BROOKHAVEN BULLETIN
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BROOKHAVEN NATIONAL LABORATORY

DOE Honors RHIC Project Director Satoshi Ozaki

On October 3, at a dinner before the next day's dedication of the Relativistic Heavy Ion Collider (RHIC) (see last week's Bulletin), RHIC Project Director Satoshi Ozaki was honored with DOE's Distinguished Associate Award.

Martha Krebs, Director of DOE's Office of Science, presented Ozaki with the award plaque which was signed by Energy Secretary Bill Richardson and which cited Ozaki's: "outstanding leadership in the successful construction of the Relativistic Heavy Ion Collider, the development of its scientific program, the fostering of important international collaborations, and a career of broad scientific achievement and outstanding management of major projects which have contributed to the Nation's efforts in High Energy and Nuclear Physics."

"This recognition of Satoshi Ozaki's accomplishments by the Secretary of Energy is richly deserved," said BNL Director John Marburger. "One of Satoshi's secret weapons is the credit he gives to everyone else, so it is most appropriate that this credit has come his way. He is an enormously effective leader."

Roger Stoutenburgh

Martha Krebs, Director of DOE's Office of Science, with RHIC Project Director Satoshi Ozaki.

In accepting the award, Ozaki did credit "the success of RHIC construction to the hard work and dedication displayed by RHIC staff, members of the detector collaborations, and others from around the Lab," including staff of the Alternating Gradient Synchrotron, Physics, and National Synchrotron Light Source Departments, the Instrumentation Division and Central

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RHIC: First DOE Office of Science and L.I. Facility Registered to ISO 14001 Environmental Standard

The Relativistic Heavy Ion Collider is the first DOE Office of Science project and the first Long Island-based facility to be registered to the International Standardization Organization (ISO) 14001 Environmental Management System.

An internationally recognized standard, ISO 14001 provides a framework for defining and preventing potential environmental impacts, monitoring and communicating performance, and fostering continual improvement of performance.

"This is a great achievement, for both the RHIC Project and BNL," said Lab Director John Marburger. "It was made possible through RHIC management's commitment and support, a lot of hard work by all staff, and enhancement and implementation of environmental and other management systems over the past two years."

"RHIC's registration to the standard is particularly significant because environmental groups had raised concerns and called for an environmental review," said Susan Briggs, who is Environmental Management Systems (EMS) Project Manager and who, with Steve Musolino, Assistant to the RHIC Project Director for ES&H, managed the registration process.

"Through BNL's EMS, we place added emphasis on compliance with environmental requirements," explained Briggs. "We address environmental groups' concerns through implementing ISO 14001 elements, such as community outreach, environmental controls, extensive monitoring, and annual audits. RHIC is our first success, but we expect more such successes when we register other BNL facilities next summer and when the entire Laboratory is ISO 14001-registered in 2001."

Plutonium Sampling In Peconic River: No Health Risk Shown

Last year, BNL announced that it had detected very low levels of plutonium in sediments of the Peconic River tributary that runs through the Lab site. In order to confirm the existence of plutonium and determine the exact levels present in sediment both on and off the Lab site, BNL recently undertook a much more extensive sampling project.

The project's sampling plan was developed with substantial input from employees and community members through a series of roundtable meetings and regulatory agencies, including: the U.S. Environmental Protection Agency (EPA), N.Y. State Department of Environmental Conservation (NYSDEC), and the Suffolk County Department of Health Services.

More than 500 samples were collected this spring from on- and off-site portions of the Peconic River, from BNL to Riverhead, and from the Connetquot River, located approximately 20-25 miles west of BNL. The Connetquot was used as a control, or comparison, location as it is not affected by BNL operations. The samples were shared with Suffolk County, NYSDEC, EPA and DOE, and each agency undertook its own analysis.

On Tuesday, October 12, BNL presented its results.

On site, plutonium concentrations in river sediments are higher than the reference levels in the Connetquot River, but still well below levels that would pose a risk to aquatic life or to human health. Higher levels of plutonium were also detected in sand berms at the Lab's Sewage Treatment Plant. The elevated levels of plutonium in the river and berms on site are likely the result of historic processing of waste from the Brookhaven Graphite Research

(continued on page 2)

BNL's First Off-Site Groundwater Cleanup Facility Starts In East Yaphank

A concrete-block building in East Yaphank that houses groundwater purification blowers would seem an unlikely place for a celebration — yet indeed, there was a celebration when the ribbon was cut recently at BNL's first off-site groundwater cleanup facility.

The Operable Unit (OU) III Off-Site Removal Action In-Well Air Stripping System is cleaning up groundwater containing the contaminant carbon tetrachloride in concentrations above federal drinking-water standards. Carbon tetrachloride is a solvent once used at the Lab and widely used in industry for degreasing equipment.

The system is installed in the general area in which DOE, as a precautionary measure, has connected more than 1,500 homes and businesses to water supplied by the Suffolk County Water Authority.

The OU III facility is located in an industrial park off William Floyd Parkway, just south of the Long Island Expressway.

The facility uses what is called in-well air stripping, a cutting-edge technology that mixes air with contaminated groundwater. This closed-loop

Roger Stoutenburgh

Cutting the green ribbon for BNL's first off-site groundwater cleanup facility are: (from left) Scott Mallette, DOE's Brookhaven Group; BNL's Assistant Director of Environmental Management Michael Schlender; local legislator Michael Caracciolo; Mike Giacamoro, President of the East Yaphank Civic Association; and Jack Ames, aide to Congressman Michael Forbes. Present but not pictured are: Brookhaven Town Supervisor Felix Grucci and leaders of civic and community groups.

system prevents air emissions and allows contaminated water to be treated below the ground without ever reaching the surface.

Community input via roundtables and workshops was a key factor in the final decision on groundwater cleanup methods. Brookhaven had sought comments from the Community Action Council (CAC), an independent group formed to provide input to the Lab on issues of concern to the community.

"The commissioning of this facility marks another positive step in BNL's commitment to environmental stewardship," said Michael Schlender, Assistant Laboratory Director of Environmental Management. "It is the result of cooperation between state, county, local, and community groups, all of which banded together to make it happen. As the Lab's first full-scale off-site remediation system, it will be closely evaluated as the model for future sites."

Mike Giacamoro, President of the East Yaphank Civic Association and a member of the CAC, said in his address to the crowd, "I commend BNL for doing its part to improve a situa-

(continued on page 2)

BNL Nuclear Technology Expertise on Tap for Assistance, Advice

Since the early days of BNL's founding as an institution for research on "atoms for peace," the Lab has been a local, national, and international resource for information on safe nuclear design and operation, as well as radiation safety and health physics.

For example, BNL experts were called in to provide their knowledge and assistance following the nuclear accidents at Windscale in England, Three Mile Island in the U.S., and the Chernobyl reactor in the former Soviet Union.

In addition, the DOE and BNL Radiological Assistance Program (RAP) is ready and has been called to respond to incidents involving radiation anywhere on the eastern seaboard. In fact, during the recent nuclear accident in Japan, Energy Secretary Bill Richardson, at the request of the Japanese, put the DOE-BNL RAP team on standby in case the situation should require its aid.

DOE, BNL Radiation Specialists Train to Stay at Cutting Edge

At the very time that the news of the recent Japanese nuclear accident broke, members of BNL's Radiological Assistance Program (RAP) team were participating in "Vigilant Lion," the largest training exercise involving a simulated radiation emergency ever held in the United States.

Alex Reben

DOE's Steven Centore and BNL's Kathleen McIntyre are at the Vigilant Lion training exercise.

RAP Region 1, based at BNL, is one of eight regional teams of health physicists and radiation professionals who are often the first federal responders to a radiation emergency. The BNL team and their mobile laboratory can provide surveying, monitoring and assessment support as necessary to state, federal and local authorities. The team is one of several DOE assets available to respond to such emergencies.

The Vigilant Lion exercise, held at Fort Indiantown Gap in Lickdale, PA, involved more than 300 people from over 30 federal, state and local agencies, including DOE, the Federal Bureau of Investigation, the National Guard and the Federal Emergency Management Agency. The three-day exercise tested the agencies' response to a simulated terrorist attack involving radioactive materials.

The BNL RAP team members participates regularly in such training events. They have also trained others.

Last October, the RAP team offered dozens of Suffolk and Brookhaven Town emergency responders hands-on lessons in dealing with radiation and radioactivity on the job. The training emphasized safety precautions that responders can take as well as use of equipment.

In the past, the RAP team has helped police, fire, and health officials from Maine to Maryland handle crimes and accidents involving radioactivity. This work is part of DOE's and BNL's ongoing cooperation with local emergency service departments.

— Peter Genzer

Nuclear Accident in Japan Triggers Calls to Brookhaven Scientists

Almost as soon as news of the accident at the nuclear fuel-processing plant in Tokaimura, Japan, reached the U.S. on September 30, reporters started calling Robert Bari, Chair of BNL's Department of Advanced Technology. *Newsday*, *The Washington Post*, NBC, CNN and others wanted details: What had happened and can it happen here?

Answering was a challenge. "We were dealing with very sketchy information," says Bari, who was fielding calls for the American Nuclear Society (ANS), as well as for BNL. "We didn't have in hand the precise chemical nature of their fuel-processing activity."

As it turns out, the chemical process, which is used to convert one form of uranium to another more suitable for reactor fuel, was "straightforward," says Bari. "It's been done many, many times in all countries that have nuclear processing units."

The problem, he says, was the kind of uranium (U) — nearly 19 percent ^{235}U— and the amount — seven times what is normally used in such processes. The high concentration of so many "splitable" atomic nuclei caused the accident, Bari explains. "What we're talking about is the 'critical mass' — assembling just the right amount to sustain a nuclear chain reaction."

Most fuel-processing procedures make it "physically very difficult, if not impossible" to accumulate such a critical mass, Bari says. U.S. processing plants also have strong administrative limits to monitor procedures, he says, as well as sensors and alarms to detect the precursors to a critical event.

Was the Japanese industry up to snuff, reporters asked Bari?

"I did not get the sense that there were problems. My impression was that the quality is very high," he replied. With few natural fuel resources, the Japanese rely on nuclear power for one third of their electrical energy, Bari says. "You'd think they'd want to make sure they were operating to the highest safety standards.

"So the big question in my mind was why?" continues Bari. "It all points to the operators making an error of omission or an error where they more or less deliberately did something that should not have been done."

Whatever the reason — convenience, overconfidence, lack of training — there will be lessons and implications for U.S. facilities, Bari suggests. Brookhaven is already working with operators at various DOE facilities to make sure they are fully briefed and trained on safety.

"We are also providing DOE with the names of people here at the Laboratory who could assist in various technical areas with the recovery from this event," Bari says. "We need to share knowledge and provide assistance when events like this happen, so we get the best possible insights from them for future safe operations," he concludes. — Karen McNulty

Visiting Japanese Scientist Recaps Accident

Takamichi Iwamura of the Japan Atomic Energy Research Institute was already scheduled to give a seminar at BNL on October 7 when the September 30th accident at the nuclear fuel-processing plant in Tokaimura, Japan, occurred. At the invitation of Robert Bari (see story above, right), Iwamura expanded his talk to discuss the accident.

Japanese workers, Iwamura said, had deliberately taken a "shortcut," by pouring 16 kilograms (kg) of uranium directly into the tank where the critical event occurred. The vessel normally used for this process and prescribed by Japanese safety manuals would have allowed only 2.4 kg.

The workers may have used this unauthorized procedure before with less reactive uranium, Iwamura said, and may have been unaware they were working with a more reactive form. There were no detectors, and they were not wearing protective suits or masks.

"The Japanese are very ashamed of this accident," Iwamura said. Inspectors are currently checking out 20 other nuclear facilities in Japan to ensure that they are not taking such dangerous shortcuts.

— Karen McNulty

Another Expert on Call

Department of Advanced Technology Senior Scientist Charles Meinhold was also swamped with calls following the recent nuclear accident in Japan, but at the Bethesda offices of the U.S. National Council of Radiation Protection, of which he is president.

Meinhold explained that it was difficult to provide callers with useful information because, at the time, there were no reliable estimates of the radiation exposures.

"Critical accidents of this type have historically led to very high absorbed doses of radiation — in the thousands of rads," Meinhold said. "Happily, the latest information is that the doses were considerably smaller than that. So, with advanced medical care, the workers' survival is entirely possible."

DOE Honors Ozaki (cont'd)

Shops and Plant Engineering Divisions.

"The project also had a successful partnership with industry in manufacturing components for the collider and detectors," he continued. "And it received invaluable help from universities and other laboratories and their funding agencies worldwide, particularly from Japan and Russia."

"People have devoted major parts of their lives to this project," commented Ozaki, "so I express my sincere gratitude to all of those who have helped make this project come true. I thank DOE, BNL Director John Marburger, and the Lab's management present and past for their unwavering support of this monumental undertaking. I also want to note the very important role that Nicholas Samios, our former director, played in conceiving the idea of RHIC and in furthering its realization beginning in 1983."

"There still remains a lot of work to optimize the performance of RHIC," Ozaki said, "but I am fully confident that our team will accomplish this task."

Off-Site Cleanup (cont'd)

tion. Our community is no better or worse off than any other.

"Our problems don't start and stop with BNL," Giacamoro added. "Collectively and individually, we all impact the environment, so it's everyone's job to ask themselves what each of us can do to have a positive impact."

Jan Schaefer, President of the Mastic Beach Property Owners' Association, commented, "The Lab is doing more than they have to do. The groundwater could have been contaminated by the U.S. Army at Camp Upton when it cleaned guns and uniforms, or by other industrial sources."

Jerry Minasi, a trustee of the East Yaphank Civic Association, lives a stone's throw from the new facility. He said, "BNL has bent over backwards to answer to the community."

The Lab's cleanup programs are halfway complete. By 2006, all contaminated soil are expected to be cleaned up, and all groundwater systems will be operating.

—Ann Ferrar Dusek

Peconic Sampling cont'd)

Reactor, shut down since 1969.

Sediment in the 17-mile length of the river from the Lab's eastern boundary to Riverhead shows average concentrations that are comparable to plutonium levels found in the Connetquot River.

Plutonium was not detected in fish or surface water.

Background plutonium levels were seen in groundwater on the BNL site, as well as in control locations west of the Lab. The background levels seen in groundwater and in the Connetquot River sediments are likely the result of atmospheric fallout in the 1950s and 1960s.

In a story published on Wednesday on the latest findings, *Newsday* quoted Joel Schwartz, an environmental epidemiologist at Harvard, as expressing concern about workers.

"Based on all of the radiological data collected in our investigations, including this latest round of sampling, we believe that our employees at the Sewage Treatment Plant are safe," said Skip Medeiros, the Project Manager in the Environmental Restoration Division.

According to Medeiros, EPA sets a dose of 15 millirems per year as a guidance level for health risk. These 15 millirems would be in addition to the 300 millirems that an average Long Island resident receives each year from natural background radiation. A worker at the plant, assuming an eight-hour workday with six hours outdoors, 250 days a year, would receive a dose of 7 millirems per year.

"Eighty-five percent of that risk is from cesium-137," adds Medeiros.

Previous studies of the river have showed elevated concentrations of mercury, silver and polychlorinated biphenyls (PCBs) in sediment on the Lab property.

As a result, BNL has proposed removing those contaminants from the river bottom and is currently working with regulators to approve a cleanup plan. The latest findings involving plutonium are not expected to cause any modifications to that plan.

— Peter Genzer

BSA Noon Concert Tuesday, October 19

Canadian cellist Andrea Lysack will perform Kodaly's sonata for unaccompanied cello on Tuesday, October 19, at noon in Berkner Hall. Also on the program is a Debussy sonata, for which Jeff Meyer will provide accompaniment. A winner of the State University of New York at Stony Brook Concerto Competition, Lysack was one of seven cellists chosen to participate in the performance class given by David Geringas at the 1998 Kronberg Cello Master classes in Germany.

Noon recitals are free, informal, and open to all.

BWIS Lecture

Resolving Conflicts About the Environment

"Democratic Institution-Building: A Way of Resolving Political Conflicts About the Environment" will be discussed by Mark Sagoff at noon on Wednesday, October 20. Sponsored by Brookhaven Women in Science (BWIS), the talk will be in the Seminar Room of the National Synchrotron Light Source, Bldg. 725. All are invited.

A senior research scholar at the University of Maryland's Institute for Philosophy & Public Policy, Mark Sagoff, Ph.D., is the author of *The Economy of the Earth* and is a past president of the International Society for Environmental Ethics. Sagoff was a fellow at the Woodrow Wilson International Center for Scholar during the past academic year.

Research Proposals

All BNL research involving human subjects or animals is required by federal policy to obtain approval from the Institutional Review Board (IRB) or the Institutional Animal Care & Use Committee (IACUC), respectively.

Administrative support for both these boards is provided at the Lab by BNL's Office of Research Administration (ORA). Information and application forms needed to apply to the IRB or IACUC for research proposals involving either human subjects or animals are available on ORA's new web site, http://www.ora.bnl.gov or under Support Divisions & Offices on the BNL Home Page. If you have questions, contact Darcy Mallon, ORA, Ext. 3362 or mallon@bnl.gov.

Arrivals & Departures

Arrivals

None

Departures

Maged S. Atiya ..... Physics
Kenneth M. Johnson ..... App. Sci.
William G. Shier, Jr. ..... Adv. Tech.
Isaias Tirado-Flores ..... AGS

Bowling

Purple & White League - 10/07/99

E. Sperry III 234/201, L. Simes 204/181/170, J. Meier 245, J. Zebuda 234, E. Mamay 223, N. Besemer 216, D. Keating 206, G. Mehl 205, J. Gormley 199, T. Mehl 199, C. Rooney 199, P. Callagari 197, B. Mullany 195, C. Johnson 189, J.Yeoman 189, Kathy Krygier 188, Ken Krygier 187, K. Dilgen 181, J. McCarthy 180, R. Freeman 179, Dolly Johnson 178, M. Addessi 176.

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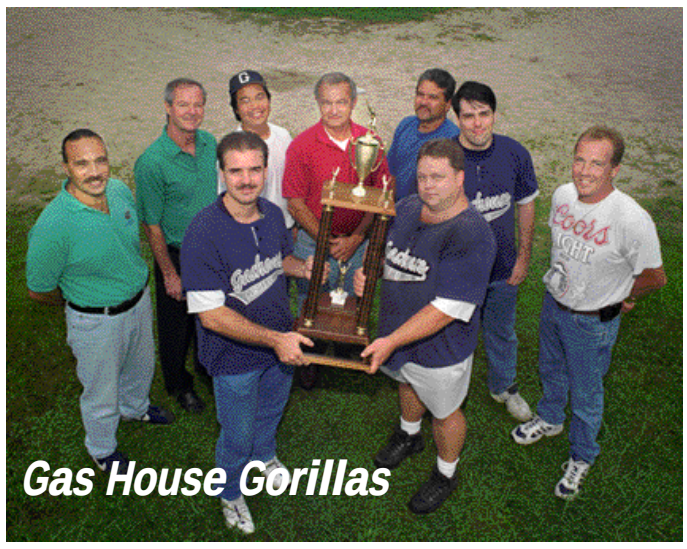

CCD won first place in League E2, but the **Gas House Gorillas** didn't monkey around — they won the league championship: (front, from left) John Bohnenblusch and Captain Gary Danowski; (back, from left) Tony Tanza, Dan Mullaly, Craig Ogata, Pete Stillman, John Deboer, Charlie Whalen, and Henry Ashby.

The **Magnuts** finished first in League E1, but it was the **Blue Jays** who flew off with the championship victory: (from left) Captain Gerry Shepherd, Larry Musso, Pat Browne, George Oldham, Tierre Farmer, and Jim Forkin. Not pictured: John Dibiase, Bill Fox, Keith Greiner, Dennis Hall, Paul Infranco, Chris Ingoglia, Alan Jones, Bob Medina, Mike O'Connor, Jason Remein, and Jim Rowehl.

1999 Softball Champs

Sure Fire didn't miss a trick and so they won the champ's title in League E3: (front, from left) Bob Danowski, Greg Meyer, Frank Trapani, Greg Stawski, Boyze Singh, and Jim Lacy; (back, from left) Captain Steve Eckhoff, Joe Devoe, John Berry, Co-Captain Dan Carneiro, Don Zaharatos, Denis Joyce, and Scott Krsnak.

Don't forget the final Softball Party of the Century — tonight at the Center!

ANSKY asked no favors but took first place and the championship in League M2: (front from left) Ali Lopez, Laurie Pearl, Michael Cowell, Captain Sue Cataldo, Bob Geib, Chris Ronick, and Susan Jones; (back, from left) Joe Gormley and Ed Sperry. Not pictured are: John Addessi, Debbie Bauer, Kay Conkling, Al DellaPenna, Tom Dilgen, Sonny Dimaiuta, Kristin Provoncha, and Jesse Wilke.

The **StingRays** stung their way into first place in League M1, but the **Gour-Mets** ate up the competition and won the championship: (front, from left) Joe D'Ambra, Phyllis Domenech, Marsha Kipperman, and Gloria DeBoer; (middle, from left): Bob Marascia, Lois Marascia, Claudia Jones, Chris Cerseko; (back, from left) Mike Schaeffer and Captain Rich Scheidet. Not pictured are: Karen Adelwerth, Co-Captain Patti Bender, Twig Bender, John Biemer, John DeBoer, Alan Jones, Steve McAlary, Kailen Neff, Mary Scheidet, and Janet Temple.

BERA News

The BERA Sales Office is open from Tuesday-Friday, 9 a.m.-1:30 p.m., in Berkner Hall. For more information, call Andrea Dehler, Ext. 3347, or M. Kay Dellimore, Ext. 2873.

One-Day Book Fair

Start early with holiday shopping at BERA's one-day Book Fair next Friday, October 22, 10 a.m.-3 p.m. Selections from children's stories, cookbooks, and *The New York Times'* best sellers will be in stock and available in Berkner Hall, at a 50-70 percent reduction. Discover, Master Card and Visa will be accepted.

Atlantic City, November 6

A few seats remain for the BERA-sponsored bus trip to Resorts Hotel Casino in Atlantic City on Saturday, November 6. The cost will be $25, with a $16 coin return.

The bus will leave the Brookhaven Center promptly at 8 a.m. and return by approximately 10 p.m. Buy tickets at the BERA Sales Office.

Holiday Bash, December 17

Mingle with friends at BERA's second annual Winter Holiday Bash, to be held on Friday, December 17, at the Knights of Columbus in Patchogue.

Tickets are $20 per person and include dinner and dancing. A cash bar will be available. Make paid reservations with: Charles Gardner, Ext. 5214, chuckg @bnl.gov; Louie Nieves, Ext. 4897, nieves@bnl.gov; or at the BERA Sales Office, Berkner Hall.

Defensive Driving

The training group of the Safety & Health Services Division will offer a six-hour defensive driving course on Saturday, November 6, 9 a.m.-3:30 p.m., in Berkner Hall, Room B.

The course will be taught by a Metropolitan Life instructor and is open to BNL, BSA and DOE employees, BNL facility-users, and their families, at a cost of $23 per person.

The class will be limited to 35 participants. To register, send a check made out to Empire Safety Council, in care of Scott Zambelli, P.O. Box 670, Mount Sinai, NY 11766. All checks must be received by Friday, October 29. So that your registration can be confirmed, include your phone number with your name. For more information, call Zambelli at 249-3000, Ext. 5877 (*not* the on-site Ext. 5877).

Equipment Demos

On Tuesday, October 19, from 10 a.m. to 2 p.m., CTP Wireless will discuss the AT&T corporate cellular rate that it offers BNLers. Free features include a digital phone, cigarette-lighter adapter, carry case, caller ID, voice mail with notification, and more.

For more information, call Dennis Lamm, 585-2900.

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On Wednesday, October 20, National Instruments will discuss computer-based measurement and automation, in the seminar room of Bldg. 515, 10 a.m.-12:30 p.m.

Software products and techniques on display will include LabView, Lab Windows/CVI, data acquisition with DAQ hardware, signal conditioning, PXI, computer-based instruments, image acquisition, motion control, and networking.

All are invited to the free seminar, which will include a slice of pizza for lunch. For reservations or more information, contact 683-0100, ni.register@natinst.com or visit www.natinst.com/events.

Sign Thank-You Card For Longwood High

To thank Longwood High School Marching Band and Longwood Cheerleaders for their excellent contribution to the RHIC Dedication ceremony on October 4, sign the poster now in the lobby of the Brookhaven Bulletin, Bldg. 134. After two weeks, the poster will be sent to the school.

Classified Advertisements

LABORATORY RECRUITMENT - Opportunities for Laboratory Employees.

DD8489. STAFF SERVICES POSITION - Requires a bachelor's degree in business or accounting and related experience as well as proficiency in business computer software applications, including Windows 95/98, word processing, databases, and spreadsheets. Demonstrated planning, organizing and problem-solving skills, excellent oral and written communication skills also required. Will provide office management and administrative support to the Staff Services Manager and central office. Will serve as Event Coordinator as well as Financial Coordinator for the program planning and execution of national and international conferences, special Director's Office and BSA corporate hosted meetings, events and lecture series. Will also act as Food Service Contract Financial Administrator. Staff Services Division.

OPEN RECRUITMENT - Opportunities for Laboratory Employees and Outside Candidates.

MK8305. MANAGER, WASTE MANAGEMENT DIVISION - Requires a technical degree in environmental science, chemistry, civil or nuclear engineering and extensive direct experience with waste management operations and programs involving radioactive, hazardous, mixed, solid waste and pollution-prevention/waste-minimization management. In addition, substantial experience and knowledge of environmental, nuclear, and construction related programs with progressively increasing management responsibilities are required, as are strong project management skills and the demonstrated ability to develop strategic plans and execute them, on time and within budget. Strong knowledge of environmental management, safety management, decision support systems, and a general working knowledge of waste regulatory requirements are necessary, and environmental-compliance and pollution-prevention knowledge/experience a plus. Strong customer-service orientation and strong communication (written and presentation) skills to address a wide variety of stakeholders are also required, as is the ability to form effective partnerships with customers and regulators. The candidate must have strong environmental data analysis skills, excellent people-management skills, and the ability to motivate and lead staff. Will be responsible for managing the waste management program at the Laboratory and assisting the Assistant Laboratory Director/Environmental Management with the development of strategies to address long-term waste-management goals and risk-management strategies concerning waste-management issues for the Laboratory. Director's Office.

NS7823. COMPUTER PROGRAMMER/ANALYST POSITION - Requires a bachelor's degree in computer science (advanced degree preferred), a strong UNIX background, programming expertise in JAVA and C, and excellent communication skills. Experience in web-based applications development with background in PERL, CGI, HTML, and JavaScript is highly desirable. Responsibilities will include assisting in the design and development of remote web-based monitoring and control systems for biomedical experiments performed at the NSLS Structural Biology facility. Biology Department.

Tomorrow, Bring Neighbors, Friends, Children of All Ages

Festival of Science, the Environment

Tomorrow, Saturday, October 16, all are invited on site rain or shine to attend the Lab's first "Festival of Science and the Environment" from 10 a.m. to 3 p.m. The event is free, and no reservations are required.

On the same day, the on-site Upton Forecast Office of the National Weather Service will hold its annual open house, which is popular with weather-watchers.

During the festival, Lab scientists will be available under the big tent to discuss exhibits on the some of the Lab's scientific and environmental research and technology-development work. Also on hand will be members of BNL's Environmental Restoration Division, to discuss what the Lab is doing to remedy the environmental problems that stemmed from Brookhaven's past operations.

Around the site, tours of some major facilities, nature walks, and many family-fun activities will be offered. Open to visitors will be Brookhaven's newest "big machine," the Relativistic Heavy Ion Collider, which was recently commissioned (see Bulletin, August 20, 1999). In addition, tours may be taken of the Lab's High Flux Beam Reactor, where world-class studies of physical phenomena, materials and molecules took place, and BNL's state-of-the-art waste management facility. Also, children may participate in a recycling race, kite flying, face painting, and birdfeeder building.

All Next Week is Healthfest '99 – A Week of Health, Fitness, Safety

From October 18 through October 22, BNL employees, retirees, facility-users, and other on-site guests are again invited to participate in Healthfest — the Lab's seventh annual celebration of personal health, fitness and safety.

The five-day festival has the following schedule of activities:

Monday, October 18

- **Aerobic stretch** - rain or shine, 11:45 a.m. - 12:05 p.m., at the Science Education Center, Bldg. 438.
- **Fitness walk** - 2 miles, rain or shine, 12:10 - 1 p.m., starting at the Science Education Center, Bldg. 438.

Tuesday, October 19

- **Aerobic stretch** - rain or shine, 11:45 a.m. - 12:05 p.m., at Central Shops, Bldg. 462.
- **Fitness run** - 5 kilometers (3.1 miles), rain or shine, 12:10 - 1 p.m., start at the Biology Department, Bldg. 463.

Wednesday, October 20

- **Health, fitness & safety fair** - 11 a.m. - 2 p.m., featuring displays, screenings and demonstrations at Berkner Hall, Bldg. 488.
- **"Youth and Violence" seminar** - noon - 1 p.m., in Berkner Hall auditorium, Bldg. 488.

Thursday, October 21

- **Health, fitness & safety fair** - 11 a.m. - 2 p.m., Walk-in podiatry and hearing screenings, displays and demonstrations at Berkner Hall, Bldg. 488.

Friday, October 22

- **Tennis skills workshop** - 11:30 a.m. - 1:30 p.m., at the BNL tennis courts on Bell Avenue.
- **Golf skills clinic** - 11:30 a.m. - 12:30 p.m. and 12:30 - 1:30 p.m., at the gazebo next to the ball field.

For more information and to sign up for the stretches, walk, run, health screenings, and/or sports clinics, look at the Healthfest flyer mailed to all employees or the Healthfest brochures found around site.

Wanted: BNL Crafts for Fall Show

Attention BNL crafters: your finest weaving, crocheting, quilting, metalworking, knitting, sewing, macraméing, or woodworking is needed for the BERA Art Society's upcoming Fall Crafts Festival to be held at Berkner Hall from Monday to Wednesday, November 22-24, from 11:30 a.m. to 1 p.m. An evening reception will also be held from 5 to 7:30 p.m. on Monday, November 22.

BNL employees, their family members 15 years and older, retirees, facility users, and guests of BNL may all contribute. More than one piece may be entered by an exhibitor, to be shown as space permits. All crafts are welcome.

Bring exhibits for the show to Room B, Berkner Hall, the afternoon of Friday, November 19. For the catalog, complete two forms for each work entered and return them by Friday, November 5, to Robert Chrien, Bldg. 510A. More forms are at the BERA Store, Berkner Hall. Copies are acceptable.

Entry for Fall Craft Festival Show, November 22-24, 1999

Name ..... home phone.....

BNL contact ..... BNL extension .....

Type of craft .....

Approximate space needed .....

Circle as appropriate: vertical or horizontal, table or floor

Please print clearly and return to Robert Chrien, Bldg. 510A, by November 5.

Star Party Invitation

The BNL Astronomical Society will have its first star party with its new telescope, on Friday, October 22, at 9 p.m., at the Brookhaven Center. All are welcome — and bring a telescope if you can. New memberships will be available. Rain date will be in November. Contact Keith Power, Ext. 5355 or power@bnl.gov for information.

See Supplement for 1999 BNL Water Quality Consumer Confidence Report.

BROOKHAVEN BULLETIN
Special Edition October 15, 1999
BROOKHAVEN NATIONAL LABORATORY

1999 BNL Water Quality Consumer Confidence Report

This special supplement to the Brookhaven Bulletin is the Lab's first annual Consumer Confidence Report, which covers calendar year 1998. Because the Lab is a drinking-water supplier, BNL is now required to produce an annual report on the quality of its drinking-water by the federal Safe Drinking Water Act (SDWA) of 1976, as amended in 1996.

The report's purpose is to inform drinking-water consumers where their water comes from, what analytical tests are conducted to ensure its safety, what those tests reveal about the water, and more.

The Lab's Plant Engineering (PE) Division is responsible for the Lab's drinking water. Among its other responsibilities, PE is committed to providing all employees, facility-users, guests, residents, and other visitors while they are on site with a safe and reliable drinking-water supply.

To do this, PE regularly tests BNL's drinking water using approved independent laboratories and in-house testing, thereby ensuring that the Lab's drinking water meets all local, state and federal standards for drinking-water quality.

For additional information and/or copies of the complete analysis of drinking-water samples taken in 1998, contact: Ed Murphy, PE Division Manager, Ext. 3466 or etmurphy@bnl.gov; William Chaloupka PE's Assistant Manager of Operations & Environment, Ext. 7136 or chaloupka@bnl.gov; or Bob Lee, Deputy Manager of the Environment Services Division, Ext. 3148 or blee@bnl.gov.

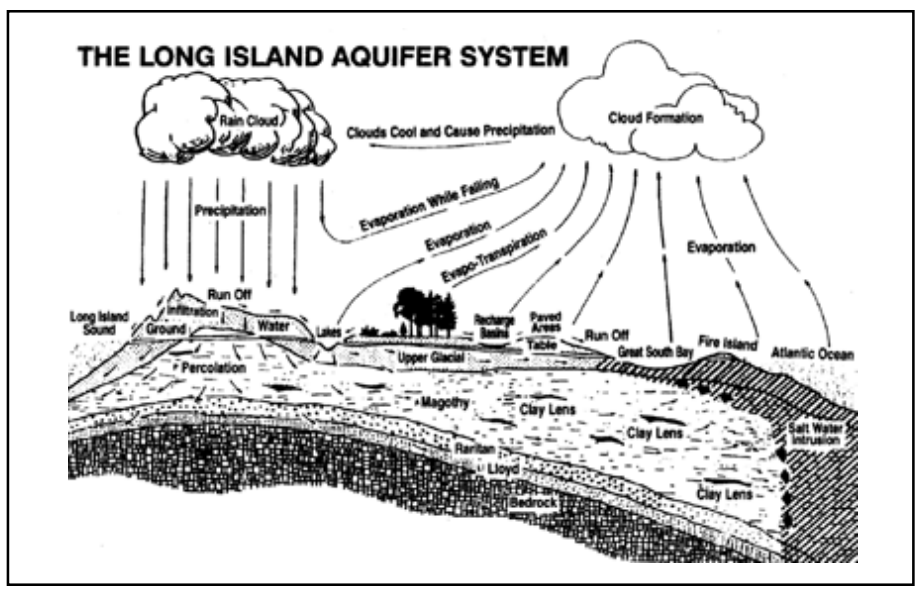
Where Does Brookhaven Lab's Drinking Water Come From?

All of the water supplied to BNL comes from beneath the ground and, hence, is referred to as groundwater.

The water is stored beneath the ground in a sandy, geological formation known as an aquifer. Water in the aquifer originates as precipitation which slowly percolates down through the soil into the aquifer.

Hydrogeologists estimate that Long Island's aquifer system contains 70 to 90 trillion gallons of water, much of which is thousands of years old and entirely free of contamination. This is enough water to supply the Long Island's population for centuries, even if it never rained or snowed again.

The depth of Long Island's aquifer system varies: at a depth of approximately 2,000 feet, it is at its deepest along the south shore. Along the north shore, it is at, 600 feet, its most shallow.



The Long Island aquifer system is made up of three primary formations which lie one on top of the other. At BNL, from the shallowest to the deepest, these aquifer layers are:

- **Glacial:** From the surface to about 150 feet down, the Glacial formation contains the youngest or newest water in the groundwater system.

  Virtually all private wells on Long Island draw their water from this portion of the aquifer, as do all six of the Lab's drinking-water wells.
- **Magothy:** From about 150 feet to a depth of 1,000 feet, the Magothy formation is the largest of the three layers and holds the most water, much of which is hundreds of years old.

  The Suffolk County Water Authority draws water from here.
- **Lloyd:** From 1,000 to about 1,450 feet, the Lloyd formation is largely untapped. It contains the oldest water, some of which is more than five thousand years old.

How Does BNL Supply Its Drinking-Water? The Supply System Described

The Lab's drinking-water supply system is the only source of what is called potable water for the on-site transient and resident population of 3,500.

In 1998, the amount of potable water produced was 786 million gallons, which equals on average 65 million gallons per month or 2.2 million gallons per day. Due to demand, flow varies from 26 million gallons per month, which is 0.86 million gallons per day, to over 120 million gallons per month, or 4 million gallons per day.

In addition to being consumed by the people on site, potable water is used within equipment cooling towers and is sent once through various pieces of on-site equipment, such as the main-magnet heat exchangers for the Alternating Gradient Synchrotron.

To produce this water, the Lab employs a drinking-water supply system, the centerpiece of the of which is the Water Treatment Facility (WTF). It is located on Upton Road in Bldg. 624.

Designed to remove iron and manganese from the Lab's source water, the WTF was constructed in 1963 and has undergone a series of upgrades over the years. The most recent upgrade came in 1995-96, when the aeration tower and a new clear well were added (see following list).

The Lab's drinking-water supply system is made up of a the following facilities:

Potable-Water Supply Wells

There are six drinking-water wells on site: Wells numbered 4, 6 and 7 are located west of Upton Road and supply water to the WTF. Wells numbered 10, 11 and 12 are located along East Fifth Avenue, are equipped with activated carbon filters, and supply water directly to the system because they pump water that is low in iron.

Water is drawn using electrically driven, vertical turbine deep-well pumps, each having an auxiliary drive engine and a design rating of 1,000 gallons per minute (gpm).

Water Treatment Facility (WTF)

The Lab's WTF employs the following components to perform the functions described:

- **Aeration tank**: reduces carbon dioxide gas and aids in oxidation.
- **Rapid-mix tank**: mixes treatment chemicals that are added to the water.
- **Retention tank**: holds the water long enough to allow chemicals enough time to react and form "floc." Flocculation is a process by which very small hydroxide particles stick together to form larger, more easily settled particles called floc.
- **Slow-mix tank:** mixes gently to aid in the formation of floc.
- **Rapid-sand filter:** removes iron floc by passing water through eight filter cells containing sand and anthracite.
- **Wet well with lift pumps:** stores filtered water before it is pumped into the aeration towers.
- **Aeration towers:** remove any volatile organic compounds (VOCs) by spraying the water down over whiffle ball-like fill while air flows upward through the water spray.
- **Clear well:** stores the finished water, before final chlorination and distribution.

Water-Treatment Chemicals

- **Sodium hypochlorite:** kills bacteria and oxidizes iron. Iron removal by oxidation and filtration reduces the water's iron concentration from groundwater's 3-4 milligrams per liter (mg/l) to the "finished" water's 0.03 mg/l. To accomplish this, the ferrous iron that is dissolved in groundwater is readily oxidized to form insoluble ferric hydroxides which flocculate and settle.
- **Lime:** raises the water's pH and softens the water.
- **Polymer:** aids in the flocculation process.

Water Storage Tanks

- **300,000-gallon tank:** was built by the Pittsburgh-Des Moines Steel Company for the U.S. Army in 1941, when the site was Camp Upton. Located on Upton Road next to Police Headquarters, Bldg. 50, this tank is approximately 124 feet to the high-water level, and its bowl is 40 feet in diameter.
- **1,000,000-gallon tank:** was built by Chicago Bridge & Iron in 1985 and is located near the center of the site, by the intersection of Cornell and North Sixth Street. The bottom of the tank is 126 feet above land surface, and the bowl is 75.5 feet in diameter.

Carbon Filters

To remove VOCs, carbon adsorption filters are installed on the wells numbered 10, 11 and 12, the three wells that discharge directly to the drinking-water distribution system.

Distribution Piping

The site has approximately 45 miles of drinking-water distribution pipe. The piping is a mix of cast iron dating from the site's World War II Camp Upton days, transite, plastic, and cement-lined ductile iron.

When drinking-water distribution pipe is added or replaced, cement-lined, ductile-iron pipe is used.

BNL's Water System Statistics

facility	capacity English	capacity metric
• Water Treatment Facility	6,000,000 gal./day	22,710,000 l/day
• Each of the six wells	1,200 gal./min.	76 l/s
• Storage tanks #1	300,000 gal.	1,152,160 l
• Storage tank #2	1,000,000 gal.	3,790,00 l
• Activated carbon filters on wells #10, 11, & 12		
carbon	40,000 lbs.	18,144 kg
flow	1,000 gpm	63 l/s
• Air stripping using 2 packed towers		
water flow	2,400 gal./min.	151 l/s
air flow	11,250 scfm	5.309 m^3/sec.
• Clear well	250,000 gal.	947,500 l
• Distribution system	45 mi.	72 km
• Pressure	55 to 70 psi	379 to 483 kPa

BNL's Commitment to Its Drinking-Water Consumers: Safe, Reliable Drinking Water

Understanding the Contents of Your Drinking Water

As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals, and, in some cases, radioactive material. Substances resulting from the presence of animals or from human activity may also be found in water (see "Water, Water Everywhere).

As a result, water from any source is often "finished," or treated to remove substances or reduce their concentration, before that water is fit for human consumption. Regardless, it is reasonable to assume that all drinking water, including bottled water, contains at least small amounts of some contaminants. However, the presence of compounds does not necessarily mean that water poses a health risk.

To ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (EPA) has established regulations which limit the amounts of certain contaminants in water provided by public water systems, such as BNL's. To protect the health of those who drink bottled water, the U.S. Food & Drug Administration also regulates certain compounds.

Each tap-water contaminant has what is called a maximum contaminant level (MCL) set by federal, state or county regulations. Tap water that exceeds MCLs for one or more compounds is in violation of EPA and/or New York State Department of Health (NYSDOH) standards.

In 1998, BNL's drinking water was in full compliance with all county, state and federal regulations. In other words, in 1998, no MCLs were reached or exceeded, and there were no violations of any governmental regulations.

Of the more than 80 drinking water contaminants for which testing is required by the EPA, NYSDOH, and the Suffolk County Department of Health Services (SCDHS), only the eight compounds listed in the table below were detected in the Lab's drinking water in 1998.

For an explanation of the abbreviations used in the table, see the list of definitions (see below, left).

Term Definitions

- **Maximum contaminant level (MCL)**: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to what is called the maximum contamination level goal, or MCLG (see definition below), as is feasible [based on the results that can be obtained] using the best available treatment technology.
- **Maximum contamination level goal (MCLG):** The level of a contaminant in drinking water below which there is no known or expected risk of health. MCLGs allow for a margin of safety.
- **Treatment technique:** A required process intended to reduce the level of a contaminant in drinking water.
- **Action level (AL):** The concentration of a contaminant which, if exceeded, then triggers treatment or other requirements that a drinking-water supplier must follow.
- **mg/l:** Abbreviation for milligrams per liter, which is equal to parts per million (ppm). For instance, if, in counting the one million dollars that you just won in the lottery, you discover that one dollar is missing, then you are missing one part per million.
- **µg/l:** Abbreviation for micrograms per liter, which is equal to parts per billion (ppb). For example, if, in counting the one billion dollars that you just inherited from your rich uncle, you discover that one dollar is missing, then you are missing one part per billion.

Analytical Data: Bacteria, Inorganic Chemicals, Radiation

The following are the average values detected in the finished water distributed from the Water Treatment Facility or in carbon-filtered water drawn from BNL wells number 10, 11 and 12.

compound	average	standard
Water-Quality Indicators		
Tot. coliform	ND	ND
Color	5 units	15 units
Odor	0 units	3 units
Cyanide	<10 ug/l	NS ug/l
Conductivity	140 umhos	NS
Chlorides	17.3 mg/l	250 mg/l
Sulfates	11.3 mg/l	250 mg/l
Nitrates	0.44 mg/l	10 mg/l
Ammonia	<0.02 mg/l	NS
pH	8.1-8.5 SU	NS
Methylene blue active substances	<0.04 mg/l	NS
Metals		
Antimony	<5.9 ug/l	6 ug/l
Arsenic	<3.0 ug/l	50 ug/l
Barium	<0.2 mg/l	2 mg/l
Beryllium	<3.0 ug/l	4 ug/l
Cadmium	<5.0 mg/l	5 mg/l
Chromium	<0.01 mg/l	0.1 mg/l
Fluoride	<0.1 mg/l	2.2 mg/l
Iron	0.03 mg/l	0.3 mg/l
Lead	<1.0 ug/l	15 ug/l
Manganese	<0.01 mg/l	0.3 mg/l
Mercury	<0.2 ug/l	2 ug/l
Nickel	<0.04 mg/l	0.1 mg/l
Selenium	<5.0 ug/l	50 ug/l
Sodium	14.3 mg/l	NS
Thallium	<1.9 ug/l	2 ug/l
Zinc	<0.02 mg/l	5 mg/l
Radioactivity		
Gross alpha activity	<2.0 pCi/l	15 pCi/l
beta	1.0 pCi/l	50 pCi/l
tritium	380 pCi/l	20,000 pCi/l
strontium-90	<1.8 pCi/l	8 pCi/l
Other		
Asbestos	< 0.19 M.fibers/l	7 M.fibers/l
Calcium	9.1 mg/l	NS
Alkalinity	52.5 mg/l	NS

<: less than the detection limit.
NS: drinking-water standard not specified.
ANR: analysis not required.
ND: not detected,
SU: standard units.

Water, Water Everywhere

While Long Island draws its drinking water from wells tapping into the aquifer (see page 1), other sources of tap and bottled drinking water elsewhere include rivers, lakes, streams, ponds, reservoirs, and springs.

Contaminants that may be present in water from these sources include:

- **Microbial contaminants:** bacteria and viruses, which may come from sewage treatment plants, septic systems, livestock operations, and wildlife.
- **Inorganic chemical contaminants:** dissolved salts and metals, which can occur naturally or result from: storm-water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, and/or farming.
- **Pesticides and herbicides:** substances for eliminating problem insects and plants, respectively; these substances may come from a variety of sources such as agricultural operations, storm water runoff, and/or residential uses.
- **Organic chemical contaminants:** natural and synthetic compounds, including what are called volatile organic compounds (VOCs); these chemicals are by-products of industrial processes and petroleum production, and can also come from gas stations, storm-water runoff, and septic systems.
- **Radioactive contaminants:** which can be naturally-occurring or result from oil and gas production, mining activities, nuclear facilities, etc.

Some people may be more vulnerable to drinking-water contaminants than others. People whose immune systems are compromised may be particularly at risk of infections. Those people include cancer patients who are undergoing chemotherapy, people who have undergone organ transplants, persons with HIV/AIDS or other immune system disorders; and some elderly people and infants. As a result, these people should seek advice about drinking water from their health-care providers. More information about drinking-water contaminants and potential health effects of those compounds may be obtained by calling the EPA's Safe Drinking Water Hotline, (800) 426-4791.

The Eight Compounds Detected In BNL's Drinking Water in 1998

Inorganic contaminants regulated in the drinking-water distribution system

substance	MCLG	MCL	BNL water
• **nitrates**	10 ppm	100 ppm	0.27-0.51 ppm

major sources in drinking water: Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits.
possible health effects: Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, then may die. Symptoms include shortness of breath and Blue baby syndrome.

Organic contaminants regulated in the drinking-water distribution system

substance	MCLG	MCL	BNL water
• **1,1 trichloroethane**			
U.S. EPA	200 ppb	200 ppb	1.0* ppb
NYSDOH	5 ppb	5 ppb	

major sources in drinking water: Discharge from metal degreasing sites and other factories.
possible health effects: Some people who drink water containing 1,1,1 trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system.
** Note: In January 1998, 1,1,1 trichloroethane was detected at 1.0 ppb in water that had gone through the carbon filter at well no. 11. As a result, the filter was removed from service, the carbon replaced, and the filter was placed back in service.*

Radioactive contaminants

substance	MCLG	MCL	BNL water
• **beta/photon emitters**			
	0 pCi/l	50** pCi/l	0.6-1.33 pCi/l

major sources in drinking water: Decay of natural and man-made deposits
possible health effects: Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photo emitters in excess of the MCL over many years may have an increased risk of getting cancer.
***Note: The U.S. EPA considers 50 pCi/l to be of concern for beta particles.*

Unregulated contaminants

substance	MCLG	MCL	BNL water
• **sulfates**	-	250 ppm	10-13 ppm
• **chlorides**	-	250 ppm	14-19.4 ppm
• **sodium**	-	-	9.7-21.8 ppm

major sources in drinking water: naturally present in the environment.
possible health effects: unregulated contaminants do not pose any significant health risk.

*Contaminants regulated at the drinking-water consumers' tap****

substance	MCLG	at 90th percentile	# BNL samples exceeding AL	value at 90th percentile
• **lead**	0 ppb	15 ppb	0 out of 20	1.8 ppb

major sources in drinking water: Corrosion of household plumbing.
possible health effects: Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight defects in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.

• **copper**	0 ppm	1.3 ppm	0 out of 20	0.05 ppm

major sources in drinking water: Corrosion of household plumbing.
possible health effects: Copper is an essential nutrient, but some people who drink water containing it in excess of the action level over a relatively short time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver of kidney damage. People with Wilson's Disease should consult their personal physician.
****Note: Sampling was done in 1997 and will be repeated in the year 2000.*

Analytical Data: Organic Compounds, Micro-Extractables

With one exception, which was immediately corrected and is explained below, the following were *not* detected (ND) in the finished water distributed from the Water Treatment Facility, or in carbon-filtered water drawn from BNL wells number 10, 11 and 12.

compound	level	µg/l
Dichlorodifluoromethane	ND	5
Chloromethane	ND	5
Vinyl Chloride	ND	2
Bromomethane	ND	5
Chloroethane	ND	5
Fluorotrichloromethane	ND	5
1,1-dichloroethene	ND	5
DichloromethaneND	ND	5
trans-1,2-dichloroethene	ND	5
1,1-dichloroethane	ND	5
cis-1,2-dichloroethene	ND	5
2,2-dichloropropane	ND	5
Bromochloromethane	ND	5
1,1,1-trichloroethane	1.0*	5
Carbon Tetrachloride	ND	5
1,1-dichloropropene	ND	5
1,2-dichloroethane	ND	5
1,1,2-trichloroethane	ND	5
1,2-dichloropropane	ND	5
Dibromomethane	ND	5
trans-1,3-dichloropropene	ND	5
cis-1,3-dichloropropene	ND	5
1,1,2-trichloroethane	ND	5
Trihalomethanes	ND	100
1,1,2,2-tetrachloroethane	ND	5
1,3-dichloropropane	ND	5
Chlorobenzene	ND	5
1,1,1,2-tetrachloroethane	ND	5
Bromobenzene	ND	5
1,1,2,2-tetrachloroethane	ND	5
1,2,3-trichloropropane	ND	5
2-chlorotoluene	ND	5
4-chlorotoluene	ND	5
1,3-dichlorobenzene	ND	5
1,4-dichlorobenzene	ND	5
1,2-dichlorobenzene	ND	5
1,2,4-trichlorobenzene	ND	5
Hexachlorobutadiene	ND	5
1,2,3-trichlorobenzene	ND	5
Benzene	ND	5
Toluene	ND	5
Ethylbenzene	ND	5
m-xylene	ND	5
p-xylene	ND	5
o-xylene	ND	5
Styrene	ND	5
Isopropylbenezene	ND	5
n-propylbenzene	ND	5
1,3,5-trimethylbenzene	ND	5
tert-butylbenzene	ND	5
1,2,4-trimethylbenzene	ND	5
sec-butylbenzene	ND	5
p-isopropyltoluene	ND	5
n-butylbenzene	ND	5
methyl tert. butylether	ND	50

** Note: In January 1998, 1,1,1 trichloroethane was detected at 1.0 ppb in water that had gone through the carbon filter at well no. 11. As a result, the filter was removed from service, the carbon replaced, and the filter was placed back in service.*

Lead in Pipes

Some of BNL's drinking-water fountains are out of service because what comes out of the spout exceeds the drinking-water standard for lead. This is *not* because the Lab's potable water contains lead. This *is* as a result of the past practice of solder containing lead to join copper pipe, such as the cooling coil within the fountain. If you are concerned about lead in your drinking water, then let the tap run for up to two minutes before consuming the water.