

NAPLES Public Health Evaluation



Phase I Report Summary of Findings

What is the Naples Public Health Evaluation?

A Public Health Evaluation is a comprehensive study of the health effects associated with exposure to chemicals in the environment. For more than a decade, the Campania region of Italy has experienced numerous challenges associated with trash collection, open burning of uncollected trash, and widespread chemical and hazardous waste dumping. In response to health concerns expressed by U.S. Navy personnel in 2007, the Commander, Navy Region Europe, Africa, Southwest Asia (CNREURAFSWA) contacted the Navy and Marine Corps Public Health Center (NMCPHC) to conduct a comprehensive Public Health Evaluation to assess the potential health risks for living in the Naples area.

Launched in 2008, the Naples Public Health Evaluation involves the collection of tap water, soil, soil gas and air samples from throughout the Naples area. Samples are being collected from off-base private rental homes and U.S. Government-related sites. In total, the study area includes 395 square miles. Given the sheer magnitude of the study area, the region was divided into nine study areas, shown in Figure I below.

The Naples Public Health Evaluation consists of three stages of sampling and analysis:

Pilot Study. This effort was conducted from April through June 2008 to test the process of collecting environmental samples in Italy. This was a critical step to ensure the integrity of all future testing efforts. Seven homes were included in the pilot study and all phases of the effort were evaluated – from environmental sampling and analysis to the process of sharing findings with residents.

Phase I. Based on the results of the Pilot Study, a broader effort was conducted from June through November 2008 to collect tap water, soil and soil gas samples from 130 homes and 10 U.S. Government-related properties throughout the nine study areas. The selection of sampling locations was based on a biased approach, where sampling areas and properties were selected based on their proximity to known locations of trash and chemical dump sites (see Figure 2 on page 2). Where testing results of samples collected showed an immediate need for action, such action was taken, including the relocation of 17 families to date where potential threats to health were categorized as “unacceptable” and could not be mitigated.

Phase II. This phase of the Public Health Evaluation is currently underway, and sampling is expected to be completed in late summer 2009. Phase II includes the sampling of 200 additional residences, continued sampling at U.S. Government-related properties, and one full year of air sampling. While Phase I sampling locations were based on proximity to known trash and chemical dump sites, Phase II sampling locations are spaced more evenly across the nine study areas.

The U.S. Navy is committed to ensuring our families are safe while serving our country at home or overseas. The following information is provided as part of a wide-ranging effort to understand the health risks of our personnel and families living in Naples, Italy. Currently underway is a comprehensive Public Health Evaluation to assess potential short and long-term health risks associated with living in the Naples area. In line with our commitment to continually share important health information, we encourage you to review this fact sheet.

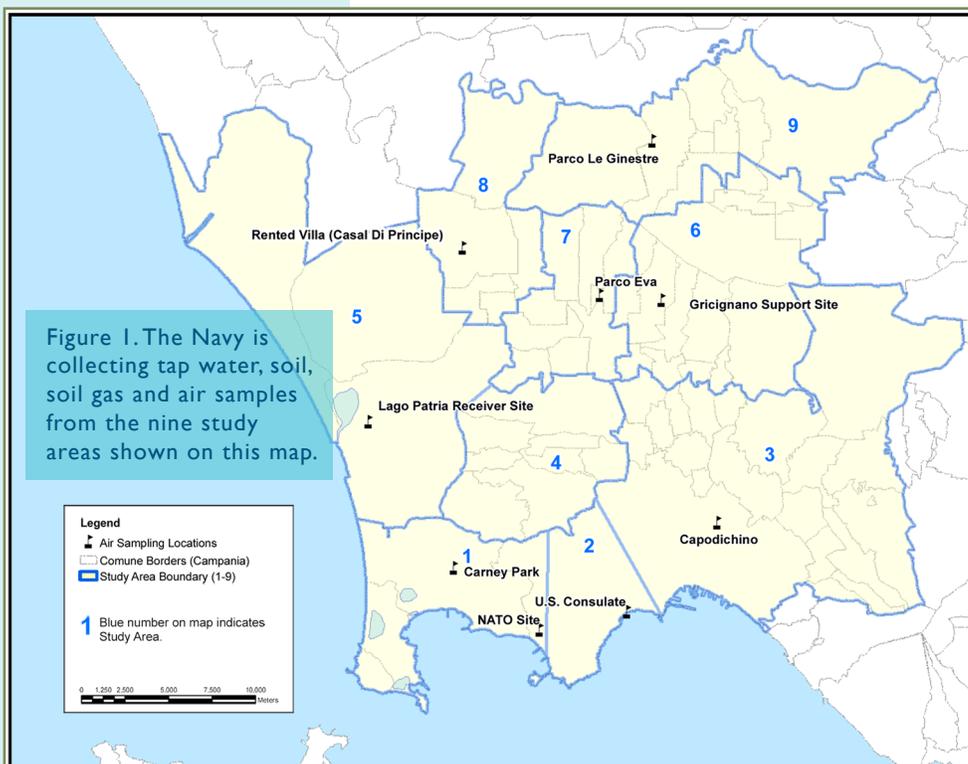
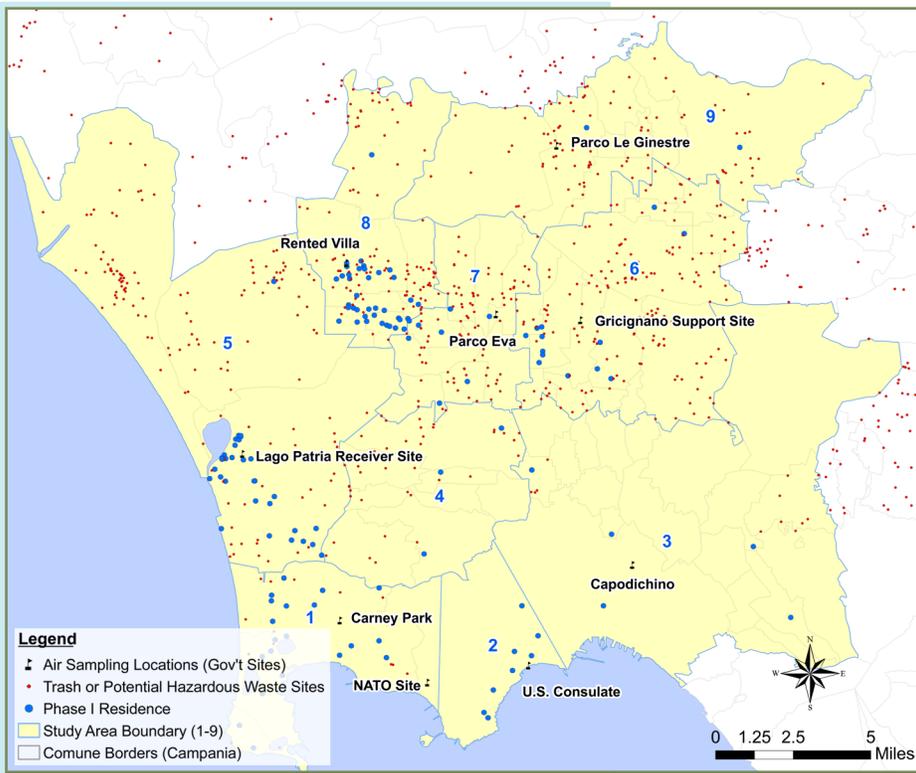


Figure I. The Navy is collecting tap water, soil, soil gas and air samples from the nine study areas shown on this map.



What is the purpose of the Public Health Evaluation?

A Public Health Evaluation is a comprehensive study of the health effects associated with exposure to chemicals in the environment. For the Naples Public Health Evaluation, these include:

- ▶ What chemicals have been released to the environment?
- ▶ How much of the chemicals are present?
- ▶ How might people come into contact with the chemicals (“exposure pathways”)?
- ▶ How might exposure to these chemicals affect human health?
- ▶ What actions are needed to protect public health?

To answer these questions, the Public Health Evaluation team evaluates:

- ▶ Environmental data – such as concentrations of chemicals in tap water, soil, air and food;
- ▶ Exposure data – how people come into contact with chemicals;
- ▶ Toxicity data – what adverse health effects might be expected due to exposure;
- ▶ Health outcome data – community-wide rates of illness, disease and mortality compared with national and regional rates; and
- ▶ Community health concerns – such as citizen reports on illness or quality of life.

Figure 2. Sampling areas and properties were selected based on their proximity to known locations of trash and hazardous waste dump sites.

What did the Navy sample for?

Tap water, soil, soil gas and air samples have been collected. Each sample was analyzed for approximately 200 chemicals and microorganisms in six main categories:

- ▶ Volatile organic compounds (VOCs)
- ▶ Semi-volatile organic compounds (SVOCs)
- ▶ Pesticides/polychlorinated biphenyls (PCBs)
- ▶ Dioxins and furans
- ▶ Metals
- ▶ Microorganisms



Tap water sampling inside a home.

What has the Navy learned in Phase I?

Several key findings resulted from Phase I, which have prompted the Navy to take immediate protective actions and have also aided in focusing Phase II study activities. Significant findings are included below. In all cases, except where residents have been instructed to relocate, residents can take certain steps to reduce their exposure.

RESULTS FOR THE I30 OFF-BASE RENTAL HOMES

TAP WATER

- ▶ Study Area 8 has the highest number of residences with unacceptable risks; approximately three quarters of the properties sampled had unacceptable risk levels that are mainly associated with tap water – mostly but not exclusively from private wells.
- ▶ For Phase I, more than 30 percent of the residences had unacceptable risk associated with tap water for residences on private wells, and to a lesser extent for those connected to a public drinking water source. This is most likely due to a number of factors including:
 - Low pressure in the public drinking water systems in Campania, which leads to the widespread practice of illegal private wells and illegal interconnections to the public drinking water system, resulting in “blended” water coming out of the tap (well water mixed with city water).
 - Improper maintenance and disinfection of domestic water holding tanks, a source of bacterial contamination.
 - Lack of backflow prevention devices that protect water supplies from contamination.
 - Lack of compliance with drinking water/private well laws by landlords.
- ▶ Chemicals and bacteria responsible for the majority of the risks associated with tap water include:
 - Tetrachloroethene (PCE)
 - Fecal coliform/Total coliforms
 - Nitrate
- ▶ No residences in Study Areas 1, 3, 4, and 9 had unacceptable tap water risks.
- ▶ Assuming that tap water is not used for drinking, approximately 7 percent of residences sampled that obtained their tap water from a public source had unacceptable risks, while 81 percent of residences sampled that obtained their tap water from a private well or unknown source had unacceptable risks.

SOIL AND SOIL GAS

The risks associated with soil and soil gas were typically acceptable with a few isolated exceptions. In Phase I, soil gas samples were collected using a passive soil gas sampling technique. In Phase II, soil gas samples are being collected using an active soil gas sampling technique.

AIR

The risk for outdoor air was consistent with outdoor air from major U.S. cities. Air sampling results are preliminary because they only represent one 30-day period during the summer months in 2008. The Phase II report will present one full year of air monitoring data, which is necessary before definitive conclusions can be made.

RESULTS FOR U.S. GOVERNMENT-RELATED FACILITIES

TAP WATER

The risks for tap water were typically acceptable with the following few exceptions:

1. Parco Artemide (lead, nickel and naphthalene);
2. Parco Eva (nickel);
3. Parco Le Ginestre (PCE and total coliforms); and
4. Homes leased by Naval Facilities Engineering Command (NAVFAC) (total coliforms).

IRRIGATION WATER

Capodichino, Carney Park, Gricignano Support Site, and Parco Le Ginestre have wells that are used for irrigation purposes only. The risks for irrigation water were frequently unacceptable when assuming that irrigation water is used for drinking water purposes (which it is not). The chemicals detected at unacceptable concentrations include bis(2-ethylhexyl)phthalate, chloroform, fecal coliform, nitrate, PCE, total coliforms, total dioxin/furans (2,3,7,8-TCDD TEQs), uranium and zinc. Categorizing the concentrations as unacceptable is a conservative assumption (to be most protective of human health) because irrigation water is not used for drinking.

SOIL

The risks for soil were typically acceptable with the following few exceptions where unacceptable concentrations of polycyclic aromatic hydrocarbons (PAHs) were detected.

1. Capodichino (1 location);
2. Gricignano Support Site (1 location);
3. Joint Forces Command NATO (1 location);
4. NAVFAC-Leased Homes (1 location); and
5. U.S. Consulate, Naples (1 location).

SOIL GAS

The risks for soil gas were typically acceptable with one exception where unacceptable concentrations of PCE were detected at Parco Le Ginestre.

How did the Navy determine what is “acceptable” or “unacceptable”?

There are a number of ways to evaluate the data collected. The Naples Public Health Evaluation approach is conservative to be overly protective of the health of Navy personnel and families. For example, the risk assessment is based on 30 years of residential exposure. In reality, however, most tour lengths last no more than three to six years for active duty personnel; longer for civil service and others.

The risk evaluation results were placed into one of two categories, “acceptable” risks or “unacceptable” risks. The Navy compared the sampling results for each chemical analyzed to U.S. Environmental Protection Agency (USEPA) standards to determine whether the detected concentration of a chemical should be categorized as an “acceptable” risk or an “unacceptable” risk. Tap water, soil and air samples were compared to USEPA risk-based Regional Screening Levels (RSLs). In addition, tap water samples were compared to USEPA Maximum Contaminant Levels (MCLs), and air samples were compared to USEPA National Ambient Air Quality Standards (NAAQS). In all cases of uncertainties or data gaps (such as unknown levels of naturally occurring chemicals), assumptions and inputs for the risk calculation were selected to ensure that risks were not underestimated, and these uncertainties did not impact the confidence in the conclusions of the assessment.

METHODOLOGY FOR CALCULATING RISKS

Categorizing a risk as acceptable or unacceptable for tap water, soil, soil gas and air is based on mathematical calculations. Generally, the concentration of a chemical found in tap water, soil, soil gas or air is divided by the screening criteria (RSL, MCL, NAAQS, or a combination), resulting in a calculated “exceedance factor.” There are “noncancer” exceedance factors and “cancer” exceedance factors. If a chemical causes cancer, it would have a “cancer exceedance factor.” The exceedance factors calculated for each chemical detected are then summed to give a “total” exceedance factor. The value of the “total exceedance factor” determines whether the risk is acceptable or unacceptable for tap water, soil, soil gas and air.

To be categorized as acceptable, the following criteria must be met:

- The total noncancer exceedance factor is less than or equal to one;
- The total cancer exceedance factor is less than or equal to 10; and
- Chemical concentrations detected in tap water are less than or equal to the MCL (this criterion applies only to tap water).

If the above criteria are not met, the risk is categorized as unacceptable. Based on the categorization, the Navy determines the appropriate course of action to ensure the safety of Navy personnel and their families.

The complex methodology for calculating risks can be found in Volume II of the Naples Public Health Evaluation Phase I report, located on the Naples Community Health Awareness website and at the Environmental Health Information Center (see page 4 for contact information).



What is the Navy doing as a result of the Phase I Study?

The Navy is committed to sharing the results of the Public Health Evaluation with military and civilian personnel and their families, Department of Defense leadership and the Italian government. The Navy is taking appropriate actions to address findings. A number of steps have already been taken:

- ▶ A variety of communication venues were developed to inform U.S. personnel, their families and the Italian government of the status and results of the Naples Public Health Evaluation, such as the Community Action Group, Naples Community Health Awareness website, All Hands e-mails, updates in the Panorama newspaper and town hall meetings.
- ▶ The Navy has provided detailed and individualized reports of findings to all residents whose homes were included in the Pilot Study or Phase I study.
- ▶ Residents in 17 locations have been relocated to date due to unacceptable risk exposures which could not be mitigated by the use of bottled water.
- ▶ A directive to use only bottled water for drinking, food preparation/cooking, ice-making and brushing teeth has been issued to all personnel.
- ▶ All new leases include provisions for landlords to connect to the public drinking water system, clean and disinfect water holding tanks semiannually, and provide containerized water service from Navy-approved vendors.
- ▶ The Environmental Health Information Center at the U.S. Naval Hospital Naples has been established to address questions and provide information regarding the Naples Public Health Evaluation.
- ▶ The Navy has shared results of findings with Italian officials.
- ▶ The Navy is evaluating ways to reduce or eliminate exposure by working with the Italian government and landlords to implement long-term solutions.
- ▶ The Navy defined high-risk areas (New Lease Suspension Zones) and as a protective measure, suspended all new leases in those areas until further notice.
- ▶ Extensive background information along with Public Health Evaluation updates have been developed for easy access online or at the Environmental Health Information Center.
- ▶ The Phase II study is underway, with sampling expected to be complete in late summer 2009.

The Naples Public Health Evaluation is being conducted in accordance with U.S. Environmental Protection Agency (USEPA) and U.S. Navy Risk Assessment Guidance, where appropriate.

Environmental testing results were compared to USEPA Maximum Contaminant Levels for tap water; USEPA Regional Screening Levels for tap water, soil and air; and USEPA National Ambient Air Quality Standards for air.

What can individuals do based on the Phase I findings?

There are a number of simple preventive steps that all military and civilian families in Naples can take to minimize their potential exposure to contaminants in tap water and soil. Each of these is outlined in detail in the Public Health Evaluation fact sheets that can be found on the Naples Community Health Awareness website or at the Environmental Health Information Center. Without question, all families residing off-base should:

- ▶ Follow the All Hands Bottled Water Advisory to use only bottled water for drinking, food preparation/cooking, ice-making, brushing teeth and for pets.
- ▶ Limit contact with soil that could contain contaminants. Wash hands and other areas of the body that come into direct contact with the soil, and thoroughly clean shoes and clothes that have come in contact with the soil before bringing them indoors.
- ▶ Continue to stay informed about the Naples Public Health Evaluation through the Naples Community Health Awareness website, Panorama, AFN Radio and Television, All Hands e-mails, chain of command and the Environmental Health Information Center.
- ▶ Ask questions. The Navy is interested in ensuring accurate and thorough information is available to all Navy personnel and families. If you have unanswered questions, visit the Environmental Health Information Center.

For more information about the Naples Public Health Evaluation or any health-related questions, contact:

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