

Cleaning Up Groundwater

in Areas South and Southeast of Brookhaven National Laboratory

This pamphlet summarizes the questions you or your neighbors raised about groundwater treatment systems, and the responses from Brookhaven National Laboratory.

During the past six months, representatives of Brookhaven National Laboratory have been listening to the concerns of the community about groundwater-treatment systems that we are required to install south and southeast of the Laboratory's site.

A public meeting was held in February at Dowling College, and, in March, we met with members of the East Yaphank Civic Association who shared their concerns with us. The Laboratory also sent out approximately 3500 brochures with pre-paid comment cards that some of you returned to us. On June 11 we conducted a workshop at which attendees from the community reached consensus in their recommendations to the Laboratory. Finally, we visited approximately 170 homes so that we could have a better understanding of your concerns and questions.

We are doing our best to act on the recommendations and input given to us by community members.

A brochure that outlines information on the locations of the systems can be found at <http://www.bnl.gov/erd/water/GroundwaterCleanup.html> or a copy of the brochure or additional information can be requested from Jeanne D'Ascoli at (631) 344-2277.

This document summarizes the questions that were asked about the groundwater-treatment systems, and outlines the associated concerns and our resolution of them.

We extend our thanks to all of the community members who were involved in discussing the placement of the groundwater-treatment systems. This involvement helped us reach better decisions about the placement and operation of these systems.

Les Hill
Director, Environmental Management Program

Introduction

The groundwater treatment systems that are planned to be installed in areas south and southeast of the Laboratory are designed to clean the groundwater, improve the quality of the aquifer and help to restore it back to its natural state. The systems that will be used in the off-site projects are known as carbon-filtration systems.

Typically, the planned water-treatment systems consist of extraction wells that are from 125 feet to more than 200 feet below ground. Well covers are at ground level. The water is pumped up through a pipe to two-carbon filtration vessels to remove the contamination. The pumps are typically installed in the bottom 50 feet of the well. The clean water is pumped back into the ground at about 50 to 100 feet below the land surface.

The groundwater-treatment systems will remove volatile organic compounds (solvents such as degreasers and cleaners) and ethylene dibromide (a pesticide commonly used in the 1960s and 70s) whose concentrations are above the drinking-water standards.



Location of buildings

Originally, a groundwater-treatment system building was designed to be placed on the Long Island Power Authority's (LIPA's) right-of-way on Puritan Drive. Some residents voiced serious concerns about this location.

Comment: Residents do not want the groundwater-treatment system's buildings close to their homes.

Response: Plans to locate the groundwater-treatment system's building on Puritan Drive will be dropped. Instead, a building already planned to be constructed at the northern portion of the Brookhaven Airport to treat water extracted from this area will be utilized for the Puritan Drive and the Airport areas. At the June 11 workshop, community members voiced their preference for this location.

We thank the community members who first suggested this alternative. We are very pleased to implement it.

Comment: The groundwater-treatment system's building that was proposed for Puritan Drive should be constructed on the corner lot on Boxwood Drive and Stratler Drive. When the cleanup is completed, the building should be given to the community for a clubhouse, or transferred to the U.S. Postal Service for use as a post office.

Response: We asked the residents living near Boxwood Drive how they felt about putting a building at this site. All but one resident opposed this idea, preferring not to have the building in their neighborhood.

If the building were placed on Boxwood Drive, it would have stood on LIPA's property, not on land owned by the Laboratory. Therefore, we would not have had the ability to guarantee eventual transfer of the building to the community or the Postal Service.

An additional groundwater treatment system building was planned to be placed on the west side of North Street. Some residents also voiced concerns about this location.

Comment: Many children play on the land where the Laboratory plans to build the North Street system. Move the system projected to be located on the west side of North Street to the east side, so that it will be less accessible to children.

Response: We are working with the County to gain approvals to construct the building on a piece of County property on the east side of North Street. If successful, this action will help to address this concern.

Groundwater Treatment System Buildings

Comment: If a building for the groundwater-treatment system is erected in the neighborhood, it should not be a square box; also, avoid constructing a building that is too high. The appearance of the building is important to us.

Response: Buildings that will be visible to community members will be sided and roofed with materials that are consistent with the residential area. Buildings will be approximately one to one-and-a-half stories high. We will contact neighbors to get their input about the building's appearance.

Comment: The system's building must be removed and the area properly restored when the groundwater cleanup is completed.

Response: We anticipate removing all buildings when the cleanup is over, and are committed to returning the site to the property owners in its original condition. Since the buildings may be located on properties owned by others, they may be turned over to the owner if this is cost-effective for the Laboratory, and the property owner requests it. As we noted above, we do not have the right to transfer the building to anyone else.

Comment: Tall fir trees should be placed around the building to help conceal it.

Response: We will do this as appropriate. In addition, we will work with community members who live near the buildings of the groundwater-treatment system so we can resolve their concerns about landscaping.

Comment: If you need to clear trees to install a system, ensure that all-terrain vehicles (ATVs) cannot use the path.

Response: We will plant trees so that there is no clear pathway for ATVs.

Health and Safety

Comment: There are many children in our community. What are you going to do to keep them safe?

Response: We are very concerned indeed about the safety of children. Safety is the first priority of all the work done by our staff. The following are some of the things being done under the groundwater-treatment system projects to keep people safe: We plan to build the systems in less populated locations that are more acceptable to the community. All buildings will have fencing around them, including barbed wire, to keep children out.

All systems will have motion detectors and silent alarms that will be connected directly to

Laboratory security which will respond if they are activated.

Signs will be installed on the fencing to warn people of the presence of high voltage equipment.

Comment: Extraction-well vaults should be childproof. Cover the vaults with soil to conceal them.

Response: The well vaults will be locked. Where possible, transformers will be placed on poles, rather than on the ground. We cannot cover the vaults with dirt since we need to be able to access them.

Comment: Leaks from the systems' piping must be prevented. Furthermore, the safety of the community must be assured should they occur. Double-walled piping should be installed to prevent leakage.

Response: We carefully evaluated this concern to determine the most appropriate engineering response. The most common cause of pipe breakage is from excavation. Double-walled piping would not prevent breakage caused by digging or excavating. All piping will be pressure-tested with clean water before operations begin. Pressure switches that will shut off the pumps automatically if the pipe fails were already planned. However, since hearing the concerns of the community, we will now install redundant pressure switches as a further safety measure. Additionally, we will periodically pressure-test the pipes. The pressure switches provide the best protection to minimize leakage resulting from a pipe break.

We will oversee the installation of all the piping associated with the groundwater projects. Piping will be buried four feet deep, which will also reduce the likelihood of any exposure in the unlikely event of a leak.

Comment: Was there a study on the possible health risks associated with carbon-filtration systems, either of long-term or short-term exposure?

Response: The public is not exposed to any health risks from the carbon-treatment systems since there are no emissions from them. This is the reason why the Suffolk County Water Authority uses this method of treating the water. We did not locate any studies on possible health risks.

Comment: By pulling up the water to these treatment plants, are chemicals released into the air?

Response: No. These systems do not generate any air emissions. Contaminants are collected on granules of carbon as the groundwater passes through the treatment

system very similar to the process that occurs in a household water treatment cartridge.

Comment: We are worried about the health risks when the carbon is changed out of the systems.

Response: Throughout the process the carbon is fully contained. When the carbon is changed out, it is carried with water through special hoses to tanker trucks. The used carbon is taken away for processing and recycling. Clean carbon is then pumped back into the vessels, also through hoses.

Comment: Have other agencies looked at the risks to our community?

Response: Yes, there is a draft 1997 Groundwater Health Consultation Report available from the Agency for Toxic Substances and Disease Registry. We will be happy to send it to you if you wish. The report finds that “The results of private residential well sampling through November 1996 do not indicate that the levels of volatile organic compounds and radionuclides are sufficient to produce adverse health effects on an individual basis for non-cancerous effects.”

Also, Suffolk County put together a task force of regulators and community members to assess the risk to the community. The Executive Summary of their report states, “We identified five off-site groundwater plumes which had extended into residential areas...Based on the data reviewed, it was estimated that the health risks that may have been incurred by residents who drank this water were minimal.”

Carbon

Comment: When you change out the carbon in the systems, notify the residents nearby.

Response: We will contact the residents who requested us to do so just before making the exchanges. If others in the community are interested in having this information, call Jeanne D’Ascoli, (631) 344-2277 to be added to the list.

Comment: Is there a system in operation that we could tour?

Response: Yes, we have installed several systems that can be inspected, or we can arrange a tour with the Suffolk County Water Authority, which has about 40 systems operating on Long Island. Please call Jeanne D’Ascoli, (631) 344-2277 to arrange for a tour.

Road Restoration

Roads will need to be cut when piping is laid for the systems. Currently, Puritan Drive will be the one most affected.

Comment: We insist that the Laboratory repave the entire road. The community’s roads have just been paved. Do not mess them up.

Response: We recognize how hard residents in East Yaphank worked to get their roads paved; some of this work was completed very recently. Realizing the community’s concerns, we publicly committed at the June 11 workshop to work closely with Brookhaven Town to meet its repaving standard, and to ensure the paving of the cut is smooth. There should only be a difference in the shade of the asphalt. Also, we will require the contractor who undertakes this work to provide a one-year maintenance bond for road repairs.

Because of budgetary constraints, we will not be able to repave the entire road.

Returning Clean Water Back Into the Ground

Comment: Into what part of the aquifer will you pump the water that has been cleaned?

Response: All of the clean (treated) water will be returned to the Upper Glacial Aquifer, approximately 50 to 100 feet below the land surface. The Upper Glacial Aquifer is the upper-most of our Aquifers, the one closest to land surface.

Comment: When you take the water from the ground in one area, and put it back in the ground in another, will this impact the wells from which some of us draw water for our lawns and to fill our pools?

Response: Residents still using their wells will not see any impact.

Well Drilling — Results and Monitoring Plans

Comment: The Laboratory drilled wells near my home to test the water. Can I get the results?

Response: Yes, please call Jeanne D’Ascoli, (631) 344-2277, to set up an appointment.

Comment: When you drilled near my home, dirt was left next to the drilling site for two weeks.

Response: We apologize for this inconvenience. This has occurred while we wait for analytical results to ensure we will not need to obtain additional samples and re-disturb the area.

We have been making a concerted effort to remove dirt piles near residents’ homes in a more timely manner.

Groundwater

Comment: Is Suffolk County’s well water contaminated?

Response: Drinking water delivered in public water supply systems must meet very strict water quality standards established by New York State. These standards are among the strictest in the United States. The water that suppliers deliver to their customers is constantly tested to insure that it is safe, pure, and meets all water quality standards.

Comment: Can I use well water to water my vegetable garden?

Response: The Suffolk County Department of Health Services recommends that anyone who owns and operates a domestic well should have the water tested annually. They provide this service for a nominal fee. This will ensure that it is safe and can be used to water vegetables or for other purposes.

Comment: How will the contaminated water have affected those of us who used it before being connected to public water?

Response: Based upon residential well sampling results, and the depths of residential wells it is unlikely anyone drank this water. However, if anyone did drink this water based on reviewing the data in a report to the Suffolk County Legislature from an Environmental Task Force Report on Non-radiological Chemical Releases, dated February 1998, it was estimated that there were minimal health risks to them.

In addition, the draft 1997 Groundwater Health Consultation Report is available from the Agency for Toxic Substances and Disease Registry. We will be happy to send you a copy if you wish. The report states, “The results of private residential well sampling through November 1996 do not indicate that the levels of volatile organic compounds and radionuclides are sufficient to produce adverse health effects on an individual basis for non-cancerous effects.”

Comment: I am considering building a home in this area and want to know if the Laboratory will pay for my water hookup?

Response: The U.S. Department of Energy program offering free hookups ended in 1998. Suffolk County code requires any new single-family residence construction within 150 feet from the property line to a water main, to hook up to the public water supply in order to receive a certificate of occupancy (CO).

Contaminated Groundwater Plumes

Comment: Why weren't the plumes of contamination more carefully monitored to prevent further contamination of groundwater?

Response: Groundwater has been monitored in portions of the Laboratory since the early 1970s, with the focus at that time being on sampling for radiological substances and metals. The monitoring program has been significantly expanded both on and off the Laboratory's property since then. When the Laboratory became a Federal Superfund site in 1989, we began installing wells so that we could further define where the contamination was and take measures to clean it up, if needed.

Much of the contamination of the groundwater took place many years ago. Past waste management practices are responsible for the off-site groundwater contamination. Current waste management practices work to prevent the release of these chemicals to the groundwater.

Comment: What chemicals are you removing?

Response: The primary chemicals that are being cleaned up are carbon tetrachloride, 1,1,1 trichloroethane, tetrachloroethylene, and, in the area furthest east, ethylene dibromide. The chemicals originated from cleaners and degreasers that formerly were used for work on site; ethylene dibromide, a pesticide, was applied to some eastern parts of the site for agricultural purposes. Its use has since been banned.

Comment: Will the groundwater-treatment systems clean up tritium?

Response: No, they will not. The North Street and North Street East systems will intercept water that contains low concentrations of tritium, well in compliance with federal drinking-water standards. These levels do not require taking any cleanup actions. The material will decay naturally.

The other off-site plumes do not contain tritium.

Comment: Are you treating this water for strontium- and cesium-contamination?

Response: No, not in areas off the Laboratory's site. There is no strontium or cesium at levels not in compliance with drinking-water standards in the water the Laboratory is treating at off-site locations. The U.S. Environmental Protection Agency sets these standards to ensure that the water we drink is safe.

Amounts of strontium, high enough that we need to clean them up, are present in groundwater on site. They are not expected to ever move off the site above the drinking water standard.

Comment: If the Laboratory's soil and water is so contaminated, why did only ethylene seep into the aquifer, and not tritium, cesium, and strontium?

Response: Soil contamination was limited to areas on the site, and not off-site. Most of this contamination was cleaned up, and former landfills were capped. Capping prevents precipitation from entering the landfills thereby leaching contaminants into the groundwater, and is commonly used nationwide as a means for doing so.

The Laboratory has six groundwater-treatment systems operating on the site, and one operating in the Industrial Park to our south. The portions of the chemical plumes that are off site migrated there before the on-site cleanup systems began operating. Chemical contamination is prevalent because of practices that were common in the past.

Cesium is not typically seen in groundwater due to its adsorption onto soils. Strontium is seen in the groundwater but moves very slowly in groundwater due to its partial adsorption onto soils. The tritium contamination that many residents refer to, and remember, came from a leak in the spent-fuel storage pool of the High Flux Beam Reactor (HFBR). As you know, the reactor was shut down, along with a small medical research reactor that once was operated on site.

At present, no reactors are operating at the Laboratory. The tritium plume from the HFBR is very well defined and is limited to an area on our property. It is contained to the Laboratory site and is not expected to leave the site above drinking water standards.

Comment: We would like geographical reports on the tritium plume at the site.

Response: Since the reports date back to 1997, we will gladly talk to you so that we can give you the information you are most interested in. Please call Jeanne D'Ascoli at (631) 344-2277 for more information.

Quality of Life Issues

Comment: The noise from the treatment system and the Laboratory's response to alarms will disrupt the neighborhood.

Response: The treatment systems are virtually noiseless; if you are inside the building you hear the sound of running water. A silent security system will alert our police if unauthorized personnel enter the facility. The uniformed police who respond will have identification badges and won't be using sirens on their vehicles. There should be little, if any, disruption to the neighborhood.

Comment: Extended work hours during the construction period will be a disruption.

Response: Construction will be carried out during normal work hours, 8 a.m. through 5 p.m. Occasionally, the crew may work past 5 p.m., if necessary. The construction work for the building will be very much like that when building a home.

Comment: The transformer may interfere with cables, cell phones, and satellites.

Response: There should be no noticeable changes from current conditions.

Comment: Nearby properties should undergo a real estate appraisal before starting construction of the treatment systems.

Response: We recognize the community's concern about the values of their homes. However, we understand that property values have increased, despite the significant news coverage several years ago of the groundwater contamination in the neighborhood. When considering the factors that affect property values, such as prevailing interest rates, the condition of the property, its location, and trends in industry, we would find it extremely difficult to estimate any impacts, positive or negative, upon those values from our treatment systems. Therefore, we cannot justify the cost and effort to conduct property valuations.

Comment: As a good-faith gesture, the Laboratory should provide drinking-water filters for the homes next to the treatment systems.

Response: Your public water is supplied by the Suffolk County Water Authority, which tests the water routinely to ensure its purity. The treatment systems that we plan to install in no way compromise the drinking water provided by the Water Authority.

Communication Issues

Comment: How and when will the Laboratory keep residents informed about what is happening.

Response: Before doing any work in the neighborhood, representatives from the Laboratory will come to residents' homes in the immediate area to inform them and to answer any questions. If residents wish, we will meet them in a group to share information about construction and get their ideas on specific issues. If you are not a resident in the immediate areas, but wish to be involved, just let us know and we will include you in these conversations.

We also will send out mailings to help keep you informed. And, of course, you are always welcome to call us, too. You can reach Jeanne D'Ascoli by phone at (631) 344-2277 or by e-mail at dascoli@bnl.gov.