

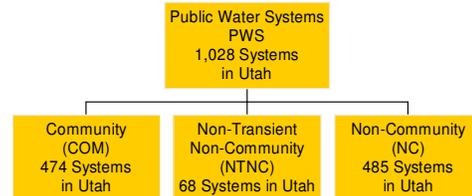
THE DIVISION OF DRINKING WATER (DDW)

- Governed by a nine-member board that establishes the rules
- Five Sections
 - Administrative Services
 - Rules
 - Engineering
 - Construction Assistance
 - Field Services
- www.drinkingwater.utah.gov



DDW REGULATES PUBLIC WATER SYSTEMS

- Public Water Systems (PWS):
 - Have 15 services connections AND/OR
 - Serve at least **25 people (or 8 service connections)** for 60 days



COMMUNITY SYSTEMS (COM)

- Serve year-round residents
- **Long-term exposure, most stringent sampling requirements**
- Municipalities, districts
- Utah has 474 COM systems.



NONTRANSIENT NONCOMMUNITY SYSTEMS (NTNC)

- Serve the same people for at least 6 months out of the year
- Industry, rural schools
- **Sampling is less stringent than COM systems.**
- Utah has 68 NTNC systems



TRANSIENT NONCOMMUNITY SYSTEMS (TNC)

- Serve different people
- Are not active year round
- **Short-term exposure**
- **Least stringent sampling requirements**
- Campgrounds, rest stops, churches, restaurants
- Utah has 485 TNC systems.



PWS REQUIREMENTS

- Construction Standards
- Operational Requirements
- Surface Water Treatment Rule
- Sanitary Surveys/Improvement Priority Rule
- Cross Connection Control
- Source Protection
- Monitoring & Reporting, Water Quality
- Public Notice
- Operator Certification (except TNC systems)
- **Private systems are NOT regulated by DDW**

CONSTRUCTION STANDARDS

- **Purpose: to provide a safe and reliable supply of drinking water.**
- Apply to: Source development, water treatment, water quantity, water storage, pump stations, and distribution systems.
- **Plans for drinking water projects must be submitted to DDW for review.**



Chlorination building. The air intake is at the top, and the exhaust is near the floor. The ammonia bottle is required.

CONSTRUCTION STANDARDS - EXAMPLES

- Proper sizing of source, storage, transmission and distribution piping to meet demands.
- Flowing wells must be controlled by a valve.
- Storage tank access lids must be locked.
- **Free flowing wells must be controlled valves.**
- **All vents, overflows and drains must be screened**
 - Air vents must have a #14 mesh screen
 - Water outlets must have a #4 mesh screen



CONSTRUCTION STANDARDS - EXAMPLES

- Finished water storage must be covered.
- Sewer lines must be at least 50 feet from storage reservoirs.
- **Sewer lines must be at least 10 feet from waterlines, and 18 inches below waterlines.**
- Pumping stations must have **2 complete pumps**, and each pump must provide the **maximum flow** of the station.



CONSTRUCTION STANDARDS - EXAMPLES

- Access Hatch Lids for Tanks and Springs
 - **The access hatch lids must be a shoebox type lid.**
 - **The lid must overlap 2 inches.**
 - **There must be a gasket between the lid and the frame.**



CONSTRUCTION STANDARDS - PRESSURE

- Pressure
 - For PWS approved before January 1, 2007:
 - Maintain **20 psi** minimum dynamic pressure at **all locations** during normal operation.
 - Meet the new minimum pressures in new service areas.
 - For new construction after January 1, 2007 at the points of connection:
 - **20 psi with fire flow during peak day demand**
 - 30 psi during peak instantaneous demand
 - **40 psi during peak day demand**
- **Individual home booster pumps are NOT ALLOWED unless an exception is granted by the Division Director.**



CONSTRUCTION STANDARDS - EXCEPTIONS

- Requesting an Exception
 - If a facility meets the intent of the rule but cannot meet the construction standards, then they submit an exception request to the Division Director in writing.
 - It must include:
 - The rule citation
 - An explanation of why the rule cannot be met
 - What the system proposes in lieu of the rule
 - Justifications

CONSTRUCTION – PLAN REVIEW

- Required for “construction, addition, and modification” of drinking water facilities.
- Examples
 - Recoat a water tank interior
 - Change or add a chemical
 - Redevelop a source
 - Add a booster pump, PRV, or chlorinator
 - Construction of tanks, pump stations, pipelines, sources, treatment plants, etc.
- **Plan review is required. There is no construction until Plan Approval is issued.**



CONSTRUCTION – PLAN REVIEW

1. Submit a “project notification form.”
2. Submit plans and specifications to obtain **Plan Approval**. (Plan on 30 days for the review process.)
3. Complete construction.
4. Obtain an **Operating Permit** before placing the facility in service. Otherwise, 50 to 150 deficiency points could be assessed.
 - This includes submitting as-built drawings, satisfactory bacteria results, etc.

CONSTRUCTION – PLAN REVIEW

- Plan Review is NOT required for certain O&M procedures such as:
 - Repair leaky pipelines
 - Replace existing pipeline of the same size or upgrade to meet minimum size requirement
 - Add new pipeline <500 feet at a time or <1,000 feet per year
 - Inspect, clean, and maintain a tank
 - Tap existing water mains to connect new service laterals
 - Replace a pump of the same type, size, and rated capacity



OPERATIONAL REQUIREMENTS

- Contaminated facilities must be disinfected before being placed back into service.
- AWWA disinfection standards (50 ppm chlorine)
 - C651 Water mains
 - C652 Storage tanks
 - C653 Water treatment plants
 - C654 Wells
- Added chemicals must meet National Sanitation Foundation (NSF) Standard 60.
- **Deep-rooted vegetation in a spring collection area must be mechanically cleaned.**

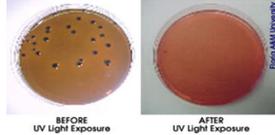
IMPROVEMENT PRIORITY SYSTEM (IPS)

- The way DDW measures the condition and performance of a PWS, based on quality, monitoring, public notification, physical deficiencies, operator certification, cross connection control, and source protection.
- **The more demerit points a PWS has, the worse off it is!**



IMPROVEMENT PRIORITY SYSTEM (IPS)

- Points are assessed for deficiencies and violations.
- The amount of points assessed is based on the threat to the water quality and public health.
 - **Confirmed E.coli contamination = 50 points**
 - **Missing a smooth-nosed sampling tap on well discharge piping = 1 point**



IMPROVEMENT PRIORITY SYSTEM (IPS)

- Thresholds:
 - **COM 150 pts**
 - **NTNC 120 pts**
 - **TNC 100 pts**
 - For an approved rating, a PWS must have **LESS** than the thresholds above.
- RATINGS
- **Approved:**
 - In good compliance
 - **Corrective Action:**
 - Provisional rating for a PWS that is working on compliance
 - **Not Approved:**
 - PWS does not fully comply with the rules

IMPROVEMENT PRIORITY SYSTEM (IPS)

- **Points are added:**
 - At the time of the sanitary survey
 - When the PWS fails to sample
 - There is a quality problem
- **Points are deleted:**
 - When the physical deficiencies are fixed
 - When samples are taken
 - **For coliform, the IPS points stay on for 12 months or 4 consecutive quarters of operation.**



IMPROVEMENT PRIORITY SYSTEM (IPS)

- **Sanitary Survey**
 - During the survey points are given for physical facility deficiencies.
 - A time period is given for the problem to be fixed before the points are activated.
 - Points are only given once for a repeating deficiency.
 - **Some deficiencies may be grandfathered if they will not impact public health.** (See Exceptions in Construction Standards.)



CROSS-CONNECTION CONTROL

There are 5 required components:

1. **Local Authority:** Identifies a person to administer the program, must require protection for cross connections, **must require periodic testing of all backflow prevention assemblies**, must require hazard assessments, identifies and authorizes enforcement methods, **requires inspection of new construction and existing privately-owned PWS.**



CROSS-CONNECTION CONTROL

2. **Public Awareness/Education:** Stuffers, newspaper, town meetings, consumer confidence reports
3. **Trained or Certified Staff:** ABPA evening seminars, backflow certification course, Rural Water seminars
4. **Records of Program Activities:** Inventory of testable assemblies, inventory of health (high) hazard air gaps, records of hazard assessment surveys, records of enforcement actions



CROSS-CONNECTION CONTROL

5. Ongoing Enforcement:

Hazard assessment surveys/appropriate protection provided, tracking annual testing of devices, continues public education,

assemblies tested annually



CROSS-CONNECTION CONTROL

Degree of Hazard Protection

- **Sewage: Air gap - minimum 1" or twice the diameter of the pipe & best form of CCC**
- High Hazard: Backpressure or backsiphonage, requires Reduced Pressure (RP) backflow assembly
- High Hazard: Backsiphonage only, requires Pressure Vacuum Breaker (PVB) assembly, spill resistant vacuum (SVB) breaker assembly or atmosphere vacuum breaker device (AVB)
- Low Hazard: Backpressure or backsiphonage, requires double check valve
- Low Hazard: Backsiphonage only, requires PVB, SVB, or AVB

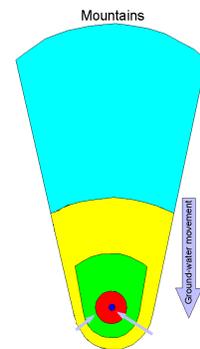
SOURCE PROTECTION PLANS

- Required for all new sources for all PWS, but TNC sources built before 1993 are exempt.
 - TNC systems have Source Water Assessments
- There are five required components:
 1. Identify a designated person
 2. Inventory all potential sources of contamination
 3. Management plan to manage and prevent contamination
 4. Contingency plan
 5. Source delineation



SOURCE PROTECTION PLANS

- Delineation
 - Zone 1 = 100-ft radius
 - Zone 2 = 250-day time of travel
 - Zone 3 = 3-year time of travel
 - Zone 4 = 15-year time of travel



*Optional 2 mile radius

SOURCE PROTECTION PLANS

• Surface Water Zones

- Zone 1 = ½ mile from High Water Mark (HWM), 100 ft downstream to 15 miles upstream
- Zone 2 = 1,000 ft from HWM, additional 50 miles upstream
- Zone 3 = 500 ft from HWM
- Zone 4 = remainder of watershed or state line



SOURCE PROTECTION PLANS

- Monitoring reduction waivers for VOCs and pesticides
- There is an implementation schedule for the plan.
- There is a resource evaluation that lists resources to implement the plan.
- The contingency plan includes all drinking water sources.
- Must notify the public of your source protection plan, usually a part of the consumer confidence report (CCR).

WATER QUALITY

- **Primary Drinking Water Standards**
 - Health based, sampling is required
- **Secondary Drinking Water Standards**
 - Aesthetic based, sampling is not required
- **Treatment Technique**
 - Only for surface water treatment systems
- **Action Levels**
 - Only for lead/copper



WATER QUALITY – VARIANCES & EXEMPTIONS

- **Variations & exemptions are not available for total coliform and surface water treatment.**
- A variance or exemption must **not** result in an **unreasonable risk** to human health.
- Variations are based on raw water quality.
- Exemptions are based on availability of feasible treatment.
- Additional time is given to meet the MCL or BAT (best available technology).



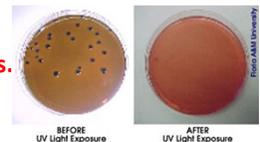
WATER QUALITY - MONITORING

- | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Distribution <ul style="list-style-type: none"> – Coliform bacteria – Lead & Copper – Asbestos – Disinfection Byproducts | <ul style="list-style-type: none"> • Source <ul style="list-style-type: none"> – Asbestos – Inorganics & Metals – Nitrate, Nitrite – Sulfate – VOCs – Pesticides – Radionuclides |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



WATER QUALITY – COLIFORM BACTERIA

- Coliform bacteria is an indicator bacteria
- Coliform is a family of bacteria. Some cause illness; others do not.
- All samples are tested for *Escherichia coli* (*E. coli*)
- All PWS must sample monthly.
- **The number of samples required depends on the system population.**
- **PWS keeps records of coliform results for 5 years.**

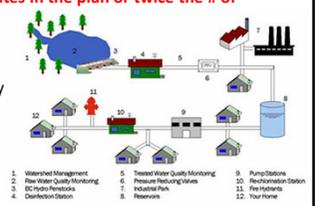


WATER QUALITY – COLIFORM BACTERIA

Community	<p>Sample every month</p> <p>The # of samples depends on population</p>
Nontransient Noncommunity (NTNC)	
Noncommunity (NC)	

WATER QUALITY – COLIFORM BACTERIA

- **Sampling Site Plan**
 - **A plan that shows the PWS is rotating its samples throughout representative sites in the system.**
 - **Must be written, submitted to DDW and is reviewed during the sanitary survey.**
 - **A PWS must have at least 5 sites in the plan or twice the # of samples required.**
 - PWS that collects >5 samples month should not collect them on the same day
 - **The PWS is responsible for taking coliform samples.**



WATER QUALITY – COLIFORM BACTERIA

1. You take the routine sample and send it to the lab.
2. The lab will mark the results:
 - Satisfactory (TC -)
 - Unsatisfactory (TC + EC -, or TC + EC +)
 - Indeterminate (interfering bacteria, **PWS must take another routine sample within 24 hours.**)
3. If the results are satisfactory, then no further action is required.
4. If the results are unsatisfactory, you must take repeat, triggered and possibly investigative samples.



WATER QUALITY – COLIFORM BACTERIA

Types of Samples

- ROUTINE** = The routine samples required monthly .
- REPEAT** = Samples taken in the distribution system after an unsatisfactory routine. **They must be pulled from within 5 service connections upstream & downstream and one at the original site.**
- TRIGGERED** = For groundwater PWS, these samples are taken at all groundwater sources in use. If a groundwater PWS purchases water, then the wholesale system must be notified so they can take these samples at their sources.
- CONFIRMATION**= Taken when Triggered GW source sample is E.coli positive.
- INVESTIGATIVE**= Samples taken to identify a potential problem, but do not count toward samples required by monitoring schedule

WATER QUALITY – COLIFORM BACTERIA

- If the result is unsatisfactory:
 - The lab analyzes for E.coli (EC).
 - PWS takes REPEAT, and groundwater systems take TRIGGERED samples within 24 hours of notification.
- How many repeats do I take?
 - All systems take 3 repeat samples
 - Original sample site
 - 5 Connections upstream
 - 5 Connections downstream

WATER QUALITY – COLIFORM BACTERIA

Violations for the Revised Total Coliform Rule

- Monitoring Violations:
 - Failure to take *routines* or *triggered* samples
 - Failure to take *repeat* samples results in assessment requirement
- Quality Violations:
 - **Acute violations are confirmed E.coli contamination.**
 - Mandatory health effects language with public notice

WATER QUALITY – COLIFORM BACTERIA

Violations for the Revised Total Coliform Rule

- Treatment Technique Violations:
 - Failure to *conduct* a Level 1 or 2 Assessment
 - Failure to *correct* significant deficiencies
 - Failure to *perform* seasonal start-up procedures
- Reporting Violation:
 - Failure to *report* results (whether they are taken or not)
 - Failure to *report* seasonal start-up procedures
 - Failure to *report* a Level 1 or 2 Assessment

WATER QUALITY – COLIFORM BACTERIA

Acute Violations: at two points in time (routine, repeat) a PWS has at least one TC+ and one EC+.

ROUTINE	REPEAT	Violation	Triggers
TC+ EC-	TC+EC-	No Violation	Level 1 or 2 Assessment
TC+ EC-	TC+ EC?	E.coli MCL Violation	Failure to test for E.coli results MCL and an assessment
TC+ EC-	TC+ EC+	E.coli MCL Violation	Level 1 or 2 Assessment
TC+ EC-	Missed Any Repeat Samples	No MCL Violation	Level 1 or 2 Assessment
TC+ EC+	TC+	E.coli MCL Violation	Level 2 Assessment
TC+ EC+	TC+ EC+	E. coli MCL Violation	Level 2 Assessment

Seasonal Systems

- Seasonal Systems: Systems that are only open part of the year. Meaning NO WATER IS SERVED DURING THEIR CLOSED PERIOD
- Required to perform and report start-up procedure before opening
 - Inspect
 - Flush
 - Disinfect
 - Clean INVESTIGATIVE bacteria sample
 - Report process to DDW

Level 1 Assessments

- Triggered By
 - TC+ Samples
 - PWS that take <40 routines = more than 1 TC+ sample in a month
 - PWS that take >40 routines = more than 5% TC+ samples in a month
 - Failure to take *repeat* samples after routine TC+EC-
- Conducted by System
- Results reported to DDW within 30 Days of Trigger

Level 2 Assessments

- Triggered By
 - An acute quality violation
 - Failure to take *repeat* samples after routine TC+EC+
 - A second Level 1 Assessment within a rolling 12 month period
- Conducted By DDW or Authorized DDW Personnel
- More In-depth Look At System

WATER QUALITY – GROUNDWATER RULE

- Applies to PWS using groundwater, consecutive PWS receiving groundwater, and wholesale PWS using groundwater
- Five Components
 1. Triggered samples at the source
 2. Assessment samples at the source
 3. Corrective actions
 4. Sanitary surveys
 5. Compliance monitoring



WATER QUALITY – GROUNDWATER RULE

1. Triggered Source Samples
 - Required when a routine coliform sample is TC +
 - How many?
 - Take one for each active groundwater source
 - What if the triggered sample is EC +?
 - PWS takes 5 confirmation source samples.
 - 4 log treated sources are exempt from triggered source samples.

WATER QUALITY – GROUNDWATER RULE

2. Assessment Samples
 - Required at DDW discretion for sensitive sources, such as redeveloped springs, sources with TC + history, sources without plan approval/operating permit
 - A minimum of 12 monthly samples is required per source.
3. Corrective Actions
 - Required when confirmed EC+ at the source
 - Uncorrected significant physical deficiencies
 - Required within 120 days, or the DDW-approved Corrective Action plan deadline



WATER QUALITY – GROUNDWATER RULE

4. Sanitary Surveys

- Required 8 elements for surveys
 - Operation & maintenance, sources, treatment, finished water storage, pumps, operator certification, monitoring & reporting data verification, distribution system
- Water system should receive the sanitary survey report within 30 days.



WATER QUALITY – GROUNDWATER RULE

5. Compliance Monitoring

- Required only for sources with the 4-log exemption
 - An engineering reviewed minimum dosage is required for 4-log exempt sources.
 - Chlorine residual samples
 - Over 3,300 population continuous monitoring
 - Under 3,300 population daily grab samples
- Reporting is combined with quarterly DBP.

WATER QUALITY – GROUNDWATER RULE

Violations:

- Monitoring
 - Failure to collect triggered samples
 - Failure to collect assessment samples
 - Failure to collection additional source samples – default to required corrective action
 - Failure to complete compliance monitoring
- Quality
 - Failure to address confirmed E. coli at the source
 - Failure to correct a significant deficiency or file a corrective action plan

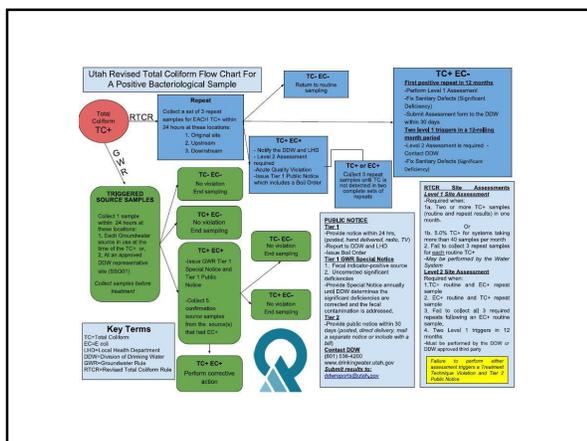
WATER QUALITY – GROUNDWATER RULE

Example Problem:



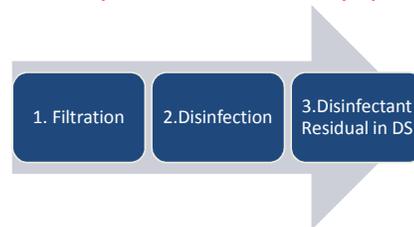
Distribution system has 1 TC+ sample. What is the operator required to do?

- Collect repeat samples.
- Collect a sample at all active groundwater sources.
- Both a & b
- Examine the meter reading at the original sample site.



SURFACE WATER TREATMENT RULE

- Surface Water must be treated. Chlorination alone is not sufficient for treating surface water.
- **Package plants must meet the same construction standards as large plants.**
- **SW Treatment systems must submit a monthly report to DDW.**



SURFACE WATER TREATMENT RULE

1. Filtration

- Filtration provides a physical barrier to remove pathogens and particles
- Maximum filter loading rate is 6 gal/min/ft².**
- Turbidity – a measure of the filtration effectiveness**
 - Surface Water (SW) systems
 - » 0.34 NTU in 95% of samples, never to exceed 1.0 NTU spike
 - » Sample turbidity at each individual filter effluent
 - » Sample the combined filter turbidity at the clear well
 - Ground water turbidity = 5.0 NTU

SURFACE WATER TREATMENT RULE

2. Disinfection

- All surface water sources must be monitoring for either cryptosporidium or *E. coli* before all treatment to determine if additional treatment is needed.
- Disinfect to obtain treatment credits and additional Log inactivation
 - 99% or 2 log inactivation of crypto**
 - 99.9% or 3 log inactivation of giardia, lamblia cysts**
 - 99.99% or 4 log inactivation of enteric viruses**

SURFACE WATER TREATMENT RULE

3. Disinfectant Residual in DS

- Disinfectant CT = Concentration (C) x contact time (T)**
- Contact time is required
- The chlorine residual leaving the plant must be = or > 0.2 mg/L and measurable throughout the system.
- Adequate disinfection is mandatory **before the first customer.**
- CT with mixing basins and storage tanks is determined by tracer studies or the equivalent.



SURFACE WATER TREATMENT RULE

- Groundwater may be “under the direct influence” (UDI) of surface water.
- UDI is determined through a filter test called microscopic particulate analysis (MPA) that detects surface origin microorganisms such as algae or observations involving temperature, turbidity, alkalinity and volume, or geologic conditions.
- Surface water treatment is required for UDI sources.



WATER QUALITY – LEAD & COPPER

- Required for COM, NTNC
- Must have a sampling site plan
- Must give results of test to sample homes and certify to DDW that results have been given.
- The number of required samples is based on population.**
- Samples taken from kitchen/bathroom cold water tap, first draw after sitting undisturbed for 6 hours.**
 - Not outside spigots, vacant homes or rarely used sinks!

Initial	Reduced	Further Reduced
Every 6 months for 2 rounds	Annually for 3 rounds	Every 3 years forever

EXAMPLE:
 1st half 2002
 2nd half 2002
 Annual 2003
 Annual 2004
 Annual 2005
 3 year 2008
 3 year 2011

WATER QUALITY – LEAD & COPPER

Sample Sites:

- Tier 1
 - **Single family homes with copper pipes 1982-1986**
- Tier 2
 - Multiple family homes with copper pipes 1982-1986
- Tier 3
 - Homes before 1982 with metal pipes

Compliance:

- Based on the 90th percentile result
- Compare the 90th percentiles to the Action Levels
 - **Copper = 1300 ppb (1.3 ppm)**
 - **Lead = 15 ppb (0.015 ppm)**
- The result can either meet or be less than the AL to be in compliance.

WATER QUALITY – LEAD & COPPER

90th Percentile

- Arrange the results from lowest to highest.
- Multiply the total number of samples by 0.9.
- Compare that result to the Action Level

A PWS takes 10 samples	A PWS takes 20 samples
$10 \times 0.9 = 9$	$20 \times 0.9 = 18$
Use the 9 th highest result to compare against the Action Level.	Use the 18 th highest result to compare against the Action Level.

WATER QUALITY – LEAD & COPPER

Practice

- Lead Results (ppb, ug/L):
 - <5, 7, 13, <5, 3, 8, <5, 17, 15, <5
- Copper Results (ppb, ug/L):
 - 129, 1402, 876, 564, 345, 1299, 1395, 290, <10, <10



- What is the 90th percentile result for lead and for copper?
- Does the PWS exceed the AL for lead, copper, both, or neither?

WATER QUALITY – LEAD & COPPER

- What happens if a PWS exceeds the AL for lead or copper?
 - Corrosion control treatment
 - Public education and notification
 - Water quality parameter testing
 - Possible lead line replacement



WATER QUALITY - ASBESTOS

• Distribution System Sampling

- Required for **COM, NTNC** that contain asbestos piping in their distribution systems
- **Samples are due once every 9 years.**



• Source Sampling

- Required for **COM, NTNC** at the source for sources in naturally occurring asbestos formations
- **Samples are due once every 9 years.**

WATER QUALITY – DISINFECTION BYPRODUCTS (DBPS)

- Disinfectants (chlorine, chloramines, chlorine dioxide) react with naturally occurring material in the water to create byproducts harmful to human health.
- Disinfection Byproduct (DBP) monitoring
 - **Required for COM, NTNC that disinfect**
- Types of Byproducts
 - Chlorine forms total trihalomethanes and haloacetic acids.
 - Ozone forms bromate.
 - Chlorine dioxide forms chlorite.

WATER QUALITY – DISINFECTION BYPRODUCTS (DBPS)

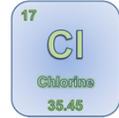
- Compliance is based on the average of results at each sampling location.
- Maximum Contaminant Levels (MCLs)
 - **Total Trihalomethanes (TTHMs) = 80 ppb (0.080 mg/L)**
 - **Haloacetic Acids (HAAs) = 60 ppb (0.060 mg/L)**
- Sampling frequency:
 - **Sampling varies from quarterly to annually based on the nature of the PWSs sources and population served.**
 - Reduced monitoring is allowed based on sample results. However, only very small groundwater PWSs (less than 500 population) will be reduced to every 3 years.

WATER QUALITY – DISINFECTION BYPRODUCTS (DBPS)

- A sampling plan is required!
 - The number of samples is based on the population served.
 - **Must submit a sampling site plan for PWS that did not do the IDSE (Very Small Systems, 40/30 waiver)**
- Consecutive PWSs are on the same sampling frequency and start date as the largest PWS in the group.

WATER QUALITY – DISINFECTION BYPRODUCTS (DBPS)

- **Maximum Residual Disinfection Level (MRDL) of 4.0 mg/L**
- Groundwater PWS measure residual 3 times/week where coliform samples are taken
- Surface water plants must continuously monitor disinfectant residuals. Grab samples are allowed for PWS serving less than 3,300 people if approved by DDW.



WATER QUALITY – DISINFECTION BYPRODUCTS (DBPS)

- There is additional monitoring for Conventional Surface Water Treatment Plants:
 - Raw water alkalinity
 - Raw and finished water Total Organic Carbon (TOC)
- **Submit quarterly reports to DDW due by the 10th day following the end of the quarter.**



WATER QUALITY – TREATMENT REPORTS

- Chlorination, Fluoridation Report Forms
 - Daily readings
 - Volume of water treated
 - Amount of chemical used, residual
- Surface Water Treatment Plant Report Forms
 - Continuous turbidity readings
 - **Clearwell is an appropriate place to take turbidity samples.**
 - Volume of treated water
 - Type and amounts of chemicals used
 - Continuous chlorine residuals

WATER QUALITY - FLUORIDE

- **Maximum Contaminant Level (MCL) = 4.0mg/L**
- **Secondary MCL = 2.0mg/L** (If a PWS is over this level, they must notify the public.)
- Plan review & operating permit
- Monthly reports
- Field test = **SPADNS for daily fluoride residual concentrations**
- Fluoride chemical addition is currently on a county basis
- Treatment Chemicals
 - Sodium Fluoride
 - Fluorosilicic acid
 - Sodium silicofluoride
 - Sodium fluorosilicate



WATER QUALITY - STANDARDS

- All chemical added to drinking water must be National Sanitation (NSF) Standard 60 approved.
- **Turbidity for groundwater source not UDI is 5.0 NTU.**
- Turbidity for surface water/UDI treated water is less than or equal to **0.34 NTU** in 95% of the results, max **1.0 NTU**.
- **Chlorine MCL is 4.0mg/L (MRDL)**
- **Reservoir disinfected to AWWA C 652 Standard**



WATER QUALITY – SOURCE SAMPLES

- May group sources if:
 - They mix before entering the distribution system.
 - 2 or more wells in the same aquifer
 - **PWS required to keep chemical results for 10 years**
 - Report results to DDW within **40 days** of receipt
- Asbestos
 - Inorganics & Metals
 - Nitrate
 - Nitrite
 - Sulfate
 - VOCs
 - Pesticides
 - Radionuclides

WATER QUALITY – SOURCE SAMPLES

Inorganics & Metals

Systems that must sample	Initial sampling frequency	Reduced sampling frequency
COM, NTNC	SW = Annual GW = Every 3 yrs	Once every 9 yrs based on all previous rounds <75% of MCL

Sulfate

Systems that must sample	Initial sampling frequency	Reduced sampling frequency
TNC	Every 3 yrs	Once every 9 yrs based on all previous results <75% of MCL

WATER QUALITY – SOURCE SAMPLES

Nitrate

Systems that must sample	Initial sampling frequency	Reduced sampling frequency
COM, NTNC, TNC	SW = Quarterly GW = Annual	SW = Annual NO OTHER REDUCTIONS ALLOWED

Nitrite

Systems that must sample	Initial sampling frequency	Reduced sampling frequency
COM, NTNC, TNC	Just one sample... If <0.5mg/L = waiver If >0.5mg/L = quarterly	Waiver = No sampling required

WATER QUALITY – SOURCE SAMPLES

Asbestos

Systems that must sample	Initial sampling frequency	Reduced sampling frequency
COM, NTNC (if the source is vulnerable)	Once every 9 yrs	No sampling required

Radionuclides

Systems that must sample	Initial sampling frequency	Reduced sampling frequency
COM	Quarterly for 1 year	Every 3, 6, or 9 yrs, depending on initial results

*Measured in picocuries per liter (pCi/L)

WATER QUALITY – SOURCE SAMPLES

VOCs (Volatile Organics)

Systems that must sample	Initial sampling frequency	Reduced sampling frequency
COM, NTNC	Quarterly	Annual, Once every 3 yrs (susceptibility waiver), Once every 6 yrs (use waiver)

Pesticides

Systems that must sample	Initial sampling frequency	Reduced sampling frequency
COM, NTNC	Quarterly	Once or twice every 3 yrs (susceptibility waiver), Not required (use waiver)

WATER QUALITY – SOURCE SAMPLES

• Waivers

- Reliably & Consistently

- Based on past data

– Susceptibility

- Based on if the source is vulnerable and past data

– Use

- Based on if the contaminants are used, transported, manufactured or stored in the source area



WATER QUALITY – REPORTING TO DDW

- It is the PWS's responsibility to report data to DDW.
- **Monthly operational report forms go to DDW.**
- Bacterial water quality data must be received by DDW by the **10th day** of the month following receipt of analysis.
- Chemical water quality data must be received by DDW within **40 days** of receipt of analysis.
- Unsatisfactory analytical results must be reported to DDW by phone **as soon as possible**.

CONSUMER CONFIDENCE REPORTS (CCR)

- Annual water quality report due by July 1 to DDW, wholesalers due by April 1.
- Required for all COM systems
- DDW must receive:
 - A copy of the CCR by July 1
 - A certification letter describing how the CCR was delivered to customers by October 1

CONSUMER CONFIDENCE REPORTS (CCR)

- The CCR must contain:
 - Date prepared, PWS identification number
 - System information (phone, meetings)
 - Source information (names)
 - Definitions (MCL = maximum contaminant level)
 - Table of **detected** contaminants
 - Violations (if any)
 - Additional health information
 - Variances & exemptions (if any)
 - Uncorrected Significant Deficiencies



PUBLIC NOTIFICATION

- Violation Types
 - Tier 1
 - Acute contaminants = confirmed E.coli coliform bacteria **acute** violation, nitrate, nitrite
 - **Mandatory health effects language**
 - Notify DDW & customers within **24 hours**
 - Tier 2
 - **Non-Acute** Contaminants = chemical MCLs,
 - **Treatment technique=Failure to perform assessment**
 - **Mandatory health effects language**
 - Notify DDW & customers within **30 days**
 - Tier 3
 - **Monitoring & reporting violations**
 - Notify customers within **1 year**
 - **Failure to correct significant deficiency\sanitary defect**
- **Continue notification every 3 months for as long as the violation exists**

OPERATOR CERTIFICATION

- **Required for all COM and NTNC systems AND any PWS that treats surface water or UDI water.**
- How do I become certified?
 - Tested Certificates
 - Pass the op cert exam, specific to operator
 - Grandfather Certificates
 - PWS is in compliance, **specific to the operator and PWS, non-transferable**, operator must have worked for the PWS for a minimum # of years



OPERATOR CERTIFICATION

- Certificates
 - Operator
 - Working for a PWS
 - Specialist
 - **Not working for a PWS**
- Certification Levels
 - Treatment – 4 levels
 - T1, T2, T3, T4
 - Distribution – 5 levels
 - SS, D1, D2, D3, D4



OPERATOR CERTIFICATION

- Required Experience
 - Unrestricted
 - Experience: from 0 to 10 years
 - **The exam cannot measure experience** (what you can do)
 - Restricted
 - **Certified at or above grade level but lacks the required experience**



OPERATOR CERTIFICATION

- Direct Responsible Charge (DRC)
 - **All DRC operators must be certified at the level of the PWS.**
 - They make **independent decisions which may affect the quantity or quality of the water.**
 - The supervisor's signature is required.
 - **If all DRC operators leave a PWS**
 - **DDW must be notified within 10 days**
 - **Obtain a new certified operator within 1 year**



OPERATOR CERTIFICATION – REQUIREMENTS FOR UNRESTRICTED LICENSE

Grade Level	BS degree	AS degree	High School	Non-High School
DRC + Years	DRC/Total (Years)	DRC/Total (Years)	DRC/Total (Years)	DRC/Total (Years)
SS & 1	0/1	0/1	0/1	0/1
2	0/2	0/2	0/2	0/3
3	1/2	1/2	2/4	3/6
4	2/4	2/6	4/8	5/10

OPERATOR CERTIFICATION

- Operator Responsibilities
 - Ensure safe and adequate supply of water
 - Be current with monitoring & reporting requirements
 - Report to DDW unsatisfactory water quality and breakdowns in treatment
 - **On call operators must be within 1 hour travel time**
 - **24-hour PWS – Each shift must have an operator certified at the level of the PWS**
- A certificate may be revoked:
 - For data falsification
 - For disregard of public health and safety
 - Cheating on an exam



OPERATOR CERTIFICATION

- Renewal
 - **All certificates are renewable every 3 years (grandfather, operator, specialist)**
 - Continuing Education Units (CEUs) are required for renewal. **1 CEU = 10 hours**

2 CEUs = 20 hours	3 CEUs = 30 hours
Small System	T3 & D3
T1 & D1	T4 & D4
T2 & D2	