

PLAIN ENGLISH
GUIDE
to
ALASKA
Drinking Water *and*
Wastewater Regulations
For Rural Utilities serving 25-1,500 people



State of Alaska
Department of Commerce, Community, and Economic Development
Division of Community and Regional Affairs
in cooperation with
Department of Environmental Conservation

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Drinking Water *and*
Wastewater Regulations
For Rural Utilities serving 25-1,500 people



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A copy of this guide can be downloaded from the department's website at:
www.commerce.alaska.gov/web/dcra/DivisionPublications

Published by
**Alaska Department of Commerce, Community,
and Economic Development**
Division of Community and Regional Affairs
Rural Utility Business Advisor Program
April 2018

With funding from
U.S. Environmental Protection Agency
and State of Alaska

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Cover: *Watersource, Whalepass 2006*
Photo courtesy of DCRA

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Introduction

The Week Everything Went Wrong

“My village learned a couple of years ago how valuable a water operator can be. This could happen to you. One week I had to fly into Fairbanks on business. It was the middle of winter, and while I was crossing the street, I slipped and cracked my knee on the curb and spent two days in the hospital. Then my flight home was cancelled once due to mechanical problems, and a second time due to ice fog. By the time I got home, ten days had gone by.

I didn't know how bad things were until I was met at the landing strip by two school teachers, the head of the village corporation, and the health aide, among others. It seems the second day I was out of town the power failed, and when it came back on, the water utility did not restart properly. The backup operators were both fairly new on the job, and when they finally got the pumps started and were refilling the tanks, raw river water was going right into the distribution system without having the required contact time with the chlorine. (It turned out the plant had been plumbed wrong all these years, and it should not have been possible for this to happen.)

But since there was no testing being done, no one knew that harmful bacteria were going right to people's bathrooms and kitchens. They only found out when people all over town began getting seriously ill with stomach cramps, diarrhea, and headaches. Village life pretty much came to a standstill for several days. Well, then the temporary operators figured they needed more chlorine in the water. Trouble is, they didn't know the exact way to do it or test whether it was done right, so they just guessed.

At first they superchlorinated the water, which gave it such a strong taste it was undrinkable. So they backed the chlorine content down until it could not be tasted but by then no one trusted it and everyone went to boiling their own water -- a real pain. When I stepped off that plane, I was met with a very unruly crowd who really didn't care that I was in a cast or that I hadn't seen my wife in almost two weeks. It was straight to the water utility to set things right.

Two days later things were back to normal, and I was a very popular guy. I later learned just how popular I was. To this day there is a note on the bulletin board at the landing strip that reads: 'Unless Joe has taught at least two people how to run the water utility, he's not allowed on any outgoing plane!'"

* * *

This story is based on a true story from an Alaskan village. Too often people in rural Alaska get sick because of a lack of safe water for drinking and washing, or from unsafe handling of waste. This guide is one of several efforts to upgrade sanitary conditions in rural Alaska.

The Purpose of This Guide

The *Updated Plain English Guide to Alaska Drinking Water and Wastewater Regulations* targets operators and managers of rural Alaska public water and wastewater utilities serving up to 1,500 people. The guide was written to help you understand and comply with state and federal regulations. Appendix D lists which regulations were used in writing the guide.

Why read it?

If you already know how to run a water and wastewater utility, this book can still be useful. Quite a few people who run water utilities are not doing it full time, so they don't have the time to interpret the regulations

or learn all the ins and outs of every process. The sheer size and complexity of the regulations may make them a real challenge to understand. This guide covers the most important points. Operators and managers may know how to do a certain water test, for instance, but aren't sure why. This guide touches on both the how and the why.

This guide is review material for experienced operators and a good introduction for new ones; it is not a step-by-step training manual in all phases of operations. This guide talks about regulations pertinent to small rural water and wastewater utilities; it is not a restatement of all the hundreds of pages of regulations. The goal is to help small utilities avoid the most common health dangers and rule violations.

What this guide is and what it isn't

Note: If you are dealing with a septic system for a private residence or small multi-family dwellings, or a private well, much of this guide will not apply. However, Alaska Department of Environmental Conservation (ADEC) Drinking Water and Wastewater Programs have information and can provide help for these systems. Contact the nearest office. (Appendix A has the contact information for the ADEC offices.)

While we would obviously be flattered if you would read the guide from cover to cover (and it's not that long), here are some ways to sift out what you need more quickly.

How to use this guide

- Scan the table of contents. All sections are named as descriptively as possible.
- Use the index for a more specific search.
- Refer to the glossary or list of acronyms if you run across an unfamiliar term.
- Much of the information is contained in tables and charts. Use them, copy them, enlarge them, laminate them, put them up on the wall...

- Feel free to "cheat" by turning to the end of chapter summaries for a list of key points.
- Some sections do not apply to all water systems. Icons mark information pertinent to the following systems:



groundwater sources



surface water/ground water under the direct influence of surface water sources



systems that chlorinate



systems that fluoridate



wastewater treatment

- The information on drinking water testing has been broken into three chapters. The first, Operations Tests, covers the most critical tests—daily onsite tests for the most part. The next, Compliance Tests, deals with samples sent to certified labs for testing. Finally, all the tests are then spelled out in more detail in the Details on the Tests chapter.
- The Appendices are quick reference sections for agency contacts, training, and educational resources (including internet sites, sample siting plan, list of certified labs, and list of regulations used in this guide), and compliance calendars which list important requirements and when they need to be done.

If you have any questions or comments about this guide, or suggestions for future editions, please contact the Department of Commerce, Community, and Economic Development (DCCED) at the address or phone number in Appendix B.

The Importance of Good Water and Sanitation

Safe drinking water is crucial to quality life in rural Alaska. Every village depends on water for drinking, showers, cooking, washing clothes, and other important uses.

If there is no sanitary disposal of wastewater, living conditions in the village can deteriorate.

Bad drinking water can spread disease. And if your village wastewater system is not developed and maintained properly, you could be leaving the door open for a health disaster. Painful cramps, gas, headaches, fever, vomiting, and diarrhea can all result from getting harmful bacteria, viruses, and protozoa in your body. Through the years Alaskan villages have been hit by hepatitis. The potentially deadly E. coli bacterial infection has also been a problem in some communities.

“I am the most important person in my village. I may not be a whaling captain or the Mayor, but I’m the one who makes sure that everyone stays healthy. The only problem is that no one knows when I’m doing my job. But I kind of like it that way. If no one’s getting sick from the water, I’m doing what I’m supposed to be doing.”

Most of these sicknesses can be easily prevented by sanitary waste disposal practices or if they are in the water, with proper treatment. Also, simple hand washing can help prevent the spread of disease.

Giardiasis, the parasitic protozoa that causes the serious illness otherwise known as “beaver fever” can be introduced to your watershed by an animal from miles away. Another dangerous protozoa, Cryptosporidium, must be filtered out, since chlorine does not work well against it. The chemical contaminant nitrate can kill babies under six months old by robbing the oxygen right out of their bloodstream (“blue baby” syndrome or methemoglobinemia). Nitrate from sewage can leach through the ground and into the water. If you test for it regularly, you will be aware if nitrate is a problem. Lead might also be a danger to your community. Lead in your water can damage brain cells, especially in children. Organic chemicals, like solvents and gasoline, that leak into your water supply can be a serious health hazard and cause cancer.

“bad water affects children and elders first”

Don’t be overwhelmed; all these problems can be controlled. If you set up a good system, outline operating procedures, and follow them, water and wastewater-borne diseases will be virtually unknown in your community.

The key to prevention

The key to this is consistently treating and monitoring the water and being careful about waste handling.

Consider the regulations as the minimum level of protection. Consider your job as the front line in the quest for a healthy community.

Chapter 1: Dealing with the Regulations

Multiple Moving Targets

Each utility has to comply with two or three sets of regulations. The first set of regulations to consider is federal. After these are the state regulations, and if you live within the boundaries of a borough or city, there may be local regulations as well. You must comply with all regulations. These are written for the safety of your village and the protection of the land and water. It is also important to remember that rules, regulations, and laws change frequently. Stay in touch with ADEC to make certain you know the most current requirements. The effective dates of the regulations covered in this guide are listed in Appendix E.

Because there are so many regulations, it is often hard to keep them straight. And sometimes, because technical and legal experts write the regulations, they can be difficult to understand for many of us. If you have any questions, you should call your nearest government or sanitation advisor. (See Appendix A for contact numbers.)

Help is
available

The people most likely to have frequent contact with you are the Alaska Department of Environmental Conservation (ADEC) Drinking Water or Wastewater Program staff members, a health corporation's Remote Maintenance Worker (RMW), or a DCCED Rural Utilities Business Advisor (RUBA) staff. You may contact the staff at the ADEC Drinking Water or Wastewater Programs for specific guidance on regulations, testing, and plan approvals.

CHAPTER 1

They are the authority for implementing and making decisions. See the listing of ADEC field contacts and the “who to call” diagram in Appendix A.

Staying in touch with ADEC is critical because the best way to solve problems is to stop them before they start. ADEC Villlage Safe Water and the Alaska Native Tribal Health Consortium (ANTHC) can also be helpful in finding funding for your utility.

The Twelve Biggest Issues for Rural Water and Wastewater Utilities

The following drinking water and wastewater issues are the most common violations for systems of your size in Alaska. Remember, if you avoid these violations, you will also avoid unnecessary safety risks. The main things to remember are:

- Protect water sources from contamination
- Properly treat water to make it safe
- Test water to confirm safety
- Report the results to ADEC and your customers
- Keep up to date on regulations

Now, the Top Twelve...

Capacity refers to a community or utility’s ability to operate and maintain a water or wastewater utility. Capacity is not only operating a system but managing and financing it, too. Utilities must have systems with trained staff and a proper organization in place in order to provide safe drinking water.

See Chapter 2

1. Determining and building capacity

Dealing with the Regulations

If samples are not collected every month, you won't really know how well your treatment system is working or the condition of your water source. People can (and do) get seriously sick if bacteria, viruses, or protozoa get through the treatment system. This important test tells you if these microbes are in your water.

See Chapters 6 and 7

If your water source is surface water or ground water under the direct influence of surface water (GWUDISW) it is probably contaminated by bacteria, viruses, and protozoa. Your filtration and disinfection (chlorine) systems help prevent these microbes from ending up in your finished drinking water. The daily turbidity and residual chlorine tests let you know how well the filter and chlorine treatment are working. If the test results are bad, you can take action right away to fix the problem.

See Chapter 6

The state needs to be assured that you are properly treating water to be safe for customers. If your utility uses surface water, or GWUDISW, turbidity and residual chlorine results must be written on the logsheet every day and a copy of the logsheet must be sent to ADEC every month. This is the monthly report required by ADEC. If you add fluoride to the water, ADEC needs to see the results of those daily tests on your logsheet each month too. ADEC will review the logsheet to make sure you are doing the important tests and that the results show the system is protecting your health.

See Chapter 6

New rules went into effect between 2006 and 2009 for additional treatment of ground water and surface water to protect the public against viruses, Cryptosporidium and additional chemicals.

2. Testing for coliform bacteria



3. Testing turbidity and residual chlorine daily



4. Sending monthly reports of daily turbidity, residual chlorine, and fluoride test results to ADEC



5. Understanding new regulations



CHAPTER 1

Also, disinfection was required. It is important that you stay on top of new regulations to make sure that you maintain a safe water supply.

If you can provide information to ADEC showing that some of these new chemicals could not possibly be in your water or piping systems, they might give you a waiver from sampling. However, you may find out that ADEC knows of pollution sources or low chemical concentrations that are still dangerous, so you may still have to sample. In that case, you must sample on the schedule set up by ADEC and make sure money is available for the laboratory costs.

In 2016, EPA revised the Total Coliform Rule (TCR). The new rule is called the Revised Total Coliform Rule or RTCR. The RTCR has the same sample schedule as the TCR, so most systems still have to sample for total coliform bacteria once per month. The biggest change in the RTCR is in the response to positive samples. If your system has a positive sample, instead of just collecting repeat samples, you will have to complete either a Level 1 or Level 2 Assessment, depending on if you have a total coliform positive or E. coli positive sample.

ADEC can send you a one-page summary of your water sampling requirements. It is called a “monitoring summary” and gives your current status of test reports and future requirements. It’s good for keeping track of the tests that aren’t done very often. The monitoring summary can help you keep track and document what you have done, in case questions come up.

See Chapter 5

Just as important as testing is the recording of the results. Unless there is a written record of the test data, there is no way to track the unique traits of your utility.

6. Completing a sanitary survey when it’s due



DEALING WITH THE REGULATIONS

Although the federal government has tried to make the water sampling schedule easier to understand, it is still very complicated. If you have any questions, call the ADEC Drinking Water Program staff for help. A list of people who can help is provided in Appendix A.

See Chapters 6, 7, and 8

The sanitary survey helps identify problems with water sources and equipment or systems that may not be working right. New rules are now based on the drinking water class, not source. Utilities must complete a sanitary survey every three years.

You must write a Consumer Confidence Report (CCR) that includes information about your water source, the levels of any detected contaminants, and compliance with drinking water rules, plus some educational material. The purpose of the CCR is to give community members information about their water system that they can understand, and make informed decisions about their water use.

See Chapter 9

Do not begin construction or modification of a water or wastewater system until ADEC Drinking Water or Wastewater Program staff review and issue plan approval or issue a letter confirming that no plan approval is required for the new or changed system.

See Chapters 3 and 11

“I’m not too worried about any state or federal people showing up to look over my utility. Realistically, the only time they show up is when the situation is so bad that I really NEED their help. But I do worry about the children and elders in the village. Everyone else is healthy enough that a day or two of bad water might give them only an upset stomach. But children and older folks are a lot more sensitive to bad water. I don’t want my children—or anyone’s children—sick, so I take extra care to make sure the water is treated and safe to drink.”

7. Distributing a Consumer Confidence Report (CCR) once a year

8. Getting “plan approval” from ADEC before building or changing a water or wastewater system



CHAPTER 1

Water systems are required to have a written plan that explains where and when coliform samples will be collected. This plan is called a sample siting plan. All systems were required to submit a new sample siting plan when the RTCR became effective in 2016.

The plan makes sure you are collecting from the correct faucets, makes sure you know how to collect the sample without contaminating it, and makes sure you know what to do if a sample comes back positive (coliform bacteria present). The plan must be available onsite and updated if anything changes (for example, if a sample location is no longer available or there is a change in disinfectant).

See Chapter 8 and Appendix C

An initial positive sample for coliform must be followed up right away with four more samples to verify the problem. These extra samples are called “repeat samples” and too often are not collected on time. They have to be collected and sent into the lab within 24 hours of finding out about the coliform in the water. Time delay can be a problem in remote locations.

See Chapters 6 and 7

Once you know for sure that your water is unhealthy, you need to get the word out to everyone who drinks the water. They need to know as soon as you find out. Post a public notice in a few popular gathering places. Talk to everyone and tell them to pass the word around. Have it broadcast on the CB radio and call the commercial radio station in your region and ask them to read the notice on the air. Call ADEC. Read the Public Notice section of this guide. **BEST OF ALL, BE PREPARED:** Review the requirements for a public notice before something happens.

See Chapter 10

9. Preparing a written sample siting plan for coliform testing



10. Taking extra samples if coliforms are detected.



11. Posting a public notice to warn people of bad water



DEALING WITH THE REGULATIONS

If wastewater is not treated properly, it could mix into the environment and pollute your drinking water source. Nitrate and fecal coliform contamination are the most serious problems, but chemicals and viruses also cause concern. If anyone eats, breathes, or accidentally exposes a cut or wound to even a small amount of fecal contamination, they could get diarrhea, stomach cramps, headaches, nausea or even worse, hepatitis. Fecal exposure to cuts cause infections. It is very important that wastewater disposal systems work properly to avoid unhealthy conditions.

See Chapter 11

The road map on the following page tells you what tests are needed for your system type and where in this guide you can find more information. A more detailed look at the requirements are presented in a series of “compliance calendars” at the very end of this guide. Supplement these calendars and road map with other material in this guide, as well as material from ADEC (especially the custom “monitoring summary” they provide), EPA, and other sources. See Appendix B for more ideas.

- ✓ **There are federal, state, and sometimes local regulations to follow. They are written for the safety of your village and the protection of the land and water.**
- ✓ **The rules, regulations, and laws change. Stay in touch with ADEC to stay current.**
- ✓ **Focus on the most important safety issues first, striving for a consistent operation. Review the top twelve issues in this chapter for ideas of what is important.**

12. Maintain the wastewater system.



“Hepatitis A is only transmitted through fecal to oral contact. In other words, don’t get poop on your hands and then get it into your mouth. You could do this unknowingly if you don’t wash your hands after going to the bathroom.”

Summary

CHAPTER 1

Testing and Reporting Road Map							
Requirement	See Chapter	Groundwater			Surface Water (GWUDISW)		
		C	NTNC	TNC	C	NTNC	TNC
Tests							
Total Coliform	7 and 9	X	X	X	X	X	X
Turbidity	7 and 9				X	X	X
Residual Chlorine (if used)	7 and 9	X	X	X	X	X	X
Surface Water Treatment Rule	9				X	X	X
Total Coliform Rule	9	X	X	X	X	X	X
Fluoride (if used)	7 and 9	X	X	X	X	X	X
Nitrate	7 and 9	X	X	X	X	X	X
Nitrite	7 and 9	X	X	X	X	X	X
Inorganics (IOCs) (unless waived)	7 and 9	X	X		X	X	
Volatile Organics (VOCs)	7 and 9	X	X		X	X	
Radionuclides	7 and 9	X			X		
Lead/Copper	7 and 9	X	X		X	X	
Asbestos (unless waived)	7 and 9	X			X		
Synthetic Organics (SOCs) (unless waived)	7 and 9	X	X		X		
Disinfectant by-products (D/DBP)	7 and 9	X	X	X	X	X	X
Arsenic	7 and 9	X	X		X	X	
Groundwater Rule (GWR)	8	X	X	X			
Routine reports and other documents							
Monthly report to ADEC	6				X	X	X
Annual Consumer Confidence Report	10	X			X		
Sanitary Survey	6	3	5	5	3	3	5
Sample Siting Plan (coliform)	9 and App. C	X	X	X	X	X	X
Operator Certification	5	X	X		X	X	X
Plan Approvals	4 and 12	X	X	X	X	X	X
Special circumstance or response document							
Public Notice	10	X	X	X	X	X	X

Chapter 2: Community Capacity

Capacity refers to a community's or utility's ability to operate and maintain a water and wastewater system. Capacity doesn't mean just having safe drinking water available for everyone; capacity is having the technical abilities, managerial skills, and financial resources to meet state and federal regulations.

Although every place is different, all utilities are required to have trained staff and an organization in place for providing safe drinking water. Having capacity includes everything from having at least one operator in the village at all times, to making sure the books are in order and the bills are getting paid, to having the money to replace parts. Thus, every board member, council member, manager, office assistant, and operator needs to know certain aspects of their water system and how their role affects its operations.

“Capacity development” was officially recognized and emphasized in the 1996 amendments to the Safe Drinking Water Act. ADEC made rules to deal with these new regulations. In fact, currently ADEC cannot give approval to construct a new public water system unless the utility can show it has the managerial, financial, and technical capacity to operate its system before it is built. To help communities and utilities comply with these regulations, ADEC worked with a citizens' advisory board to develop ways to determine capacity.

Definitions

Technical capacity is the ability of local staff to operate and maintain the built part of the water system, including

CHAPTER 2

the wells, source water intakes, treatment, storage, and distribution systems.

Managerial capacity is the community's ability to administer the water system, including a business structure and communication skills for good staff management.

Financial capacity is having an accounting and reporting system that keeps track of the money coming in and going out of the water utility. It means always having enough money to operate the system.

Capacity Self-Assessments

Below are a few checkpoints to help focus improvements to your water system's capacity. Some of the checkpoints are actually required by ADEC. Other checkpoints are listed to get you thinking about your system's ability to provide safe water into the future. Are you able to put a check mark next to all of them? If not, you may need to look further at your capacity to operate and maintain the water system. To see your water system's capacity in detail, visit www.arwa.org or talk with ADEC or RUBA staff about a capacity assessment.

- As required, your water system completes water quality testing on time and the water meets regulatory standards.
- Your water system submits required operator reports on time.
- The operation and maintenance plan is a part of the daily checklist for the water system. Enough supplies, tools, and spare parts are available to operate important system components.
- The operator is certified at the level required for your type of water system and there are enough operators to keep the system running at all times.

Technical
capacity

COMMUNITY CAPACITY

There is a very clear record showing the staff structure and who is responsible for each part of the operation and management of your water system and when tasks should be completed.

Managerial
capacity

Your system was installed after getting written approval of construction drawings and specifications, and ADEC issued the final operation approval.

By-laws, ordinances, tariffs, or rate schedules exist, are used and are regularly reviewed.

There are written job descriptions for each staff member and the job descriptions are followed.

Written policies covering personnel, customer service, and safety exist and are actively used. (Although this documentation is not required by ADEC, it helps everyone understand his or her responsibilities and helps keep your water system running smoothly.)

Your system is current on all bills and financial obligations. In case of emergency, your system has credit or other resources.

Your system's rates are set and adopted in writing by the council or board.

No more than 20 percent of accounts payable or receivable of any type are more than three (3) months behind.

Financial
capacity

Regular periodic budget reports/balance sheets are produced and reported to the council or board.

An annual budget is completed, approved, and filed as required by the water system ordinances. The budget meets operation and maintenance needs.

CHAPTER 2

Ways to Build Capacity

As you understand your utility's strengths and its weaknesses, it is time to start looking at ways to improve your capacity. There are a number of ways to increase your utility's ability to operate and manage the functions required to successfully run your water system. One key way to do this is by training staff. Below are training programs that can help develop capacity to help you run your water system.

The Division of Community and Regional Affairs (DCRA) has eight courses, each a week long, to help your utility build management and financial capacity. These courses include:

- *Introduction to Utility Management:
Overview and Elements of Utility Management*
- *Planning Management:
Steps for Developing a Master Plan*
- *Organizational Management:
How to Get the Most Out of Your Utility*
- *Personnel Management for Rural Utilities:
How to Effectively Work with Your Staff*
- *Operational Management for Rural Utilities:
Skills Necessary to Run a Utility*
- *Financial Management for Rural Utilities:
How to Manage Your Utility's Cash Flow*
- *Clerks Management for Rural Utilities:
Clerks Role In Utility Management*
- *Elected Officials Management for Rural Utilities:
Elected Officials role in Financial, Technical and Personnel
Management*

DCRA contractors also provide training in QuickBooks.

COMMUNITY CAPACITY

There are many options for other training in general administrative, computer, bookkeeping, and management skills. A good local source is the University of Alaska and its community college campuses. The university also offers many courses through its distance delivery program. There are private colleges and businesses that also provide short courses and multi month/year programs. The Regional Health Corporations and the Alaska Native Tribal Health Consortium (ANTHC) also deliver ADEC's Operator Training and Certification Program. Check with your Regional Health Corporation or ADEC for the training nearest you.

- ✓ **Capacity is the ability to properly operate, manage, and maintain a utility in compliance with regulations.** Summary
- ✓ **Capacity includes having the technical abilities, managerial skills, and financial resources.**
- ✓ **A utility should determine where capacity development is needed to ensure safe water and compliance with regulations.**
- ✓ **Training is available to help build local resources.**

Chapter 3: Building or Updating a Drinking Water or Waste Water System

Before you can offer one cup of water to your village, you must have a water system that meets federal and state standards and guidelines. Before you can begin any construction on a water or waste water utility—regardless of whether it is a new facility or you are expanding or modifying an existing facility—you must get approval from ADEC. Coordinating with ADEC during the planning, construction, and operating phases of your project will save you many headaches.

A step-by-step process

Listed below are the steps in ADEC’s approval process for building or updating a water or wastewater system. They are also shown in the flow chart later in this chapter.

- Communicate with ADEC in a **preapplication conference** and get comments on your plan.
- Submit **plan approval** package and plan review fee.
- Obtain **approval to construct**.
- Obtain **interim approval to operate**.
- Obtain **final approval to operate**.

Before you start planning or constructing any new project or modification to your existing system, call the ADEC Drinking Water or Wastewater Program staff and ask if plan approval is required.

In most cases, ADEC will confirm that plan approval is required, but in some cases plan approval is not required. If that is the case, protect yourself by sending ADEC a letter

CHAPTER 3

explaining the project and asking for written confirmation that plan approval is not required.

Preapplication Conference

Good planning will avoid surprises or delays. Early in the design process, long before final design or construction, arrange a meeting with ADEC Drinking Water and/or Wastewater Program staff to discuss your project. (Contact names and phone numbers are provided in Appendix A.) This initial meeting, called a *preapplication conference*, is not required but is recommended to:

- Discuss your design concepts
- Identify potential regulatory concerns
- Identify ADEC contacts
- Identify other potential ADEC permit requirements (separate from *plan approval* requirements)
- Review the plan approval process
- Identify plan review fees

These conferences (meetings of an hour or so) are especially important if you plan to apply for a separation distance waiver. Also, if the system is new or innovative (something ADEC has not reviewed before), it would be good to meet with ADEC before the plans go in officially, so the designers can provide data that proves the system meets state regulations.

Plan Approvals

ADEC has checklists and required forms for submitting a complete review package. If you have grant money or other financial assistance for your project, the agency providing those funds can provide assistance—but you are still responsible for compliance. A plan review fee, must be paid to ADEC. The fee amount may be determined in the preapplication conference.

BUILDING OR UPDATING A DRINKING WATER PLANT

With few exceptions, plans for a water or wastewater system must be signed and stamped by a registered professional engineer registered in Alaska.

If you are planning new construction or expansion of your current facilities, pay special attention to aspects of the design that could cause problems. Find a place for your sewage lagoon or sewage disposal area that avoids problems. Keep it away from planned housing areas, airport facilities, wetlands, and high use areas, such as subsistence areas, picnic areas, boat launches, playgrounds, or ballparks. You must maintain certain distances between your water sources and distribution mains and wastewater, fuel, and other sources of contamination. These distances are bare minimums, so give them a little extra room to avoid problems down the road; some facilities might be expanded later or not end up exactly where you thought they were going to be. The preapplication conference is a good time to voice any concerns about separation distances—before ADEC officially examines your plans...and makes you redo them.

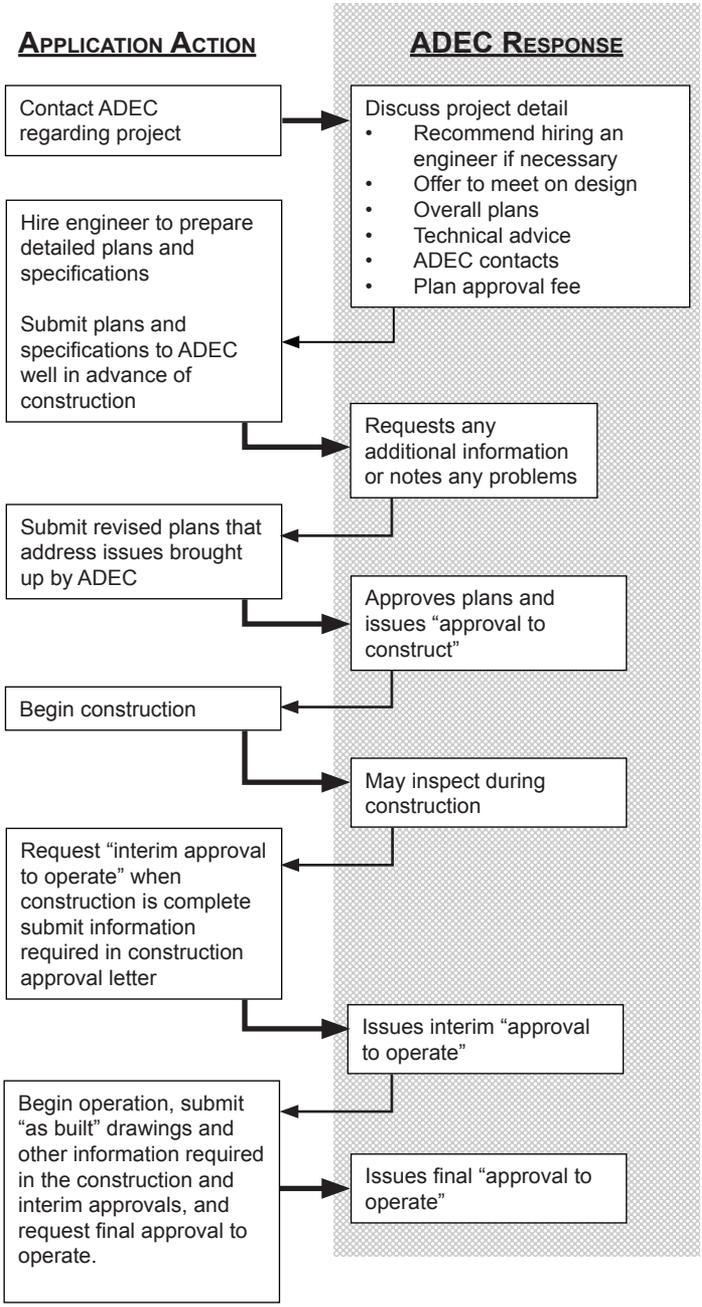
Separation
distances

Distance Requirements

Community, non-transient non-community, and transient non-community drinking water wells and surface water intakes must be kept:

200 ft. from:	Wastewater treatment and disposal systems (tundra ponds, sewage lagoons, honey bucket disposal areas, leach fields)
	Sewage pump stations (lift stations)
	Sewer main cleanouts
	Sewer line manholes
	Privies (outhouses)
	Community sewer lines (utilidors)
	Holding tanks (septic tanks)
	Sanitary landfills (garbage dumps)
	Industrial discharge lines (seafood plants, mines)
100 ft. from:	Private sewer lines
	Petroleum storage tanks (gas, diesel, etc)
	Drinking water treatment waste (backwash and reject water)

Plan Approval Process



BUILDING OR UPDATING A DRINKING WATER PLANT

ADEC may approve exceptions (waivers) to these separation distances, but the exceptions are not legal until you have reviewed the reasons with ADEC and been issued a written approval.

All construction designs must show that you have made certain that there will be no potential for backflow or cross connections. Backflow is the movement of any non-potable fluid into a drinking water system. Cross connections are, according to ADEC, any actual or potential mixing between drinking water and a source of contamination. Cross connections could include drinking water mixing with wastewater, drinking water mixing with untreated water (“raw” or “source” water), or drinking water mixing with boiler water.

Prevention of backflow and cross connections

ADEC states that emergency repairs and routine maintenance to your utility usually do not require submission of plans. But if you are considering any other change, call or submit a description of your planned changes to ADEC. If they say no plan review is required, you may want to get that in writing in case there are any questions later. Examples of changes that may require a plan review include:

Changes that require plan approval

- Changes in system equipment (such as adding water storage tanks)
- Changes in the distribution or collection system (such as extending it to serve more homes)
- Changes in a chemical treatment process (such as changing from chlorine to ozone disinfection)
- Addition of a new treatment process (such as adding fluoridation)
- Elimination of a chemical process (such as stopping disinfection)

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If you have any question about whether a change requires plan approval, contact ADEC's Drinking Water or Wastewater Program staff. See Appendix A for phone numbers.

Approval to Construct

Once the engineering design plans are complete, you need to request approval to construct from ADEC. If all requirements are met, ADEC will issue an **approval to construct**. No construction may begin before you have this approval even if you are in danger of missing the construction season and having to store equipment and supplies over the winter. Advance planning and early coordination with ADEC will avoid these sorts of problems during this phase of your project. During the construction process, if you need to change your design, you must contact ADEC and get approval for the change before proceeding.

Interim Approval to Operate

Once construction is complete, and all design requirements have been met, ADEC will issue an **interim approval to operate**. During this interim period, you need to provide as-built drawings and specifications to ADEC and submit information specified in interim approval letter.

“It’s easy for people living in Fairbanks or Anchorage to maintain sanitation. They flush a toilet and never think about where the water is going. They put their trash out on the street, and poof, it disappears. And how often does their water system fail? Out here, we don’t have the money to pay for systems like that. So we have to be extra careful to stay healthy. We make sure our separation distances are maintained and we take our solid waste way away from the village. It’s not easy living in the Bush, but it doesn’t have to be dangerous to our health.”

Final Approval to Operate

The final piece of paperwork that shows that a system passes the regulation and guidance requirements, is the final approval to operate. ADEC issues this after all the final construction and interim operation information has been submitted and approved.

- ✓ **Plan out your steps before beginning anything; don't make any assumptions.** Summary
- ✓ **Have a preapplication conference early on; consider it a free consulting service.**
- ✓ **New construction or significant modification to existing systems requires plans to be approved.**
- ✓ **Plans need two signatures: a registered engineer who drew the plans or can vouch for them and ADEC to approve them.**
- ✓ **Make special note of separation distances; it could save much grief years down the road.**
- ✓ **Watch out for backflow and cross connections.**
- ✓ **You will need three green lights on your way to building or modifying a water or wastewater system: approval to construct, interim approval to operate, and final approval to operate.**

Chapter 4: System Classification and Operator Certification

Since the health of everyone in the community depends on safe drinking water and sanitation, it is important that utility operators are well trained for their jobs. All community water system (C) and non-transient non-community (NTNC) drinking water systems are required to employ a water system operator who has been certified by the State of Alaska Operator Training & Certification (OpCert) Program. Transient non-community (TNC) drinking water systems using surface water or groundwater under the direct influence of surface water must also employ a certified operator.

The level of required operator certification depends on the classification of the system. Systems are classified based on size and complexity. Small, simple systems have low classifications. Large, complex systems have higher classifications. The supervising operator of a system must hold a certificate at a level equal to, or higher than the classification of the system.

Classifications of water systems include:

Least Complex:	Small, Untreated	
	Small, Treated	
	Water Treatment 1	Water Distribution 1
	Water Treatment 2	Water Distribution 2
	Water Treatment 3	Water Distribution 3
Most Complex:	Water Treatment 4	Water Distribution 4

The OpCert Program has a certification process for water system operators. To become certified, operators must first pass exams and then submit applications documenting that they meet the eligibility requirements. Eligibility requirements consist of varying amounts of education and experience. The higher the certification, the greater amounts of education

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and experience required. Each certification exam tests an operator's knowledge equal to the level of certification sought.

Operators of small untreated water systems who pass the exam and who have already demonstrated their eligibility by completing a department approved training course or by having three months experience operating a small untreated (or higher) water system will be issued their certifications without having to submit further applications. Similarly operators of small treated water systems will be eligible for certification if they have completed a department approved training course or have six months experience operating a small treated (or higher) water system.

Large system operators who hold no certifications will start the certification process by taking provisional level exams. Once an operator has passed a provisional level exam, they can then register for the level two exam in that same system type. If they pass the level two, they can take the level three exam and so on. At any point after an operator has passed one or more exams, they can submit an application for certification. They must complete an application form that documents their work experience as an operator as well as their education and submit it to the OpCert Program along with an application fee (\$100 as of November 2016). The Program will review the application, attempt to confirm their experience, and issue any certifications where they have met the eligibility requirements and passed the appropriate level exam.

Large system operators have five potential levels of certification, each level authorizing the operator to perform increasingly difficult tasks. The entry level certification is the provisional level which requires three months of operating experience or completion of a department approved training course. A provisional level certification may be upgraded to level one when the experience requirement has been met; this upgrade does not require taking an additional exam.

OPERATOR CERTIFICATION AND TRAINING

The next four levels of responsibility and certification are listed in the accompanying table along with their education and experience requirements. Extra education can go toward the experience requirement in many cases.

Operator Education and Experience Chart

	Operator Level									
	Provisional		I		II		III		IV	
System Type	Ed.	Op.	Ed.	Op.	Ed.	Op.	Ed.	Op.	Ed.	Op.
Water Dist.	12	**	12	1	12	3	13	4	13	6
Water Treat.	12	**	12	1	12	3	14	4	16	4
<p>Notes: Required periods of education and experience are reflected in years. Twelve years of education represents high school diploma or general educational development (GED) diploma. The department will waive the minimum education requirement for the provisional level and level I in accordance of this section.</p> <p>*Additional experience and education criteria and substitution requirements are set out in this section.</p> <p>**Three months of operating experience or the completion of a department-approved training course, as described in this section is required.</p> <p>Abbreviations: Ed. - Education Op. - Operator Experience</p>										

State certificates are good for three years and expire on December 31st of the third year. To renew a certificate, operators must complete appropriate Continuing Education Units (CEUs) (0.5 for small-untreated, 1.0 for small-treated, and 3.0 for provisional level through level 4) and pay a renewal fee. One CEU is equal to 10 hours of training.

Certificates from other states may qualify a person to receive Alaska certification without examination. This process is known as reciprocity.

Training

There are many training resources available for anyone who wants to become certified, learn more about public water systems, or obtain CEUs. Training courses are generally offered in three ways: correspondence, online, and classroom based.

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Many universities and organizations offer correspondence and online courses. Participation in RUBA 32-hour utility management courses is recognized as 3.2 core CEUs that may be applied toward certification requirements. A list of approved courses is available on the OpCert Program website.

The University of Alaska Southeast (UAS) offers small untreated and small treated water system courses that many operators use to qualify for certification. The OpCert Program maintains a list of correspondence courses that will meet the eligibility requirement for provisional level certifications. There are also numerous organizations that teach classroom based training courses throughout the state. These courses are generally taught in larger cities, but are sometimes sponsored in smaller communities. A calendar of upcoming classes can be found on the OpCert website.

For more information about training, registering for an exam, or applying for certification, please visit the OpCert Program's website or contact the OpCert Program directly. See Appendix B for website and contact information.

Chapter 5: Basics of Water Source Protection and Testing

Water Sources

There are a variety of possible sources of water for a community, each with its own particularities. Some utilities get their water from groundwater wells while others draw water from lakes, rivers, or other surface water sources. A few use both.

It is vital that you know what contaminants could get in your water and their potential health effects. What is near your water supply that could contaminate the water? Are any chemicals stored nearby? Is there any fueling of aircraft, snow machines, cars, or machinery nearby? Where is your fuel tank farm in relation to your water supply? How close is your sewage lagoon or wastewater outflow to your water intake? Where are your honey buckets being dumped? How can your water source be protected?

If you are using a well, what kind of groundwater contamination might be possible? Was the area used as a dump site by the military? Were chemicals ever spilled in the area?

Because of a limited amount of fresh water in the area, some villages use water from more than one source. If this is the case in your village, you will have to be aware of what each source might mean to your operations.

What kind of a water source or sources you use will determine how you sample your water. There are three types of water sources defined by the regulations.

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You need to be aware of all three but realize that the last two are treated exactly the same so in effect there are only two types. The water source types regulated by ADEC are:

1. Groundwater, usually a well.
2. Surface water, such as a river or lake.
3. Groundwater under the direct influence of surface water, also known as GWUDISW.

GWUDISW exists where there is a mixing of groundwater and surface water. For instance, perhaps you have a shallow well or spring that is drawing water from a water table 20 feet below the surface. But the well or spring is very near a wetland, lake, or other surface water body. The surface waters could mix with groundwater in the nearby shallow well or spring because the surface water and groundwater are connected underground. Thus, your well water or spring could be affected by the water quality of the surface water. Remember, GWUDISW is regulated just like surface water, so the more frequent sampling requirements of surface water regulations apply rather than the simpler sampling requirements of true groundwater sources.

“Running a water utility means more than just keeping the pipes full of water. It means thinking ahead. For example, we have a dip bucket system. People come to a faucet and fill up buckets and take the water home. But it doesn’t matter how good the water is coming out of the faucet if the buckets are dirty. One of the ways I make sure that the water in the buckets is safe is to add a drop of bleach to each bucket of water that leaves the faucet. Yeah, it’s time consuming, but no one is getting sick and saying I should be fired. I kinda like this job.”

BASICS OF WATER SOURCE PROTECTION AND TESTING

If you think you have a groundwater source, but ADEC has determined that you have a GWUDISW source, you will follow the sampling and testing requirements for surface water. ADEC will use field survey information and water test data to make the GWUDISW determination for you. You may have already been asked to send in information about your area soils, geology, wells, and surface waters to help ADEC make this determination.

We won't refer much to "groundwater under the direct influence of surface water" or its unwieldy acronym, GWUDISW, in the rest of the guide. Because GWUDISW is regulated just like surface water! If you have a GWUDISW source, just think "surface water."

Even though most of Alaska is pristine, and your watershed is probably wilderness, do not take anything for granted. Even from sources deemed "protected" by the state, there may be some problems. The greatest risks to health are microbiological contaminants such as bacteria, viruses, and protozoa. People can get very sick and some may get hepatitis if microbiological contamination is not controlled. Pesticides and underground leakage can also foul your water. These pollutants show up as Volatile Organic Chemicals (VOCs) or Synthetic Organic Chemicals (SOCs) in your water and can cause cancer and other health problems.

Is your water source at risk?

Minerals like arsenic (a health concern) and iron (a nuisance) from area soils and rocks may be dissolved in your water supply. Nitrate, an inorganic chemical that can have very serious health effects on babies, could enter your water from failing septic tanks or an abundance of septic systems discharging nitrates into the groundwater. Finally, older piping may contain asbestos, lead, or lead solder. Brand new copper piping may raise levels of copper in the water until the insides of the pipes get covered with a protective scale. Excessive copper or lead leaching into the drinking water can, over long periods, give people serious health problems.

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Drinking Water Protection

ADEC Drinking Water Program has a Drinking Water Protection group responsible for publishing Source Water Assessment (SWA) reports for each federally-regulated public water system (PWS) in Alaska. A SWA report identifies the area contributing water to your well or intake and the potential sources of contamination within that area. It uses this information in combination with the condition of your well or intake and the characteristics of the source area, to determine the vulnerability of your well or intake to contamination. Much of the information used in the SWA report is gathered from existing sources of information. Each PWS has an opportunity to review this information and provide feedback before the report is finalized. The accuracy and usefulness of the SWA report is dependent on the PWS providing timely and accurate information to ADEC, when requested. Occasionally, ADEC may coordinate visits to your PWS to verify the accuracy of the data used to complete the SWA report.

The Executive Summary of the SWA report can be used by a community water system (CWS) to meet some of the Consumer Confidence Report (CCR) requirements identified in Chapter 9. In addition, the CCR requires that the community be informed on where they can get a copy of the SWA report. A copy of the completed SWA report is provided to the PWS and should be made available by the PWS to the community upon request. If a PWS does not have a copy of their SWA report or does not know if one has been completed, the PWS can contact ADEC and request a copy or an update on the report status.

Once completed, the PWS and the community are encouraged to use the SWA report to begin developing a Drinking Water Protection Plan (DWPP). Since having a DWPP is voluntary in Alaska, ADEC is continually developing incentives for systems to develop a DWPP and implement the protection strategies identified in the DWPP.

BASICS OF WATER SOURCE PROTECTION AND TESTING

If the PWS or community is interested in developing a DWPP, please contact Drinking Water Protection staff to learn about the latest incentives, criteria and procedures for developing a DWPP that qualifies for state incentives.

The Sanitary Survey

The sanitary survey is a periodic checkup of an individual water system to identify problems which may affect the safety of the water. Community water systems must complete a sanitary survey every three years, non-transient non-community and transient non-community water system must complete a survey every five years.

Qualified drinking water professionals, who are approved by the state and have the expertise to spot potential problems with water sources, water treatment system, and piping should conduct sanitary surveys. These include approved third party surveyors and water supply engineers, who charge for the service. ADEC Drinking Water Program staff can complete the surveys as well. Communities served by a health corporation should be able to arrange a survey through their sanitarian. (Contact ADEC Drinking Water Program to obtain a list of people approved to conduct sanitary surveys.)

After the sanitary survey is complete, ADEC will review it and determine if your system has any deficiencies or compliance issues. They will send a letter listing deficiencies and the amount of time that you have to fix each deficiency. All deficiencies must be fixed; however, if you are not able to meet the deadlines given, contact ADEC immediately to negotiate an alternate schedule. Once you have fixed the deficiencies, send ADEC documentation that they are fixed. Photos are an easy way to show that most deficiencies have been fixed, and they can be e-mailed to the ADEC.

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Treated Water Testing

The federal government requires significant testing of drinking water. State agencies have to enforce those requirements. In 2006, the number of tests was increased substantially. While ADEC can issue waivers for certain pollutants not expected to be present (SOC and asbestos), this should not lead you to believe that you do not need to test your water regularly. The best policy is to regularly test for any potential contamination using a schedule issued by ADEC.

Where you actually draw samples depends on what you are testing for. Some samples are collected at the source water treatment plant while others are done after treatment as the water is entering the distribution system (main pipes to customer homes). Some tests are done at customers' faucets in the distribution system. The frequency of the sample tests will also depend on what you are testing for and what type of system you have. The next three chapters will describe the tests in increasing detail.

We've broken the many possible tests into two basic types: operations and compliance. *Operations testing* is aimed at catching potentially big problems right away. Most are daily tests. *Compliance tests* are samples sent to a certified laboratory to analyze for a variety of contaminants. Compliance tests are confirmation that your water is safe. Some of these tests are monthly, some only every few years. The next three chapters cover the tests. Chapter 6 covers operations testing, Chapter 7 compliance testing, and Chapter 8 provides more details about all the tests.

Recording the test data is just as important as testing. Unless there is a written record of the results of your samples, there is no way to track the unique characteristics of your utility. This could create problems for you when a new person does the testing.

BASICS OF WATER SOURCE PROTECTION AND TESTING

Say turbidity regularly runs a bit high at your utility at certain times of the year. Someone who is not aware of that may want to take extreme measures to discover why his or her turbidity is different than expected. If they can look back on the logsheets, they will see that it fits a normal pattern and can relax. So write down each test result on the logsheet right after you take it.

Record and report the results

To comply with federal and state regulations, you'll need to send in a copy of your monthly report logsheet within 10 days of the last day of every month. See the sample logsheet in Chapter 6. Late reporting may require public notice (see Chapter 10 or call ADEC).

ADEC needs to know that regulated contaminants are below maximum contaminant levels (MCLs) so that human health is not at risk. If you do not comply with federal and state reporting requirements, you will wind up with a violation.

“Sometimes being a water utility operator means educating the community. For example, we have a lot of people who will leave town for a week or so to shop or visit relatives. They come back in ten days, take a drink and get sick. Well, what happens is that the chlorine I put in the water is only good for a few days. If the water sits in the pipe for ten days, the chlorine becomes gas and comes out with the water when the faucet is opened. With no chlorine in the water, any germs that are there grow. So I suggest that anyone coming back after an absence let the water run a bit before taking a drink.”

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It is wise to maintain high standards for your testing. Approximating test results does no one any good. Regular testing with correct methods and equipment ensures a good quality of water is delivered to your customers. So, unless you have a waiver, follow the tests required by ADEC, as a minimum.

Maintain high standards

- ✓ **There are two basic types of water sources: groundwater and surface water.**
- ✓ **There is also “groundwater under the direct influence of surface water” (GWUDISW), which is regulated just like surface water.**
- ✓ **A clean water source is vital—be aware of and deal with any possible contamination.**
- ✓ **Surface water, especially, must be treated to be safe.**
- ✓ **Have a sanitary survey done every three or five years depending on your drinking water class.**
- ✓ **Operations testing is intended to alert you to immediate circumstances that may indicate a problem.**
- ✓ **Compliance testing is done to ensure that water is tested and results are recorded. It confirms that your system is operating properly.**
- ✓ **Record and report all operator-performed test results. Maintain high standards for the sake of your community’s health.**

Summary

Chapter 6: Operations

Testing

The operations tests, performed by water utility operators, are most important because they tell you on a daily or monthly basis how well your treated water (sometimes called “finished water”) meets safe levels. These tests must be done frequently so that corrective actions can be taken if something isn’t quite right. The tests you do depend on your water source type and treatment process.

Daily Onsite Tests

If you are using surface water or GWUDISW, you must filter and disinfect the water and test daily for turbidity and residual chlorine.

If you have a groundwater source and disinfect with chlorine, ADEC may require you to test and report residual chlorine daily, but not turbidity. In most instances, groundwater-only systems do not need disinfection.

If you add fluoride to your water, you must do a daily fluoride test and report the results to ADEC.

Monthly Coliform Test

Total coliform tests are required according to an ADEC schedule. Operators need to collect the water sample and send it to a certified laboratory for analysis. If your community population is over 1,000 (and up to 2,500 people), you need to do two coliform samples per month. Utilities serving fewer than 1,000 people may need to do only one test per month. You should contact ADEC to determine how often total coliform tests should be performed at your utility. Remember, there are new requirements for assessments to be performed if your system has a positive sample under the new RTCR. ADEC will contact you if your system triggers an assessment.



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Monthly Reports

Do all the daily and monthly tests that are required by ADEC and records results on your monthly report.

There are several monthly reports of varying complexity used by different size utilities. (The sample monthly report on the next page is an example of one of these.) Monthly operator report templates are available through the ADEC Drinking Water Program website or by contacting ADEC staff, who can help you put together a template specific for your water system.

The monthly reports are your records, but a copy must also be delivered, e-mailed, or faxed to ADEC within 10 days of the end of each month. All too frequently utilities fail to send a copy of the monthly report logsheet to ADEC or turn it in late. Remember, ADEC needs the information for the entire month, not a partial month.

Safe Limits

These four tests: turbidity, residual chlorine, fluoride, and total coliform are the most important tests for making sure your system is operating properly and the quality of your water is safe. You always want to know what these parameters are so that when you make operational changes, water quality does not stray outside safe limits. The limits for each test are listed in the *Operations Water Tests and Safe Limits* table on page “Operations water tests and safe limits” on page 56. **Testing is not a substitute for good operation. Rather, it is used for confirmation or indicator purposes.**

CHAPTER 6

More on the Four Tests

Turbidity is a measure of suspended solids in your water. It is measured by shining a light into a sample and seeing how much is scattered versus passed through. Low turbidity (say 0.2 NTU) means not much light is scattered (the water looks clear). High turbidity (for example, 10 NTU) means much of the light is scattered (the water looks dirty or cloudy). Filtration is the most effective way to remove solids. Even filtered, all water has a certain amount of solids but the lower your turbidity reading the better.



Operations water tests and safe limits

Test	Where is the test done?	Safe limit
Turbidity ^a (surface water and GWUDISW sources only)	Onsite in the treatment plant (before treatment for unfiltered systems)	Standard safe limit is 1TU. ^b However, different filtration systems and systems avoiding filtration have varying safe limits. ^c
Residual Chlorine (if added)	Onsite in the treatment plant (daily)	Greater than 0.2 mg/L
	Onsite in the distribution system at the same time and place as the Total Coliform sample is taken. ^d	Trace or detectable amount
Total coliform bacteria	State-certified lab test (sample is collected in the distribution system)	Absence of coliform bacteria
Fluoride (if added)	Onsite in the treatment plant	less than 2 mg/L (best operating level is 0.7 mg/L)

a The regulations require that a sample be collected every four hours, but most small systems can get this reduced to daily if they serve fewer than 500 people or use filtration other than conventional, direct, or diatomaceous earth.

b No more than 5% of the samples in a month can be over 0.3 NTU for conventional or direct filtration or over 1 NTU for other filtration technologies, and the average of two consecutive days of sampling cannot exceed 5 NTU.

c ADEC may increase or decrease turbidity limits on a case by case basis depending on the utility proving treatment efficiency.

d Preferably a sample at the customer's faucet farthest from the treatment plant.

OPERATIONS TESTING DAILY TESTING ON-SITE TESTS

High turbidity hampers the disinfection process since much of the chlorine will be wasted on the particles and not be available to kill bacteria. Another way to look at it is that the bacteria are “hidden” from the chlorine by the particles. Unusually high turbidity could indicate problems in the water supply. If the reading jumps up unexpectedly, you should immediately inspect your water source. Have high water levels caused bank erosion? Has spring breakup or heavy rains caused the water to be dirty or cloudy? Has someone dumped something in the area?

It is critical to monitor turbidity regularly so you can adjust your treatment process to match these conditions. All surface water systems must provide filtration or meet special requirements to avoid filtration. GWUDISW systems are treated as surface water systems.



Chlorine is used to disinfect the water—to kill bacteria, viruses, and protozoa. Chlorine can be added as a solid, liquid, or gas. The amount of chlorine added is dependent on a number of factors, such as the temperature, pH, and turbidity of the raw water. There are two important considerations in chlorination.

- The chlorine must be in the water long enough to kill the microorganism. This is called **contact time**.
1. There must be enough chlorine in the system to kill microorganisms in the water while the water is going to the users. There needs to be a detectable amount of chlorine throughout the system. This detectable amount is called **residual chlorine**. If residual chlorine measures OK at the plant but drops below safe levels at the last service connection, how can you be sure it didn't drop below a safe level before the last service connection? In other words, you need to make certain that the level of chlorine in the piping system is high enough to continue to kill new bacteria that may enter the system while it is being piped to each household.

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For this reason, it is critical to maintain the minimum 0.2 mg/L of residual chlorine entering the distribution system and a detectable amount through the entire distribution system. Test for it daily and carefully.

The presence of any **coliform bacteria** in your water should be a red flag to you. A certified lab does the coliform bacteria test (sometimes called “coli” or “bacti” for short). If any are detected (called a “positive” test), the laboratory will automatically test the positive coliform sample for the dangerous types of bacteria, such as fecal **coliform** or *E. coli*, and report the results to you and to ADEC. A positive total coliform test means that you, as the utility operator or manager, must call ADEC as soon as possible to determine what to do next. You will work with ADEC to take one or more of the following actions:

- Take a minimum of 3 repeat samples using great care to do it right
- Perform a Level 1 or Level 2 Assessment to evaluate the problem and provide an explanation to ADEC
- ADEC will inform you when you can resume your normal sampling schedule.
- Possibly post a public notice (for example, a Boil Water Notice)



“I really didn’t care about turbidity until I found out why the turbidity test is so important. You see, all kinds of little tiny germs can hide around those suspended particles. If the chlorine cannot find the germs, it can’t kill them. The more particles there are — that is, the higher the turbidity — the more chlorine it’s going to take to kill all the germs. Now I’m REAL careful about my turbidity count. The health of my kids depends on it.”

OPERATIONS TESTING DAILY TESTING ON-SITE TESTS

With the proper concentration of disinfectant, your testing will reveal a consistent purity of water being pumped out to your customers. However, you should be aware that there is nothing constant in any water system.

Fluoride is an additive to the water that helps protect teeth from decay. If you add fluoride to your water supply, you have to test to make certain that the amount of fluoride in your water is both adequate and constant. The fluoride test is done onsite by a water treatment plant operator. Fluoride is added and monitored to keep it within a specific range. Too little fluoride won't do any good—children's teeth may not receive any protection from decay. Too much fluoride could cause mottling (brown stains on teeth), bone problems, and at extreme, levels over fluoridation could prove fatal.

Coordinate with your village health aide to make sure your children aren't getting too much fluoride. If the village health program sponsors a tooth fluoridation program and fluoride is added to the water supply, your children are probably getting more fluoride than they need.



“Getting fluoride into the water is a matter of doing it exactly right. It’s not as though a little is good and more is better. Fluoride is basically to strengthen the teeth of children, those under about 12 years of age. If you don’t put enough fluoride into the water, it won’t help one tooth in the village, and it will cost you money besides. If you put too much fluoride into the water, everyone’s teeth will become mottled, grainy, and dark. Once that happens, everyone in town is going to blame you for ruining their good looks!”

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- ✓ **Operations tests are the most important tests because they tell you on a daily basis how well your water treatment is working.** Summary
- ✓ **The tests you do depend on your source water type, system classification and treatment process.**
- ✓ **The turbidity, residual chlorine, and fluoride tests are done daily onsite.**
- ✓ **The total coliform test is done at least monthly or according to an ADEC schedule by a certified lab.**
- ✓ **The monthly report must be kept and a copy sent to ADEC within 10 days of the end of each month.**

Chapter 7: Compliance Testing

In addition to the operations tests outlined in the last chapter, there are a handful of other tests that must be done at a certified laboratory. Details on each test will be covered in Chapter 8. Compliance testing is to confirm that your system is operating properly and to make sure no contaminant has shown up in your water unexpectedly.

This chapter covers the general procedures for compliance testing and stresses some important points to remember. It also includes a flow chart for routine compliance testing (*Water Utility Typical Sampling Locations*) and one for when tests come back out of acceptable limits (*Compliance Monitoring Basics*).

Choosing Labs

Compliance testing can only be done by a laboratory certified by ADEC. There are only a few such labs in Alaska, so systems are not required to use a lab in Alaska. Laboratories are certified to test for certain contaminants. For example, only a few labs in the state are certified to do synthetic organic chemical (SOC) analyses—such as pesticides and polychlorinated-biphenyls (PCBs). Check ADEC’s list of certified laboratories before sending your water to a lab. A link to the certified laboratories and the tests they are certified to do is located on the ADEC Drinking Watermain website, www.dec.state.ak.us/eh/dw/dwmain/drinking_water.html. It may work out to use one lab for some tests and another for others.

The cost of testing will vary from laboratory to laboratory, so it is suggested that you “shop around” before committing yourself to any one lab.

CHAPTER 7

Call several certified labs and ask for their price list for the required tests. In some regions, health corporations may offer subsidized coliform testing. Check to make sure the lab is state-certified. And check from time to time to make sure you are still getting a good value for your money; remember, good service is important too.

Taking the Samples

There are several planning tasks that must be done before you collect your samples:

- Secure the funds to pay for required lab tests. Make the financial commitment to keep a proper testing program going.
- Order sample bottles and paperwork from the lab well ahead of time. With some tests, it is a good idea to keep a few extra sample bottles on hand; utilities are required to have a minimum of four bottles on hand for coliform retesting.
- Sample early in the month, within the required time so the sample can arrive at the lab on time. Be sure to take the weather into account. It does you no good to send a sample that will not arrive on time.

Before you
sample

Before you start gathering samples for compliance tests, there are six critical matters to keep in mind.

1. ***Maintain a clean environment.*** Wash your hands thoroughly before collecting samples. This includes cleaning under fingernails, particularly when collecting coliform samples. Make sure the sink is clean (no meat or blood from cleaning game or fish). Remove the aerator from the sink faucet and avoid sampling from swing faucets. These rules are especially important for coliform and VOC sampling.
2. ***Collect sample from the correct location.*** Samples must be collected from specific locations. For example, coliform samples must be collected from

Six important
points

the distribution system according to the approved sample siting plan, rather than back at the treatment plant. See *Water Process Diagram* on the next page for required sample locations.

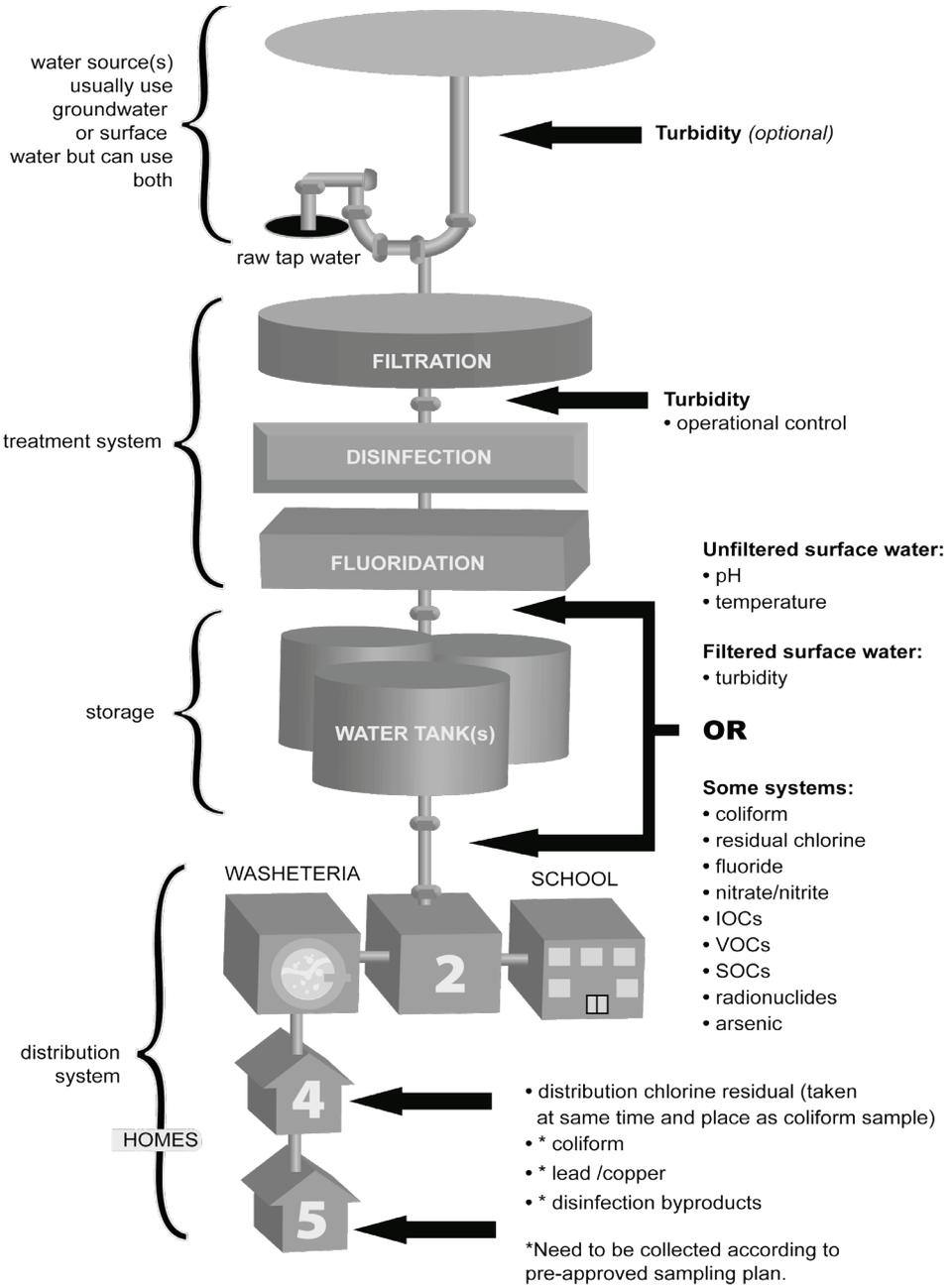


3. ***Do not rinse any sample*** container you receive from the laboratory. Some of the sample containers have preservatives in the bottle that keep the sample just as it was when you collected it from your water system. Be careful that the sample bottle does not overflow, this could wash out the preservatives. The laboratory expects to find those preservatives in the sample analysis.
4. ***Label every sample*** with the utility name and public water system (PWS) number, phone number, your name, and date and time of collection. Write legibly with waterproof ink. If any of your writing cannot be clearly read, the laboratory could refuse to test the sample and ask for another one. If there's a mix-up at the laboratory, you want to make sure that the lab personnel can distinguish between your sample and anyone else's.
5. ***Maintain and ship all samples cooled but not frozen.*** Samples must arrive at the lab unfrozen, but no warmer than 10 degrees Fahrenheit. Frozen samples could result in cracked sample bottles or loosened bottle caps. The lab will mark these samples "invalid"

"One time I did something really stupid. I was taking a water sample when I accidentally let some of the water run over my fingers before it went into the bottle. 'No big deal,' I thought. Well, it was. And an expensive one too. I didn't have to redo just the one sample. Noooo. I had to redo it a whole bunch of times so the lab could be sure that whatever was on my fingers wasn't actually in the water supply. That cost money. Guess what? I don't put my fingers in the water anymore."

CHAPTER 7

Water Process Diagram



and will not test them. Wrap each bottle or container in bubble wrap. Then pack the samples with “blue ice” packs in the shipping container (usually a cooler supplied by the testing lab).

6. Schedule your sampling so the specimen arrives at the lab in time to be tested and not over a weekend or holiday. A coliform sample **MUST BE TESTED WITHIN 30 HOURS OF COLLECTION**, unless a 48 hour waiver is in effect. If this presents a hardship due to your remote location, call ADEC. The laboratory provides the chain of custody form (see example on next page), sample bottles, labels, blue ice and shipping containers (usually coolers), as well as, sample instructions and precautions. **YOU MUST REQUEST AND RECEIVE THIS EQUIPMENT FROM THE LAB BEFORE YOU COLLECT SAMPLES.** Then follow their instructions.

Maintaining the Chain of Custody

It is important that you understand and maintain the **chain of custody**. The chain of custody ensures that your samples are collected, packaged, sent, transported, and received properly with no contamination, tampering, or delay between your sampling and the laboratory’s testing. An example chain of custody record from a lab is shown on the next page. On the chain of custody form, list all of the samples taken, along

“When it comes to sampling, what you do after you get the water in the bottle is just as important as getting the water there in the first place. One time I left the coliform sample on a window sill for three hours before the plane came to the village. That cooked whatever was in there and I had to send another set of samples – and we had to pay for both sets. That’s the last time I ever did that. Now I take my samples and put them in the refrigerator until the plane comes. And I always call to make sure the plane is even coming before I sample.”

CHAPTER 7

with the date, time, and exact location of each sample, the PWSID number, and number of sample containers you used. IT IS IMPORTANT TO SIGN YOUR CUSTODY FORM. A LAB WILL NOT RUN TESTS IF THE CHAIN OF CUSTODY IS NOT SIGNED.

Example of chain of custody

Example of Chain of Custody

Client Name & Address: DEC - Drinking Water 610 University Ave Fairbanks AK 99709		Public Water System (PWS) ID#: 310000		Section To Be Completed by Analytica Quote ID: DSN	
Report for: DEC Drinking Water		Project Name: DEC - Drinking Water Fairbanks		Invoice to Name & Address: DEC Drinking Water 610 University Ave Fairbanks, AK 99709	
Phone No.: 907-451-2110		Turnaround Time for Results (TAT) <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Expedited (+10 days, prior authorization required) <small>(Please specify due date below and include any charges.)</small>		Account: _____ Cash _____ Credit Card _____	
Fax No.: 907-451-2188		Requested Due Date for Results:		P.O. or Contract No.:	
E-mail: janah.boddy@dec.alaska.gov		Special Instructions/Comments: Example ONLY		Requested Analytes/Method	
Kit Pre-Shipping Charge: \$		Client Sample Identification/Location		HAA5 Lot: _____ Pres: _____ VOC Lot: _____ Pres: _____ NITRATE Lot: _____ Pres: _____ Lead/Copper Lot: _____ Pres: _____ _____ Lot: _____ Pres: _____ _____ Lot: _____ Pres: _____ Field Preserved _____ Field Filtered _____ MS/MSD ? _____	
End of Distribution (Sample according to plan)		Date Sampled Time Sampled Matrix (S-DW-WW-Other) No. of containers		_____	
Western Pt (only point to distribution)		12/10/10 13:10 DN 5		_____	
Western Pt (only point to distribution)		12/10/10 13:13 DN 1		_____	
13 E Street (Distribution)		12/10/10 14:00 DN 1		_____	
18 Elm Street (Distribution)		12/10/10 14:20 DN 1		_____	
20 Raven Rd (Distribution)		12/10/10 14:25 DN 1		_____	
2 Dog House Dr (Distribution)		12/10/10 14:40 DN 1		_____	
43000th Ave (Distribution)		12/10/10 14:49 DN 1		_____	
TRANE PLANK (do not open)		_____		_____	
Reinquished by: <i>Janah</i> Date: 12/10/10 Time: 15:00		Received by: _____ Date: _____ Time: _____		Section To Be Completed by Analytica THO _____ ANC _____ JNU _____ EMS _____	
Reinquished by: _____ Date: _____ Time: _____		Received by: _____ Date: _____ Time: _____		_____	
Reinquished by: _____ Date: _____ Time: _____		Received by: _____ Date: _____ Time: _____		_____	
Name of Sampler (printed): <i>DAWN D BODDYFELT</i>		Condition of Custody Seal?		_____	
_____		Initiated by: _____		_____	
_____		Temp Loc: _____		_____	
_____		Thermo ID# _____		_____	
_____		Shipped Via: _____		_____	

Comparing Results to Safe Limits

Compliance tests that must be done in a certified lab are:

1. Coliform Bacteria (covered in Chapter 6)
2. Nitrate and Nitrite
3. Inorganic Chemicals (IOCs)
4. Volatile Organic Chemicals (VOCs)
5. Synthetic Organic Chemicals (SOCs) (for example, pesticides and PCBs)
6. Lead and Copper
7. Asbestos
8. Radionuclides
9. Arsenic
10. Disinfectants and Disinfection By-Products (TTHM, HAA5)

No one in the village has more control over good health than the water treatment operator. Supplying bad water can make the whole village sick.

Test results must be compared to state and federal safe limits, called maximum contaminant levels (MCLs). MCLs are available from ADEC and are listed for each contaminant in Chapter 8, *Details on the Tests*. If test results are above MCLs, you will need to work with the ADEC Drinking Water Program staff for follow-up compliance requirements. Your lab will call you and ADEC when they get results over the MCLs, but don't wait for a call from ADEC when you get results that exceed MCLs to take action. Example of follow-up actions ADEC may include:

- Requires resample immediately
- Increase sampling frequency
- Post a public notice
- Find an alternate water source (requires ADEC plan approval)
- Install additional water treatment (requires ADEC plan approval)

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Remember, you need to contact ADEC immediately and follow their requirements for follow-up actions. Do not install new treatment processes without first going through the ADEC plan approval process.

In many cases, test results come back with levels that indicate a concern, but the levels are not higher than MCLs. These warning levels are called “trigger levels” or “action levels” in the regulations. “Trigger levels” (for fluoride, nitrate/ nitrite, VOCs, and SOCs) and “action levels” (for lead and copper) are available from ADEC and are also listed in Chapter 8. If your test results are higher than trigger levels, contact ADEC for follow-up requirements.

Exceptions to the Requirements

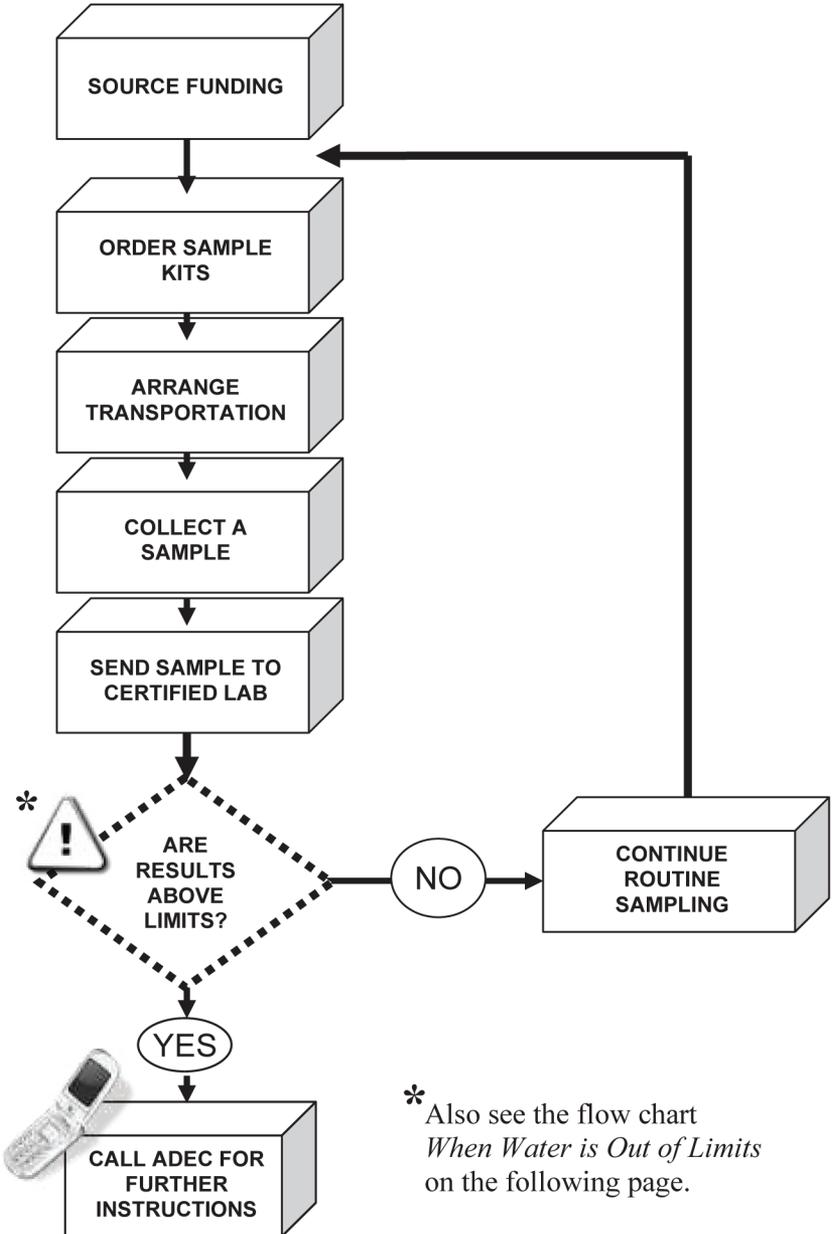
There are three types of exceptions to compliance testing: **waivers, variances, and exemptions**. In addition, composite sampling allows a simplification in procedure in a multiple sample situation. It should be made quite clear that these exceptions do not allow you to deliver unsafe water. Rather, exceptions take into account your local circumstances versus expensive test requirements. You need to ask ADEC for exceptions; they are not automatically granted.

ADEC issues waivers for specific contaminants. Waivers mean you don’t have to test for the contaminants listed in the waiver or you may be able to reduce the frequency of testing. You have to apply for a waiver from the ADEC Drinking Water Program and you might have to pay a fee but in the long run, a waiver will save you a lot of money. Waivers are available for single contaminants, such as asbestos and dioxin (one of the SOCs). Waivers are available for groups of contaminants, such as SOCs. If you are issued a waiver, make sure you know when you need to renew it. Depending on the contaminant, waivers need to be renewed every three to nine years. Contact ADEC for details.

Waivers

Compliance Monitoring Basics

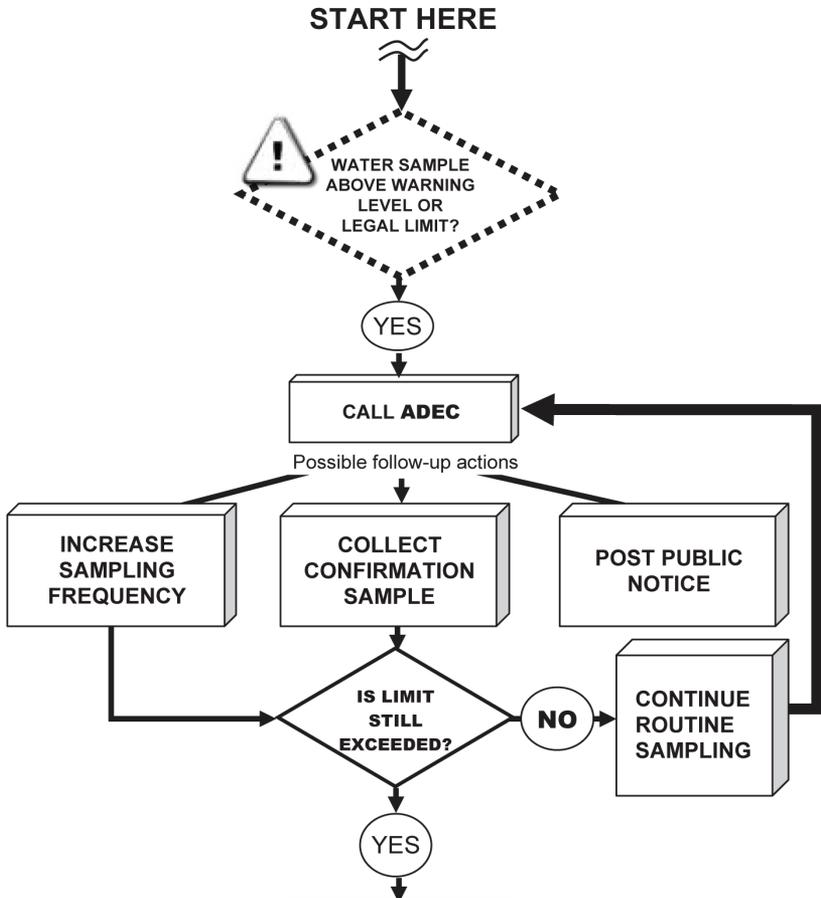
START HERE



* Also see the flow chart *When Water is Out of Limits* on the following page.

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When Water is Out of Limits



This generalized chart shows a possible series of events when test results reveal contaminants over warning (trigger) levels or legal limits (MCLs). A utility would work closely with ADEC to determine the exact course of action.

COMPLIANCE TESTING

Variations apply to MCLs. If a water system can't meet an MCL but does not pose an immediate health risk, ADEC may grant a variance for the MCL. However, ADEC has never issued a variance for this purpose. If you are granted a variance for an MCL, you will be required to post public notice and may be required to use bottled water or different treatment devices (such as filters on water taps) as a condition of the variance. Variations are issued for specific periods of time. Variations may also be granted for treatment techniques. Contact ADEC for details.

Variations

Exemptions also apply to MCLs. If a water system can't meet an MCL, but could if given time to address the problem, ADEC may grant an exemption to the MCL. If you are issued an exemption, you will be issued a compliance schedule (usually no more than one year) and must post a public notice. You may be required to use bottled water or different treatment devices (such as filters on water taps) as conditions of the exemption. Exemptions are also granted for treatment techniques. Contact ADEC for details.

Exemptions

Composite sampling is available in two situations but only if first approved by ADEC. Utilities with more than one water source may collect a sample from each source and instruct the lab to composite them. The lab will mix the samples together and run only one test, saving you money. A variation of compositing is allowed for initial radionuclides tests. For the first four quarters of testing, ADEC may allow you to collect one sample each quarter, but wait to the end of the year and send them in together. In both cases, it is important to remember that only the lab may do the actual mixing.

Composite
sampling

CHAPTER 7

Testing Overview

Contaminant	Sample location	Composite sampling?	Waivers possible?
Turbidity	After filtration ^a	No	Yes ^b
Residual Chlorine (disinfectants)	After treatment (daily) Distribution system (monthly)	No No	No No
Total Coliform Bacteria	Distribution system (sample siting plan)	No	No
Fluoride (if added)	Distribution system (sample siting plan)	No	No
Nitrate	After treatment	No	No
Nitrite	After treatment	No	No
Phase 2 Inorganics (IOCs)	After treatment	No	Yes
Phase 5 Inorganics (IOCs)	After treatment	No	Yes
Volatile Organics (VOCs)	After treatment	No	Yes ^c
Synthetic Organics (SOCs)	After treatment	No	Yes
Lead/Copper	Distribution system ^d (sample siting plan)	Yes	No
Asbestos	Distribution system	Yes	Yes
Radionuclides	After treatment	Yes	Yes ^c
Disinfectants and Disinfection By-Products (TTHM, HAA5)	Distributions system ^e (sample siting plan)	No	No
Arsenic	After treatment	Yes	No

a Unfiltered surface water may also be sampled at the source.

b Depending on filtration technique.

c For a reduction in frequency only.

d First draw (where water has been sitting in the pipes for a minimum of 6 hours).

e Total organic carbon samples at the source and after treatment.

Overview of Drinking Water Tests

Summary

The table on the previous page summarizes sample locations and composite sampling and waiver options for drinking water tests. Chapter 8 will cover the tests in more detail, including sampling frequency.

- ✓ **Compliance testing is a check for various contaminants that could show up in your water.**
- ✓ **Compliance testing can only be done by a laboratory certified by ADEC.**
- ✓ **Shop around for a lab (or labs) that meets your needs at a fair price.**
- ✓ **Get a “monitoring summary” from ADEC specifically for your utility.**
- ✓ **Plan out your test strategy, including funding, timing of sample kits, and transportation issues.**
- ✓ **Observe the six critical matters in this chapter when taking samples.**
- ✓ **Maintain a proper chain of custody with samples.**
- ✓ **Compare test results to safe limits and take appropriate action.**
- ✓ **Obtain waivers, variances, or exemptions when necessary and appropriate.**

Chapter 8: Details on the Tests

The operations and compliance tests mentioned in prior chapters of this guide are explained in more detail in this chapter. The turbidity and residual chlorine tests are explained under the Surface Water Treatment Rule (SWTR). The summary of the Disinfectants and Disinfection By-Products Rule (D/DBPR) explains some new rules for testing.

To simplify things, we've assumed that your utility has only one water source. ***If your utility has more than one water source, contact ADEC for the appropriate water sampling location(s).*** You may be able to use composite sampling. When it comes to sampling frequency, surface water sources are usually tested more often than groundwater sources. Surface water sampling frequencies are usually listed separately from groundwater sampling frequencies in this chapter. In general, if an MCL is exceeded, you should contact ADEC immediately and work out what to do next with a Drinking Water Program staff specialist.

Surface Water Treatment Rule (SWTR)

What is the issue?

Surface water is usually considered more susceptible to contamination than groundwater. In general, surface water will have more debris and dirt particles (higher turbidity) and biological contamination. The rule requires a minimum level of treatment so that bacteria, viruses, and protozoa in your water supply are killed.

Bacteria, viruses, and protozoa can cause severe stomach and intestinal diseases and can even kill those with weakened immune systems including babies, the elderly and anyone with an existing illness.

CHAPTER 8

Parasites live off your body and can really knock you down. Diseases caused by these germs and viruses include Hepatitis A, Cryptosporidiosis, and Giardiasis. Symptoms of these diseases include yellow skin, headaches, nausea, gas, vomiting and diarrhea.

How do these microbes get into the water?

Bacteria, viruses, and protozoa are usually introduced to water from contact with human and animal wastes. They could get into the water from upstream villages, dog lot runoff, leaking septic or sewage systems, sewage systems too close to water sources, and droppings from infected animals (like waterfowl, beaver, moose, caribou, etc..) in the watershed.

What is the minimum treatment required for surface water?

If you are using surface water for your water supply you should be filtering your water, then disinfecting it with a chemical like chlorine. Other disinfectants such as ozone and chloramine are also used but are not common in Alaska. Make sure you have enough disinfectant in the water so the bacteria, viruses, and protozoa are killed. The amount of disinfectant remaining after the disinfection process is called “concentration or residual disinfection concentration” and must be at least 0.2 mg/L entering the distribution system.

Also in the SWTR is the requirement that all community, non-transient, non-community public source water utilities regardless of size and non-transient community drinking water systems using surface water or GWUDISW source employ a *state-certified* operator. See Chapter 4 for details on certification and training.

What, where, and when do I test the surface water samples? How many samples do I collect?

SWTR testing for filtered systems is located on page 81. For unfiltered system testing contact ADEC.

Filtered Systems Table

Test	Sample Frequency	Sample Location
Turbidity	Daily ^a	After filtration
Residual Chlorine Water plant	1 per day under 500 people 2 per day 501-1,000 people ^b 3 per day 1001-2,500 people ^b	At the entry point to the distribution system
Residual Chlorine Distribution system (associated with coliform sample)	1 per month (or 2 per month for systems serving 1,001-2,500)	At the same place and time the total coliform sample is taken in the distribution system. Sample according to the sample siting plan.

See Chapter 6 for MCLs on these tests and the next table for turbidity MCLs.

a Contact ADEC for your system's specific requirements.

b ADEC may reduce to one per day for systems serving up to 1,500 people.

Is there anything special I should know about surface water sampling?

These tests listed above are all performed onsite. It is required to increase the sampling frequency to every four hours if the chlorine residual goes below 0.2 mg/L. If the residual is low it is important to get it back above 0.2 mg/L within four hours. Also make sure that both the low residual and increased level reading are written on the monthly operator report, along with the time each reading was taken. If you are unable to get chlorine above 2 mg/L, contact ADEC immediately.

ALWAYS DO THE RESIDUAL CHLORINE TEST IMMEDIATELY WHEN COLLECTING THE COLIFORM BACTERIA SAMPLE AND RECORD THE VALUE ON THE LAB PAPERWORK.

If you wait longer, the result may be lower than the water system's actual (or "real time") concentration. You are required to keep a daily logsheet and send in a monthly operator report of all the daily test results that are required for "compliance." ADEC requires that test results be submitted to their office every month. The report must arrive by the 10th day of the next month or you are in violation. Remember that reports can be emailed, faxed, or mailed through the United States Postal Service.

CHAPTER 8

The following table shows trigger levels and MCLs that can indicate a dangerous water quality condition.

Exceeding turbidity MCLs

Treatment Technique	Maximum Containment Level (MCL)	95% of samples must be less than	Action Required
Conventional or direct filtration (continuous monitoring required) ^a	1 NTU	0.3 NTU	Call ADEC
Alternate filtration technologies	5 NTU	1 NTU	Call ADEC
Any waterborne disease outbreak	Any	Not applicable	Notify ADEC as soon as possible

a Consecutive MCL exceedances can trigger a “filter” or a “comprehensive performance evaluation” Contact ADEC for any results exceeding 1.0 NTU.

Are there any special requirements or considerations for the surface water treatment rule?

There are no variances for disinfection. It must be done if you use a surface water source.

What else might be required if I can't meet MCLs for turbidity or residual chlorine?

Additional or more advanced treatment technologies may have to be installed if the filtration and disinfection treatment techniques do not adequately protect your community's health.

Ground Water Rule (GWR)

Note: The Ground Water Rule (GWR) was finalized in October 2006. Public water systems (PWS) using ground water as a source needed to comply with the rule by December 1, 2009. This rule does not apply to water systems that combine all of their ground water with surface water or with ground water under the influence of surface water prior to treatment.

What is the issue?

Ground water, although less susceptible to contamination than surface water, may become contaminated by fecal material through many different ways, including: leaking septic or sewage systems or through a defect in design, operation, maintenance or structural condition of the water system. The Ground Water Rule was created to increase protection of ground water sources from the disease causing microbial pathogens (bacteria and viruses) that can be found in fecal contamination.

Components of the Ground Water Rule

1. Increase sanitary survey frequency from every 5 years to every 3 years for Community Public Water Systems using ground water as a source. Sanitary surveys are to include evaluation of the eight critical elements of a PWS and identification of deficiencies.
2. Triggered monitoring: when a PWS's routine sample is positive for total coliform, one of the four repeat samples must be taken from the raw (untreated) source water. If the source water sample is positive for fecal coliform, five (5) additional source water samples must be taken and submitted to the lab within 24 hours. If any of the five additional samples are positive, corrective actions are required.

CHAPTER 8

An updated total coliform sample siting plan including the raw water tap must be submitted to ADEC for approval. If the PWS does not have a source water tap, one needs to be installed.

The GWR established specific laboratory methods for the testing of fecal coliform. Check with the laboratory prior to sending in source water samples to make sure that the lab is certified to analyze these samples.

Call ADEC immediately if the lab calls and tells you your source water sample is fecal positive.

3. Corrective actions are required for any PWS that has deficiencies identified in a sanitary survey or that has source water fecal contamination identified through triggered monitoring. Corrective action alternatives include:
 - Correct all deficiencies or establish a written corrective action plan to correct the deficiencies within the timelines required by the ADEC;
 - Provide an alternate source of water;
 - Provide treatment that reliably achieves at least 4-log treatment of viruses. Any PWS providing treatment must get ADEC approval prior to constructing and operating the treatment. In addition, the PWS will be required to do routine monitoring to ensure that the treatment is working reliably and effectively.

What else might be required if my PWS has significant deficiencies that do not get fixed by the end of the calendar year or if my source water is fecal positive?

Public notification is required when:

- APWS is not able to correct all the significant deficiencies by December 31st of the year they were identified; or a PWS has a source water fecal positive sample result. The people in the community may need to boil their water until the problem is fixed. A Boil Water notice may need to be issued and the community has the option of providing each person bottled water for drinking and cooking. ADEC may also require more testing.

Call ADEC for assistance with public notification prior to taking any action.

PWS that provide approved 4-log treatment and are meeting all compliance monitoring will not be required to do triggered monitoring or boil the water for a fecal positive source water sample.

Disinfectants and Disinfection By-Products Rule (D/DBP)

What is the issue?

Disinfection by-products (DBPs) are produced when disinfectants, like chlorine, that are added to drinking water to kill microorganisms react with naturally occurring organic and inorganic material. This can cause the formations of D/DBPs (like trihalomethanes).

While elimination of microorganisms in drinking water is beneficial to public health, the formation of D/DBPs needs to be closely monitored to avoid adversely affecting public health. Ingestion of drinking water with D/DBPs above the MCL limits can affect the liver, kidneys, central nervous system, and increase the risk of cancer.

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Could D/DBPs really be a problem in my water supply?

Yes, surface water sources with high concentrations of algae and grass are susceptible to the DBPs. Groundwater sources can also be susceptible.

Where do I collect D/DBP samples?

These samples are taken in the distribution system and must be sampled according to an approved sampling plan. Contact ADEC if you have any questions about sample sites.

When do I collect D/DBP samples?

The sampling frequency for D/DBPs is listed below. However, you should check with ADEC to make sure your compliance schedule is correct.

D/DBP sampling frequency chart

Chemical	Sampling Frequency
DISINFECTANTS	
Chlorine	monthly
Chloramines	monthly
Chlorine Dioxide	daily
DISINFECTION BY-PRODUCTS	
Total Trihalomethanes (TTHMs)	contact ADEC
Haloacetic Acids (HAA5)	contact ADEC
Chlorite	daily
Bromate	monthly (ozone systems only)
Total Organic Carbon	monthly

Is there anything special I should know about D/DBP sampling?

When sampling, it would be helpful for the operator to note raw water and treated water turbidity. Also note the weather conditions (such as sunny, rainy, etc...). By knowing what the raw water and treated water conditions are, the operator may be able to correlate the D/DBP test results. If the test results are high, it may correspond to a high runoff event or an algae bloom in the water system. The operator can then adjust treatment next time around.

What result triggers a water quality alarm for D/DBPs?

D/DBP MCLs

Chemical	MCL (mg/L)
DISINFECTANTS	
Chlorine	4.0
Chloramines	4.0
Chlorine Dioxide	0.8
DISINFECTION BY-PRODUCTS	
Total Trihalomethanes (TTHMs)	0.080
Haloacetic Acids (HAA5)	0.060
Chlorite	1.0
Bromate	0.010
Total Organic Carbon	Treatment technology based on TOC removal, please contact ADEC about Total Organic Carbon removal.

What else might be required if I can't meet MCLs for D/DBPs?

If a water system can't meet MCLs then there are various actions an operator can take to reduce the formations of D/DBPs. You should talk with ADEC to solve the problem.

Revised Total Coliform Rule

The coliform bacteria test is an indicator test that warns you that something harmful to human health may be present in your water. Having some coliform bacteria is not necessarily harmful, but their presence indicates there may be a problem with water treatment or distribution, and that some of the dangerous strains could have gotten in. Symptoms of coliform illness may include diarrhea, cramps, nausea, and associated headaches and fatigue.

If the test result says coliform is present in the sample (called a positive result) the lab will continue with analysis of the same sample, by testing for fecal coliform or E. coli. If fecal coliforms or E. coli is present, the risk of getting sick is much higher. E. coli are very dangerous organisms to have in your water.

CHAPTER 8

Keep in mind that coliform results are indicators of problems and are usually “too little, too late.” They are not a preventive measure. Regular disinfectant testing (the residual chlorine test) shows whether adequate protection is being maintained and is the best way to prevent a bacteria problem from developing.

How do coliform bacteria get into the water?

Coliform bacteria occur naturally in soil and water. Fecal coliform bacteria are spread through human and animal wastes. They could get into the water from dog lot runoff, leaking septic or sewage systems, or any carrier animal, dead or alive in the watershed. They could come from an upstream village that discharges sewage into the river or any number of other sources.

Where do I collect total coliform samples?

Coliform samples must be collected in the distribution system (see Appendix C). At least five sample locations need to be identified, carefully mapped, and given identification numbers in the written sample siting plan. The extra sample locations are required even though only one or two samples are routinely required per month. The extra locations are designated in case repeat samples or additional routine samples are required after a positive coliform test result. Sample locations must be representative of the water being delivered to the customer; customer taps are the usual sample locations.

How many coliform samples do I collect and when?

The number and frequency of coliform test are dependent on the number of people served as follows:

Total coliform sampling frequency chart

Number of people served	Numbers of samples required	Action Required
25-1,000	1 per month ^a	Call ADEC
1,001-2,500	2 per month (on separate days) ^a	Call ADEC

^a Remember, for systems that chlorinate, collect a residual chlorine sample reading at the same place and time you collect each coliform sample. Analyze residual chlorine. Include the residual chlorine reading on the chain of custody paperwork for the total coliform sample.

Is there anything special I should know about coliform sampling?

A written sample siting plan must be prepared by every water system; and approved by the ADEC. This plan shows exactly where the routine samples will be collected and where the alternate repeat and routine samples will be collected if a sample comes up positive. See the example sample siting plan in Appendix C.

When you request sample bottles from the lab, make sure they know whether or not you chlorinate your water. If you do, they will add a dechlorinating agent to your sample bottles so the chlorine in your sample won't interfere with the sample result. A coliform sample must be collected in a sterile bottle that contains at least 100 ml of water. When collecting the sample, be extra careful not to touch the inside of the bottle or bottle cap.

Remove faucet aerators and screens before collecting a coliform sample and do not collect a sample from a swing faucet or faucets with a removable nozzle. Clean the faucet with bleach and run the water before sampling. Hold the cap in the hand that isn't holding the sample bottle; fill the bottle to the line and immediately place the cap on the sample bottle; do not put the bottle cap in your pocket or on a counter while collecting the sample. (*See Appendix C for sampling instructions.*)

Always have extra coliform bottles on hand. It is required to have at least four extra sample bottles onsite at all times. If a sample result comes up positive at the lab, you will have to collect four more samples (called repeat samples) within 24 hours of receiving notice of the positive results. (Be sure to keep these bottles closed and clean and ask the lab how long you may keep these bottles before the dechlorinating agent is no longer effective—the “shelf life” of reserve sample bottles.) The written sample siting plan should identify the repeat sample locations.

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If you ever have a positive coliform sample (a “hit”), a Level 1 or Level 2 Assessment will be performed to determine the cause of the positive sample and to make sure the system is being operated safely and/or the source water is clean. Call ADEC for help.

Note: If there is only one service connection in the community, sample (such as a washeteria dispensing point) according to the sample siting plan or contact ADEC.

What result triggers a water quality alarm for coliform?

A positive total coliform result (*test result says coliform bacteria are “present”*) triggers:

- A call to ADEC
- Repeat sampling
- Fecal coliform or E. coli analyses (performed on the same sample in the lab)
- Possible public notice
- A Level 1 or Level 2 Assessment

Call ADEC immediately if the lab calls and tells you your total coliform result is positive.

Results may be deemed invalid by the laboratory due to questionable sampling technique, sample arriving at the lab outside acceptable temperature range (frozen or too warm) or other reasons that the lab will specify. If the sample is deemed invalid, another sample must be collected as soon as possible. Contact ADEC for details.

Coliform action levels and MCLs

Contaminant	Unsatisfactory level	Action required if above unsatisfactory level	MCL is exceeded if:	Action required if MCL is exceeded
Total coliform	Presence	Repeat sampling within 24 hours	More than one sample per month positive.	Call ADEC, possible public notice
Fecal coliform	Presence	Repeat sampling within 24 hours	A routine or repeat sample is total fecal or E. Coli positive.	Call ADEC, possible public notice(acute violation)

Are there any special requirements or considerations for coliform sampling?

- There must be a written and approved sample siting plan.
- It is very important to do the repeat and follow-up sampling and timely public notice.
- Contact ADEC immediately with questions.
- No waivers are allowed.
- No grandfathering of prior sample results is allowed.

What else might be required if I can't meet the MCL for coliform?

If your water contains coliforms above the MCL, people in the community may need to boil their water until the problem is fixed. Contact ADEC before taking any action. A **Boil Water** notice may need to be issued and the community has the option of providing each person bottled water for drinking and cooking. ADEC may require more follow-up testing instead of the Boil Water notice.

CHAPTER 8

Fluoride (F)

What are the concerns?

Fluoride is found in water sources in some areas but not usually at levels beneficial to dental health. Some public water systems add it to their water to strengthen teeth and reduce the number of cavities, especially in young children. If too little is added, it is a waste of money, but too much fluoride can be harmful (see Chapter 6). **Remember: Fluoride is not the same as chlorine. These two chemicals are frequently confused.**

What kind of training does the fluoride treatment operator need?

A fluoridating system operator is required to be certified according to federal rules by passing a state exam compatible with the classification of the system. The classification (or complexity) of a system is determined based on treatment performed, taking fluoride addition into consideration. See Chapter 4, Operator Certification and Training, for details.

When, where, and how many fluoride samples do I collect?

If you add fluoride to your water supply, collect one fluoride sample per day after treatment. Record fluoride concentrations on a daily logsheet and report fluoride test results to ADEC on the monthly report. Test by measuring the fluoride ion concentration of your sample using onsite test equipment and chemicals.

What result triggers a water quality alarm for fluoride?

Understand your “ideal” or “target” fluoride level for your facility. This level should be less than the trigger or MCL level mentioned below. **Operators are suggested to maintain Fluoride levels at 0.7 mg/L.** If a sample result is greater than 2.0 mg/L, a sample must be sent to a certified laboratory for confirmation and an increase in sampling may be required. A sample result that exceeds the MCL (4.0 mg/L) triggers a public notice.

Call ADEC if you exceed a trigger level or MCL.

Fluoride summary

Chemical	Trigger level (regulated value)	Action required if trigger level is exceeded	MCL	Action required if MCL is exceeded
Fluoride	2 mg/L	Call ADEC, possible public notice stating children under the age of nine should drink from an approved alternate water source.	4 mg/L	Call ADEC, public notice danger to adults as well as children.

Are there any special requirements or considerations for fluoride sampling and testing?

Be careful to use the right measuring tools that have been properly calibrated. Get a sample that represents what is used by the consumers. Make sure fingerprints and smudges are wiped off the sample and calibration tubes before putting them into the spectrophotometer.

What else might be required if I can't meet MCLs for fluoride?

If your water contains fluoride above the MCL, public notice will be required. *Immediately* consult ADEC for proper action to take, this could be very dangerous.

Nitrate and Nitrite (NO₃/NO₂)

Why are nitrate and nitrite a problem?

Nitrate in drinking water can cause “blue baby” syndrome or methemoglobinemia (lack of blood oxygen). Nitrate converts to nitrite in the body; nitrite interferes with the oxygen-carrying capacity of the child’s blood. This condition can cause serious illness and even death in children under six months old. Symptoms include the skin on the arms, legs, or stomach turning blue, weakness and rapid heart rate. If you think this serious medical condition has developed, contact a health professional immediately.

CHAPTER 8

How do nitrate and nitrite get into the water?

The most common source of nitrate is septic tank effluent (outflow). Nitrates are also found in fertilizer, agricultural areas, spilled sewage areas, and in natural deposits. When any of these substances are dumped or stored too close to a water supply, there may be pollution. If you are planning community buildings or facilities, make sure that there is a proper distance between any storage facility or sewage system and your water supply. Also remember, once you construct a storehouse, there is no guarantee what will be stored there in five or six years, particularly if the next generation of residents is unaware of how close the building is to the water supply.

Where do I collect a nitrate/nitrite sample?

Collect the sample after treatment, at the entry point to the distribution system.

When and how many nitrate/nitrite samples do I collect?

Nitrate (NO₃) sampling frequency

Water source	Sample frequency
Surface water	Once per quarter for a year, afterward ADEC may reduce to once per year
Groundwater	Once per year

Nitrite (NO₂) sampling frequency

Water source	Sample frequency
Surface water	Once, then maybe again at ADEC discretion
Groundwater	Once, then maybe again at ADEC discretion

Is there anything special I should know about nitrate or nitrite sampling?

A nitrate sample will be collected in a small plastic bottle that may be preserved with sulfuric acid. A nitrite sample will be collected in a small plastic bottle with no preservative. If the sample bottle is not preserved, both nitrate and nitrite can be tested from the same bottle. (You get these bottles from the lab.)

DETAILS ON TEST

Carefully note sample location on the chain of custody form. Keep an extra sample bottle onsite for nitrate because, if a result comes back over 10 mg/L, a confirmation sample may be requested by ADEC within 24 hours of learning about the high result.

What result triggers an alarm regarding water quality?

A sample result that is greater than the trigger level listed in the following table requires an increase in sampling frequency. A sample result that exceeds the MCL triggers a public notice and the requirement to provide an alternate water source for your customers (such as bottled water). **Call ADEC if you exceed a trigger level or MCL.**

Nitrate/Nitrite summary

Chemical	Trigger level(mg/L)	Action required if above trigger level	MCL (mg/L)	Action level MCL is exceeded
Nitrate (NO ₃ as N)	0.5	Increase sampling frequency	1	Public notice and alternate water supply
Nitrate (NO ₃ as N)	10.0	Increase sampling frequency	10	Public notice and alternate water supply
Nitrite (NO ₂ as N)	0.5	Increase sampling frequency	1	Public notice and alternate water supply
Total NO ₃ /NO ₂ as N	10.0	Increase sampling frequency	10	Public notice and alternate water supply

Are there any special requirements or considerations for nitrate or nitrite sampling?

No waivers are allowed. No grandfathering of prior sample results is allowed. Nitrite has a very short holding time, meaning that the nitrite tends to convert quickly to nitrate. Don't let this sample sit around—it needs to get to the lab within 48 hours.

What could be required if I can't meet MCLs for nitrate or nitrite?

You would need to correct the situation. This might mean installing an ion exchange or reverse osmosis water treatment process or locating a new water source. It is that important to public health.

CHAPTER 8

Lead and Copper (Pb/Cu)

What are lead and copper problems?

High levels of lead in the blood can be very harmful. Young children are especially vulnerable and easily harmed. Lead may interfere with physical and mental development in children. High values of copper can also cause stomach and intestinal distress, liver and kidney damage.

How do lead and copper get into the water?

Lead may leach out of solder and other pipe materials into drinking water. Copper may leach out of copper pipes into drinking water. Sometimes lead and copper occur naturally in source water, although this is not common.

Where do I collect the lead/copper samples?

Lead and copper samples are collected in customer's homes, at bathroom or kitchen sink cold-water faucets, or wherever water is taken for regular use.

How many lead/copper samples do I collect?

The number of lead and copper samples required depends on the population. See the following table. ADEC can help with details.

Lead/copper number of samples

Number of people served	Initial number of samples	Reduced number of samples
100 or less	5	5
101-500	10	5
501-3,300	20	10

When do I collect lead/copper samples?

In the first year you should collect a sample set once every six months (called initial sampling). In the second and third year you should collect a sample set once per year (called annual sampling). After three years you may be able to further reduce sampling to once every three years. Annual and reduced

monitoring samples must be collected within a four month period, June-September, if not otherwise specified. Work with ADEC on sampling requirements.

Is there anything special I should know about lead/copper sampling?

Samples must be first-draw samples—these are the first water samples drawn from the cold water tap after normal use the water allowed to sit in the lines for at least six hours. It is recommended that the water not sit in the lines for more than eight hours. A single sample for both lead and copper may be collected in a one-liter plastic sample bottle provided by the lab. Sample bottles may be preserved with nitric acid. Ask your lab to provide sample bottles that comply with the lead/copper rule. You must carefully identify and number your sample locations, pick locations that will still exist years from now (don't pick a spot that may be torn down in five years). Most water systems have established sampling locations, if your water system does not have a lead/copper sample plan call ADEC for assistance.

First draw samples

Note: Do not change sample locations without getting approval from ADEC.

Samples should be collected from locations regularly used for potable water. Locations chosen are those most likely to have a problem, such as places with lead soldered pipes, copper pipes, brass faucets, or other fixtures made from lead or copper alloys. If problem spots are OK, then other spots probably are too.

What result triggers an alarm regarding lead/copper water quality?

An alarm is triggered if greater than ten percent of the sample results exceed the “action level.” (If one or more out of ten samples is over the “action level”—OR—if you take only five samples, if the average of the two highest results exceeds the “action level.”)

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MCLs have not been set for lead or copper, instead, action levels are followed.

Lead/copper action levels

Chemical	Action level (mg/L)	Action required
Lead	0.015	Contact ADEC for further requirements.
Copper	1.3	Contact ADEC for further requirements.

Are there any special requirements or considerations for the Lead and Copper Rule?

Systems must provide individual lead results to all people who consume water from the sites that were sampled regardless of the sample results.

What might be required if I can't meet MCLs for lead or copper?

If lead or copper levels exceed their action levels, sampling for other chemicals (water quality parameters) will be required. In that case, you would work with ADEC to meet the requirements. Public education is required for exceeding the lead action level. Corrosion control treatment or source water treatment may be required if the lead or copper levels continue to exceed action levels.

Inorganic Chemicals (IOCs)

What are IOCs and why are they a problem?

Inorganic chemicals, IOCs, are metal or mineral elements and their compounds. IOCs have been known, over time, to damage kidneys, liver, heart, intestines, brain, lungs, circulatory systems, and nervous systems. Barium can contribute to high blood pressure. Cyanide can damage the brain, spleen, and liver and can even be fatal. Regulated inorganic chemicals are listed toward the end of this section.

How do IOCs get into the water?

IOCs get into water sources by dissolving out of mineral deposits and soil, primarily natural sources. They are also found in areas with mining, manufacturing of fertilizers, and in paint.

Where do I collect IOC samples?

Collect IOC samples after treatment at the entry point to the distribution system.

When do I collect IOC samples?

IOC sampling frequency

Water source	Routine sample frequency	Waiver possible?
Surface water or GWUDISW	Once every year	Once per nine years if 3 annual samples show less than MCLs
Groundwater	Once every compliance period	Once per nine years if 3 compliance samples show less than MCLs

Is there anything special I should know about IOC sampling?

Several different containers might be used to take the required samples. These might be glass or plastic bottles, or plastic cubitainers. Many bottles contain a preservative that should not be spilled, splashed out, or rinsed out.

You may ask the lab to add the proper preservative to the sample bottle before they are shipped to you, or you can send the samples to the lab as soon after collecting the sample as possible. Carefully note sample locations on chain of custody forms.

What results trigger a water quality alarm for IOCs?

A sample result that is greater than the maximum contaminant level (MCL) for an IOC chemical should be confirmed by additional sampling and increased sampling frequency. Public notice may be required. Call ADEC if you exceed an MCL.

CHAPTER 8

IOC MCLs

Chemical	MCL (mg/L)	Chemical	MCL (mg/L)
Cadmium (Cd)	0.005	Antimony (Sn)	0.006
Chromium (Cr)	0.1	Beryllium (Be)	0.004
Mercury (Hg)	0.002	Cyanide (CN)	0.2
Selenium (Se)	0.05	Nickel (Ni)	0.1
Barium (Ba)	2.0	Thallium (Tl)	0.002

Are there any special requirements or considerations for IOC samples?

Reduction in monitoring frequency are possible and are granted based on initial sampling results, a waiver may be obtained by contacting ADEC. Systems may only have to sample every nine years.. At least one sample needs to be collected during the waiver period and you must reapply for the waiver every nine years. While composite sampling can be granted by ADEC, it is usually not. Typically, at least one IOC will be detected in a composite sample, requiring a repeat sample for each of the sample points to determine if an MCL is exceeded, and if so, where. Use of grandfather results is allowed. Three sample results from prior years (grandfather samples) may be used to support the first monitoring waiver. The grandfather samples must have been collected in the time frames listed below to apply toward the monitoring frequency reduction. Contact ADEC for details.

IOC grandfather requirements

Chemical	At least one grandfather sample must have been collected	Two other grandfather samples must have been collected
Cd, Cr, Hg, Se, Ba	After 1/1/90	After 6/24/77
Sn, Be, CN, Ni, Tl	After 1/1/90	After 1/1/88

What might be required if I can't meet MCLs for IOCs?

If your water contains IOCs above MCLs, public notice will be required. Extra treatment might be required to remove them. Some possible treatments to remove IOCs are activated

alumina, coagulation/filtration, granular activated carbon, ion exchange, lime softening, reverse osmosis, electro dialysis, or chlorine oxidation.

“Before I take any water samples, I call the airport. If the plane isn’t coming in, I don’t take samples. If I can’t get my samples to the lab they are going to come back, and I’ll have to pay transportation charges for extra samples. My village doesn’t have enough money to waste. So I carefully plan when I am going to take samples.”

Arsenic (As)

Note: Specific information has been provided on arsenic because of the change to the MCL, outlined in the Arsenic Rule finalized in January 2001 and effective in 2006.

What is arsenic and why is it a problem?

Arsenic is a metal that is found in some ground water supplies and an occasional surface water supply. Arsenic is known to cause cancer and may harm the lungs and skin.

How does arsenic get into the water?

As groundwater travels through the earth, it comes into contact with many different minerals. Arsenic is one of those naturally occurring metals that may dissolve into the water. Once arsenic is dissolved in groundwater, it tends to stay in water.

Could arsenic really be a problem in my water supply?

Arsenic is more of a problem for groundwater sources than surface water or GWUDISW sources. Also, certain areas of Alaska, such as the interior, are more prone to arsenic.

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Where do I collect an arsenic sample?

Samples are collected at the entry point to the distribution system, unless otherwise specified by ADEC.

When do I collect an arsenic sample?

Arsenic sampling frequency

Water source	Routine sample frequency
Surface water/GWUDISW	Once every year year, then every 3 years after 3 annual samples are below the MCL.
Groundwater	Once every compliance period (every 3 years)
If the water system exceeds the MCL, sampling will increase to quarterly, TNC systems are not regulated by the arsenic rule.	

Is there anything special I should know about arsenic sampling?

Monitoring frequency reduction may be permitted depending on sample results. In addition, water systems may grandfather old arsenic testing results, if approved by ADEC.

What results trigger a water quality alarm for arsenic?

Results over the MCL (0.010 mg/L) are cause for alarm. Depending on the results, specific statements must be included in the water systems Consumer Confidence Report (CCR, see Chapter 9). After July 1, 2002, for CCR reports covering calendar years 2001 and beyond, systems that detect arsenic between 0.005 mg/L and 0.010 mg/L must include an educational statement in the CCR.

Are there any special requirements or considerations for arsenic sampling?

There are no special requirements or considerations for arsenic sampling.

What might be required if I can't meet MCLs for arsenic?

Changes to the treatment system may be required if the system cannot meet the MCLs for arsenic.

Contact ADEC with your questions.

Volatile Organic Chemicals (VOCs)

What are VOCs and why are they a problem?

Volatile Organic Chemicals, also known as Volatile Organic Compounds, are carbon-based chemicals that evaporate rapidly into the air. Many things you might use in your garage—parts washing fluids, fuel additives (such as benzene in gasoline, solvents, paint thinner, etc.)—contain VOCs. VOCs are regulated by their chemical names (see VOC MCLs, on page 106). VOCs can cause cancer and may damage the kidney, liver, circulatory, and nervous systems.

How do VOCs get into the water?

VOCs can leak into drinking water sources or could contaminate groundwater if they are spilled or seep into the soil. VOCs could leak from underground or above ground fuel storage tanks or result from poor chemical handling procedures (such as spills while filling a tank).

Could VOCs really be a problem in my water supply?

VOCs have been found in water supplies throughout Alaska. VOCs are present in gasoline and other common fuels and in many chemicals regularly used around workshops and homes. But if you believe VOCs could not possibly be present in your water, you may want to contact ADEC for a possible reduction in sampling frequency. ADEC allows monitoring frequency reductions for VOC sampling for water systems with groundwater sources that did not detect VOCs in their initial quarterly sampling.

For surface water systems, a monitoring frequency reductions could be issued to decrease sampling frequency or to allow composite sampling. When determining whether to grant a reduction, ADEC looks at whether the system is at risk to VOCs contamination. For example, ADEC looks at how close possible contamination is to the water source.

CHAPTER 8

Where do I collect a VOC sample?

Collect VOC samples after treatment, at the entry point to the distribution system.

When do I collect a VOC sample?

When your system is first set up, quarterly samples are required. After a year, if quarterly sampling does not show VOCs in the water, samples are collected once per year for surface water sources and once every three years for groundwater sources.

VOC sampling frequency

Water source	Initial sample frequency	Routine sample frequency
Surface water	Four quarters for one year	Once every year
Groundwater	Four quarters for one year	Once every compliance period

Is there anything special I should know about VOC sampling?

The sample must not contain any bubbles in the full sample bottles. VOCs could vaporize into the air bubble in the sample bottle and lead to an incorrect result in the lab. Let the lab know if you chlorinate your water. They will add a special preservative to the sample bottles and provide specific sampling instructions if you chlorinate. A single sample may be collected in small (40 to 120 ml) sample vials. These are sample bottles with special TFE-fluorocarbonlined caps. Sample should be preserved with hydrochloric acid. The lab usually adds this preservative to the sample bottles before sending them to you but it never hurts to verify this. Carefully note sample location on the chain of custody form.

What result triggers a water quality alarm for VOCs?

Very small concentrations of VOCs are harmful to human health (specifically MCL concentrations). Because of this, even lower concentrations, or “trigger levels,” are used as warning concentrations. If test results show that even a trace of a VOC chemical is in your water supply, contact ADEC for further requirements. Sampling frequencies may be increased, investigations may be conducted to find and clean up a contamination source or plans may be made to design and construct additional water treatment. If sample results exceed MCLs, public notice will be required. Call ADEC if you have questions.

Are there any special requirements or considerations for VOC sampling?

Instead of sampling and testing each water source, you may ask ADEC if you can take a “composite sample” option for up to five water sources. Only a certified lab is allowed to composite the samples. Note sample locations on the chain of custody form. Use of grandfather results is allowed. Sample results from prior years (“grandfather samples” taken between 1/1/88 and 10/1/93) may be used as partial compliance with new sampling requirements. Call ADEC for details.

What might be required if I can't meet MCLs for VOCs?

If your water contains VOCs above MCLs, public notice and/or remediation will be required. Treatment methods for removing VOCs from water include granular activated carbon or packed tower aeration.

CHAPTER 8

VOC MCLs

Chemical	Trigger level (mg/L)	MCL (mg/L)
Benzene	0.0005	0.005
Carbon Tetrachloride	0.0005	0.005
1,2-Dichloroethane	0.0005	0.005
1,1-Dichloroethylene	0.0005	0.007
Para-Dichlorobenzene	0.0005	0.075
1,1,1-Trichloroethane	0.0005	0.2
1,1,2-Trichloroethane	0.0005	0.005
Trichloroethylene (TCE)	0.0005	0.005
Vinyl Chloride	0.0005	0.002
Ortho-Dichlorobenzene	0.0005	0.6
Cis-1,2-Dichloroethylene	0.0005	0.07
Trans-1,2- Dichloroethylene	0.0005	0.1
1,2-Dichloropropane	0.0005	0.005
Ethylbenzene	0.0005	0.7
Chlorobenzene	0.0005	0.1
Styrene	0.0005	0.1
Tetrachloroethylene (PCE)	0.0005	0.005
Toluene	0.0005	1.0
Xylenes(total)	0.0005	10.0
Dichloromethane	0.0005	0.005
1,2,4- Trichlorobenzene	0.0005	0.07

Synthetic Organic Chemicals (SOC's)

What are SOC's and why are they a problem?

Synthetic Organic Chemicals, known as SOC's, are manmade chemicals such as pesticides, herbicides, PCBs (polychlorinated biphenyls), and chemicals found in coal tar linings and sealants. SOC's are regulated by their chemical names (see *SOC MCLs*, page 110). SOC's can cause cancer and can damage kidneys, liver, the gastrointestinal tract, and reproductive organs. These chemicals can also damage the nervous system and circulatory system.

How do SOC's get into the water?

Pesticide residues could get into surface water or groundwater from farmland runoff. PCBs are found in fluids used in old electrical equipment (transformers) and can enter water supplies through improper disposal of equipment. Chemicals from leaking equipment could contaminate soil and leach

down into the water supply. Other SOC's can enter the environment from improper wastewater and solid waste disposal at chemical factories, leaking equipment at old military facilities, or unlined landfills.

Could SOC's really be a problem in my water supply?

It is not likely that you will have these chemicals in your water supply unless you live near an industrial or agricultural area or old military site and solid waste landfills. Contact ADEC for a possible waiver from SOC sampling (*See waivers on page 108*).

When do I collect an SOC sample?

Sample frequencies are summarized in the table below. Call ADEC for waivers, grandfather options, and other details.

Is there anything special I should know about SOC sampling?

Let the lab know if you chlorinate your water so they can add a special preservative to the sample bottles. Note your sampling location on the chain of custody form.

Where do I collect an SOC sample?

Collect your SOC sample after treatment at the entry point to the distribution system.

SOC sampling frequency

Water source	Initial sample frequency	Routine sample frequency
Surface water	Four quarters for one year unless grandfathered	Once every compliance period
Groundwater	Four quarters for one year unless grandfathered	Once every compliance period

CHAPTER 8

What result triggers a water quality alarm for SOC's?

Very small concentrations of SOC's are harmful to human health (MCL concentrations). Because of this, even smaller concentrations, "trigger levels," are used as warning concentrations. If test results show that even a trace amount of an SOC chemical is in your water supply, contact ADEC for further requirements. Sampling frequencies may be increased, investigations may be conducted to find and clean up a contamination source, or plans may be made to design and construct additional water treatment. If MCLs are exceeded, public notice will be required. MCLs and trigger levels are listed in SOC MCLs, opposite page 110.

Are there any special requirements or considerations for SOC sampling?

Composites are allowed. Instead of sampling and testing each water source, you may ask ADEC if you can take the "composite sample" option for up to five water sources. Only a certified lab is allowed to mix the samples. Note sample locations on the chain of custody form.

Waivers are possible. Since the first year of SOC sampling can cost up to \$12,000, you probably want to look into a waiver. To apply for a waiver, contact ADEC, fill out an application and pay the fee. On the application you will submit information on your water usage as well as potential contamination sources surrounding your water source. If there is any chance a contamination source (such as a landfill or cemetery) might be polluting your water supply, ADEC may ask for at least one test before issuing the waiver. SOC waivers are good for three years, then you must reapply.

Use of grandfather sample results is allowed. Sample results from prior years (“grandfather samples” taken after July 1, 1990) may be used as partial compliance with new sampling requirements. Call ADEC for details.

What might be required if I can’t meet MCLs for SOCs?

If your water contains SOCs above MCLs, a public notice will be required. Remediation may be required. Treatment methods for removing SOCs from water include granular activated carbon, packed tower aeration, chlorine, and ozone (for glyphosate).

CHAPTER 8

SOC MCL's

Chemical	Trigger level (mg/L)	MCL (mg/L)
2,3,7,8-TCDD (Dioxin)	0.00000005	3×10^{-8}
2,4,5-TP (Silvex)	0.0002	0.07
2,4-D (Formula 40, Weedaar 64)	0.0001	0.07
Acrylamide	Depends on type of water treatment; submit annual report to ADEC if applicable.	
Alachlor (Lasso)	0.0002	0.002
Aldicarb Sulfone	0.0008	0.002
Aldicarb Sulfoxide	0.0005	0.004
Aldicarb	0.0005	0.003
Atrazine (Atranex, Crisazina)	0.0001	0.003
Carbofuran (Furadan 4F)	0.0009	0.04
Chlordane	0.0002	0.002
Dalapon	0.001	0.2
Di(2-ethylhexyl) adipate	0.0006	0.4
1,2-Dibromo-3- chloropropane (DBCP) Nemaframe)	0.00002	0.0002
Di(2-ethylhexyl) phthalate (DEHP)	0.0006	0.0006
Dinoseb	0.0002	0.007
Diquat	0.0004	0.02
Endothall	0.009	0.1
Endrin	0.00001	0.002
Epichlorohydrin	Depends on type of water treatment; submit annual report to ADEC if applicable.	
Ethylene Dibromide (EDB) (Bromofume)	0.00001	0.00005
Glyphosate	0.006	0.7
Heptachlor (H-34, Heptox)	0.00004	0.0004
Heptachlor Epoxide	0.00002	0.0002
Hexachlorobenzene	0.0001	0.001
Hexachlorocyclopentadiene (HEX)	0.0001	0.05
Lindane	0.00002	0.0002
Methoxychlor (DMDT, Marlate)	0.0001	0.04
Oxamyl (Vydate)	0.002	0.2
PAHs (Benzo(a)pyrene)	0.00002	0.0002
PCBs (Polychlorinated Biphenyls) (Arochlors)	0.0001	0.0005
Pentachlorophenol	0.00004	0.001
Picloram	0.0001	0.5
Simazine	0.00007	0.004
Toxaphene	0.001	0.003

Asbestos

Why is asbestos a problem?

Exposure to asbestos over a long period of time may increase the risk of cancer.

How does asbestos get into the water?

Asbestos enters drinking water from natural mineral deposits or asbestos-cement pipes used to carry water.

Could asbestos really be a problem in my water supply?

Your water system was probably constructed long after asbestos-cement pipe was used. For this reason, you may be eligible for an asbestos monitoring waiver (see special requirements on page 112 for waiver information).

Where do I collect an asbestos sample?

If you do need to collect an asbestos sample, the sample location depends on where the asbestos is likely to come from in your system. If it might be present in source water, then a sample should be taken at the entry point to the distribution system. If your system has asbestos-cement piping or if the corrosivity of the water is high, then the sample must be taken at a customer tap served by asbestos-cement piping.

When do I collect an asbestos sample?

Once in the first three years, after which a nine-year waiver may be available.

What result triggers an alarm regarding water quality for asbestos?

Sample results that exceeds the MCL for asbestos may require a confirmation sample, increased monitoring, and public notice. Call ADEC if you exceed the MCL.

CHAPTER 8

Asbestos MCL

Chemical	MCL	Action required if above MCL
Asbestos	7 million fibers/L (Longer than 10 micrometers) ^a	Call ADEC

a Fibers this long are the ones that may increase the risk of cancer.

Are there any special requirements or considerations for asbestos sampling?

Waivers are allowed. Contact ADEC with information about your pipe materials and area geology, including soils. No fee is required for an asbestos waiver. The waiver is good for nine years and will save you the expense of asbestos testing. Use of grandfather samples is allowed. If the grandfathered sample is collected after July 1, 1990, it may be used to support a monitoring waiver.

What might be required if I can't meet the asbestos MCL?

If your water contains asbestos above the MCL, public notice will be required. Remediation may also be required, such as replacing asbestos-cement pipe or installing corrosion control or filtration.

Radioactive Materials

Why are radioactive materials a problem?

Radioactivity (radiation) from these materials may lead to cancer particularly bone cancer in humans. In addition, being exposed to uranium may have toxic effects on a person's kidneys.

How do radioactive materials get into the water?

Radionuclides are radioactive particles that occur naturally in areas of uranium and radium deposits. Man-made radiation is caused by power plant operations, weapons testing fallout, and wastewater disposal from some industrial processes. You will most likely be looking for the naturally occurring radionuclides in Alaska.

Where do I collect a radionuclide sample?

Collect your sample after treatment at the entry to the distribution.

When do I collect a radionuclide sample?

Radionuclide sampling frequency is based on the results of a composite water sample that has been collected during four consecutive calendar quarters. All existing community and non-transient non-community public water systems were required to complete the composite sampling prior to December 31, 2007. New water systems or systems with new sources must complete a composite water sample beginning the first quarter after beginning to use the new source.

After the composite sampling a water system may be placed on a reduced monitoring schedule. The results plus the analytical error will be used to determine the frequency of subsequent monitoring periods. The analytical error is combined with the result so that the worst case scenario is used for monitoring purposes. For example, if a water system is on a six year monitoring period and the sample result plus the analytical error is above $\frac{1}{2}$ the MCL, the next monitoring period for that sampling point will be three years.

CHAPTER 8

**Monitoring frequency is based on the following:
Radionuclide Sampling Frequency**

Gross Alpha (including Radon and Uranium) *	
Result (pCi/L)	Frequency
< 3 **	1 sample per 9 years
≥ 3 but ≤ 7.5	1 sample per 6 years
> 7.5 but ≤ 15	1 sample per 3 years
> 15	1 sample per quarter

Combined Rad 226 and 228	
Result (pCi/L)	Frequency
< 1 **	1 sample per 9 years
≥ 1 but ≤ 2.5	1 sample per 6 years
> 2.5 but ≤ 5	1 sample per 3 years
> 5	1 sample per quarter

Uranium *	
Result (Ug/L)	Frequency
< 1 **	1 sample per 9 yrs
≥ 1 but ≤ 15	1 sample per 6 yrs
> 15 but ≤ 30	1 sample per 3 yrs
> 30	1 sample per quarter

NOTES:

* If GA < 15 pCi/L, Uranium sampling is not required.

If GA ≥ 15 pCi/L, Uranium sampling is required.

** Method Detection Level established by EPA in the Radionuclide Rule

What radionuclide concentration is harmful to water quality?

In radionuclide testing, samples are analyzed for gross alpha radiation. If the gross alpha radiation concentration exceeds the MCL (see the chart below), the same water sample is further tested for Radium 226. If the concentration of Radium 226 exceeds the MCL, call ADEC to determine follow-up actions. Generally, sampling frequency will be increased, both Radium 226 and Radium 228 will need to be tested, and all the results are compared to federal MCLs. If sample results exceed federal MCLs, public notice will be required. In rare cases, water treatment may need to be installed or an alternative water source may need to be obtained. Call ADEC if results exceed MCLs.

Radionuclide MCLs	
Analyte MCL	Frequency
Gross Alpha (including radon and uranium)	15 pCi/L
Combined Rad 226 and 228	5 pCi/L
Uranium	30 ug/L
Gross Beta	Contact ADEC for MCL and testing requirements

Are there any special requirements or considerations for radionuclide sampling?

Composite samples may be allowed. Instead of sampling and testing each water source, you may ask ADEC if you can take the composite sample option for up to five water sources and have a lab mix them together before testing the sample, and save on test costs. Waivers are possible for reduced sampling frequency only. Grandfather sampling is not allowed.

What might be required if I can't meet radionuclide MCLs?

If your water contains radionuclides above MCLs, public notice will be required. Remediation may also be recommended and could include aeration or granulated activated carbon treatment.

CHAPTER 8

- ✓ **The tests outlined in this chapter check your water for many harmful substances.** Summary
- ✓ **Review the tests and keep track of when they are coming up.**
- ✓ **Request a “monitoring summary” from ADEC tailored to your utility.**
- ✓ **Make sure lab kits are ordered and tests are done when they need to be completed.**
- ✓ **Analyze the results and note any problems.**
- ✓ **Take appropriate action if levels are exceeded.**
- ✓ **Waivers, grandfather samples, or composite samples are sometimes allowed.**

Chapter 9: Consumer Confidence Reports

Customers have the right to know what is in their drinking water and where it comes from. These yearly reports, called Consumer Confidence Reports (CCRs), must include background information on any substances that have been found in the drinking water and whether the water is safe to drink.

CCRs help people understand their drinking water quality and allow them to make health-related choices related to their water. CCRs also help the community to better understand the difficulties behind delivering safe drinking water. This helps you since educated people are more likely to value the true costs of providing safe drinking water. Also, people are more likely to protect their drinking water sources (like the rivers or lakes near the community) when they are aware of the concerns and possible consequences of not protecting their water.



Now It Comes With A List Of Ingredients.

A short new report from your water supplier will tell you what's in your tap water. Look for your report and read it. When it comes to your drinking water, the most important ingredient is you.



Drinking Water. Know What's In It For You.

Call your water supplier or the Safe Drinking Water Hotline at 1-800-426-4791. Or visit www.epa.gov/safewater/

CCR Distribution

Every water system must deliver or make readily available water a CCR to each customer by **July 1** of each year. Each report must include data from the previous calendar year (January- December). If your system is new, the first CCR should be sent out July 1st after the first full calendar year of operation and annually thereafter.

CHAPTER 9

Most water systems send out the CCR with a water bill. This may not work for your system. If you have customers prepay several months, self-haul water, or pay only when service is received, you may have problems getting a copy to every customer. Instead, you may want to try these ideas for getting your CCR out to the community:

- Send the CCR to all the post office boxes in town.
- Post the CCR in places that people visit often, like the city office, tribal office, store, post office, church, etc.
- Leave a stack of CCRs in public places where people may pick them up, like city or tribal offices, community centers, etc.
- Place a radio or cable TV advertisement telling people that the CCRs are available at the water system office.

In addition, a copy of the CCR and the signed/dated Certification of Completion of CCR requirements must be sent to ADEC by the July 1 deadline to get credit for the regulatory requirement.

CCRs summarize much of the information that your water system already collects to comply with regulations. You should not need to do any new monitoring—just report on what you’ve been doing for the past year.

CCR Requirements

CCRs are required to include information about your water source, the levels of any detected contaminants, and compliance with drinking water rules, plus some educational material. Most reports are only a few pages. In fact, a report that contains too much information or is full of technical jargon will probably keep people from reading the report. To make community members want to read the report, your CCR should be personalized for the community. To do this, include photos, figures, tables, and graphics that make the information easier to understand. The CCR can have additional information if you want, as long as it does not take away from the purpose of the report. While water utilities can write their reports in any useful way, each report must provide the following information about the drinking water they provide.

CONSUMER CONFIDENCE REPORTS

Templates are available. (Visit www.water.epa.gov/lawsregs/rulesregs/sdwa/ccr/index.cfm for more information.)

The community should know how to get information on the water system including:

- Name and phone number of the water utility contact person.
- Public meetings or other public education events to learn more about the utility and drinking water.
- Ways to get information.

Water system information

Give information on where your community's drinking water comes from including:

- Type (lake, stream, well, etc.), name, and location of water source(s).
- How to get a copy of the source water assessment.
- Information on major sources of possible contamination, if available.

Water source information

There are many words and abbreviations used in water treatment that people might not know. You should explain any technical words or terms that are in the CCR. Your CCR should explain if any contaminants were found during testing throughout the year. The report should have:

- An explanation of the highest levels of contamination and the range levels of contaminants found.
- A table summarizing data on any detected contaminants, regulated and unregulated.
- The known or likely source of each detected regulated contaminant.
- For MCL violations (see Chapters 5 and 6), explain potential health effects.

Important definitions

Contaminants found in the drinking water

CHAPTER 9

If you monitored for *Cryptosporidium* or other contaminants and did not detect them, you do not need to include this information. However, if you did detect something, include this information:

- The values or levels reported to you by the lab.
- Why people may need to be concerned about the results.

If your water system violated any rules during the past year, your CCR should explain:

- Each violation.
- Potential health effects of each violation.
- Steps taken to correct the problem.
- Explanations of any variances or exemptions to drinking water regulations.

Information on Crypto-sporidium and other contaminants, if applicable

There are some statements that your CCR should include to give basic information about the drinking water and contaminants (visit www.water.epa.gov/lawsregs/rulesregs/sdwa/ccr/index.cfm for more information). These statements include:

Compliance with other drinking water regulations

- Explanations of contaminants and their presence in drinking water.
- A warning for vulnerable populations about *Cryptosporidium*.
- Informational statements on arsenic, nitrate, and lead.

Educational information

Finally, your CCR can include any other information that you think will help people understand their water system and what you do to bring them safe, clean water.

Contact ADEC for Data Dump information that will be beneficial in compiling and creating your CCR

Helpful Hints

EPA created an easy to use on-line application that can be used to create regulation compliant CCRs. The application can be found at www.ccriwriter.com. You will need to log-in and then you simply fill in the requested information.

Templates are available online at www.water.epa.gov/lawsregs/rulesregs/sdwa/ccr/index.cfm

- Not using too many technical words, abbreviations or jargon that people can't understand (If you must use them, include their definition).
- Using tables, figures, and other graphics to help you get your information across.
- Keeping sentences and paragraphs short. People won't read a big complicated report—keep the entire report as short as possible.
- Having someone that isn't a drinking water expert read the report to see if it makes sense. Also, ask community members for their comments when you send out the CCR.

✓ **Consumer Confidence Reports (CCRs) are required annual reports that provide the community with information on their drinking water.**

Summary

✓ **CCR reports and certification forms must be submitted to ADEC by July 1st each year.**

✓ **The CCR should be easy to understand.**

✓ **Every customer getting drinking water from the system should receive a CCR either by mail or other ways by July 1 of each year.**

✓ **CCRs should include information about the drinking water source, the levels of any detected contaminants, compliance with drinking water rules, and educational information.**

✓ **CCRs can easily be done using CCRi writer.**

Chapter 10: Posting a Public Notice

A public notice is an alert to the consumers that something has gone wrong with the water service. Usually this means that your water quality is below standard.

The public notice requirement regulations were revised in 2000 to require faster notice in emergencies and fewer notices overall. The revisions should result in notices that better communicate the potential health risks from drinking water violations and how to avoid such risks. Remember that public notices are required in addition to a consumer confidence report (CCR, see Chapter 9).

You post a public notice because you want to make sure everyone knows there is a problem. While most of your notices will be for minor problems, if you have major problems, the public must be told right away how to get safe drinking water. If the problem is serious, the notice will warn the village before people get sick.

You must notify the people who drink your water if the level of a contaminant in the water is above drinking water regulations, if there is a waterborne disease outbreak or any other situation that may be a health risk, if the water system fails to test its water as required, or if the system has a variance or exemption from the regulations.

State regulations require that you post a notice when your operation violates a drinking water regulation.

Notify ADEC within 24 hours of any situation that requires public notification.

CHAPTER 10

There are three levels of violations that trigger public notice:

Tier 1 (Immediate notice, within 24 hours): exceeding the limits or failure to take a confirmation sample for coliform bacteria, nitrate and nitrite, turbidity, chlorine, waterborne disease outbreak or other waterborne emergency. ADEC determines when a Tier 1 notice is needed. These are situations that may immediately harm public health.

Tier 2 (Notice as soon as practical, within 30 days): exceeding the MCL for all contaminants outside of the Tier 1 category. Failure to meet the following Drinking Water requirements: fix significant deficiencies or meet corrective action plans; failure to monitor *cryptosporidium* if required; failure to provide or properly operate required treatment, for example, disinfection, filtration, or corrosion control.

Tier 3 (Annual notice): all other monitoring or testing procedure violations, if operating under a variance or exemption schedule, and special public notices. (Water utilities may choose to include this notice in their annual consumer confidence report.)

Depending on the severity of the situation, water suppliers have from 24 hours to one year to notify their customers of a drinking water problem. (See the Public Notice Requirements table on page 130). It should clearly describe the problem, any health risks, what the utility is doing about it, and what people can do to protect themselves. Utilities must address specific points and use certain wording in a public notice, including:

1. A description of the violation.
2. When the violation occurred.

What should the public notice say?

POSTING A PUBLIC NOTICE

3. Potential health effects.
4. The population at risk (for example, infants, children, elderly).
5. What is being done to fix the problem.
6. Whether other water supplies should be used.
7. Actions that customers should take (for example, boiling).
8. Mandatory language for each chemical problem regarding potential health effects (provided in The Standard Health Effects Language for Public Notice, 40 CFR 141 Appendix B Subpart Q.)
9. The name, phone number, and address for more information -include water plant contact information as well as ADEC contact information.
10. This statement: "Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail."

BOIL WATER NOTICE

Samples from _____
public water system show that the water may be
contaminated.

The BOIL WATER notice is in effect March 31
until further notice.

Boil water for 2 minutes before drinking.

For more information call the Alaska Department of Environmental
Conservation in Fairbanks at 907-451-2108

Example
of a Boil
Water
public
notice

CHAPTER 10

Again, ADEC can help you get a proper public notice out. The specific points are listed in the Drinking Water Regulations under 40 CFR 205 (General Content for Public Notice). You may want to use EPA's Public Notice Writer (PNiwriter); located at www.epa.gov/dwreginfo/public-notification-compliance-help-primacy-agencies.

The minimum required methods of getting a public notice out to the community include the media, hand delivery or posting for Tier 1 notices and direct mail, hand delivery, or posting for Tier 2 and Tier 3 notices. For serious violations Tier 1 (acute), you should set up broadcasts over any radio or television stations that serve the area or hand deliver notices to all your customers. Also, you should place public notices on bulletin boards, in public locations, in local newspapers, and, in addition, send them out by mail. For less serious violations (Tier 2), you should publish notices in local newspapers (daily or weekly) or send them out by mail or direct delivery.

Tier 3: Public notice for Tier 3 violations can be provided through an annual report such as the CCR and should be mailed out or hand delivered to the customers. Notices must be posted in popular public locations regardless of the seriousness of the infraction.

If it is a matter of serious health concern, the notice must go out *immediately*. Tier 1 requires a public notice posting within 24 hours. But in those cases, don't wait at all. ***Let everyone know as soon as possible***. There are some other regulated time frames as indicated on the table.

Water utilities must consult with the state within 24 hours of a Tier 1 violation to receive direction on future requirements. Also, the utility needs to submit a copy of their certification page and a copy of the public notice to ADEC within 10 days showing that it has met all public notice requirements.

POSTING A PUBLIC NOTICE

In some circumstances, you may be required to continually post notices until the hazard is eliminated. If the condition is serious, hand delivered notices must be repeated at least once every three months until the problem is resolved. Even if you are given a variance or exemption, you must continue posting as long as the variance or exemption is in effect.

Public notification must reach all consumers.

Public Notice Requirements

Class of violation	Posting Method	Contact ADEC and notice out to public within	Repeat notice required?
Tier 1 (acute)	<ul style="list-style-type: none">• Radio and/or TV• Hand delivery• Post in noticeable places	24 hours	Posting for as long as the violation exists or for 10 days, whichever is longer.
Tier 2	<ul style="list-style-type: none">• Newspaper (daily or weekly)• Mail or hand delivery• Post in noticeable places	30 days	Repeat mail or hand delivery every three months for as long as the violation exists.
Tier 3	<ul style="list-style-type: none">• CCR• Mail or hand delivery	12 months	Repeat annually as long as violation exists.

“Public notice means that the public notices. I mean that’s pretty simple if you live in a city. There’s all kinds of ways to let people know there’s a problem. Out here, quite a few people are not native English readers, so when I have to put out a public notice, I also walk around the village and talk to people. Rumor moves faster than radio waves out here, so I consider talking to people just as important as any piece of paper I stick on a bulletin board.”

- ✓ **A public notice is an alert to the public when there is a problem with their drinking water.**
- ✓ **To notify customers of a drinking water problem, a notice must be posted within 24 hours to one year depending on the health risk. (When a threat to public health exists, get the word out immediately!)**
- ✓ **There are three levels, or tiers, of violations that require public notices. Each tier has different time requirements for getting the notice out to the public.**
- ✓ **Specific wording is required on a public notice.**
- ✓ **Utilities can use several methods to get notices out to the public including posting on bulletin boards, TV and radio, newspapers, hand delivery, and mailing.**
- ✓ **Water utilities must notify ADEC of the violation immediately and follow up with the agency and public, as appropriate.**
- ✓ **Submit Public Notice and Certificate of Public Notice to ADEC within 10 days of posting the public notice.**

Chapter 11: Running a Wastewater Disposal Program

Several years ago, a honey bucket waste hauler came home from work and hung his work overalls on a hook in his home. When his son rushed over to give his dad a hug, he brushed up against the overalls. As all kids do, the child later put his fingers into his mouth. Without anyone realizing it, he got hepatitis from the germs on the overalls. But before any symptoms appeared, he went to school and spread the disease to 15 other kids.

A health inspection traced the outbreak back to the overalls. Now people in that village who work with wastewater or honey buckets are much more careful how they handle waste. Workers now change clothes and wash thoroughly before going home. Clothing and equipment are stored in lockers so other people and animals can't accidentally touch them. Spilled sewage is cleaned up immediately.

This true story illustrates the potential for serious sickness if waste is not dealt with properly. Training workers to operate a wastewater system is vitally important for any type or size of system. So is setting up your system correctly to begin with—for instance, sewage lagoons should be well fenced to keep animals out and have signs warning people to stay away.

The regulations change every couple of years or so. (The dates of the regulations this guide was written under are listed in Appendix E.) Make sure you get on ADEC's mailing list for updates and call ADEC every year to double-check that you have the current version.

Where to
get help on
regulations

CHAPTER 11

Often, ADEC has plain English fact sheets or short letters that explain new requirements so when you call ADEC, ask for anything that might be available that helps explain the new regulations. A list of ADEC contacts for wastewater issues is provided in Appendix A.

To Whom Does this Chapter Apply?

This chapter applies to utility managers and wastewater operators that serve communities of 25 to 1,500 people.

It points out the important issues involved in running a wastewater program and urges readers to contact ADEC for more detail. Wastewater systems for Alaskan communities of this size include:

- Community septic tanks attached to drainfields
- Community septic tanks attached to ocean outfalls
- Wastewater treatment plants with surface water outfall or drainfield
- Some communities still use tundra ponds as sewage lagoons. Due to changes in regulations and permitting, tundra ponds will not be allowed. New lagoons will need to be engineered.

Single family and duplex residences are not covered in this guide.

If you are the owner or operator of an onsite septic system for a single-family house, duplex, or small multi-family residence this guide is not for you. Contact ADEC for your requirements. Ask for a copy of the ADEC's Onsite Wastewater System Installation Manual. If you have an onsite septic system and it isn't performing well, you may need to hire a Certified Installer to repair or replace the system.

If local conditions are not good for septic systems, you will need to hire a professional engineer to design an alternative system that will work for your area.

Setting Up a Wastewater System

Long before your target date for a new or improved wastewater system—before you even start designing or looking for funding for a wastewater system—arrange a meeting with ADEC to discuss your project. This meeting, or preapplication conference, is not required but is recommended to:

Preapplication
Conference

- Discuss your wastewater problems
- Brainstorm possible solutions
- Learn who to call at ADEC for help
- Discuss potential funding sources
- Identify permit requirements
- Review the plan approval process
- Identify plan review fees
- Get a completeness checklist

Wastewater system maintenance should be a routine part of your wastewater treatment program. If your system serves more than 500 people or has more than 100 service connections you are required to have a certified wastewater operator. See Chapter 4, *Operator Certification and Training*, for details.

System
maintenance
and certified
operators

Before you build or improve a community wastewater system, you must get your plans approved by ADEC. Plans apply to the physical building and construction of the system. No construction can begin until the plans are reviewed and signed off by ADEC staff. Local building or construction permits may also be required. The plan approval process involves several steps. These steps are shown on the chart on page 138.

Plan
approvals

ADEC has specific forms that must be included with the application and certain design criteria that needs to be met. In 2002, ADEC started charging a plan approval fee that must be paid when you send in your application package. (Contact the Division of Water to determine fee amount.) A registered engineer must seal the plans before they are submitted to ADEC, and no construction can begin until ADEC has issued an Approval to Construct.

CHAPTER 11

It may take a while for ADEC engineers to review and sign off on the plans, so include plenty of time in your schedule to prepare information and get approval from ADEC.

Plans for your system should include operating procedures and contingency plans, such as:

- A sewage solids disposal plan and provisions to prevent clogging
- A routine maintenance program
- Provisions for funding to keep the program going at all times
- A plan for cleaning up and disinfecting spilled sewage

Contact ADEC Wastewater Program staff for a copy of sewage spill cleanup recommendations. Sewage spills or overflows are a health hazard and must be reported to ADEC and cleaned up immediately according to a plan developed ahead of time. If your wastewater treatment system discharges wastewater to surface, water, land, or subsurface, a discharge permit from ADEC may be required. Wastewater permits set the **operating conditions** of your system. One example of the importance of permitting is the protection of beaches certified for clamming or shellfish harvesting. If ADEC knows ahead of time that a wastewater system may discharge near a certified beach, extra treatment requirements may be added to the conditions of the permit to protect those beaches.

Permits apply to the *operation* of a wastewater system. For example, permits often include:

- Test requirements
- Report requirements
- Flow measurements
- Operating restrictions
- Effluent limits
- Best Management Practices

Viral meningitis, caused by improperly handling sewage and wastewater, is a serious illness. It is very painful and can be fatal if left untreated.

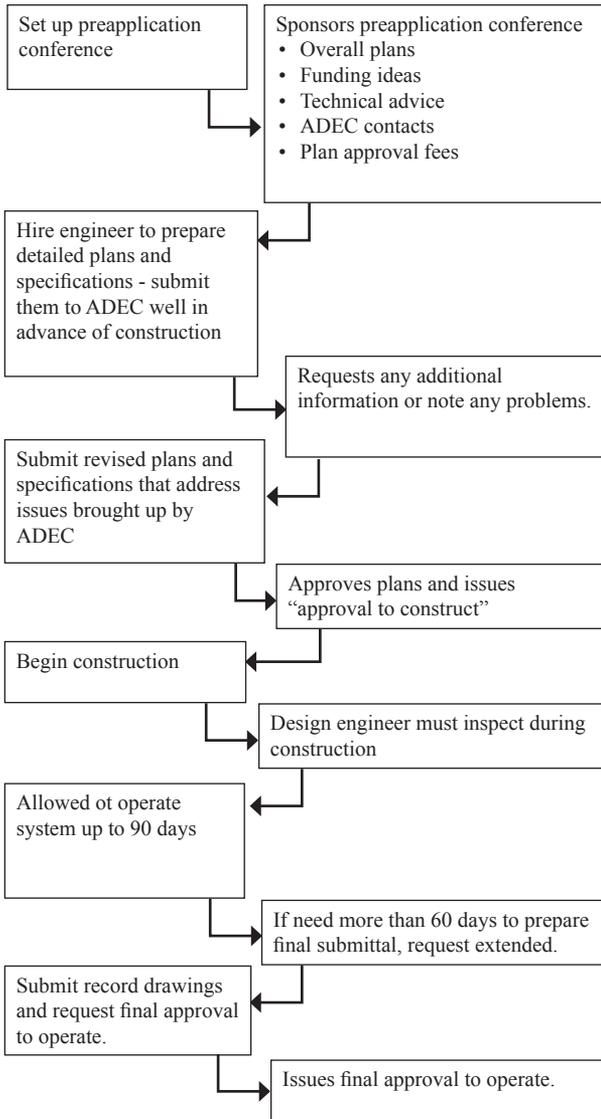
Permits

RUNNING A WASTE WATER DISPOSAL PROGRAM

Plan Approval Process

Applicant's Action

ADEC's response



Wastewater system plan approval process

CHAPTER 11

Try to find out as early as possible which permits are required for your project. Contact your local ADEC office for help. Your preapplication conference with ADEC, discussed early in this section, is a good place to nail down which permits you will need. You will need a permit to discharge treated wastewater into a river, lake, or even the ocean. These permits benefit you since no one wants to pollute the river or bay they depend on. ADEC has the technical expertise to make certain that your plans do not unexpectedly cause problems. The permit sets limits to help assure that the water body can handle the wastewater after treatment. State law requires a high level of treatment before discharging wastewater into rivers and lakes and usually a lower level of treatment for discharging into the ocean.

Septic systems and sewage lagoon systems that let sewage soak into the ground rather than flow into a water body may require a surface or subsurface disposal permit. The ADEC's Wastewater Discharge Authorization Program is responsible for issuing wastewater disposal permits. Contact the nearest ADEC office to determine which permit might apply to your project.

The permit process is different from the plan approval process and sometimes takes longer. Permit applications need to be filled out and any permit fees paid. The ADEC person who approves wastewater plans is not the same person who drafts and issues permits. Here are some permits that may be required for various situations:

- Permit to discharge wastewater into rivers, lakes, or the ocean
- Permit to discharge wastewater to a percolating sewage lagoon
- Permit to discharge sewage solids onto land

A “general permit” may be issued to a utility using a common wastewater treatment method generally used by many systems for discharging wastewater. General permits are usually easier to get than individual permits.

Permits are not plan approvals

RUNNING A WASTE WATER DISPOSAL PROGRAM

- Permit to discharge filter backwash from a drinking water treatment process (nondomestic water discharge)

ADEC issues two types of permits: individual and general permits. An individual permit is issued to a facility with effluent limits and monitoring requirements tailored specifically for that facility and the discharge location. A general permit is issued to cover similar facilities with similar treatment processes, discharges, and monitoring requirements. After ADEC issues a general permit, permittees submit a notice of intent or NOI to ADEC requesting to be covered under the general permit. The ADEC reviews the NOI to ensure the permittee's facility meets the requirements of the general permit and then issues an authorization to be covered under the general permit. Both individual and general permits are issued for a period of five years.

An "Individual permit" is a custom permit written to meet the specific needs and requirements of the facility.

On October 31, 2008, the Environmental Protection Agency (EPA) approved ADEC's application to administer the federal National Pollutant Discharge Elimination System Program (NPDES). The NPDES Program requires a permit to discharge wastewater to a lake, river, wetlands, or the ocean. The state's program is called the Alaska Pollutant Discharge Elimination System (APDES) Program. ADEC's APDES Program is now responsible to issue these discharge permits instead of EPA.

Septic systems

Contact the nearest ADEC office to determine which permit might apply to your project.

"Sometimes avoiding a health disaster is as simple as looking at the big picture. I've seen some villages where they just dump their honey buckets out on the beach. The sewage goes out with the tide, and, you got it, it comes back in with the next one. Sometimes people are drying fish in the area. Then you get flies that feed on the sewage and then land on the salmon. That's not good for anyone's health."

CHAPTER 11

Next we'll examine more closely some of the various systems used in Alaska.

Common Wastewater Systems in Alaska

If you use a septic tank attached to a drainfield, soil tests must be done before the system is installed to be sure the water will percolate without contaminating nearby groundwater or surface water. If your soil is frozen most of the year or your soils contain silt and clay, you may not be able to install a septic system with a perforated pipe drainfield. As a rule, your septic system needs to sit at least 4 feet above the water table and at least 6 feet above impermeable materials such as bedrock, clay, or permafrost. The system must also maintain a minimum separation distance from drinking water wells or other drinking water sources. (See the *Separation distances for sewage lagoons and septic tanks* table) A good source of information for septic system design is the ADEC *Onsite Wastewater Installer's Manual*.

For your health and safety, you should inspect your septic system at least once a year. Pump out the solids (also called fecal solids or biosolids) on a routine schedule and dispose of them properly. Companies will often try to sell additives to unsuspecting septic tank owners—chemicals that are supposed to make the system work better. In the opinion of most Alaskan wastewater specialists, chemicals are not necessary and may even be harmful to the natural bacteria that treat the water in the septic tank. Enzymes that may work well in warmer climates tend not to work well in Alaska septic systems. Some added chemicals might leach out of the system and contaminate groundwater. Avoid use of chemicals in septic tanks without contacting ADEC first.

Chemical
additives

Only select villages are allowed to have a septic tank that discharges to the ocean without further treatment. ADEC no longer issues permits for septic tanks with ocean outfalls, authorization is handled through EPA for those select villages.

Septic tanks
with ocean
outfalls

RUNNING A WASTE WATER DISPOSAL PROGRAM

If your wastewater is disposed of in a percolating lagoon, no wastewater is pumped out; it just soaks into the ground. The slow percolation of wastewater through soil provides some treatment before the wastewater reaches the groundwater table. Monitoring wells and testing may be required to make sure the groundwater is not being contaminated. If solids in the bottom of the lagoon prevent proper percolation and threaten a lagoon overflow, the solids must be removed and disposed of safely.

Percolating
lagoons

If your wastewater is disposed of in a lagoon that discharges to a water body, all discharges need to comply with permit requirements. Tests are required before and during your lagoon discharge. These tests make sure the waste discharge can be mixed with the water body without endangering the people or animals that use it. ADEC issues general permits for lagoons that discharge less than 1,000,000 gpd. The permit must be obtained before a lagoon discharges and must be renewed every five years. Discharge limits are written into the permit. Current lagoon designs must have a minimum of two lined cells, a primary cell and a secondary cell.

Discharging
lagoons

Operating a Wastewater System

There are several ways small utilities can properly dispose of sewage solids. For further detail, call your local ADEC Wastewater Discharge Authorization Program and Solid Waste Program contacts listed in Appendix A. When the sewage solids are still mostly liquid (less than 5 percent solids), contact the ADEC Wastewater Program for management details. When the sewage solids are drier (greater than 5 to 10 percent solids) contact the ADEC Solid Waste Program for proper disposal information.

Sewage
solids

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Sewage solids in small Alaskan communities are typically handled in the following ways:

- Hauled by the honey bucket collector to the sewage lagoon
- Hauled by citizens to the sewage lagoon
- Hauled by a pumper truck to the sewage lagoon
- Hauled to a Class III Municipal Solid Waste Landfill where they can be disposed and disinfected in trenches under certain conditions

Honey bucket haul systems should be cleaned regularly.

The ADEC Solid Waste Program allows disposal of septic tank solids and wastewater treatment sludge in trenches at the landfill if these rules are followed:

- Fill only one trench at a time
- Make sure the trench is not more than 4 feet wide and 12 feet deep
- Make sure the bottom of the trench is at least 6 feet higher than the water table
- Add dry hydrated lime or quicklime to the waste so that a pH of 12 (waste gets very hot under this condition) is maintained for at least 30 minutes
- Make sure the waste is covered with at least 6 inches of soil after being placed in the trench

“We have a lot of dogs in the village, and every once in a while one of them will get loose. Once a dog fell into the sewage lagoon, then ran all over town trying to shake itself dry. Right after I saw that, I locked up the gate to the sewage lagoon and repaired all of the holes in the fence. I can’t say that I’ve bettered the health of the village, but I’ve gotten rid of one more potentially bad situation.”

Separation Distances

Alaska drinking water regulations require that septic tank and sewage lagoon wastewater systems be kept certain minimum distances away from drinking water sources, treatment, and piping systems. These separation distances are listed in ADEC regulations and guidance documents and are summarized below and in the table on page 29.

Minimum separation distances

Distance	Sewage lagoons and drainfields	Septic tanks
200 ft from:	public drinking water wells	public drinking water wells
100 ft. from:	river, lake, stream, spring and private wells	river, lake, stream, spring and private wells
50 ft. from:	slopes >25%	
10 ft. from:	lot line ^a , building foundations	lot line ^a , building foundations, drainfield
6 ft. vertically from:	bedrock, clay	
4 ft. vertically from:	seasonal high water table	
2 x gravel depth or 6 ft, whichever is greater, from:	other drainfields	

Separation distances for sewage lagoons and septic tanks

a Recommended

Water Quality Standards

As stated above, wastewater must be treated before it can be discharged into surface water or groundwater or to the land surface. There are very strict rules about water quality in a river, lake, or ocean. These rules, called the Alaska Water Quality Standards, are designed to protect the many types of water users and the different types of water. (Freshwater standards are sometimes a little different than saltwater standards.) Water users include

CHAPTER 11

humans who may drink the water, fish and other organisms that live in the water, and ecologically sensitive land areas, such as wetlands. Water quality standards are also designed to protect recreational users such as fishermen, swimmers, and boaters whose skin may come in contact with water. It may seem surprising, but water quality standards for fish and other animal life are usually stricter than water quality standards for drinking water. Fish and other water organisms are sometimes more sensitive to small pollution concentrations than humans are—they live in the water after all.

- ✓ **There is potential for serious sickness if waste is not dealt with properly.** Summary
- ✓ **A preapplication conference with ADEC can be very helpful in planning your wastewater system.**
- ✓ **ADEC must approve all plans for new or modified sewage systems.**
- ✓ **Besides approval of plans, one or more permits could be required before the system can operate.**
- ✓ **If your system serves more than 500 people or 100 or more connections, it must have a certified wastewater operator.**
- ✓ **Removing sewage solids and performing other regular maintenance are vital in keeping your system operating properly.**
- ✓ **Septic systems and sewage lagoon wastewater systems must be kept certain minimum distances away from drinking water sources, and distribution systems.**
- ✓ **The Alaska Water Quality Standards exist to protect waterways from degradation.**

Acronyms and Abbreviations

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
ANTHC	Alaska Native Tribal Health Consortium
As	Arsenic
ATTAC	Alaska Training and Technical Assistance Center
Ba	Barium
Be	Beryllium
CCR	Consumer Confidence Report
Cd	Cadmium
CEU	Continuing Education Unit
CFR	Code of Federal Regulations
Cl	Chlorine
Cn	Cyanide
Cr	Chromium
Cu	Copper
CWS	Community Water System
DCCED	Department of Commerce, Community, and Economic Development
D/DBPs	Disinfectants and Disinfection By-Products
D/DBPR	Disinfectants and Disinfection By-Products Rule
EPA	Environmental Protection Agency
F	Fluoride
Gpd	Gallons per day
GWR	Ground Water Rule
GWUDISW	Groundwater Under the Direct Influence of Surface Water
Hg	Mercury
HC	Hypochlorite (chlorine in liquid form)
HPC	Heterotrophic Plate Count
HTH	Chlorine in powder form
IOC	Inorganic Chemical or Inorganic Compound

LMI	Brand name for a type of pump used to add chemicals to water
MCL	Maximum Contaminant Level
MSWLF	Municipal Solid Waste Landfill
mg/L	Milligrams per liter (same as parts per million)
ml or mL	Milliliter. 1000 ml = 1 liter. 100 ml = about 5 fluid ounces
Ni	Nickel
NO₂	Nitrite
NO₃	Nitrate
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Units
NTNC	Non-transient non-community water system
Pb	Lead
Pb/Cu	Lead and Copper
PCB	Polychlorinated Biphenyl
pCi/L	pico Curies per liter (radioactivity unit of measure)
PERC	Perchloroethylene (also known as tetrachloroethylene), a VOC found in dry cleaning and solvent degreasing operations
PWS	Public Water System
RMW	Remote Maintenance Worker
RUBA	Rural Utility Business Advisor
Sb	Antimony
Se	Selenium
SO₄	Sulfate
SOC	Synthetic Organic Chemical or Synthetic Organic Compound
SS	Suspended Solids
SWTR	Surface Water Treatment Rule
TCR	Total Coliform Rule
TFE	Trifluoroethylene
TI	Thallium
TSS	Total Suspended Solids
TNC	Transient non-community water system
VOA	Volatile Organic Analysis
VOC	Volatile Organic Chemical or Volatile Organic Compound

Glossary of Terms

Action level	Term used in the lead/copper rule. An action level is a concentration of lead or copper in a drinking water supply that is just high enough to cause concern and trigger further action toward reducing the concentration.
Backflow	Water flowing from a potential contamination source into a potable water system (drinking water system). Backflow prevention devices are required on all drinking water systems at points where potential contamination could occur. Backflow prevention devices include check valves, anti-siphon valves, and air gaps.
Bacteria	Microbiological contaminants found in drinking water (coliform is a type of bacteria which concerns drinking water).
“Bacti”	A shorthand term for bacteria (usually in reference to coliform bacteria).
Beaver fever	A disease, also called Giardiasis, caused by the parasite <i>Giardia lamblia</i> , a drinking water microbiological contaminant.
Biosolids	Solids removed from domestic wastewater, also called sludge. Biosolids are regulated by the federal Clean Water Act under the Part 503 regulations.
Capacity	A community or utility’s ability to operate and maintain a water or wastewater utility. Capacity is not only operating a system but managing and financing, too.
Community Water System	<i>(See Public Water System)</i>
Cleanouts	Hard to reach places in wastewater systems where operators can get into the system to clean it out. Cleanouts are required on septic tank chambers and in sewage pipelines.

“Coli”	A short term for coliform.
Coliform	A type of bacteria often found in untreated water (especially surface water). Some forms, such as E. Coli and fecal, are quite harmful.
Compliance point	A sample location in a water or wastewater system where the water collected from that location is tested and compared to environmental regulations for compliance purposes. For example, a sewage lagoon outfall is the compliance point for collecting a wastewater sample and comparing the results to permit limits.
Composite sample	A sample consisting of up to five individual samples combined into one. Composite samples are allowed for some drinking water systems as a way to save money on expensive laboratory tests. Certified laboratories composite the sample before testing.
Confirmation sample	When a drinking water sample is out of compliance, a second sample is collected as soon as possible in the same place as the first sample as a double-check on the accuracy of the first noncompliant sample. The second or subsequent sample is called a “confirmation sample.”
Consumer Confidence Report (CCR)	Yearly reports that water utilities are required to write and distribute to customers that include information on any substances that have been found in drinking water and whether the water is safe to drink.
Contaminant	Any physical, chemical, biological, or radiological material in water which, in sufficient quantity, makes it unsafe for human consumption.
Corrosivity	A measure of the corrosive nature of a water supply such as the tendency for water to oxidize the insides of pipes. Corrosive water may leach metals from water pipes causing lead or copper concentrations to be unsafe in drinking water supplies.

Cross connection	Any direct or indirect connection between a water supply and a potential or actual source of contamination. For example, a connection between a sewer, drain, storage reservoir, fire fighting water, or boiler water system and a potable water system is considered a cross connection.
Cryptosporidium	A microbiological contaminant in drinking water that is extremely resistant to treatment and can cause death and sickness if not removed. Filtration is required to remove cryptosporidium since disinfection is not effective against it.
Cubitainer	A collapsible, plastic water sample container shaped like a cube when full.
Disinfectant residual	The chlorine (or other disinfectant) concentration remaining in a water piping system after a chlorine (or other disinfectant) dose is applied at the treatment plant.
Disinfection	A chemical treatment process used to kill or inactivate microbiological contamination in drinking water supplies. Examples of disinfectants are chlorine, ozone, and chloramines.
Distribution system	The piping system used to carry treated water to customers.
Drainfield	A set of perforated underground pipes installed in shallow gravel trenches and used to disperse septic tank treated wastewater to surrounding soil (also referred to as a leach field).
E. coli	Bacteria that can cause severe health problems if consumed in a drinking water supply.
Fecal coliform	Bacteria that can cause severe health problems if consumed in a drinking water supply.
Filtration	A treatment process to remove particles, including microorganisms, from water or wastewater.
Finished water sample	A treated water sample (also referred to as a polished water sample).

First draw sample A sample technique required for the lead/copper drinking water rule. A first draw sample is one that is collected from a sample location only after the water in the pipes has been sitting still for at least 6 hours. For example, a family that is supposed to collect a lead/copper sample from their kitchen water faucet has to make sure no one in the house uses any water for at least six hours before they collect the sample. Unlike other water sample techniques, the water is not supposed to be run for a few minutes before the sample is collected. A first draw sample has to be the first drop out of the faucet after the required 6 hour waiting period.

Giardia A drinking water microbiological contaminant that causes the disease Giardiasis, also known as Beaver Fever.

Grandfather samples Water samples that were collected before a regulation existed but are allowed to be used to comply with a new regulation. Specific rules apply.

Groundwater Water beneath the surface of the ground.

Groundwater under the direct influence of surface water (GWUDISW) GWUDISW exists where there is a mixing of groundwater and surface water. Surface water sources could allow water to seep down to the water table from which you draw your drinking water. Thus your groundwater well water could be affected by the water quality of the surface water.

Honey bucket A bucket (usually five gallons) used for in-home sewage collection in rural Alaska. Honey buckets may be lined with plastic garbage sacks. Honey buckets are emptied into a large honey bucket wagon, holding tank, disposal lagoon or onto a beach by individuals or wastewater operators.

Hydrated lime A common water treatment chemical manufactured from limestone. The chemical formula is $\text{Ca}(\text{OH})_2$.

Hypochlorite (HC) Chlorine in liquid form.

HTH Chlorine in powder form.

Initial sampling	The very first sample set you send to a laboratory when you open your utility for business. This initial sample will serve as your testing benchmark. Initial sampling is usually four quarters of sampling or two six-month consecutive sets of samples.
Inorganic Chemicals or inorganic compounds, inorganics (IOCs)	Chemicals that do not have carbon in their chemical composition. IOCs are regulated contaminants with respect to drinking water. Most of these chemicals are minerals or metals.
Invalid sample	A sample that cannot be used for compliance purposes because it has been contaminated or mishandled. Examples include arriving at the laboratory too late to make the holding time or having the sample bottles break in the airplane on the way to the laboratory.
Leach field	See drainfield.
Liter	A liquid measure of volume equal to about one quart.
LMI	Brand name for a type of pump used to add chemicals to water
Log Sheet	A daily record of water test data.
Maximum Contaminant Level (MCL)	The maximum level of contaminant that is allowed to exist in your water and still be consumed by humans without harmful health effects.
Methemoglobinemia	A condition caused by drinking water with high nitrate concentrations. It robs oxygen from the blood stream and is seriously harmful to infants.
Milligrams per liter (mg/L)	A measure of mass showing how many milligrams of a substance occur in one liter. Typically used to describe concentration of a substance. mg/L is equal to Parts Per Million (PPM).
Milliliter (ml or mL)	A measure of liquid volume. 1000 ml = 1 liter. 100 ml = about 5 fluid ounces.
Monitoring	A general term referring to the sampling, testing, and reporting of water supplies or wastewater discharges.

Monitoring summary	A one page summary of drinking water monitoring requirements unique to each public water system. ADEC prepares these and sends them to each PWS.
Nephelometric turbidity unit (NTU)	Unit used to measure turbidity in water.
National Pollutant Discharge Elimination System (NPDES)	A wastewater permit issued by the U.S. Environmental Protection Agency.
Organics	Chemicals that have carbon in their composition. Organics are regulated contaminants in the drinking water regulations. See volatile organic chemicals and synthetic organic chemicals.
Outfall	Where wastewater leaves a piping system. An outfall is usually the end of a pipe, but can also be the end of a water channel where it dumps into river, lake, or ocean.
pCi/L	pico Curies per liter (radioactivity unit of measure).
Perchloroethylene (PERC)	A VOC found in dry cleaning and solvent degreasing operations (also known as tetrachloroethylene).
Polychlorinated -biphenyl (PCB)	A chemical formerly used in electrical equipment such as transformers. PCB is a regulated drinking water contaminant under the SOCs rule.
Percolating sewage lagoon	A wastewater treatment system used in rural Alaska. (See “ <i>sewage lagoon</i> ”) in this glossary. A percolating sewage lagoon does not have a discharge pipe. Rather, water seeps into the ground from the bottom surface area of the lagoon.
Plan approval	ADEC requirement for any new or modified work on a water or wastewater system. Construction may not begin until ADEC completes the plan approval process.
Potable water	Water that meets the drinking water standards of the US Environmental Protection Agency.

Preapplication conference	The preapplication conference is the recommended first step in the ADEC plan approval process, this is a meeting between community representatives and ADEC to discuss all aspects of new construction or modifications of water or wastewater systems.
Protozoa	Small, one-celled microorganisms that can be the cause of several waterborne diseases, such as amoebic dysentery, giardiasis, and cryptosporidiosis.
Public Water System	Means a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least fifteen service connections or regularly serves an average of at least twenty-five individuals daily at least 60 days out of the year.
Identification number (PWSID)	<ul style="list-style-type: none"> • This water utility identification number is a utility specific number, it is very important to have this number on laboratory chain of custody or purchase order paperwork. This number should always be included on written correspondence with government agencies such as monthly reports, sanitary surveys, and compliance test results.
Community water system	<ul style="list-style-type: none"> • A public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.
Non-community water system	<ul style="list-style-type: none"> • A public water system that is not a community water system. A non-community water system is either a “transient non-community water system (TNC) or a “non-transient non-community water system (NTNC).”
Non-transient non-community water system or (NTNC)	<ul style="list-style-type: none"> • A public water system that is not a community water system and that regularly serves at least 25 of the same persons over 6 months per year.
Transient non-community water system or TNC	<ul style="list-style-type: none"> • A non-community water system that does not regularly serve at least 25 of the same persons over six months per year.

Quicklime	A common water treatment chemical manufactured from limestone. The chemical formula is CaO.
Radionuclides	Drinking water contaminants that may cause cancer in humans and are regulated under the drinking water radionuclide rule. An example of a regulated radionuclide is gross alpha radiation. Radioactivity occurs in nature and also in industrial weapons and power supply operations.
Raw water	Water taken directly from a water source, i.e., untreated water.
Registered engineer	A professional engineer registered in Alaska.
Routine sample	The normal, scheduled water sample you take to test your water quality. This term is usually used with regard to total coliform sampling.
Repeat sample	A second sample or set of samples sent to the laboratory because the first sample or samples (routine samples) showed noncompliance with MCLs. A double-check to rule out false positive tests. This term is usually used with regard to total coliform sampling.
Sample labeling	The labels on the samples which show exactly who took the sample, when, from where, on what date, and at what time. All of these details are important so that the laboratory can make a quality assessment of your samples.
Sample point	Exactly where in the water or wastewater utility you take your samples.
Sampling frequency	How often you take water samples. This will vary depending on the sample type and how often the regulations require.

Sanitary survey A report prepared by ADEC drinking water staff, a registered engineer, or qualified individual (approved third party sanitary surveyor) who inspects and evaluates a drinking water system's water sources, treatment processes, distribution system, water storage, pumps, data monitoring and reporting, system management and operator compliance. The report is submitted to ADEC to assist ADEC in determining drinking water system compliance with the regulations.

Separation distances Minimum distances listed in the drinking water and wastewater regulations that make sure contamination sources are far away from drinking water sources and systems.

Septic tank A wastewater treatment system that consists of a holding tank (usually underground) where sewage solids can settle out of wastewater and the partially treated wastewater can gravity flow (or be pumped) out of the tank to a drainfield or ocean outfall where the wastewater is further treated by microbiological action.

Service connection A piped connection in a water system that leads from a main pipeline to the curb or property line of a customer, such as a single family home, a community center, or a school.

Sewage lagoon A wastewater treatment system commonly used in rural Alaska. Lagoons may be lined or unlined, mechanically aerated, passively aerated (no equipment), and constructed above ground or partially below ground. Some lagoons have discharge pipes for discharging treated water to lakes, rivers, or the ocean. Some lagoons do not have discharge pipes and the water in these lagoons seeps into the ground over time (see percolating sewage lagoon).

Synthetic Organic Chemicals (SOCs) or Synthetic Organic Compounds (nonvolatile)	A list of specific chemicals regulated under the drinking water SOCs program. Most of these chemicals are pesticides or PCBs.
Special purpose sample	A water sample that is needed for a specific purpose. For example, suppose that it is discovered that the military had used a special chemical on a now-abandoned base near your village. ADEC may want to test to see if any of that chemical exists in your well water. A special purpose sample would be drawn and the water tested once. If the laboratory test came back non-detect, you would likely not be required to test further.
Spectrophotometer	A lab instrument used to measure turbidity using principles of light.
Suspended solids (SS)	Particles in water or wastewater that can cause harm to aquatic life or cause taste problems in drinking water.
Surface water	A water source such as a lake, stream, river, or pond that is open to the atmosphere and is subject to surface water runoff. Surface water sources are regulated a specific way under the drinking water surface water treatment rule.
Surface Water Treatment Rule (SWTR)	A federal regulation adopted by ADEC that regulates the monitoring, treatment, and reporting for drinking water systems using surface water sources.
Transient Non-Community Water system	<i>See Public Water System for TNC definition.</i>
Total Suspended Solids (TSS)	See suspended solids.
Turbidity	A measure of the amount of solids in water. High turbidity may cause water to look cloudy or dirty.

Utilidors	A corridor, usually constructed above ground in rural Alaska, in which thermally insulated water pipes are routed from water source tanks and treatment processes to homes and businesses. Wastewater pipes are also routed in utilidors from homes and businesses to wastewater treatment processes.
Volatile Organic Analysis (VOA)	A test used to determine the concentration of a volatile organic chemical in water.
Volatile Organic Chemical or Volatile Organic Compound (VOC)	A carbon-based chemical that escapes easily from water into the air. VOCs are regulated under the drinking water regulations. An example of a VOC is benzene.
Washeteria	A community building common in rural Alaska where showers, laundry facilities, drinking water, and sometimes saunas are available.
Well	A hole, shaft, or excavation from which water can be pumped.

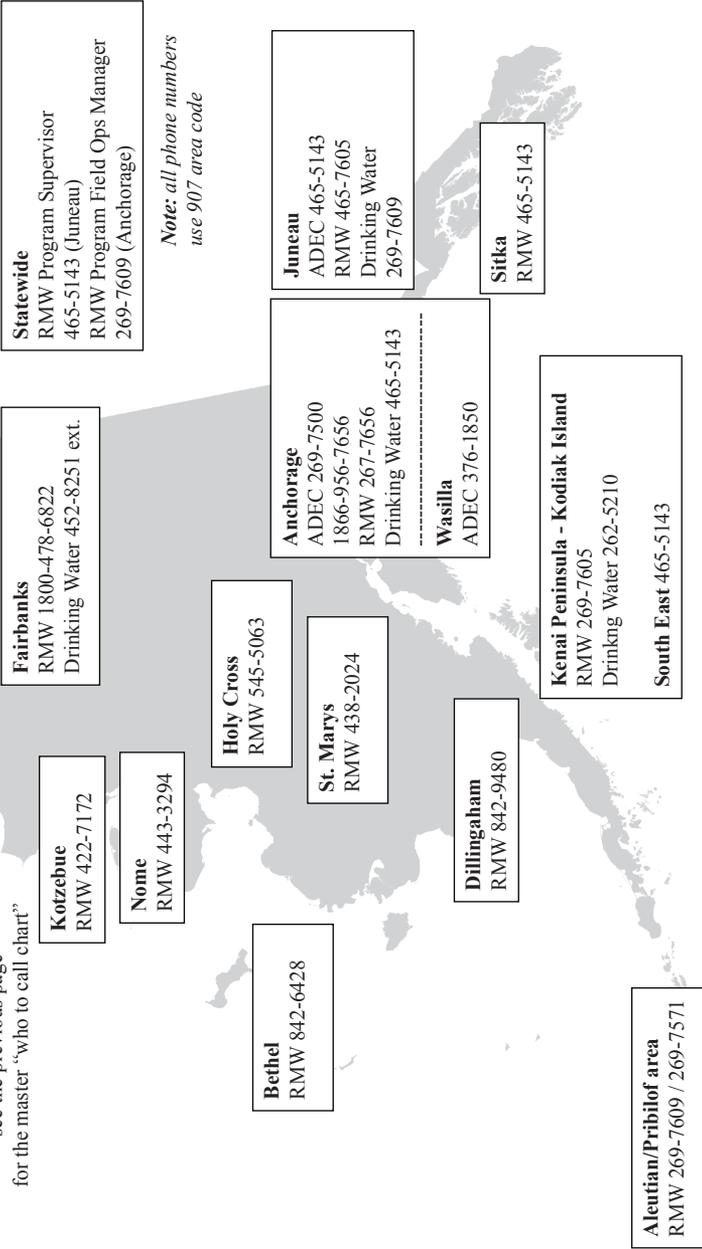
Who to Call for Help

For:	Call:	At:
building or updating facilities	Project funding	269-7601 (Anchorage)
	ADEC Drinking Water or Wastewater	451 - 2108 (Fairbanks) 262 - 3408 (South East)
	Plan Approval Staff	376 - 1850 (Wasilla) 1- 866 - 956- 7656 (Anchorage)
help with repairs or routine maintenance	the nearest RMW	see map on next page
help with testing procedures	a certified lab or ADEC Drinking Water Program	see Appendix D (lab) and map on next page
questions on laws and regulations	ADEC Environmental Health	see map on next page 1- 866 - 956 - 7656 (Anchorage) 1- 800 - 770 - 2137 (Fairbanks) 262 - 3408 (South East) 376 - 1850 (Wasilla)
health and safety concerns	regional health corporation, local nurse or health aide, Sanitarian	see your local phone book
information on training or operator certification	Facility Construction and Operation	465-5140
help with drinking water and wastewater systems	ADEC Drinking Water and ADEC Wastewater Program	1- 866 - 956 - 7656 (Anchorage) 1- 800 - 770 - 2137 (Fairbanks) 262 - 3408 (South East) 376 -1850 (Wasilla)
help with permits	ADEC	1-800-510-ADEC (2332)
help with business or financial issues and capacity development	RUBA	269 - 4556

Note: All phone numbers are 907 area code.

Remote Maintenance Workers (RMW's) and ADEC local offices

see the previous page for the master "who to call chart"



Note: all phone numbers use 907 area code

Information Sources

Alaska Department of Environmental Conservation (ADEC)

555 Cordova Street, Anchorage, 99501

www.dec.state.ak.us/

Numerous divisions within ADEC regulate and provide technical assistance to rural water and wastewater systems. Here are the most commonly called ones:

- **Operator Training & Certification Program**
465-1139 Juneau

Oversees certification of water system operators, including exam administration and applications for certification. Provides technical and training information on small utility water and wastewater treatment, distribution, and collection. Videos courses, training manuals, and certified operator study guides are available for free or a nominal fee. Some items are loaned out. Keeps lists of upcoming courses and other training options on their website.

Drinking Water Program

269-7467 Anchorage

451-2178 Fairbanks

1-866-956-7656 Toll Free Anchorage

1-800-770-2137 Toll Free Fairbanks

www.dec.state.ak.us/eh/dw/index.htm

Ensures public water systems provide safe water. The Drinking Water Program requires public water systems to be in compliance with state and federal regulations, for drinking water, for the public health protection of residents and visitors to the State of Alaska. The Drinking Water Program ensures that suppliers test drinking water as required for regulated contaminants. Reviews contaminant monitoring test results from public water suppliers and specifies corrective measures where contamination is indicated, approves new public water systems and modifications to existing ones, and provides design assistance and training, regulates minimum health standards and procedures for design, construction, and operations of Alaska's public water systems. This program

Note: use 907 area code with phone numbers unless otherwise indicated

See Appendix E for sources for regulations.

implements a rural drinking water compliance strategy to assist rural Alaska water systems in providing cost-effective safe drinking water, provides information about contaminant monitoring and sampling procedures for public water systems, responds to complaints of contaminated or damaged drinking water wells and impacted watersheds. The Drinking Water Program maintains a statewide database with monitoring, compliance, and enforcement information on public drinking water systems, responds to confirmed waterborne disease outbreaks, and incidents of illness. The program provides workshops on wellhead protection and source water assessments for communities and public water systems.

Village Safe Water Program

(907) 269-7613 Anchorage

www.dec.alaska.gov/water/village-safe-water

Secures federal grant funds with state matching funds. Provides grants to small communities for water, wastewater and solid waste studies and projects. Assigns an engineer to each project to assist communities with planning facility design options and addressing regulatory issues. Ensures appropriate and effective use of grant funds by disbursing funds to communities as progress payments after review of invoices.

Department of Commerce, Community, and Economic Development Rural Utility Business Advisor (RUBA) Program

550 West 7th Avenue, Suite 1640

Anchorage, AK 99501

(907) 269-4556 Anchorage

www.commerce.alaska.gov/dca/ruba/ruba.htm

Provides assistance to small rural communities statewide that are preparing to receive new or upgraded sanitation systems and assesses a community's ability to provide management and administration of sanitation utilities.

APPENDIX B

Tracks efforts to bring communities up to an acceptable management performance standards. Continued RUBA assistance to these communities depends on the community meeting a baseline level of progress towards improvement.

U.S. Environmental Protection Agency

Anchorage Office
222 West 7th Avenue #19
Anchorage, AK 99513-7588
(907) 271-5083 Anchorage

Region 10 Drinking Water Unit

1200 Sixth Avenue, Seattle, WA 98101
(206) 553-1200 Seattle
www.epa.gov/aboutepa/region10.html

Protecting public health of Northwest communities by working with states, municipal water suppliers, tribes, and others to ensure that all public water systems provide safe drinking water.

U.S.
Government

Alaska Native Tribal Health Consortium (ANTHC) Department of Health and Engineering

4141 Ambassador Drive, Anchorage, AK 99508
(907) 729-1900 Anchorage
www.anthctoday.org/dehe/

Working in partnership with Native communities, provides a comprehensive array of public health-based services statewide including sanitation facility planning, design, and construction, and water and sewer system operation and maintenance assistance.

Alaska Training and Technical Assistance Center (ATTAC)

1332 Seward Avenue, Sitka, AK 99835
Toll Free (888) 750-3823
www.uas.alaska.edu/sitka/coed/

Conducts training and provide technical assistance to small public water systems in Alaska, thereby enabling small rural communities and the State of Alaska to provide access for all residents to safe drinking water essential to public health. **AI**

APPENDIX B

Asaska Water and Wastewater Management Association (AWWMA)

P.O. Box 244141 Anchorage Alaska 99524

(907) 561-9777 Anchorage

www.awwma.org/

An organization of utility operators and managers that sponsors numerous training and information programs. AWWMA sponsors an annual conference, including a session on research and development for rural sanitation. They publish a newsletter, AWWMA News and Information, for members. Their web site includes numerous helpful links.

National Rural Water Association, Alaska

(907) 357-1155

www.arwa.org/1/

To provide rural community water systems with the highest quality of support services designed to assist them in meeting the needs of their consumers.

Texas Water Resources Institute

www.twri.tamu.edu/

Great pages of links, among the other information.

Water and Wastewater Equipment Manufacturers Association (WWEMA)

www.wwema.org/

A non-profit trade organization founded in 1908 to represent the interests of companies that manufacture products sold to the potable water and wastewater treatment industries.

SAMPLE SITING PLAN

PWSID#:

II. Sampling Information

A. Routine Sample Rotation Schedule

Routine Sample Site	1st Quarter			2nd Quarter			3rd Quarter			4th Quarter		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.												
2.												
3.												
4.												
5.												

B. Routine and Repeat Sample Locations

Routine Sample Sites Location/Address	Repeat Sample Sites Location/Address
1.	1-1 Original sample site
	1-2 Upstream
	1-3 Downstream
2.	2-1 Original sample site
	2-2 Upstream
	2-3 Downstream
3.	3-1 Original sample site
	3-2 Upstream
	3-3 Downstream
4.	4-1 Original sample site
	4-2 Upstream
	4-3 Downstream
5.	5-1 Original sample site
	5-2 Upstream
	5-3 Downstream

C. Reasons for Choosing Routine Sample Locations

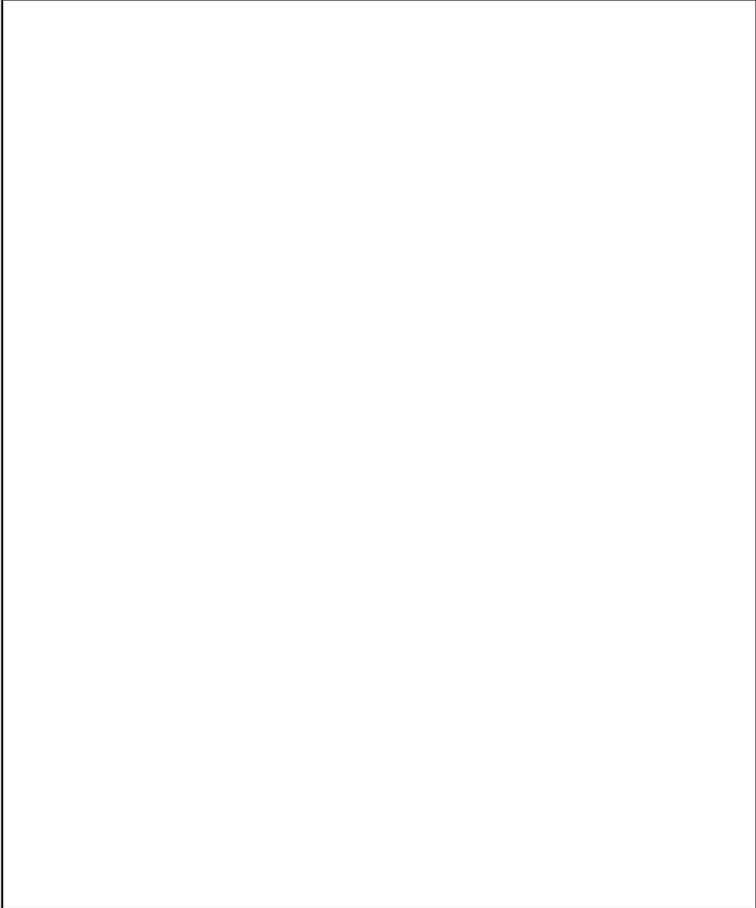
1.
2.
3.
4.
5.

Systems Operating Year-Round

PWSID#: _____

D. System Schematic

Provide a line drawing in the space below or attach a separate sheet or map of this public water system that **identifies water system facilities** (sources, storage, treatment, distribution, and pressure zones) and **sample point locations**.



PWSID#: _____

Systems Operating Year-Round

E. Sample Interval Description

Describe below how you plan to ensure that samples are collected at evenly spaced time intervals:

- Example for systems collecting 1 sample/month - We plan to collect our routine sample the first week of each month*
- Example for systems collecting multiple samples/month - We plan to collect our routine samples every Tuesday throughout the month*
- Example for systems collecting 1 sample/quarter - We plan to collect our routine sample the first month of each quarter*

F. Groundwater Rule Triggered Source Water Monitoring

If you answer "No" to the question below, you are required to perform source water monitoring, from each active well under the Groundwater Rule in the event of a routine total coliform positive sample. This sampling is in addition to the repeat sampling required by the RTCR. Enter your source sample site information in the table below. If you need more space, attach additional sheets.

Do you provide DEC-approved 4-log treatment of viruses for all your groundwater sources?

- Yes
 No
 N/A- We do not have any wells or all of our water is treated as SW or GWUDISW
 (There are no wells in the distribution system that bypass surface water treatment.)

Groundwater Rule Triggered Source Water Monitoring	
Source ID/Name	Description of location of raw water sample tap

DEC Area Office: _____ Date Received: ____/____/____

Was a dual purpose sample approved? Yes No Date discussed with Supervisor: ____/____/____

NOTE: The only systems eligible for using a dual purpose sample are Groundwater systems, serving 1,000 or fewer people, that only have 1 well, and serve a single building with 2 or fewer sample taps.

Sample Siting Plan deemed complete and satisfactory? Yes No

Comments: _____

State Reviewer Signature: _____ Date: ____/____/____

APPENDIX D

Regulations Used in Guide

When this guide was published in November 2011, the following regulations were in effect:

Alaska Administrative Code (AAC)

- 18 AAC 80 Drinking Water May 20, 2011
- 18 AAC 70 Water Quality Standards September 19, 2009
- 18 AAC 72 Wastewater Disposal December 23, 2009
- 18 AAC 74 Operator Certification and Training November 21, 2010
- 18 AAC 50 Air Quality Control Regulations April 13, 2011
- 18 AAC 60 Solid Waste Management September 5, 2010

If you have internet access, check the regulations at:

www.touchngo.com/lglcntr/akstats/aac/title18.htm

Check on proposed changes, if any, at:

www.dec.state.ak.us/commish/regulations/index.htm

Regulation Code of Federal Regulations (CFR)

- 40 CFR 141 and 143 Drinking Water Requirements
- 40 CFR 122 Wastewater Discharges

The Code of Federal Regulations is republished each July 1, sometimes with little or no change to a given section. The Federal Register is published daily and lists changes as they are made.

If you have internet access, check the regulations at:

www.epa.gov/lawsregs/topics/water.html

or www.gpoaccess.gov/cfr/retrieve.html

You can access the Federal Register at:

www.federalregister.gov/

This guide is updated from time to time. Always make sure you are not referring to an outdated version.

Compliance Calendars

Community - Groundwater

Key: ADEC = Alaska Department of Environmental Conservation
 CEU = continuing education units (1 unit=10 classroom hours)
 HAA5 = haloacetic acids
 IOC = inorganic chemical
 SOC = synthetic organic chemicals
 TTHMs = total trihalomethanes
 TOC = total organic carbon
 VOC = volatile organic compounds

Frequency	Requirement	Notes
Three times per day	Residual chlorine (if serving 1,001-2,500 people per day)	
Twice daily	Residual chlorine (if serving 501-1,000 people per day)	If disinfectant (chlorine) is used
Daily	Test fluoride, if applicable	If fluoride used
	Test disinfectants (chlorine dioxide) ^a	If disinfectant (chlorine) is used
	Disinfectant by-products (chlorite) ^a	If disinfectant (chlorine) is used
	Disinfectant by-products (chlorite) ^a	If disinfectant (chlorine) is used
	Residual chlorine (if serving 500 or less per day)	
Twice a month	Test total coliform (if serving 1,001-2,500 people per day)	Samples must be collected on different days
Monthly	Test disinfectants (chlorine, chloramines), if applicable ^a	If disinfectant (chlorine) is used
	Test disinfectant by-products (bromate), if applicable ^a	Ozone systems only
	Test disinfectant by-products (TOC), if applicable	If chlorine is used
	Test total coliform (if 25-1,000 people served per day)	
	Report daily operator readings and monthly coliform test results to ADEC (if applicable)	Use ADEC monthly report form
	Check critical parts inventory. Reorder if necessary	Not a regulation
Quarterly	Test disinfectant by-products (TTHMs, HAA5), if applicable ^a	If disinfectant (chlorine) is used
Annually	Test nitrate	Quarter with highest concentration
	Test lead/copper tap samples	Initial sampling is extensive and depends on population
Every 3 years	Take continuing education classes (operator)	3 CEU (approved courses and pay fee)
	Arsenic monitoring requirement (after Jan. 23, 2006)	Based on new MCL of 10mg/L
Every 4 years	Test radio activity (CWS only)	Check for waivers
Every 5 years	Complete a sanitary survey	Must be done by a third party
Initially	Test nitrite	Test again at ADEC discretion
Once every	Test SOCs	Initial quarterly sampling, check for waivers
Compliance period	Test asbestos	
	Test VOCs	After initial monitoring requirements are met
	Test IOCs	After initial monitoring requirements are met
	Test radionuclides	After initial monitoring requirements are met
	Reapply for monitoring waivers, sample again if required	May have to sample to maintain certain waivers

a Based on the Disinfectants and Disinfection By-Products (D/DBP) Rule, effective January 2003. This chart is generalized — Call ADEC for a copy of your specific water system monitoring summary.

Transient Non-Community (TNC) - Groundwater

Frequency	Requirement	Notes
Daily	Test fluoride, if applicable	If fluoride used
Twice a month	Test Residual chlorine (if serving 1,001-2,500 people per day) Test total coliform (if serving 1,001-2,500 people per day)	If chlorine is added
Monthly	Check critical parts inventory.	Reorder if necessary. Not a regulation.
Quarterly	Test total coliform (if serving 1,000 or fewer people per day)	
Annually	Test nitrate	
Initially	Test nitrite	
Every 5 years	Complete a sanitary survey	Must be done by a third party
Once every compliance period	Reapply for monitoring waivers, sample again if required	May have to sample to maintain certain waivers

This chart is generalized - Call ADEC for a copy of your specific water system *monitoring summary*.

Key: ADEC - Alaska Department of Environmental Conservation
CEU - continuing education units (1 unit - 10 classroom hours)

Community - Surface Water (or GWUDISW)

*Based on Disinfectants and Disinfection By-Products (D/DBP) Rule, effective January 2003. This chart is generalized - Call ADEC for a copy of your specific water system *monitoring summary*.

Key: ADEC = Alaska Department of Environmental Conservation
 CEU = continuing education units (1 unit=10 classroom hours)
 HAA5 = haloacetic acids
 IOC = inorganic chemical
 SOC = synthetic organic chemicals
 TTHMs = total trihalomethanes
 TOC = total organic carbon
 VOC = volatile organic compounds

Frequency	Requirement	Notes
Three times per day	Residual chlorine (if serving 1,001-2,500 people per day)	If chlorine is used
Twice daily	Test total coliform (if serving 501-3,300 people per day and system is avoiding filtration) Test Residual chlorine (if serving 501-1,000 people per day)	
Daily	Test fluoride Test turbidity (filtered systems)	If fluoride used Contact ADEC for unfiltered systems
	Test total coliform (if serving 500 or fewer people per day and system is avoiding filtration)	
	Test residual chlorine (if serving 500 or less per day)	If chlorine is used
	Test disinfectants (chlorine dioxide)	If disinfectant (chlorine) is used
	Test disinfectant by-products (chlorite)	If disinfectant (chlorine) is used
Twice a month	Test total coliform (if serving 1,001-2,500 people per day)	Samples must be collected on different days
Monthly	Test total coliform (if 25-1,000 people served per day)	
	Test disinfectants (chlorine, chloramines), if applicable ^a	If disinfectant (chlorine) is used
	Test disinfectant by-products (bromate), if applicable ^a	Ozone systems only
	Test disinfectant by-products (TOC), if applicable	If chlorine is used
	Report daily operator readings and monthly coliform test results to ADEC (if applicable)	Use ADEC monthly report form
	Check critical parts inventory. Reorder if necessary	Not a regulation
Quarterly	Test disinfectant by-products (TTHMs, HAA5), if applicable ^a	If disinfectant (chlorine) is used
Annually	Test VOCs Test nitrate Test IOCs	Check for waivers
Every 3 years	Arsenic monitoring requirement (after Jan. 23 2006)	Based on new MCL of 10mg/L
Initially	Complete a sanitary survey Take continuing education classes (operator)	Must be done by third party 3 CEU (approved courses) and pay fee
Once every	Test nitrite Test SOC's	Test again at ADEC discretion
Compliance period	Test asbestos Radionuclide	Initial quarterly sampling, check for waivers Check for waivers
	Reapply for monitoring waivers, sample again if required	May have to sample to maintain certain waivers

Transient Non-Community (TNC) - Surface Water (or GWUDISW)

This chart is generalized. Call ADEC for a copy of your specific water system *monitoring summary*

Key: ADEC = Alaska Department of Environmental Conservation
 CEU = continuing education units (1 unit=10 classroom hours)
 GWUDISW = groundwater under the direct influence of surface water.

Frequency	Requirement	Notes
Three times per day	Test Residual chlorine (if serving 1,001-2,500 people per day)	If chlorine is used
Twice daily	Test total coliform (if serving 501-3,300 people per day and system is avoiding filtration)	
Daily	Test Residual chlorine (if serving 500 people per day)	If chlorine is used
	Test fluoride, if applicable	If fluoride used
	Test turbidity (filtered systems)	Contact ADEC for unfiltered systems
	Test total coliform (if serving 500 or fewer people per day and system is avoiding filtration)	
	Test residual chlorine (if serving 1,001 - 2,500 people per day)	If chlorine is used
Twice a month	Test total coliform (if serving 1,001-2,500 people per day)	Samples must be collected on different days
Monthly	Test total coliform (if 25-1,000 people served per day)	
	Report daily operator readings and monthly coliform test results to ADEC (if applicable)	Use ADEC monthly report form
	Check critical parts inventory. Reorder if necessary	Not a regulation
Annually	Test nitrate	
Every 3 years	Complete continuing education classes (operator)	3 CEU (approved courses) and pay fee
Every 5 years	Take a sanitary survey	Must be done by third party
Initially	Test nitrite	Test again at ADEC discretion

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The following information is provided in accordance with State law AS 44.99.210.

Name of agency releasing publication:

Department of Community and Regional Affairs

Production cost for each copy of the publication:

\$13.33 by *Alaska Tab and Bind*

Purpose of the publication:

To help operators and managers of small rural Alaska water and wastewater utilities to understand and comply with State and Federal regulations.

City and State where printed:

Anchorage, Alaska