

Private Well Testing Act (PWTA) Program Overview and 2008 Data Report

Judy Louis, PhD., DSRT

John Shevlin, BSDW

NJ Department of Environmental Protection

Presented at: NJ Water Monitoring Council

May 20, 2009

New Jersey Private Well Testing Act - Summary of Rules

- ◆ **September 14, 2002** - Effective Date of Law
- ◆ Requires testing of private well water quality prior to the sale of real estate and leasing of real estate
- ◆ Buyer & Seller must certify in writing that they have received and reviewed the water test results at closing of title of sale.
- ◆ Results valid for 1 year (6 mo. for coliform), 5 years for rental properties
- ◆ Confidentiality : PWTA requires details such as owner name, address, location, results, etc. be kept **CONFIDENTIAL**, results are only to be used as "compilations" by municipality/county or by geographic region.

PWTA Sample Collection Requirements

- ◆ Samples must be collected and preserved in accordance with N.J.A.C. 7:18 (OQA Regulations.)
- ◆ RAW (untreated) well water from cold water, non-aerated spigot or tap if no water treatment exists.
- ◆ Well water samples must be collected either by a NJ Certified Laboratory, or by the laboratory's "authorized representative".
- ◆ Lead RAW water sample must be a flushed for at least 2 minutes (until temperature changes).
- ◆ All results must be submitted by the reporting lab electronically to DEP via E2/Compass Database System.

- Start Here!
What Should I Do First?
- Frequently Asked Questions (FAQ's)
- More Helpful Information & Regulatory References
- Resources for Certified Laboratories
- Technical Resources
- What Every Well Owner Should Know
- Have a Question? Contact Us Directly

BUYING OR SELLING A HOME WITH A PRIVATE WELL?

This site will help you understand the requirements of New Jersey's Private Well Testing Act (PwTA) - a new law aimed at disclosing important information about private drinking water wells. Under the PwTA, certain wells must be tested before a house can be sold. Landlords of certain properties must also test for certain drinking water parameters and provide a written copy of the result to their tenants. This testing provides important information about your drinking water quality.

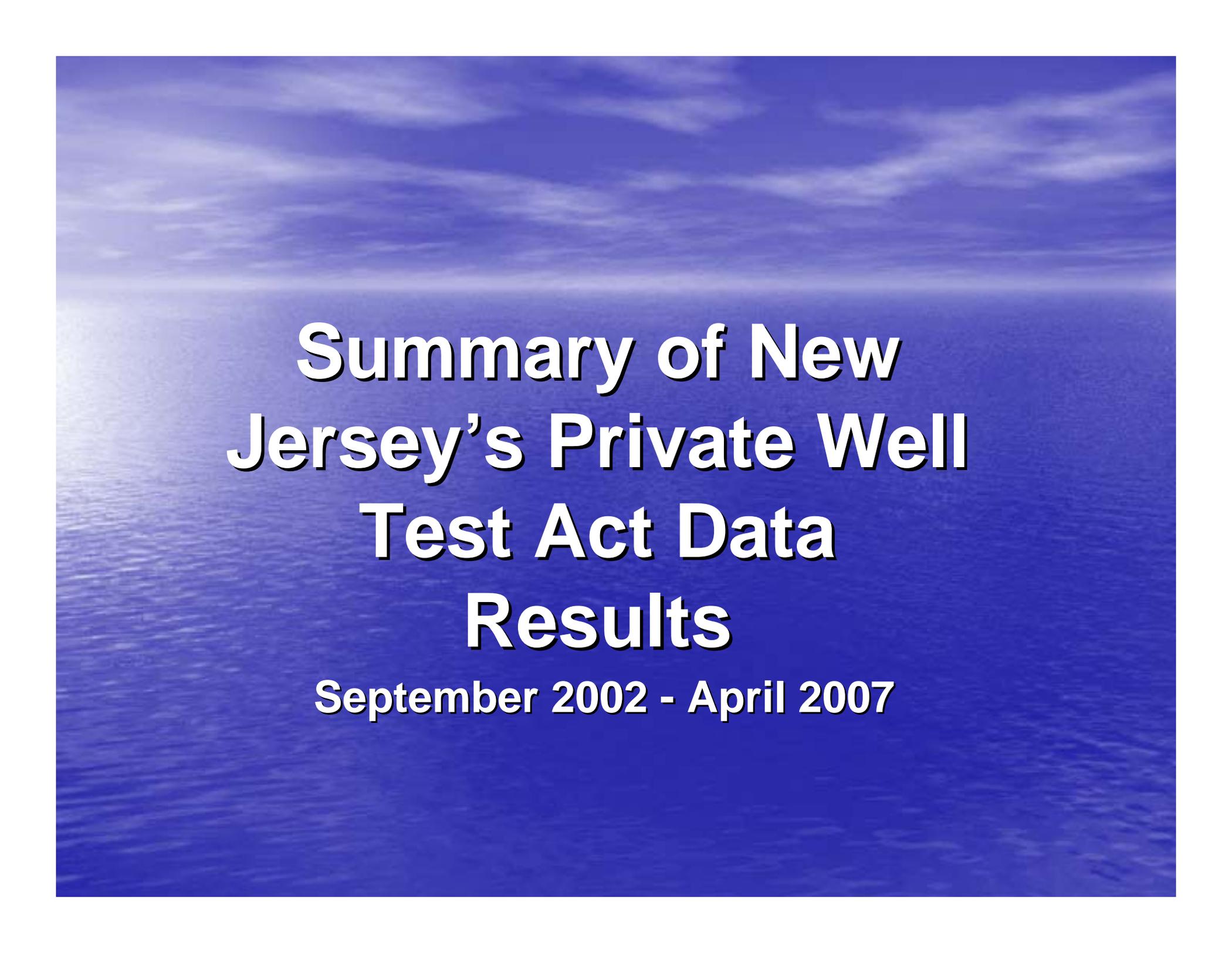
- [Frequently Asked Questions for Customers of Accurate Analytical Laboratories](#)
- [New Information for Certified Laboratories](#)
- [Initial Well Test Results for September 2002 - March 2003 \(pdf format\)](#)
- [Well Test Results For September 2002 - April 2007 \(pdf format\)](#)
- [Addendum to Well Test Results For September 2002 - April 2007](#)



TOLL-FREE INFORMATION HOTLINE:
1-866-4PW-TEST (1-866-479-8378)

This site should answer your questions. If it doesn't, please click [here](#) to send us an email, or call us Toll-Free at 1-866-4PW-TEST (1-866-479-8378).

Some files on this site require Adobe Acrobat Pdf Reader to view. [Download the free reader now](#)

The background of the slide is a photograph of a blue sky with light, wispy clouds above a calm blue body of water. The text is centered and rendered in a white, bold, sans-serif font with a black drop shadow.

Summary of New Jersey's Private Well Test Act Data Results

September 2002 - April 2007

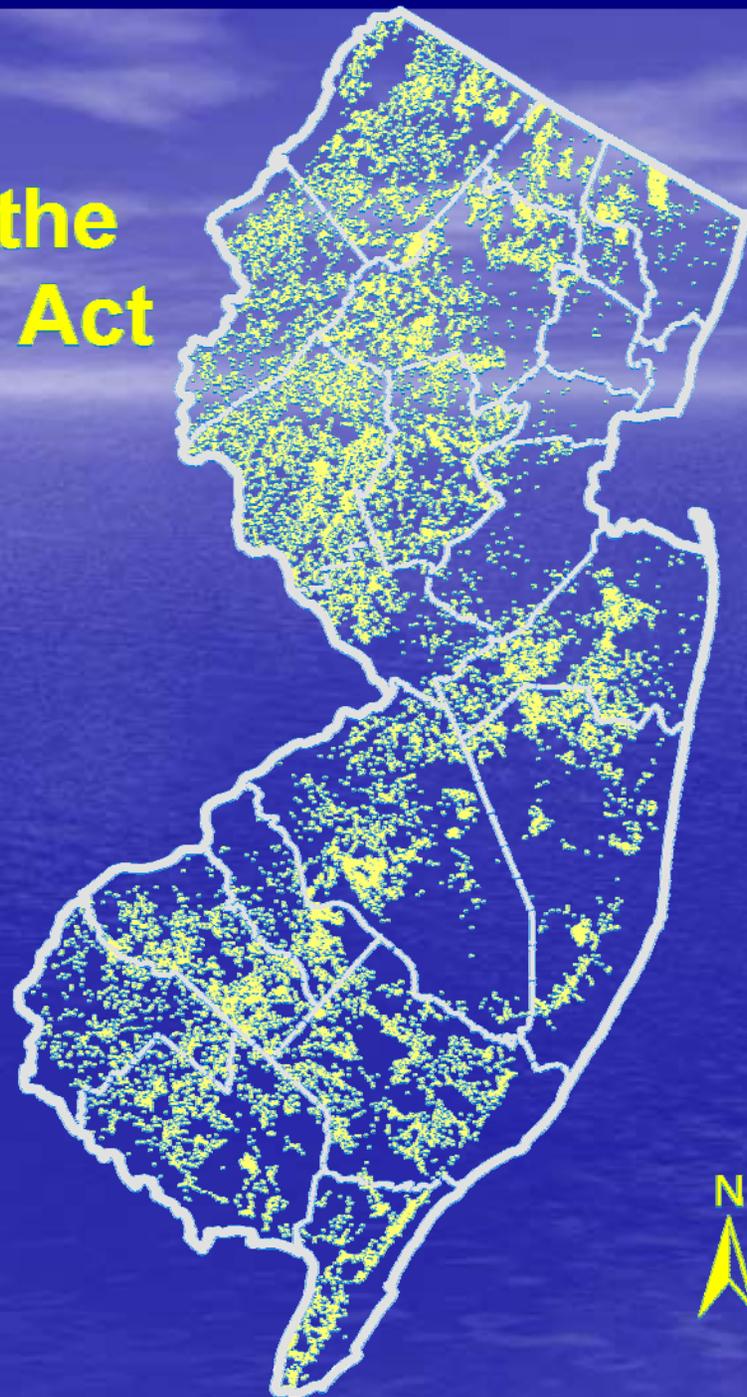
PWTA Drinking Water Contaminants

- ◆ Total Coliform - Fecal coliform/E. coli (If total coliform is positive)
- ◆ Nitrate
- ◆ Arsenic - in 12 northern counties
- ◆ Mercury - in 9 southern counties
- ◆ Lead
- ◆ Gross Alpha – phased in for 12 Southern and Central Counties
- ◆ Volatile Organic Chemicals (26 with MCLs)
- ◆ Secondary Parameters (Iron, Manganese & pH)

Wells Sampled for the Private Well Testing Act

Sept. 2002 to April 2007
50,882 Wells Sampled

- Location of Wells



0 20 40 Miles



Total Coliform/Fecal Coliform

- Total coliform tested in all NJ counties.
- 7,035 of 50,882 wells (13%) tested positive for total coliform.
- 1,136 of 50,882 wells (2.2%) tested positive for either fecal coliform or E.coli .
- Occurrence of fecal coliform or E coli in northern counties was 3.5%, southern counties was 1.0%.

Fecal Coliform/E.coli

Private Well Testing Act
50,882 Wells

Fecal Coliform/E.coli

- Negative Fecal Coliform/E. coli
- positive Fecal Coliform/E. coli



Arsenic

- Arsenic originally tested in 10 Northern counties (Piedmont region).
- Method 200.7 was initially allowed. Its MDL = 8 ug/l.
- In January 2006, the MCL for arsenic was reduced to 5 ug/l.
- 1,445 of 11,763 wells (12%) had concentration of arsenic above the State MCL (5 ug/l). (Excludes wells tested with Method 200.7 or about 35% of the samples.)
- Arsenic exceedances most commonly found in Hunterdon (18%), Mercer (20%) and Somerset Counties (17%).

Arsenic

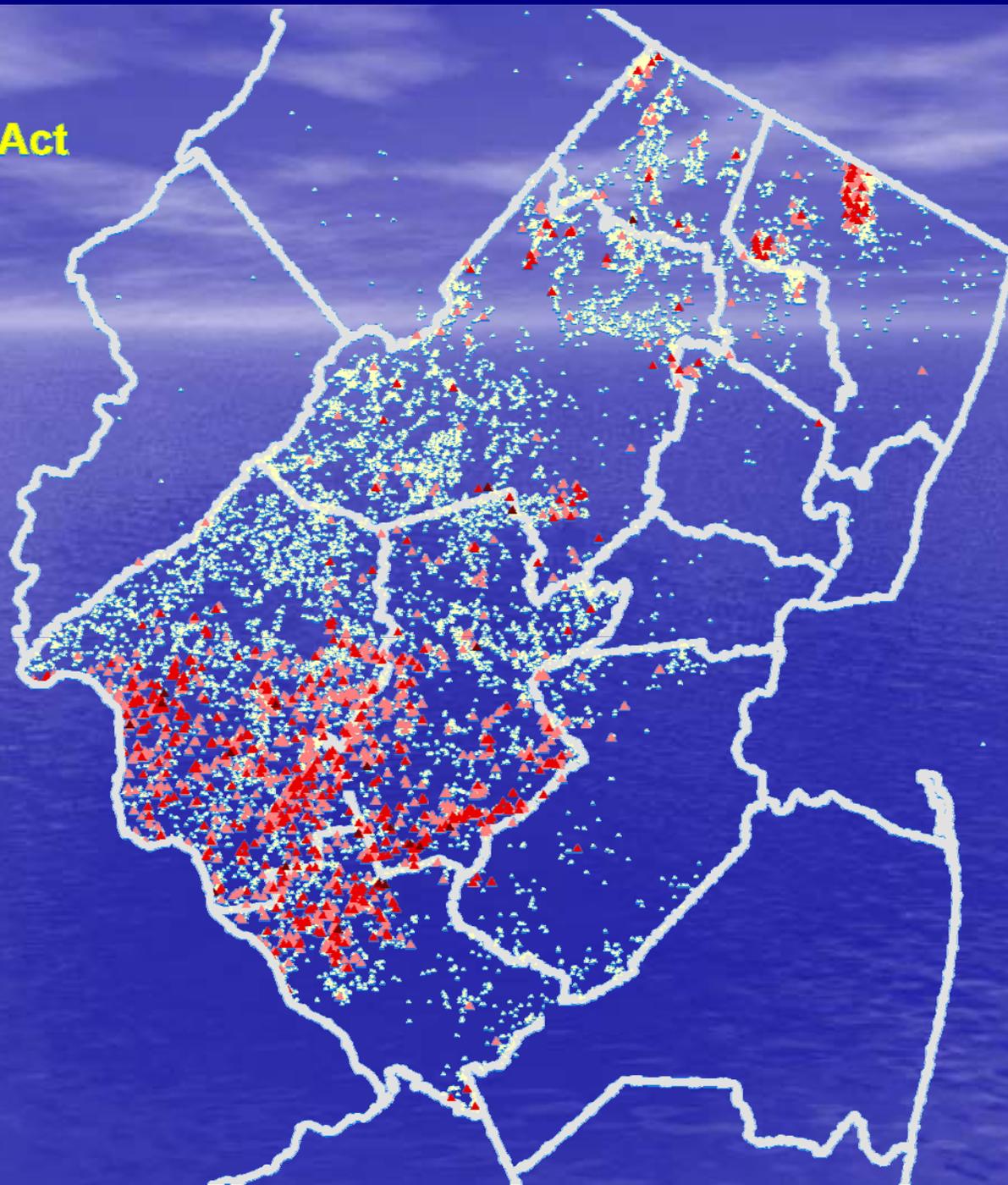
Private Well Testing Act
11,763 Wells

Arsenic
MCL = 5.0 ug/l

- ▲ < 5 ug/l
- ▲ > 5 - 10 ug/l
- ▲ > 10 - 50 ug/l
- ▲ > 50 - 254 ug/l



0 10 20 Miles



Additional Arsenic Requirements

- In March 2008, testing for Arsenic was required in two additional counties – Sussex and Warren.

Arsenic Sussex and Warren Co.

Private Well Testing Act

733 Samples

Sussex and Warren Co.

Mar 2008 thru Nov 2008

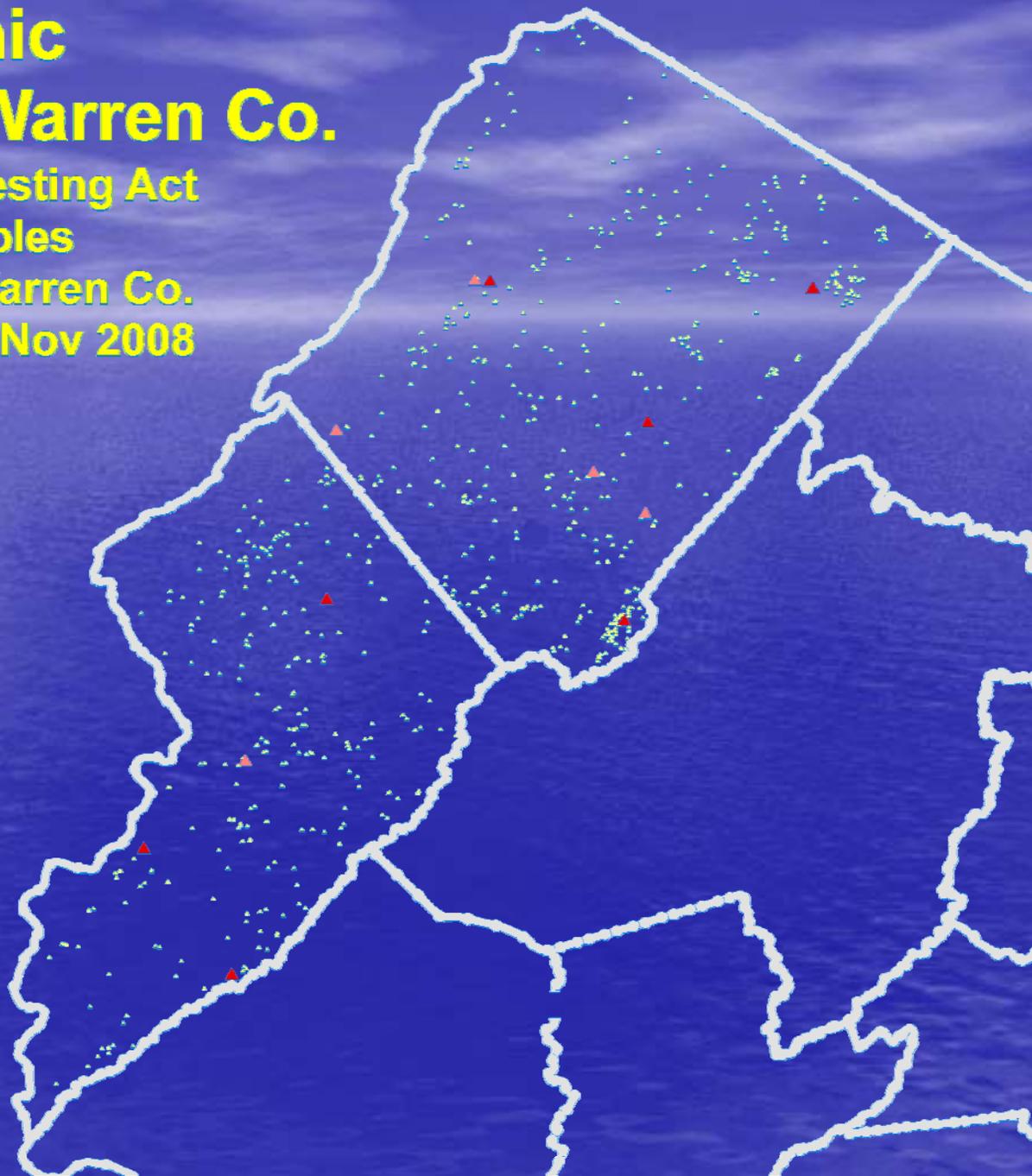
Arsenic Results

MCL = 5 ug/l

- ▲ < 5
- ▲ >5 - 10
- ▲ >10 - 35.7



0 7.5 15 Miles



Nitrate

- Nitrate tested in all counties.
- 1,399 of 50,882 wells (2.7%) had concentration of nitrate above the MCL (10 mg/l).
- Two counties had very high exceedances: Cumberland (11%) and Salem (9%).

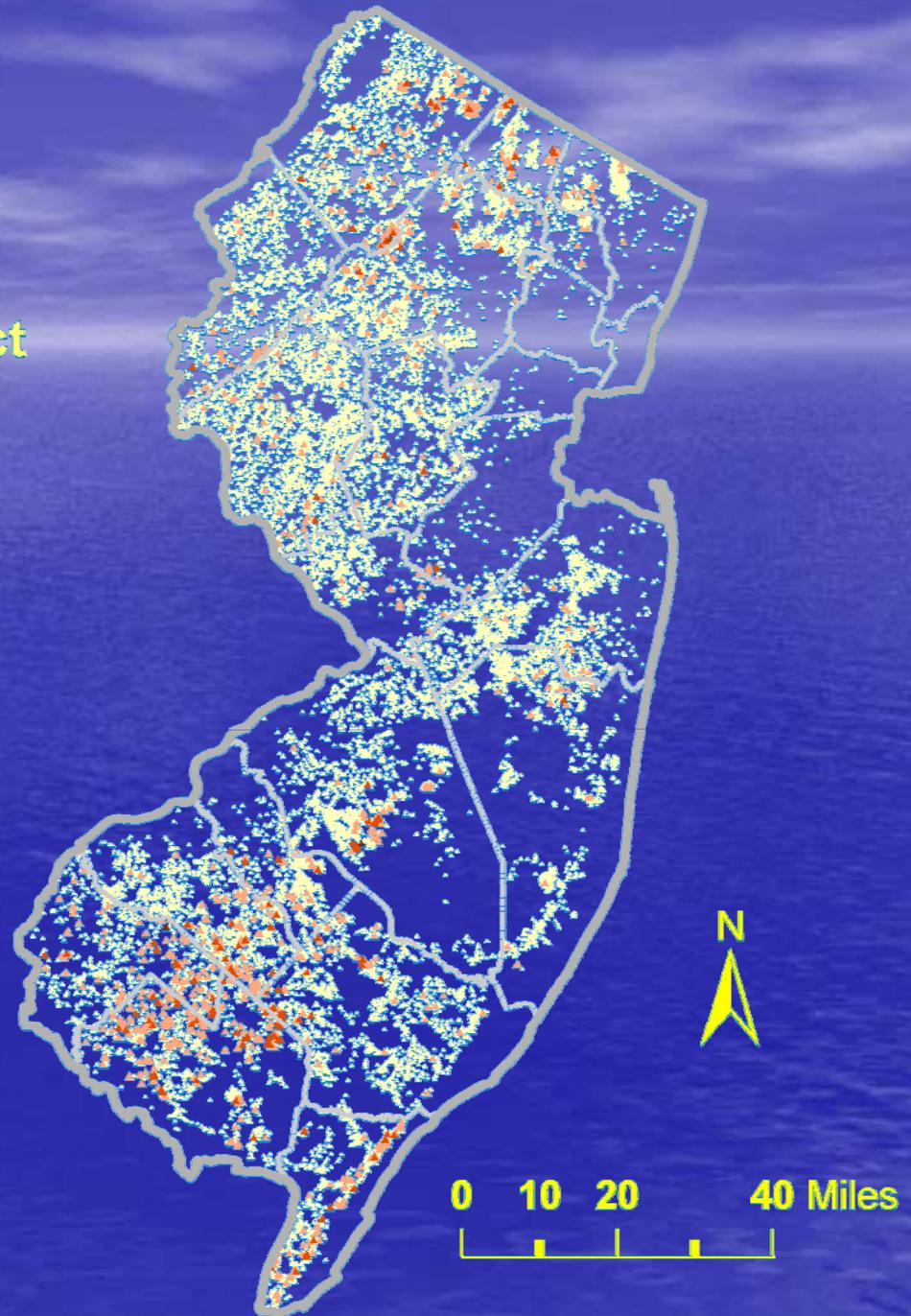
Nitrates

Private Well Testing Act
50,882 Wells

Nitrate Samples

MCL = 10 mg/l

- ▲ < 10 mg/l
- ▲ >10 to 20 mg/l
- ▲ >20 to 100 mg/l
- ▲ >100 to 153 mg/l



Mercury

- Mercury tested in 9 Southern NJ counties.
- 250 of 25,183 wells (1.0%) had concentration of mercury above the MCL (2 ug/l).
- Three counties had relatively high exceedances: Camden (2.4%), Gloucester (1.8%) and Cumberland (1.7%).

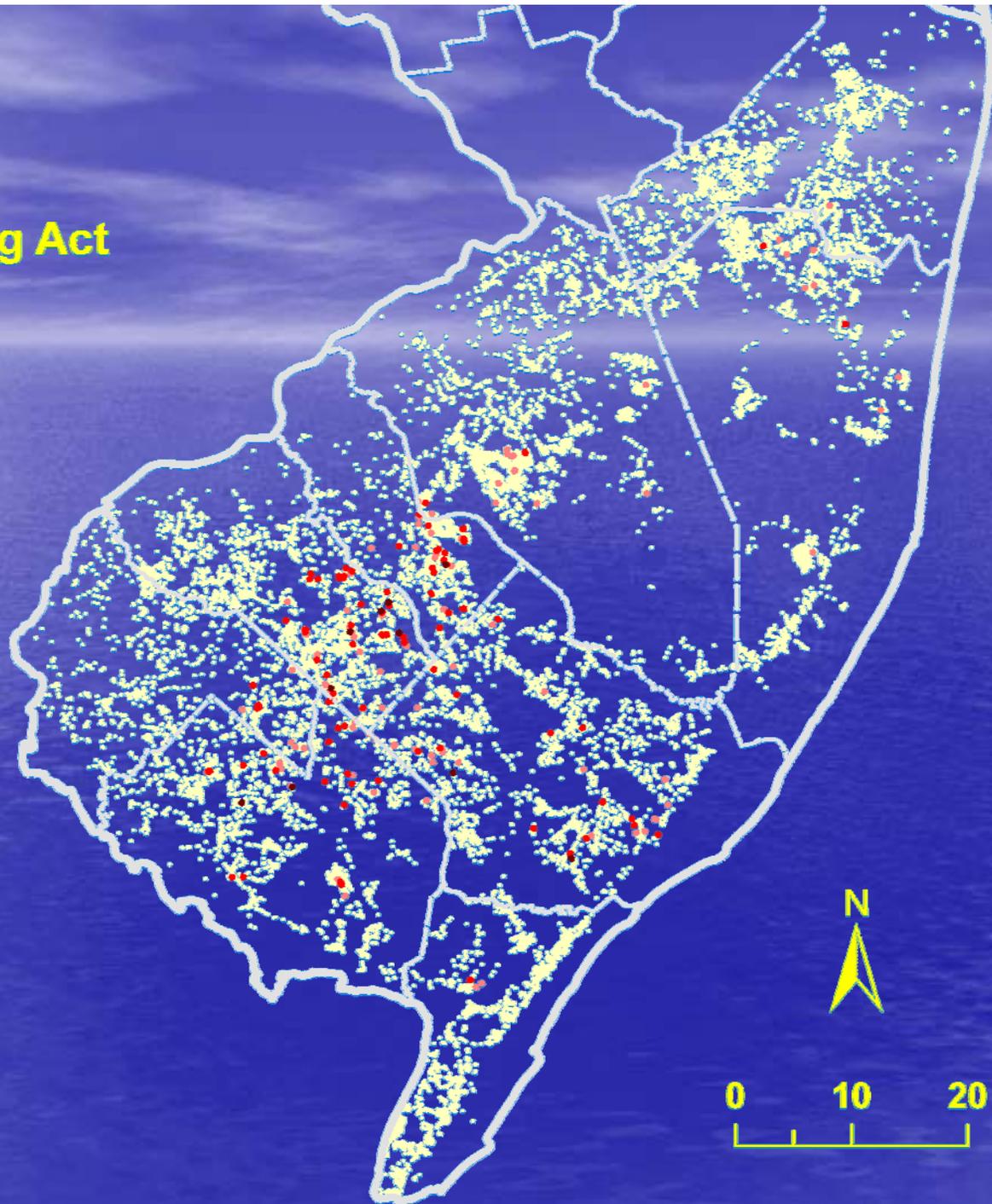
Mercury

Private Well Testing Act
25,183 Wells

Mercury Results

MCL = 2 ug/l

- 0.0 - 2.0
- 2.1 - 4.0
- 4.1 - 20.0
- 20.1 - 114.2



The New Jersey 48 Hr. Gross Alpha Test

- Gross alpha readings in southern NJ where Radium-226 and Radium-228 were known to occur were not reproducible.
- It was found that the variation was due to Radium-224, a short-lived radionuclide.
- New Jersey developed and certified a new rapid method gross alpha test.

Gross Alpha

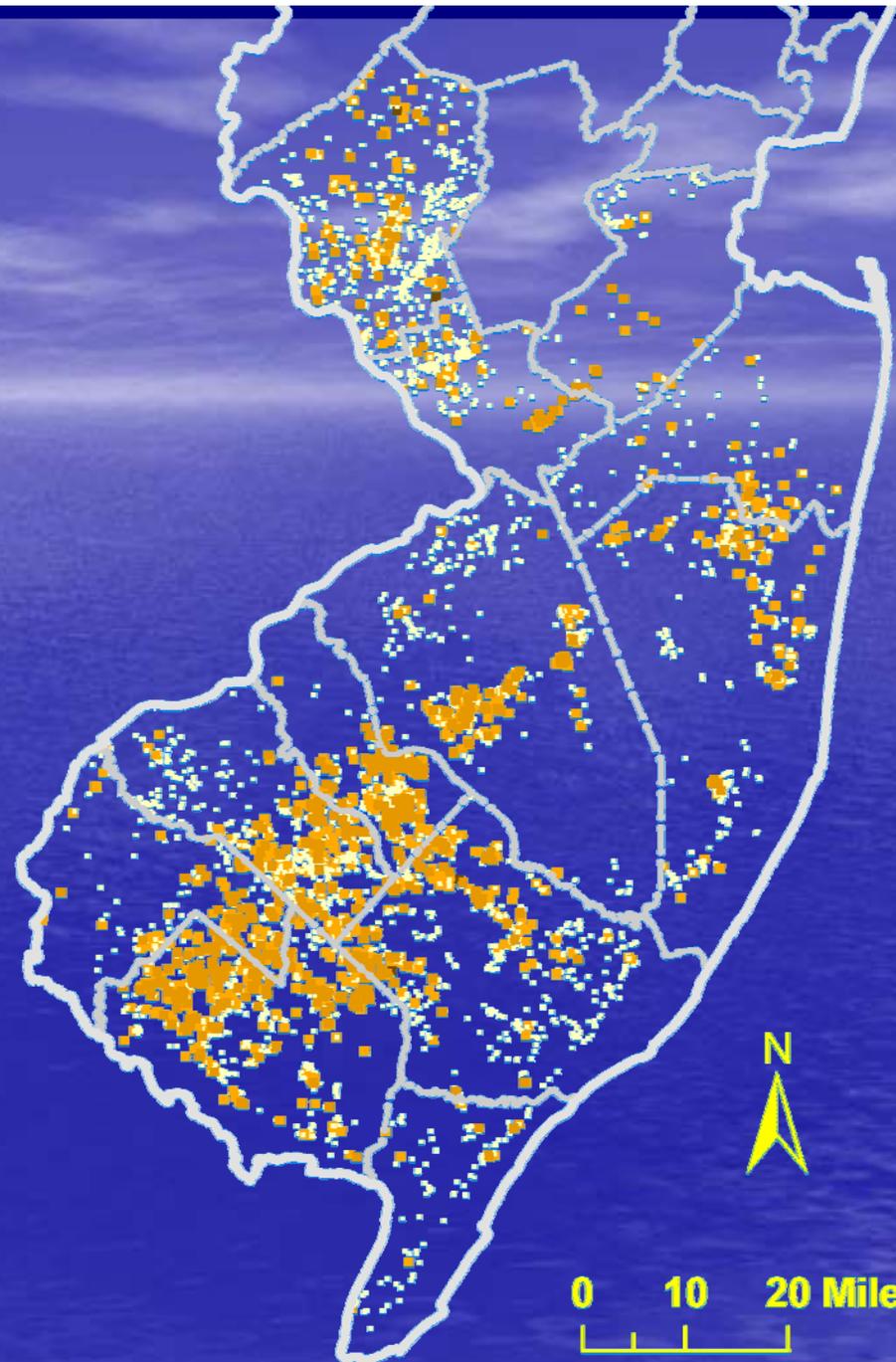
- Gross alpha tested in 12 Central and Southern NJ counties.
- 2,209 of 22,808 wells (9.7%) had concentration of gross alpha above the MCL (15 pCi/l).
- Four counties had relatively high exceedance rates: Camden (33%), Cumberland (25%), Salem (14%), and Gloucester (11%).

Gross Alpha

Private Well Testing Act
22,808 Wells

Gross Alpha Final
MCL = 15 pCi/l

- < 15 pCi/l
- >15 - 30 pCi/l
- >30 - 150 pCi/l
- >150 - 481 pCi/l



0 10 20 Miles

Interpreting Gross Alpha Data

- The limit of 15 pCi/l for gross alpha assumes that the contribution of uranium and radon is subtracted.
- This raises the question about interpreting gross alpha data in northern NJ where uranium and radon are expected to be the major issues.

Gross Alpha

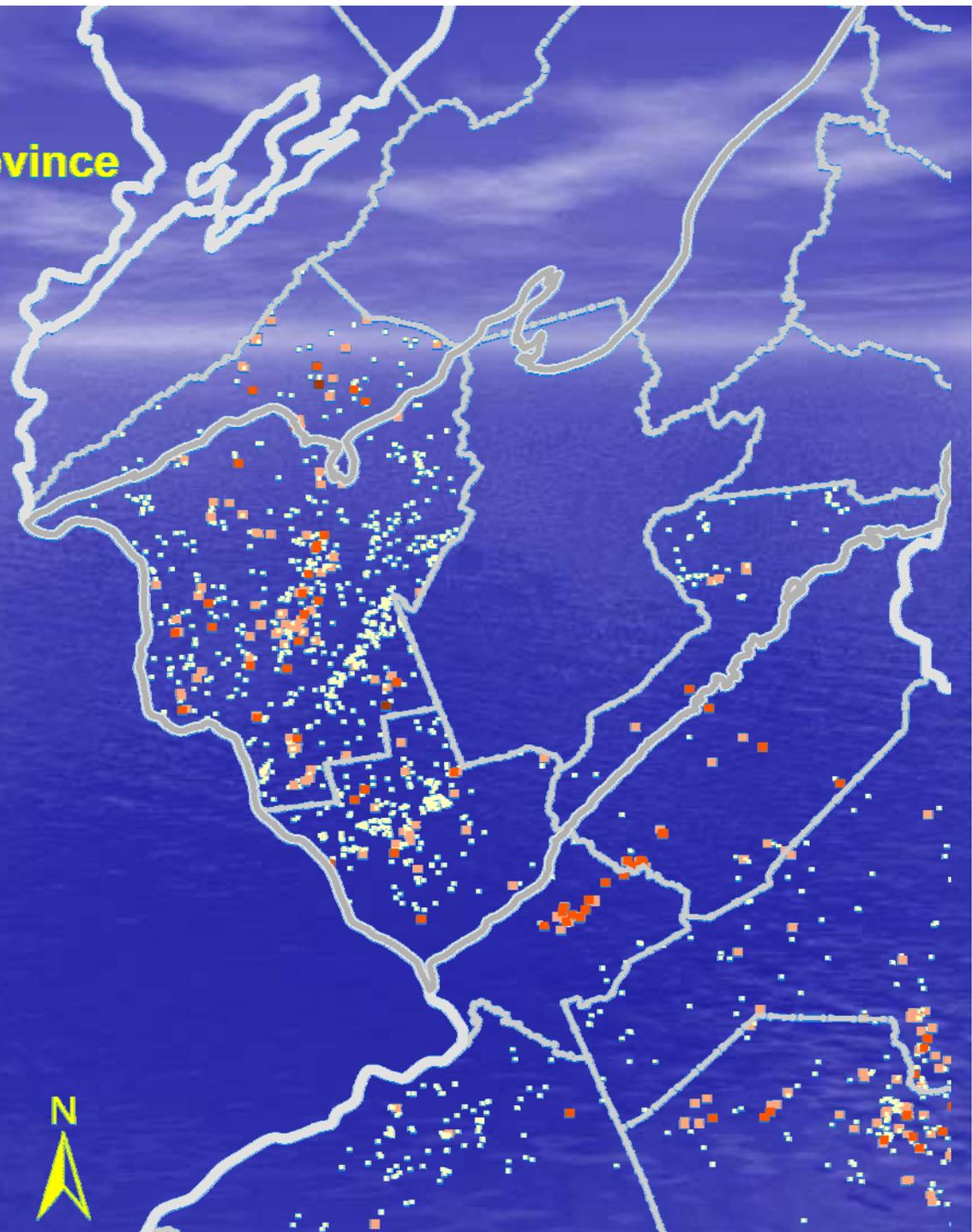
Piedmont Physiographic Province
4,127 Wells

Gross Alpha Final

MCL = 15 pCi/l

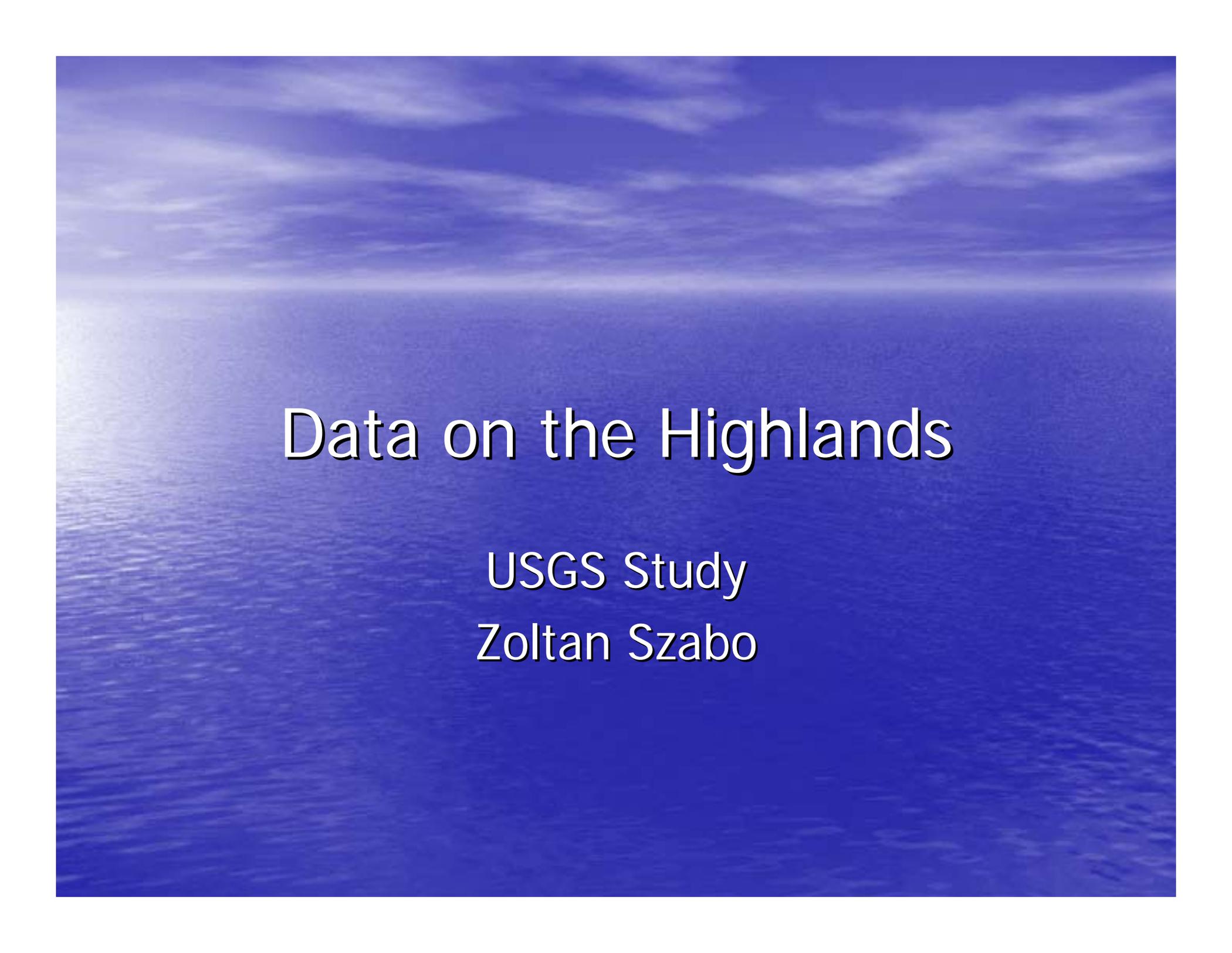
- < 15 pCi/l
- >15 - 30 pCi/l
- >30 - 150 pCi/l
- >150 - 481 pCi/l

0 5 10 Miles



Gross Alpha Data from PWTA

County	No. Samples	No. > 15 pCi/l	% > 15 pCi/l
Hunterdon	2833	114	4%
Mercer	999	45	4.5%
Middlesex	295	24	8%
Total	4127	183	4.4%



Data on the Highlands

USGS Study
Zoltan Szabo

Uranium Data from USGS Study

County	No. Samples	Gross Alpha pCi/L (Range)	Radium Total pCi/L (Range)	Uranium > 30 ug/l (Range)
Hunterdon	3	0.69-12.33	ND – 1.72	ND – 20.84
Morris	7	ND – 9.69	ND – 4.90	ND – 2.26
Passaic	6	ND – 14.74	ND – 2.91	ND – 14.4
Sussex	11	ND – 231.90	ND – 19.16	ND – 623.4
Warren	4	7.42 – 61.26	ND – 2.75	5.15 – 100.9

*Total Radium – Ra224 + Ra226 + Ra228

Treatment Options

- Radium – Cation Exchange Resin (Water Softener or Reverse Osmosis (RO))
- Uranium – Anionic Exchange Resin or Reverse Osmosis (RO)

VOCs

- VOCs tested in all 21 NJ counties.
- 702 of 50,882 wells (1.4%) had concentration of one or more VOC above the corresponding MCLs.
- 8 wells exceeded 3 MCLs, 54 wells exceeded 2 MCL

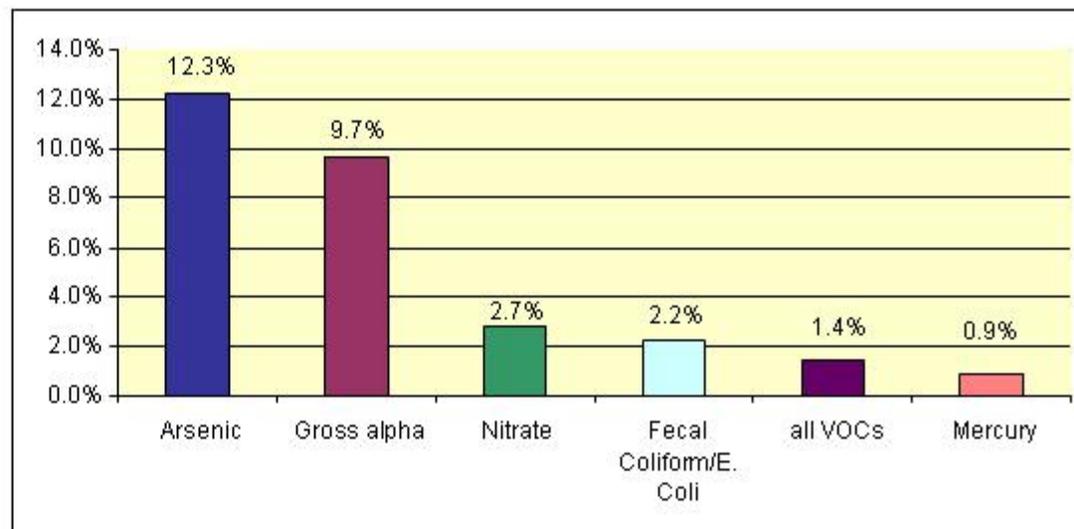
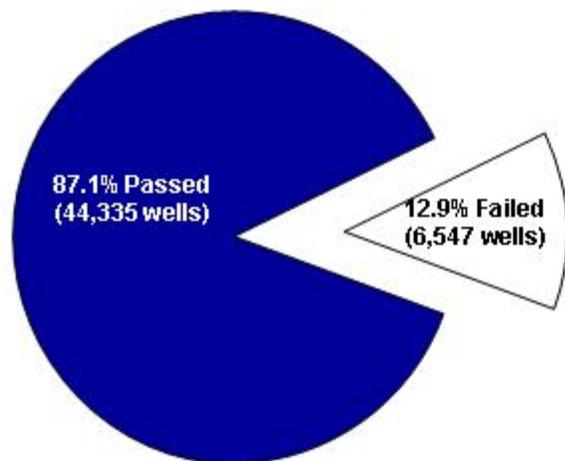
VOC table

Number Exceeding MCL

VOC	MCL (ug/l)	Exceed MCL
Trichloroethylene	1	246 (0.48%)
Tetrachloroethylene	1	221 (0.43%)
Benzene	1	66 (0.13%)
Methylene Chloride	3	44 (0.09%)
MTBE	70	38 (0.07%)
Carbon Tetrachloride	2	37 (0.07%)

VOC Detected

VOC	Detected > 0.5 ug/l
MTBE	3,769 (7.42%)
Toluene	2,500 (4.91%)
Trichloroethylene	422 (0.83%)
Tetrachloroethylene	360 (0.71%)
Methylene Chloride	323 (0.63%)
1,1,1-Trichloroethane	216 (0.42%)



- a. Ten counties were required to test for arsenic: Bergen, Essex, Hudson, Hunterdon, Mercer, Middlesex, Morris, Passaic, Somerset and Union. A total of 11,763 wells were test for arsenic using a sensitive analytic method.
- b. Twelve counties were required to test for gross alpha: Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Hunterdon, Mercer, Middlesex, Monmouth, Ocean and Salem. A total of 22,808 wells were tested for gross alpha.
- c. Nine counties were required to test for mercury: Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Monmouth, Ocean and Salem. A total of 25,183 wells were tested for mercury.

Lead

- Lead tested in all NJ counties.
- 9,368 of 50,882 wells (18.4%) had concentration of lead above the NJ ground quality water standard. (5 ug/l), which is used by PWTA Program as its drinking water standard.
- DEP has determined that lead is seldom found in ground water, and the source of lead is almost always from the home's plumbing system or the well pump.

Secondary Parameters

- pH: 22,699 of 50,882 (45%) wells outside optimum range (6.5 – 8.5)
- Iron: 14,751 of 50,882 (29%) exceeded the Secondary Standard of 0.3 mg/L
- Manganese: 9,890 of 50,882 (19%) exceeded the Secondary Standard of 0.05 mg/L

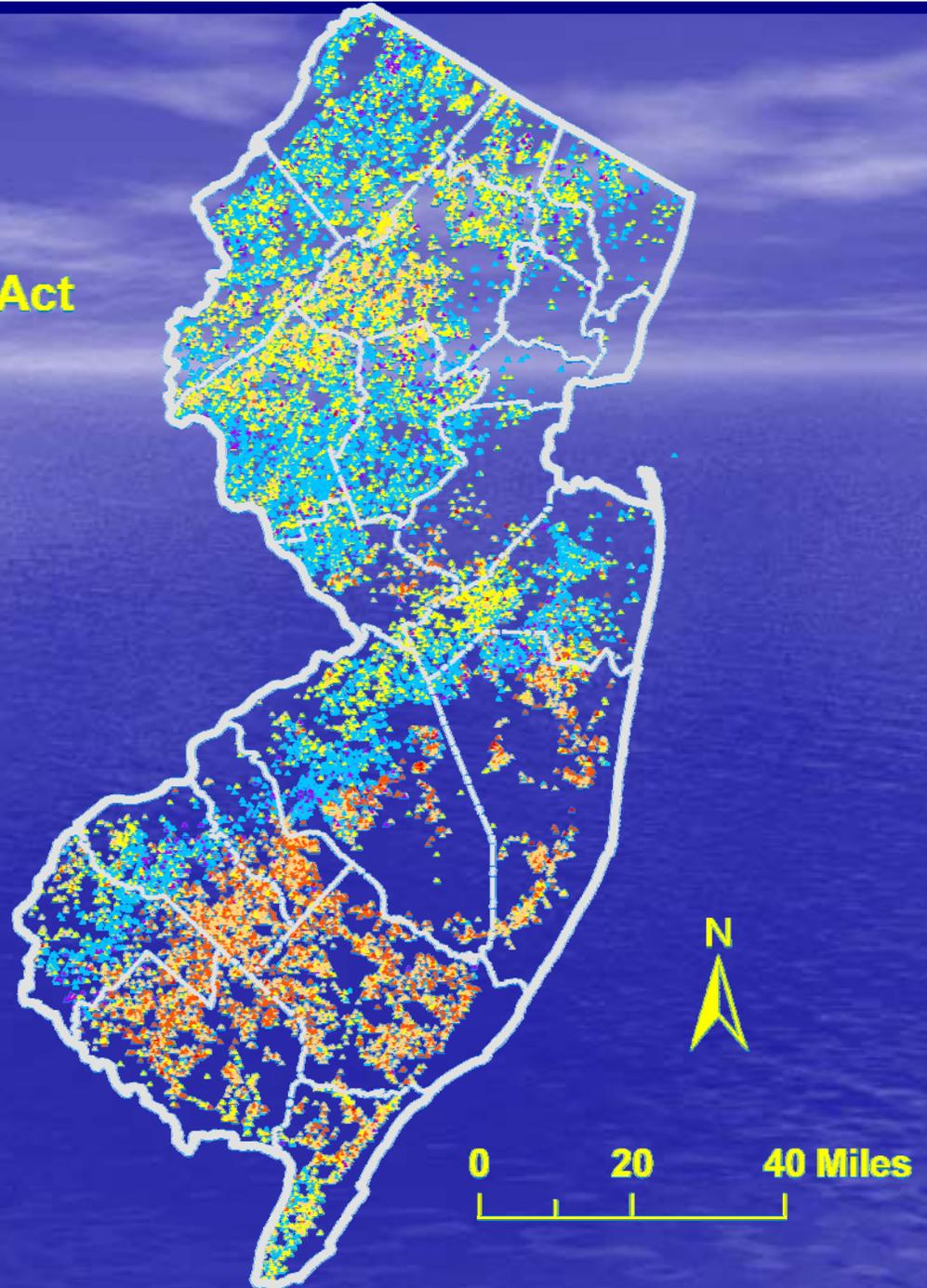
pH

Private Well Testing Act
50,882 Wells

pH Secondary Standard

6.5 - 8.5

- ▲ 4 or lower
- ▲ >4 to 5
- ▲ >5 to 6
- ▲ >6 to 7
- ▲ >7 to 8
- ▲ >8 or higher



Iron

Private Well Testing Act
50,882 Wells

iron

Secondary Standard - 0.3 mg/l

- ◆ > 0.3 mg/l
- > 0.3 - 3 mg/l
- > 3 to 30 mg/l
- > 30 - 219 mg/l



Manganese

Private Well Testing Act
50,882 Wells

Manganese
Secondary Standard 0.05 mg/l

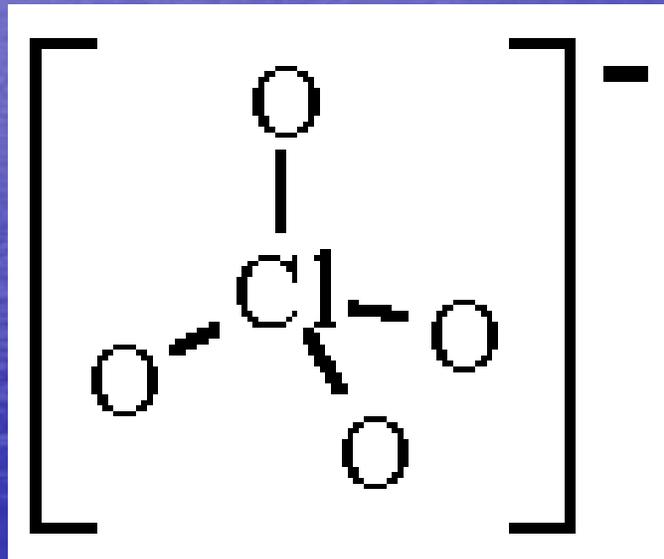
- > 0.05 mg/l
- > 0.05 - 0.5 mg/l
- > 0.5 - 5 mg/l
- > 5 - 65 mg/l



New additions

- Perchlorate
- Radon

Perchlorate



Perchlorate

- Chemical (oxidizer) used in the mostly manufacturing of rocket fuel, explosives and fireworks, also found naturally in certain types of fertilizers.
- Inhibits thyroid function
- The New Jersey DWQI recommended an MCL of 5 ppb for perchlorate.

Perchlorate

- Proposed MCL, expected to be adopted by the fall 2009. Testing will start 90 days after the rule is adopted.
- Acceptable Methods 314.0 (IC), 314.1(IC) and 331.0 (LC). Analysis must be done within 48 hours of sample collection.
- Recommended treatment - Three types of treatment technologies are sufficiently developed and proven for use in public water systems, and could be applied to private wells: Anion Exchange, Granular Activated Carbon, and Membrane filtration technologies.

Radon MCL

- The DWQI is recommending an MCL for radon of 800 pCi/l
- The question of treatment must be addressed before adding radon to the Private Well Testing requirements.

Radon Results from USGS Study

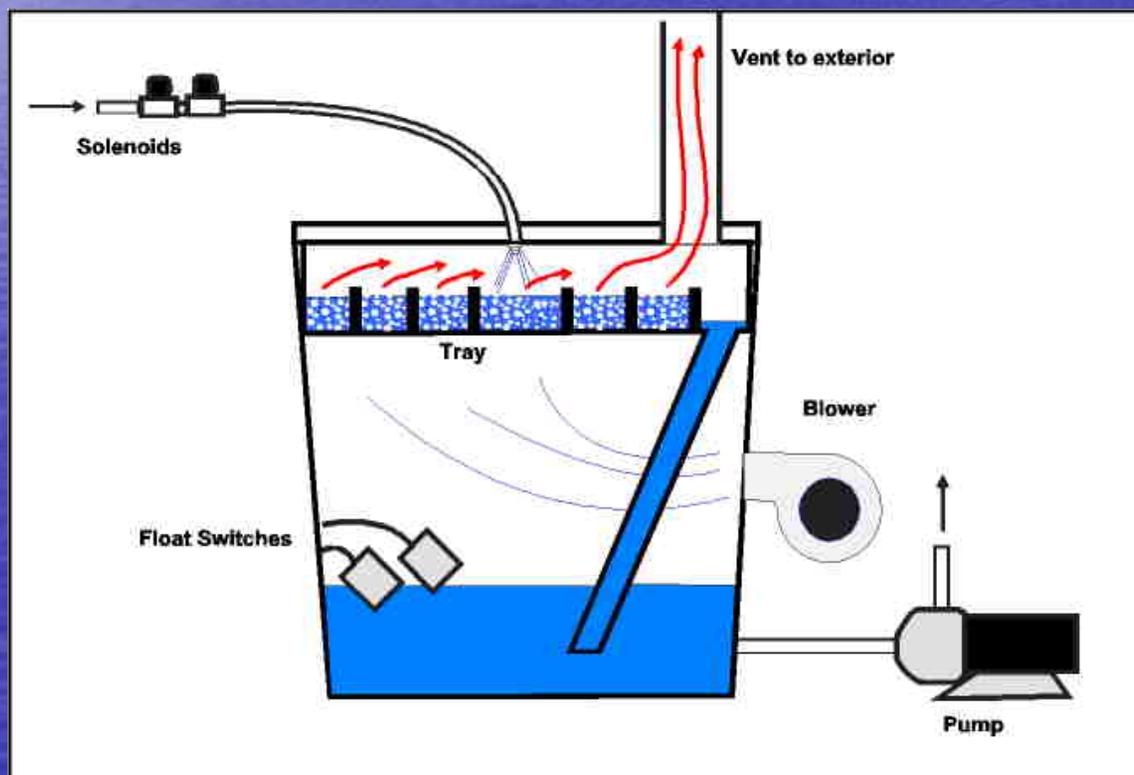
County	No. Samples	Radon pCi/l
Hunterdon	3	2,838-38,264
Morris	7	209-16,356
Passaic	6	1,210-17,346
Sussex	11	660-42,655
Warren	4	2,836-28,150

Treatment options for radon

- Granular Activated Carbon
 - Relatively inexpensive (\$1,000-1,500)
 - 80-85% removal, so it would only work for radon concentrations of 4,000-5,000 pCi/l
 - Media must be changed once or twice a year
 - Lead-210 builds up in the carbon filter requiring isolation of the unit
- Aeration System
 - 99% removal of radon

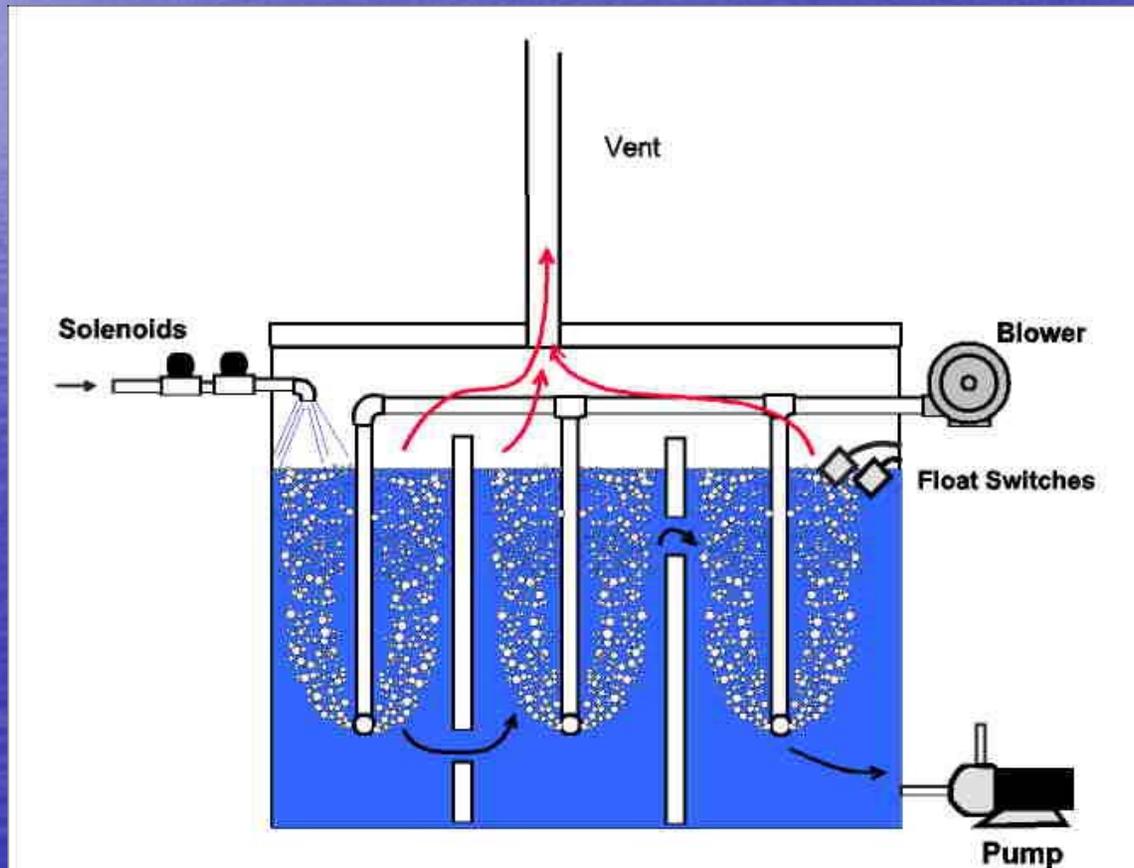
Treatment options for radon

- Aeration systems – Shallow tray system



Treatment options for radon

- Aeration – Diffused Bubble



Treatment options for radon

- Issues with aeration system
 - Initial cost is higher (\$2,000-\$4,000)
 - Additional cost of electricity - \$40-60/year
 - Annual cleaning required (about \$100/year)
 - Sediment must be removed prior to treatment unit
 - Iron will be oxidized by the system

Limitations of PWTA Data

- No Information about well depths
- Single Sample
- Errors in Municipality, Lot and Block
- GPS points (or location) are sometimes incorrect.

Summary of PWTA Data Results

- ◆ Data is valuable. The size and geographic extent of the database make it unique. Largest known database of private well water quality in the United States. This makes it an invaluable resource for groundwater studies.
- ◆ The contaminants most frequently reported over the MCL are gross alpha, arsenic, and nitrate.
- ◆ Test data provides a valuable consumer information to seller/buyer and landlord/tenant with regards to drinking water quality

For Additional Information

- Contact: judy.louis@dep.state.nj.us
john.shevlin@dep.state.nj.us
- PWTA website:
<http://www.state.nj.us/dep/pwta>