Considerations When Purchasing Water Treatment Equipment For Small Community and Noncommunity Water Systems

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Water Quality

If you are planning to drill a new well for potable use, it is important to know as much information about your water as possible. The owner of the water system should always test the quality of the source water before considering installing any treatment equipment to effectively remove contaminants. Under the N.J.A.C. 7:10 Safe Drinking Water Act, both community and noncommunity water systems must conduct drinking water analysis upon construction of a well. In addition, if the well is located within a specific County, mercury or uranium must be tested. Please reference to N.J.A.C. 7.9E-2.1(b) and (c) for further details or see "Attachment A" for a summarized list of required Primary and Secondary contaminants and parameters to be tested. All water quality tests for compliance should be performed by a NJ certified laboratory according to N.J.A.C. 7:10-5.3 (b). A list of NJ certified laboratories is available at https://www.nj.gov/dep/enforcement/oqa/certlabs.htm or by calling (609) 777-1749 for more information.

Installation of Treatment Devices

There are two types of water treatment devices: "Point-of-Use" and "Point-of-Entry".

> **"Point-of-Use"** (POU) device treats water from a single outlet, faucet, or fixture and does not treat all the water entering a house or building.
> **"Point-of-Entry"** (POE) device treats all the water entering a house or building to reduce contaminants in the drinking water prior to it entering the distribution system. This can be referenced at N.J.A.C. 7:10-12.3.

In New Jersey, any treatment specifically installed to comply with the Federal and NJ State Primary and Secondary Drinking Water Standards must be installed as a POE. POU treatment is NOT acceptable for both community and non-community water systems. In addition, all additives and devices installed for potable water treatment process must be ANSI/NSF Standard 60 (NSF-60 for drinking water additives) and ANSI/NSF Standard 61 (NSF-61 for treatment system components) certified as stated in N.J.A.C. 7:10-8.2. In accordance with 7:10-12.33(a), it is also recommended for noncommunity water systems that such devices meet appropriate ANSI/NSF Standards 42, 44, 53, 55, 58, and 62.

Identifying Treatment Options

"What is the purpose of this treatment device?" is a great question to ask before you make any treatment purchases. Treatment devices are very expensive and require frequent maintenance. As a result, installation of a minimal and effective device is highly recommended. It is also a good practice for water system owners to request information from two or more water treatment companies and research each proposed treatment options before any purchases are made. The following questions may help you make the best selection of device(s) for your water system.

- Why is this treatment necessary?
- What is the most commonly used treatment for this contaminant?
- What is the treatment method?
- How does it work?
- What other treatment options are available?
- Why is this treatment option better than the other options?
- How do you know the treatment unit will be adequately sized?
- What maintenance is required and how often for efficient operation?
- How much will maintenance cost monthly and yearly?

- Can I physically and financially maintain this treatment?
- Is there enough space to install this type of treatment with my limited space?
- Research what treatment other systems in your area may have.
- Review and understand the contract prior to signing/agreeing to each treatment unit.

When choosing a treatment device, understand what contaminant(s) must be removed and identify the following:

- What chemicals does the treatment add to the water?
- How will the water quality change after each treatment?
- Is this treatment effective enough?
- Is treated water in-compliance with Federal and NJ State Primary and Secondary Standards?
- What factors would cause this treatment process to malfunction?
- Where does the waste go?
- What permits are required from the state and/or county health department? Recommend verifying with the departments.
- Will the installation of new treatment require me to obtain the services of a licensed operator or a licensed operator of a different class?
- What is the guarantee and any services provided after installation?

It is important for water systems to make sure to ask various layers of questions before a decision is made.

Installation of the Treatment Equipment

Some considerations when laying out water treatment equipment include:

- All installation must be Point-of-Entry.
- Direction of the flow, raw and treated water sample taps, and all treatment devices should be labeled.
- For noncommunity water systems, a sample tap is required after each treatment unit per N.J.A.C. 7:10-12.33(a)5.
- No treatment bypass is allowed if a device is installed to remove any MCL established contaminants from the source water such as arsenic, nitrate, radionuclides, etc.
- Place the device(s) in a well-lighted, heated, easily accessible area, and secure.
- Wellhead and treatment building shall be protected against unauthorized entry or vandalism.

Operation of the Treatment Equipment

Following the installation of treatment, a water system shall conduct the following:

- Implement the use of a bonded logbook at the treatment facility to document the work performed by the licensed operator and the approved person.
- Record any issues determined and the corrective action taken by the licensed operator.
- Maintain an updated Operation and Maintenance (O&M) Manual including Standard Operating Procedures (SOPs), specifications, and schematic drawing of the treatment plant. Develop and implement an emergency response plan in the O&M Manual.
- Determine if compliance monitoring requirements have changed.
- Sample treated water during daily or monthly visit for operational purposes in addition to compliance samples is strongly recommended to ensure the water complies with Federal and NJ State Primary and Secondary Drinking Water Standards.
- Sample raw water occasionally to determine whether the contaminant levels have changed.

Additional Resources

Private Well Testing Act (N.J.A.C. 7:9E) • https://www.nj.gov/dep/watersupply/pwta/pdf/pwtafinal.pdf
Safe Drinking Water Act Rules (N.J.A.C. 7:10) • https://www.nj.gov/dep/rules/rules/njac7_10.pdf
Rules and Regulations Governing the Licensing of Water Supply and Wastewater Treatment System Operators (N.J.A.C. 7:10A) • https://www.nj.gov/dep/rules/rules/njac7_10a.pdf
Federal and NJ State Primary and Secondary Drinking Water Standards as of June 2021 • https://www.state.nj.us/dep/watersupply/pdf/dw-standards.pdf

Contact the NJDEP Water Supply Operations Element at (609) 292-2957 or (609) 292-5550 or via email at watersupply@dep.nj.gov for any technical assistance or questions.

Federal and New Jersey State Primary and Secondary Drinking Water Standards – As of June 2021

PRIMARY DRINKING WATER STANDARDS

Volatile Organic Compounds

Contaminants	MCL [µg/l or ppb]
» Benzene	1*
» Carbon Tetrachloride	2*
» Chlorobenzene	50
» 1,2-Dichlorobenzene	600
» 1,3-Dichlorobenzene	600*
» 1,4-Dichlorobenzene	75
» 1,1-Dichloroethane	50*
» 1,2-Dichloroethane	2*
» 1,1-Dichloroethylene	2*
» cis-1,2-Dichloroethylene	70
» trans-1,2-Dichloroethylene	100
» 1,2-Dichloropropane	5
» Ethylbenzene	700
» Methyl tertiary Butyl Ether	70*
» Methylene Chloride	3*
» Monochlorobenzene	50*
» Naphthalene	300*
» Styrene	100
» 1, 1,2,2-Tetrachloroethane	1*
» Tetrachloroethylene	1*
» Toluene	1,000
» 1,2,4-Trichlorobenzene	9*
» 1,1,1-Trichloroethane	30*
» 1,1,2-Trichloroethane	3*
» Trichloroethylene	1*
» Vinyl Chloride	2
» Xylenes [Total]	1,000*

* N.J. MCL [A-280]

Inorganics Compounds

Contaminants	MCL [µg/l or ppb]
» Antimony	6
» Arsenic	5 *
» Asbestos	7 x 10^6 fibers/l >10 µm
» Barium	2,000
» Beryllium	4
» Cadmium	5
» Chromium	100
» Copper	1,300**[AL]
» Cyanide	200
» Fluoride	4,000
» Lead	15**[AL]
» Mercury	2
» Nickel	+
» Nitrate [as nitrogen]	10,000
» Nitrite	1,000
» [combined Nitrate/Nitrite]	10,000
» Selenium	50
» Thallium	2

** An [AL] action level is not an MCL. It is a trigger point at which remedial action is to take place

\+ No MCL – Monitoring Required

* N.J. MCL [A-280]

Synthetic Organic Compounds

Contaminants	MCL [µg/l or ppb]
» Alachlor	2
» Aldicarb	+
» Aldicarb Sulfone	+
» Aldicarb Sulfoxide	+
» Atrazene	3
» Benzo[a]pyrene	0.2
» Carbofuran	40
» Chlordane	0.5*
» Dalapon	200
» Dibromochloropropane [DBCP]	0.2
» Di[2-ethylhexyl]adipate	400
» Di[2-ethylhexyl]phthalate	6
» Dinoseb	7
» Diquat	20
» Endothall	100
» Endrin	2
» Ethylene dibromide [EDB]	0.05
» Glyphosate	700
» Heptachlor	0.4
» Heptachlor Epoxide	0.2
» Hexachlorobenzene	1
» Hexachloroclyclopentadiene	50
» Lindane (BHC-Gamma)	0.2
» Methoxychlor	40
» Oxamyl	200
» PCBs	0.5
» Pentachlorophenol	1
» Perfluorononanoic acid (PFNA)±	0.013*
» Perfluorooctanoic acid (PFOA)±	0.014*
» Perfluorooctane sulfonic acid (PFOS) ±	0.013*
» Picloram	500
» Simazine	4
» Toxaphene	3
» 2,3,7,8—TCDD [Dioxin]	$3x10^{-5}$
» 2,4-D	70
» 2,4,5-TP [Silvex]	50
» 1,2,3-Trichloropropane (1,2,3-TCP)	0.030*

* N.J. MCL [A-280]

\+ No MCL – Monitoring Required

Other (if applicable)

» Trihalomethanes (TTHMs)	80 µg/l [ppb] running annual average; Total of Dichlorobromomethane, Chlorodibromomethane, Bromoform and Chloroform.
» Haloacetic Acids (HAA5s)	60 µg/l ppb running annual average; Total of Monochloroacetic, Dichloroacetic, Trichloroacetic, Bromoacetic and Dibromoacetic acids.
» Radionuclides	Combined radium 226/228; Gross alpha particle radioactivity; Beta/phaoton emitters; Uranium
» Turbidity	
» Total coliform bacteria	
» ± Perfluorinated Chemicals	are considered to be Synthetic Organic Compounds due to their chemical makeup, however, their regulatory framework follows that of Volatile Organic Compounds.

SECONDARY DRINKING WATER STANDARDS

Physical Characteristics

Parameter	RUL
» Color	10 color units
» pH	6.5 to 8.5 (optimum range)
» Odor	3 Threshold odor number
» Taste	No objectionable taste

Chemical Characteristics

Parameter	RUL [mg/L or ppm]	Parameter	RUL [mg/L or ppm]
» ABS/L.A.S. (Foaming Agents/Surfactants)	0.5	» Manganese	0.05
» Aluminum	0.2	» Silver	0.1
» Chloride	250	» Sodium	50
» Fluoride	2	» Sulfate	250
» Hardness (as $CaCO_3$)	250	» Total Dissolved Solids (TDS)	500
» Iron	0.3	» Zinc	5

RUL = Recommended Upper Limit

** In addition to the parameters listed above, water samples collected from Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Monmouth, Ocean, and Salem County locations shall be analyzed for mercury.

** In addition to the parameters listed above, water samples collected from Bergen, Essex, Hudson, Hunterdon, Mercer, Middlesex, Morris, Passaic, Somerset, Sussex, Union, and Warren County locations shall be analyzed for uranium.

Note: This fact sheet is accurate as of January 2022. Statutory or regulatory changes, or the availability of additional information after this date may render this information inaccurate or incomplete.