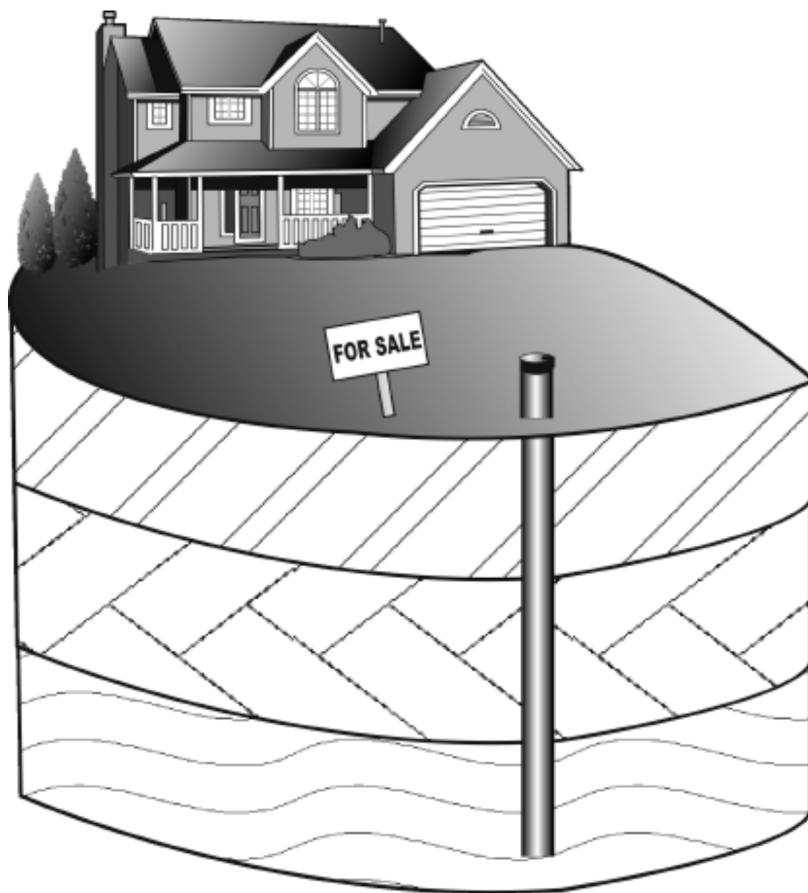


NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

PRIVATE WELL TESTING ACT PROGRAM

INITIAL WELL TEST RESULTS FOR SEPTEMBER 2002 - MARCH 2003



FEBRUARY 2004

New Jersey Private Well Testing Act Program

September 2002 – March 2003

**Report written and prepared by
NJ Department of Environmental Protection
Division of Science, Research and Technology (DSRT)
and
Water Supply Administration/Bureau of Safe Drinking Water**

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Executive Summary

New Jersey is the only state in the nation that requires mandatory statewide private well testing upon the sale of a house. The fundamental goal of the Private Well Testing Act (PWTA) is to ensure that purchasers and lessors of properties served by private potable wells are fully aware of the quality of the untreated drinking water sources prior to sale or lease.

The New Jersey Private Well Testing Act as set forth by N.J.S.A. 58:12A-26 et seq., was signed into law in March of 2001 and became effective in September 2002. State lawmakers were prompted to pass the PWTA because of private well contamination discovered throughout the state. The data generated by this program are sent to the New Jersey Department of Environmental Protection (NJDEP), Bureau of Safe Drinking Water; local health agencies are notified when water quality exceeds drinking water standards within their jurisdiction. NJDEP uses these data to assess the quality of the water from private wells on a statewide basis.

This report provides a summary of the water test results submitted to the NJDEP in the first six months of the PWTA Program. Results for 5,179 wells are included, which represent approximately one-percent of the private wells used as potable water supplies in New Jersey. Eventually, as more sample results are sent to the PWTA Program, NJDEP will perform a more comprehensive evaluation of the quality of the water sources that supply New Jersey's private wells. In accordance with the PWTA, the information in this report is provided in a manner that meets the confidentiality requirements of the law. The confidentiality requirements mean that the PWTA information can be released as a general compilation of water test results by county and municipality or appropriate geographical area, such that these compilations and reports do not include the names of specific property owners, their addresses or locations.

Primary Contaminants: Protecting Human Health

Based on the results submitted to NJDEP during the first six months, 92% of the 5,179 wells passed all the required primary (health-based) standards, with the exception of lead. For reasons presented below, the lead results are not included in any of the summary results. Of the 8% (417 wells) of test results that exceeded the primary drinking water standards, the most common reason for failure statewide was nitrate (189 wells) followed by fecal coliform (92 wells) and volatile organic compounds (71 wells). For those wells in the counties where arsenic and mercury testing are required, 72 wells failed for arsenic¹ and 14 wells failed for mercury. A summary of all the primary contaminant test results is presented in Figure E1. A list of parameters that are tested are presented in Table E1.²

¹ The following counties are required to test for arsenic: Bergen, Essex, Hudson, Hunterdon, Mercer, Middlesex, Morris, Passaic, Somerset, and Union. The arsenic test results were compared to a lower Federal MCL (10 ug/l) that will take effect on January 23, 2006. Mercury testing is required in Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Monmouth, Ocean, and Salem Counties.

² In addition, properties in certain counties are required to sample for gross alpha particle activity. This requirement is being phased in over an 18-month period beginning in March 2003. The results of gross alpha activity will be evaluated and presented in future reports.

Figure E1

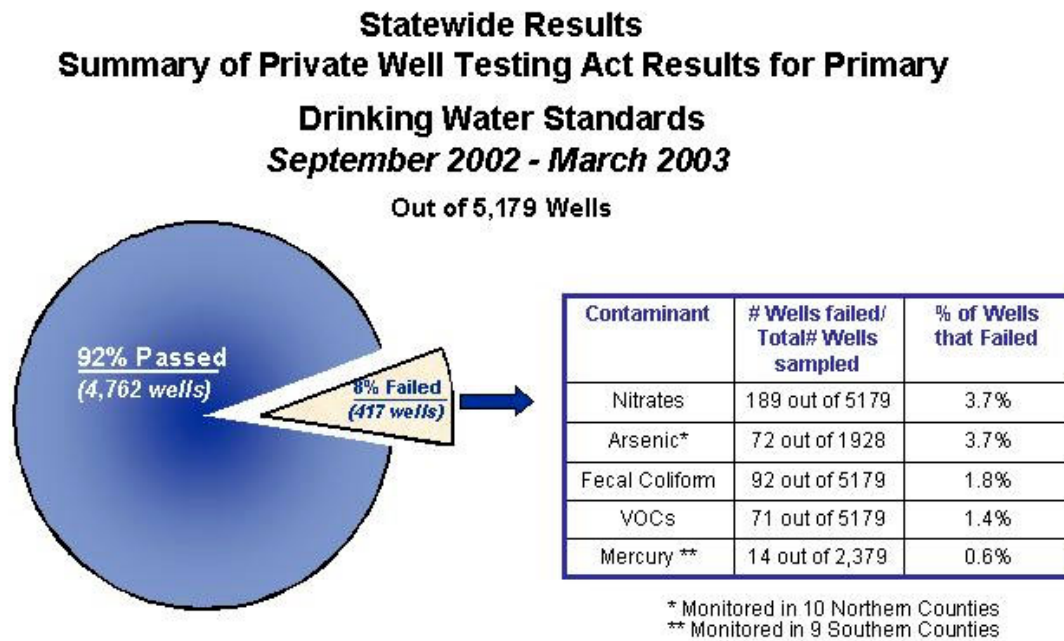


Table E1: List of PWTA Program Parameters

Primary Contaminants	Secondary Parameters
<u>Bacteriological</u> Total Coliform (Fecal Coliform or <i>E. coli</i>)	- pH - Iron - Manganese
<u>Organics</u> All Volatile Organic Compounds (VOCs) with Maximum Contaminant Levels (MCLs)	
<u>Inorganics</u> - Arsenic* - Lead - Mercury* - Nitrates	
<u>Radiological</u> 48-Hour Rapid Gross Alpha Particle Activity*	

* These parameters are only required in certain counties

Shortly after the PWTa sampling began, county and local health agencies noted that some of the reported lead results were unexpectedly high. Often the local health departments, through careful confirmatory sampling, could not confirm the results. Well water testing conducted prior to the PWTa rarely detected the presence of lead in well water. High lead levels in drinking water were attributed to well structures or plumbing, not groundwater sources. NJDEP considers the lead results to be suspect and therefore did not include them in the summary charts. The suspect results indicate that 640 wells (12%) out of the 5,179 tested had lead levels above the state's Ground Water Quality Standard of 10 ug/l. Furthermore, the range of reported concentrations for lead, 1-12,000 ug/l, is unrealistically high and indicates a likely problem with the sampling location. A research study is underway to further evaluate lead sampling and analytical techniques so that the NJDEP may better understand the lead sampling results.

When reviewing PWTa results, it is important to remember that the tests were conducted on untreated (raw) water samples collected prior to any water treatment system. Many houses or wells may already have treatment systems in place to remove or lessen the degree of contamination. If the homeowner treats the water, the PWTa test results do not reflect the drinking water that is being consumed after the water has passed through the treatment system. When exceedences are found, further post-treatment samples collected at a kitchen tap are recommended to determine the quality of the water consumed and to evaluate the effectiveness of the treatment system.

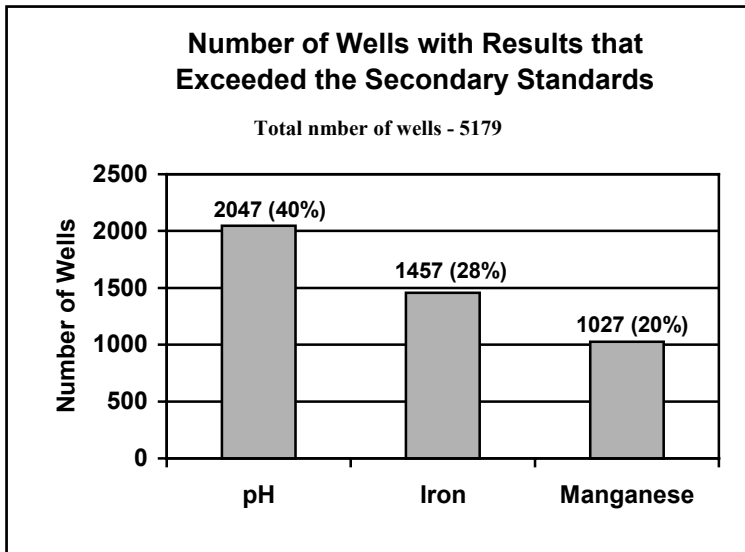
The NJDEP does not receive the results of a second, or confirmation, sample that may be taken by the buyer or the seller of a property. Suspicious or unexpected results are neither confirmed nor verified by the NJDEP. Subsequent investigations of suspect results for specific parameters of concern are performed by the local health departments. Only the PWTa results received have been included in the data analysis and summaries.

Secondary Parameters: Measuring Natural Water Quality Characteristics

The PWTa program tests for three naturally occurring secondary parameters: pH, iron, and manganese. Secondary drinking water standards address aesthetics such as corrosivity, taste and color and testing for secondary parameters determines if the water is suitable for laundering, plumbing, and showering. Secondary parameters are used to determine if any treatment is needed before the water can be used.

A total of 3,089 wells of 5,179 tested (59%) exceeded one or more of the recommended limits for secondary parameters. Due to the nature of soils and geology, the ground waters in the southern part of the state tend to be acidic (pH below 7), while ground waters in the northern part are neutral (pH = 7) to basic (pH above 7). Of the 5,179 wells tested, 2,047 wells (40%) had pH values outside the recommended range of 6.5 to 8.5. Both iron and manganese are inorganic ions that occur naturally in soils and rocks throughout the state. Of the 5,179 wells, 1,457 wells (28%) reported iron levels above the recommended standard of 0.3 mg/l. For manganese, 1,027 of the wells (20%) were above 0.05 mg/l, the recommended standard. (See Figure E2).

Figure E2



The PWTa Program uses the same federal and state primary drinking water standards that apply to New Jersey public water systems to define which wells “pass” or “fail” under the PWTa Program for each parameter, with two exceptions, arsenic and lead. For arsenic, the Federal MCL for arsenic that is scheduled to take effect in 2006 is used in this report to define a failure for arsenic (above 10 ug/l). For lead, the more stringent groundwater quality standard is used (above 10 ug/l) because there is no Federal or State MCL for lead.

Success Stories

The PWTa is primarily designed to provide buyers or lessors of property with private well information about the drinking water quality of the well. It also can provide benefits to the neighboring homes and businesses. If a well demonstrates an exceedance, or failure, the local health agency normally notifies the well owner plus neighboring homes and businesses of potential problems with the water supplies. Examples of two such situations where PWTa testing results led to the discovery of adjacent contaminated wells occurred in Bloomingdale Borough, Passaic County and Hopewell Township, Mercer County.

In Bloomingdale Borough, Passaic County, an ordinance was passed that extended the PWTa testing requirements to some private wells that were not covered by the PWTa, such as new wells installed on properties that are not involved in a real estate transfer. When a private well failed for volatile organic compounds (VOC), local health officials tested wells in the area and determined that 17 of 40 wells failed to meet standards. The NJDEP Environmental Claims Administration installed 16 point-of-entry systems to address the well contamination.

The well water tested at a home in Hopewell Township failed for trichloroethylene (TCE), one of the regulated VOCs. The Health Department notified homeowners in the area and additional homes were tested. Additional contaminated wells were discovered and treatment has been installed.

Summary

Although the PWTa program is still in its infancy, and this report reflects only 1% of New Jersey's private wells, the preliminary results are encouraging because 92% of the private wells passed for the primary drinking water standards. As more test results

become available, the information will be used to develop a better understanding of the well water quality supplied to homeowners by private wells. Some results have confirmed expectations about ground water quality: e.g. in those counties requiring arsenic testing, the results have shown that arsenic is detected in the Piedmont region of New Jersey. Other results are leading us to a better understanding of ground water quality: e.g. the fecal coliform results have shown that the wells in the bedrock aquifers of New Jersey are more likely to have fecal coliform contamination than wells in the Coastal Plain. In addition, the discovery of contamination through the PWTa test results provides additional public health protection. For more information about the PWTa Program, visit the PWTa website at www.nj.gov/dep/pwta.

Recommended Program Improvements

Despite the successes of the PWTa Program, NJDEP has identified several problems that need to be addressed to ensure program success.

1. Need for Improved Data Collection and Management

The existing PWTa database was designed to electronically receive PWTa data from certified drinking water laboratories, but has proven to be unstable. The database periodically shuts down and needs maintenance for the flow of data to continue. In addition, it is difficult to manipulate the data into meaningful formats for the presentation of data according to the PWTa requirements. Enhancements to the database were envisioned as part of a database upgrade that was to have taken place after the database was designed and running, however, the PWTa Program is reluctant to pursue these upgrades based on the current instability of the database. Based on the limitations and instability of the system, NJDEP is considering new solutions to the data management system and electronic deliverable process. A new data management system will require significant financial resources, and extensive testing and development periods. Limited funding is available this fiscal year to support these efforts, and additional funding will be necessary to complete the changes needed to the system.

2. Identification of a stable funding source for NJDEP and the Counties

The PWTa outlined an active role for county and local health departments. In addition to the NJDEP notifying the county health department, health agency or designated health officer about each well test failure in their jurisdiction, the PWTa states these agencies may issue a general notice to owners of properties served by private wells within the vicinity of failed wells. County and local health agencies may also assist the NJDEP with the establishment of a public education program for private well owners. The health agencies anticipated receiving grants from the NJDEP, as outlined in the PWTa, to pay for any costs incurred by implementation of the PWTa. In the first year of the program (SFY 03), a total of \$97,000 was dispersed to the CEHA agencies in small grants ranging from \$1,900 to \$6,000. Unfortunately, no funds are available in SFY 04 to support these county/local activities.

Program costs for the NJDEP are funded at a level of \$600,000 per year. This includes salaries and the costs associated with maintaining the current database such as licensing fees. The Counties estimate that collectively they need \$3.1 million dollars per year to manage the increase in well test failure results received, to provide subsequent sampling and the appropriate field investigations resulting from the knowledge of potentially contaminated groundwater within their jurisdiction, and to provide basic public education for the PWTa Program. No long-term funding source has been identified to support NJDEP or county programs over the long-term at the needed levels.

3. Inaccurate GPS Information - improved requirements for collecting well location data

The PWTA Program requires that all test results sent to NJDEP as part of the PWTA include a GPS location collected according to NJDEP regulations. The testing results for arsenic, mercury and fecal coliform/E. coli were mapped in this report based on GPS locations reported by the certified laboratories. During the mapping process, NJDEP became aware of serious problems with the location data that were being reported. Comparisons of the municipalities and counties of the properties involved in real estate transactions to GPS locations revealed numerous errors. The PWTA Program's intention of mapping all of the contaminant information was unfortunately hampered by the submission of poor-quality GPS data on the PWTA reporting forms. Although the GPS locations are required to be reported in accordance with the PWTA regulations, there is no certification program for those who collect the GPS data. The NJDEP will consider a comprehensive training on GPS information systems, followed by an assessment of enforcement mechanisms, including a certification program to ensure that the GPS information throughout NJDEP is being collected and reported in correct and consistent manner.

4. Inability to assess the effectiveness of the PWTA Program in ensuring that properties are being tested, and those with well test failures are providing treatment

NJDEP regulates the laboratories that perform PWTA testing by requiring that the laboratories report test results conducted as part of the PWTA to NJDEP in a manner prescribed by the PWTA regulations. NJDEP relies on the licensed real estate agents and the real estate attorneys to advise their clients to utilize the services of certified laboratories according to the requirements of the PWTA. At this time, NJDEP is unable to track how many properties involved in real estate transactions have well water on the property, and NJDEP cannot be sure that only certified laboratories are conducting analyses and reporting results to their clients. Therefore, NJDEP, in providing statistics on the test results reported, must assume that all test results analyzed as part of the PWTA have been reported to NJDEP. To address these concerns, NJDEP will seek assistance from municipal and county agencies and local health departments to develop a strategy for obtaining information on the number of real transactions conducted per year that have well water.

In addition, the PWTA Program only receives the initial sample for compliance with the PWTA, taken from a location that represents the well water prior to treatment. The PWTA Program has been unable to answer questions about the effect of this legislation on improving drinking water quality from domestic wells because the PWTA Program does not collect the data for the follow-up samples for specific parameters that fail. If a well fails a water test, NJDEP does not know if the owners of the property have existing treatment on the well and are consuming water that meets the drinking water standards or have installed treatment on the well or are continuing to drink contaminated water. NJDEP believes that some of the local health departments may be collecting some of these data. NJDEP will investigate enlisting the help of the local health departments to complete a survey regarding the outcomes of the PWTA sampling in their areas of

jurisdiction in order to obtain State-wide information regarding the effect of the PWTA program on detecting contaminated drinking water wells ensuring consumed water meets standards and on the remediation of sources of contamination.

5. Rule changes for the sampling protocol for lead

Shortly after the institution of the PWTA Program, state, county and local health agencies noticed that the reported lead results were unusually high. Often the local health departments, through careful confirmatory sampling at an alternate location within the home, could not confirm the elevated results. Research conducted in the 1990s by scientists at NJDEP and Rutgers University have shown that lead in well water samples collected from homes served by private wells in New Jersey is most likely coming from plumbing. Further, this research shows that the sampling method, sample volume and sampling location are vital in distinguishing between lead in the ground water versus lead coming from the plumbing. Lead-containing plumbing materials are still available on the market and some fixtures may still contain up to 8% lead, which is used as an alloying material in brass. Depending upon the corrosivity of the well water, the brass plumbing materials can leach lead at varying concentrations into the water. However, because the sample is required to be taken prior to treatment, and the water system is flushed prior to sample collection, the exact source of the lead in some of the samples is unknown. As a result the NJDEP considers the lead results collected for the PWTA to be suspect. The NJDEP has initiated a study with Rutgers University chemists to pinpoint the source of the lead definitively. Results of the study are expected to be available in the summer 2004. NJDEP suspects that some of the problems associated with the elevated lead values are the result of sampling from the water holding tank because this is an acceptable location according to the regulations. The sampling location may need to be altered in future regulations.

6. Legislative and regulatory changes

The PWTA referred to a single sample collected at each property for the purposes of complying with the PWTA, therefore, a legislative change would be needed to require sample collection before and after the treatment unit, if present. This would enhance the information that is collected as part of each real estate transaction and would allow NJDEP to make statements regarding drinking water quality improvements. The PWTA contains details regarding the type of information that can be collected with each water sample, but additional types of information such as well depth and aquifer, would allow the NJDEP to perform more detailed and more meaningful analyses. Changes to the legislation would allow the NJDEP to provide better analysis of groundwater quality in New Jersey.

Part 1: Introduction

In March 2001, the Private Well Testing Act (PWTa or Act), as set forth by N.J.S.A. 58:12A-26 et seq., was signed into law. This Act required that, statewide, buyers and sellers of properties whose water supply is provided through a private well share information regarding the quality of that water. The Act made the exchange of information regarding the potability of drinking water akin to other required information such as termite inspections, radon testing and building inspections. This information was also to be shared with the New Jersey Department of Environmental Protection (NJDEP) to enhance that agency's understanding of groundwater quality. The NJDEP is required to notify the county or local health department whenever a level of a regulated contaminant was found to exceed the drinking water standard. The county or local health officer may then notify neighboring homes and businesses without disclosing the location of the well test failure.

The testing requirements for the PWTa became effective in September of 2002. Private wells of properties being sold were tested for a specific list of parameters in accordance with the Private Well Testing Act Regulations or N.J.A.C. 7:9E. These requirements are based on the most commonly found types of contaminants in public drinking water supplies along with some additional water quality characteristics traditionally measured in private wells.

The PWTa Program is in its early stages and there are still several issues that need to be examined: Should all of the test parameters be required throughout the State? Are there other parameters that need to be added, and if so, in which areas of the state? Where is the best place in the home to sample for each parameter? How can the Program insure the proper handling and analysis of the water samples? What additional information about the well should be recorded in order for the results to make sense or be more useful?

This preliminary report summarizes the test results submitted between September 2002 and March 2003 for 5,179 private wells located throughout the state. A detailed analysis of the groundwater quality used to supply New Jersey private wells will be conducted in the future. While it may be too early to get a clear picture, discussions will be presented based upon current findings.

Many terms are used through this report that may be unfamiliar to some therefore, the report includes a Definition and Terms Section (Appendix C) providing many commonly used terms that relate to the PWTa program. In addition, further information about the PWTa program can be found at the PWTa webpage at <http://www.nj.gov/dep/pwta>.

History of the New Jersey Private Well Testing Act

The Private Well Testing Act (PWTa or Act), was signed into law on March 23, 2001. This Act is available online at http://www.njleg.state.nj.us/2000/Bills/PL01/40_.HTM. This Act required, for the first time in New Jersey that private well(s) on properties involved in certain real estate transactions be tested for a specific list of contaminants. Some parts of the Act became effective immediately, but the testing requirements were not effective until September 14, 2002 to allow the NJDEP time to promulgate a rule. Beginning September 14, 2002 certain contracts of sale involving real properties with private wells, and some public wells, were subject to having the well water tested before going forward with the real estate closing. The Buyer and Seller (or in some cases Lessor and Lessee) are notified of the test results prior to the closing, and both must attest to the fact that the test results have been reviewed. The well water must be tested by a New Jersey laboratory certified for the contaminants listed in the Act and supplemented by NJDEP regulations that went into effect on September 16, 2002. Once testing is completed, a copy of the test results must be given to the person who requested the test on a standardized form and must also be submitted electronically to the NJDEP. Specific information about individual water tests, such as results, address or other location information is confidential as mandated by the Act.

Who is required to test and when?

Real estate transactions subject to the PWTa are those which involve real property where: 1) the water supply at that property is from a private (homeowner) well; or 2) property (such as commercial property) where the water supply is a well that has less than 15 service connections or that does not regularly serve an average of 25 people daily at least 60 days out of the year. The Act mandates that the closing of title may not take place on these types of properties until testing of the water supply has taken place, and until both the buyer and seller have received and reviewed a copy of the test results. The buyer and seller must certify in writing that they have received and reviewed the test results. The individual who pays for the test is not addressed in the Act or state regulations. Therefore, it is up to the buyer and seller to determine who pays for the test, as well as what actions, if any, will occur if the test results indicate a contaminant is present in the water above an applicable standard. The Act and subsequent regulations do not require water treatment if any test parameter standard level is exceeded. The Act is considered a "notice" type of provision to all interested parties involved in the real estate transaction.

PWTa testing also applies to certain lessors (landlords) in New Jersey. For example, the lessor of a property where the water supply is a private well must also test the water for the same PWTa contaminants as a buyer or seller no later than March 16, 2004. In addition, the well water must be tested at least once every five years thereafter, as long as the well is not required to be tested under any other state law. The lessor is also required to provide a copy of new test results to each rental unit within 30 days of receiving those results. In addition, new leases must also be provided with a written copy of the most recent test results by the lessor. Providing new lessees with recent well test results functions as a type of "notice" provision.

What contaminants are we looking for?

Samples collected from private wells that are subject to the Act must be analyzed by a New Jersey laboratory certified to test a specific list of what are called primary contaminants and secondary parameters. Primary contaminants are contaminants that may cause potential health risk if consumed on a regular basis above the established maximum contaminant levels (MCLs). All primary contaminants have an MCL, which is established by the United States Environmental Protection Agency (USEPA) or NJDEP based upon known or suspected adverse health effects. However, New Jersey has the authority to lower an MCL for a primary contaminant. New Jersey has lower MCLs for 13 primary contaminants and regulates five more primary contaminants than USEPA. (see Appendix D). Primary contaminants include bacteria (total coliform, including fecal coliform bacteria or *E. coli*), nitrates, lead, and all volatile organic contaminants for which MCLs have been established according to Federal and state regulations. State regulations further require that in certain counties testing must include a screening test for the presence of radium (a short term 48-hour gross alpha test), mercury and/or arsenic based on geographical location (See Appendix A for a complete list of the required parameters by county.) In addition, state regulations also mandate that the water be tested for *E. coli* or fecal coliform bacteria when the initial total coliform bacteria test is positive.

Table 1: List of PWTA Program Parameters

Primary Contaminants	Secondary Parameters
<u>Bacteriological</u> • Total Coliform (Fecal Coliform or <i>E.coli</i>) <u>Organics</u> • All Volatile Organic Compounds (VOCs) with Maximum Contaminant Levels (MCLs) <u>Inorganics</u> • Arsenic* • Lead • Mercury* • Nitrates <u>Radiological</u> • 48-Hour Rapid Gross Alpha Particle Activity*	• pH • Iron • Manganese

* these parameters required in certain counties

Secondary parameters are regulated by the State for aesthetic or other concerns (taste, odor, staining, scaling of home fixtures) rather than health effects. Secondary parameters under the Act include iron, manganese and pH. Many secondary parameters are *naturally occurring* in the ground water due to geologic conditions. Whether or not these natural water quality parameters are a problem depends on the amount of the substance present. Some common examples of the effects of secondary contaminants include: brownish drinking water, staining of sink or toilet bowl, staining of clothing, an unpleasant taste in the water, or fouling of a home heating unit.

A complete list of the PWTa parameters, their corresponding standards being used to define an exceedance and the most likely sources of the contaminants is provided in Appendix D (the Private Well Testing Act Reporting Form). Please note that there are special considerations for arsenic and lead. The USEPA has set an action level of 15 ug/L for lead in drinking water. The action level for lead is not being used in the PWTa Program because the Federal Regulations state that the action level should be applied to a series of samples taken from consumers taps and the tap samples must stand motionless in the plumbing system for at least six hours prior to sample collection. Since a raw (untreated groundwater) sample is required by the PWTa, the more stringent NJDEP groundwater quality standard of 10 ug/L is used as the exceedance threshold because the PWTa sample more closely represents groundwater quality. Also, though the current effective USEPA MCL for arsenic is 50 ug/L, 10 ug/L is currently utilized as the PWTa exceedance threshold in anticipation of a new USEPA arsenic standard becoming effective in 2006³. Future sampling will be compared to the newly proposed State MCL for arsenic of 5 ug/L.

³ In September 2003, NJDEP Commissioner Campbell issued a policy directive for the development of a proposed regulation for arsenic in drinking water of 5 ug/l. The Department proposed a new arsenic MCL of 5 ug/l in the January 20, 2004 NJ Register. In the meantime, the MCL for arsenic is 50 ug/l from now until January 23, 2006.

Part 2: Private Well Testing Act (PWTa) DATA

How do PWTa test results differ from State and Federal drinking water test results?

The PWTa differs from the New Jersey Safe Drinking Water Act (SDWA) in a number of respects. The biggest difference is that the SDWA regulates *public* water systems that are responsible for providing drinking water to customers. The wells subject to the PWTa are for the most part privately owned domestic wells that generally provide drinking water to a specific dwelling(s) or building(s) on the property that is being sold. Another difference is that the SDWA requires that public water systems perform frequent testing of the water being supplied to its customers. The PWTa requires just a one testing event before the property containing the well is sold. Finally, the SDWA requires the testing of water *after* it has undergone treatment for removal of natural or man-made chemicals or contaminants, while the PWTa requires testing of *untreated* (source) water.

How is the PWTa data generated?

Once the buyer and seller determine who will pay for the test and hire a certified laboratory, the well sample is collected by an employee of the certified laboratory or by the laboratory's authorized representative. A list of certified laboratories is available on the PWTa website at: <http://www.nj.gov/dep/pwta>. Samples must be collected from an untreated (raw), cold, non-aerated spigot or tap. If a treatment device is on the spigot or tap, the device must be disabled before a sample is collected or collected from a spigot or tap prior to the treatment device. If the treatment device is on the plumbing entering the house (e.g. Point of Entry Treatment) and cannot be disabled, the well water sample must be collected from a location outside the house or dwelling and must represent untreated water. Treated samples do not meet the requirements of N.J.A.C. 7:9E and therefore, are not considered to be in compliance with the Act and regulations.

The water is analyzed by a laboratory(ies) certified by the State to test for the various contaminants listed in the Act and regulations, using specific test methods. The test methods have been established and certified by the USEPA, and have been approved by the NJDEP's Office of Quality Assurance. As part of the test requirements, the sampler must record the lot and block of the property, as well as the X and Y coordinate locations of the well (or at a minimum the front door) using a Global Positioning System (GPS) unit in accordance with NJDEP standards N.J.A.C. 7:1D. Within five business days of generating the test results, the laboratory must provide a copy of the results to the individual(s) who requested the test on a standardized NJDEP-PWTa form. This form is available on the PWTa website: <http://www.nj.gov/dep/pwta>. Additionally the laboratory must also submit an electronic data file to the NJDEP-PWTa database.

How does the data get submitted to the NJDEP?

The PWTa regulations require the test laboratories to electronically submit test results including additional pertinent information as *one complete analytical package* to the

NJDEP within five business days after completion of the analyses. The laboratory does this by creating a data file that contains the test results and other pertinent location information (i.e., lot, block, etc.) described in the regulations. The data file is e-mailed to a database at the NJDEP, which is designed to store all of the PWTAs test results.

If the results indicate that one or more parameter standards has been exceeded, then the PWTAs database automatically forwards an electronic copy of the well test results and well information to the appropriate county or local health authority within five business days of receiving the results from the laboratory. A well test “failure” is defined as any result that exceeds a primary or secondary safe drinking water standard with the two exceptions noted above (i.e., lead and arsenic). Laboratories are also required to directly notify the county or local health authority of well test failures for nitrate and total coliform because they are considered acute contaminants.

What if contaminants are found?

Once the local health authority is notified electronically by the NJDEP when a failed water test is sent to the NJDEP, the health authorities may (but are not required to) notify property owners within the vicinity of the failing well. However, because these individual tests are considered confidential, the exact location of the well test failure cannot be identified. The health authority's notice would recommend testing for the same contaminant(s) detected in the well test.

Limitations of the data

Several factors may effect the measurement and quality of the data utilized in this report. These factors include: sample collection and transport, laboratory analysis, collection of related well location information, and data entry and reporting. Any of these factors, if handled improperly, could result in an unwarranted test failure or approval. The nature of this program is such that the NJDEP does not have direct oversight of the sample collection and analysis, nor does it have the ability to verify the related information such as analytical result, the property address or the well location. Errors or mistakes in any of these areas could significantly alter the accuracy and usefulness of the data. Data may be missing, since no state agency has the ability to verify that all transactions subject to testing under the PWTAs have been reported to the NJDEP. The absence of results, along with errors or mistakes in the reported data could have a significant impact on the evaluation and interpretation of the data presented. The following identifies some key issues concerning PWTAs data:

1. Sample Collection and Transport - Samples collected or transported improperly often yield contaminated or suspicious test results. For example, the NJDEP currently suspects that collection of lead samples from a location other than the kitchen or bathroom tap may be the primary reason why many high lead levels are being reported.
2. Analysis - The PWTAs Program testing data is submitted electronically and automatically enters the database without any quality control or quality assurance reviews. It is assumed that the certified laboratory properly met all required protocols and the data is accurate.

3. Collection of related well location information - Without accurate information, the analytical results cannot be properly correlated to the well; thereby hindering ground water evaluations of the data.
4. Data entry and reporting - The PWTa Program relies on the reporting laboratory to catch and correct any data entry errors.

When reviewing PWTa results, it is imperative to remember that the tests were conducted on an untreated or raw water sample collected prior to any water treatment system. Many houses or wells may already have treatment systems in place to remove or lessen the degree of contamination. Therefore, the PWTa test results do not reflect any information regarding potable drinking water subsequent to the use of an installed treatment system. In addition, further post-treatment samples collected at a kitchen tap are recommended to evaluate the effectiveness of a treatment system.

PWTa test results are not confirmed through the collection and analysis of a second, or confirmation, sample. Suspicious or unexpected results are neither confirmed nor verified by NJDEP. Therefore, all results have been included in the data analysis and summaries.

Although PWTa testing is more extensive than previous requirements, the list of parameters is limited. The requirement to test for some parameters, such as arsenic and mercury, is based on regional occurrence where these parameters are known to be present in groundwater. Other types of compounds may be present in water if the well is near specific sources of contamination. Caution must be used not to infer that these contaminants are not present in the drinking water. Inferences about water quality may only be made for the tested parameters.

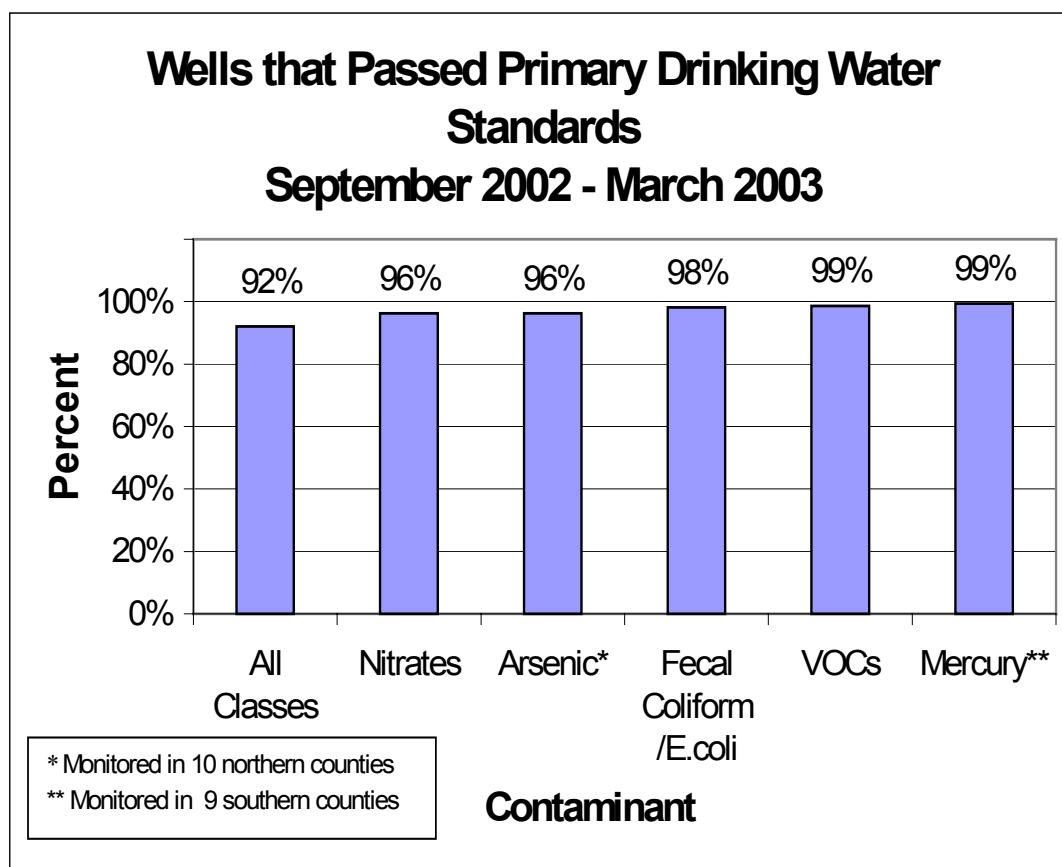
Part 3 – Private Well Testing Act Test Results

Test results can be divided into two categories: primary contaminants, which are biological or chemical substances regulated based on potential health effects and secondary parameters, which may be either chemical or physical characteristics regulated for non health-based purposes (e.g., aesthetics and taste). See Definitions and Terms for a more complete explanation.

PRIMARY DRINKING WATER CONTAMINANTS

The PWTA Program uses the same federal and state primary drinking water standards that apply to New Jersey public water systems to define which wells “pass” or “fail” under the PWTA Program, with two exceptions. As discussed in Part 1, more stringent, lower levels are used to define a failure for arsenic (above 10 ug/l) and lead (above 10 ug/l). Results for the primary drinking water contaminants are presented below. Figure 1 (below) depicts the percentage of wells that passed primary drinking water standards; lead results are discussed separately because of problems encountered with the test results for lead. Additionally, Table 5 depicts the number of wells that failed for one or more of the primary drinking water standards by county.

FIGURE 1: Wells That Passed Primary Drinking Water Standards

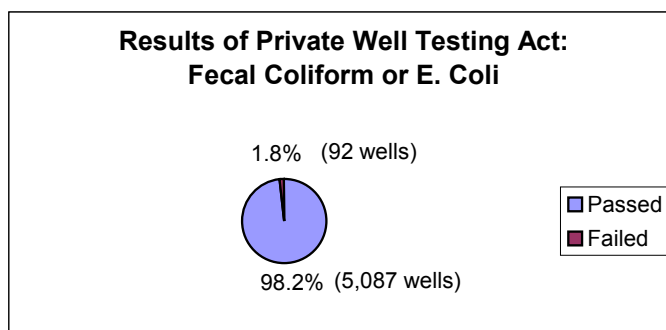


Bacteriological: Total and Fecal Coliform

Fecal waste from humans and animals may contain disease-causing microorganisms. Illness can occur if contaminated water is consumed without prior or adequate treatment to remove or inactivate the pathogens. Therefore, it is important to detect fecal waste contamination in ground water, especially for systems that do not treat the water prior to delivery. Fecal contamination is usually determined by testing water for the presence of certain fecal-derived “indicator” bacteria, such as total coliforms, fecal coliforms or *E. coli*. These bacteria are always present in untreated wastes from humans and warm-blooded animals. The presence of these bacteria “indicates” that the water is contaminated and thus may contain disease-causing microorganisms.

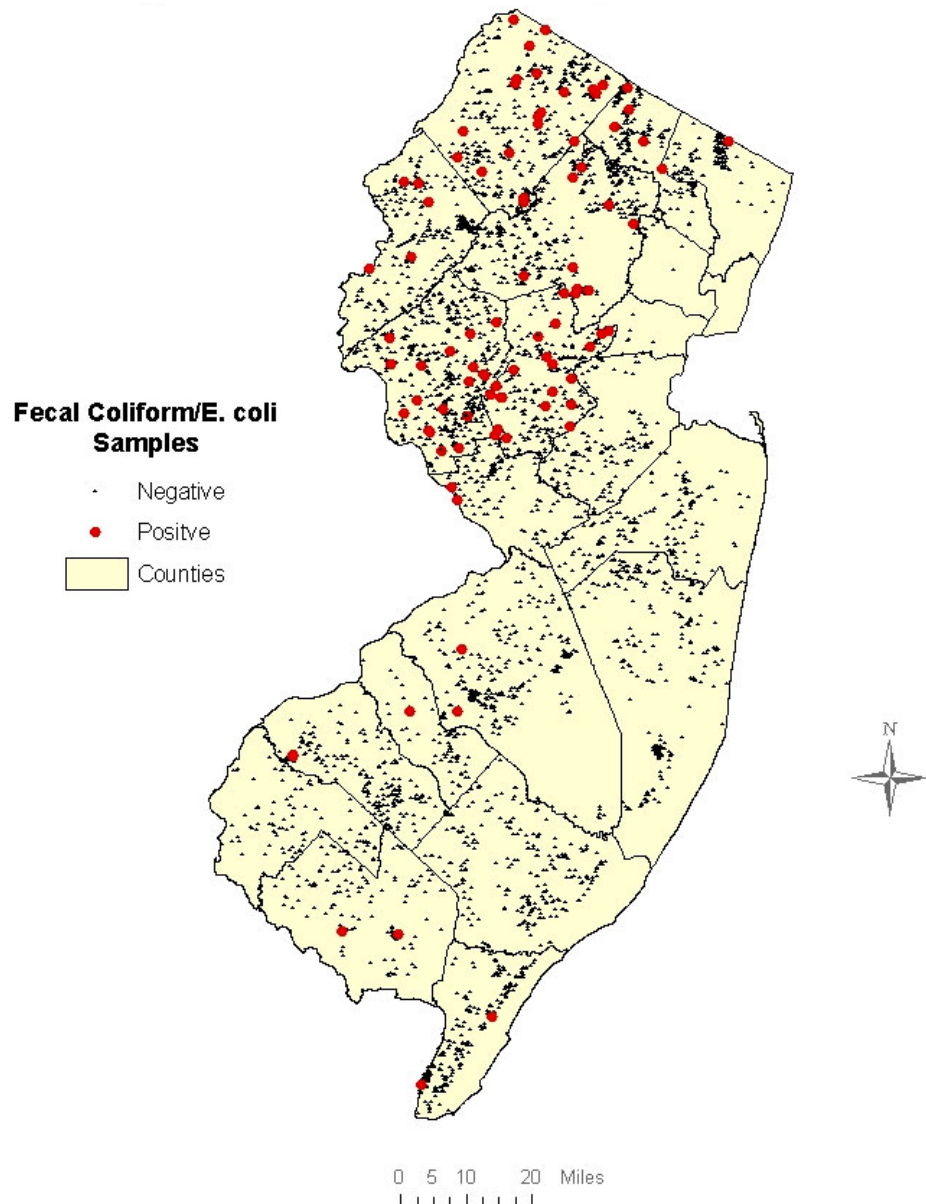
- *Sources* – septic tanks, cesspools, outhouses, cracked sewer lines, fecal-contaminated surface water including lakes, streams, rivers and wetlands, stormwater runoff and detention/infiltration basins, runoff from agricultural lands, feedlots, stockyards, land-applied sludge or manure, manure storage areas and landfills.
- *Counties that Sampled* – All counties were required to sample for total coliform and if the sample was positive, follow with a test for fecal coliform or *E. coli*.
- *MCL* – If a sample tests positive for the presence of fecal coliform or *E. coli*, the well fails the test. The presence of fecal-derived “indicator bacteria is an indication that disease-causing fecal microorganisms are present in the sample.
- *Number of Wells that tested positive for Total Coliform* – A total of 614 wells (11.9%) out of 5,179 wells tested positive for total coliform
- *Number of Wells that tested positive for Fecal Coliform or E. coli* – A total of 92 wells (1.8%) tested positive for Fecal Coliform or *E. coli*. (See figure 2)

Figure 2: Fecal Coliform And E. Coli Results



Geographic Distribution – The percentage of wells with fecal coliform or *E. coli* bacteria in the northern counties was and 3.0%. In the southern counties, the percentages was 0.4% respectively. The northern/southern difference is probably due to the different geology in these regions. (See figure 3) The geology in the northern part of the state is characterized by limestone subject to solution cavities (called karst), fractured bedrock or gravel/cobble water-bearing zones. The southern part of the state is comprised mainly of the coastal plain (sand and gravel). Coastal plain geology appears to protect ground water from fecal contamination better than the other geological areas of NJ.

Figure 3
Fecal Coliform/ E. Coli Results from the
Private Well Testing Act
September 2002 through March 2003



- *Comments* – This data is based on a single sample and 6 months of data. This value is probably an underestimate of the true extent of contamination, since the microbes are randomly distributed in ground water, a single sample can miss the contamination.⁴ Alternatively, microbiological contaminants other than coliform contamination may be present in some samples in the absence of the coliform bacteria.⁴

Inorganics

The Private Well Testing Act required testing for four inorganics: nitrate, arsenic, mercury, and lead. Testing for nitrate and lead was required for the entire state, while testing for arsenic was limited to 10 northern New Jersey counties (Bergen, Essex, Hudson, Hunterdon, Mercer, Middlesex, Morris, Passaic, Somerset, and Union). Testing for mercury was limited to 9 Southern New Jersey counties (Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Monmouth, Ocean and Salem).

Nitrate

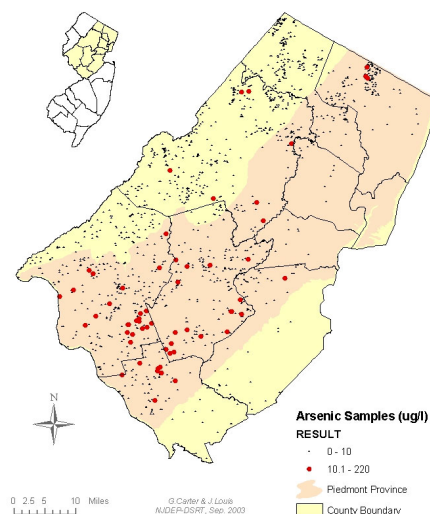
- *Sources* – Nitrate and its reduced form nitrite are found in ground water due to a number of factors including natural deposits, runoff from fertilizer use, leaching from septic tanks, and from sewage.
- *Counties that Sampled* – All counties were required to sample for nitrate.
- *MCL* – The MCL for nitrate is 10 mg/l. If nitrate is present in drinking water at levels above the MCL, it can cause blue-baby syndrome in infants below the age of six months. The symptoms include shortness of breath and if untreated it can lead to death.
- *Number of Wells that were above the MCL for Nitrate* – A total of 189 wells (3.7%) of the 5,179 wells tested had concentrations of nitrate above the MCL.
- *Range of Concentrations* – The concentration of nitrate ranged from 0-129 mg/l.

⁴ Atherholt, T. et al. October 2003. Evaluation of Indicators of Fecal Contamination in Ground Water. Journal. American Water Works Association. 95:10: [in preparation].

Arsenic

- **Source** – Arsenic can leach into ground water from erosion of natural deposits of arsenic, from past use as a pesticide, and from waste from glass or electronics production. In New Jersey, it is known that wells drilled into the Piedmont Region in the northern part of New Jersey can contain high levels of arsenic.
- **Counties that Sampled** – The 10 counties in the Piedmont region of the state were required to sample for arsenic. The counties are Bergen, Essex, Hudson, Hunterdon, Mercer, Middlesex, Morris, Passaic, Somerset, and Union.
- **MCL** – The MCL for arsenic has recently been revised. The current standard of 50 ug/l was set by the U.S. Public Health Service in 1942. This standard has been lowered to 10 ug/l, effective January 23, 2006. For the purposes of this report, the data are reported for the new proposed standard of 10 ug/l⁵. Arsenic is a known human carcinogen linked to increased risk of skin, lung, liver, kidney and urinary bladder cancer.
- **Number of Wells over the proposed MCL of 10 ug/l** – A total of 72 wells (3.7%) of the 1928 wells sampled for Arsenic had arsenic concentration over the proposed new arsenic standard.
- **Range of Concentrations** – The arsenic concentrations ranged from 0 to 216 ug/l.
- **Geographic Distribution** – Arsenic exceedances were most commonly found in Hunterdon, Mercer and Somerset Counties. (See Figure 4)

Figure 4
Arsenic Results From Private Well Testing Act
September 2002 Through March 2003

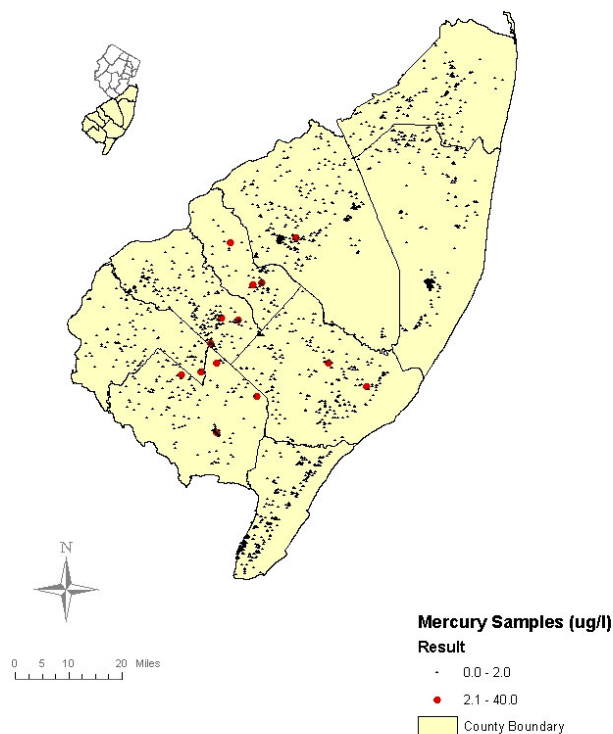


⁵ In September 2003, NJDEP Commissioner Campbell issued a policy directive for the development of a proposed regulation for arsenic in drinking water of 5 ug/l. The Department proposed a new arsenic MCL of 5 ug/l in the January 20, 2004 NJ Register. In the meantime, the MCL for arsenic is 50 ppb from now until January 23, 2006.

Mercury

- *Sources* – Sources of mercury include air deposition, past pesticide use, and discharges from industrial facilities.
- *Counties that Sampled* – Mercury has been found in private wells in southern New Jersey, nine southern counties were required to test for mercury are Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Monmouth, Ocean and Salem.
- *MCL* – The MCL for mercury in drinking water was set by EPA at 2 ug/l. Mercury has been linked to neurological problems.
- *Number of Wells over the MCL* – A total of 14 wells (0.6%) out of 2,380 wells tested for mercury had concentrations above the MCL.
- *Range of Concentrations* – The range of mercury concentrations varied from 0 to 37 ug/l.
- *Geographic Distribution* – There are no obvious geographic patterns, but as additional data is collected some may emerge. (See Figure 5)

Figure 5
Mercury Results From Private Well Testing Act
September 2002 Through March 2003



Lead

- *Sources* – Sources of lead include air deposition, past use of leaded paint and fuels, and discharges from industrial facilities. However, lead typically gets into drinking water after it leaves the well aquifer; the source of lead in a home's drinking water is most likely from the piping or solder in the dwelling's plumbing.
- *Counties that Sampled* – All counties were required to sample for lead
- *MCL* – Lead does not have an MCL, but it does have an action level of 15 ug/l (defined in Definitions and Terms Section). The PWTA Program has the ability to lower the lead threshold. Consequently, the PWTA Program set the threshold for lead in well water at 10 ug/l, so that it is in accordance with the New Jersey Ground Water Quality Standards.
- *Geographic Distribution* – There are no obvious geographic patterns, but as additional data is collected some may emerge. Please see Part 4 (Lead – A special Case) of this report for further information concerning lead.

Summary of Inorganic Results

Table 2 below summarizes the PWTA data for inorganic compounds which includes the number of wells sampled for each inorganic parameter and the range of observed values. As mentioned in Part 4 below, lead was excluded from this table for this report.

Table 2: Summary of PWTA Data for Inorganic Compounds

Inorganic Compound	MCL	No. of Wells with Detections over the MCL	Range of Values in ug/l or ppb
Arsenic	10*	72**	0 to 216
Mercury	2	14***	0-37
Nitrate	10,000	189	0-129,000

* Current MCL is 50 ug/l, EPA will lower the MCL in 2006 to 10 ug/l.

** Ten counties were required to sample for arsenic (Bergen, Essex, Hudson, Hunterdon, Mercer, Middlesex, Morris, Passaic, Somerset, and Union).

*** Nine counties were required to sample for mercury (Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Monmouth, Ocean, and Salem).

Volatile Organic Compounds

New Jersey has drinking water standards (MCLs) for 26 volatile organic compounds (VOCs).

- *Sources* - VOCs include solvents, degreasers, and components of gasoline. (See Table 3 for a more detailed description)
- *Counties that Sampled* - All counties were required to sample for VOCs.
- *MCLs* - The MCLs for the 26 VOCs are listed in Table 3.
- *Number of Wells that exceeded one or more MCLs* - One or more VOCs were detected above their MCL in 71 wells (1.4%) out of 5,179 tested. A total of 8 wells had two VOCs over the MCL, and only one well had three VOCs over the MCLs. (See Figure 6)

- *Most Frequently Detected VOCs* - The VOCs that were most frequently detected above their MCL were trichloroethylene (0.71%), tetrachloroethylene (0.54%), and benzene (0.10%). (See Table 4)
- *Range of Concentrations* - See Table 4.

Figure 6: Volatile Organic Compounds Results

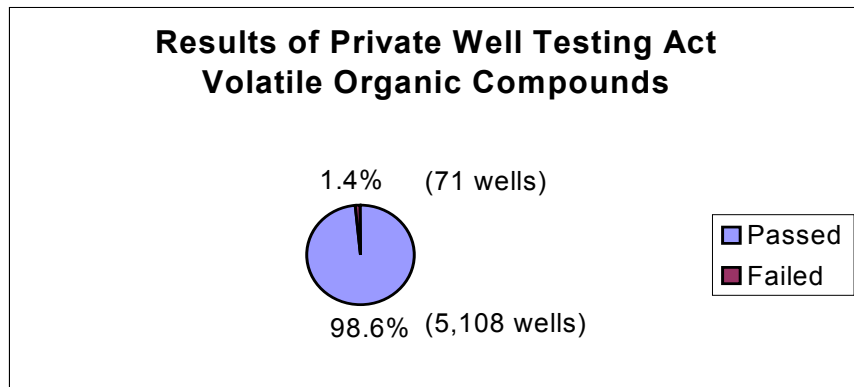


Table 3: Regulated Volatile Organics Compounds, MCLs and Sources

Volatile Organic Compounds	MCL* (in ug/l)	Sources of Contaminants in Ground Water
Benzene	1	Discharge from factories; leaching from gas storage tanks and landfills
Carbon Tetrachloride	2	Discharge from chemical plants and other industrial activities
Chlorobenzene	50	Discharge from chemical and agricultural chemical factories
1,2-Dichlorobenzene	600	Discharge from industrial chemical factories
1,3-Dichlorobenzene	600	Discharge from industrial chemical factories
1,4-Dichlorobenzene	75	Discharge from industrial chemical factories
1,1-Dichloroethane	50	Discharge from metal degreasing sites and other factories
1,2-Dichloroethane	2	Discharge from industrial chemical factories
1,1-Dichloroethylene	2	Discharge from industrial chemical factories
cis-1,2-Dichloroethylene	70	Discharge from industrial chemical factories
trans-1,2-Dichloroethylene	100	Discharge from industrial chemical factories
1,2-Dichloropropane	5	Discharge from industrial chemical factories
Ethylbenzene	700	Discharge from petroleum refineries
Methyl-tertiary Butyl Ether	70	Leaking underground gasoline and fuel oil tanks; Gasoline and fuel oil spills.
Methylene Chloride	3	Discharge from drug and chemical factories
Naphthalene	300	Discharge from industrial chemical factories; exposure to mothballs
Styrene	100	Discharge from rubber and plastic factories; leaching from landfills
1,1,2,2-Tetrachloroethane	1	Discharge from industrial chemical factories
Tetrachloroethylene	1	Discharge from factories and dry cleaners
Toluene	1000	Discharge from petroleum factories
1,2,4-Trichlorobenzene	9	Discharge from textile finishing factories
1,1,1-Trichloroethane	30	Discharge from metal degreasing sites and other factories
1,1,2-Trichloroethane	3	Discharge from industrial chemical factories
Trichloroethylene	1	Discharge from metal degreasing sites and other factories
Vinyl Chloride	2	Leaching from PVC pipes; discharge from plastic factories
Xylenes	1000	Discharge from petroleum factories; discharge from chemical factories

*MCL= Maximum Contaminant Level

Units of Measure

µg/l = micrograms/liter (parts per billion)

Table 4 lists the VOCs that were detected over the MCL and the range of detected values for each VOC tested.

**Table 4: Volatile Organic Compounds Results
September 15, 2002 to April 1, 2003 (out of 5179 wells)**

Compound	MCL ug/l or ppb	No. of Wells with VOCs over the MCL	Range of detected concentrations (in ug/l or ppb)
Benzene	1	5	0-45.8
Carbon tetrachloride	2	2	0-11.7
Chlorobenzene	50	0	0-3.98
1,2-Dichlorobenzene	600	0	0-0.39
1,3-Dichlorobenzene	600	0	0-0.58
1,4-Dichlorobenzene	75	0	0-7.8
1,1-Dichloroethane	50	0	0-8.97
1,2-Dichloroethane	2	3	0-31.3
1,1-Dichloroethylene	2	4	0-5.68
cis-1,2-Dichloroethylene	70	0	0-44
trans-1,2-Dichloroethylene	100	0	0-1.8
1,2-Dichloropropane	5	3	0-8.82
Ethylbenzene	700	0	0-18
MTBE	70	1	0-642
Methylene Chloride	3	1	0-10
Napthalene	300	0	0-3.5
Styrene	100	0	0-2.45
1,1,2,2-Tetrachloroethane	1	0	0-0.3
Tetrachloroethylene	1	26	0-504
Toluene	1000	0	0-270
Trichlorobenzene(s)	9	0	0-0.81
1,1,1-Trichloroethane	30	0	0-14
1,1,2-Trichloroethane	3	0	0-0.2
Trichloroethylene	1	35	0-169
Vinyl chloride	2	1	0-5.07
Xylene	1000	0	0-39

Summary of All Primary Drinking Water Contaminants in PWTA Program

The Private Well Testing Program required testing for the following primary drinking water parameters: fecal coliform, nitrate, arsenic, mercury, and 26 separate VOCs. A total of 417 wells (8.0%) exceeded one or more of the primary drinking water standards. Figure 7 shows the percentage of wells that failed for each tested parameter or parameter group (VOCs). Table 5 shows the number of wells that failed for one or more primary drinking water standards for each county.

FIGURE 7

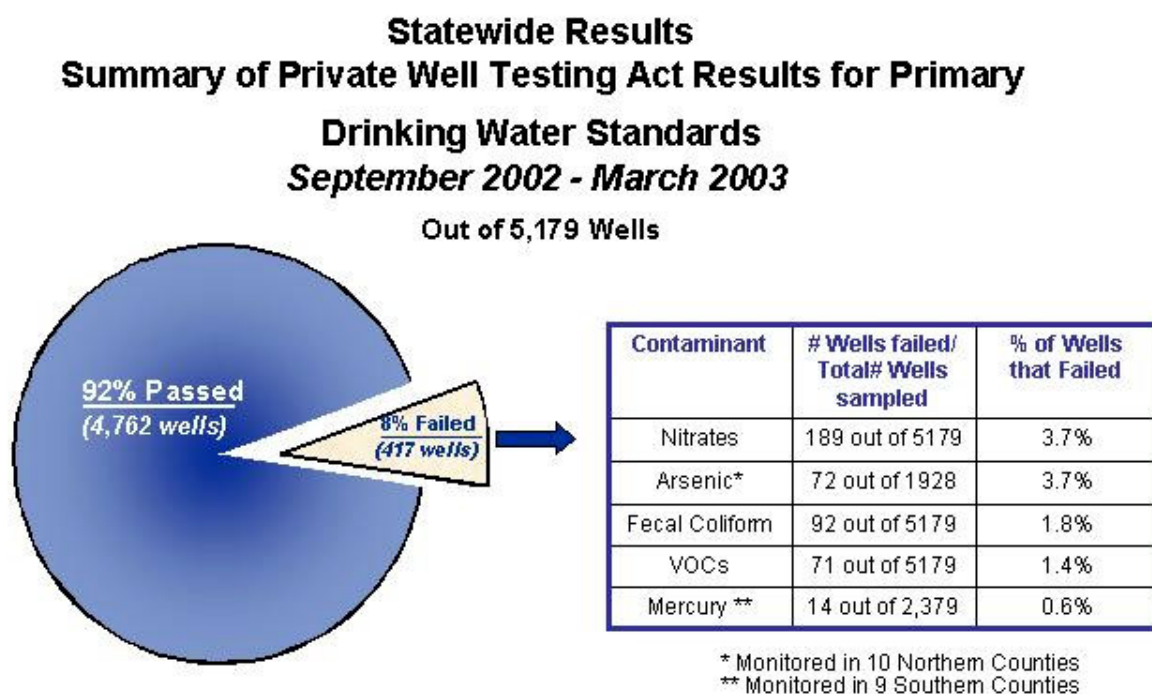


Table 5: Number of Wells that Failed for One or More of the Primary Drinking Water Standards Tested

County	# Wells Sampled	# Wells with MCL Exceedances	Fecal Coliform/ E.coli	Nitrate	Arsenic	Mercury	VOCs
Atlantic	296	12	0	4	NR	2	6
Bergen	145	10	1	2	3	NR	4
Burlington	392	15	2	12	NR	1	0
Camden	136	11	1	4	NR	3	4
Cape May	354	18	2	13	NR	0	3
Cumberland	161	28	2	15	NR	4	8
Essex	8	1	0	0	0	NR	1
Gloucester	288	22	2	11	NR	3	7
Hudson	0	0	0	0	0	NR	0
Hunterdon	574	63	19	8	36	NR	1
Mercer	131	16	2	1	8	NR	5
Middlesex	50	5	0	5	0	NR	0
Monmouth	286	8	0	4	NR	0	4
Morris	458	37	10	18	7	NR	4
Ocean	365	5	0	2	NR	0	4
Passaic	249	28	5	17	0	NR	8
Salem	101	9	0	9	NR	1	0
Somerset	313	42	21	6	18	NR	3
Sussex	601	74	20	54	NR	NR	5
Union	7	1	0	0	0	NR	1
Warren	264	12	5	4	NR	NR	3
	5179	417	92	189	72*	14**	71

NR - Not Required to Sample

* Only 10 counties were required to sample for arsenic (Bergen, Essex, Hudson, Hunterdon, Mercer, Middlesex, Morris, Passaic, Somerset, and Union). A total of 72 wells of the 1,928 wells tested exceeded 10ug/l of arsenic, the federal standard that will take effect January 23, 2006.

** Only 9 counties were required to sample for mercury (Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Monmouth, Ocean, and Salem). A total of 14 of the 2,379 wells tested in those counties exceeded the drinking water standard for mercury.

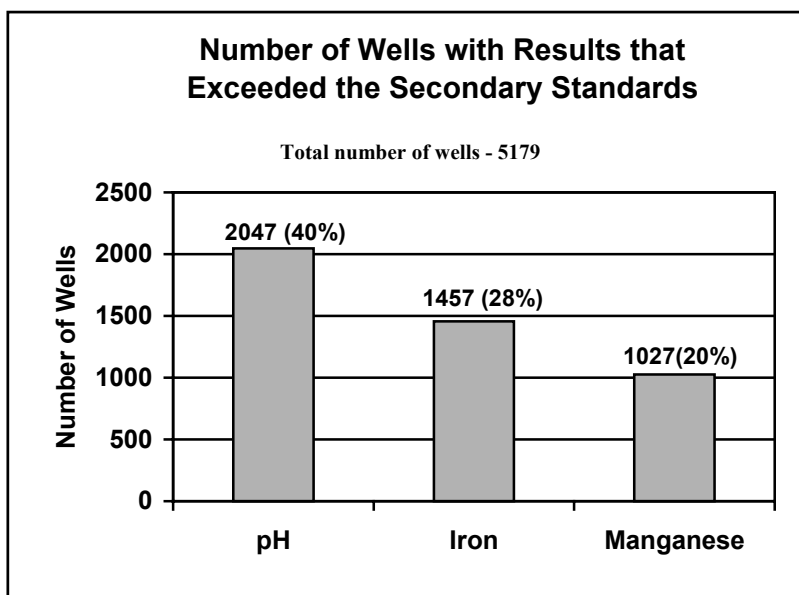
SECONDARY DRINKING WATER CONTAMINANTS

NJDEP has established standards for some water quality constituents called secondary standards. Testing is required for these parameters. Secondary standards were established for contaminants that cause problems with taste and odor, cause discoloration of skin, or teeth, and contaminants that corrode, stain plumbing fixtures or clothes during washing. Most wells that have problems with secondary standards have treatment on the well. Because the Private Well Testing regulations require sampling of raw or untreated water, a number of wells were found to have problems with these water quality or secondary standards.

There are three secondary water quality constituents included in the private well testing program: pH, manganese, and iron. Traditionally, ground water is treated to alter or reduce levels of these parameters to less problematic levels. Figure 8 below depicts the number of PWTA wells that had concentrations over the secondary standards.

The secondary standard for pH was adapted for both aesthetic reasons and for control of corrosion. The pH for drinking water should be between 6.5 and 8.5. If the pH is too low (less than 6.5) water has a bitter metallic taste, and causes corrosion of pipes and fixtures. If the pH is too high (greater than 8.5) the water has a slippery feel, it tastes like soda, and deposits can form on plumbing fixtures. In general, ground water in southern New Jersey is acidic (lower than pH 7.0), and ground water in northern New Jersey is basic (higher than pH 7.0).

**Figure 8:
Secondary Standards Exceedances**



pH -For the 5,179 wells sampled between September 15, 2002 and April 1, 2003, 60.6% met the secondary standard for pH. The pH was less than 6.5 for 38.6% of the samples, and the pH was above 8.5 for 0.8% of the samples. The range of pH values

varied from 3.3 to 10.4. There were 2047 wells that did not meet the secondary standard for pH (see Figure 8).

Iron - Iron is a naturally occurring inorganic constituent of ground water. The secondary standard for iron is 0.3 mg/l. If the concentration of iron is above the standard, the water has a rusty color, a metallic taste, causes reddish or orange staining and a sediment deposits in the holding tank and in the plumbing fixtures. For the approximately 5,200 wells sampled between September 15, 2002 and April 1, 2003, 71.9% met the iron secondary standard, while 28.1% (1,457) samples were above the iron standard. The range of iron concentrations varied from 0-170 mg/l.

Manganese - Manganese is a naturally occurring inorganic constituent of ground water. The secondary standard for manganese is 0.05 mg/l. If the concentration of manganese is above the standard, the water appears black to brown colored, black stains occur on plumbing fixtures, and the water has a bitter metallic taste. For the 5,179 wells sampled between September 15, 2002 and April 1, 2003, 80.2% met the manganese secondary standard, while 19.8% of the samples (1,027) were above the manganese standard. The range of manganese concentrations varied from 0-13.1 mg/l.

Part 4: Discussion and Summary

What is the data telling us about private wells?

The 5,179 results presented in this summary represent an estimated one percent of the private wells used as potable water supplies in New Jersey. Eventually, the PWTA Program will collect enough information for groundwater experts to more comprehensively evaluate the quality of the water sources that supply New Jersey's private wells. While it is too early to determine water quality trends and assessments of the safety of private well sources, some patterns are beginning to emerge. For example, the arsenic test results verify what was known through previous hydrogeologic studies. That is, that certain geologic formations in the Piedmont region contain layers that may leach arsenic into the groundwater as it passes through. More wells will need to be tested prior to determining if there are any geographic patterns associated with mercury levels. Very few of the mercury test results exceeded the MCL; those that did are scattered through the region. The data for volatile organic compounds is also too sparse to draw any regional conclusions. The fecal coliform test results confirm that wells in the coastal plain are more protected than those which are drilled into the bedrock aquifers in the northern regions of the state. Although the data may preclude the identification of the source of some contaminants, the data does provide information that homeowners and regulators can use to assess regional ground water quality concerns needed to make well owners, as well as state and local officials, aware of drinking water quality concerns in their area. This awareness is an important step in the consumer education process.

Excluding lead, the majority of the wells that exceeded a primary drinking water standard did so for either nitrate or fecal coliform. Health concerns over bacteria led to the establishment of a U.S. Public Health Service drinking water standard in 1914 and a nitrate standard in the 1940's. Today, both of these contaminants are regulated as acute (primary drinking water) parameters because exceeding the standard might lead to immediate health concerns.

Lead

Exposure to lead is a significant health concern, especially for young children and infants whose growing bodies tend to absorb more lead than the average adult. Drinking water is one possible source of lead exposure. Infants whose diets consist mainly of liquid can get 40 - 60% of their lead exposure from water. Some drinking water pipes, taps, solder and other plumbing components contain lead. Lead in the plumbing may leach into water and pose a health risk when consumed.

Even though water in the ground (ground water), which is the source of water for private well owners, may have little or no lead, a water sample collected from a home as part of the PWTA requirements may still show elevated lead due to the presence of lead and lead-containing plumbing materials and water use patterns. The NJDEP did not expect raw water samples to exhibit elevated levels of lead. Testing methods, including sampling methods, are important parameters in understanding the potential sources of lead in a water samples.

Lead-containing plumbing materials are still being sold. Some fixtures may still contain up to 8% lead, which is used as an alloying material in brass. For example, yellow brass contains 1-3% lead and red brass contains 5-6% lead. Depending upon the corrosivity of the well water, the brass plumbing materials can leach lead at varying concentrations into the water.

The results of lead testing indicate that 640 wells (12%) of the 5,179 wells tested for lead exceeded the groundwater quality standard of 10 ug/l. Furthermore, the range of reported concentrations for lead, 1-12,000 ug/l, is unrealistically high. Based on the NJDEP's experience with groundwater investigations and monitoring of ambient groundwater, the homes with water samples showing elevated lead levels are not near areas where lead is likely to be a contaminant in ground water. So where is the lead coming from?

Research conducted in the 1990's by scientists at NJDEP and Rutgers University⁶ have shown that lead in well water samples collected from homes served by private wells in New Jersey is most likely coming from plumbing. Further, this research shows that the sampling method, sample volume and sampling location are vital in distinguishing between lead in the ground water versus lead coming from the plumbing.

As a result of those well water samples that contain elevated lead levels in the PWTA database, the Department has initiated a study with Rutgers University chemists to pinpoint the source of the lead definitively. Results of the study are expected to be available in the summer 2004.

⁶ Hall GS, Murphy EA. (1993) Determination of sources of lead in tap water by inductively coupled plasma mass spectrometry. *Journal of Radioanalytical and Nuclear Chemistry*; 175(2): 129-138. Murphy EA and Hall GS (2000). Determination of sources of lead in water samples using isotope ratios. *Bulletin of Environmental Contamination and Toxicology*; 65:314-321. Scholtz H, Hall, G. (1993). The Determination of the sources of lead in sequentially obtained tap water samples. Final Report. Contract No. C29218. Trenton, NJ: Division of Science and Research, New Jersey Department of Environmental Protection and Energy.

Part 5: PWTA Education and Outreach

Communication Efforts:

From the beginning of the program, the NJDEP recognized the importance of public education and outreach. The NJDEP was cognizant of the fact that the program would not only impact buyers, sellers, landlords and renters, but also would affect other professionals involved in real estate transactions including, but not limited to, municipal officials, health agencies, realtors, and certified laboratories. The PWTA program consequently developed and utilized several measures to educate these constituents and provide the necessary support as needed to make the implementation process as straightforward as possible, and to lessen any burden incurred.

Two initial educational components were the development of a toll free hotline and the development of the Private Well Testing Act website (PWTA website). The PWTA website went public on September 17, 2002, one day after the PWTA rules were published in the NJ Register, on September 16, 2002. September 2002, was a very busy time, with approximately 300 calls logged to the Department. The PWTA is currently working on the aforementioned measures, and developing other initiatives, included participation in and organization of PWTA-related training sessions, and developing and distributing educational and informational materials.

The PWTA Website, since its inception, has been a popular public informational resource. The PWTA website includes a list of frequently asked questions that address issues and concerns related to the requirements of the Private Well Testing Act and implementing regulations. In September 2002, the Department received 30,579 hits to the PWTA website. Another convenience is the e-mail box, which is frequently used to submit personal questions. Frequently asked questions are developed from commonly submitted questions to the PWTA program and were recently updated and posted in October 2003.

Various PWTA educational and informational materials were developed and distributed to the public and targeted audiences. Fact sheets and a list of certified laboratories were developed and are available on the PWTA website. Beginning in March of 2003, a "Health Officer Advisory Bulletin" was established and distributed on a periodic basis to inform New Jersey county and local health officials of pertinent PWTA-related issues. A "Laboratory Advisory Bulletin" was initiated and to facilitate communication with New Jersey Certified Laboratories whom offer PWTA-related laboratory services and provide them with pertinent information concerning PWTA data management issues.

Educational and Outreach Needs:

While the PWTA program has made some significant efforts to explain the program and educate our constituents this past year regarding education and outreach activities, there are numerous areas that still must be addressed. These include the development of additional fact sheets for the public for specific drinking water contaminants (i.e., lead, mercury, arsenic, etc.). Additionally, PWTA sponsored training events for targeted audiences such as realtors, buyer and sellers of real estate with private wells, real

estate attorneys, certified laboratories and county and local health officials are planned for the upcoming year. Coordination of efforts with intra-departmental, inter-departmental offices and other agencies will continue in order to assist our constituency, and other interested parties. PWTA issues, such as health-related education concerning drinking water contaminants, Geographic Information System (GIS), real estate law and the implementation and compliance with the PWTA and its regulations, must be conveyed through further organized educational and outreach events.

Success Story #1 – Passaic County

Health and environmental officials have long recognized the importance of private (domestic) well testing and recently numerous municipalities in New Jersey have adopted the PWTA parameters to be applied to wells that are not subject to the PWTA. For example, wells on properties where there is not a contract of sales executed are not subject to the Act. An example of such is an inherited property that contains a domestic well however does not have a contract of sale executed.

In Passaic County recently, local officials, by local ordinance, adopted that the PWTA testing "parameters" be applied to all domestic wells, not just the wells subject to the Act. In Bloomingdale Boro for instance, a well was tested for PWTA parameters due to the newly created ordinance (which would not have been subject to the Act) and volatile organic contamination above the MCL was found. As a result, the local health officials tested numerous domestic wells in the vicinity and found that 17 out of 40 wells were identified with contamination above the MCL. After confirmatory sampling, the well owners applied to the NJDEP-Claims Administration-Spill Fund Program for assistance and the NJDEP installed 16 point-of-entry systems to address the well contamination. Had the local officials not created a town ordinance that applied the PWTA parameters to that well the contamination would probably not have been detected.

Success Story #2 – Hopewell Township, Mercer County

A home being sold recently in Hopewell Township, Mercer County was required to test its well water in accordance with the Private Well Testing Act (PWTA). When the test results were completed they were sent to the homeowner. The results showed that the well water exceed the Primary Drinking Standard of 1 ug/l Maximum Contaminant Level (MCL) for one parameter, trichloroethylene (TCE). TCE is a probable human carcinogen. The PWTA requires the local health authority to be notified within five business days by the NJDEP whenever a MCL for a Primary PWTA parameter is exceeded. The PWTA also authorizes the local health authority to notify neighboring homes in a specific radius from the impact home. Knowing the potentially adverse health effects of TCE, the Hopewell Township Health Department expanded this radius, notified several homeowners in the vicinity, and requested that their well be tested for TCE. The Hopewell Township Health Department discovered that many of these homes also tested positive for TCE, with levels as high as 300 ug/l. The impacted homes were subsequently fitted with water treatment devices that effectively removed TCE, and minimized these home's occupants exposure to this contaminant. The TCE in the groundwater was attributed to a groundwater contaminant plume, which moved through a commonly used aquifer beneath Hopewell Township. The source of the contamination has yet to be determined. However, because of the PWTA, the residents

who were affected are now aware of the potential impacts that this kind of contamination can have to a home's drinking water source, and measures that must be taken to protect against exposure to such contamination.

Part 6: Recommendations for Private Well Owners

What Every Private Well Owner Should Know

Many homeowners in New Jersey receive their drinking water supply from private wells. Contaminated drinking water can pose a risk to human health, especially young children, the elderly, and people with suppressed immune systems. Therefore, it is recommended that private wells should be maintained and tested once a year to help safeguard the health of those individuals that receive their drinking water from private wells and also to protect the integrity of the wells. Additionally, if water treatment devices are being utilized to treat the water supply, they should be maintained in accordance with manufacturer specifications. Further information may be obtained by visiting the PWTa website at www.nj.gov/dep/pwta.

Well Maintenance, Record Keeping, and Closing of an Abandoned Well

Careful management of activities near the water source will assist in protecting your water supply. Activities such as the application of pesticides, fertilizers and termite treatments should be carefully monitored so they don't accidentally migrate into the well. Periodical inspections of exposed well components for such things as cracking, corroded or damaged well casing, and broken or missing well cap or settling or cracking of surface seals will help maintain the integrity of a private well. The area around the wellhead should be sloped so that water will drain away from the well, and never dispose of any hazardous material near the well head or into the septic system.

New Jersey requires that all wells constructed must be appropriately permitted by the NJDEP as set forth by N.J.A.C. 7:9D. As part of this permit process, a well log is required to be created by a well driller of the appropriate licensed classification when a new well is constructed. The well log includes such information as a well record number, the name of the well owner when the well was constructed, the location of the well, and an assortment of facts about the well construction. The well construction information will include such things as the drilling method used, the depth of the well, the type of casing, the type of screen and the type of pump. Furthermore, when well pumps are replaced or wells are redeveloped, these processes should be carried out by professionals whom are licensed by the appropriate authority to perform these activities. The well log and other maintenance records should be continuously maintained by the homeowner to keep a complete history of the well.

Wells that are no longer in use should be properly closed and sealed because they can pose a threat to ground water quality and are a potential safety hazard. When a drinking water well is no longer utilized, the homeowner should taken the necessary measures to ensure that it is properly closed, sealed and abandoned in accordance with all State, county and local requirements. Further information regarding the appropriate

approach to closing and sealing a well can be obtained by contacting the DEP's Bureau of Water Allocation at (609) 292-2957.

Additionally, cleaning the screens at the various taps through the home is another preventative technique that should be followed to prevent the possible accumulation of bacteria in the faucets. The homeowners may minimize exposure to bacteria by simply removing these screens periodically and effectively cleaning them, such as running them through a dishwasher cycle.

Well Water Testing

To assure the quality of your drinking water, the DEP encourages private well owners to test their drinking water supply once a year. At the minimum, tests for nitrates and coliform bacteria should be performed to detect potential contamination problems of these acute parameters as soon as possible. Also, testing should be performed if you notice that the water is discolored, has a particular odor or objectionable taste, someone in your household is pregnant or nursing, your neighbor finds a unsafe contaminant, or if you suspect for any reason that your drinking water may contain any other kind of contamination. Also, testing should be completed whenever a well pump is replaced or if a well is reconditioned.

Analytical tests on potable well water should be performed by a New Jersey Certified Laboratory. A list of New Jersey Analytical Laboratories can be attained by contacting the NJDEP Office of Quality Assurance at (609) 292-3950. Approach well water testing as a smart shopper. Once you attain a list of laboratories, contact as many as possible and compare prices.

Annual Check-up of Water Treatment Units

When you are certain that you have a particular contamination problem, consult with a water-treatment expert (can be found in the yellow pages of the phonebook). These professionals are familiar with the specific type of equipment that is available to effectively remove the contaminant in question. Using a reputable dealer and certified installer will make certain that the treatment device is installed appropriately and works in accordance with manufacturer's specifications. Once installed these devices must be checked initially to make sure they are functioning correctly. Households that have installed water treatment devices need to monitor and maintain them in accordance with the manufacturer's specifications, and it should be checked at least once a year to make sure it is functioning properly. Following these measures will ensure that these devices are effectively treating your drinking water.

Appendix A: PWTa Required Parameters by County

List of Required Parameters for Private Well Testing
Effective September 16, 2002

	Total Coliform	*Fecal Coliform or E. Coli	Nitrate	Iron	Manganese	pH	VOCs	Lead	Arsenic	Mercury	Gross Alpha Particle Activity
Atlantic	X	X	X	X	X	X	X	X		X	2
Bergen	X	X	X	X	X	X	X	X	X		
Burlington	X	X	X	X	X	X	X	X		X	2
Camden	X	X	X	X	X	X	X	X		X	2
Cape May	X	X	X	X	X	X	X	X		X	3
Cumberland	X	X	X	X	X	X	X	X		X	1
Essex	X	X	X	X	X	X	X	X	X		
Gloucester	X	X	X	X	X	X	X	X		X	1
Hudson	X	X	X	X	X	X	X	X	X		
Hunterdon	X	X	X	X	X	X	X	X	X		3
Mercer	X	X	X	X	X	X	X	X	X		3
Middlesex	X	X	X	X	X	X	X	X	X		3
Monmouth	X	X	X	X	X	X	X	X		X	3
Morris	X	X	X	X	X	X	X	X	X		
Ocean	X	X	X	X	X	X	X	X		X	3
Passaic	X	X	X	X	X	X	X	X	X		
Salem	X	X	X	X	X	X	X	X		X	2
Somerset	X	X	X	X	X	X	X	X	X		
Sussex	X	X	X	X	X	X	X	X			
Union	X	X	X	X	X	X	X	X	X		
Warren	X	X	X	X	X	X	X	X			

* Fecal Coliform or E. coli testing is required only if a sample tests positive for total coliform. See N.J.A.C. 7:9E-2.1(a)2.

1 = testing required starting March 15, 2003

2 = testing required starting September 16, 2003

3 = testing required starting March 16, 2004

Appendix B: Summary of Test PWTa Results by County and Municipality from September 2002-March 2003

(List includes each municipality for which a sampled was submitted, not all municipalities have private wells)

Atlantic County

Municipality	# Wells Sampled	# Wells over MCL	Fecal/ E.coli	Nitrate	Arsenic	Mercury	Any VOC over the MCL	VOCs over MCL
Absecon City	4	0	0	0	NR	0	0	
Buena Boro	2	0	0	0	NR	0	0	
Buena Vista Twp	32	4	0	3	NR	0	1	tetrachloroethylene
Corbin City	7	0	0	0	NR	0	0	
Egg Harbor City	7	1	0	0	NR	1	0	
Egg Harbor Twp	60	1	0	0	NR	0	1	tetrachloroethylene
Estell Manor City	10	0	0	0	NR	0	0	
Folsom Boro	7	0	0	0	NR	0	0	
Galloway Twp	49	2	0	0	NR	1	1	1,2-dichloropropane
Hamilton Twp	51	1	0	0	NR	0	1	carbon tetrachloride
Hammonton Town	19	2	0	1	NR	0	1	1,2-dichloropropane
Mullica Twp	26	1	0	0	NR	0	1	benzene
Northfield City	2	0	0	0	NR	0	0	
Pleasantville City	4	0	0	0	NR	0	0	
Port Republic City	6	0	0	0	NR	0	0	
Somers Point City	3	0	0	0	NR	0	0	
Weymouth Twp.	7	0	0	0	NR	0	0	
Atlantic County Totals:	296	12	0	4	NR	2	6	

Bergen County

Municipality	# Wells Sampled	# Wells over MCL	Fecal/ E.coli	Nitrate	Arsenic	Mercury	Any VOC over the MCL	VOCs over MCL
Alpine Boro	1	0	0	0	0	NR	0	
Carlstadt Boro	1	0	0	0	0	NR	0	
Closter Boro	1	0	0	0	0	NR	0	
Cresskill Boro	1	0	0	0	0	NR	0	
Demarest Boro	1	0	0	0	0	NR	0	
Emerson Boro	1	0	0	0	0	NR	0	
Franklin Lakes Boro	21	1	0	1	0	NR	0	
Hillsdale Boro	2	0	0	0	0	NR	0	
Mahwah Twp	12	1	0	1	0	NR	0	
Midland Park Boro	2	1	0	0	0	NR	1	tetrachlorethylene
Montvale Boro	4	0	0	0	0	NR	0	
Oakland Boro	2	0	0	0	0	NR	0	
						NR		1,1-dichloroethylene, tetrachloroethylene, trichloroethylene
Old Tappan Boro	1	1	0	0	0		1	
Paramus Boro	1	0	0	0	0	NR	0	
Ramsey Boro	1	0	0	0	0	NR	0	
River Vale Twp	1	0	0	0	0	NR	0	
Saddle River Boro	33	1	0	0	0	NR	1	tetrachlorethylene
Tenafly Boro	1	0	0	0	0	NR	0	
Upper Saddle River	53	5	1	0	3	NR	1	tetrachlorethylene
Washington Twp	1	0	0	0	0	NR	0	
Wyckoff Twp	4	0	0	0	0	NR	0	
Bergen County Totals:	145	10	1	2	3	NR	4	

Burlington County

Municipality	# Wells Sampled	# Wells over MCL	Fecal/ E.coli	Nitrate	Arsenic	Mercury	Any VOC over the MCL	VOCs over MCL
Bass River Twp	8	0	0	0	NR	0	0	
Burlington Twp	2	0	0	0	NR	0	0	
Chesterfield Twp	7	0	0	0	NR	0	0	
Delran Twp	1	0	0	0	NR	0	0	
Eastampton Twp	4	0	0	0	NR	0	0	
Evesham Twp	21	0	0	0	NR	0	0	
Florence Twp	7	0	0	0	NR	0	0	
Hainesport Twp	2	1	1	0	NR	0	0	
Lumberton Twp	8	0	0	0	NR	0	0	
Mansfield Twp	8	0	0	0	NR	0	0	
Medford Lakes Boro	39	0	0	0	NR	0	0	
Medford Twp	54	2	1	1	NR	0	0	
Moorestown	6	0	0	0	NR	0	0	
Mount Holly Twp	1	0	0	0	NR	0	0	
Mount Laurel Twp	9	0	0	0	NR	0	0	
New Hanover Twp	2	0	0	0	NR	0	0	
North Hanover Twp	7	0	0	0	NR	0	0	
Pemberton Boro	2	0	0	0	NR	0	0	
Pemberton Twp	76	2	0	2	NR	0	0	
Shamong Twp	31	3	0	3	NR	0	0	
Southampton Twp	38	1	0	1	NR	0	0	
Springfield Twp	13	0	0	0	NR	0	0	
Tabernacle Twp	34	6	0	5	NR	1	0	
Washington Twp	2	0	0	0	NR	0	0	
Westampton Twp	1	0	0	0	NR	0	0	
Willingboro Twp	1	0	0	0	NR	0	0	
Woodland Twp	8	0	0	0	NR	0	0	
Burlington County Totals:	392	15	2	12	NR	1	0	

Camden County

Municipality	# Wells Sampled	# Wells over MCL	Fecal/ E.coli	Nitrate	Arsenic	Mercury	Any VOC over the MCL	VOCs over MCL
Berlin Boro	2	0	0	0	NR	0	0	
Berlin Twp	1	0	0	0	NR	0	0	
Cherry Hill Twp	1	0	0	0	NR	0	0	
Chesilhurst Boro	11	1	0	0	NR	1	0	
Gloucester Twp	10	2	0	2	NR	0	0	
Lindenwold Boro	4	1	1	0	NR	0	1	benzene
Voorhees Twp	5	0	0	0	NR	0	0	
Waterford Twp	56	1	0	0	NR	1	0	
Winslow Twp	46	6	0	2	NR	1	4	1,2-dichloroethane, tetrachloroethylene, trichloroethylene, vinyl chloride
Camden County Totals:	136	11	1	4	NR	3	5	

Cape May County

Municipality	# Wells Sampled	# Wells over MCL	Fecal/ E.coli	Nitrate	Arsenic	Mercury	Any VOC over the MCL	VOCs over MCL
Cape May Point Boro	1	0	0	0	NR	0	0	
Dennis Twp	34	4	1	3	NR	0	0	
Lower Twp	137	5	1	3	NR	0	1	trichloroethylene
Middle Twp	105	4	0	3	NR	0	1	tetrachloroethylene, trichloroethylene
Ocean City	1	0	0	0	NR	0	0	
Sea Isle City	1	0	0	0	NR	0	0	
Upper Twp	75	5	0	4	NR	0	1	trichloroethylene
West Cape May Boro	1	0	0	0	NR	0	0	
Cape May Totals:	354	18	2	13	NR	0	3	

Cumberland County

Municipality	# Wells Sampled	# Wells over MCL	Fecal/ E.coli	Nitrate	Arsenic	Mercury	Any VOC over the MCL	VOCs over MCL
Bridgeton City	2	1	0	1	NR	0	0	
Commercial Twp	25	3	0	0	NR	1	2	trichloroethylene
Deerfield Twp	14	3	0	2	NR	1	0	
Downe Twp	4	0	0	0	NR	0	0	
Fairfield Twp	13	1	0	0	NR	0	1	trichloroethylene
Greenwich Twp	6	0	0	0	NR	0	0	
Hopewell Twp	10	2	0	1	NR	0	1	trichloroethylene
Lawrence Twp	11	2	1	1	NR	0	0	
Maurice River Twp	10	2	0	0	NR	1	1	benzene
Millville City	15	2	1	1	NR	0	0	
Shiloh Boro	2	1	0	1	NR	0	0	
Stow Creek Twp	2	1	0	1	NR	0	0	
Upper Deerfield Twp	19	5	0	5	NR	0	0	
Vineland City	28	5	0	2	NR	1	3	1,2-dichloropropane, tetrachloroethylene, trichloroethylene
Cumberland County Totals:	161	28	2	15	NR	4	8	

Essex County

Municipality	# Wells Sampled	# Wells over MCL	Fecal/ E.coli	Nitrate	Arsenic	Mercury	Any VOC over the MCL	VOCs over MCL
Fairfield Twp	5	0	0	0	0	NR	0	
Montclair Town	1	0	0	0	0	NR	0	
North Caldwell Boro	1	0	0	0	0	NR	0	
West Orange Town	1	1	0	0	0	NR	1	tetrachloroethylene
Essex County Totals:	8	1	0	0	0	NR	1	

Gloucester County

Municipality	# Wells Sampled	# Wells over MCL	Fecal/ E.coli	Nitrate	Arsenic	Mercury	Any VOC over the MCL	VOCs over MCL
Clayton Boro	2	0	0	0	NR	0	0	
Deptford Twp	1	0	0	0	NR	0	0	
East Greenwich Twp	4	0	0	0	NR	0	0	
Elk Twp	17	1	0	1	NR	0	0	
Franklin Twp	94	13	0	8	NR	2	3	tetrachloroethylene, trichloroethylene
Glassboro Boro	3	0	0	0	NR	0	0	
Greenwich Twp	2	0	0	0	NR	0	0	
Harrison Twp	27	0	0	0	NR	0	0	
Logan Twp	2	0	0	0	NR	0	0	
Mantua Twp	7	0	0	0	NR	0	0	
Monroe Twp	55	6	0	2	NR	1	4	tetrachloroethylene, trichloroethylene
Newfield Boro	1	0	0	0	NR	0	0	
Pitman Boro	1	0	0	0	NR	0	0	
South Harrison Twp	14	0	0	0	NR	0	0	
Swedesboro Boro	2	0	0	0	NR	0	0	
Washington Twp	14	0	0	0	NR	0	0	
West Deptford Twp	1	0	0	0	NR	0	0	
Woolwich Twp	41	2	2	0	NR	0	0	
Gloucester County Totals:	288	22	2	11	NR	3	7	

Hunterdon County

Municipality	# Wells Sampled	# Wells over MCL	Fecal/ E.coli	Nitrate	Arsenic	Mercury	Any VOC over the MCL	VOCs over MCL
Alexandria Twp	22	4	1	1	2	NR	0	
Bethlehem Twp	26	1	1	0	0	NR	0	
Califon Boro	10	1	0	1	0	NR	0	
Clinton Town	3	0	0	0	0	NR	0	
Clinton Twp	36	3	2	0	0	NR	1	tetrachloroethylene
Delaware Twp	33	7	2	1	4	NR	0	
East Amwell Twp	34	8	1	0	7	NR	0	
Flemington Boro	23	1	0	0	1	NR	0	
Franklin Twp	21	3	1	1	1	NR	0	
Frenchtown Boro	4	0	0	0	0	NR	0	
Glen Gardner Boro	2	0	0	0	0	NR	0	
Hampton Boro	6	0	0	0	0	NR	0	
Holland Twp	24	1	0	0	1	NR	0	
Kingwood Twp	25	6	2	1	3	NR	0	
Lambertville City	3	0	0	0	0	NR	0	
Lebanon Boro	4	0	0	0	0	NR	0	
Lebanon Twp	37	0	0	0	0	NR	0	
Milford Boro	7	0	0	0	0	NR	0	
Raritan Twp	108	14	2	1	12	NR	0	
Readington Twp	63	8	4	1	3	NR	0	
Stockton Boro	2	0	0	0	0	NR	0	
Tewksbury Twp	36	2	1	0	1	NR	0	
Union Twp	25	0	0	0	0	NR	0	
West Amwell Twp	20	4	2	1	1	NR	0	
Hunterdon County Totals:	574	63	19	8	36	NR	1	

Mercer County

Municipality	# Wells Sampled	# Wells over MCL	Fecal/ E.coli	Nitrate	Arsenic	Mercury	Any VOC over the MCL	VOCs over MCL
East Windsor Twp	3	0	0	0	0	NR	0	
Ewing Twp	16	3	0	0	1	NR	2	tetrachloroethylene, trichloroethylene
Hamilton Twp	3	0	0	0	0	NR	0	
Hopewell Boro	3	0	0	0	0	NR	0	
Hopewell Twp	81	11	2	1	6	NR	2	trichloroethylene
Lawrence Twp	9	0	0	0	0	NR	0	
Pennington Boro	3	0	0	0	0	NR	0	
Princeton Boro	2	1	0	0	0	NR	1	tetrachloroethylene
Princeton Twp	2	1	0	0	1	NR	0	
Washington Twp	3	0	0	0	0	NR	0	
West Windsor Twp	6	0	0	0	0	NR	0	
Mercer County Totals:	131	16	2	1	8	NR	5	

Middlesex County

Municipality	# Wells Sampled	# Wells over MCL	Fecal/ E.coli	Nitrate	Arsenic	Mercury	Any VOC over the MCL	VOCs over MCL
Cranbury Twp	3	2	0	2	0	NR	0	
Dunellen Boro	1	0	0	0	0	NR	0	
Edison Twp	6	0	0	0	0	NR	0	
Helmetta Boro	1	0	0	0	0	NR	0	
Metuchen Boro	2	1	0	1	0	NR	0	
Middlesex Boro	4	0	0	0	0	NR	0	
Monroe Twp	7	0	0	0	0	NR	0	
Piscataway Twp	14	0	0	0	0	NR	0	
Plainsboro Twp	4	2	0	2	0	NR	0	
South Brunswick Twp	4	0	0	0	0	NR	0	
South Plainfield Boro	1	0	0	0	0	NR	0	
Woodbridge Twp	3	0	0	0	0	NR	0	
Middlesex County Totals:	50	5	0	5	0	NR	0	

Monmouth County

Municipality	# Wells Sampled	# Wells over MCL	Fecal/ E.coli	Nitrate	Arsenic	Mercury	Any VOC over the MCL	VOCs over MCL
Allentown Boro	2	0	0	0	NR	0	0	
Colts Neck Twp	67	1	0	0	NR	0	1	benzene
Eatontown Boro	1	0	0	0	NR	0	0	
Englishtown Boro	1	0	0	0	NR	0	0	
Farmingdale Boro	4	1	0	1	NR	0	0	
Freehold Boro	2	0	0	0	NR	0	0	
Freehold Twp	21	1	0	1	NR	0	0	
Holmdel Twp	2	0	0	0	NR	0	0	
Howell Twp	89	3	0	2	NR	0	1	trichloroethylene
Manalapan Twp	25	0	0	0	NR	0	0	
Marlboro Twp	13	0	0	0	NR	0	0	
Middletown Twp	2	0	0	0	NR	0	0	
Millstone Twp	34	0	0	0	NR	0	0	
Monmouth Beach Boro	1	0	0	0	NR	0	0	
Ocean Twp	1	0	0	0	NR	0	0	
Upper Freehold Twp	13	0	0	0	NR	0	0	
Wall Twp	6	1	0	0	NR	0	1	tetrachloroethylene
West Long Branch Boro	2	1	0	0	NR	0	1	trichloroethylene
Monmouth County Totals:	286	8	0	4	NR	0	4	

Morris County

Municipality	# Wells Sampled	# Wells over MCL	Fecal/ E.coli	Nitrate	Arsenic	Mercury	Any VOC over the MCL	VOCs over MCL
Boonton Town	7	0	0	0	0	NR	0	
Boonton Twp	15	3	1	1	0	NR	1	carbon tetrachloride, methylene chloride
Butler Boro	1	0	0	0	0	NR	0	
Chatham Twp	2	1	0	0	1	NR	0	
Chester Boro	7	0	0	0	0	NR	0	
Chester Twp	35	2	1	1	0	NR	0	
Denville Twp	7	0	0	0	0	NR	0	
East Hanover Twp	2	0	0	0	0	NR	0	
Hanover Twp	1	0	0	0	0	NR	0	
Harding Twp	22	4	3	0	1	NR	0	
Jefferson Twp	61	7	3	3	1	NR	1	trichloroethylene
Kinnelon Boro	52	1	0	1	0	NR	0	
Lincoln Park Boro	4	0	0	0	0	NR	0	
Long Hill Twp	3	0	0	0	0	NR	0	
Mendham Boro	8	2	0	1	1	NR	0	
Mendham Twp	15	0	0	0	0	NR	0	
Mine Hill Twp	3	0	0	0	0	NR	0	
Montville Twp	30	4	1	2	1	NR	1	trichloroethylene
Morris Twp	6	1	1	0	0	NR	0	
Mount Arlington Boro	17	1	0	1	0	NR	0	
Mount Olive Twp	50	6	0	4	1	NR	1	trichloroethylene
Pequannock Twp	1	0	0	0	0	NR	0	
Randolph Twp	24	2	0	2	0	NR	0	
Riverdale Boro	1	0	0	0	0	NR	0	
Rockaway Boro	7	0	0	0	0	NR	0	
Rockaway Twp	17	3	0	2	1	NR	0	
Roxbury Twp	26	0	0	0	0	NR	0	
Washington Twp	33	0	0	0	0	NR	0	
Wharton Boro	1	0	0	0	0	NR	0	
Morris County Totals:	458	37	10	18	7	NR	4	

Ocean County

Municipality	# Wells Sampled	# Wells over MCL	Fecal/ E.coli	Nitrate	Arsenic	Mercury	Any VOC over the MCL	VOCs over MCL
Barnegat Twp	10	0	0	0	NR	0	0	
Berkeley Twp	25	2	0	1	NR	0	1	tetrachloroethylene
Brick Twp	1	0	0	0	NR	0	0	
Dover Twp	39	1	0	0	NR	0	1	trichloroethylene
Eagleswood Twp	8	0	0	0	NR	0	0	
Jackson Twp	98	0	0	0	NR	0	0	
Lacey Twp	5	0	0	0	NR	0	0	
Lakewood Twp	34	1	0	0	NR	0	1	trichloroethylene
Little Egg Harbor Twp	19	1	0	1	NR	0	0	
Manchester Twp	18	0	0	0	NR	0	0	
Ocean Twp	2	0	0	0	NR	0	0	
Plumsted Twp	28	0	0	0	NR	0	0	
South Toms River Boro	1	0	0	0	NR	0	0	
Stafford Twp	75	1	0	0	NR	0	1	MTBE
Tuckerton Boro	2	0	0	0	NR	0	0	
Ocean County Totals:	365	6	0	2	NR	0	4	

Passaic County

Municipality	# Wells Sampled	# Wells over MCL	Fecal/ E.coli	Nitrate	Arsenic	Mercury	Any VOC over the MCL	VOCs over MCL
Bloomingtondale Boro	9	0	0	0	0	NR	0	
Haledon Boro	1	0	0	0	0	NR	0	
North Haledon Boro	24	1	0	1	0	NR	0	
Ringwood Boro	32	7	1	6	0	NR	1	trichloroethylene
Totowa Boro	1	0	0	0	0	NR	0	
Wanaque Boro	4	0	0	0	0	NR	0	
Wayne Twp	14	3	1	1	0	NR	2	1,1-dichloroethylene, tetrachloroethylene
West Milford Twp	162	15	3	7	0	NR	5	1,2-dichloroethane, 1,2-dichloroethylene, trichloroethylene
West Paterson Boro	2	2	0	2	0	NR	0	
Passaic County Totals:	249	28	5	17	0	NR	8	

Salem County

Municipality	# Wells Sampled	# Wells over MCL	Fecal/ E.coli	Nitrate	Arsenic	Mercury	Any VOC over the MCL	VOCs over MCL
Alloway Twp	23	2	0	2	NR	0	0	
Elsinboro Twp	4	0	0	0	NR	0	0	
Lower Alloways Creek Twp	4	0	0	0	NR	0	0	
Mannington Twp	4	0	0	0	NR	0	0	
Oldmans Twp	1	1	0	1	NR	0	0	
Pennsville Twp	1	0	0	0	NR	0	0	
Pilesgrove Twp	20	1	0	1	NR	0	0	
Pittsgrove Twp	27	5	0	5	NR	1	0	
Quinton Twp	9	0	0	0	NR	0	0	
Salem City	1	0	0	0	NR	0	0	
Upper Pittsgrove Twp	6	0	0	0	NR	0	0	
Woodstown Boro	1	0	0	0	NR	0	0	
Salem County Totals:	101	9	0	9	NR	1	0	

Somerset County

Municipality	# Wells Sampled	# Wells over MCL	Fecal/ E.coli	Nitrate	Arsenic	Mercury	Any VOC over the MCL	VOCs over MCL
Bedminster Twp	7	0	0	0	0	NR	0	
Bernards Twp	6	2	2	0	0	NR	0	
Bernardsville Boro	13	2	0	2	0	NR	0	
Bound Brook Boro	4	0	0	0	0	NR	0	
Branchburg Twp	32	8	6	0	2	NR	0	
						NR		
Bridgewater Twp	52	7	3	0	2		3	1,1- dichloroethylene, trichloroethylene
Far Hills Boro	6	0	0	0	0	NR	0	
Franklin Twp	51	8	4	3	3	NR	0	
Green Brook Twp	5	0	0	0	0	NR	0	
Hillsborough Twp	45	4	2	1	2	NR	0	
Montgomery Twp	39	7	1	0	7	NR	0	
North Plainfield Boro	2	0	0	0	0	NR	0	
South Bound Brook Boro	3	0	0	0	0	NR	0	
Somerville Boro	3	1	0	0	1	NR	0	
Warren Twp	27	0	0	0	0	NR	0	
Watchung Boro	18	3	3	0	1	NR	0	
Somerset County Totals:	313	42	21	6	18	NR	3	

Sussex County

Municipality	# Wells Sampled	# Wells over MCL	Fecal/ E.coli	Nitrate	Arsenic	Mercury	Any VOC over the MCL	VOCs over MCL
Andover Boro	5	0	0	0	NR	NR	0	
Andover Twp	24	4	1	3	NR	NR	0	
Branchville Boro	9	0	0	0	NR	NR	0	
Byram Twp	15	0	0	0	NR	NR	0	
Frankford Twp	17	1	1	0	NR	NR	0	
Franklin Boro	7	0	0	0	NR	NR	0	
Fredon Twp	35	2	2	0	NR	NR	0	
Green Twp	18	1	0	1	NR	NR	0	
Hamburg Boro	2	0	0	0	NR	NR	0	
Hampton Twp	21	0	0	0	NR	NR	0	
Hardyston Twp	20	3	3	1	NR	NR	0	
Hopatcong Boro	94	27	2	24	NR	NR	2	tetrachloroethylene
Lafayette Twp	7	0	0	0	NR	NR	0	
Montague Twp	19	2	1	0	NR	NR	1	benzene
Newton Town	7	0	0	0	NR	NR	0	
Ogdensburg Boro	1	0	0	0	NR	NR	0	
Sandyston Twp	13	0	0	0	NR	NR	0	
Sparta Twp	36	2	1	1	NR	NR	0	
Stanhope Boro	9	2	0	2	NR	NR	0	
Stillwater Twp	11	2	1	1	NR	NR	0	
Sussex Boro	9	0	0	0	NR	NR	0	
Vernon Twp	153	20	4	17	NR	NR	2	tetrachloroethylene, trichloroethylene
Wantage Twp	69	8	4	4	NR	NR	0	
Sussex County Totals:	601	74	20	54	NR	NR	5	

Union County

Municipality	# Wells Sampled	# Wells over MCL	Fecal/ E.coli	Nitrate	Arsenic	Mercury	Any VOC over the MCL	VOCs over MCL
Berkley Heights Twp	1	0	0	0	0	NR	0	
Clark Twp	1	1	0	0	0	NR	1	trichloroethylene
Mountainside Boro	1	0	0	0	0	NR	0	
Scotch Plains Twp	3	0	0	0	0	NR	0	
Westfield Town	1	0	0	0	0	NR	0	
Union County Totals:	7	1	0	0	0	NR	1	

Warren County

Municipality	# Wells Sampled	# Wells over MCL	Fecal/ E.coli	Nitrate	Arsenic	Mercury	Any VOC over the MCL	VOCs over MCL
Allamuchy Twp	8	0	0	0	NR	NR	0	
Alpha Boro	1	0	0	0	NR	NR	0	
Belvidere Town	8	0	0	0	NR	NR	0	
Blairstown Twp	42	2	2	0	NR	NR	0	
Franklin Twp	20	3	0	3	NR	NR	0	
Frelinghuysen Twp	8	1	0	0	NR	NR	1	tetrachloroethylene
Greenwich Twp	10	1	0	0	NR	NR	1	trichloroethylene
Hackettstown Town	10	0	0	0	NR	NR	0	
Hardwick Twp	5	0	0	0	NR	NR	0	
Harmony Twp	14	1	0	1	NR	NR	0	
Hope Twp	10	1	1	0	NR	NR	0	
Independence Twp	15	0	0	0	NR	NR	0	
Knowlton Twp	32	0	0	0	NR	NR	0	
Liberty Twp	16	0	0	0	NR	NR	0	
Lopatcong Twp	5	0	0	0	NR	NR	0	
Mansfield Twp	10	0	0	0	NR	NR	0	
Oxford Twp	14	1	1	0	NR	NR	0	
Phillipsburg Town	3	0	0	0	NR	NR	0	
Pohatcong Twp	6	0	0	0	NR	NR	0	
Washington Twp	16	1	0	0	NR	NR	1	trichloroethylene
White Twp	11	1	1	0	NR	NR	0	
Warren County Totals:	264	12	5	4	NR	NR	3	

Appendix C: Definitions and Terms

The following words and terms used in this report shall have the following meanings unless otherwise noted:

Act - refers to the Private Well Testing Act, P.L. 2001, c. 40; N.J.S.A. 58:12A-26 et seq., which applies to buyers, sellers and lessors of certain real property as follows:

(a) All contracts of sale for any real property in which the potable water supply is a private well located on the property, or for any other real property in which the potable water supply is a well that has less than 15 service connections or that does not regularly serve an average of at least 25 individuals daily at least 60 days out of the year, shall include a provision requiring the testing of that water supply for certain parameters as set forth in the Act. (b) The lessor of any real property in which the potable water supply is a private well for which testing of the water is not required pursuant to any other State law. The lessor shall test that water supply for certain parameters as set forth in the Act. Testing of the water is required at least once every five years. In addition, within 30 days after receipt of the test results, a written copy of the results must be provided to each rental unit and each new lessee.

Acute parameter - a contaminant in drinking water that has significant potential to have serious and adverse effects on human health as a result of short-term or limited exposure.

Authorized representative – refers to a person other than an employee of a New Jersey certified laboratory from which a New Jersey certified laboratory accepts a drinking water well sample(s) and also accepts responsibility for such a sample(s) in accordance with the requirements of N.J.A.C. 7:18-9.1(c).

Certified laboratory - any laboratory, facility, consulting firm, government or private agency, business entity or other person that the Department has authorized pursuant to the Regulations Governing The Certification of Laboratories and Environmental Measurements, N.J.A.C. 7:18, to perform analysis in accordance with the procedures of a given analytical method using a particular technique as set forth in a certain methods reference document, and to report the results from the analysis of environmental samples in compliance with a Department regulatory program.

Contaminant – Any physical, chemical, biological, or radiological substance or matter that has an adverse affect on air, water or soil.

Drinking Water Quality Standard - means a standard that applies to a contaminant that is required to be tested pursuant to the New Jersey Safe Drinking Water Act, N.J.S.A. 58:12A-1 et seq. that include a maximum contaminant level, recommended limits, or in the case of lead analysis, an action level.

Exceedance - the concentration of a contaminant that is greater than a MCL, action level, standard or recommended upper limit for that given contaminant.

Global Positioning System (GPS) Location – refers to a specific geographic location on the earth's surface as determined by satellite radio signals.

Local health authority - a county, regional or municipal health agency that serves as the lead point of contact with the Department on environmental issues. This agency would ordinarily be the local health agency certified pursuant to the County Environmental Health Act (CEHA), N.J.S.A. 26:3A2-21 et seq. In those counties that do not have a certified CEHA health agency, the local health authority is the agency that serves as the lead for administering the Local Information Networks and Communication System (LINCS) as designated by the Department of Health and Senior Services.

Maximum contaminant level (MCL) - the maximum permissible concentration of a contaminant in drinking water. Maximum contaminant levels shall apply to public and non-public water systems, in accordance with the New Jersey Safe Drinking Water Act, N.J.S.A.58:12A-1 et seq. and implementing rules at N.J.A.C. 7:10.

Parameter - a general term that includes other terms such as contaminant, constituent, substance, metal, organic/inorganic chemical, and characteristics that are used to designate an analyte, group of analytes, attribute, or physical property.

Point-of-entry treatment (POET) device - means a water treatment device applied to the drinking water entering a house or building for the purpose of reducing contaminants in the drinking water distributed to the entire the house or building. Examples of POET include such devices such as calcite filters and ion exchange (water softeners).

Point-of-use treatment (POUT) device - refers to a water treatment device applied to a single tap for the purpose of reducing contaminants in drinking water at that individual tap. Examples of POUT include such devices as reverse osmosis or distillers.

Potable water - any water used, or intended to be used, for drinking and/or culinary purposes which is free from impurities in amounts sufficient to cause disease or harmful physiological effects, and complies with the bacteriological and chemical quality conforming to applicable standards the New Jersey Safe Drinking Water Act rules at N.J.A.C. 7:10.

Potability – The ability to drink potable water. (See *Potable Water*).

Private well - a potable water well that serves a dwelling unit and is located on the same real property as the dwelling unit.

Public notification - a general notice sent by the appropriate local health authority of private well test failures to surrounding and/or neighboring owners of real property. The notification can include recommendations to test for the parameters of concern to the owners of surrounding or neighboring properties served by wells.

Recommended limit - the optimum range for pH or upper limit for iron, and manganese, in accordance with the New Jersey Safe Drinking Water Act rules at N.J.A.C. 7:10-7.

Reporting laboratory - the certified laboratory responsible for reporting a

complete set of required information related to the analysis of a private well sample to the Department.

Secondary parameter - a drinking water contaminant regulated for aesthetic purposes rather than health effects under the SDWA rules at N.J.A.C. 7:10. Secondary parameters include pH, iron and manganese.

Water test failure - means an exceedance of an applicable drinking water quality standard of a required test parameter under the Private Well Testing Act. This term includes all applicable maximum contaminant levels, recommended limits, or an action level for lead analysis.

Water treatment system - means a device applied to the drinking water at a house or building for the purpose of reducing contaminants in the drinking water distributed in the house or building. Examples: point-of-entry devices and point-of-use devices.

Well - means a hole or excavation larger than four inches in diameter or a hole or excavation deeper than 10 feet in depth that is drilled, bored, cored, driven, jetted, dug, or otherwise constructed for the purpose of removal or emplacement of, or investigation of, or exploration for, fluids, water, oil, gas, minerals, soil, or rock.

Well permit - refers to a written approval issued by the Department, pursuant to Well Construction and Maintenance at N.J.A.C. 7:9D, to a licensed well driller which authorizes a licensed well driller of the proper class to construct a well or wells.

Well record - means the form provided by the Department that depicts the construction details of a well, which is completed by the well driller subsequent to well permit issuance and well installation.

Appendix D: PWTA Parameters and Applicable Standards



New Jersey Private Well Testing Act Primary and Secondary Drinking Water Standards

Primary Standards

Secondary Standards

(Primarily Aesthetics)

Volatile Organic Compounds	MCL	Units
Benzene	1	µg/l
Carbon Tetrachloride	2	µg/l
meta-Dichlorobenzene	600	µg/l
ortho-Dichlorobenzene	600	µg/l
para-Dichlorobenzene	75	µg/l
1,1-Dichloroethane	50	µg/l
1,2-Dichloroethane	2	µg/l
1,1-Dichloroethylene	2	µg/l
cis-1,2-Dichloroethylene	70	µg/l
trans-1,2-Dichloroethylene	100	µg/l
1,2-Dichloropropane	5	µg/l
Ethylbenzene	700	µg/l
Methyl tertiary butyl ether	70	µg/l
Methylene Chloride	3	µg/l
Monochlorobenzene	50	µg/l
Naphthalene	300	µg/l
Styrene	100	µg/l
1,1,2,2-Tetrachloroethane	1	µg/l
Tetrachloroethylene	1	µg/l
Toluene	1,000	µg/l
1,2,4-Trichlorobenzene	9	µg/l
1,1,1-Trichloroethane	30	µg/l
1,1,2-Trichloroethane	3	µg/l
Trichloroethylene	1	µg/l
Vinyl Chloride	2	µg/l
Xylenes (Total)	1,000	µg/l

Inorganic Compounds	MCL	Units
Mercury	2	µg/l
Nitrates	10,000	µg/l
Arsenic	50*	µg/l
Lead	10**	µg/l

Microbiological	MCL	Units
Total Coliform	0	pres/abs
Fecal Coliform [†]	0	pres/abs
E. coli [†]	0	pres/abs

Radiological ^{##}	MCL	Units
Gross Alpha (initial)	5 [#]	pCi/L
Gross Alpha (final)	15	pCi/L

Secondaries	Standard [‡]	Units
pH	6.5-8.5	Optimum Range
Iron	0.3	mg/l
Manganese	0.05	mg/l

UNITS:

µg/l=micrograms/liter (ppb)

mg/l=milligrams/liter (ppm)

pCi/L=picocuries/liter

pres/abs=presence or absence

MCL= Maximum Contaminant Level

[‡]Standard means Recommended Upper Limit

^{*}As of January 23, 2006 the MCL for Arsenic will be 10

^{}Ground Water Quality Standard NJAC 7:9-6**

[†] Either one is required if Total Coliform is present

^{##} Gross alpha particle testing is phased in over time based on county location of the well. The effective dates are:

3/15/03 - Cumberland and Gloucester counties

9/16/03 - Atlantic, Burlington, Camden, and Salem counties

3/16/04 - Cape May, Hunterdon, Mercer, Middlesex, Morris, Monmouth, and Ocean counties

^{*} Results greater than 5 pCi/L requires a second gross alpha count. The MCL for gross alpha is 15 pCi/L.

Appendix E: New Jersey Private Well Test Reporting Form

New Jersey Private Well Water Test Reporting Form

The New Jersey Private Well Test Reporting Form is a standardized form to be used exclusively by laboratories reporting well test results to their client in accordance with the Private Well Testing Act Regulations N.J.A.C. 7:9E.

These laboratory analyses were completed for the purposes of complying with the Private Well Testing Act.

In accordance with the Private Well Testing Act Regulations all analytical results except for coliform (total, fecal, or e. coli) shall remain valid for a period of one year from the date of sample collection. All coliform (total, fecal, or e. coli) analytical results shall remain valid for a period of six months from the date of sample collection.

- ☐ Analytical results meet primary and secondary contaminant standards for drinking water
- ☐ One or more of the analytical results do not meet primary⁺ contaminant standards for drinking water
- ☐ One or more of the analytical results do not meet secondary⁺⁺ contaminant standards for drinking water

CLIENT INFORMATION:

Name: _____ Date Test Requested: _____

Mailing Address & Phone #: _____

PROPERTY INFORMATION:

Property Address: _____ Municipality: _____ Muni Code (4 digit): _____

County: _____ Property Lot: _____ Block: _____

GPS Location- State Plane Coordinates (feet): (X) _____ (Y) _____

GPS Coordinate Origin (Circle One): Well Head/ Front Door/Sample Collection Point/Other (Explain): _____

NJ Well Permit or Well Record Number: _____ (if known)

LABORATORY INFORMATION:

Reporting Laboratory Name & ID #: _____

Reporting Laboratory Address & Phone #: _____

SAMPLE INFORMATION:

Sample Collector Name: _____

Authorized Representative/Certified Laboratory Employee Lab Certification ID #: _____

Sample Type: **NOTE: Only raw or untreated water samples meet the requirements of the PWTA regulations N.J.A.C. 7:9E.**

a.) Indicate Specific Location of Sample Collected: _____

b.) Type of Treatment Device(s) Installed (if known): _____

⁺ Primary Drinking Water contaminants are those contaminants that have Maximum Contaminant Levels or Action Levels established to protect health. The Primary Drinking Water contaminants are coliform bacteria, nitrate (total), lead, the volatile organic compounds, arsenic, mercury and gross alpha. The standards for primary contaminants are the maximum permissible levels allowed in drinking water based on ingesting the drinking water over the course of a lifetime.

⁺⁺ Secondary Drinking Water contaminants are those contaminants that have Recommended Upper Limits or Optimum Ranges established to protect against those properties that adversely effect the taste, odor, or appearance of drinking water. The Secondary Drinking Water contaminants are iron, manganese and pH.

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SUMMARY OF WELL WATER TEST RESULTS:

Required Test Parameters	Result	Units	Applicable Standard (Maximum Contaminant Level, Action Level or Recommended Limit)	Standard Exceeded (Y/N)	Laboratory Certification ID #	Analytical Method
Microbial Parameters						
Total Coliform		Pres/Abs	Absent			
Fecal Coliform*		Pres/Abs	Absent			
<i>E. coli</i> *		Pres/Abs	Absent			
Metals						
Arsenic [#]		ug/l	50 ug/l			
Mercury [^]		ug/l	2 ug/l			
Lead**		ug/l	10 ug/l **			
Iron		mg/l	0.3 mg/l			
Manganese		mg/l	0.05 mg/l			
General Chemistry						
pH		su	6.5-8.5 (optimum range)			
Nitrate (total)		ug/l	10,000 ug/l			
Volatile Organic Compounds						
Benzene		ug/l	1 ug/l			
Carbon Tetrachloride		ug/l	2 ug/l			
meta-Dichlorobenzene		ug/l	600 ug/l			
ortho-Dichlorobenzene		ug/l	600 ug/l			
para-Dichlorobenzene		ug/l	75 ug/l			
1,1-Dichloroethane		ug/l	50 ug/l			
1,2-Dichloroethane		ug/l	2 ug/l			
1,1-Dichloroethylene		ug/l	2 ug/l			
cis-1,2-Dichloroethylene		ug/l	70 ug/l			
trans-1,2-Dichloroethylene		ug/l	100 ug/l			
1,2-Dichloropropane		ug/l	5 ug/l			
Ethylbenzene		ug/l	700 ug/l			
Methyl tertiary-butyl ether		ug/l	70 ug/l			
Methylene Chloride		ug/l	3 ug/l			
Monochlorobenzene		ug/l	50 ug/l			
Naphthalene		ug/l	300 ug/l			
Styrene		ug/l	100 ug/l			
1,1,2,2-Tetrachloroethane		ug/l	1 ug/l			
Tetrachloroethylene		ug/l	1 ug/l			
Toluene		ug/l	1,000 ug/l			
1,2,4-Trichlorobenzene		ug/l	9 ug/l			
1,1,1-Trichloroethane		ug/l	30 ug/l			
1,1,2-Trichloroethane		ug/l	3 ug/l			
Trichloroethylene		ug/l	1 ug/l			
Vinyl Chloride		ug/l	2 ug/l			
Xylenes (total)		ug/l	1,000 ug/l			
Radiological Parameters						
Gross Alpha (initial)~		pCi/l	5 pCi/l~	Not Applicable		
Gross Alpha (final)~		pCi/l	15 pCi/l			

UNITS: Pres/Abs=presence or absence; ug/l= micrograms per liter (also known as parts per billion); mg/l=milligrams per liter (also known as parts per million); pCi/l=picocuries per liter; su=standard units.

* If total coliform bacteria are detected then additional analyses are required to determine the specific type (fecal or *E. coli*) present. Fecal coliform or *E. coli* analysis are not required if total coliform sample results indicate the absence of total coliform bacteria.

** The results of a "flushed" raw (untreated) water sample, which is required by the Private Well Testing Act regulations, should be compared to the Ground Water Quality Standard of 10 ug/l found at N.J.A.C.7: 9-6 et seq. The Lead Action Level of 15 ug/l applies to a one liter first-draw tap sample collected from a cold water kitchen or bathroom tap/sink in which the water has remained motionless in the plumbing system for at least six hours [40 CFR 141.86(b)(2)]. This type of standing-water sample is NOT required by the Private Well Testing Act regulations.

Arsenic analysis is required only in Bergen, Essex, Hudson, Hunterdon, Mercer, Middlesex, Morris, Passaic, Somerset and Union Counties. The current USEPA MCL for arsenic is 50ug/l (ppb). A new MCL of 10ug/l (ppb) has been adopted by the USEPA and will take effect nationally in January 2006.

^ Mercury analysis is required only in Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Monmouth, Ocean, and Salem Counties.

~ Gross alpha particle activity testing will be required in Cumberland and Gloucester Counties starting March 15, 2003; Atlantic, Burlington, Camden and Salem Counties starting September 16, 2003; Cape May, Hunterdon, Mercer, Middlesex, Monmouth and Ocean Counties starting March 16, 2004. If the initial Gross alpha particle count exceeds 5 pCi/l a second count is required according to the Method. The MCL for Gross alpha particle activity is 15 pCi/l.

New Jersey Private Well Water Test Reporting Form

The New Jersey Private Well Test Reporting Form is a standardized form to be used exclusively by laboratories reporting well test results to their client in accordance with the Private Well Testing Act Regulations N.J.A.C. 7:9E.

These laboratory analyses were completed for the purposes of complying with the Private Well Testing Act

ADDITIONAL SAMPLE INFORMATION:

Coliform Analyses:

Date/Time Sample Collected: _____ Date/Time Sample Analyzed: _____ Sample ID Number: _____

Date/Time Sample Collected: _____ Date/Time Sample Analyzed: _____ Sample ID Number: _____

Volatile Organics:

Date/Time Sample Collected: _____ Date/Time Sample Analyzed: _____ Sample ID Number: _____

Inorganics:

Date/Time Sample Collected: _____ Date/Time Sample Analyzed: _____ Sample ID Number: _____

Date/Time Sample Collected: _____ Date/Time Sample Analyzed: _____ Sample ID Number: _____

pH Analysis:

Date/Time Sample Collected: _____ Date/Time Sample Analyzed: _____ Sample ID Number: _____

Gross Alpha Analyses:

Date/Time Sample Collected: _____ Date/Time Sample Analyzed: _____ Sample ID Number: _____

Date(s) All Analyses Received by Reporting Lab from Subcontracted Lab (if applicable): _____

CERTIFICATION OF RESULTS:

I certify in writing that all sampling, analyses, and reporting performed herein, comply with all requirements set forth in N.J.A.C. 7:9E and N.J.A.C. 7:18, and hereby certify that this laboratory is in compliance with all laboratory certification and quality control procedures and requirements as set forth in N.J.A.C. 7:18.

Laboratory Manager or Designee

Date

ADDITIONAL INFORMATION:

I. Treatment Options

Listed below are the common treatments available to homeowners having well contamination above a Maximum Contaminant Level, Action Level or Recommended Limit. The goal of water treatment is the removal of contaminants to levels below the Maximum Contaminant Level, Action Level or Recommended Limit. For additional information on home treatment devices contact your local/county health department or the NJDEP Private Well Testing Act Hotline at **1-866-4PW-TEST** or visit the Private Well Testing Act webpage at: www.state.nj.us/dep/pwta for links to other appropriate websites, such as the National Sanitation Foundation website at www.nsf.org, or the USEPA website at www.epa.gov/safewater. You may also call the USEPA Drinking Water Hotline at (800) 426-4791 to obtain a copy of USEPA's pamphlet entitled "Home Water Treatment Units" (WH-550A). All treatment devices must be properly maintained in accordance with manufacturer recommendations to ensure operating efficiency in removing contaminants. As noted below, not all treatment devices remove every contaminant; there may be more than one device installed if multiple contaminants exist in the drinking water. Water treatment companies may be found by consulting the yellow pages of your local area phone book.

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SUMMARY OF TREATMENT OPTIONS FOR HOMEOWNERS

Treatment Type	Contaminants Treated
Activated Carbon Filtration	Some Organic Chemicals
	Taste
	Trihalomethanes
	Some Pesticides
	Odor
Air Stripping	Volatile Organic Compounds (higher concentrations)
	Iron (with filtration)
	Hydrogen Sulfide
	Radon Gas
Chlorinators	Bacteria (Coliform)
	Microbiological Contamination
Distillation	All Inorganic Chemicals (i.e., Nitrate, Sodium Chloride)
	Some Organic Chemicals
Ion Exchange	Hard Water (Water Softening)
	Manganese
	Some Heavy Metals
	Calcium
	Iron
Reverse Osmosis	Certain Organic Chemicals
	Nitrates
	Dissolved Solids/Metals
Mechanical Filtration	Turbidity
	Dirt
	Sediment
	Particulates (Loose Scale)
Bottled Water	Temporary Solution to Aesthetic Problems & Emergency Situations
KDF-55 with pH adjustment	Mercury
Ultraviolet Radiation	Bacteria (Coliform)
	Microbiological Contamination

II. Health Effects

Drinking water standards are established to protect consumers of drinking water from both adverse health effects (primary drinking water standards) and from qualities that make the water unpalatable (secondary drinking water standards). Both NJDEP and USEPA set drinking water standards; those in effect in New Jersey can be found at www.state.nj.us/dep/watersupply. Both NJDEP and USEPA periodically review this list and add or subtract contaminants based on new scientific information. Standard setting is summarized in a brochure entitled "Standards for Safe Drinking Water In New Jersey" available by calling **1-866-4PW-TEST**.

There are several resources available to assist in interpreting your test results. An informative booklet explaining drinking water results written by Rutgers Cooperative Extension Service entitled "Interpreting Drinking Water Quality Analysis - What do the Numbers Mean? - 5th edition" is available at www.rce.rutgers.edu/pubs/pdfs/e214.pdf. Health effects information developed by the USEPA is summarized at www.epa.gov/safewater/mcl.html. The New Jersey Department of Health and Senior Services, in conjunction with NJDEP's Bureau of Safe Drinking Water and Division of Science Research and Technology, has developed a series of brochures for drinking water and health that can be found at www.state.nj.us/health/eoh/hhazweb/edmat.html

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III. Recommendations for Additional Testing

The Private Well Testing Act regulations require well water samples to be collected from untreated or "raw" water. Raw water quality represents the well water quality. Additional water testing may be conducted to determine the effectiveness of a water treatment system or to determine if the distribution system (pipes) may be contributing additional contamination. In those cases sampling of treated or finished water at the tap is recommended. This additional testing of treated water is not required under the Private Well Testing Act regulations. For example, testing of finished water to determine the effectiveness of a treatment system to remove contaminants for a known, pre-existing water quality problem would be desirable. Below are recommendations for additional testing.

Scenario One: There is an existing treatment system or device installed at the house or building due to a known pre-existing water quality problem and raw water testing indicates that one or more parameters are above a Maximum Contaminant Level, Action Level, or Recommended Limit. NJDEP recommends that a second water sample be collected for the parameter(s) of concern at a location after the treatment system or device at a primary tap to insure that the system or device is working properly in removing or reducing the contaminants to below the applicable Maximum Contaminant Level, Action Level, or Recommended Limit.

Scenario Two: After testing, total and fecal coliform bacteria are found to be above the Maximum Contaminant Level. The well is subsequently treated via chlorine disinfection. Re-testing is recommended after a chlorine residual can no longer be detected to insure the effectiveness of the treatment.

Scenario Three: [FOR LEAD ANALYSIS ONLY] (**Note:** The Private Well Testing Act regulations require that a "flushed" sample be collected for lead analysis meaning the well water was run to remove any water that may have been in contact with the plumbing for an extended period of time). **In scenario three**, the flushed, untreated sample, collected at the tap, indicates there is lead contamination greater than 10 ug/l. The state's ground water quality standard of 10 ug/l is the more appropriate standard to apply to a "flushed" water sample rather than the drinking water Action Level of 15 ug/l, which is based on sampling drinking water that has been allowed to remain in the plumbing for at least six hours.

If the interested party wants to better evaluate the level of potential lead contamination from the plumbing system, a "first draw" (non-flushed) sample should also be analyzed for lead. This "first draw" water sample may likely contain the highest level of lead to which one is likely to be exposed. The results of this sample should be compared to the lead Action Level of 15ug/l. Results above 15 ug/l mean that there is a source of lead in the home plumbing system. The interested party may install treatment to make the water less corrosive and less likely to dissolve lead from the plumbing; may attempt to locate the source of the lead and remove it from the home plumbing system or may choose to run the water through the plumbing (or selected faucets) each morning to insure that the standing water is flushed through the pipes and is not consumed.

IV. Remediation/Treatment Funding Sources

- A.) The **Spill Fund Program** administered by the Bureau of Contract and Fund Management within the New Jersey Department of Environmental Protection offers help to innocent parties suffering from direct or indirect damages resulting from the discharge of a *hazardous substance*. A property owner may file a claim for reimbursement for most of the expenses incurred to install a treatment device for a potable well or to connect to a public water supply because of a hazardous substance in the well water. A claimant has **1 year** from the date he/she learns that the well is contaminated above standards to file a claim. There are specific requirements and guidelines for filing claims with the Spill Fund. For more information, please contact the NJDEP-Bureau of Contract and Fund Management at: 609-777-0101 or visit their website at: www.state.nj.us/dep/srp or you may write to the BCFM: NJDEP-BCFM/Spill Fund, P.O. Box 413, 401 E. State Street, Trenton, N.J. 08625-0413.
- B.) The **New Jersey Housing and Mortgage Finance Agency** (NJHMFA) has a Potable Water Loan Program that is available to owners of single family residences whose source of potable water exceeds the State of New Jersey's Primary Drinking Water Standards, including lead and mercury. In addition, the loan program covers iron and manganese although these contaminants do not have Primary Drinking Water Standards. For further information, please contact the NJHMFA Hotline at 1-800-NJHOUSE (1-800-654-6873) or they may be reached at: P.O. Box 18550, 637 South Clinton Avenue, Trenton, N.J. 08650-2085 or on the web at: www.state.nj.us/dca/hmfa