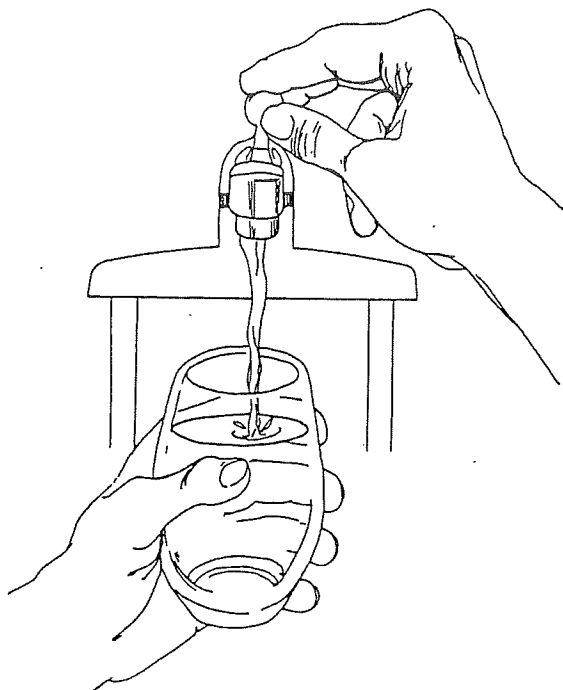


2023 Water Quality Report for the Village of Armada

Water Supply Serial Number: 00240



This report covers the drinking water quality for the Village of Armada for the 2023 calendar year. This information is a snapshot of the quality of the water that we provided to you in 2023. Included are details about where your water comes from, what it contains, and how it compares to United States Environmental Protection Agency (USEPA) and State of Michigan standards.

Contaminants and Their Presence in Water: Drinking water, including store bought bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the *USEPA's Safe Drinking Water Hotline (800-426-4791)*.

Vulnerability of Sub-Populations

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune systems disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water contaminants from their health care providers. USEPA/Center for Disease Control guidelines on the appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the *EPA Safe Drinking Water Hotline (800-426-4791)*.

Sources of Drinking Water

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. Our Village tap water comes from wells that are fed by the aquifers running under the Village. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Village water comes from three groundwater wells (wells #6, #7, and #8) from what's known as the Saginaw Aquifer. Our wells are between 113 and 162 feet deep. The State of Michigan performed an assessment of our aquifer source water in 2016 to determine the susceptibility or the relative potential for contamination. A summary of the Source Water Assessment report is included later in this report, and a copy of the report is on file and available for review in the Village Office.

Contaminants that may be Present in our Source Water Include:

- **Microbial contaminants**, such as viruses and bacteria, can come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- **Inorganic contaminants**, such as salts and metals, can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, and farming.
- **Pesticides and herbicides**, may come from a variety of sources such as agriculture and residential uses.
- **Radioactive contaminants**, can be naturally occurring or be the result of oil and gas production and mining activities.
- **Organic chemical contaminants**, including synthetic and volatile organic chemicals, are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.

In order to ensure that our tap water is safe to drink, the USEPA prescribes regulations that limit the levels of certain contaminants in water provided by public water systems. Federal Food and Drug Administration (FDA) regulations establish limits for contaminants in store-bought bottled water which provide the same protection for public health.

Water Quality Data

The Village of Armada tests for many contaminants that may not be detected in our drinking water. The table below lists all the drinking water contaminants that we detected during the 2023 calendar year. The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk. Unless otherwise noted, the data presented in this table is from testing completed January 1 through December 31, 2023. The State allows us to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. All the data is representative of our current water quality, but please be aware some results are more than one year old.

Terms and Abbreviations Used in the Table Below

- Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.
- Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available water treatment technologies.
- Maximum Residual Disinfectant Level (MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
- Maximum Residual Disinfectant Level Goal (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of specific disinfectants to control microbial contaminants.
- N/A: Not applicable
- ND: Not detectable at testing limit
- ppm or mg/L: parts per million or milligrams per liter
- ppb or ug/L: parts per billion or micrograms per liter
- ppt or ng/L: parts per trillion or nanograms per liter
- pCi/l: picocuries per liter (a measure of radioactivity)

- Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.
- Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water.

Village Water Sampling – Results Table							
Regulated Contaminant	MCL	MCLG	Level Detected	Range of Detection	Year Sampled	Violation Yes/No	Typical Sources of Contamination
Arsenic ¹ (ppb)	10	0	9**	4 - 9	2023	No	Erosion of natural deposits; runoff from orchards; runoff from glass and electronics production wastes
Barium (ppm)	2	2	0.15	0.15	2022	No	Discharge of drilling wastes; discharge of metal refineries; erosion of natural deposits
Fluoride (ppm)	4	4	1.1	1.1	2022	No	Erosion of natural deposits; water additive which promotes stronger teeth; discharge from fertilizer and aluminum factories
Total Xylenes (ppm)	10	10	ND	ND	2022	No	Discharge from petroleum or chemical factories
Alpha Emitters (pCi/l)	15	0	2.35	2.35	2022	No	Erosion of natural deposits
Total Trihalomethanes (TTHM) (ppb)	80	N/A	49	42 - 49	2023	No	By-product of drinking water disinfection
Haloacetic Acids (HAA5) (ppb)	60	N/A	8.7	5.0 – 8.7	2023	No	By-product of drinking water disinfection
Sodium ² (ppm)	N/A	N/A	170	170	2022	No	Erosion of natural deposits
Regulated Contaminant	MRDL	MRDLG	Level Detected	Range of Detection	Year Sampled	Violation Yes/No	Typical Sources of Contamination
Chlorine Residual ³ (ppm)	4	4	1.06	0.18 - 1.51	2023	No	By-product of drinking water disinfection
Inorganic Contaminants Subject to Action Levels (AL)	AL	MCLG	Your Water ⁴	Range of Results	Year Sampled	No. of Samples above AL	Typical Sources of Contamination
Lead (ppb)	15	0	5	ND - 7	2021	0	Lead service lines, corrosion of household plumbing including fittings and fixtures; erosion of natural deposits
Copper (ppm)	1.3	1.3	0.41	ND - 0.42	2021	0	Corrosion of household plumbing systems; erosion of natural deposits

¹ While our drinking water meets EPA standards for Arsenic contaminate levels, it does nevertheless contain low levels of Arsenic. EPA's standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from our drinking water. EPA continues to research the health effects of low levels

of arsenic, which is a mineral known to cause cancer in humans in high concentrations and is linked to other health effects such as skin damage and circulatory problems.

² Sodium is not a regulated contaminant.

³ The chlorine residual "Level Detected" was calculated using a running annual average.

⁴ Ninety (90) percent of the samples collected were at or below the level reported for our water.

** A high, but below the Maximum Contamination Level (MCL) arsenic reading was obtained on 2/27/2023. It was during this time that the Village was experiencing issues with its arsenic sump backing up. The sump issue was resolved shortly thereafter. Arsenic readings ranged from 3.6 to 4.5 ng/l during the next three 2023 readings.

Per- and Polyfluoroalkyl Substances (PFAS)							
Regulated Contaminant	MCL	MCLG	Level Detected	Range of Detection	Year Sampled	Violation Yes/No	Typical Sources of Contamination
Hexafluoropropylene oxide dimer acid (HFPO-DA) (ppt)	370	N/A	ND	ND	2023	No	Discharge and waste from industrial facilities utilizing the Gen X chemical process
Perfluorobutane sulfonic acid (PFBS) (ppt)	420	N/A	ND	ND	2023	No	Discharge and waste from industrial facilities; Stain-resistant treatments
Perfluorohexane sulfonic acid (PFHxS) (ppt)	51	N/A	ND	ND	2023	No	Firefighting foam; Discharge and waste from industrial facilities
Perfluorohexanoic acid (PFHxA) (ppt)	400,000	N/A	ND	ND	2023	No	Firefighting foam; Discharge and waste from industrial facilities
Perfluorononanoic acid (PFNA) (ppt)	6	N/A	ND	ND	2023	No	Discharge and waste from industrial facilities; Breakdown of precursor compounds
Perfluorooctane sulfonic acid (PFOS) (ppt)	16	N/A	ND	ND	2023	No	Firefighting foam; Discharge from electroplating facilities; Discharge and waste from industrial facilities
Perfluorooctanoic acid (PFOA) (ppt)	8	N/A	ND	ND	2023	No	Discharge and waste from industrial facilities; Stain-resistant treatments

2023 Microbiological Contaminants – Monthly Monitoring in the Distribution System

Regulated Contaminant	MCL, TT, or MRDL	MCLG or MRDLG	Level Detected	Range	Year Sampled	Violation Yes/No	Typical Source of Contaminant
Total Coliform (total number or % of positive samples/month)	TT	N/A	0	0	2023	No	Naturally present in the environment
<i>E. coli</i> in the distribution system (positive samples)	See <i>E. coli</i> note ⁵	0	0	0	2023	No	Human and animal fecal waste
Fecal Indicator – <i>E. coli</i> at the source (positive samples)	TT	N/A	0	0	2023	No	Human and animal fecal waste

⁵ *E. coli* MCL violation occurs if: (1) routine and repeat samples are total coliform-positive and either is *E. coli*-positive, or (2) the supply fails to take all required repeat samples following *E. coli*-positive routine sample, or (3) the supply fails to analyze total coliform-positive repeat sample for *E. coli*.

Monitoring and Reporting to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) Requirements

The USEPA and State of Michigan require us to test our water system on a regular basis to ensure its safety. We have met all the water monitoring and reporting requirements for 2023, with the exception of Nitrate. This was due to an administrative oversight. Please see the public notice at the end of this report. We will update this Water Quality Consumer Confidence Report (CCR) annually and will keep you informed of any problems that may occur throughout the year as they happen. A copy of this CCR is mailed to all Village water customers in their March water/sewer bills and additional copies are available at the Village Office.

Important Health Information about Lead:

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water primarily comes from materials and components associated with water service lines. These service lines connect the Village Water Distribution System with the plumbing lines within homes and commercial buildings. While the Village of Armada is responsible for providing high quality drinking water it can't control the variety of materials used in residential and commercial plumbing components. When your water has been sitting (unmoving in household pipes) for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you have a lead service line, it is recommended that you run your water for at least 5 minutes to flush water from both your home plumbing and the lead service line. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the *EPA Safe Drinking Water Hotline (800-426-4791)* or <http://www.epa.gov/safewater/lead>.

Information about Iron

Iron is considered a secondary contaminant. It is found in our groundwater supply. It is a common problem for groundwater systems. Iron and other metals occur naturally in soils, rocks, and minerals. In the aquifer underlying the Village, groundwater comes in contact with these solid materials dissolving and releasing them. Much of the iron found in the water pumped out of the ground for Village use is removed through the Arsenic filtration and chlorination processes used at our Water Treatment Plant. However, the Village does not specifically treat our water for iron. Residents may occasionally notice indications of iron in their tap water. Although not considered to cause health problems in humans, its presence in potable water may be unpleasant due to the bad odors it causes, its rusty taste and color, its feel on skin and hair, and its tendency to cause rusty stains on laundry.

Summary of the Village of Armada Source Water Assessment

As previously indicated, the Village of Armada pumps water from three wells located in an aquifer underlying the Village. In 2016, the Michigan Department of Environmental Quality, now known as the Department of Environment, Lakes, and Energy (EGLE), performed an assessment of our source water to determine susceptibility for contamination. The Susceptibility rating is on a six-tiered scale from "Very Low" to "High" based primarily on geologic sensitivity, water chemistry, and possible sources of contaminants.

The susceptibility of our source water to contamination from local activities in the vicinity of the wellheads is:

- Well #6: Moderate
- Well #7: Moderately High
- Well #8: Moderately High

replacement more difficult and expensive. The good news is the Village now knows where the outdated and underperforming underground water infrastructure is and is developing plans on when to replace it and how to fund the work. This is an ongoing effort with lead/galvanized service line replacement a priority (lead lines are discussed below).

Finally, it's important for water consumers to understand the Village is responsible for maintaining the public part of the system. The private side of the system is generally composed of the pipes that run from the street through your yard and throughout your house, including water softeners, water filters, and sub-pumps. These can and do go bad. You, as the homeowner, are responsible for maintaining the private side.

The Good Water vs Terrible Water Controversy

The CCR shows the Village has very good water – clean, drinkable, with negligible contaminants. Occasionally, however, I hear people say Village water is terrible. “It’s so bad I need to buy bottled water”. The obvious question then is what’s terrible about it? There are almost always the same two answers – “it tastes terrible” and/or “it’s rusty and develops mineral deposits”.

Let me tackle these one at a time. First, the very purpose of the CCR is to show you the results of last year’s water chemical analysis testing program. The spreadsheet on previous pages details the results of the rigorous sampling and testing program EGLE requires the Village water department to participate in. It shows very few contaminants in our water with none in a dangerous range as objectively analyzed by independent laboratories. The conclusion is clear – we have good drinkable water. Other communities with higher amounts of contaminants such as PFAS, other toxic chemicals, or organic compounds in their drinking water would be envious of us.

That said, our water is drawn from aquifers underlying the village. It has naturally occurring minerals in it so there could be a mineral taste to those that have been drinking bottled water for a long period of time. I’d suggest the issue here is simply a taste preference, not contaminants. Taste is highly subjective, quality is objective (as shown by the CCR test results). You can’t dispute its clean but I concede you may not like how it tastes.

Here are a couple additional thoughts. If you are currently buying bottled water, compare the cost of that against Village water. A gallon of village water costs about ~\$.13 cents from your tap. Bottled water by the ounce, quart, or gallon is much more. The average cost of a gallon of water bought from a store in 2021 was ~\$1.23. Try saving some money. You can reduce your cost for water by becoming accustomed to the taste of clean village water. Also, if you have a water filter at home, you may also consider changing the filter element more often. It can contribute to bad taste in tap water over time.

On to the issue of rust and mineral deposits such as calcium and lime. The Village WTP does reduce the amount of iron oxide (rust) in our drinking water through the filtration process we use, although we don’t specifically treat the water to remove it. Similarly, we don’t soften the water which would take out some of the calcium or lime.

An additional possible contributor to rust in Village water are old water main pipes in parts of the Village and the galvanized service lines that some residences and businesses still have. The Village generally works to combat rust that accumulates in distribution pipes through its semi-annual hydrant flushing program which clears out accumulated rust and scale.

The Village could add processes to deal with taste, rust, and mineral deposits, but these would raise the cost of water treatment and would have to be passed on to water customers. Consequently, we leave it to individual customers to decide if they value these amenities;

year focused on lead and galvanized service line identification. A grant helps make the limited funds we have go further and keeps water rates as low as possible.

Our average yearly waterworks budget is ~\$650,000. The water rates we establish every year in March for the new Village fiscal year (1 April to 31 March) are to ensure clean drinkable water is reliably delivered to consumers. The rates must be sufficient to operate, maintain, and improve the water system, to keep up with the rate of inflation, to allow some savings for emergencies, and to pay down any waterworks debt we incur.

While the State tells us our water rates are "low but adequate to operate the system", I know our water customers consider them to be high. We understand that water customers are concerned by their water rates and rate increases so, here are a couple reasons why rates are set where they are.

- Inflation keeps adding to the cost of operation and we must keep up with these increased costs. Trying to do more with less just gets you less and reducing the cost for the service means it will have to be increased that much more at some point in the future. It is better to maintain the small cost increases as they incurred.
- We have a low population density in the Village. That means fewer people pay for system operation here than other locations with more people. Romeo and Richmond have larger populations, for example. Their relative costs for water service are lower because the costs can simply be spread over a larger number of customers.

That said, there are a couple bright spots ahead regarding rates. We will pay off the principal of our WTP loan this year and the last WTP interest rate payment will occur in October 2024. When that happens, you will see the debt payment on your water bill be taken off. That means you will see a ~\$60 reduction to your water costs this year. Next year, it will be further reduced by another ~\$60 for the full savings of ~\$120 for the year.

A final comment on funding and rates. Arguably more important than the cost of water is the need to understand what the Village does with the revenue it receives from water consumers. Customers should ask if they are getting the value they expect from the cost and is the system being managed well? Residents can take a personal interest in how our water system is managed and the funds spent to see that they are getting the level of service expected. I welcome your interest, questions, and comments about management of the Village water system.

What's the System Comprised of and What Shape is it in

The Village Water Distribution System is comprised of above ground facilities and an underground distribution system. The above ground facilities include the WTP, three Well Houses, a Water Tower, back-up generators, and fire hydrants. Underground distribution system components include miles of water main and service line piping connecting the above ground facilities to your homes and businesses. The distribution system includes shut off valves and a large detention tank supporting the WTP.

We have done a considerable amount of preventative maintenance work to the facilities over the last 5 years and made improvements where needed. These facilities are now in good condition and very reliable. The improvements made are one reason clean water continues to flow in power outages.

Our current challenge is the Villages' underground water infrastructure. Some requires replacement due to age, size, and material composition (lead or galvanized pipe components, for example). A complicating factor is that some lines are underneath our streets which makes

Significant possible sources of contamination include but are not limited to improper wellhead isolation, industrial and wastewater treatment plants built within 2,000 feet of a wellhead, and sanitary sewer and storm drains located inside wellhead isolation areas.

General Summary of Village Water System

Hello, this is Ross Boelke, Village Water Commissioner. While much Consumer Confidence Report (CCR) content is directed by the Michigan Department of Environment, Great Lakes, and Energy (EGLE), I'm able to summarize some Village Waterworks issues in this final section of the report which may be important to you. If a topic of interest is not addressed here, please contact me; I'd be happy to discuss it with you.

In this section, I'll briefly discuss the Village Waterworks Team, Waterworks Budget and Rates, the State of our Water System, the Good Water vs Terrible Water Controversy, and Lead and Galvanized Service Line Identification and Replacement.

Who Makes up the Village Waterworks Team

The Waterworks Team is comprised of the Village Water Commissioner (an additional duty assigned to a Village Council Trustee), our Department of Public Works (DPW) Superintendent and their crew, our F&V Operations Contractor Team, our HydroCorp Contractor Team, and finally our Village Office Staff.

In general, the DPW performs day-to-day system maintenance. F&V provides an Operator in Charge to oversee the operation of our Waterworks facilities and conduct regular water quality sampling and testing, and HydroCorp conducts recurring commercial and residential cross-connection and backflow prevention inspections. Our Village Administrative and Billing Clerk may be the person you interact with most as you pay your quarterly water/sewer bill. The Water Commissioner is the person that is directly responsible to you for water quality and system operation. They oversee and manage Village water activities and performs a number of planning and coordination functions.

If you have an issue or concern, you can get in touch with me or other members of the Village Water Team by talking with the admin/billing clerk (in person or call 586-784-9151) or by attending a Village Council meeting. Water System updates are routinely provided by the Water Commissioner at Village Council meetings. These are held on the second and fourth Monday of the month at the Village Hall. The Village Hall is located at 74274 Burk Street; start time is 7:00 pm. Additional copies of this CCR may also be acquired from the admin/billing clerk.

Funding the Water System Funding and Water Rates

We have ~625 service lines (with ~660 water meters) in our Village which has a population of ~1625 people. Those figures represent the small number of residences and businesses that pay to run the Villages' Type I public water supply. The system operates 24 hours a day, seven days a week, 365 days a year. In simple terms, it costs money to maintain a system that does that.

The Village water system is directly funded by the residents and businesses (called customers or consumers), that use it. It is a self-funded system. Rarely do we get external funding from the Federal Government or State of Michigan to help defray the costs of operating and maintaining the water system, however, it does occasionally happen. For example, we applied for and received Covid Relief (ARPA) Funds (~\$180,000.) in Fiscal Year 2021-22. That helped pay about a quarter of the cost to replace the filtration media in the WTP. We have also applied for state grants in the past and occasionally, we are awarded one. Grants can help defray the costs to meet Federal or State clean water initiatives. We believe we will qualify for a grant this

customers can reduce rust and calcium in the water in their home by adding a home filter or water softener.

The bottom line is the Village has objectively high-quality water but it's not mineral free so some people will not appreciate the taste, occasional rust (iron oxide) that shows up, or calcium build-up on fixtures. These can be fixed at home, if desired.

Lead and Galvanized Service Line Identification and Replacement

Earlier in the summary section, we indicated the Village has work to do on its underground water infrastructure. Old undersize pipes need to be replaced and additional connections made to ensure the water in the distribution system flows better in some areas of the Village. In addition to replacing old water infrastructure, lead and galvanized service line replacement is required. It presents, perhaps, the biggest challenge the water department will face over the next 10 or more years.

We have long known that lead water lines are a health risk. Galvanized service lines are equally bad because they can trap lead particles in the lining of the pipes. We have known and suspected lead and galvanized service lines in the Village. Building codes have eliminated lead and galvanized fixtures in new construction since 1988, however, a large amount of these lines remain in service nationwide. Because of the health dangers posed by lead and galvanized pipe, the Federal government and the State of Michigan have enacted legislation over the last few years aimed at mandating the removal of all lead and galvanized lines from use by ~2040. That date will likely be accelerated by new pending legislation.

Accordingly, the Village is beginning to undertake efforts to fully identify water service line material composition in the Village this summer (2024). Once done, it will then begin to replace all lead and galvanized lines that are found at the Villages expense, likely in 2025. This includes lead and galvanized pipe on both public (village owned) and private (privately owned) property. This effort is complicated and it may stress the water department budget over the next few years. The Village will begin an information campaign later this summer to advise water customers on the details so I'll keep this discussion short.

CCR Wrap Up

Finally, I do want to offer that aside from concerns about water rates, we can be very proud of our Village water system. The water is very clean, the system is highly reliable, it is inspected to prevent unsafe backflow contamination, facilities have been modernized, it has dedicated people working 7 days a week, 24 hours a day, and 365 days a year to ensure consistent operation, we largely know what the infrastructure challenges are and are steadily working to fix those issues, and the system is well managed.

Additional copies of the CCR may be acquired at the Armada Village Office. The office is open Monday through Thursday, from 8:00 - 4:30 and Friday, from 8:00 - 12:00.

- ***The Village of Armada Water Department***

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

Monitoring Requirements Not Met for Village of Armada

We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not our drinking water meets health standards. During January 1, 2023, to September 30, 2023, we did not complete all monitoring for nitrate. Therefore, we cannot be sure of the quality of your drinking water during that time. This violation **does not** pose a threat to the quality of the supply's water.

What should I do? There is nothing you need to do at this time. This is not an emergency. You do not need to boil water or use an alternative source of water at this time. Even though this is not an emergency, as our customers, you have a right to know what happened and what we are doing to correct the situation.

The table below lists the contaminants we did not properly test for, how often we are supposed to sample for these contaminants, how many samples we are supposed to take, how many samples we took, when samples should have been taken, and the date we will collect follow-up samples.

Contaminants	Required sampling frequency	Number of samples taken	When samples should have been collected	Date additional samples will be collected
Nitrate	1 sample every year	0	January 1, 2023 – September 30, 2023	October 1, 2023 – December 31, 2023

What happened? What is being done? We inadvertently failed to collect a sample within this required sampling period. Follow-up samples are being collected immediately. Our staff is making every effort to assure this does not happen again.

For more information, please contact Michael Glasgow, Designated Operator in Charge, at 810-820-0829.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly. You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by Village of Armada.