

Private Wells in New Jersey: Building Local Health Capacity

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Presentation Agenda

- Needs Assessment Findings
- Private Well Water Regulations in NJ
- Specific Contaminants of Concern
 - Coliform
 - Gross Alpha
 - Arsenic
- Water Treatment Financing Programs
- Public Notification: Neighbors Outreach
- Identification of Neighbors: Tips & Tools

Centers for Disease Control and Prevention (CDC) Support

- **Perform targeted outreach efforts:** neighbor-based, school-based, communities & healthcare-based
- **Develop guidance** that can be utilized by local health departments
- **Provide local health department funding**
 - **\$5,000 awards** to support private well outreach
 - NJ SAGE
 - Estimated funding opportunity announcement October/November Up to three LHD awards available over the next four years (dependent on funding availability)



Private Wells in New Jersey

- Most densely populated state in U.S.
- About 11-13% of NJ residents on private well water, about 1 million people
- Estimated 400,000 wells used for water consumption purposes
- No federal regulations - unregulated under 1974 Safe Drinking Water Act

13% OF NEW JERSEY RESIDENTS GET THEIR DRINKING WATER FROM A PRIVATE WELL

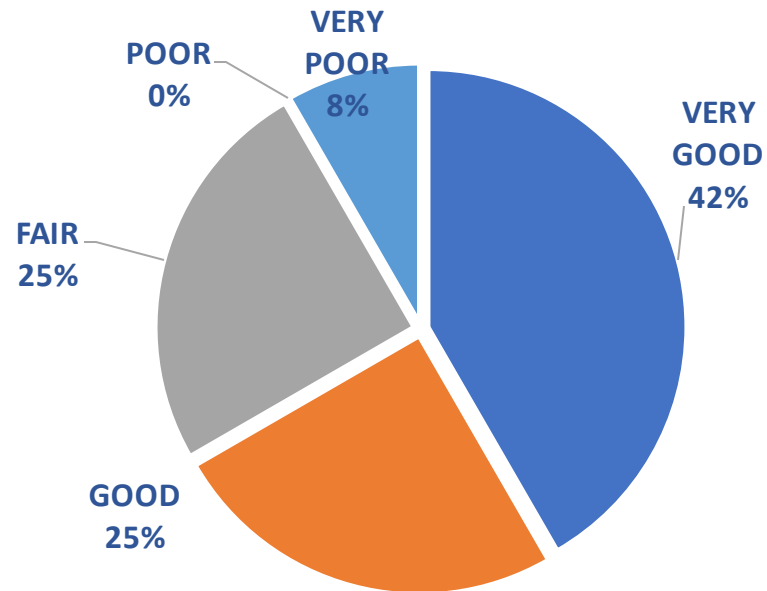
THAT'S ABOUT ONE MILLION PEOPLE

The infographic is a blue square with a white border. At the top center is a white icon of a faucet. Below the icon, the text "13% OF NEW JERSEY RESIDENTS GET THEIR DRINKING WATER FROM A PRIVATE WELL" is written in white, bold, uppercase letters. At the bottom, the text "THAT'S ABOUT ONE MILLION PEOPLE" is written in white, uppercase letters.

Needs Assessment Findings

- Limited survey to LHD attendees at 2016 NJ NEHA meeting
 - Included representatives from 11 LHDs that serve private well users

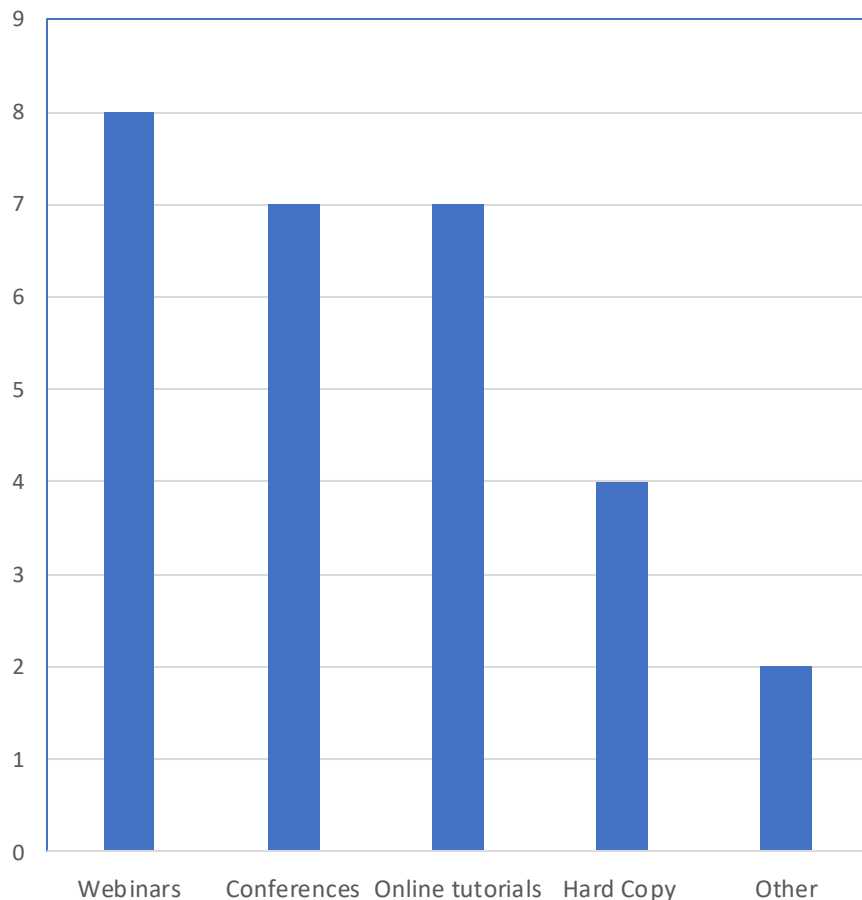
Do you think your health department does a good job assisting private well users?



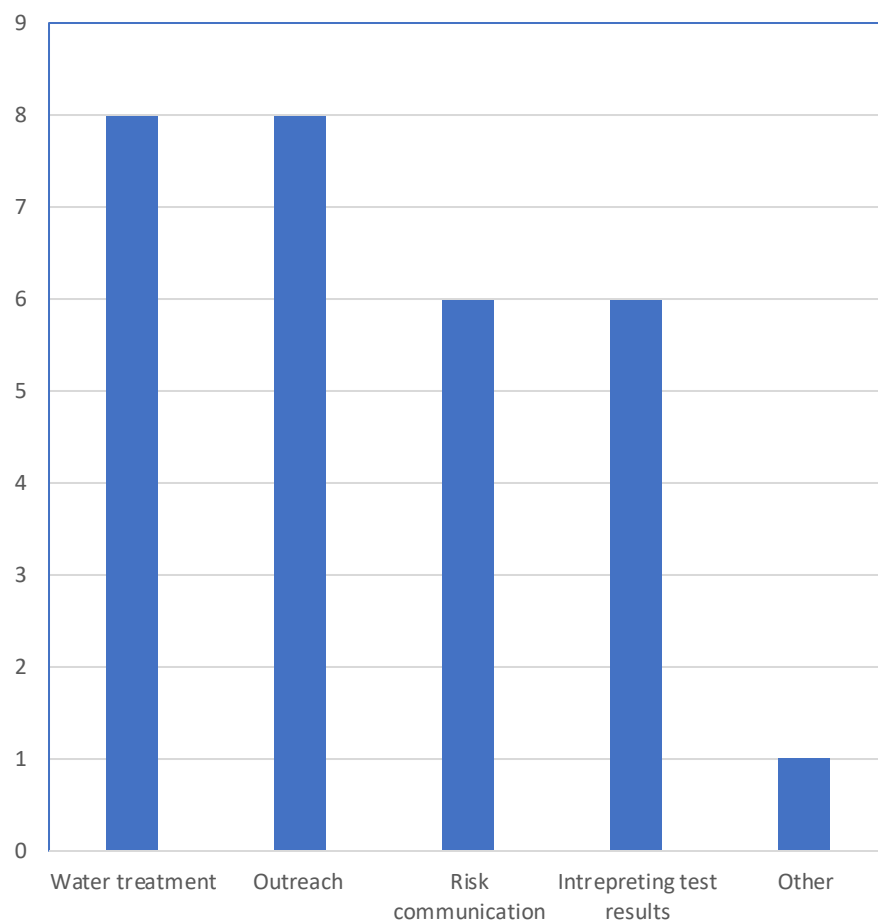
- Staffing shortages and heavy workloads identified as barriers to LHD private well programs
- Respondents were asked whether they conduct outreach when the PWTA identified a problem
 - 50% responded 'Yes'
 - 50% responded 'No'

Needs Assessment Findings: LHD Training for Private Wells

What would be the best way to receive training?

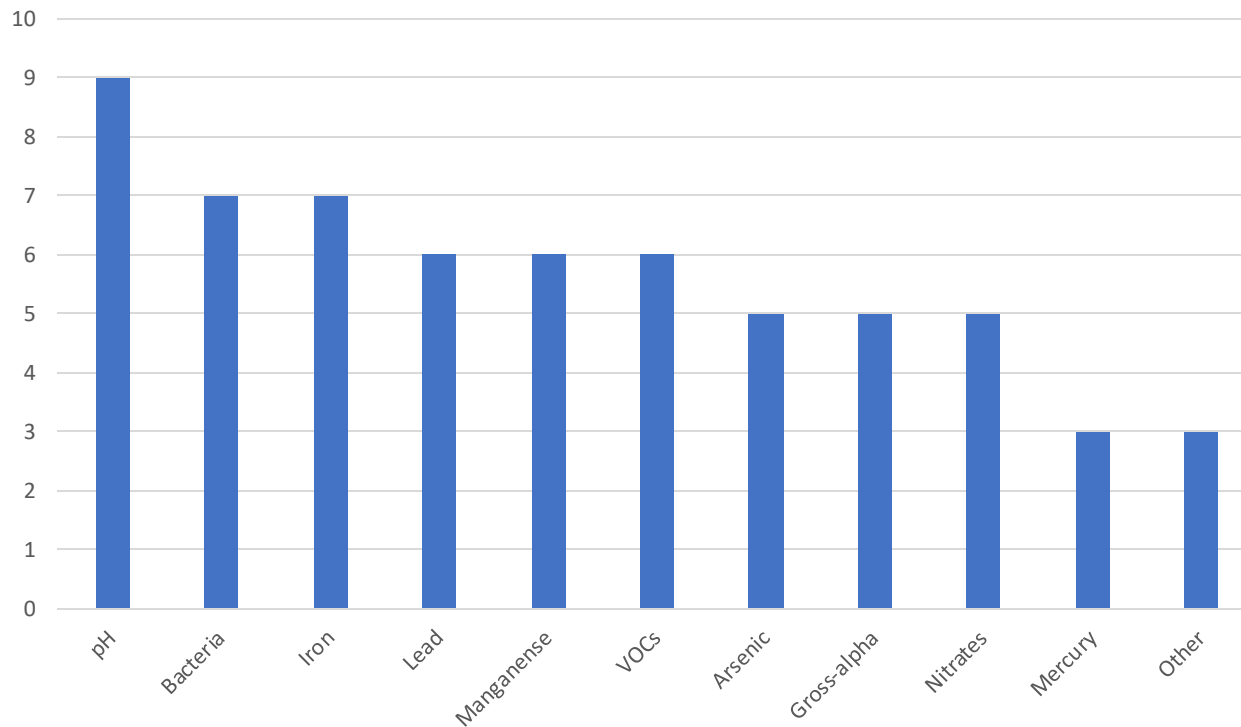


What type of training would be most useful?

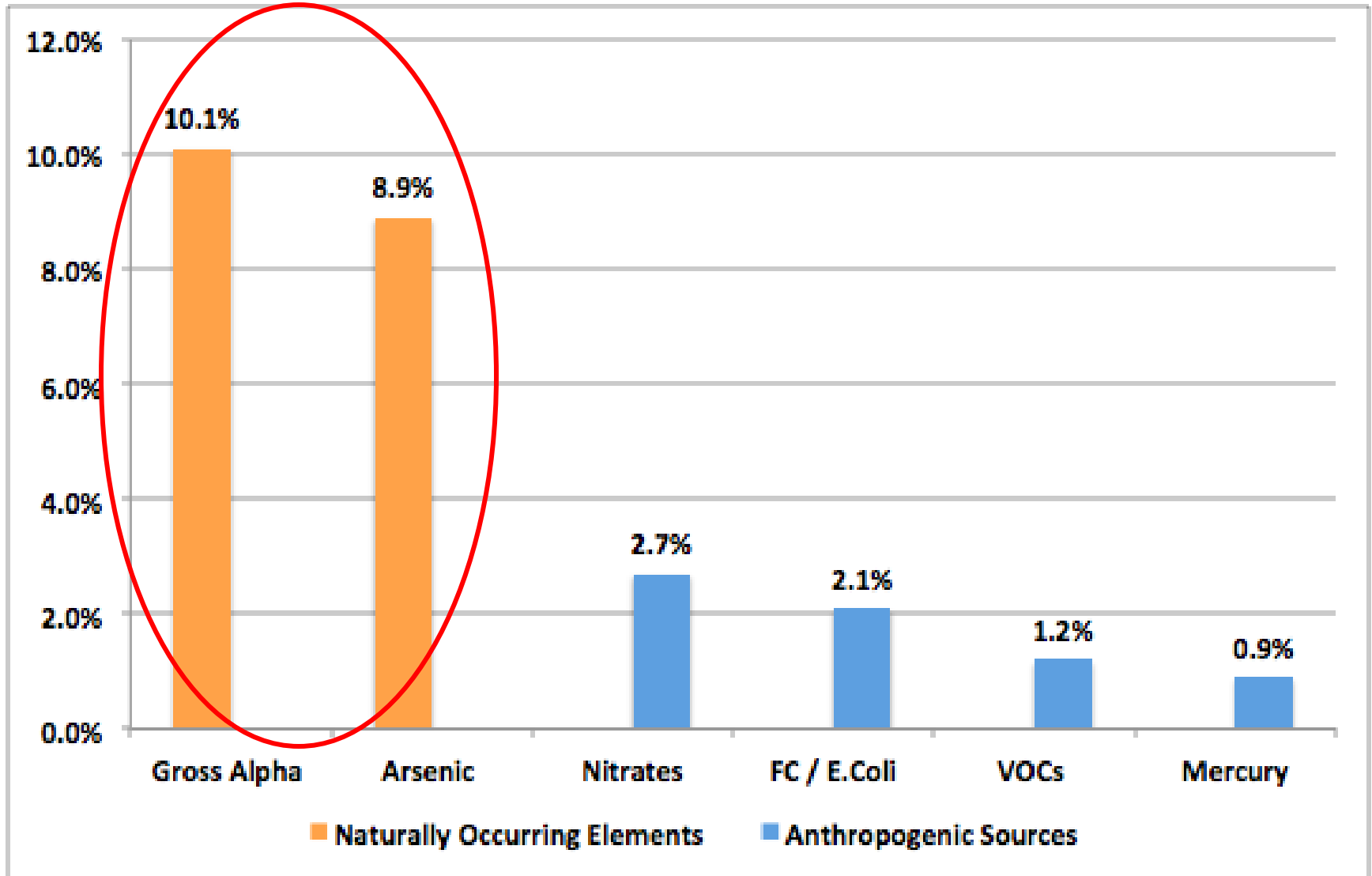


Needs Assessment Findings: Contaminants of Concern

What are the most important private well contaminants of concern in your service area?




Percentage of Most Prevalent Contaminants Exceeding MCLs in Private Wells



slido

How frequently do you receive questions from private well users?

 Start presenting to display the poll results on this slide.

Private Well Water Regulations in NJ



NJ Private Well Testing Act (NJ PWTA)

- Adopted September 2002
- Consumer Information law
- Requires buyer or seller of property with a private well to test untreated water
- Landlords required to test wells every 5 years
- Confidential
- Certified laboratories submit water results electronically to NJDEP
- Some water quality parameter requirements are specific to geographic location (North v. South Jersey)
- ~100,000 (25%) wells test results reported

https://www.state.nj.us/dep/watersupply/pw_pwta.html

Private Well Testing Act Rules

- Sample collection and analysis must be performed by a PWTA certified lab
 - List of labs available at NJDEP Data Miner
<https://www13.state.nj.us/DataMiner>
- Laboratory must follow reporting rules using standard form and must report to NJDEP electronically
 - Analytical results are valid for 1 year
 - Coliform results valid for 6 months
- Raw water samples (pressure tank or bypass treatment and sample at kitchen sink)
 - Lead sampling requires 2-minute flush
- Laboratory must notify person requesting the test and local health department of a violation within 24 hours from obtaining results
- NJDEP shall notify LHD of violation within 5 business days after receiving notice

PWTA Required Parameters

| Primary Drinking Water Contaminants | MCL |
|---|----------------------|
| Bacteriological: Total Coliform (E. Coli or Fecal) | Presence/ Absence |
| 29 Volatile Organic Compounds (VOCs) | MCLs vary |
| Inorganic Compounds: Arsenic | 5 µg/L |
| Lead | 5 µg/L |
| Mercury | 2 µg/L |
| Nitrates | 10 mg/L |
| Radiological: Gross Alpha | 15 pCi/L |
| Uranium* | 30 µg/L |
| Radium (226+228) | 5 pCi/L |

| Secondary Drinking Water Contaminants | SMCL |
|---------------------------------------|-----------|
| pH | 6.5-8.5 |
| Iron | 0.3 mg/L |
| Manganese | 0.05 mg/L |

Abbreviations

MCL = Maximum Contaminant Level

SMCL = Secondary Maximum Contaminant Level

ml = milliliters

pCi/L = picocuries per liter

µg/L = micrograms per liter


NJ PWTA Expansion Includes PFAS

- NJ MCLs developed for PFNA, PFOA and PFOS

| PFAS | MCL |
|------|--------|
| PFNA | 13 ppt |
| PFOA | 14 ppt |
| PFOS | 13 ppt |

parts per trillion (ppt) = Nanogram/Liter (ng/L)

- Testing for PFAS required under NJ PWTA - **December 2021**



Updated September 2020

Drinking Water Facts:
Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water
*formerly titled PFCs in Drinking Water

- Per- and polyfluoroalkyl substances (PFAS) are a group of chemicals with many commercial and industrial uses.
- PFAS have been associated with a variety of adverse health effects in humans, but it has not been definitively established that PFAS cause these effects.
- PFOA, PFNA, and PFOS have drinking water regulations in New Jersey.

What are PFAS and perfluorinated chemicals (PFCs)?

PFAS are a group of manmade chemicals which include a smaller group of chemicals called PFCs. PFAS repel water and oil and are resistant to heat and chemical reactions. They therefore have important industrial and commercial uses. PFAS are used in production of some non-stick cookware, in waterproof and stain proof coatings, in "leak-proof" coatings on food packaging materials, in fire-fighting foams, and in other uses. PFAS can enter drinking water through industrial release to water, air, or soil; discharges from sewage treatment plants; land application of contaminated sludge; and use of fire-fighting foam.

PFCs are not broken down in the body. Four types of PFCs have been found in the blood (serum) of greater than 98% of the United States population. **These PFCs build up and stay in the human body for many years, and the amount goes down very slowly over time.**

- PFOS – perfluorooctane sulfonate
- PFOA – perfluorooctanoic acid
- PFNA – perfluorononanoic acid
- PFHxS – perfluorohexane sulfonate

How can I be exposed to PFAS?

Some PFAS can dissolve in water. Therefore, drinking water may be a major source of exposure to PFAS for people living in communities with contaminated drinking water. Other sources of PFAS exposure include food, food packaging, consumer products, house dust, indoor and outdoor air, and at workplaces where PFAS are made or used.

Exposure to PFAS in drinking water is primarily from ingestion. Exposure to PFAS through other household uses of water such as showering, bathing, laundry and dishwashing is not significant.

Are PFAS harmful to my health?


There is considerable information on the health effects of PFAS in humans and animals, and more information is continually becoming available. In experimental animals, some PFAS have been found to cause developmental, immune, neurobehavioral, liver, endocrine, and metabolic toxicity, generally at levels well above human exposures. Some studies of the general population, communities with drinking water exposures, and exposed workers suggest that PFAS increase the risk of a number of health effects. The most consistent human health effect findings for PFOA – the most well-studied of the PFAS – are increases in serum cholesterol, some liver enzymes, and uric acid levels. For PFOS, the most consistently found human health effects include increased serum cholesterol and uric acid levels. PFOA and PFOS have been associated with decreased antibody response following vaccination.

PFOA and PFOS caused tumors in rodents. In a community with substantial exposure to PFOA through drinking water, PFOA exposure was associated with higher incidence of kidney and testicular cancers.

How can PFAS affect children?

In experimental animals, some PFAS cause developmental effects. In humans, exposure to PFAS before birth or in early childhood may result in decreased birth weight, decreased immune responses, and hormonal effects later in life. More research is needed to understand the role of PFAS in developmental effects.

Infants and children consume more water per body weight than older individuals, so their exposures may be higher than adults in communities with PFAS in drinking water. They may also be more sensitive to the effects of PFAS.



Continue to Page 2

Frequently Asked Questions (FAQs)

How much will the testing cost?

- Currently, \$650 - \$750.
- With PFAS included, around \$1,000

What is the cost of water treatment?

- It depends on contaminant. Potable water loan available (0% interest)

How do I know what water treatment is suitable?

- Contact a local water treatment consultant if you are unsure about appropriate water treatment. Water treatment professional are not certified.

Is the water safe to bathe/shower in?

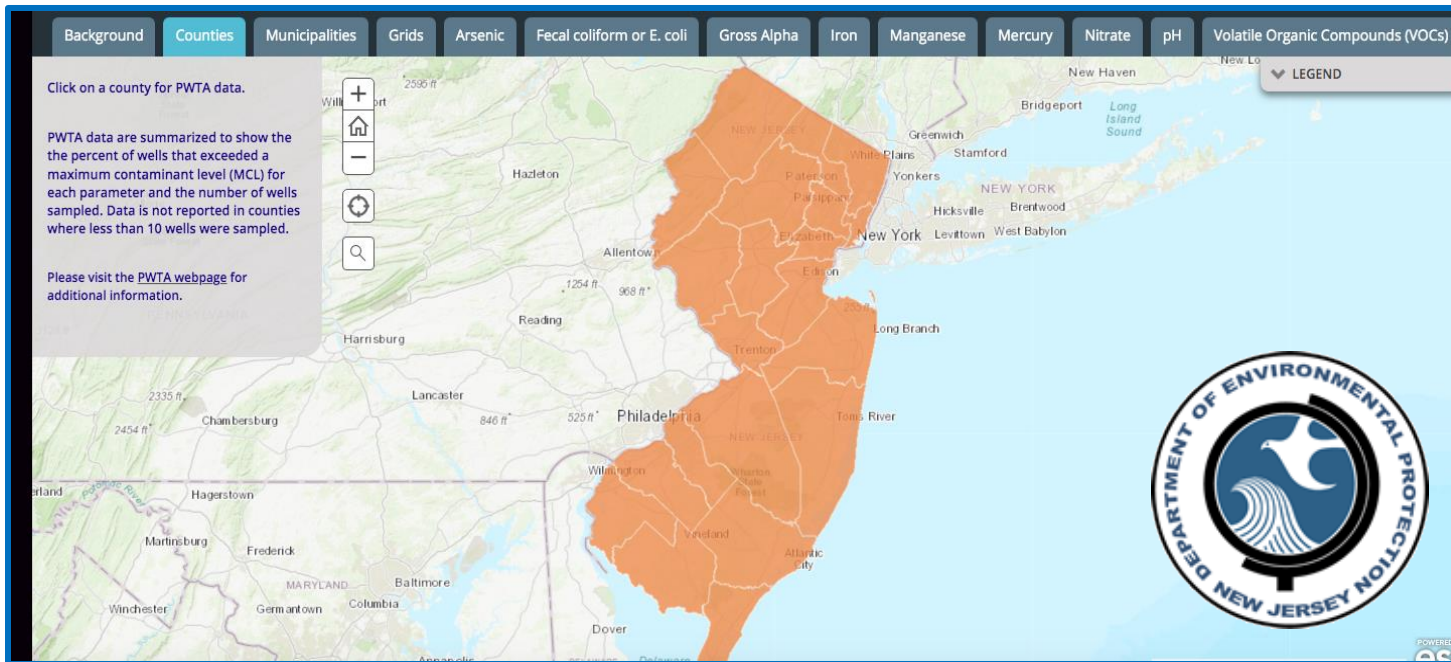
- It depends (arsenic and VOCs above MCL not recommended for bathing/showering).

Does boiling/cooking water get rid of the contaminants?

- No – can cause contaminants to concentrate even more.

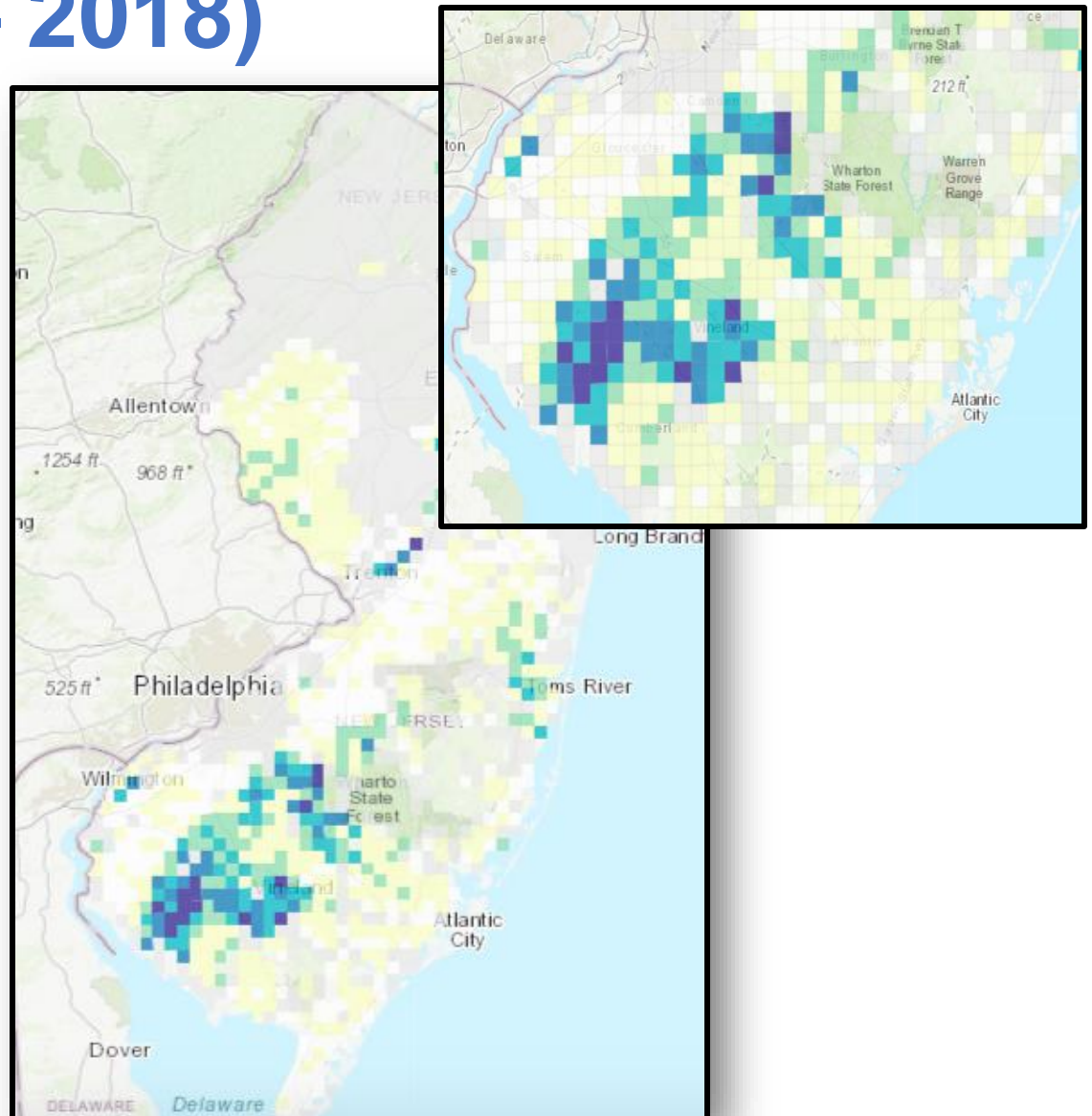
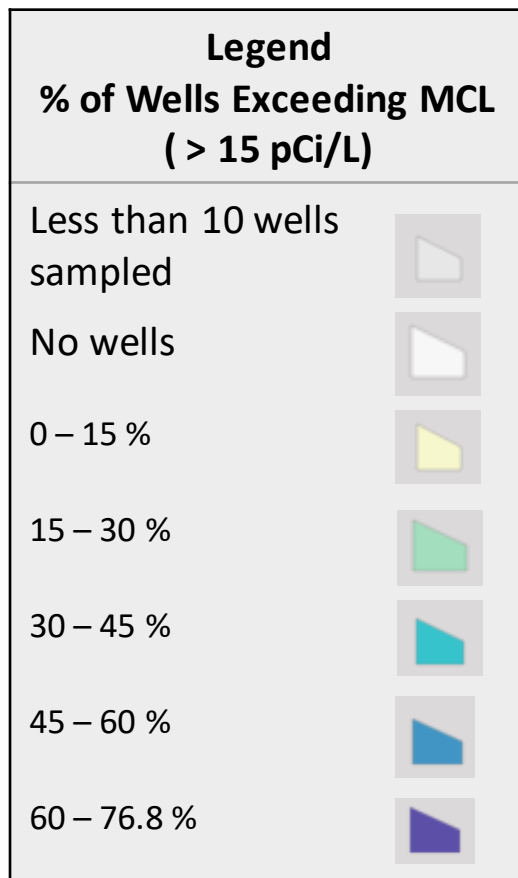
NJ PWTA Data Summary

<https://njdep.maps.arcgis.com/apps/MapSeries/index.html?appid=826ec9fae77543caa582a787d5f088e7>

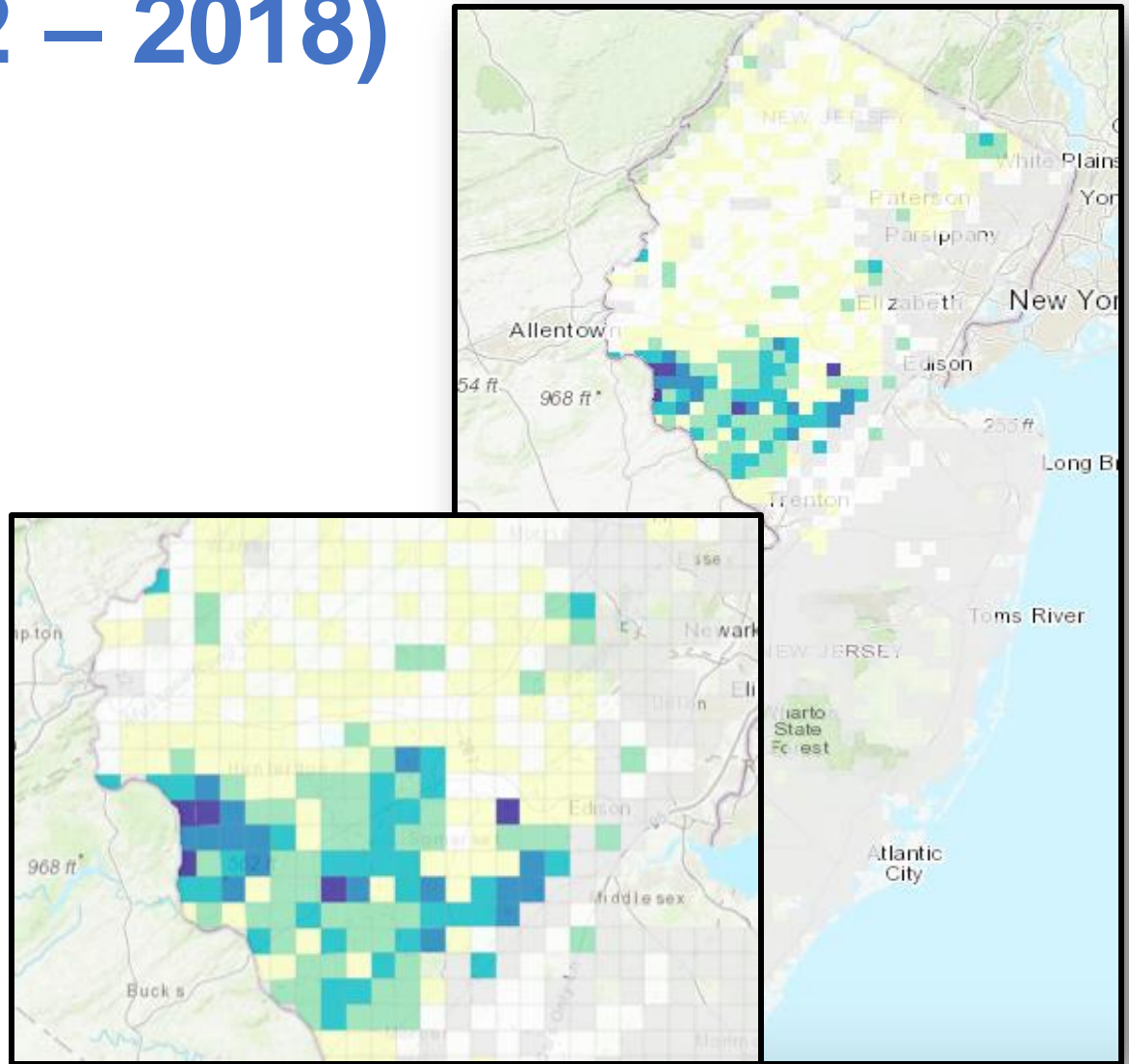
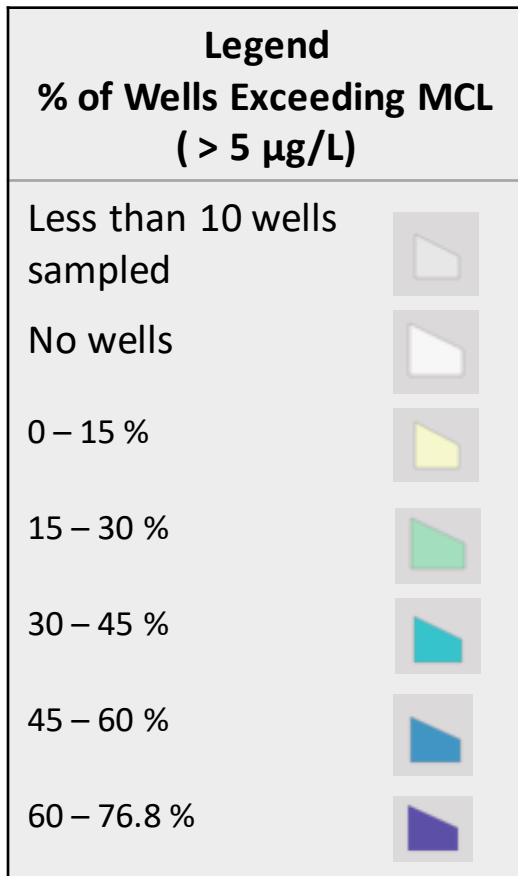


- Data summarized by county, municipality and 2x2 mile grids
- Address location feature allows pinpoint to grid

Gross Alpha Data: PWTA (2002 – 2018)



Arsenic Data: PWTA (2002 – 2018)



NJ Safe Drinking Water Act

- New wells: requires conditional “certification” from LHD before drilling begins (or alteration)
- Upon completion of new well – the owner must have a state-certified laboratory test the water for contaminants and submit results to local health agency
- Local health agency *may* require “physical and chemical treatment”
- Local health agency *shall* require treatment when
- (1) water does not meet the primary drinking water standards
 - (2) water exceeds the secondary drinking water standard
- Local health agency finalizes certification after well is constructed and tested.
- Pursuant to SDWA, New Jersey Housing and Mortgage Finance Agency provides 0% loans for treatment

New Jersey Subsurface and Percolating Waters Act

- Only professionals licensed by DEP and the State Well Drillers and Pump Installers Examining Board are authorized in installing, servicing, repairing and decommissioning residential wells and pumping equipment
 - Well drillers are specifically authorized to install, maintain, and replace treatment equipment located between a well and storage tank
 - A master well driller has authority to certify that a well – including any related treatment – has been constructed in accordance with state standards
- Establishes construction standards for wells, and minimum distance requirements from buildings, sewers, septic tanks, and fuel storage tanks, among other things

Water Treatment Regulations

- There are no regulations for treatment professionals, only regulations regarding treatment installation are in the plumbing code
- State plumbing license law of 1968
 - “Master plumber” requires valid license
 - Plumbing license is required to install or disconnect “water filtration or softening equipment”

Local Ordinances

- Hopewell Twp., Mercer County
 - Requires two-tank arsenic treatment if PWTA results exceed NJ arsenic MCL
- Cumberland County Health Department
 - Ordinance #12
 - Requires water certification before Certificate of Occupancy can be issued and for rental licenses
 - Original lab results (initial and/or retest) presented to CCHD - all PWTA required parameters must pass standards
 - Certificate issued for a fee paid to CCHD

Extra credit for information on other local ordinances
(add to chatbox or send me an email)

Specific Contaminants of Concern

Private Well Sources of Contamination

Naturally occurring sources:

- Private wells drilled into bedrock units
 - Underlying bedrock geology (e.g. - arsenic, gross alpha, uranium, radium)
 - Leaches into water through – construction of new well, drilling, and/or fractured bedrock units
- Other contributing factors: age, depth, and type of well

Anthropogenic sources:

- Agricultural and lawncare – nitrates
- Septic tanks – microorganisms
 - Minimum of 100-foot separation of leach fields and septic tanks from well
- Air pollution
- Industrial discharge

Coliform Bacteria

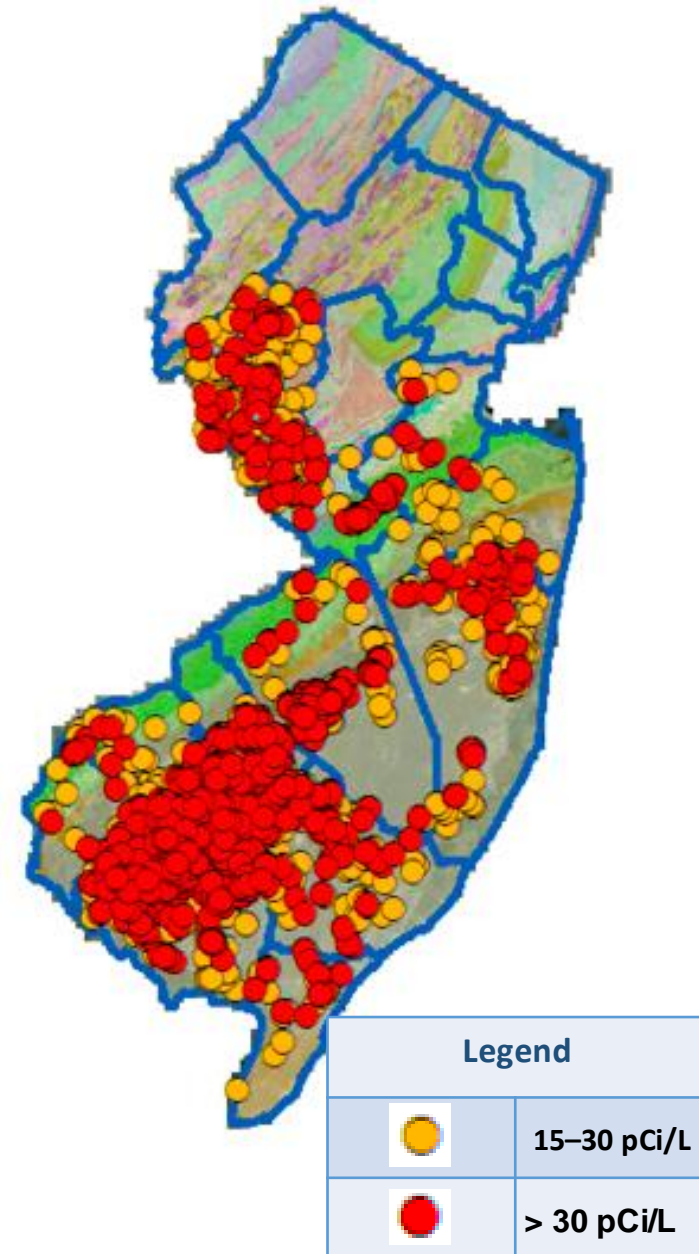
- Required PWTA testing statewide in NJ
 - Results are good for 6-months if using for PWTA
- Total coliform (TC) - "indicators" for possible disease-causing microorganisms
- Sources: septic tanks, contaminated surface waters, stormwater runoff, damage to well head such as a broken well cap, etc.
- Colilert – simultaneously determines presence of coliform and E.Coli – no confirmation test needed
- Test annually
- Water treatment: Ultraviolet light or chlorination
 - Additional Resources – Penn State Extension:
 - <https://extension.psu.edu/coliform-bacteria>
 - <https://extension.psu.edu/shock-chlorination-of-wells-and-springs>

TC/EC Recommendations:

- If (TC + / EC +) stop drinking water
- If (TC +/- EC -) or (TC +/- EC +) the following steps may be useful:
 1. Retest immediately (ASAP, < 1 week); test again in 6 months
 2. Ongoing (+) test results require removal of surface contamination source(s), remedy of well construction defects (Does rainfall surface runoff impact the wellhead area? Is there a septic tank leach field near by with potential impact? Are there pet and/or farm animal wastes near the wellhead?)
 3. If unable to find an issue, have well inspected by certified well professional
 4. If still unable to find an issue, install certified UV disinfection system or install a new well
 5. Shock chlorination may be appropriate if the source of your contamination is nearby and likely due to a one-time event (e.g., a neighbor drilled into the same aquifer and you're downstream, hurricane and extreme flooding or maintenance on a well that could have introduced bacteria)
 6. After two weeks retest to ensure corrective actions have remedied the issue

Gross Alpha Background Information

- Gross alpha is a measurement of radioactivity in drinking water
 - MCL: **15 pCi/L**
- Naturally occurring
- North vs. South Jersey
 - North – Uranium, lesser extent radium
 - South – Radium
- Odorless, colorless, tasteless
- Adverse health effects
 - Radium – bone and sinus cancer
 - Uranium – kidney toxicity
- Requires a 48-hour test



PWTA (2003 – 2014) Gross
Alpha Exceedances

Radioactive Elements and Isotopes

- Radioactivity (i.e., gross alpha) in drinking water is caused by elements such as radium and uranium
- Radium: MCL of **5 pCi/L**
 - **If gross alpha > 5 pCi/L but < 15 pCi/L** additional testing for combined isotopes radium-226 (Ra-226) + radium-228 (Ra-228) recommended
 - 48-hour gross alpha test captures Ra-224 (half-life < 4 days)
- Uranium: MCL of **30 µg/L or ppb**
 - Naturally occurring isotopes: uranium-234 (U-234) and/or uranium-238 (U-238)

Gross Alpha Water Treatment Options

Radium (Positive Charge +)

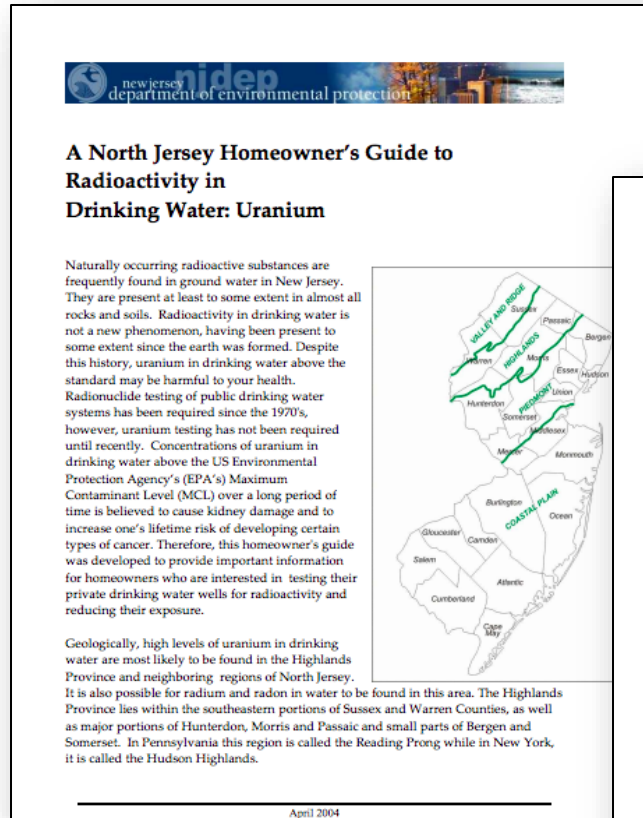
- Water softener
 - \$1200 - \$1500
- POU Reverse Osmosis
 - \$800

Uranium (Negative Charge -)

- Anion Exchange (followed by pH neutralizer)
 - \$2000
- POU Reverse Osmosis
 - \$800

Radioactivity in Drinking Water Guides

- How and why radioactivity affects private wells
- Risks of radioactivity
- Testing procedures
- Ways to reduce radioactivity

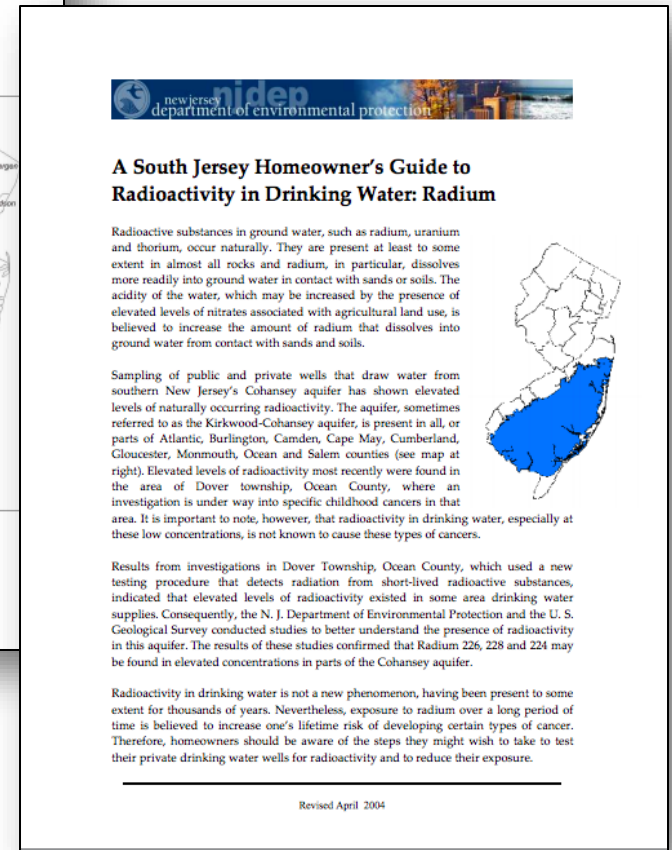


A North Jersey Homeowner's Guide to Radioactivity in Drinking Water: Uranium

Naturally occurring radioactive substances are frequently found in ground water in New Jersey. They are present at least to some extent in almost all rocks and soils. Radioactivity in drinking water is not a new phenomenon, having been present to some extent since the earth was formed. Despite this history, uranium in drinking water above the standard may be harmful to your health. Radiometric testing of public drinking water systems has been required since the 1970's, however, uranium testing has not been required until recently. Concentrations of uranium in drinking water above the US Environmental Protection Agency's (EPA's) Maximum Contaminant Level (MCL) over a long period of time is believed to cause kidney damage and to increase one's lifetime risk of developing certain types of cancer. Therefore, this homeowner's guide was developed to provide important information for homeowners who are interested in testing their private drinking water wells for radioactivity and reducing their exposure.

Geologically, high levels of uranium in drinking water are most likely to be found in the Highlands Province and neighboring regions of North Jersey. It is also possible for radium and radon in water to be found in this area. The Highlands Province lies within the southeastern portions of Sussex and Warren Counties, as well as major portions of Hunterdon, Morris and Passaic and small parts of Bergen and Somerset. In Pennsylvania this region is called the Reading Prong while in New York, it is called the Hudson Highlands.

April 2004



A South Jersey Homeowner's Guide to Radioactivity in Drinking Water: Radium

Radioactive substances in ground water, such as radium, uranium and thorium, occur naturally. They are present at least to some extent in almost all rocks and radium, in particular, dissolves more readily into ground water in contact with sands or soils. The acidity of the water, which may be increased by the presence of elevated levels of nitrates associated with agricultural land use, is believed to increase the amount of radium that dissolves into ground water from contact with sands and soils.

Sampling of public and private wells that draw water from southern New Jersey's Cohansey aquifer has shown elevated levels of naturally occurring radioactivity. The aquifer, sometimes referred to as the Kirkwood-Cohansey aquifer, is present in all, or parts of Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Monmouth, Ocean and Salem counties (see map at right). Elevated levels of radioactivity most recently were found in the area of Dover township, Ocean County, where an investigation is under way into specific childhood cancers in that area. It is important to note, however, that radioactivity in drinking water, especially at these low concentrations, is not known to cause these types of cancers.

Results from investigations in Dover Township, Ocean County, which used a new testing procedure that detects radiation from short-lived radioactive substances, indicated that elevated levels of radioactivity existed in some area drinking water supplies. Consequently, the N. J. Department of Environmental Protection and the U. S. Geological Survey conducted studies to better understand the presence of radioactivity in this aquifer. The results of these studies confirmed that Radium 226, 228 and 224 may be found in elevated concentrations in parts of the Cohansey aquifer.

Radioactivity in drinking water is not a new phenomenon, having been present to some extent for thousands of years. Nevertheless, exposure to radium over a long period of time is believed to increase one's lifetime risk of developing certain types of cancer. Therefore, homeowners should be aware of the steps they might wish to take to test their private drinking water wells for radioactivity and to reduce their exposure.

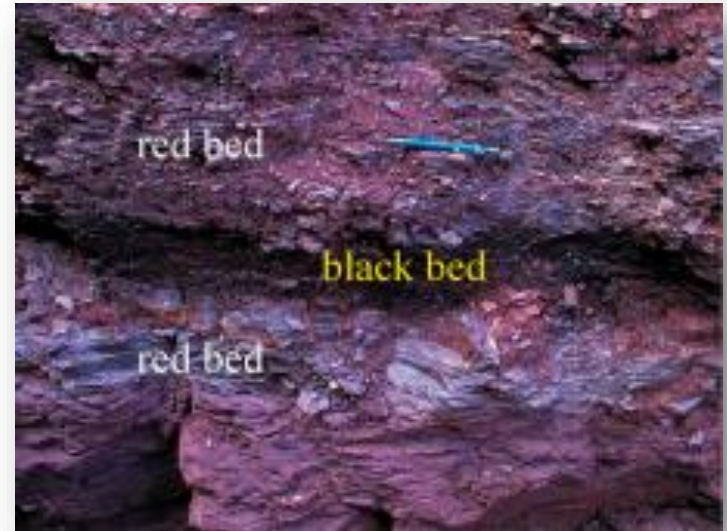
Revised April 2004

North Jersey Guide: <https://www.state.nj.us/dep/rpp/rms/agreedown/urwater.pdf>

South Jersey Guide: <https://www.nj.gov/dep/rpp/rms/agreedown/radwater.pdf>

Arsenic Background Information

- Inorganic arsenic – naturally occurring or anthropogenic
- Very prevalent in NJ Piedmont Province
 - Pyrite found in black shale
 - Hematite and clay minerals from red shale
- Potential chronic drinking water exposure effects: variety of cancers (skin, lung, urinary bladder, etc.), diabetes
- Exposure routes: ingestion and dermal
- Odorless, colorless, tasteless in drinking water
- Only way to detect arsenic – test your water!



Serfes M 2004, Black and red shale beds in Passaic Formation

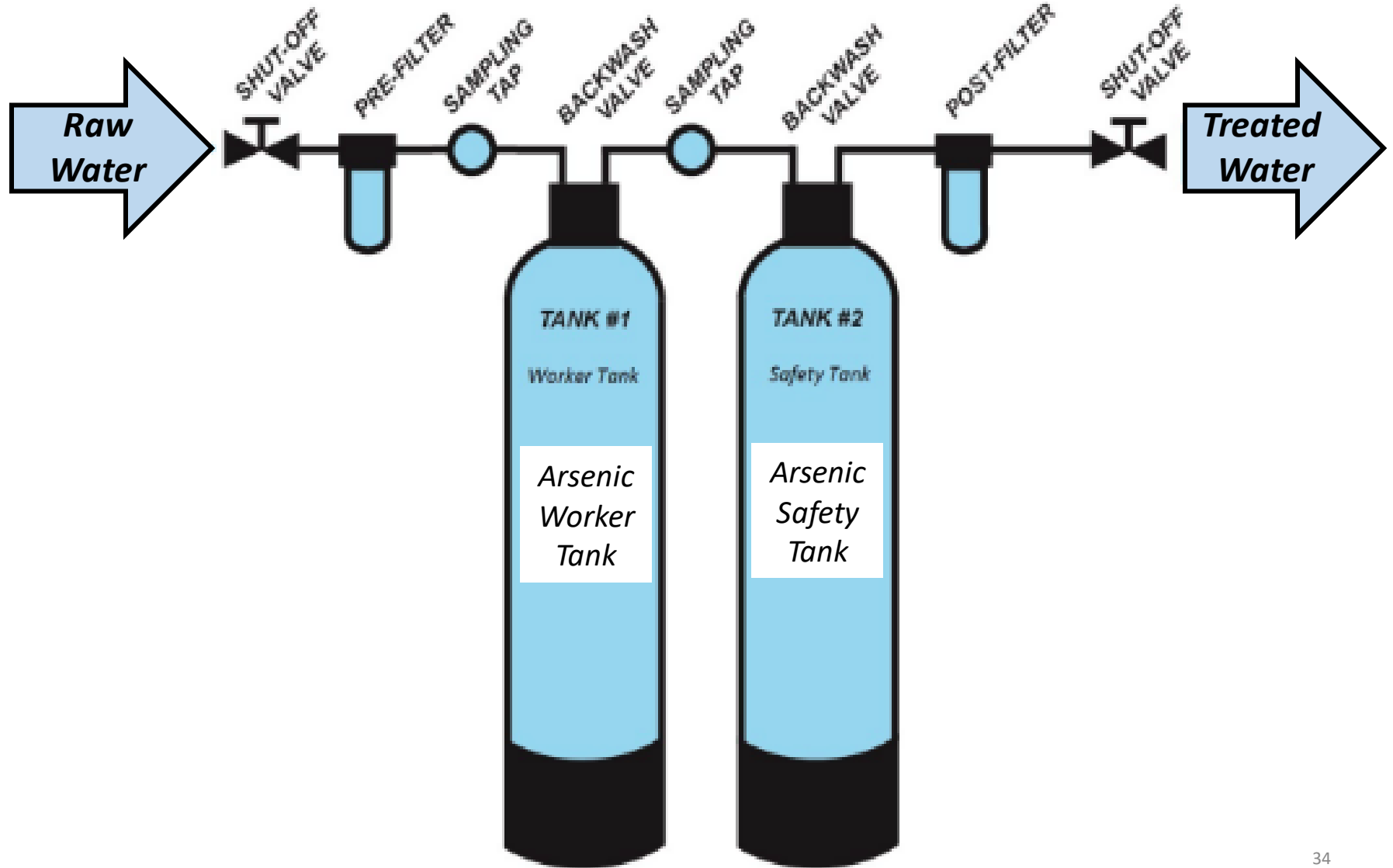
NJ Arsenic Standard

- **Current federal standard: 10 µg/L**
- **Current NJ arsenic standard: 5 µg/L**
 - Both became effective in January 2006
 - New Jersey and New Hampshire - most protective standard
- Prior, standard was **50 µg/L**
- Maximum contaminant level goal (MCLG) of **0 µg/L**

Common complications/issues with arsenic removal

- Two inorganic species: As III (arsenite) and As V (arsenate)
 - Different species – limited testing availability from commercial labs
 - Arsenic speciation cartridges
- Typical water treatment (water softener or anion exchange) will **NOT** remove As III from drinking water
- Possible indicators of presence of As III:
 - dissolved iron ($> 100 \mu\text{g/L}$)
 - manganese ($> 50 \mu\text{g/L}$)
 - sulfur odor
- pH can negatively impact water treatment
- Two-tank arsenic treatment system recommended in NJ

Recommended Arsenic Water Treatment





Pre
Sediment
Filter

The image shows a water filtration system installed in a utility room. It features a blue pre-sediment filter connected to a network of copper pipes. A pressure gauge is mounted on the piping between the filter and the tanks. Two large, light-green plastic tanks are connected to the system. The left tank is labeled 'Arsenic Worker Tank' and the right tank is labeled 'Arsenic Safety Tank'. The background wall has a decorative border with a house pattern.

Arsenic
Worker
Tank

Arsenic
Safety
Tank

Arsenic Water Treatment Options

| Treatment Type | Preferred Treatment | Process / Maintenance | Chemical Use | Waste Generated | Arsenic Species Removed | Typical Media Life | Average Installation Cost |
|------------------------------|---------------------|-----------------------|--------------|-----------------|-------------------------|--------------------|---------------------------|
| Whole-House Adsorption | 1st Choice | Simple | None | Low | As3 & As5 | 2-3 years | \$2,495 |
| Point-of-Use Adsorption | 2nd Choice | Simple | None | Low | As3 & As5 | 2-3 years | \$835/Unit |
| Whole-House Anion Exchange | No | Complex | Salt | High | As5 Only | 10 years | \$2,000 |
| Point-of-Use Reverse Osmosis | No | Moderate | Disinfectant | Low | As5 Only | 3 years | \$835/Unit |

Arsenic Awareness Website

<http://njarsenic.superfund.ciesin.columbia.edu/>

HOME VIDEOS HEALTH RISKS TESTING OPTIONS TREATMENT OPTIONS FAQ ABOUT US

New Jersey Arsenic Awareness Initiative

Informing owners about the need to test their wells, and the importance of treating drinking water for arsenic when results show levels exceeding the standards.

Many northern New Jersey residents get their drinking water from private wells, and NJ Private Well Testing Act results from 2002-2012 show that >9% of wells tested exceed state limits for arsenic in drinking water, and in some townships >40% of private wells tested exceeded state limits.

[KEY FACTS ABOUT ARSENIC EXPOSURE \(pdf\)](#)

Health Care Providers

If your patients have private wells, let them know they need to test their water to know if it's safe to drink. Testing and treatment companies, FAQs and videos are available on this website (tinyurl.com/arsenichelp).

Infants and children are the most vulnerable to the health risks of arsenic. Click here for an overview of health risks.

If you're practicing obstetrics or pediatrics in Hunterdon County let your patients know free well water testing is available through Columbia University.

To get started with free tests for your patients or if you have any questions get in touch with Stuart Braman at sbraman@deo.columbia.edu.

Private Well Owners

- TEST** – the only way to learn if your water has unsafe levels of arsenic or other contaminants is to test it. Click here for a list of certified labs using the most sensitive methods available to test for arsenic. Click here to watch a short video about testing your well water for arsenic.
- TREAT** – if your water has unsafe levels of arsenic switch to drinking and cooking with bottled water and assess your treatment options. Click here for a list of companies in New Jersey offering treatment for private wells contaminated with arsenic. See also (FAQs): Recommended arsenic treatment methods and Treatment options NOT recommended for arsenic. Click here to watch a short video about treating your private well water for arsenic.
- MONITOR** – if you treat your water for arsenic, test your water again after installation to make sure it's working and then annually. Click here for FAQs about maintaining an arsenic treatment system.

Arsenic in New Jersey Private Well Water

Exposure to Arsenic

Arsenic in wells → Exposure → Drinking water → Food → Air → Ingestion → Inhalation → Absorption

Health Effects of Arsenic Across the Life Course

Health impacts are based on risk.

Infants: Stunted growth, cognitive impairment. Children: Skin lesions, learning disabilities. Adults: Skin lesions, cancer, heart disease, diabetes, kidney disease.

Every Well Must Be Tested

By the State of New Jersey. County private wells. Free of charge. No arsenic, lead, or lead pipes. Drinking is the only way to know your water is safe.

Reducing Exposure

Switch to bottled water. Buy bottled or filtered. Reverse osmosis. Perchlorate-free. See label. See label. See label. See label.

© 2012 Hunterdon County Health Department. www.nj.gov/arsenic njarsenic.columbia.edu

Website Features:

- Key facts regarding arsenic exposure
- Health Risks
- Informative videos
- Testing and treatment options

Additional Resources:

- Detailed arsenic treatment presentation:

<https://www.youtube.com/watch?v=xH8v2mZeVYQ>

Water Treatment Financing Programs

Water Treatment Financing: New Jersey Housing and Mortgage Finance Agency (NJHMFA)

- **Eligibility:**
 - Individual private well homeowners only
 - Violations of state Primary Drinking Water Standards
 - Some secondary Drinking Water Standards included
- **Maximum loan amount:**
\$10,000:
 - 0% no-interest
 - 10-year maximum term



- Potable Water Fact Sheet:
https://www.state.nj.us/dca/hmfa/consumers/docs/ho_potablewater_fs.pdf

Water Treatment Financing: NJ Spill Compensation Fund

- Compensation for damage caused by discharge of hazardous substances (manmade chemicals)
- Qualifications:
 - Requires certified laboratory test: initial and confirming
 - Eligible claim applicable if initial and confirmation results exceed drinking water standards
 - More complicated damages must include evidence/documentation
 - Claims may be eligible for:
 - Installation of water treatment
 - Confirmation test fee
 - Connection to public waterline
- Contact Environmental Claims Administration (ECA) to file a claim
 - URL for claim forms: <https://www.nj.gov/dep/srp/finance/ecacclaim.htm>
- Claims must be filed within one year from date of damage discovery

Public Notification: Neighbor Outreach

NJ PWTA Public Notification

- Local health department is

“authorized to issue a public notice to owners of property within vicinity of the subject property suggesting or recommending that property owners may wish to have nearby wells sampled for the failed parameter(s)”

- The specific address or location of the failed private well shall not be identified
- Notification shall be made at a minimum of 200ft
- Public notification at sole discretion of local health authority

slido

Does your department conduct any neighbors
outreach?

 Start presenting to display the poll results on this slide.

Demonstration Example #1: Statewide PWTA Neighbors Arsenic Outreach

- Targeted PWTA arsenic neighbors
 - Distance: < 500 ft., 500 – 1,000 ft.
- Invitation letters sent to 1,743 private well homeowners
- Free arsenic test kit mailed to participants (n=274)
- Wells tested: n=214
- 70% of wells previously untested

Arsenic Results – Distance from Neighbors Well

| | All Wells | Within 500 ft. | 500 – 1,000 ft. |
|---|------------------|-----------------------|------------------------|
| # of raw samples | 214 | 151 | 60 |
| Max. Arsenic Level (µg/L) | 66.0 | 66.0 | 14.4 |
| % Exceeding MCL (> 5 µg/L) | 26.2% (n=56) | 33.8% (n=51) | 8.3% (n=5) |

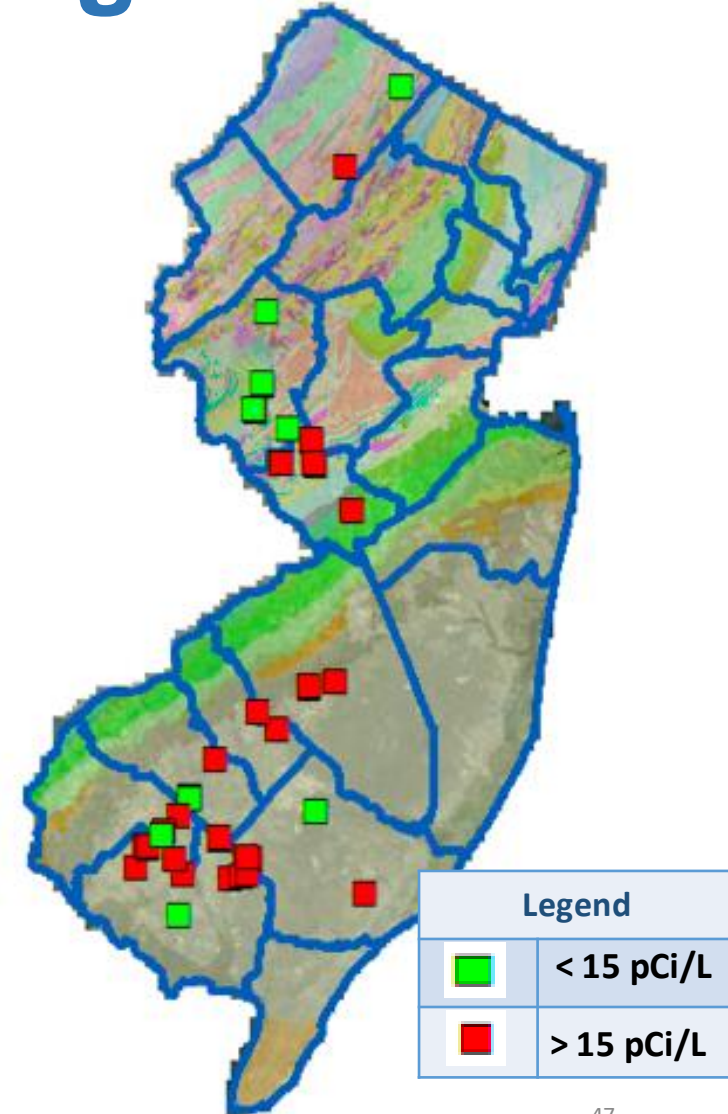
Flanagan, S., et al. (2020) *Summary of arsenic results by distance to neighbor's well*

Risk Communication Language

- Three risk version outreach letters sent out, “***A well in your neighborhood with arsenic at levels:***
 - **Low** (5 – 10 µg/L): ***above the standard...***”
 - **Medium** (10 – 25 µg/L): ***several times higher than...***”
 - **High** (> 25 µg/L): ***5 times higher than...***”
- Homeowners receiving high risk letters
 - More likely to request arsenic test kit compared to low-risk letters (**17.4% vs. 12.8%**)
 - And higher participation (**14.9% vs. 10.5%**)

Demonstration Example #2: Gross Alpha PWTA Neighbors

- Targeted neighbors of high PWTA (> 100 pCi/L) gross alpha homes within **500 foot-distance**
- 412 neighbors identified and 5 high gross alpha wells confirmed
- Free testing for 75 wells
- Contaminants tested:
 - Raw water - **gross alpha (map)**, radium, uranium, radon, iron
 - Treated water – gross alpha

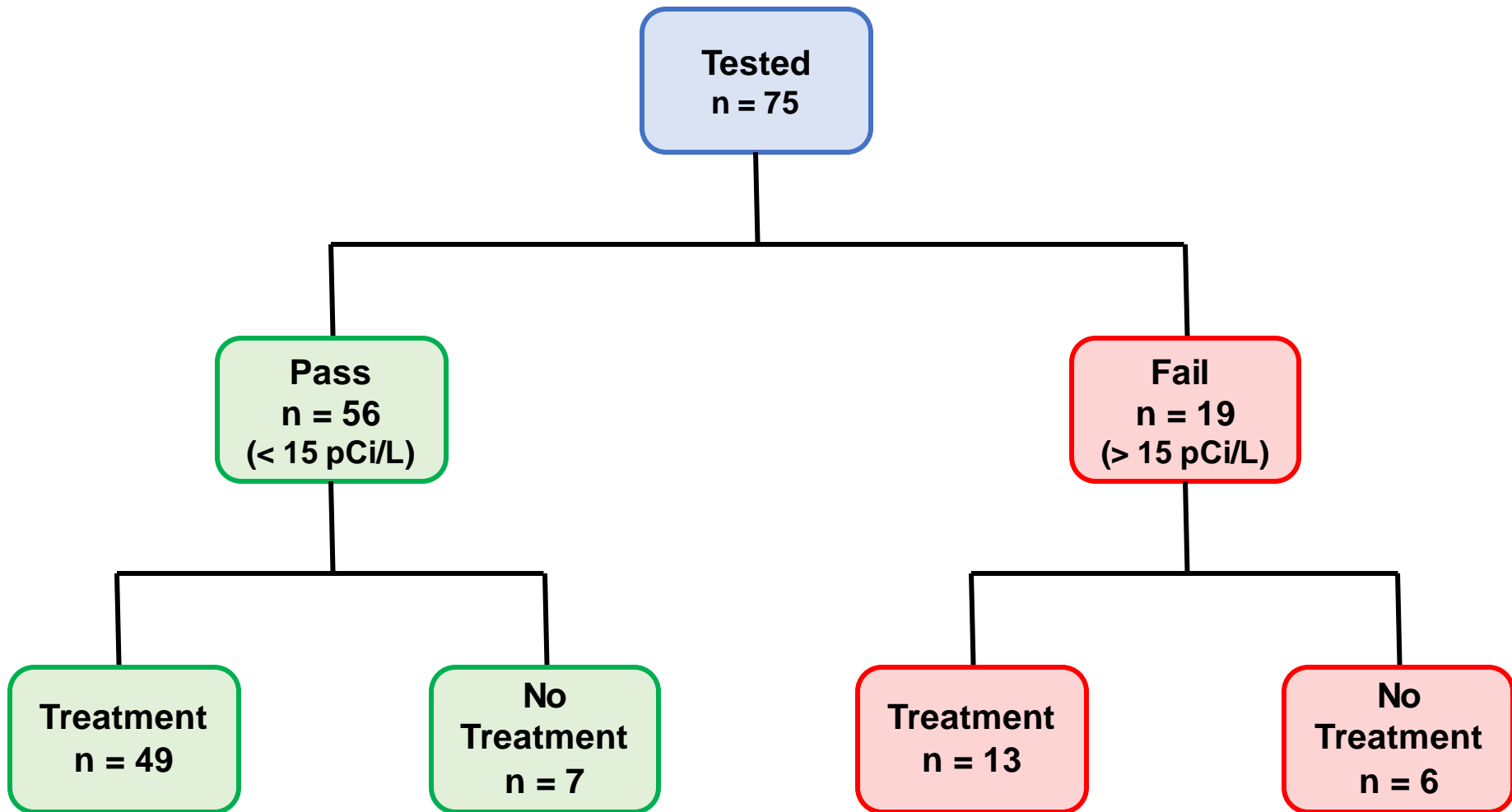


Raw Water Results:

Number & Percentage of Neighboring Wells Exceeding the Standard

| | Gross Alpha (> 15 pCi/L) | Iron (> 300 µg/L) | Radium (> 5 pCi/L) | Radon (> 800 pCi/L) |
|--------------|--|---------------------------------|----------------------------------|-----------------------------------|
| All | 52 (69%) | 13 (17%) | 43 (59%) | 20 (27%) |
| North | 12 (55%) | 1 (5%) | 3 (14%) | 19 (86%) |
| South | 40 (76%) | 12 (23%) | 40 (78%) | 1 (2%) |

Gross Alpha Neighbors – Drinking Water Exposure



Neighbors Outreach – Summary

- Lack of awareness of widespread arsenic and gross alpha occurrence in local regions
- Outreach to neighbors is effective at identifying contaminated wells
- Recommend outreach to neighbors within 500 ft
 - Percentage of high exceeding wells increases with proximity
 - Highest exceeding neighbor wells > 200ft
- Appropriate high-risk messaging improves participation
- Discrepancies among high PWTA gross alpha value, confirming high PWTA wells prior to selecting neighbors may be useful.

Identification of Neighbors: Tips & Tools

slido

Does your department use mapping software?

 Start presenting to display the poll results on this slide.

Identification of High-Risk Neighbors

- PWTA data to identify high exceeding wells
 - NJDEP -> County Health Department
 - If you are not getting the data you can reach out to Richard.Gunosky@dep.nj.gov
- Geographic Information Systems (GIS) ArcMap
 - Software program used for spatial and geographic data analysis
- Map
 - Wells may have incorrect X,Y values – check these first
- Select neighbors within buffer radius of choice (e.g., 200, 500, 1000ft)

Removing specific properties

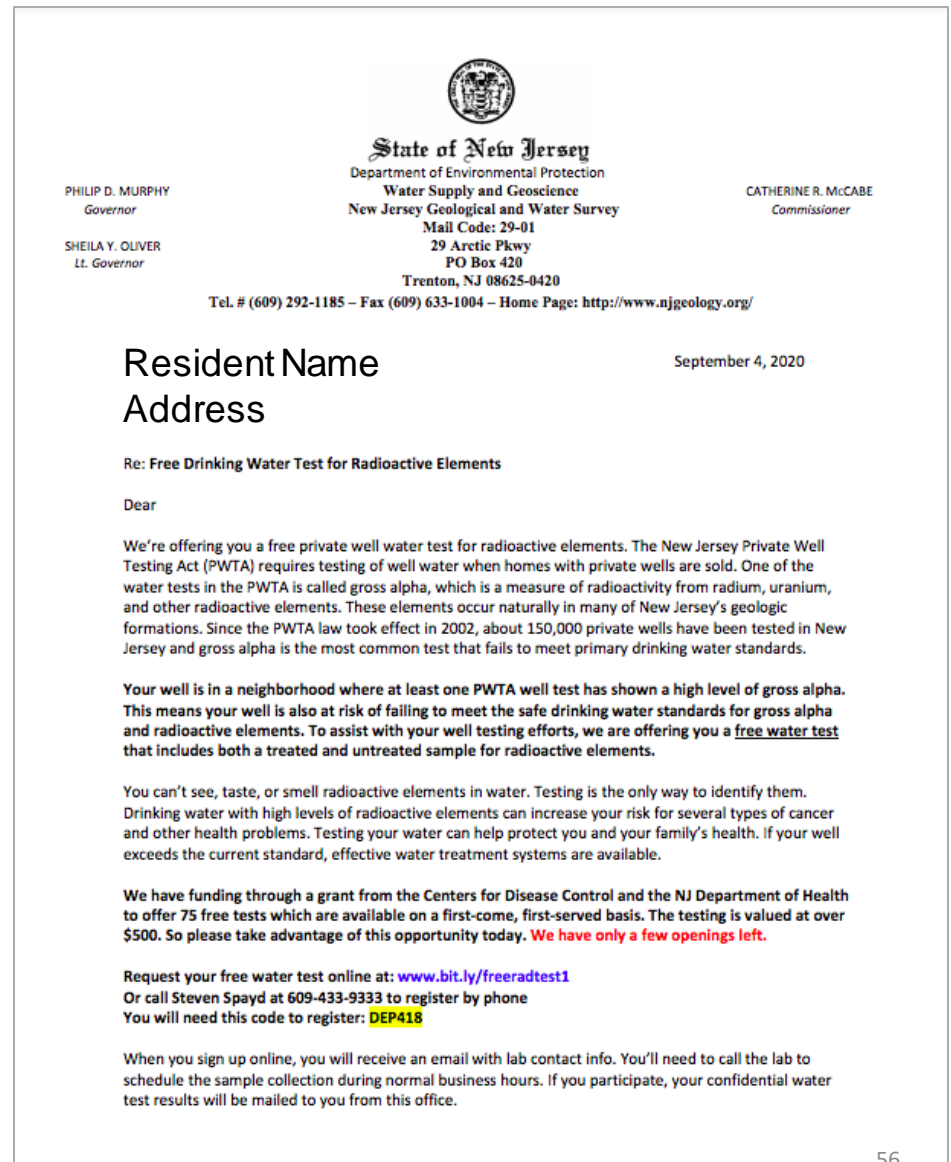
- Parcel data includes mailing addresses, property location (sometimes can be different from street address) – does the person really live here?
- Specific properties removed prior to selecting neighboring homes for outreach
 - Churches, farms, schools, etc.
 - Double check building descriptions (BLDG_DES) to check whether they're a house or not
 - Low property values (e.g. - below \$1,000)
 - Addresses with a P.O. box address
 - Zip codes from other states
 - May need to remove duplicate addresses

Buffers surrounding Neighbor Parcel Data (Highlighted in Green)



Notification Letters Sent Out

- Letters addressed to resident name of neighboring homes
- Dear "Resident Name or Current Resident"
 - Current resident also addressed
 - New homeowner could be residing in home
- Free water test opportunity outlined in letters
- Registration link also outlined in letters





Please complete a brief survey – we will use your response as attendance record for Public CE credits.

Link to survey: <http://healthsurveys.nj.gov/NoviSurvey/n/zz2km.aspx>

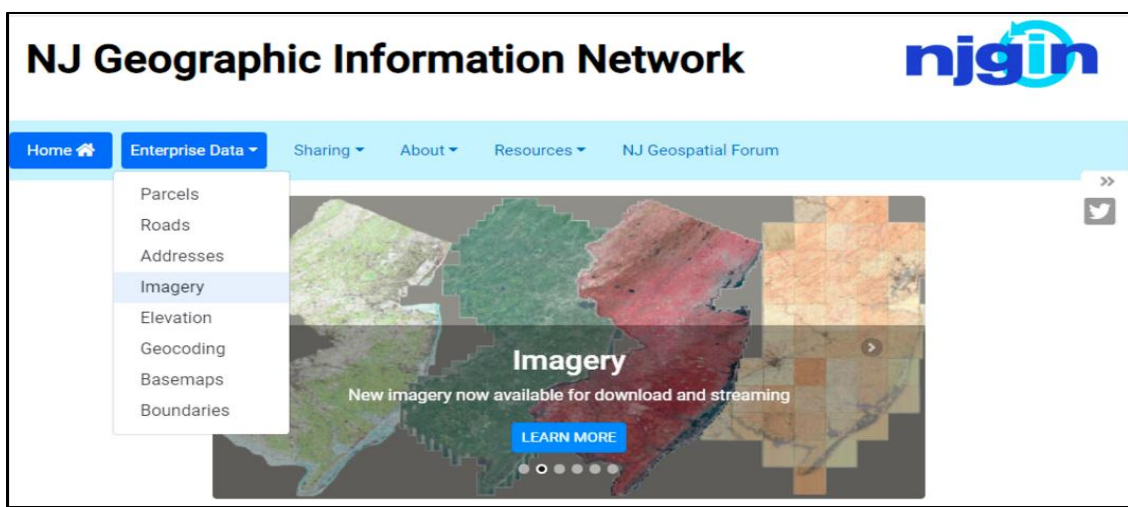
Special thanks to Dr. Steve Spayd, Dr. Nick Procopio, Heidi O'Neill and Dr. Sara Flanagan

For questions about anything discussed today contact jessie.gleason@doh.nj.gov

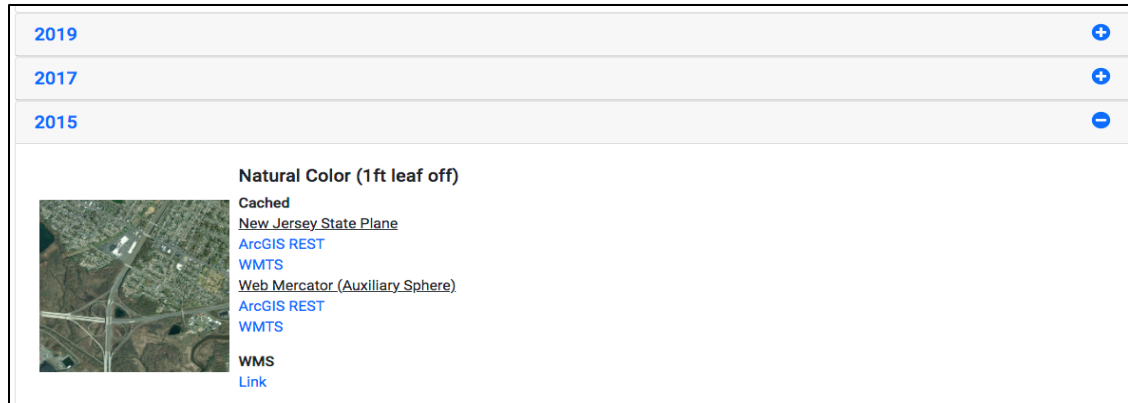
Step by Step GIS Instructions for Neighbor Identification

Upload New Jersey Imagery

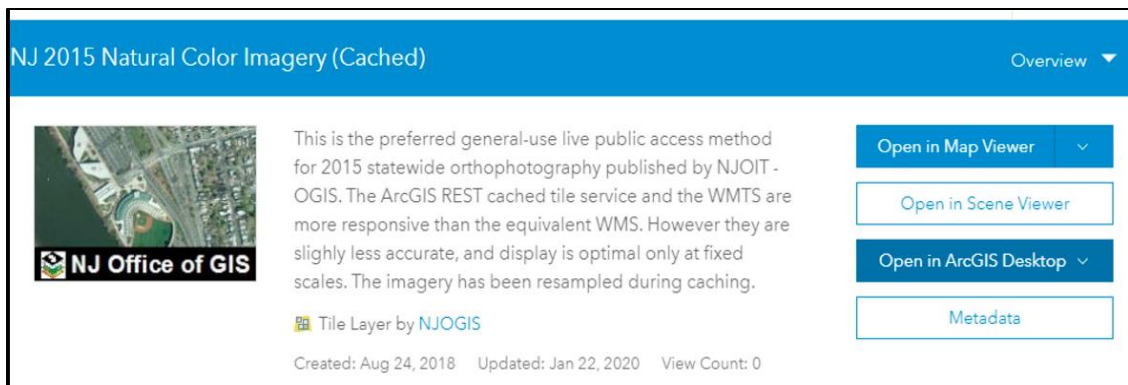
- Enter NJ Geographic Information Network → Imagery



- Under "Streaming", find desired imagery map and click on "ArcGIS REST"

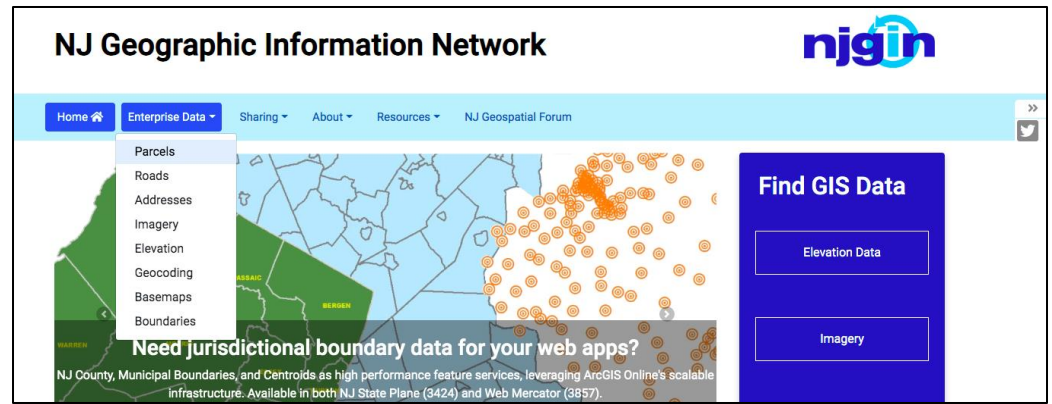


- Open in ArcGIS Desktop

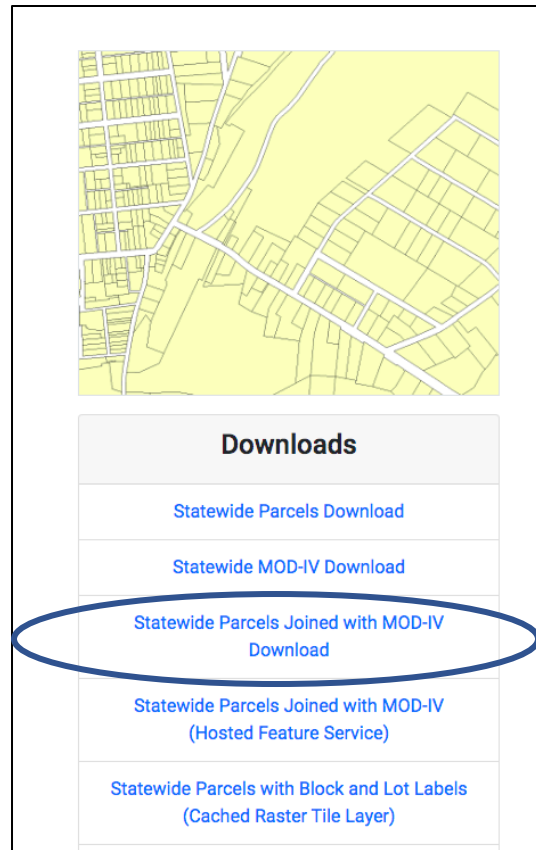


Upload New Jersey Parcel Data

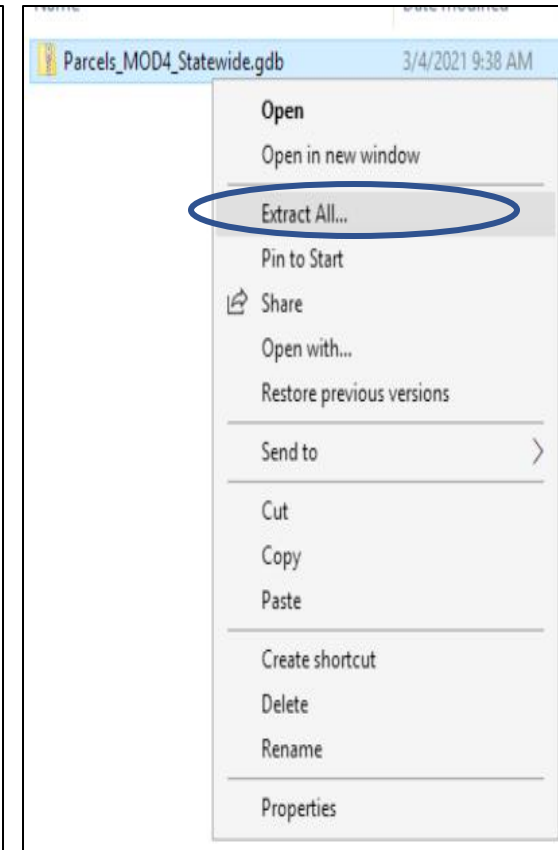
- Click on "Parcel Data" in NJ Geographic Information Network



- Under "Downloads" click "Statewide Parcels Joined with MOD-IV Download"

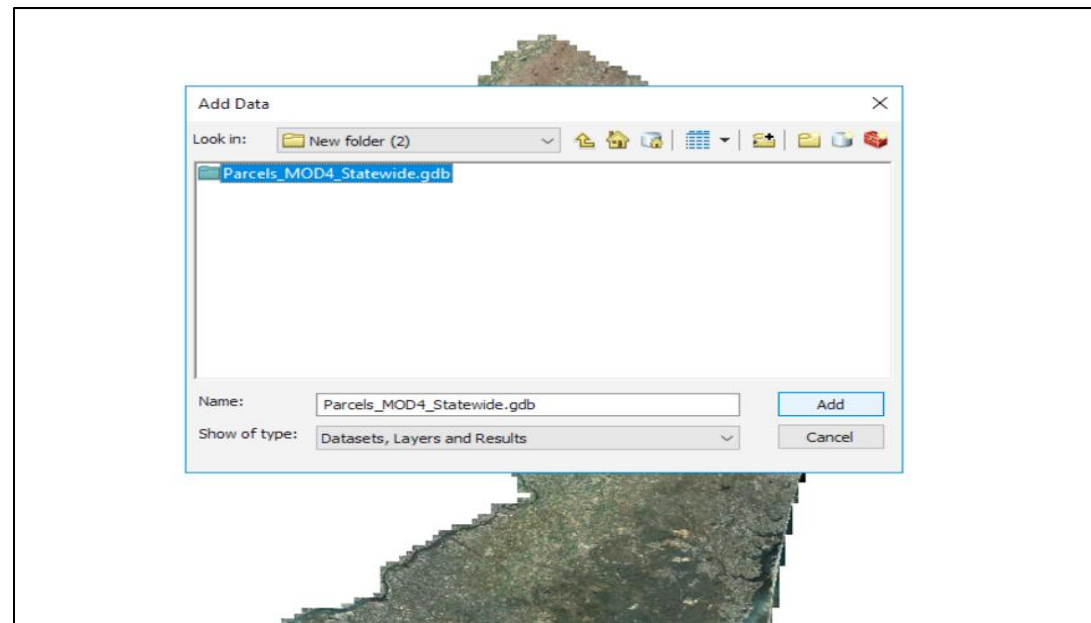
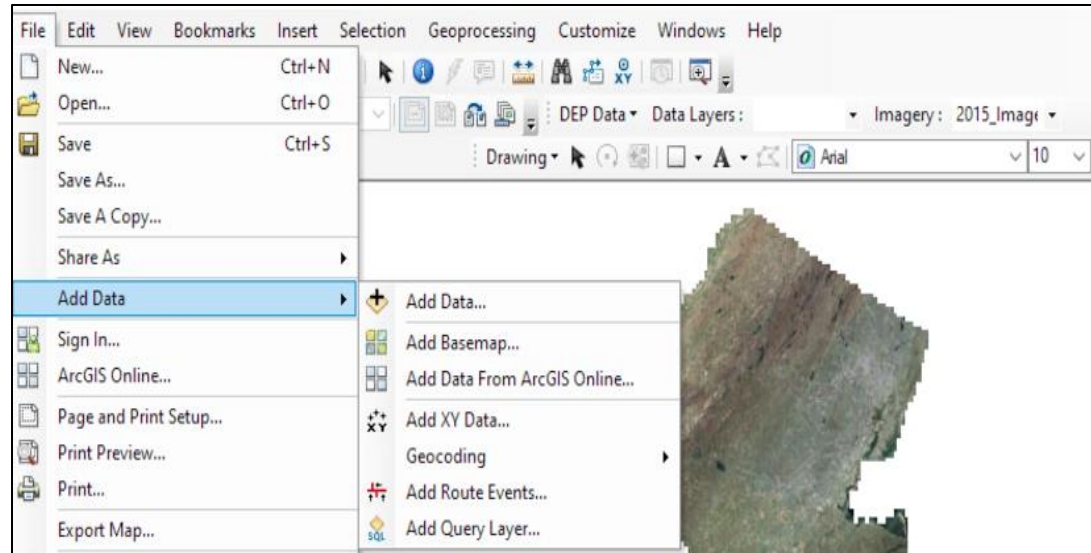


- Place data in appropriate folder and extract data ("Extract All...")



Upload New Jersey Parcel Data

- In ArcMap, click File → Add Data → Add Data...
- Add Parcels_MOD4_Statewide.gdb



2015 Imagery Map

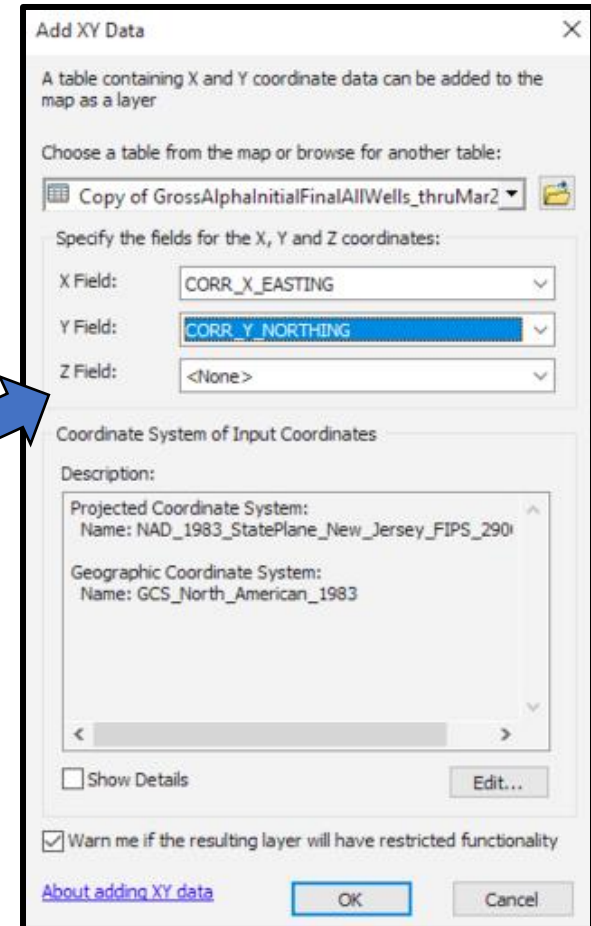
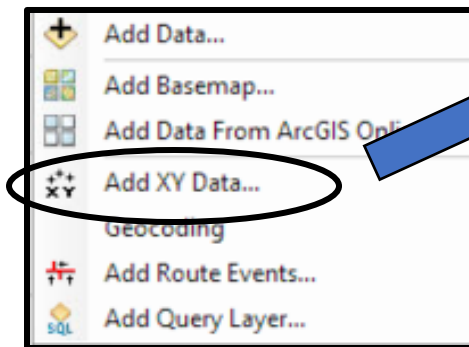
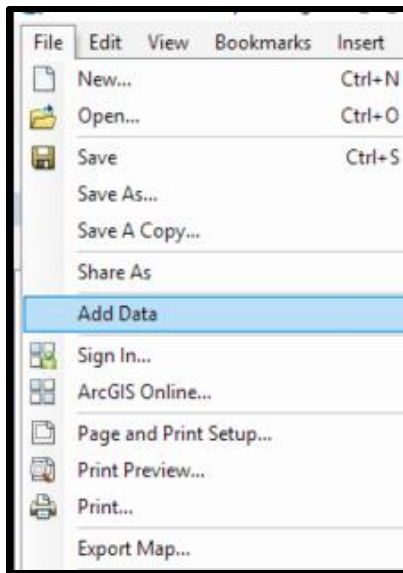


Parcel Data



GIS: Inserting "Corrected" X & Y Data

- Add Excel Spreadsheet **only** with PWTA exceedances
 - Data contains X and Y coordinates
 - ** Make sure Excel spreadsheet saved as Comma Delimited (*.csv)



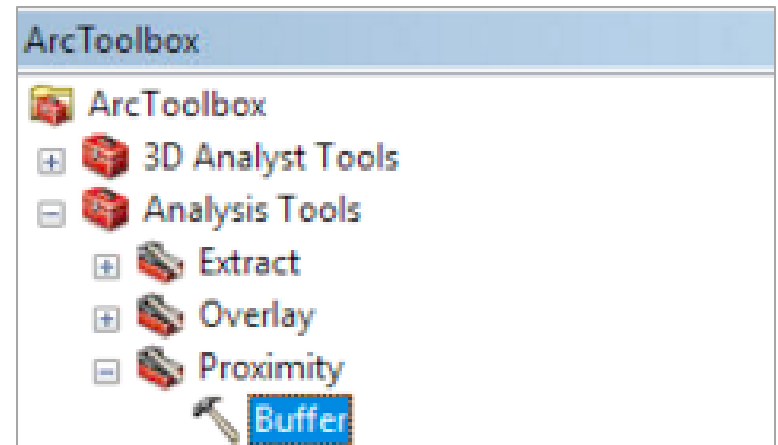
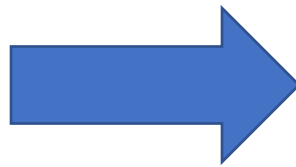
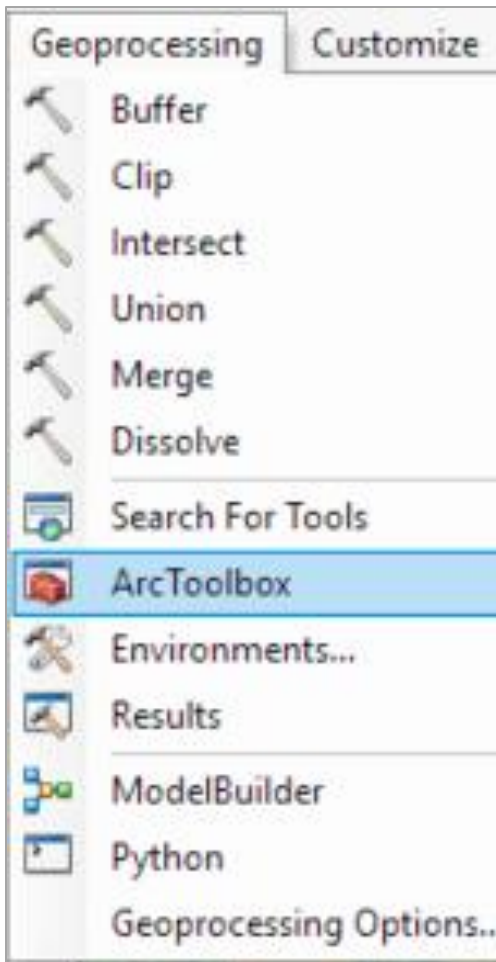
Projected Coordinate System:

NAD_1983_StatePlane_New_Jersey_FIPS_2900_feet

Geographic Coordinate System: GCS_North American_1983

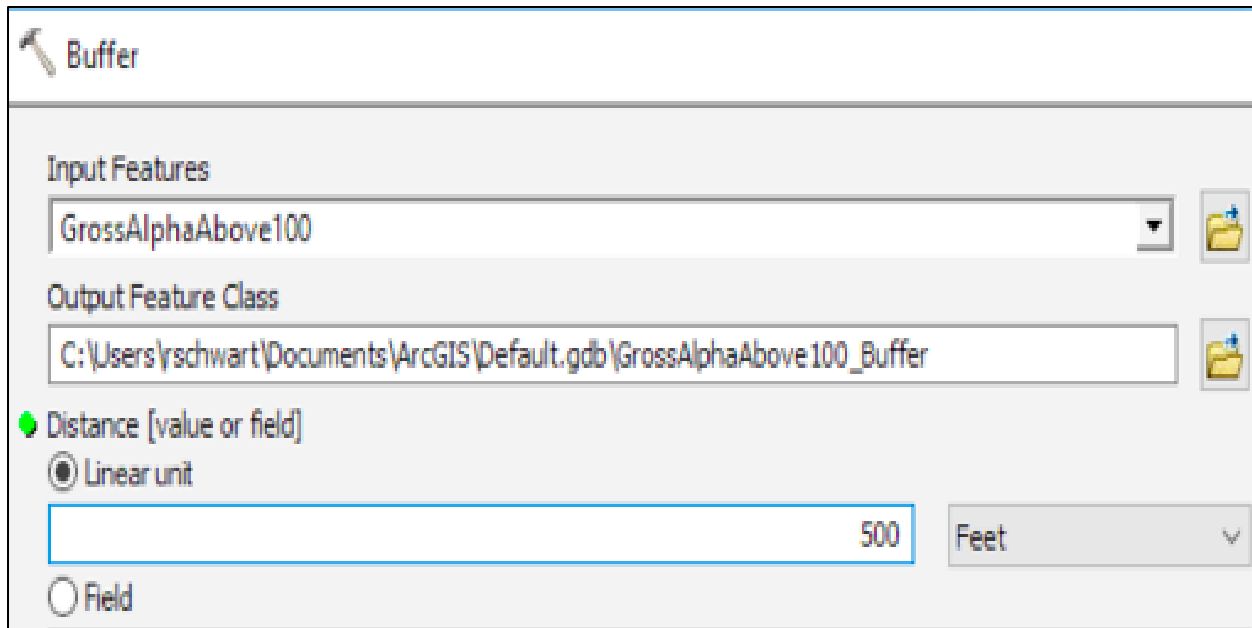
GIS: To create a buffer...

- Go to ArcToolBox
 - Analysis Tools → Proximity → Buffer



GIS: To create a buffer...

- Identify input feature (PW TA point buffer will surround)
- Output Feature Class:
 - Folder location
 - Saved as a shapefile (.shp)
- Identify the buffer of choice (250, 500, etc...)
 - Select Unit (e.g. feet)

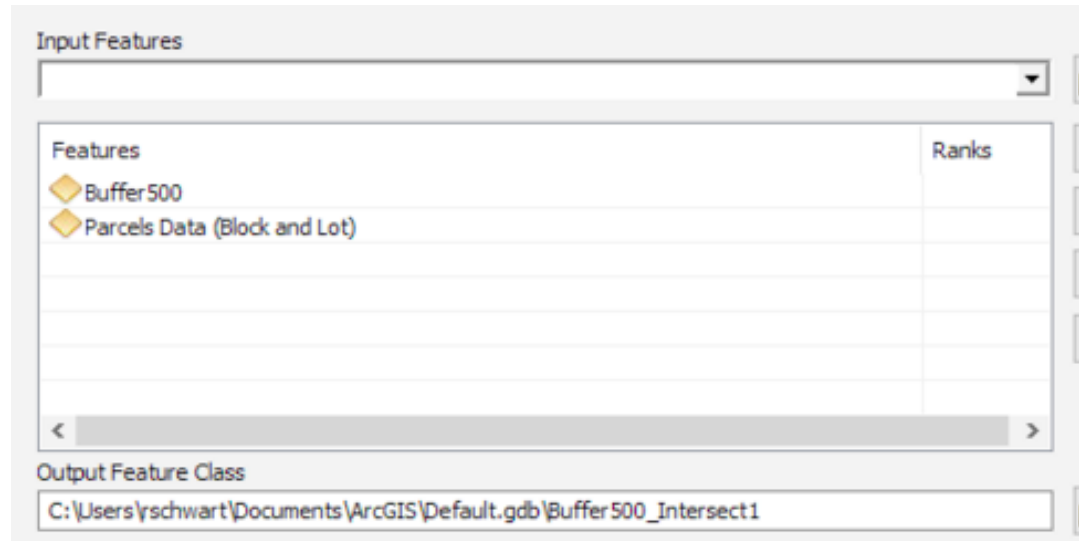
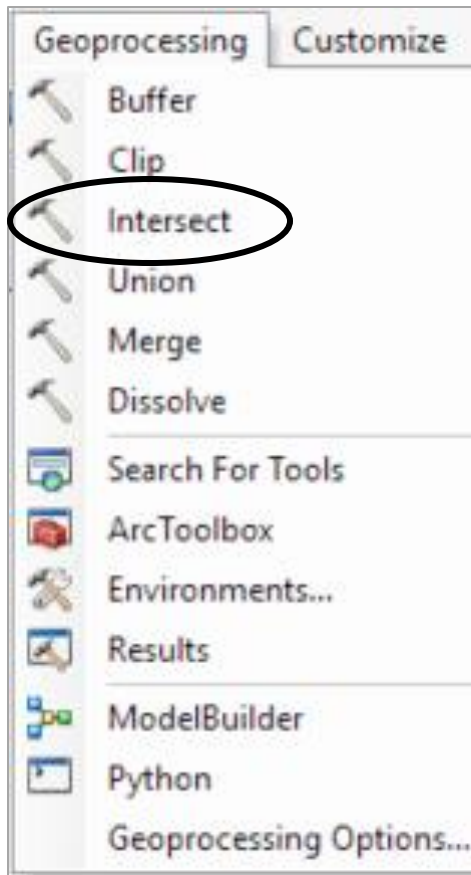


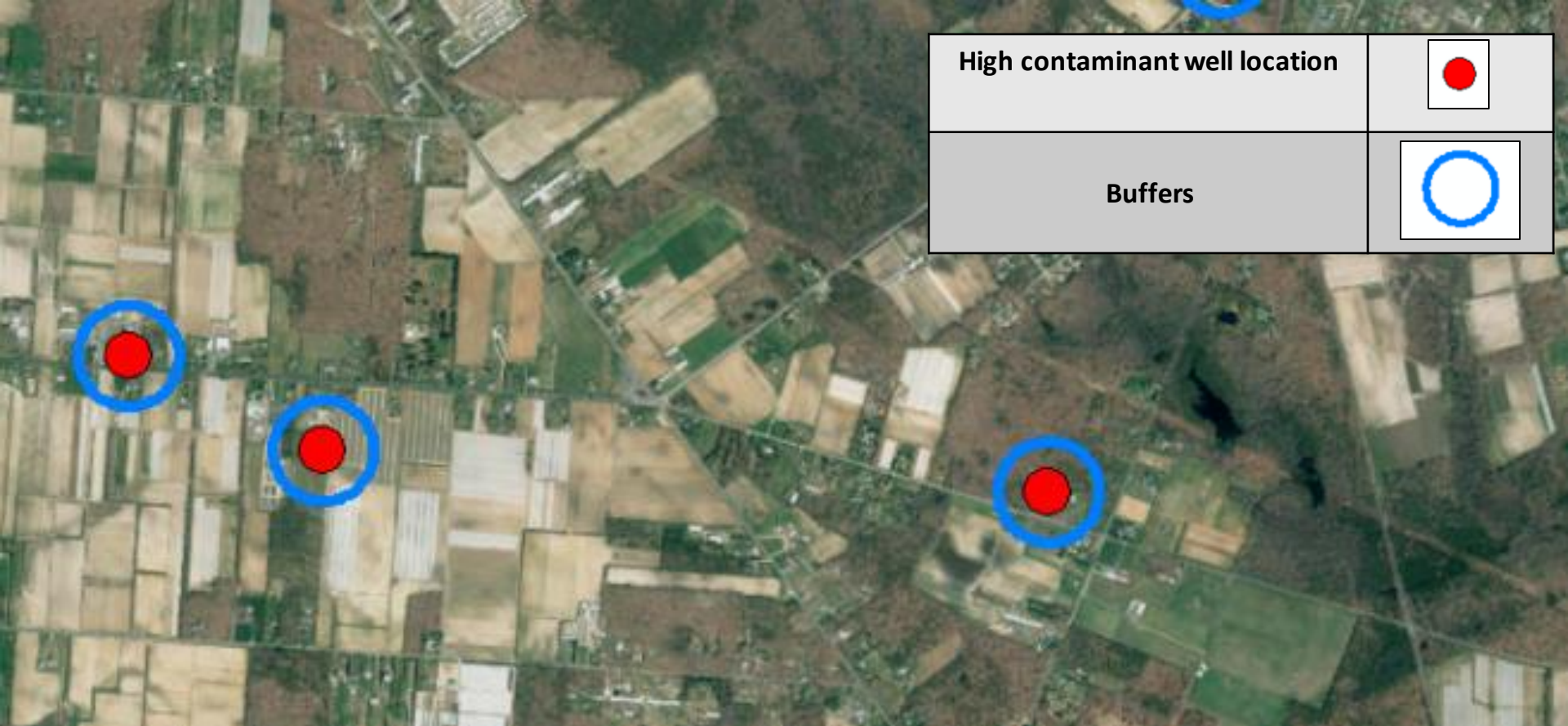
The screenshot shows the 'Buffer' tool interface. It includes the following fields and options:

- Input Features:** A dropdown menu containing 'GrossAlphaAbove100'.
- Output Feature Class:** A text box containing the file path 'C:\Users\rschwart\Documents\ArcGIS\Default.gdb\GrossAlphaAbove100_Buffer'.
- Distance [value or field]:** A section with two radio buttons: 'Linear unit' (selected) and 'Field'. Below the radio buttons is a text box containing the value '500' and a dropdown menu set to 'Feet'.

GIS: Intersecting buffer to parcel data

- Buffer intersects the parcel
- How to obtain neighbor identification with certain proximity



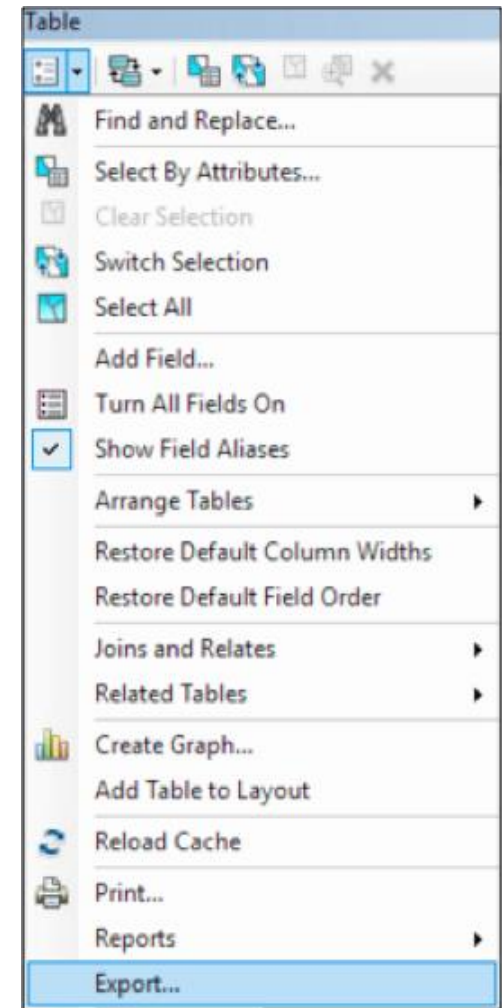
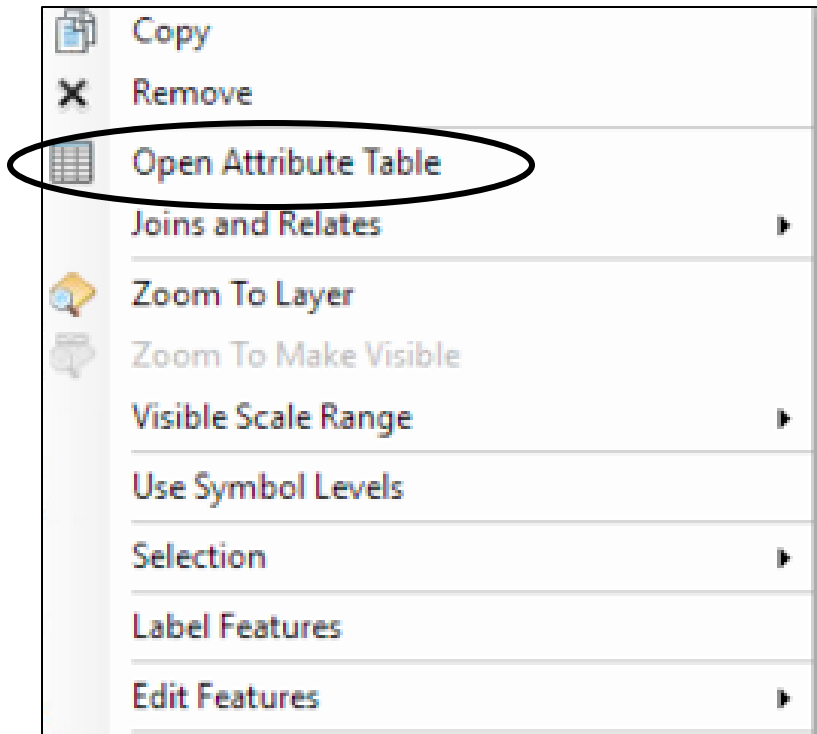


| | |
|--------------------------------|---|
| High contaminant well location |  |
| Buffers |  |

Buffers surrounding high contaminant wells

Export Data

- Right click buffer intersect shapefile and click "Open Attribute Table"
- In left hand corner, click export and save table as a **excel file**



Neighbor's block and lot data (Buffer Intersect)

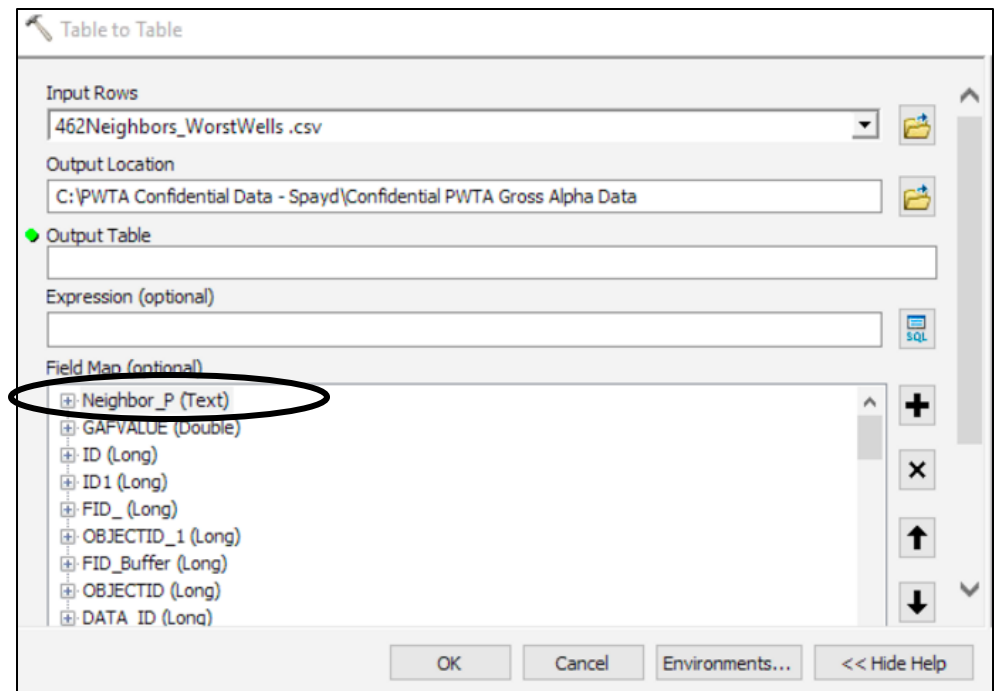
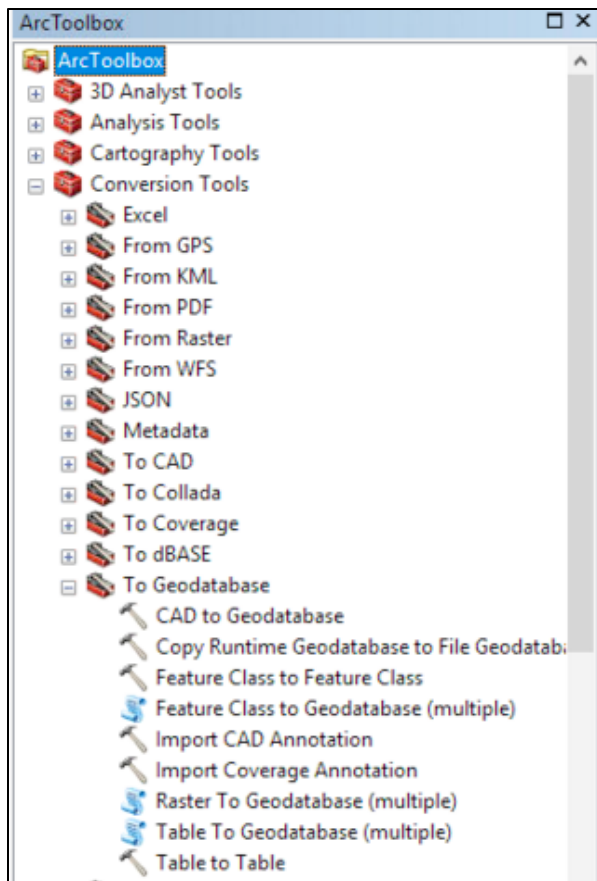
| A | B | C | D | E |
|-------------|--------------|---------|----------|--------|
| Shape_Leng | PAMS_PIN | PCL_MUN | PCLBLOCK | PCLLOT |
| 3141_625844 | 0105_2235_7 | 1108 | 4235 | 3 |
| 3141_625844 | 0105_2235_2 | 1108 | 4235 | 5 |
| 3141_625844 | 0105_2235_4 | 1108 | 4235 | 7 |
| 3141_625844 | 0105_2235_5 | 1108 | 4235 | 12 |
| 3141_625844 | 0105_2235_11 | 1108 | 4235 | 17 |
| 3141_625844 | 0105_2235_12 | 1108 | 4235 | 110 |
| 3141_625844 | 0105_2235_3 | 1108 | 4235 | 112 |
| 3141_625844 | 0105_2235_1 | 1108 | 4235 | 2 |
| 3141_625844 | 0105_2235_8 | 1108 | 4235 | 18 |
| 3141_625844 | 0105_2235_9 | 1108 | 4235 | 24 |
| 3141_625844 | 0105_3522_11 | 1108 | 4132 | 23 |
| 3141_625844 | 0105_3522_1 | 1108 | 4132 | 115 |
| 3141_625844 | 0105_3522_9 | 1108 | 4132 | 4 |
| 3141_625844 | 0105_3522_3 | 1108 | 4132 | 6 |
| 3141_625844 | 0105_3522_5 | 1108 | 4132 | 9 |
| 3141_625844 | 0105_3522_10 | 1108 | 4132 | 14 |
| 3141_625844 | 0105_3522_17 | 1108 | 4132 | 118 |
| 3141_625844 | 0105_3522_12 | 1108 | 4132 | 29 |
| 3141_625844 | 0105_3522_2 | 1108 | 4132 | 27 |
| 3141_625844 | 0105_3522_3 | 1108 | 4132 | 1 |
| 3141_625844 | 0105_3522_19 | 1108 | 4132 | 29 |
| 3141_625844 | 0105_3522_6 | 1108 | 4132 | 25 |
| 3141_625844 | 0105_4217_2 | 1108 | 6912 | 17 |
| 3141_625844 | 0105_4217_4 | 1108 | 6912 | 10 |
| 3141_625844 | 0105_4217_9 | 1108 | 6912 | 4 |
| 3141_625844 | 0105_4217_6 | 1108 | 6912 | 116 |
| 3141_625844 | 0105_4217_3 | 1108 | 6912 | 5 |
| 3141_625844 | 0105_4217_13 | 1108 | 6912 | 12 |
| 3141_625844 | 0105_4217_17 | 1108 | 6912 | 109 |
| 3141_625844 | 0105_4217_1 | 1108 | 6912 | 2 |
| 3141_625844 | 0105_4217_6 | 1108 | 6912 | 3 |

Removing specific properties

- Parcel data includes mailing addresses, property location (sometimes can be different from street address) – does the person really live here?
- Specific properties removed prior to selecting neighboring homes for outreach
 - Churches, farms, schools, etc.
 - Double check building descriptions (BLDG_DES) to check whether they're a house or not
 - Low property values (e.g. - below \$1,000)
 - Addresses with a P.O. box address
 - Zip codes from other states
 - May need to remove duplicate addresses

Table to Table Join

- ArcToolBox → Conversion Tools → Geodatabase → Table to Table Join
- Table to Table join – Neighboring worst wells with PAMS PIN



Buffers surrounding Neighbor Parcel Data (Highlighted in Green)



GIS Results

- Use identify tool to click on parcel and find address associated with parcel
- Neighbor parcels highlighted
- Selected neighbors and their addresses entered into Excel spreadsheet

