



# ENVIRONMENTAL EXPOSURE EVALUATION

## Existing Environmental Data Are Used to Evaluate Elevated Levels of Contaminants

### Summary

State Health Department scientists examined a large amount of existing information about contaminants and other potential environmental exposures in the CMP area. They looked at air quality, pesticide use, in-home radon, hazardous waste sites, industrial sites, public and private drinking water and electromagnetic fields (EMF). They compared what they saw in the CMP area to the rest of Suffolk County and New York State. What they learned is that for many comparisons, the levels of environmental contaminants in the CMP area were similar or lower. Some levels of contaminants were greater in the CMP area, and they were evaluated further. More information about those contaminants is available in the *Integration Evaluation* booklet.

### Environmental Findings

**Air Quality.** The levels of the majority of air contaminants were similar to or below levels than in other areas of the state, but some were at least 10% higher in this area. Ethylene thiourea is the first air contaminant evaluated in the integration evaluation.

**In-Home Radon.** Radon levels in the Town of Brookhaven are estimated to be lower on average than the rest of New York State. Radon exposures are not being further evaluated.

**Pesticides Use.** The amount of commercial applications of lawncare and landscaping pesticides per square mile appear somewhat higher in the CMP area than in the rest of Suffolk County and New York State. 2,4-D is the first pesticide evaluated in the integration evaluation.

**Hazardous Waste Sites.** Hazardous waste sites in the area have not been a source of widespread contamination. Lawrence Aviation is the only site in the CMP area that has an ongoing clean-up program.

**Industrial Sites.** Based on monitoring near Brookhaven National Laboratory, air radiation levels near the CMP area are not higher than in other areas of New York State. Records about the ongoing cleanup of the Northville Industry East Setauket Terminal gasoline leak showed it was not a source of widespread contamination. Information about the historical operation of the Port Jefferson Power Station was reviewed.

**Public and Private Drinking Water.** Based on the contaminants evaluated, this area has high quality drinking water. This evaluation shows that public and private drinking water is as good, if not better, than the rest of Suffolk County.

Volatile organic compounds (VOCs) are the only kinds of water contaminants in public water supplies being further examined. The levels of these are low, and the number of people exposed is small. These have all been further evaluated in the integration evaluation.

Pesticides are the only contaminants being further evaluated in private drinking water wells. The levels of these were lower in the CMP area than in the rest of Suffolk County, although some were found more frequently in the CMP area in localized areas near known agricultural areas.

**Electromagnetic Fields (EMF).** Data about EMFs are limited, but we would not expect them to be higher in the CMP area than in other areas of the state. The area has about the same coverage of transmission lines as other parts of Suffolk County. EMFs are not being further evaluated.

## Environmental Data Evaluated

- **Air Quality** including emissions from industries, residential heating oil, cars, trucks and other emission sources
- **Pesticide Use** by commercial applicators including those at area residences and businesses
- **In-Home Radon**
- **Hazardous Waste Sites**
- **Industrial Sites** such as Brookhaven National Labs, Northville Industry Corporation East Setauket Terminal and the Port Jefferson Power Station.
- **Public and Private Drinking Water**
- **Electromagnetic Fields (EMF)**

The environmental factors evaluated were selected based on the availability of existing data and the level of community concern. Earlier in the investigation, an *Initial Environmental Inventory* was prepared describing existing environmental data sets and locations of commercial/industrial sites that could be possible sources of contaminants in these communities. This inventory was presented to local residents at a June 2002 public availability session. Residents also reported their environmental concerns to researchers at that time.

Our researchers developed criteria to evaluate data sets for estimating possible environmental exposures and for selecting those meeting minimal guidelines. They also developed methods to determine whether levels of contaminants might be elevated in the CMP area compared to other areas in the state. These methods are described prior to discussing the results of each environmental data set evaluated.

# Methods

## Criteria Used to Select Data to Estimate Exposures

Many more data sets were evaluated than are described in this booklet. All data sets listed on the *Initial Environmental Inventory* contained potentially useful data, but they were not developed for this kind of investigation. Each lacked some important information for this purpose and what they lacked varied. Our researchers developed criteria to evaluate all these data in a consistent way to select those best suited for this evaluation. Here's what they evaluated:

- 1. How were the data geographically related to the CMP area?** Data that covered the entire area were considered better than those representing a subset of the area.
- 2. How well did the data represent the levels of contaminants in the CMP area?** Data sets that represented more frequent monitoring efforts for the same contaminants were considered better than those that had less routinely collected data.
- 3. What could the data tell us about the size of a potentially exposed population?** Researchers prioritized data sets that indicated that a large portion of the population could have been exposed to contaminants.
- 4. Were the data actual measures of contaminants in the environment or reported emissions or chemical releases?** Researchers were more confident in measured levels of contaminants in the environment than in data that reported industrial emissions or chemicals released to the environment.
- 5. Do the data suggest that people actually could have had contact with the contaminant?** Exposure is contact with a contaminant. Without exposure there can be no health effect, regardless of the level of contamination found in the environment. In every case, researchers used data about levels of contaminants to estimate exposure.
- 6. Did the data represent a time period that could have been related to breast cancer incidence between 1993 and 1997?** Scientists estimate that breast cancer could occur somewhere between 5 and 40 years after a person is exposed to risk factors that might have caused the disease. This time period is referred to as the "latency period." This varies depending on what may have started the breast cancer and the age of a woman when she was exposed. For the most part, even the oldest environmental data sets evaluated did not include data prior to the 1970s. Because of data limitations and cancer latency, environmental data that pre-dated the cancer incidence data were given a higher rating for purposes of characterizing exposure.
- 7. Did a better data set exist that could be used?** Data sets that met more of the above criteria were selected over data sets that met fewer. However in some cases, researchers needed to use data minimally qualified for this type of evaluation because no alternatives were available.

## Determining if a Contaminant Was “Elevated”

Our researchers also selected methods to determine if there was evidence that a contaminant was elevated in these seven ZIP Codes. The most frequently used method was to compare levels of contaminants in these communities with other areas. In most cases, more than one comparison area was used including Suffolk County, New York State and New York State not including the five boroughs of New York City.

If levels of contaminants were greater in the CMP area compared to any of these other areas, researchers evaluated them further to determine the likelihood that those levels could be related to breast cancer incidence or other adverse health effects. This evaluation was performed in the final step of this stage of the Investigation called “Integration.”

### Data Sets Selected To Evaluate Possible Exposures

#### Air Quality

- US Environmental Protection Agency’s (US EPA) Air Quality System database of routinely monitored contaminants in outdoor air.
- Two US EPA data sets of estimated concentrations of hazardous air pollutants in outdoor air: Cumulative Exposure Project (CEP) and National-scale Air Toxics Assessment (NATA).

#### Pesticides

- The portion of the New York State Pesticide Sales and Use Reporting Database containing the amount of reported use of pesticides by professional, certified applicators. Additional data were evaluated from public and private drinking water data sets.

#### Levels of Contaminants in Public and Private Drinking Water

- Suffolk County Health Department Services databases containing water monitoring data for certain inorganic compounds, pesticides and volatile organic compounds.

#### Hazardous Waste Sites and Industrial Sites

- NYS Department of Environmental Conservation and Department of Health site investigation records and other publicly available data.

#### Electromagnetic Fields (EMF)

- NYS Department of Public Service’s Transmission Lines database containing data about statewide electric transmission lines of 115 kilovolts and higher.

#### In-Home Radon

- NYS Department of Health data on household radon levels.

## Air Quality

For this evaluation, an **air pollutant** is a substance detected in the air at levels greater than what would normally be found or considered desirable. It comes from many different human sources (cars, buses, trucks and factories). Air pollutants also come from natural sources (dust, pollen and wildfires). Air pollution is typically thought of as an outdoor problem, but it also exists inside homes and the workplace. Other than indoor radon levels, no data were available to evaluate indoor air pollutants.

A number of data sets provided information about emissions from specific industrial facilities in the area. However, the fact that an industrial plant emitted a certain contaminant does not necessarily mean that the substance has entered someone’s body. Emissions are amounts of contaminants discharged to the environment over time from a smokestack, for example. Exposure measures the amount of contact people have with contaminants. Ideally, the best exposure data provide information about the amount of that contaminant present in a person’s body. Because those data were not available, the next best data provide information about the concentrations of contaminants in the air that people could have inhaled.

**US EPA’s Air Quality System Database.** Concentrations of sulfur dioxide, nitrogen oxides, ozone, carbon monoxide, fine particulate matter and total suspended particles were evaluated for the years 1982-1984 and 2000-2001. Except for ozone, which exceeds national air quality standards for portions of Long Island on some hot summer days, all other pollutants were within air quality standards and will not be evaluated further. An additional evaluation of ozone will be conducted in the final draft report. For more information about ozone, visit NYS DEC’s site: <http://www.dec.state.ny.us/website/dar/bts/ozone/index.html>.

**Two US EPA Air Quality Assessments: Cumulative Exposure Project (CEP) and National-scale Air Toxics Assessment (NATA).** US EPA estimated average concentrations of hazardous air pollutants in outdoor air for two windows in time, 1990 and 1996. These estimates were calculated using models that consider air emissions from large and small industries and cars, trucks and other mobile sources.

The results showed that the levels of the majority of contaminants were similar to or below levels for Suffolk County, New York State and New York State not including the five boroughs of New York City. However, 31 of the 180 contaminants evaluated were at least 10% higher in the CMP area compared to any of those areas (see Table, p.4). These contaminants are being further examined to evaluate the likelihood

that they could be related to breast cancer incidence or other health effects. Ethylene thiourea, which was estimated to be present at a very low concentration, was the contaminant most elevated relative to the three comparison areas. This was the first air contaminant evaluated in the Integration Evaluation in the Working Draft Report. The remaining contaminants are being further evaluated for the Final Draft Report

Ethylene thiourea levels appear higher in the CMP area because it is not a common air contaminant in other regions of the state. An evaluation of US EPA's Toxics Release Inventory identified emissions from a Stratford, Connecticut rubber manufacturing plant as the source of this contaminant in the CMP area. Our researchers further evaluated the likelihood that these low-level air concentrations could be related to breast cancer incidence or other health effects. The results of that evaluation are found in the *Integration Evaluation* booklet.

**CEP and NATA Contaminants More than 10% Higher in the CMP Area Than in Any of the Three Comparison Areas**

**Key**

- 5-35 times higher than in at least one of the three comparison areas
- 2-5 times higher than in at least one of the three comparison areas
- 1-2 times higher than in at least one of the three comparison areas

**Estimated Concentration**  
(Micrograms per cubic meter)

Ethylene thiourea	0.00000009
Acrylic acid	0.001
Hexane	4.6
1,2-Dibromoethane	0.00005
Diethanolamine	0.000002
Methyl tert-butyl ether (MTBE)	0.9
Propionaldehyde	0.5
1,2,4-Trichlorobenzene	0.00009
Dimethyl phthalate	0.0004
Methylene diphenyl diisocyanate	0.0003
Acetaldehyde	1.5
Hydrofluoric acid	0.07
Ethylbenzene	0.8
2,2,4-Trimethylpentane	1.6
Methyl ethyl ketone	1.4
Toluene	5.7
Beryllium	0.00003
Xylene	3.7
Aniline	0.002
Trichloroethene	0.4
1,1,1-Trichloroethane	2.9
Hydrochloric acid	0.9
Arsenic	0.0003
1,3-Dichloropropene	0.05
Glycol ethers	0.6
Acrylamide	0.00000004
1,1-Dichloroethene	0.00001
Ethylene oxide	0.0004
Diesel particulate matter	2.4
Cadmium	0.0001

**Limitations**

- CEP and NATA data estimate levels of contaminants that were present in 1990 and 1996, respectively, and might not necessarily reflect possible exposures for other years.
- All air data are annual average concentrations. People could have been exposed to higher or lower levels of contaminants during shorter time periods that would not be reflected in these data.
- CEP and NATA data are calculated estimates based on emissions data, not actual measures of these contaminants in the air.

# Pesticide Use

People can be exposed to pesticides during their application and afterwards through contact with vegetation, soil and drinking water. Overall, very few data exist for estimating possible exposures to pesticides. *The Initial Environmental Inventory* identified two data sources that could provide some information about pesticides in the CMP area. One is the New York State Pesticide Sales and Use Reporting Database, which is the focus of this evaluation and can be accessed at Cornell University's web site at <http://pmep.cce.cornell.edu/psur/>. The other is the Suffolk County pesticide groundwater and drinking water monitoring database, which is discussed later in this booklet in the private drinking water evaluation.

Our researchers evaluated data from the New York State Pesticide Sales and Use Reporting Database about pesticides applied by commercial applicators in New York State. Since 1997, New York State has required commercial applicators to report their use of pesticides.

The majority of pesticides used in Suffolk County and the CMP area are used for lawn care and landscaping. The amount of commercial applications of these pesticides in the CMP area is somewhat higher on a per square mile basis than the rest of Suffolk County and New York State. Eastern Suffolk County has larger agricultural and undeveloped areas where people are less likely to use lawn care and landscaping pesticides. New York State also has large areas with low population density where there is little reported use of these pesticides.

Products containing 2,4-D, which were used between 1997 and 2001 and were also used historically, were the first pesticides evaluated. They are used to control broadleaf weeds in lawns. Researchers evaluated data for 10 commonly used 2,4-D-containing products in the CMP area. Nearly all of these products contain the active ingredients 2,4-D (2,4-dichlorophenoxyacetic acid), mecoprop [2-(4-chloro-2-methylphenoxy) propionic acid] and dicamba (3,6-dichloro-o-anisic acid).

Commercial applications of products containing 2,4-D, mecoprop and dicamba appear to be higher on a per square mile basis in the CMP area than in Suffolk County and New York State. However, our researchers need to resolve an issue about the reported 2,4-D data. By looking into these data further, they hope to have a better understanding about the use of 2, 4-D, as well as mecoprop and dicamba, throughout the state.

Our researchers also evaluated Suffolk County drinking water data for 2,4-D. Since 1998, 18 area private wells and 10 public water supply wells were tested for 2,4-D and it was not detected.

2,4-D, has been used for more than 50 years, and it may have been used at many residences. As a result, the likelihood that exposures to 2,4-D could be related to health effects is further evaluated and summarized in the *Integration Evaluation* booklet. An evaluation of breast cancer risks and other health risks associated with mecoprop and dicamba will be completed for the final draft report.

The evaluation of pesticides is ongoing. Our researchers are reviewing the New York State Pesticide Sales and Use Reporting data to evaluate the commercial applications of other pesticides to determine if they are greater in the CMP area than in other parts of New York State and, if so, to evaluate breast cancer and other health risks associated with these pesticides.

## Limitations

- Data evaluated from the NYS Pesticide Sales and Use Reporting Database reflect only the portion of pesticides applied by commercial, certified applicators. Data available about pesticide applications by individual homeowners and other private applicators are not available.
- The NYS Pesticide Sales and Use Reporting data do not meet the evaluation criteria for the proper time frame for evaluating a possible relationship between pesticide use and breast cancers diagnosed between 1993 and 1997 in the CMP area.
- These data are the amount of product applied, not concentrations of contaminants found in the water, land or air. As a result, the confidence level in any exposure estimates based on these data are low.

# In-Home Radon

**Radon** is an odorless, invisible, radioactive gas that comes from the decay of naturally occurring radium in rock. It can be detected only through the use of proper monitoring equipment. The radon concentration in a home is dependent on the type of soil upon which the home is built. Cracks in the building foundation provide the pathway for radon to enter a home. Important factors that affect how much radon will be found throughout a house include the amount of ventilation and airflow patterns.

Radon concentration in air is measured in units of picoCuries per liter. When testing indicates that the radon level in the lowest primary living area of the home is 4 picoCuries per liter or higher, the State Health Department recommends that the homeowner take corrective action to reduce these levels.

The State Health Department collects data on household radon levels (<http://www.health.state.ny.us/nysdoh/radon/radonmaps.htm>). Since 1986, maps have been prepared for every county that estimate the percent of homes with 4 picoCuries per liter or higher based on more than 45,000 basement screening measurements and more than 11,000 long-term living area measurements. As part of that data set, the State Health Department has radon measurements for 58 homes in the Town of Brookhaven, including the CMP area. Our researchers did not separate out the data for the CMP area from the remainder of the Town of Brookhaven. They evaluated these data for estimating radon exposure in the CMP area and determined that these data were adequate.

## Likelihood of Exceeding Radon Action Level

	In Living Area	In Basement
Town of Brookhaven	0.7%	5%
Suffolk County	1%	6%
New York State	5%	18%

Based on these data, our researchers evaluated the likelihood that homes in Brookhaven would exceed the radon action level compared to Suffolk County and New York State. The results show that the Town of Brookhaven has a lower percentage of measurements exceeding the action level in the living area and basement than the comparison areas. As a result, radon was not considered a significant environmental exposure in the CMP area and was not further evaluated. Because radon levels can vary from home to home, the State Health Department still recommends

that individual homeowners test home radon levels in every community in New York State regardless of local trend data.

## Limitations

- Not all the homes in the Town of Brookhaven have had radon tests.
- Data evaluated reflects testing results only for 1986-1999 and not from other time periods.

# Industrial and Hazardous Waste Sites

The *Initial Environmental Inventory* identified major industrial and waste sites and other environmental data for the CMP area. Local residents also identified some industries, waste sites and spills as environmental concerns.

Possible exposures associated with sites were evaluated as part of the public and private drinking water evaluations. Available data show these have not been the source of widespread contamination. Our researchers also reviewed existing site evaluations and other environmental data to determine potential exposures from the release of chemicals from sites in the CMP area. Most hazardous waste sites in the area have been remediated or removed from the State's Inactive Hazardous Waste Site Registry. Lawrence Aviation is the only site in the CMP area that has an ongoing remediation program. Efforts continue to evaluate and address any sources of exposure from this site to the surrounding communities.

**Lawrence Aviation Industries.** Lawrence Aviation is an active manufacturer and a hazardous waste site in Port Jefferson Station. The US EPA is investigating environmental contamination at Lawrence Aviation and health and environmental agencies continue to evaluate potential exposures. Contamination was first detected in a small number of private wells north of Lawrence Aviation in the 1970s. Affected residents were provided with bottled water until they were connected to public water, which is routinely sampled for contaminants.

In 1997, the Suffolk County Department of Health Services identified 10 additional private wells north of Lawrence Aviation Industries that were also potentially affected. These homes were also connected to public water.

Brook Road Pond and a small stream near the site are affected by trichloroethene contamination potentially related to Lawrence Aviation. Since 1993, signs stating "Warning, contaminated waters; do not drink; avoid prolonged contact with skin" have been posted to warn residents about potential exposures.

Our researchers will continue to assess local exposures as new data become available.

**Brookhaven National Laboratory.** Brookhaven National Laboratory is an active research facility that is outside the CMP area in Upton, New York, about five miles southeast of the CMP area. It is owned by the US Department of Energy and has operated since 1947. There are several nuclear reactors on site used for research. The facility includes disposal facilities containing hazardous chemicals and nuclear waste. The Department of Energy oversees on-site environmental activities with oversight from US EPA and New York State. Because many residents expressed concerns about the facility, State Health Department researchers used existing sampling data to evaluate potential exposures from radioactive air emissions.

Our researchers reviewed data related to emissions of radioactive substances from Brookhaven National Laboratory to determine whether these emissions might have affected the CMP area. The winds near the facility blow mainly from the southwest and the northwest and typically carry air away from the CMP area. However, less frequent southeasterly winds may transport air from the facility towards these communities. Air monitoring results from 1973 to 1994 showed the levels of gross beta particulates in the air (an indicator of release of radioactive substances) near Brookhaven National Laboratory were well below statewide averages. It is expected that levels in CMP are similar to the monitored levels.

**Northville Industry Corporation East Setauket Terminal Gasoline Leak.** In November 1987, gasoline contamination of the groundwater beneath the Northville Industries Corporation's East Setauket Terminal was discovered. A leak in one of the facility's underground pipes was the source of the gasoline. About 1.2 million gallons of gasoline leaked into the ground and groundwater that is about 100 feet below the surface. While it is unknown when the leak began, it could have occurred over a 25 to 30 year period. The pipe was repaired, and the facility's storage tanks and underground pipes were inspected. No other leaks were discovered. Northville Industries took steps to identify the extent of contamination and recover gasoline from the groundwater to prevent the contamination from spreading further. On October 13, 1994, Northville Industries entered into a Consent Order with New York State. The agreement defined actions necessary for the completion of site remediation and closure.

Most nearby homes are served by public water. A review of the public drinking water data did not detect drinking water contaminants associated with this gasoline spill. The review of private drinking water databases also did not show these contaminants in private wells near the facility. Some nearby homes were tested for gasoline-related vapors as required by New York State and Suffolk County. Based on these samples, no further action was required.

**Port Jefferson Power Station.** Local residents identified air emissions from the Port Jefferson Power Station as a community concern. It is located on 73 acres in the Village of Port Jefferson.

The power plant has been operating for more than 50 years. In the 1950s, two coal units were used to generate electricity. According to the Long Island Power Authority, by the 1960s, two larger coal units were added. By the late 1960s, these were converted to fuel oil and natural gas. By the mid-1990s, the two original units stopped operating and remain on standby. In 2002, two new units were added that burn natural gas or low-sulfur oil when natural gas is unavailable. The facility also has a small gas-fired combustion turbine used in periods of high energy demand and a 500 horsepower diesel generator used to start this turbine.

The US EPA included emissions from the Port Jefferson Power Station in the CEP and NATA models used to evaluate air quality. However, these model estimates do not reflect historical emissions of hazardous air pollutants associated with using coal as a primary fuel. The emissions of some hazardous air pollutants such as polycyclic aromatic hydrocarbons are likely to have been greater when coal was used as fuel than when fuel oil and natural gas were used. Emissions of regularly monitored air pollutants (such as particulate matter and sulfur dioxide) would also likely have been greater during those years.

However, the data available to evaluate the higher levels of pollutants in the 1950s or 1960s are limited. Any evaluation based on those data would be highly uncertain. The more recent air pollution estimates from the US EPA were used in the evaluation

**Heins Landfill.** The Heins Landfill is in Port Jefferson Station. In 1985, allegations of improper waste disposal at Heins Landfill were reported to the NYS Department of Environmental Conservation. Soil samples collected between 1985 and 1990 did not identify any hazardous wastes on the site. In 1991, Heins Landfill was removed from the Registry of Inactive Hazardous Waste Sites in New York because no hazardous wastes were identified.

### **Suffolk Material and Mining Corporation.**

Suffolk Material and Mining Corporation is in East Setauket. In 1984, the NYS Departments of Health and Environmental Conservation received complaints about hazardous waste disposal at this site. These resulted in a site investigation and subsequent listing of Suffolk Materials and Mining Corporation on the Registry of Inactive Hazardous Waste Sites in New York. Sampling of soil, groundwater and soil gas conducted until 1989 did not identify any hazardous wastes on the site. Groundwater samples detected volatile organic compounds in several nearby private drinking water wells, but Suffolk Materials and Mining was not identified as the source of the contamination. In 1993, Suffolk Materials and Mining was removed from the Registry of Inactive Hazardous Waste Sites in New York because no hazardous wastes were identified.

**Brookhaven Aggregates.** Brookhaven Aggregates is in Miller Place. In 1984, allegations of improper disposal practices led to an investigation by the NYS Department of Environmental Conservation. Samples of soil and groundwater were collected in 1984 and in 1986. The site was misclassified as a hazardous waste site in 1988, based on inaccurate results for some of the collected samples. In July 1998, the site was removed from the Registry of Inactive Hazardous Waste Sites in New York. Because no hazardous wastes were identified at the Brookhaven Aggregates Landfill, it will not be given further consideration in this investigation.

**Pine Road Ecology Landfill.** Pine Road Ecology is in the Hamlet of Coram. Sampling of a private drinking water well near Pine Road Ecology detected volatile organic contaminants. The site was listed in the Registry of Inactive Hazardous Waste Sites in New York, and an investigation into disposal practices at the site was conducted. The investigation did not find any evidence of hazardous waste, and it was removed from the Registry of Inactive Hazardous Waste Sites in New York. The drinking water contamination is discussed in the Public and Private Drinking Water evaluations described in the following sections.

## **Public Drinking Water**

Based on 1990 census data, most of the population in the CMP area was served by public water. Since the mid-1970s, water supply wells throughout Suffolk County have been sampled for a variety of potential contaminants and the area's public water supplies have historically provided drinking water that has met or was of higher quality than required by state and federal drinking water standards.

Our researchers evaluated public drinking water supply data for the CMP area collected by Suffolk County (1971-2001) and determined that these data were of very good quality for estimating possible exposures to drinking water contaminants. The evaluation focused primarily on historical data (1971-1996) as the period most important to women in the area diagnosed with breast cancer between 1993 and 1997.

Our researchers compared drinking water data in the area with the rest of Suffolk County and found that overall drinking water quality in the CMP area is as good, if not better, than the rest of Suffolk County. No contaminants were considered elevated compared to the county. Because Suffolk County was the only comparison area in this evaluation, the research team also compared the levels of contaminants with today's water quality standards, which are more stringent than standards and guidelines in place in the 1970s and 1980s.

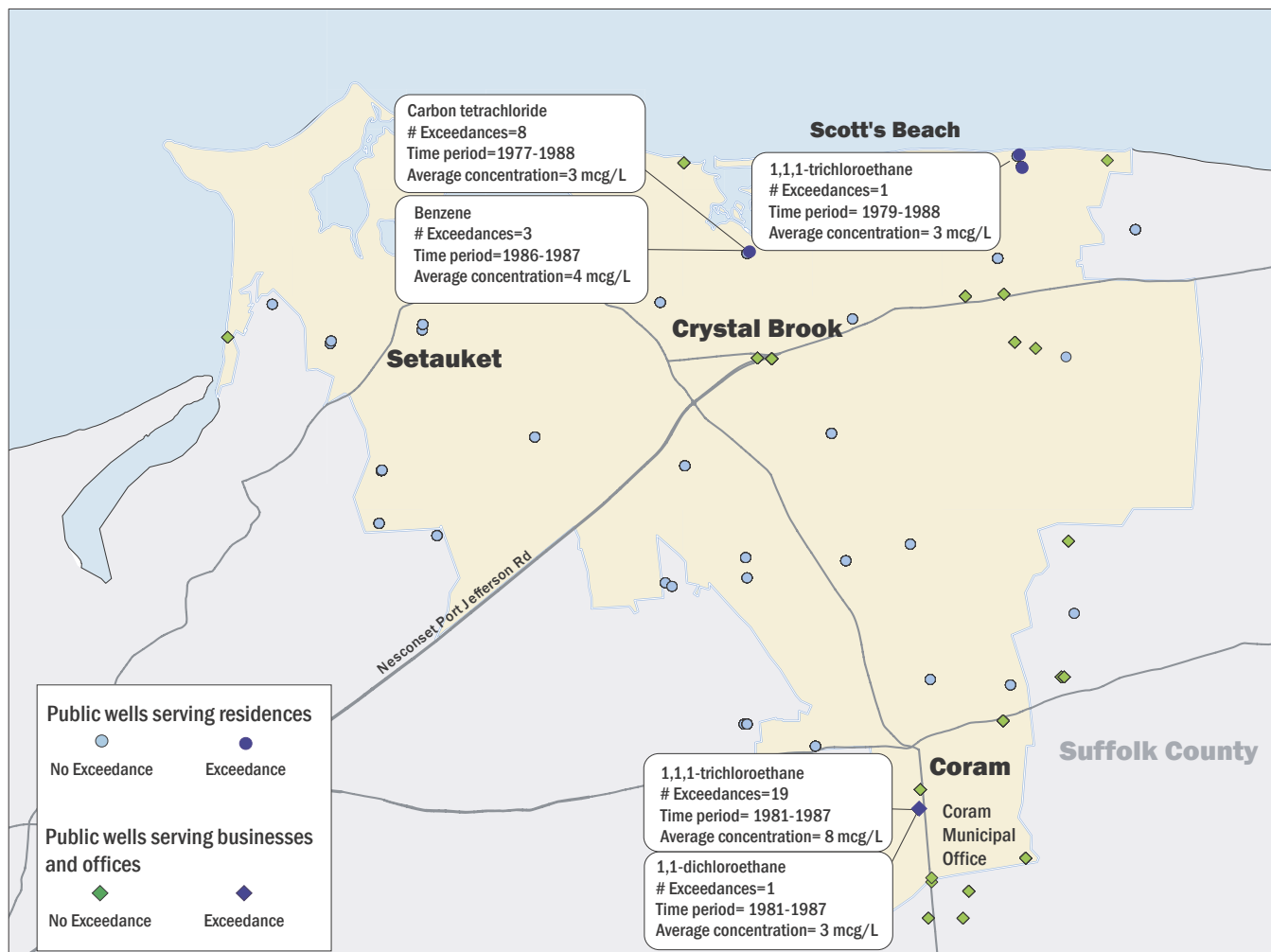
**Metals.** The types of metals and the frequency that they were detected were no different than the rest of Suffolk County. Metals, such as sodium and iron, that are normally associated with groundwater were found at high frequencies. In addition, metals commonly associated with water piping, such as copper, manganese and lead, were found; these data did not show the potential for any long-term exposures. Certain metals have been found less frequently in drinking water in the CMP area since the implementation of corrosion control programs in the mid-1980s. That program reduced the levels of metals associated with leaching from water piping into drinking water. Because the levels of metals were low and no long-term exposures were identified, these were not evaluated further.

**Nitrates.** Nitrates are produced primarily by human activities. They come from the breakdown of nitrogen-containing organic matter such as fertilizers and septic waste. They are commonly found in public and private water supply wells throughout Long Island and were detected in the CMP area at the same frequency and concentration as the rest of Suffolk County. Only one sample exceeded the state drinking water standard of 10 milligrams per liter with a concentration of 21 milligrams per liter. Because the levels of nitrates were low and no long-term exposures were identified, these were not evaluated further.

**Pesticides.** The historic public drinking water data show that aldicarb was detected three times between 1992 and 1993 in a single well serving the North Shore Mall. These data do not suggest that long-term exposures to pesticides occurred from public drinking water.



## Location of Possible Exposures to Low Levels of VOCs



**Volatile Organic Compounds (VOCs).** Low levels of VOCs were detected in certain drinking water wells between 1971 and 1996. These levels did not exceed drinking water quality standards or guidelines in place at the time that they were detected. Most of them also did not exceed today's more stringent drinking water standard of 5 micrograms per liter (mcg/L).

Our researchers estimated geographic areas that could have received contaminated water to identify where people may have been exposed. The location of these wells is shown on the map above.

1,1,1-trichloroethane, 1,1-dichloroethane, carbon tetrachloride and benzene levels in certain wells exceeded today's drinking water standards. The levels of contaminants detected were low and not likely to result in health effects. The highest concentration was for 1,1,1-trichloroethane at 18 micrograms per liter. Wells with exceedances were further evaluated to determine the health risks from exposure to any detected contaminants. The results of that evaluation are described in the *Integration Evaluation* booklet.

The levels of the contaminants detected in public water supplies are low, and the number of people potentially exposed is small.

# Private Drinking Water

According to U.S. Census Bureau estimates, about 6% of the households in the CMP area were using private well water in 1990. More local residents now receive public water as the area served by public water supplies has been expanded.

Private wells are usually sampled in response to problems or because of suspected contamination. Suffolk County and New York State sampled private wells as part of the site investigations including those described earlier (see *Industrial and Hazardous Waste Sites*). Suffolk County and the NYS Department of Environmental Conservation have also been conducting a pesticide groundwater monitoring program in Nassau and Suffolk counties. This program began in the late 1990s, and associated data were also used in this evaluation.

The same drinking water standards were used to evaluate water quality in private drinking water wells as for the public water supply evaluation. Because private wells usually serve one or two households, the number of people potentially exposed to contaminants is small for each well.

Determining the length of time that people could have been exposed to contaminants in private well water is difficult. A contaminant may have been present for some time before it was detected. When contamination is detected, the state and county usually recommend that the landowner connect to public water.

Our researchers found that overall drinking water quality in private wells in the CMP area is as good, if not better, than the rest of Suffolk County. Very few samples exceeded state standards. Our researchers evaluated Suffolk County private drinking water data (1971-2001). They evaluated both historic and recent data because there was no way to identify how long problems in local wells might have existed before the time of sampling. As a result, all data were considered relevant for estimating possible exposures important to the breast cancer incidence between 1993 and 1997. As was done for public drinking water, our researchers examined data for metals, nitrates, pesticides and volatile organic compounds (VOCs), comparing the levels and the frequency of detections with the rest of Suffolk County.

**Metals.** Overall, metals found in the CMP area were no different than the rest of Suffolk County. Many of the metals occur naturally in groundwater and some do not

have drinking water standards. Few samples exceeded drinking water standards. Because of no unusual levels of metals were found, these were not evaluated further.

**Nitrates.** Nitrates are commonly found in private wells throughout Long Island. They were detected at a lower concentration in the CMP area than in the rest of Suffolk County. The highest level detected in the area was 15 milligrams per liter in older data, which is higher than the New York State standard. Because the levels of nitrates were lower than in the rest of the county, they were not evaluated further.

**Pesticides.** Private wells are generally shallower than public water supply wells, making them more susceptible to pesticides. Average concentrations of pesticides found in private wells were well below state standards and maximum concentrations were all lower in the CMP area than in the rest of Suffolk County. Four pesticide-related compounds, alachlor, alachlor ESA, alachlor OA and tetrachloroterephthalic acid (a breakdown product of Dacthal) were found more frequently in the CMP area than in Suffolk County. These are probably not representative of widespread levels of these compounds because they were detected in samples taken near known agricultural areas. However, they are being further evaluated and results will be provided in the final draft report.

**Volatile Organic Compounds (VOCs).** The VOCs in private water wells were found with the same frequency and about the same average concentrations in the CMP area as in the rest of Suffolk County. Maximum concentrations were all lower in the CMP area than in Suffolk County.

## Limitations

- In most cases, the length of time that residents may have been exposed to elevated levels of contaminants is not known.
- Sampling is limited to only a portion of private wells in the CMP area.

# Electromagnetic Fields

Electromagnetic fields (EMFs) occur wherever there is electricity. EMFs weaken with distance from the source. Sources include electric power lines, household wiring, and common items in the home, such as clothes dryers, electric blankets, waterbeds, hair dryers, toasters, stoves and televisions.

Limited information is available to evaluate EMFs in the area. There is no evidence of unusual levels of EMFs in the area. Our researchers reviewed the New York State Electric Transmission Lines Database available from the NYS Department of Public Service. Researchers compared total miles of transmission lines, miles of transmission lines per person and miles of transmission lines per square mile of land in the CMP area with other parts of Suffolk County. The CMP area had fewer miles of transmission lines and about the same number of miles per person and miles per square mile of land as other parts of Suffolk County. Based on these findings, researchers did not find evidence that people in the CMP area were exposed to higher levels of EMFs than people in other areas.

## Limitations

- Data on possible EMF exposures are extremely limited.
- Comparing miles of transmission lines in CMP to other parts of Suffolk County does not consider exposures to EMFs from indoor sources.

## **About the Coram, Mt. Sinai, Port Jefferson Station Follow-up Investigation**

The CMP Follow-up Investigation is being conducted as part of the New York State Cancer Mapping Project, also known as the Cancer Surveillance Improvement Initiative. This investigation follows the Unusual Disease Pattern Protocol, which was developed to conduct investigations in areas where the incidence of a disease is significantly greater than expected. This protocol is being used for the first time during the CMP Investigation to identify unusual environmental and other factors that may help to explain elevated breast cancer incidence in this seven ZIP Code area.

Teams of State Health Department researchers have prepared four evaluations as part of this investigation:

- **Epidemiological evaluation.** A team of epidemiologists has been analyzing breast cancer data, researching what is known about breast cancer and evaluating additional information on women living in this seven ZIP Code area.
- **Toxicological evaluation.** A team of toxicologists has been evaluating substances to characterize the likelihood that they are risk factors for breast cancer.
- **Environmental exposure evaluation.** With input from the communities, a team of environmental scientists evaluated a large number of existing environmental data sets to identify possible exposures to elevated levels of contaminants compared to other areas of the state.
- **Integration evaluation.** These research teams have been working collectively to integrate their results and evaluate health risks associated with identified environmental exposures in terms of their relationship to breast cancer and other non-cancer health effects.

The CMP investigation is ongoing. Researchers are providing their findings to date in the *Coram, Mt. Sinai, Port Jefferson Station Follow-up Investigation Working Draft Integration Report*.

**For more information contact  
New York State Department of Health  
(800) 458-1158 ext. 27530**

**<http://www.health.state.ny.us/nysdoh/cancer/sublevel/follow.htm>**