in forests adjacent to the storage site make them ripe for another fire -- and a potentially more dangerous situation because of the increasing quantity of stored waste.

Typically, the laboratory generates 150 cubic meters of waste a year that is stored above ground in 55-gallon steel drums and in smaller wood boxes that sit under a fabric dome. The current level is 4,808 cubic meters -- the equivalent of 14,000 drums.

"The problem is just sitting there, just waiting for another incident to happen," said a Los Alamos scientist familiar with the storage area who spoke on the condition of anonymity. "And there are a lot of people at the lab who share that concern."

Greg Mello, director of the **Los Alamos Study Group**, a nuclear watchdog organization, said: "It's a dangerous situation. If they could get that stuff out of there, everyone would be better served."

Officials from the Energy Department and the laboratory have disputed the contention that anything at the storage site, a mesa surrounded by canyons known as Technical Area 54, is vulnerable to fire.

They cite an environmental-impact study of the laboratory conducted four years ago in which officials created a theoretical worst-case fire and found that the waste would survive unaffected.

But even if conditions became so grave that the drums overheated and exploded, sending toxic plumes skyward, the study concluded that no one living within a 50-mile radius would suffer ill effects.

Many scientists, however, contend that the department's worst-case test was not worst-case at all. While the department model assumed a breach of 62 drums, Edwin Lyman, scientific director of the Nuclear Control Institute, said an intense fire would more likely breach "closer to hundreds" of drums, causing a much greater potential for illness than the study provides."

"The department," Lyman said, "has refused to look at the real worst-case scenario."

Efforts are under way to remove the waste at Los Alamos to the Waste Isolation Pilot Plant outside Carlsbad, which opened last year after a decade of delays. For now, the rate of removal is but a trickle.

With cleanup at the Rocky Flats nuclear-weapons plant outside Denver, which is scheduled to close by 2006, and three other facilities producing nuclear waste for disposal, the competition for removal has grown intense.

For Los Alamos, the pace has been further slowed by lawsuits challenging environmental impact and a dispute between the state government, which requires that the contents of every container be itemized, and the Energy Department, which does not agree that detailed inventories are necessary.

Energy Department officials said Friday that Los Alamos shipped 714 drums of waste last year, with 252 scheduled to go this year, 1,176 next year, 2,940 in 2002 and increasing numbers in the following years.

While that leaves the majority of the drums on site for the foreseeable future, officials from the laboratory and the department insisted that the containers were well protected, largely because the recommendations of the environmental impact study were followed. To add layers of protection, wood was removed from the perimeter of the laboratory, the tree line was moved back and dirt pathways were built as a buffer against fires from the canyons below.

Still, critics are not convinced that enough safeguards are in place, especially with the unpredictable updrafts from the canyons, which the current fires demonstrated, and the ever-present possibility of sparks during an intense fire.

Rep. Tom Udall, a Democrat whose district includes the laboratory, said Friday that a recent tour of the laboratory convinced him that the fire "was too close for comfort," and that rebuilding efforts -- some older buildings were destroyed -- should emphasize greater protection against fire and other disasters.

Udall also said that the waste removal from Los Alamos was part of a larger national problem for which Congress has traditionally authorized only limited spending.

"On a national scale," he said, "this is not regarded as a high risk. But we need to get to the job of cleaning up all over the country."

The Los Alamos scientist who did not want to be identified added one further regret. He said he and his colleagues were eager to return to work next week when the laboratory reopens. But they were anxious, as well, he said.

"The lab is tucked away in what was some of the most beautiful scenery you've ever seen," he said. "Since the fire, it looks terrible, and you can't just go out there with a bucket of paint and fix it. That was slow-growth forest that burned. It will take a long time to come back to what it was."

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# Lab to take waste from other sites

► Los Alamos will temporarily store radioactive waste from private industries

By KRISTEN DAVENPORT

The New Mexican

3/26/00 5M

Truckloads of radioactive waste from private industries will be arriving at Los Alamos National Laboratory to be temporarily stored above ground for years at Area G.

This would apparently be the first time the lab has accepted large amounts of radioactive waste to store from private sources, although almost 60,000 drums of contaminated material from the nation's weapons work already sit above ground under tents at Area G, the lab's Technical Area 54. Much of the weapons waste is destined for WIPP.

The proposal to store outside "sealed sources" containing plutonium, beryllium and americium passed an environmental hurdle this week, the Department of Energy announced.

The 30,000 curies of radioactive waste would be temporarily stored in above-ground drums while the Department of Energy decides what to do with it — reprocess and treat it or send it to someplace that accepts high-level waste such as Yucca Mountain in Nevada.

Some lab-watchdog groups warn that by allowing the waste onto LANL property even temporarily, the state risks having it permanently buried here.

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## LAB

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"This is really just turning Area G into a WIPP site," said Greg Mello of the Los Alamos Study Group. "This is a lot of plutonium to bury there."

Much of the outside contaminated material cannot be sent to WIPP because it comes from nondefense sources, and the law does not allow defense waste to be mixed in storage with waste from other civilian industry.

Sealed sources are stainless-steel containers with nuclear materials inside — largely from university laboratories or private industries. The 21,000 sources will be stored in about 1,000 drums, most of which will be put on the mesa top in LANL.

Many of the 21,000 sealed sources in existence in the United States come from devices for drilling oil and gas. Gauges used by research organizations to measure soil moisture and content also contain radioactive chemicals. Qualified public and private organizations have been allowed to use nuclear materials for some activities since 1954.

Several years ago, the federal government ordered the Department of Energy to round up the estimated 21,000 radioactive sources because they could pose a threat to public health if they were accidentally opened.

The sources have periodically been found abandoned in warehouses and trucks across the country in recent years, leading

some anti-nuclear activists to worry that a rogue nation or terrorist could collect the devices and instruments to eventually build a bomb.

But just the same, they say, the waste should not be sent to New Mexico for storage.

"Why is New Mexico the target of yet another kind of nuclear waste?" Mello asked. "Why is this the natural place to accumulate waste? Why are we the target? We seem to be Ground Zero for the nation's waste."

But John Themelis, acting assistant manager for environmental operations at DOE in Albuquerque, said that Los Alamos is only a temporary storage spot for the radioactive waste and that it will be sent somewhere else.

A supplemental analysis for the Site-Wide Environmental Impact Statement for Los Alamos states that waste storage would be "on an interim basis until a strategy is developed for final disposition of the sources," a DOE letter released this week states.

"We have no intention of disposing of it (permanently) at Los Alamos," Themelis said. "I don't see any chance of that."

Themelis said it's important for the DOE to gather the dispersed radioactive sources quickly because similar devices in other countries have killed people when they were accidentally opened.

And "this is just a small amount of waste compared to what is already there (at Area G)."

The lab has been accepting small amounts of nondefense waste since 1979 — about 1,100 of the radioactive devices sources or drums? have already been sent to the site. However, in 1995, DOE was asked to come up with a comprehensive plan to gather the remaining 21,000 sources.

Themelis said the DOE hopes to have all the sealed sources gathered by 2006. They will be separated, and the federal government will then figure out what to do with them.

The Cerro Grande fire in May burned within a half-mile of Area G, where the current waste sits in drums under a large tent. The fire caused lab officials and activists alike to say that the waste sitting on the top of the mesa would be better off in the underground salt chambers of WIPP.

"At the same time they're making a big deal about accelerating sending that stuff to WIPP, they're doing the opposite here," said Don Hancock, director of the nuclear safety program at the Southwest-ern Research and Information Center in Albuquerque.

Hancock said he also opposes storing the sealed radioactive sources at LANL because "the DOE doesn't have a good record of handling its own waste."

"In fact, commercial industry has a better safety record. So the industry that handles it better sends to stuff to DOE — this is not a plus for the health and security (of the public)."



# Waste Found In Water

## Tritium Traces In LANL Well

BY JENNIFER MCKEE  
Journal Staff Writer

2/8/01

Scientists at Los Alamos National Laboratory have found trace amounts of radioactive waste in the ground water near the lab's nuclear storage area, which may suggest the facility is leaking.

A monitoring well near lab Area G, a collection of dry nuclear waste stored above ground in oil drums, showed contamination by tritium, a radioactive form of hydrogen that seamlessly blends in with water. The findings were announced last week at a meeting of the lab Groundwater Integration Team.

The contamination was tiny — 109.2 picocuries of tritium per liter of water — and a minuscule fraction of the Environmental Protection Agency's drinking water standard of 20,000 picocuries.

Nonetheless, said lab spokesman James Rickman, the lab takes the finding seriously and hasn't ruled out the possibility that the tritium is leaking from Area G — the first time any deep ground-water contamination has been tied to the dump.

"It underscores our need for continued monitoring and surveillance," Rickman said.

Greg Mello, of the Santa Fe-based Los Alamos Study Group, said the contamination is cause for concern.

"We have a huge, nuclear waste dump (at Area G) to which more waste is added every day," he said. "It's located right next to a wetland and above a drinking water aquifer."

Area G is home to the equivalent of 45,000 drums of dry, solid nuclear waste, Rickman said — all of it eventually bound for the federal government's Waste Isolation Pilot Plant near Carlsbad.

The tritium, which was probably produced as either steam or water, is absorbed into a special kind of resin to make it solid. Then, it is

## Tritium Found in Water

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sealed in drums and stored in shafts drilled 65 feet into the ground, Rickman said. The shafts and barrels are designed to be more or less waterproof.

But older tritium storage wasn't so sound, he said, leading scientists to believe the tanks might be leaking. Still, Rickman said, the mesa where Area G sits is very dry and composed of volcanic rock that would not give water any easy pathway to the deep aquifer where the tritium was found. Such water migration would demand more water than typical Los Alamos rains.

The tritium also could have trickled into the aquifer from some place else near the lab and merely ended up in the aquifer near Area G, Rick-

man said. Scientists will continue watching the well to see if the contamination levels change.

The tritium definitely came from the lab, Rickman said. Both he and Mello agreed that the tiny amounts found in the well aren't dangerous.

The contamination was found in one of 10 monitoring wells on the lab to help scientists map the underground geology of the lab and how ground water moves through it, Rickman said. Such a picture will help scientists predict where possible lab-generated pollution may appear next and in what amounts. Then, Rickman said, they will be able to clean up the source of the contamination or plug it to keep it from further seeping into the aquifer.

So far, the lab has drilled 10 such wells, with plans to sink 22 more.