



New Mexico Environment Department

What to Expect When You're
Expecting a Sanitary Survey

Kevin Sarmiento

6/26/26





Introductions

- What kind of water systems do you operate/manage/volunteer?
 - Groundwater
 - Surface water

- What kind of treatments do you have at your facility?
 - Disinfection
 - Filtration
 - Membrane filtration
 - Ion exchange
 - GAC Media
 - Other?



Agenda

- Section 1: Overview of Sanitary Survey Process
- Section 2: Preparing for a Sanitary Survey
- Section 3: Sanitary Survey On-Site Activities
- Section 4: Post-Inspection Activities



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Overview of Sanitary Survey Process

- Purpose and Regulatory Basis of the Sanitary Survey
- Role of NMED Drinking Water Bureau/Compliance and Enforcement Section/Contract Surveyor
- Sanitary Survey Frequency and Triggers
- Eight Elements of a Sanitary Survey
- Sanitary Survey Reports: Structure and Content
- Recommendations vs. Significant Deficiencies vs. Violations
- Enforcement and Compliance Expectations



Definition of a Sanitary Survey



- "..an on-site review of the water source, facilities, equipment, operation, and maintenance of a public water system for the purpose of evaluating the adequacy of such source, facilities, equipment, operations, and maintenance for producing and distributing safe drinking water."
- Title 40 Code of Federal Regulations (CFR) Section 141.2



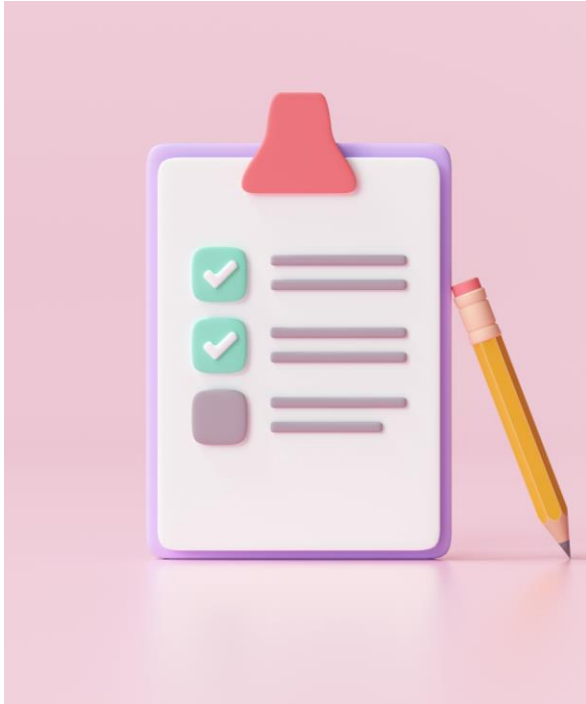
Why Conduct a Sanitary Survey?



- Protect public health
- Regulatory requirements
- Compliance
- Oversight
- Preventative in nature
- Build relationship between State and PWS
- Educate water system personnel
- Provide technical assistance



Who Conducts the Sanitary Survey?



- Primacy agency or an agent approved by the primacy agency is responsible for conducting surveys
 - NMED staff or others approved by the state, such as ERG, conduct the sanitary surveys
 - 40 CFR 142.16 describes sanitary survey program
 - NMED has authority to conduct sanitary surveys under NMAC 20.7.10.504



Sanitary Survey Frequency

- Interim Enhanced Surface Water Treatment Rule (IESWTR, 1998) sanitary survey requirements for PWSs with SW or GWUDI sources (40 CFR 142.16(b))
 - CWSs - every 3 years
 - NCWSs – every 5 years
 - Evaluation of the 8 elements
- Ground Water Rule (GWR, 2006) sanitary survey requirements for GWSs (40 CFR 142.16(o))
 - CWSs - every 3 years
 - NCWSs – every 5 years
 - Evaluation of the 8 elements



Sanitary Survey Frequency



- CWS with outstanding performance based on prior sanitary surveys and no violations or provides 4-log virus removal/inactivation
 - Can reduce to every 5 Years except for community surface water systems
- Phased approach allowed for sanitary surveys
 - The 8 elements can be covered in separate visits
 - All 8 elements must be covered before the 3- or 5-year deadline



8 Elements of a Sanitary Survey

1. Source
2. Treatment
3. Distribution System
4. Finished Water Storage
5. Pumps/Pump Facilities and Controls
6. Management and Operations
7. Monitoring/Reporting/Data Verification
8. Operator Compliance with NM Requirements





Review Previous Sanitary Survey

- **Sanitary Survey Report Components**
 - Cover Letter
 - Introduction
 - Background
 - System Description
 - Sanitary Survey Findings & Corrective Actions
 - Conclusion
 - Significant Deficiency Summary
 - Notes & Recommendations Summary
 - System Schematic
 - Sanitary Survey Corrective Action Plan (CAP)



Sanitary Survey Report Components



MICHELLE LUSAN GRISHAM
GOVERNOR

JAMES C. KENNEY
CABINET SECRETARY

Notification provided via E-mail

November 20, 2024

Lynn Crawford: lynn crawford@ruidoso-nm.gov
Ruidoso Water System, NM3513114
313 Cree Meadows Rd
Ruidoso, NM 88345

RE: 2024 Sanitary Survey Report

Dear Lynn Crawford:

On October 16, 2024 and October 30, 2024 the New Mexico Environment Department Drinking Water Bureau (DWB) conducted a sanitary survey site visit at the Ruidoso Water System.

During the survey, three significant deficiencies were identified. Ruidoso Water System must submit a written Corrective Action Plan to DWB within 45 days of the sanitary survey cover letter date, indicating how and on what schedule the system will address significant deficiencies noted in the survey. For your convenience, a CAP form is included at the end of the sanitary survey report. Enter the date of completion or expected completion next to each deficiency listed. Sign and date the form prior to submittal.

Failure to correct and provide documentation of significant deficiency corrections within the established timeframes will result in treatment technique violations being issued to Ruidoso Water System.

NMED DWB appreciates your assistance in this matter and your compliance efforts to ensure protection of the State's drinking water. If you or members of your staff have any questions or need additional clarification concerning this report, please feel free to contact me at 505-469-5222 or by e-mail at rosto.galvan@env.nm.gov

Respectfully,


Rocio Galvan, Compliance Officer
Drinking Water Bureau
Water Protection Division

cc: Brandi Littleton, Compliance Supervisor (electronic)
Joe Savage, Surface Water Rule Administrator (electronic)
Electronic Central File

SCIENCE | INNOVATION | COLLABORATION | COMPLIANCE
1216 Mechem Drive, Ruidoso, NM 88345 | 505-469-5222 | www.env.nm.gov

NMED
New
Mexico
Environment
Department



2024 SANITARY SURVEY REPORT

For

**Ruidoso Water System
NM3513114**

*Este informe contiene información importante acerca de su agua potable.
Haga que alguien lo traduzca para usted, o hable con alguien que lo entienda.*

Prepared by: Rocio Galvan— Compliance Officer
New Mexico Environment Department
1216 Mechem Drive
Ruidoso, NM 88345

■ Cover Letter

- Date of sanitary survey
- Summary of significant deficiencies
- Corrective action plan requirements
- Applicable violations
- Contact information



Sanitary Survey Report Components

INTRODUCTION

A sanitary survey enables the New Mexico Environment Department Drinking Water Bureau (NMED DWB) to provide a comprehensive review of the components of a water system, to assess the operating condition and adequacy of the water system, and to determine if past recommendations have been implemented effectively. The Sanitary Survey encompasses eight specific elements that are evaluated during the survey. Those eight elements are:

- Source (Protection, Physical Components, and Condition);
- Treatment
- Distribution System
- Finished Water Storage
- Pumps/Pump Facilities and Controls
- Monitoring/Reporting/Data Verification
- Water System Management/Operations
- Operator Compliance with State Requirements

Each element may not be specifically mentioned within this report; however, a significant deficiency or area of concern will be noted if any issues are discovered with any of these eight (8) elements.

The Administrative Contact, for the Ruidoso Water System was given prior notification of the sanitary survey. The preliminary sanitary survey letter provided a list of required records which would be reviewed as part of the sanitary survey as well as a checklist for preparing for the sanitary survey. The letter requested that specific records be provided to the Compliance Officer prior to the sanitary survey.

The sanitary survey was conducted on October 16, 2024 by:
Compliance Officer Rocio Galvan
Compliance Officer Tim Willy
Compliance Supervisor Brandi Littleton

Surface Water survey was conducted on October 30, 2024 by:
Compliance Officer Joe Savage
Compliance Officer Debbie Jones
Compliance Officer Rocio Galvan
Compliance Officer Brandi Littleton

Also in attendance were system operators Randy Koehn and Terry Yarborough.

BACKGROUND

The previous sanitary survey at Ruidoso Water System was conducted on July 20, 2021 by Compliance Officer John Pijawka. During the previous sanitary survey, three significant deficiencies were cited. All significant deficiencies identified during the previous sanitary survey were corrected.

SYSTEM DESCRIPTION

The Ruidoso Water System is a surface water system with an approximate population of 16,777 with 7557 total service connections. The population for the Ruidoso Water System was calculated in accordance with 20.7.10.9.A NMAC. The Ruidoso Water System is classified as a community water system according to the New Mexico Drinking Water Regulations 20.7.10 NMAC. The water system consists of twelve wells, four raw water intakes, one reservoir, seven disinfection units, six pump stations, and eleven storage tanks.

Alto Lake Area:

North Fork Well #1 (004) is a pitless well that can produce an average of 170 gallons per minute (gpm). North Fork Well #3 (006) is a pitless well that can produce an average of 175 gpm. North Fork Well #4 (007) is a pitless well that can produce an average of 320 gpm. Green Well (016) is a pitless well that can produce an average 220 gpm. Apple Orchard Well (021) is a pitless well that can produce an average of 65 gpm. Brown Well is a pitless well that can produce an average of 30 gpm. Alto Well #1 (020) is a pitless well that can produce an average of 95 gpm. Fault Well is a pitless well that can produce an average of 50 gpm. All raw water produced from these wells flow through a commingled raw water line to the Alto Raw Water Intake (063).

The Eagle Creek #4 (017) is a spring that flows to the Eagle Creek Diversion (024) and through the Eagle Creek Desander (035). Desander raw water from the spring is then combined with the raw well water in the commingled raw water line.

Alto Well #2 (018) is a pitless well that can produce an average of 45 gpm. Alto Well #3 (070) is a pitless well that can produce an average of 45 gpm. Alto Well #4 (071) is a pitless well that can produce an average of 45 gpm. All raw water produced from these wells flow to the Alto Reservoir Pump Station (052). From the pump station, water is pushed through the commingled raw water line to the Alto Raw Water Intake.

The Alto Reservoir (019) is currently inactive due to the recent forest fires and flooding in the area. When active, the surface water flows from the lake to the Alto Reservoir Pump Station then to the Alto Raw Water Intake.

From the Alto Raw Water Intake (063), raw water flows through the Alto SW Treatment Plant #3 (014). At the Alto SW Treatment Plant, raw water is treated conventionally with an ATS polymer solution that is injected prior to the flash mixer. Water then passes through a conventional flocculation basin, settling basin, settling tubes, and finally a mixed media gravity filtration. Sodium hypochlorite is injected after the settling basin for iron and manganese treatment through oxidation. After treatment the water flows to a clear well where it is disinfected with gaseous chlorine. Treated water is then boosted via three-125 horsepower booster pumps to the Alto West Tank (037) and Alto East Tank (038).

The Entry Point (EP) sample tap is located inside the Alto SW Treatment Plant #3 building and is labeled with a yellow tag.

The Alto East Storage Tank (038) is constructed of steel with a capacity of 5,000,000 gallons. The Alto West Storage Tank is constructed of steel with a capacity of 5,000,000 gallons. Both tanks are direct tanks in the system and are both scheduled for rehabilitation in 2025 due to damage during the wildfires.

- Introduction
- Background
- System description



Sanitary Survey Report Components

Significant Deficiency Summary

Significant Deficiencies:

A significant deficiency is defined as any deficiency that is causing or has the potential to cause a threat to public health [New Mexico Administrative Code (NMAC) 20.7.10.100 incorporating 40 Code of Federal Regulations (CFR) §141.403(a)(4) or § 141.723(b)].

1. **Significant Deficiency Code:** 004P Chemical dosage records are insufficient to ensure proper operation of the treatment plant

Regulatory Citation: 20.7.10.100 NMAC incorporating 40 CFR 141.723(b)

Significant Deficiency Description: The Ruidoso Water System does not formally calibrate, check calibration, or maintain calibration records for chemical addition pumps.

Required Corrective Action Plan: Ruidoso Water System must submit a written Corrective Action Plan to DWB within 45 days of the sanitary survey cover letter date.

Required Corrective Action: Ruidoso Water System must calibrate and routinely check calibration of all chemical addition pumps and document the results. Ruidoso Water System must detail the procedure in the O&M Plan. Ruidoso Water System must provide documentation acceptable to DWB to verify that this deficiency has been corrected.

2. **Significant Deficiency Code:** 001L Well head is susceptible to flooding.

Regulatory Citation: 20.7.10.100 NMAC incorporating 40 CFR 141.723(b)

Significant Deficiency Description:

- a) Alto Well #1 (020): No cement pad around well casing.
- b) Alto Well #2 (018): Inadequate seal of well casing cap.

Photographic Documentation:



Notes and Recommendations Summary

Notes and Recommendations are defined as any issue which in the estimation of the DWB, is not currently significant enough to be considered as a Significant Deficiency, however, the issue should be further investigated or addressed by the water system so as to not negatively contribute to the poor operations, management, or adequacy of the water system. Recommendations may be escalated to significant deficiencies if they are not addressed before the next sanitary survey.

The following Notes & Recommendations were identified at the Ruidoso Water System water system during the survey.

1. **Note:** During the survey it was noted that the security fence, around the Cherokee Well and Cherokee Treatment Unit building, was damaged due to the recent flooding. Ruidoso Water System is actively working with other organizations to clear remaining debris near the well and treatment unit to rebuilt security fence.



2. **Note:** The Alto East Storage Tank (038) and Alto West Storage Tank (039) are scheduled to be rehabilitated in 2025 due to fire damage.

Recommended Action: After rehabilitation, Ruidoso Water System should ensure that the storage tank level indicators are repaired or removed if on a SCADA system. If removed, Ruidoso Water System must ensure that the indicator cable hole is adequately sealed.

3. **Note:** The cement pad around the Green Well (016) casing is developing small cracks.

Recommended Action: Ruidoso Water System should repair the cement pad cracks to ensure an adequate sanitary seal of the well casing.

4. **Note:** Alto Reservoir (019) and the Grindstone Diversion (009) are currently inactive due to damage from wildfires and flooding. The Grindstone Reservoir has approximately one year of water available.

Recommended Action: Ruidoso Water System should notify NMED once the facilities are back in operation.

- Sanitary Survey Findings
- Significant Deficiency Summary
- Notes & Recommendations Summary



Sanitary Survey Report Components



Sanitary Survey Corrective Action Plan (CAP)

Surface water and GWUDI systems must submit a CAP within 45 days of the issuance of the sanitary survey report

PWSS Name	Ruidoso Water System
PWSS ID	NM3513114
Sanitary Survey Date:	October 16, 2024; October 30, 2024
Date report was issued:	November 20, 2024

Deficiency Listing– Shaded Section is to be filled out by water system representative

Deficiency Code	Description	Choose one and fill in date:	
		Date Deficiency was addressed	Expected date of completion
004P	Insufficient chemical dosage records		
001L	Alto Well #1 (020) no cement pad		
001L	Alto Well #2 (018)-inadequate well cap seal		
Comments:			

If a deficiency has been addressed, submit documentation to the compliance staff listed below.

Submit this form to:

Rocio Galvan at rocio.galvan@env.nm.gov

Corrective Action Plan submitted by:

Signature

Printed Name

Date

■ Sanitary Survey Corrective Action Plan (CAP)

- CAP must be submitted to NMED within 45 days of the sanitary survey report.
- Identify the date each deficiency was addressed (if it has been addressed).
- Identify expected date of completion (if not yet addressed).
- Documentation that shows a deficiency has been corrected must be submitted and can include work orders, purchase orders, and photographs.



Significant Deficiencies

- Per 40 CFR 142.16(o)(2)(iv) for ***ground water systems***:
 - ***Significant deficiencies*** are serious sanitary deficiencies identified in water systems, which include, but are not limited to, defects in design, operation, maintenance, or a failure or malfunction of the sources, treatment, storage, or distribution system that the primacy agency determines to be causing, or has the potential to cause, the introduction of contamination into the water delivered to consumers.
 - States must send a report to the water system within ***30 days*** of identifying a significant deficiency
 - The water system has 30 days to respond to the state. Can respond that the significant deficiency was resolved or request additional time to address the significant deficiency. Can grant up to 120 days or develop another schedule that could require a compliance order.



Significant Deficiencies

- Per 40 CFR 142.16(b)(1)(ii) for *surface water systems*:
 - The State must describe how it will decide whether a deficiency identified during a sanitary survey is significant for the purposes of paragraph (b)(1)(ii) of this section.
 - State must send report to the water system within **45 days** of identifying a significant deficiency
 - Water system has **45 days** to respond to state but can be granted additional time similar to previous slide under GWR.



Significant Deficiencies

- Significant deficiencies for New Mexico are based on operating or design requirements to ensure the delivery of safe and reliable drinking water defined in:
 - NMAC 20.7.10
 - 40 CFR Part 141
- Significant deficiencies tracked and failure to address significant deficiencies within required timeframe results in a violation.
- A list of significant deficiencies are included in the sanitary survey checklist provided by NMED, but surveyors may also note other concerns observed during a sanitary survey.



Significant Deficiencies

■ Examples

- *Failure of treatment*, such as loss of chlorine feed at a surface water plant and unable to meet CT requirements
- *Pathway for contaminant entry*, such as hole in the storage tank vent screen or wellhead vent screen
- *Inadequate security* or unauthorized access, such as lack of fencing or locked gate around a well or storage tank
- *Inadequate spare parts or lack of redundant equipment* that could result in water outage or pressure loss
- *Lack of NMED approval* for well, storage tank, or treatment installation



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Preparing for a Sanitary Survey

- Communicating and Coordinating with the Surveyor
- Required Documents, Records, and Data
- Pre-Survey Self-Assessment and Readiness
- What to Expect on the Day of the Sanitary Survey



Sanitary Survey Notification

- Notice letter from NMED or contract inspectors detailing:
 - Date of survey
 - Contact information
 - Required documents for submittal before the onsite inspection
- Respond to notice to coordinate date, time, and location of sanitary survey.



MICHELLE LUJAN GRISHAM
GOVERNOR

JAMES C. KENNEY
CABINET SECRETARY

Notification Provided Via Electronic Mail

February 20, 2025

Ana Berry, afcwa@msn.com
Tesuque MDWCA, NM3505326
P.O. Box 24277
Santa Fe, NM 87502

Re: Sanitary Survey for the Tesuque MDWCA Water System

Dear Ana Berry:

The New Mexico Environment Department Drinking Water Bureau (NMED DWB) will be conducting a sanitary survey of Tesuque MDWCA water system on **Thursday, March 13, 2025**. The purpose of the sanitary survey is to evaluate the adequacy of the system, its sources and operations, and the distribution of safe drinking water [NMAC 20.7.10.100 incorporating 40 CFR §141.401].

The attached *Sanitary Survey Records Review Checklist* identifies specific records and planning documents requested via electronic submittal at least 7 days in advance of the date of the sanitary survey. If unable to provide electronic copies of the required documents, hardcopies shall be made available during the sanitary survey. Other records shall be located and organized in a manner that will facilitate an effective discussion.

Please indicate if you would like to have an opening telephone conference on **Thursday, February 27, or Friday, February 28**, in advance of the sanitary survey date. If requested, it will provide an opportunity to review the sanitary survey process in preparation for the onsite inspection of the water system. The discussion will cover water system updates, compliance standing, recordkeeping requirements, and other topics that may arise. In addition to having required documents and records available, ready access to the *Drinking Water Watch* (DWW) website (<https://dww.water.net.env.nm.gov/NMDWV/>) may contribute to the discussion. It is recommended that personnel participating in the sanitary survey review water system information listed in DWW prior to the opening telephone conference. A DWW tutorial is available on the NMED-DWB homepage (https://www.env.nm.gov/drinking_water/).

If hardcopy records and/or planning documents are to be provided during the inspection, they shall be placed in flexible folders or other suitable containers.

Once you have reviewed this notice and all attachments provided, please contact me at (703) 633-1642, or by email at Kevin.Sarmiento@erg.com.

Respectfully,

A handwritten signature in black ink, appearing to read "Kevin Sarmiento".

Kevin Sarmiento, Environmental Engineer
Eastern Research Group, Inc. (ERG) on behalf of:

New Mexico Environment Department
Drinking Water Bureau
Water Protection Division

cc: Region Compliance Supervisor (electronic)
Electronic Central File



Pre-Sanitary Survey Record Review Request

The notification letter will include a list of requested records and documents to be provided prior to the scheduled sanitary survey.

- Operator information
- Sampling Plans
- Water System Maps
- Operations & Maintenance Plan

	Pre-Sanitary Survey Record Review: Please provide the following documents to your compliance officer prior to your scheduled sanitary survey
<u>Certified Operator Information</u> ☐ Copies of certification card(s) for the Certified Operator(s) of your water system ☐ Operator contract (<i>if system is operated by contract operator</i>)	
<u>Sampling Plans</u> Current and updated sampling plans for the following: ☐ The Revised Total Coliform Rule ☐ The Lead and Copper Rule (<i>if applicable by regulation</i>) ☐ The Disinfection Byproduct Rules (<i>if applicable by regulation</i>) ☐ Collection of Asbestos samples (<i>if applicable by regulation</i>) ☐ Collection of SOC, VOC, IOC, radionuclide, nitrate, samples (<i>if applicable by regulation</i>)	
<u>Water System Maps</u> At a minimum your maps should have the following: ☐ Locations of all system sources ☐ Locations of pipelines, valves, & blow-offs ☐ Pressure zone boundaries (if system has multiple pressure zones) ☐ Locations of interconnections to other systems ☐ All water system facilities such as, water treatment plants, water storage tanks, pumping stations, disinfection units. <i>*Systems may use one map to show all major features, or several maps that can be overlaid to give a complete picture of the distribution system. Maps should be updated regularly to document changes or additions to the system.</i>	
<u>Operations & Maintenance Plan</u> At a minimum, the operations & maintenance plan should contain the following: ☐ Define your organizational structure ☐ Formalize general and detailed description of system components and treatment units ☐ Schedule standard operating, maintenance and sampling procedures (SOPs, SMPs and SSPs) ☐ Define specifications for new installations and repairs ☐ Identify chemical, appurtenance and equipment suppliers and contractors	



Pre-Sanitary Survey Record Review Request

The notification letter will include a list of requested records and documents to be provided prior to the scheduled sanitary survey.

- Operator information
- Sampling Plans
- Water System Maps
- Operations & Maintenance Plan
- Emergency Response Plan
- Additional Documents

Emergency Response Plan (community water systems only)

At a minimum, the emergency response plan should contain the following:

- ☐ Identified likely threats to their system and assigned the appropriate severity level and response to each type of event
- ☐ Routine operating emergencies such as: line breaks, pump malfunctions, acute MCL exceedances, power outages
- ☐ Non-routine emergencies such as: chemical spills, drought, wind/ice storms, fire, floods, earthquakes, other natural occurrences, intentional acts of sabotage
- ☐ Identified appropriate contact personnel within and outside the system in the event of an emergency
- ☐ Formalized emergency event communication protocol
- ☐ Boil water advisory notification templates
- ☐ Public Notification template forms and protocol
- ☐ Established emergency plans, actions and procedures
- ☐ Inventoried and assessed critical equipment
- ☐ Identified critical or vulnerable customers

Additional Documents

- ☐ Copy of the NMED DWB approval for representative sampling under the groundwater rule *(if applicable)*
- ☐ Copy of the NMED DWB approval for 4 log filtration/inactivation under the groundwater rule *(if applicable)*.
- ☐ Disinfectant residual measurements at the point of compliance for 4 log filtration/inactivation for the last year *(if applicable)*
- ☐ Monitoring results for the following: Total coliform and all chemical samples, Disinfectant residuals *(if applicable)*, Monthly Operating Reports *(if applicable)*
- ☐ Most recent three years of correspondence with the NMED DWB
- ☐ Copy of Public Notice posted
- ☐ Repair records: maintenance and repair logs, disinfection records, special sample lab reports
- ☐ Water production rates and water sold data



Pre-Sanitary Survey Self-Assessment – Source Water



- Inventory all structures, man-made materials, and land use within 100 feet of any water source that could pose a threat to source water.
- Inspect your water source facilities. Verify the existence and/or integrity of:
 - Seals and screens used to keep contaminants out of the well casing or spring box
 - Appropriate raw source water sample taps
 - Security features



Pre-Sanitary Survey Self-Assessment – Treatment



- Inspect your water treatment facilities. Verify:
 - Proper and safe storage and use of treatment chemicals and ensuring NSF compliance
 - Operations and maintenance of equipment
 - Protection from cross-connections with backflow prevention devices
 - Process control and monitoring data
 - Compliance sampling
 - Security features



Pre-Sanitary Survey Self-Assessment – Distribution



- Inspect your finished water storage tank facilities. Verify:
 - Roof hatch, vent, and roof structures are weatherproof
 - Integrity of the screens installed over the vents and overflow outlets
 - Overflow outlets are air gaped and terminate between 12 and 18 inches above the ground surface
 - Protection from cross-connections with backflow prevention devices
 - Tank foundation seals intact and vegetation cleared around tank
 - Security features



Pre-Sanitary Survey Self-Assessment – Distribution



- Inspect your booster pump facilities. Verify:
 - Operations and maintenance
 - Screens on air relief valves
 - Adequate protection from cross-connections with backflow prevention devices
 - Guards around rotating pump shafts
 - Security features



What to Expect on Day of Sanitary Survey

- Sanitary survey duration can be between a few hours and a few days, depending on system complexity
 - Duration will be discussed during pre-inspection communication with the compliance officer
- Staff with knowledge of the system's management, operations, and maintenance should be made available for the duration of the survey to answer specific questions
 - Managers
 - Treatment/Distribution Operators
 - Maintenance Staff
- Expect to visit each system asset, including sources, treatment facilities, consecutive connections, finished water storage tanks, and booster stations
 - Have keys and other necessary means to access each site
- Have all requested documents and data available for review at the time of the onsite inspection



What to Expect on Day of Sanitary Survey

Have all requested documents and data available for review at time of onsite inspection

All Public Water Systems	Record Keeping and Retention Periods
Bacteriological Analysis	5 Years
Chemical Analysis	10 Years
Actions to correct significant deficiencies or violations	3 years
Sanitary Survey reports and subsequent correspondence	10 years
Sampling Plans	Indefinitely or until these documents have been updated to new versions
Significant correspondence with NMED DWB (e.g. engineering applications & subsequent correspondence, engineering approval/denial letters, etc.)	Indefinitely
Public Notice Information	3 Years after issuance of the Public Notice



What to Expect on Day of Sanitary Survey

Have all requested documents and data available for review at time of onsite inspection

Community Water Systems	Record Keeping and Retention Periods
Emergency Response Plans, Operations & Maintenance Plans	Indefinitely or until these documents have been updated to new versions
Lead & Copper Records	12 Years
Disinfectant/disinfection by-products Records	Up to 10 Years
Consumer confidence reports (CWS only)	3 Years



What to Expect on Day of Sanitary Survey

Have all requested documents and data available for review at time of onsite inspection

Subpart H Water Systems (Surface Water or Ground Water Under the Direct Influence of Surface Water)	Record Keeping and Retention Periods
Turbidity Results	5 Years
Disinfection Profile/benchmark	Indefinitely
Long Term 2 Surface Water Treatment Rule Information	10 Years



What to Expect on Day of Sanitary Survey

- Have other pertinent documents/plans/SOPs not initially requested available
 - Asset Management Plan
 - Work orders
 - Cross-Connection Control Plan
 - Capital Improvement Plan/Budgets
 - Source Water Protection Plan
 - Tank inspection reports
 - **Customer complaints log**
 - **Hydrant Flushing Plan and records**
 - Valve Exercising Plan and records
 - **Water loss evaluation/audit**



3

Sanitary Survey On-Site Activities

- Overview of the NMED Sanitary Survey Checklist
- Operation, Maintenance, and Management Review
- Document and Records Review
- Operator Requirements
- Source Water Inspection
- Disinfection Process Inspection
- Surface Water Treatment Inspection
- Ground Water Treatment Inspection
- Chemical Storage, Handling, and Management Inspection
- Distribution System Inspection
- Finished Water Storage Tank Inspection
- Booster Pumping Facilities and Controls Inspection



Sanitary Survey Checklist

Sanitary survey
checklist used
by compliance
officers



 New Mexico Environment Department Drinking Water Bureau Sanitary Survey Checklist			
PWS ID#:	NM#####	PWS Name:	
Survey Date:	6/22/2026	System Type:	C Community
Connections:	200	Population:	650
		Source Type:	Groundwater
Compliance Officer Name:			
PERSONS ATTENDING SURVEY			
Name	Title	Address	Phone Number
GENERAL WATER SYSTEM DESCRIPTION			
Provide a general description of the water system including changes, updates, connections, source(s), storage, number of pressure zones, treatment, and control system(s) and alarm(s). Make corrections and updates to the PWS facilities inventory.			
OPERATIONS and MANAGEMENT			
Recommendation	Was the certified system operator present for the sanitary survey?		Recommended
002U	Is system operated by or under the supervision of a certified operator who meets or exceeds the appropriate certification level?		20.7.10.400.Q NMAC
002V	Does the system have enough appropriately leveled certified operators?		20.7.10.400.Q NMAC



General Information and Document Review

Missing or incomplete
non-bolded items are
generally
recommendations,
and bolded items are
significant deficiencies

The initial part of the sanitary survey is a review of your system information, such as:

- Population served
- Service connections
- Sources and treatment plants

Compliance officer(s) (CO) will also review

☒ Status of operator(s)

- Operator(s) present during the sanitary survey
- Names, level of certification, status of certification
- **Level of certification is adequate for designation of water system with respect to population served and treatment**
- Enough appropriately leveled certified operators

☒ Water systems records



General Information and Document Review

☑ Emergency Response Plan must be complete and available for review. Applies to community water systems only and lack of any of the following items *may* deem the plan inadequate.

- Identifies likely threats to their system and assigns the appropriate severity level and response to each type of event.
- Identifies routine operating emergencies such as: line breaks, pump malfunctions, acute MCL exceedances, power outages
- Identifies non-routine operating emergencies such as: chemical spills, drought, wind/ice storms, fire, floods, earthquakes, or other natural occurrences, intentional acts of sabotage
- Identifies appropriate contact personnel within and outside the system in the event of an emergency





General Information and Document Review

☒ Emergency Response Plan- continued

- Contains a formalized emergency communication protocol such as boil water advisory communication protocol and sample public notification forms and protocol
- Contains established emergency plans, actions, and procedures
- Contains list of identified critical or vulnerable customers (if applicable)
- Contains an inventory and has assessed critical equipment



General Information and Document Review

☑ Operation and Maintenance Plan must be complete and available for review. Lack of any of the following items may deem the plan inadequate.

- Contains a defined organizational structure
- Formalizes general and detailed system components and treatment information
- Contains scheduled standard operating procedures, maintenance, and sampling procedures (SOPs, SMPs, and SSPs)
- Defines specifications for new installations and repairs
- Identifies chemicals, appurtenance and equipment suppliers and contractors





General Information and Document Review

☑ Distribution System Sampling Plan (DSSP) must be complete and available for review.

- **Revised Total Coliform Rule**
 - Location of routine and repeat samples
 - Sampling schedule
- **Disinfectants and Disinfection Byproducts Rule (if required)**
 - Location of routine samples
 - Sampling frequency
 - Methodology used for site selection
- **Lead and Copper Rule (if required)**
 - Materials evaluations
 - Sample pool tiers
 - Primary and alternative sample site locations
- **IOCs, VOCs, SOCs, Radionuclides Rules (if required)**



General Information and Document Review

Compliance officer can also ask to see and discuss the following:

- ☑ Facility/distribution maps**
- ☑ Asset Management Plan (AMP)**
- ☑ Capital Improvement Plan (CIP)/budget**
- ☑ Current and future sampling requirements and results**
- ☑ Frequency of power outages (more than 2 per year)**
- ☑ Demonstrate adequate reliability**



3.1

Operator Requirements Review



Operator Definition

20.7.4.7 NMAC Definitions

L. "operate" means performing any activity or function or making any process control or system integrity decision regarding water quality or water quantity that has the potential to affect the proper functioning of a public water supply system or public wastewater facility or to affect human health, public welfare or the environment; **the term "operate" does not include the operation of monitoring equipment from a distant remote location;**

M. "operator" means any person who operates a public water supply system or public wastewater facility;





NMED Operator Rule Updates

■ Day-to-Day Operations

- Updates to set baseline operation requirements and expectations
 - Internal procedures for immediate NMED notification
 - Operator involvement, tank inspections, treatment and pressure monitoring, leak tracking, chemical feed oversight

■ Operator Responsibilities

- Certified operators run the system
 - Inspect tanks, verify chlorine residual, respond to system conditions, monitor system pressure, maintain monthly operating reports, log water usage
 - Daily monitoring of treatment facilities and chemical feed equipment
- Legal agreements between wholesale and consecutive systems





Operator Requirements

- ☑ It is highly recommended that the certified system operator be present for the sanitary survey
- ☑ **The system must be operated by or under the supervision of a certified operator who meets or exceeds the appropriate certification level**
- ☑ **The system must have enough appropriately leveled certified operators**
- ☑ Is there a backup certified operator if the primary one is not available?





Operator Requirements

☑ Operator's certification status

- Operator certification level and NM ID number (if certified)
- Expiration date of current certification
- Duration of employment with water system
- Relationship with system
 - Contract operator
 - Direct hire
 - Volunteer
 - Owner
- Duties and responsibilities
 - Process control or system integrity decisions
 - Microbial and chemical sampling
 - Distribution system

20.7.4.10 NMAC: LEVELS OF CERTIFICATION FOR OPERATORS OF PUBLIC WATER SUPPLY SYSTEMS

A. The levels of general certification for operators of public water supply systems from lowest to highest shall be:

- (1) level 1 water supply (WS1);
- (2) level 2 water supply (WS2);
- (3) level 3 water supply (WS3); and
- (4) level 4 water supply (WS4).

B. The levels of special certification for operators of public water supply systems from lowest to highest shall be:

- (1) small water (SW); and
- (2) small water advanced (SWA);

C. The levels of certification for water sample technicians at public water supply systems from lowest to highest shall be:

- (1) water sample technician 1 (WST1); and
- (2) water sample technician 2 (WST2).

D. The levels of certification for operators of distribution systems at public water supply systems from lowest to highest shall be:

- (1) distribution systems 1 (DS1);
- (2) distribution systems 2 (DS2); and
- (3) distribution systems 3 (DS3).



Operator Certification Levels - Treatment

Type of Treatment Process	Population Served				
	25 to 500	501 to 5,000	5,001 to 10,000	10,001 to 20,000	20,000+
Filtration (sand, gravity)	SWA	WS3	WS3	WS3	WS4
Coagulation, sedimentation, filtration	SWA	WS3	WS3	WS4	WS4
Chemical precipitation (Mn, Fe, softening)	SWA	WS3	WS3	WS4	WS4
Aeration	SW	WS2	WS3	WS3	WS4
Odor and taste control (activated carbon)	SW	WS2	WS3	WS3	WS4
Chemical addition (stabilization)	SW	WS2	WS2	WS3	WS4
Pressure filtration	SWA	WS2	WS2	WS3	WS4
Ion exchange (softening, defluoridation)	SWA	WS2	WS3	WS3	WS4
Chlorination	SW	WS2	WS2	WS3	WS4
Fluoridation	SW	WS2	WS2	WS3	WS4
Arsenic removal	SWA	WS3	WS3	WS3	WS4
Radionuclide removal	SWA	WS3	WS3	WS3	WS4
Special, such as desalinization	SWA	WS4	WS4	WS4	WS4
Production, ground water only	SW	WS1	WS2	WS3	WS4



Operator Certification Levels - Distribution

Type of Distribution Systems	Population Served				
	25 to 500	501 to 5,000	5,001 to 10,000	10,001 to 20,000	20,000 +
Distribution of treated surface water	SW	DS2	DS2	DS2	DS3
Distribution of chlorinated groundwater	SW	DS2	DS2	DS2	DS3
Distribution of unchlorinated groundwater	SW	DS1	DS2	DS2	DS3



Operator Certification Levels - Sampling

Type of Water Sampling	Population Served				
	25 to 500	501 to 5,000	5,001 to 10,000	10,001 to 20,000	20,000 +
Microbiology	SW or WST1	WST1	WST1	WST1	WST1
Chemical and Radiological	WST2	WST2	WST2	WST2	WST2



Operator Requirements

- ☑ It is recommended that the operator conducts self-inspections of the water system
 - Scope and frequency of self-inspections
- ☑ **The operator must perform measurements and calibration of water treatment monitoring equipment consistent with manufacturer recommendations**
 - Inline and benchtop analyzers
 - Analyzers measuring water quantity and quality
- ☑ The CO will want to review documentation to verify the operator is using proper inputs for treatment plant operations reports
 - Chemical usage and operational volumes
 - Peak flow rates
 - Calculated values, such as contact time





Operator Considerations

- If a contract operator used, have contract available for compliance officer to review how often the operator is onsite
 - Small systems contract for minimum amount of time onsite, so need to determine who else is checking on the well site, storage tanks, chlorine feed system
- Compliance officer can ask additional questions about operator responsibilities, such as:
 - who is responsible for responding to main breaks?
 - How does the operator interact with decision makers, particularly for the purchase of chemicals and equipment?
- Additional requests
 - Review of daily or weekly log sheets for reading of source meter, tank levels, and chlorine residuals
 - Ask for operator to demonstrate how chlorine residual is obtained



Questions and Discussion





3.2

Ground and Surface Water Source Review

- Wells, Springs, Reservoirs/Lakes, Streams and Rivers, and Infiltration Galleries



Ground Water Sources: Wells

- ☑ All well sources and capacity (gpm) should be listed accurately in DWW
 - Any changes should be reported to NMED
- ☑ **All sources must be approved by DWB**
- ☑ Emergency wells in use should be identified





Ground Water Sources: Wells

At each well site, compliance officers will evaluate the following:

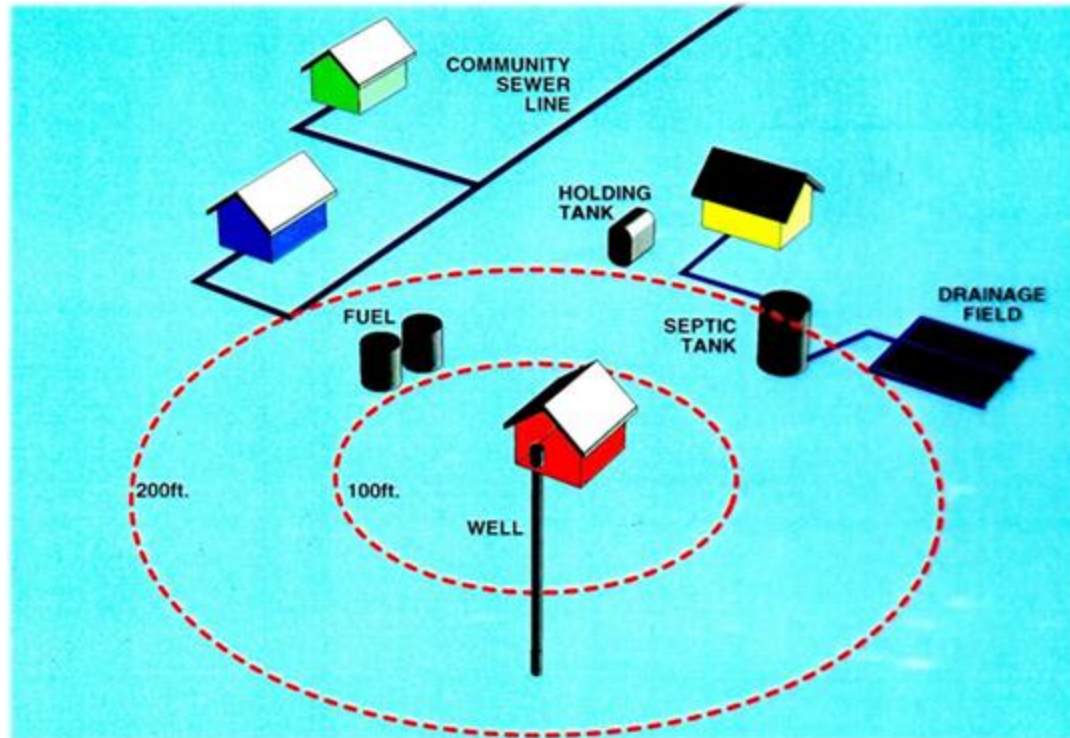
- ☑ If well is potentially influenced by surface water**
 - Less than 100 ft from a surface water body (including intermittent sources) and <200 ft if <100 ft elevation difference

- ☑ Existence of sources of contamination within 1,000 feet of the well**
 - NMAC 20.7.3.302 requires 200 feet between drainfield and public water supply well
 - Abandoned wells within range should be properly sealed





Well Setback Distances of Pollution Sources





Ground Water Sources: Wells

☑ Well Construction

- Well protected from submergence or, if in a pit, not subject to flooding
- Well protected with a water-tight sanitary seal with no unprotected openings, including electrical connections
- Well vented with non-corrodible 16-mesh or finer screen
- Well properly protected from damage





Ground Water Sources: Wells

- **New Construction & Engineering Standards based on Recommended Standards for Water Works (Ten States Standards)**
 - All wells have a downturned blowoff line above flood level
 - All system facilities secured behind locked fencing
 - Updated well and wellhead protection requirements
 - Non-threaded raw water sampling taps
 - Flow meters required at wells, treatment facilities, and service connections





Ground Water Sources: Wells

- ☑ Well should not be at risk to physical damage
- ☑ There must be a non-threaded raw water sample tap
- ☑ There must be a source meter and record of monthly readings
- ☑ Wellhouse properly constructed and maintained
 - No evidence of rodents or unauthorized entry (vandalism or graffiti)





Ground Water Sources: Wells





Ground Water Sources: Wells





Ground Water Considerations: Wells





Ground Water Considerations: Wells





Ground Water Considerations: Wells





Ground Water Sources: Wells

- ☑ Air/vacuum relief valve discharge pipe should be screened and air gapped
- ☑ There should be adequate pump controls to prevent water outages or premature pump failure
 - If well pump is manually operated, how is the storage tank is kept full and how are overflows at the tank prevented?





Ground Water Sources: Springs

- Springs can be difficult to survey since most of the infrastructure is buried and old

- ☑ **Spring construction must prevent contaminant entry or direct surface discharge**

- Overflow is protected and screened
- Hatch on spring box properly sealed
- Structure protected, fenced
- Spring water remains piped, doesn't surface
- Properly drained and surface water runoff directed away from the spring collection area

- ☑ **Must have raw water sample tap**

- ☑ **Spring source must be metered** and read at least monthly, records

- ☑ **Springhouse must be properly constructed and maintained**



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Ground Water Sources: Springs

- ☑ **Must not be signs of rodents or insects**
- ☑ **Springhouse must be protected from unauthorized access**
 - Spring collection infrastructure and spring box fenced, locked gate
 - Livestock or other animals within or near fenced area?
- ☑ **Must not be any sources of contamination within 1,000 feet of the spring**
- **Other considerations:**
 - Springs are typically located in remote areas, ensure year-round access
 - Ensure easements for access to spring and transmission main



Ground Water Under Direct Influence

☑ The compliance officer will evaluate if wells and springs are Ground Water Under the Direct Influence (GWUDI) of Surface Water

- Shallow wells (<120 ft deep or <120 to screened interval)
- Wells close to surface water bodies (within 200 ft of permanent or intermittent sources)
- Infiltration gallery
- Spring in fractured bedrock or limestone
- Bacteriological contamination or turbidity >0.3 NTU after storm event
- Subject to flooding or runoff

■ **GWUDI wells or springs must be treated as surface water sources**



Surface Water Sources

- All sources should be listed in DWW, capacity, and approved by DWB
- ☑ **Must have raw water sample tap** and monitoring of raw water
 - Turbidity, temp, pH
 - Measured continuously or grab samples
 - Frequency of grab samples
 - How raw water monitoring results are used to control or modify treatment processes
- ☑ If raw water subject to algae blooms, evaluate if copper sulfate fed or other measures to control algae blooms

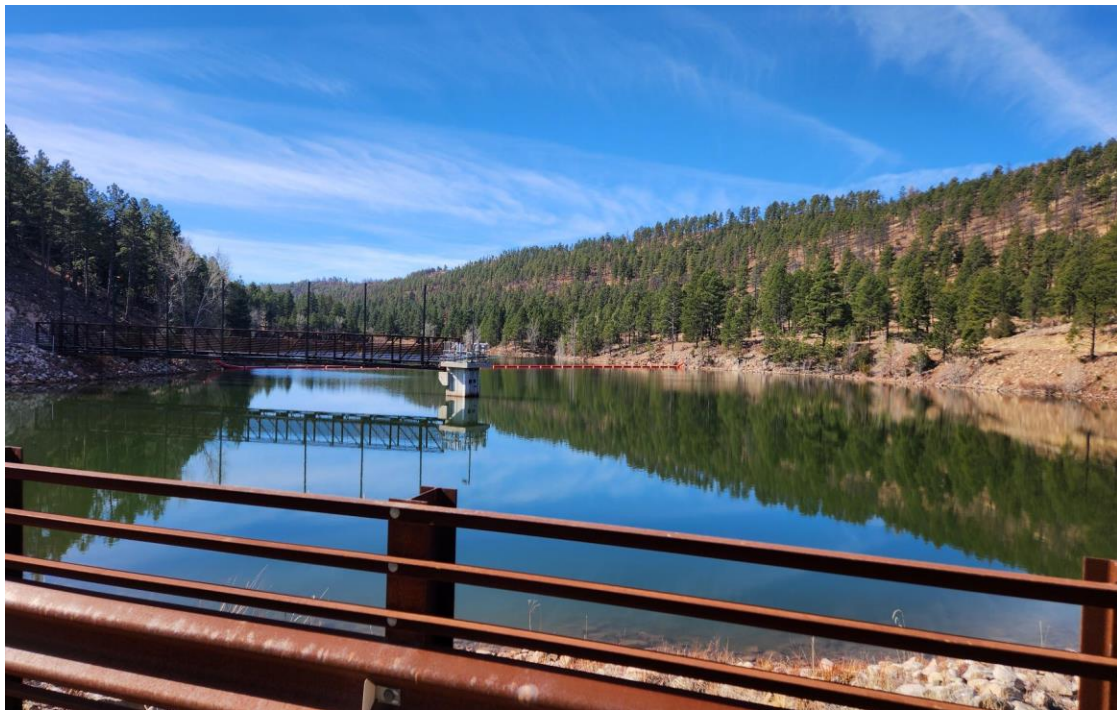


Surface Water Sources

- ☑ If intake level adjustable, is intake level adjusted to obtain best water quality?
- ☑ **Source must be metered, and production records available for review**
- ☑ **Pumps and controls operational and maintained**
 - If pumps used to convey raw water to the treatment plant, how are they activated: manually or based on clearwell level
- ☑ **Emergency backup power available and tested**
 - Should be tested weekly (on/off); monthly at full load
- ☑ **Source valves operational and maintained**



River/Stream - Intake





Surface Water Sources

- ☑ Source pumphouse must be in good condition and maintained inside and outside
- ☑ Source pumphouse must be protected from unauthorized personnel
- ☑ There must be secondary containment for fuel tanks (for a generator) and chemical storage tanks

WARNING

Public Water Facility

**TAMPERING WITH THIS FACILITY
IS A FEDERAL OFFENSE!!!**

INDIVIDUALS WHO ILLEGALLY ENTER OR
TAMPER WILL BE PROSECUTED TO THE
FULLEST EXTENT OF THE LAW!

FEDERAL STATUTE (42 U.S.C 300i-1)
MAXIMUM PENALTY UP TO 20 YEARS PRISON TERM
MAXIMUM FINE UP TO \$1 MILLION

To Report Suspicious Behavior:

Call 911 and

Insert System Name

Insert System 24 Hour Phone Number



Surface Water Sources- Considerations

Sanitary Survey Checklist items and observations that may meet the definition of a Significant Deficiency.

Not limited to a deficiency "...that is causing or has the potential to cause the introduction of contamination into the water delivered to consumers."

- Area around the intake restricted or under system ownership
- Watershed management and planning for long-term reliability
- PSOC: Dischargers (e.g., industrial, wastewater), Non-Point (e.g., cattle grazing, run-off)
- Source water monitoring –monitoring upstream of intake
- Dam safety and maintenance for impoundments
- Weather concerns (e,g, freezing/ice damage, floating debris, clogging)



Miami, NM Lake Raw Water Intake



Source Water - Considerations

- Frequency of intake inspections
- Treatment/Maintenance provided at the reservoir or impoundment
 - Algae control (e.g., copper sulfate)
 - Iron/ manganese (e.g., pre-oxidant, aeration)
 - Cleaning (e.g., air burst, traveling screen, manual)
- Transmission main operations and maintenance
- ERP should include raw water emergencies – intake failures, natural disasters, transportation corridor spills, wildfire, and malevolent acts
- SOP for operational and treatment adjustments following source water impacts
 - Wildfire ash/sediment, heavy rain events, seasonal run-off, upstream discharges
- Secondary or alternative water supply planning



Questions and Discussion



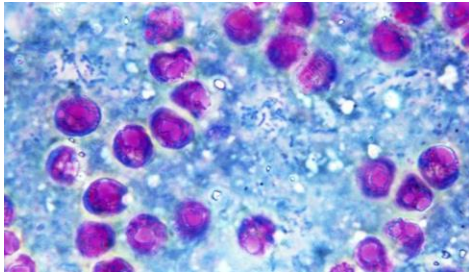
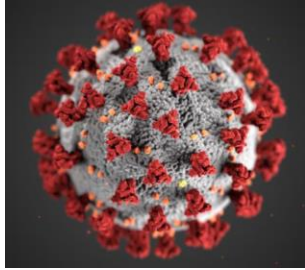


3.3

Disinfection



Disinfection



- **Disinfection** is the process of inactivation of microorganisms (like bacteria, viruses, and parasites).
- Drinking water sources may be contaminated with microorganisms harmful to human health.
- Disinfection is used when there is a risk of pathogenic microorganisms, such as:
 - E. coli
 - Cryptosporidium
 - Giardia
 - Pathogenic viruses



Disinfection

■ Who is required to disinfect?

- Surface water treatment systems
 - **All** sources - Including Ground Water Under Direct Influence (GWUDI)
- Groundwater treatment systems
 - The Ground Water Rule (GWR) **may trigger** disinfection requirement if...
 - Source is E. coli positive
 - Susceptible to contamination
 - Questionable sanitary quality,
 - Significant deficiencies; (up to 5 NM PWSs now / rare)
 - NMED may require disinfection
 - Must meet 4-log reduction for viruses and conditions of approved disinfection plan
 - PWS disinfects voluntarily
 - Application to NMED per 20.7.10.200.C(2) NMAC (approval not needed)
 - Report chlorine residuals with bacteriological results and meet MRDL





NMED Rule Update to Disinfection

■ Groundwater System Disinfection Updates

- Disinfection regardless of prior findings (3,300+ people)
- Dead-end flushing to maintain disinfectant residuals
- Residual of at least 0.2 mg/L free chlorine
- Disinfectant residual measured weekly and reported monthly
- Chemical storage tank spill containment
- Day tank chemical storage
- 4-log removal/inactivation based on required sampling under GWR





Disinfection in New Mexico



■ 45 Surface Water Treatment Plants in NM

- 29 Hypochlorination
- 2 Gas Chlorine
- 1 Chlorine Dioxide
- 2 Ozone
- 3 Ultraviolet light radiation
- Some WTPs use more than one type of disinfection
- Chloramination (secondary disinfection only)

■ Groundwater systems in NM

- Predominately, chlorination with hypochlorite, typically aqueous sodium hypochlorite (sometimes generated onsite)



Disinfection

- ☑ Compliance officer will conduct a walk-through of all chlorination facilities and evaluate O&M, recordkeeping, sanitary concerns, and security concerns
 - Records must be maintained and available if required to disinfect under GWR or SWTR
- ☑ Operators should not practice batch chlorination prior to taking a coliform sample
 - Elevating the disinfectant level, locally or w/timing, to get a negative test result
 - Source, storage tank, distribution system
- ☑ All disinfection systems must be approved and listed in the database as active



Disinfection – Ultraviolet Light

☑ If Ultraviolet Light (UV) is used

- Ensure size is appropriate for maximum flow
- UV transmittance sensor should operate a valve to automatically shutdown the water supply if the UV reactor fails
- Maintain records of:
 - UV manufacturer and model number
 - cleaning frequency of quartz sleeve
 - Rated capacity
 - Month and year UV lamp was replaced





Disinfection

- ☑ Install and maintain proper backflow assembly if the water supply line is plumbed directly to a chlorine solution tank
- ☑ Must have post-treatment sample tap
 - Needed to determine adequate chlorine residual under GWR and SWTR
 - Allows for process control
- ☑ Chlorine (and all chemicals used) must be NSF/ANSI Standard 60



e.g., Backflow preventor in chlorine room that has not been tested within the past year.



Disinfection

- ☑ There should be back-up chlorine feed pumps and spare parts
- ☑ Operators should understand requirements to meet CT (chlorine concentration X time) Method
 - Prior to the 1st service connection (often is at the WTP)
 - Free chlorine is required for disinfection/CT Method, then can use total chlorine for entry to distribution
 - Ensure CT Method is met and ability to maintain a minimum 0.2 mg/L chlorine residual at entry point (SWTR)
 - Ensure portable chlorine test kits are properly calibrated using an approved EPA method (correct and unexpired reagents)





Disinfection

☑ Chlorine feed pumps and controls should be properly constructed and maintained to provide uninterrupted, reliable service

- Verify inline chlorine analyzer reading on display matches SCADA display and check the reagent expiration and condition
- Fully understand how chlorine feed pumps are operated (on/off) and feed rate is adjusted (e.g., flow-paced)
- Follow manufacturer instructions for install and service
- Ensure a representative stream of sample water (keep water line runs short and flowing)





Aqueous Hypochlorite Disinfection - Considerations

- What type of hypochlorite is used (calcium or sodium)? What strength?
- Are safe and secure practices followed during chemical handling and mixing?
- Are chemicals properly stored (spill containment)?
- Any concerns with old chemical/decay (delivery record)?
- Are solution tanks covered with screened vents to the exterior to minimize corrosive vapors?
- If operator is diluting chlorine, is an SOP in place?
- Are critical spare parts available, such as spare chemical feed pump?
- Security measures in place from natural and malevolent incidents?





Gas Chlorine Considerations

■ Gas chlorine safety concerns

- Ammonium hydroxide (leak detection)
- Enclosed (chlorine room)
- Inspection window
- Outward opening doors w/panic hardware
- Cylinders restrained / out of direct sunlight
- Air intake (high level) / Exhaust fan (floor level)
- Vacuum operation
- Gas detection device (near floor level) w/alarms
- Scrubber, SCBA, Cylinder Repair Kit, RMP, ERP,...

 Chlorine Gas Injection Room Safety Checklist <i>(Recommended inspection frequency annually)</i>					
Authority:			Inspection Date: / /		
Name of Inspector:			Title:		
Location Surveyed:			How many Cylinders? Full ____ MT ____		
#	Needs work	Yes/OK	N/A	Item	
1.				Is there a chemical ID sign on the room door	
2.				Does the door swing outward towards the exterior?	
3.				Is the door kept locked & only accessible to authorized personnel?	
4.				Does the room have at least one shatter resistant observation window?	
5.				Are all in-service cylinders supported with a chain or other mechanism?	
6.				Are the Chlorine weigh scales set at grade level or a ramp provided?	
7.				Are empty cylinders clearly identified?	
8.				Are spare cylinders secured at the point of 2/3 rds their height?	
9.				The room piping & building steel should not be significantly corroded?	
10.				Is all interior room piping identified?	
11.				Does interior lights & ventilation fan have a switch outside the entry door?	
12.				Does the exhaust fan operate?	
13.				Does the fan shut off within 1 minute of the door closing?	
14.				Is the exhaust fan located low in the space? But above 15" from the floor?	
15.				Air intake located high in the space? But less than 12" from the ceiling?	
16.				Does the room have a Cl ₂ gas monitor system?	
17.				Is the alarm system inspected and calibrated periodically? Last? _____	
18.				Does the alarm system have a warning light/horn outside?	
19.				Is the annunciator light/horn identified with a sign?	
20.				Does the sign specify what the correct response action(s) should be?	
21.				Is the chlorine alarm connected to your SCADA system?	
22.				Room has a heater that keeps temperature above 50°F. Does it work? Y N	
23.				Is the flexible tubing replaced at least annually?	
24.				Are all chlorine gas pressure lines located on interior walls only?	
25.				Is there a supply of new lead washers? At least 10 Y N	
26.				Is a leak detection (10 % ammonium hydroxide) squirt bottle provided?	
27.				Is the leak detection bottle labeled? CAS# 1336-21-67	
28.				PPE: Rubber gloves, apron & face shield clean, protected & available?	
29.				Is there a special cylinder cart available to move cylinders?	
30.				Is the SDS and HSPS # 367 available & accessible?	
31.				Is the SOG for cylinder change available & accessible?	
32.				Is there an eye wash drench shower available at this location?	
33.				Is a "Compressed Gas" Pictogram (see above) posted on the entrance door?	
34.				Does the Authority own a Chlorine Leak KIT A for 150 pound cylinders?	
35.				Are SCBA units available for emergencies when cylinders are changed out?	
36.				Is the DOT placard for Poison gas 2.3 posted outside? (see above)	



Gaseous Chlorine Considerations

- At least 2 cylinders available- 1 online and the other in standby w/automatic switchover (150 lbs. or 1-ton)
- Additional spare cylinders nearby to replace empty cylinders (30-90 day supply)
- Cylinders properly secured, typically a chain device
- Scale to monitor chlorine gas usage
- Procedure for delivery, change-out of cylinders, operation, and maintenance in the O&M Plan
- Security measures in place from natural and malevolent incidents?





3.4

Treatment Facility and Chemical Storage



Treatment Plant – General Information

☒ Treatment plant must be protected from unauthorized access

- Fences and locked gates
- Security cameras
- Intrusion Alarms
- Access procedures (IDs, FOBs, Keys, etc.)

☒ The treatment plant must have adequate drainage to protected from flooding

- Perimeter/site drainage to divert water offsite?

☒ Secondary containment must be provided for chemical storage containers

- Aqueous Sodium Hypochlorite at 5% or less is not categorized as hazardous
- NMED Recommended Standards: 'double contained...and not threaten operations if spilled'
- 10 States Standards: 'for hazardous and incompatible chemicals'
- 100% of container volume plus freeboard.





Treatment Plant – General Information

☑ The treatment plant must be kept clean, dry, and in good repair inside and out

- Water may be present from cleaning
- Scale stains from standing water?

☑ The treatment plant should not be used to store pesticides, fertilizers, petroleum products or yard equipment

- Chemicals that react with each other should be stored separately
- Risk of staff accidentally using wrong chemicals for treatment

☑ Available equipment should be correct and designed for continuous operation of the treatment applications used

- If no, what is missing?
- What controls pump operation?
- Is it a temporary setup?





Treatment Plant – General Information

☑ Operational backup units should be available in case of emergency

- Pumps (pressure and chemical)
- Chemical storage
- Automatic or manual switchover, shutdown?

☑ **The PWS should have a preventative maintenance program, and should have spare parts on hand for critical components**

- Maintenance being performed and documented (is equipment out-of-service?)

☑ Auxiliary power should have automatic startup available and be tested regularly

- Documentation of generator tests
- Testing with load is best practice





Treatment Plant – General Information

☑ Material Safety Data Sheets (MSDS) [Safety Data Sheets (SDS)] should be posted for each chemical

- Key locations
 - Chemical storage rooms
 - Admin/Office “Right to Know” location

☑ Safety equipment should be provided as needed

- List safety measures



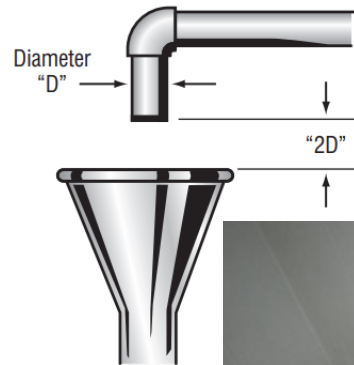


Treatment Plant – General Information

☑ Cross connection control measures must be in place between treated and untreated water in the treatment plant

- Hose connections equipped with double-check valves
- No submerged water inlets to chemical tanks
- Drainpipes terminate at an air gap of at least 2 pipe diameters and none less than 1"

☑ Backflow devices must be inspected at least annually





Treatment Plant – General Information

☒ Does your system use Supervisory Control and Data Acquisition (SCADA) system to monitor, maintain, and make process control decisions?

- What can be viewed with SCADA vs. controlled by SCADA?
- Limitations of SCADA controls?
- What security measures are in place?

☒ Staff should be trained on how to use the SCADA system to maintain compliance

- Procedures on how to read and respond to alarms





Treatment Plant – General Information

☑ Does your PWS have emergency plans for process control decisions if equipment is inoperable?

- Procedure for manual continuous operation.
- Procedure for shutdown of flow to finished water storage and distribution.

☑ Plant piping should be color-coded and/or labeled to differentiate between finished, raw, process, and wastewater flow and direction





Treatment Plant – General Information Considerations

Review Sanitary Survey observations that may meet the definition of a Significant Deficiency.

Not limited to a deficiency “...that is causing or has the potential to cause the introduction of contamination into the water delivered to consumers.”

- Intermittent operation
- Lack of redundancy
- Poor automation or manual operation
- Inadequate chemical storage
- Lack of security
- Poor housekeeping



3.5

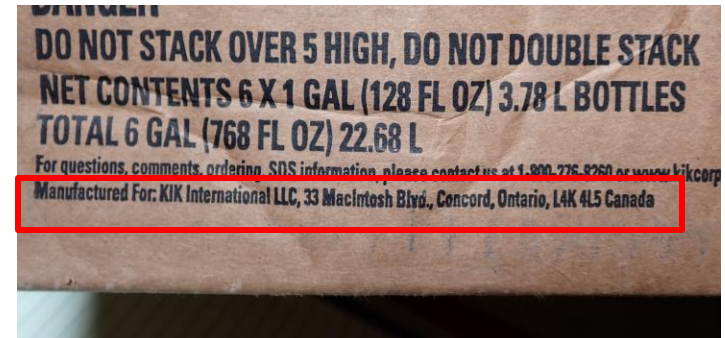
Chemical Addition



Chemical Addition – Chemicals

☑ All chemicals used must be approved under ANSI/NSF standard 60 or equivalent

- Applies to all chemicals
- If not labeled, the brand name, manufacturer, and location of manufacture are referenced in NSF database





Chemical Addition – Chemical Storage

- ☑ Chemicals should be stored out of sunlight and in a dry area
 - Sunlight and heat degrade the solution strength of chemicals like sodium hypochlorite
 - White or opaque tanks protect against UV light but not heat

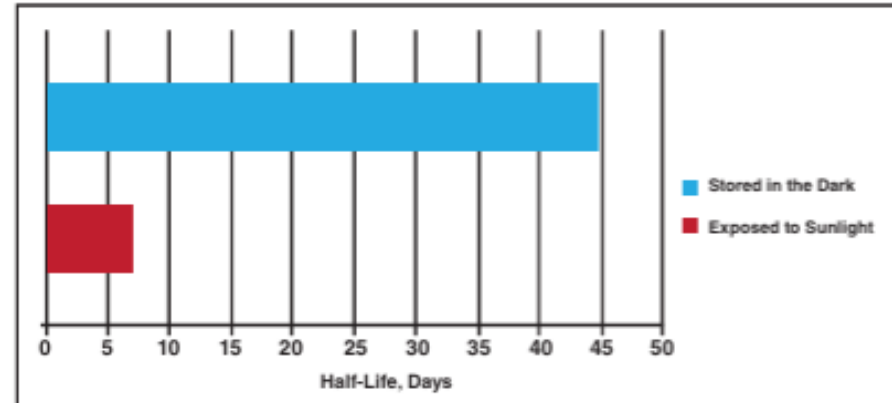




Chemical Addition – Chemical Storage

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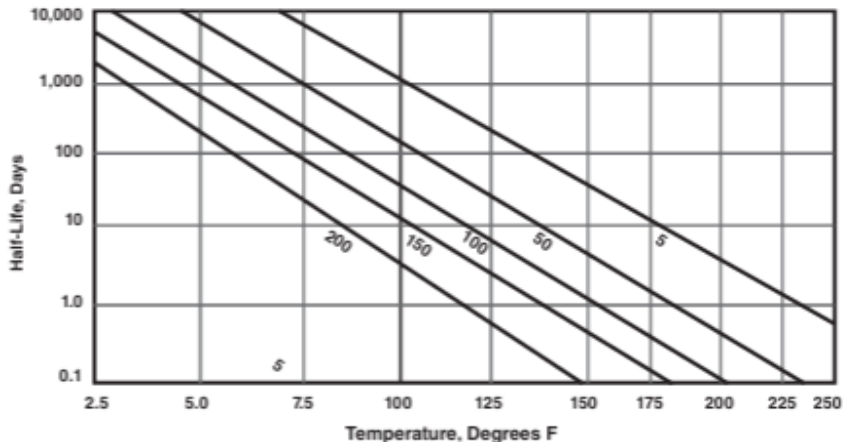
The effect of light on the stability of sodium hypochlorite solution (200 gpl available chlorine, 25° C)

Source: Hill Brothers Chemical Co. Sodium Hypochlorite Chemical Profile



Chemical Addition – Chemical Storage

- ☑ Chemicals should be stored out of sunlight and in a dry area
 - Sunlight and heat degrade the solution strength of chemicals like sodium hypochlorite
 - White or opaque tanks protect against UV light but not heat



The effects of increasing temperature on the storage life of sodium hypochlorite solutions at different strengths stored in the dark. 200gpl, 150gpl, 100 gpl, 50 gpl and 5gpl.

Source: Hill Brothers Chemical Co. Sodium Hypochlorite Chemical Profile



Chemical Addition – Chemical Incompatibility

- ☑ Incompatible chemicals need to be stored and handled separately
 - Liquid chemicals and dry chemicals should not be stored together, regardless of which compatibility group they fall into.
 - Water treatment chemicals are divided into six incompatible groups: Acids, Bases, Salts & Polymers, Adsorption Powders, Oxidizing Powders, and Compressed Gases. Chemicals in different compatibility groups should not be stored together.
 - Products such as paint, antifreeze, detergent, oil, grease, fuel, solvent, and beverages should not be stored in the same area as water treatment chemicals.
 - All chemicals should be stored in secure, well-ventilated areas that are free of moisture (especially dry chemicals), excessive heat, ignition sources, and flammable/ combustible materials.
 - Dry chemicals in bags need to be stored on pallets to avoid getting wet or damaged



Chemical Addition – Chemical Incompatibility



Incompatible Chemicals Storage

A sanitary survey quick reference guide for determining how to properly store chemicals at a water treatment plant

Dos and Don'ts

Do not store liquid chemicals and dry chemicals together regardless of which compatibility group they fall into.

Do not store chemicals from different compatibility groups together. Water treatment chemicals are divided into six incompatible groups: Acids, Bases, Salts & Polymers, Adsorption Powders, Oxidizing Powders, and Compressed Gases. To ensure the safety of system personnel and the system itself, store each of these groups of incompatible chemicals separately (compatibility groups listed on reverse side).

Do not store products such as paint, antifreeze, detergent, oil, grease, fuel, solvent, and beverages in the same area as water treatment chemicals.

DO store all chemicals in secure, well-ventilated areas that are free of moisture (especially dry chemicals), excessive heat, ignition sources and flammable/ combustible materials.

DO see your Material Safety Data Sheet (MSDS) if you encounter a chemical that is not listed on one of the following tables (MSDS required by OSHA Regulation 29.CFR.1910.1200 for all organizations/water systems that handle hazardous chemicals).

⚠ Warning ⚠

Storing incompatible chemicals together could create a hazardous reaction such as the production of toxic gas, accelerated corrosion, or an exothermic reaction (a chemical reaction that releases heat), which could result in an explosion and/or fire. This reaction could be catastrophic, resulting in loss of life and rendering the water plant inoperable.

Examples:

Examples of Incompatible Chemicals	Hazardous Reactions
Powdered Activated Carbon (PAC), an adsorption powder, should not be mixed with Potassium Permanganate, an oxidizing powder	Excessive heat generation, with the possibility of explosion and fire. Note: PAC alone is extremely combustible.
Calcium Hypochlorite, a combination base/oxidizer should not be exposed to moisture or mixed with viscous fluid such as oil.	Excessive heat, fire or explosion possible. Can provide an ignition source for combustible materials.
Concentrated Sulfuric Acid, a strong acid, should not be mixed with Concentrated Sodium Hydroxide, a strong base.	Excessive heat and liquid explosion. Note: Highly concentrated acids and bases when mixed together will have a much more hazardous reaction than weak acids and bases.
Calcium Oxide, a strong base available only as a powder, should not be exposed to moisture.	Excessive heat, fire. Can provide an ignition source for combustible materials.

Compatibility Groups: Common Water Treatment Chemicals

Group I: Acids

Name	Common Name	Available Forms ¹
Acetic Acid	Ethanoic Acid	Liquid
Hydrofluosilicic Acid	Fluosilic Acid	Liquid
Hydrogen Fluoride Acid	Hydrofluoric Acid	Liquid
Hydrochloric Acid	Muriatic Acid	Liquid
Nitric Acid	Sulfuric Acid	Liquid

Group II: Bases

Name	Common Name	Available Forms ¹
Calcium Hydroxide	Hydrated Lime	Dry
Calcium Oxide	Quicklime	Dry
Calcium Hypochlorite	HTH	Dry
Sodium Bicarbonate	Sodium Bicarbonate	Dry
Sodium Carbonate	Soda Ash	Dry
Sodium Hydroxide	Caustic Soda, Lye	Liquid, Dry
Sodium Hypochlorite	Bleach	Liquid
Sodium Silicate	Water Glass	Liquid

¹ Certain concentrated dry chemicals, like calcium hypochlorite and calcium oxide (quicklime) will produce an exothermic reaction when exposed to liquid or even small amounts of moisture.

Group III: Salts & Polymers

Name	Common Name	Available Forms
Aluminum Sulfate	Alum	Liquid, Dry
Copper Sulfate	Blue Stone	Liquid, Dry
Ferric Chloride	Ferrichlor	Liquid, Dry
Ferric Sulfate	Ferri-Floc	Dry
Ferrous Sulfate	Coppers	Liquid, Dry
Polyaluminum Chloride	PACL	Liquid
Polyelectrolytes (Cationic, Anionic, Non-ionic)	Polymer	Liquid, Dry
Sodium Aluminate	Soda Alum	Liquid, Dry
Sodium Fluoride	Sodium Fluoride	Liquid, Dry
Sodium Hexametaphosphate	Glassy Phosphate	Dry
Sodium Phosphate	Sodium Phosphate	Liquid, Dry
Zinc Orthophosphate	Zinc Ortho	Liquid

Group IV: Adsorption Powders

Name	Common Name	Available Forms
Powdered Activated Carbon	PAC	Dry
Granular Activated Carbon	GAC	Dry

Group V: Oxidizing Powders

Name	Common Name	Available Forms
Potassium Permanganate	Permanganate	Dry

Group VI: Compressed Gases²

Name	Common Name	Available Forms	Incompatible Chemicals Within This Category ³
Ammonia	Ammonia	Liquid, Gas	Chlorine
Chlorine	Gas Chlorine	Liquid, Gas	Ammonia
Carbon Dioxide	Dry Ice	Liquid, Gas	-
Sulfur Dioxide	SO ₂	Liquid, Gas	-

² Each compressed gas should have its own separate storage shed area.

³ Chlorine and ammonia should be stored separately from each other, as well as from all other chemical groups.



Chemical Addition – Chemical Mixing/Day Tanks

☑ Chemical containers need tight-fitting covers

- Off-gassing of chemicals can be corrosive to equipment and harmful to staff working in the area

☑ There should be sufficient capacity for at least one day of storage for each solution day tank

☑ There should be means to measure the solution levels in solution tanks

- Ultrasonic sensor
- Sight glass



Photograph from Albuquerque Water System



Chemical Addition – Chemical Mixing/Day Tanks

- ☑ Ensure volumes are determined accurately and mixing tanks are filled properly
 - Review SOPs for mixing or diluting chemicals, filling day tanks
- ☑ Ensure sufficient solution in the chemical mix tank to avoid the interruption of a key treatment process
- ☑ Ensure continuous agitation is provided to maintain slurries in suspension
- ☑ Ensure overflow pipes, when provided, are turned downward with the end screened



Albuquerque Water System



Chemical Addition – Bulk Delivery





Chemical Addition – Chemical Mixing/Day Tanks

☑ Describe if cross-connection control is provided on the service water lines that discharge to the solution tank

- Pressure reducing zone or double check valve

☑ **Determine if there are any cross connections present at any of the chemical solution tanks**

- Are backflow prevention devices tested annually?

☑ **Verify that tanks are labeled to designate the chemicals contained in them**





Chemical Addition – Chemical Feed Pumps

- ☑ Ensure chemical feed equipment is readily accessible for servicing, repair, and observation of operation
- ☑ Ensure pumps are operational and maintained
 - Are there redundant feed pumps installed?
- ☑ Ensure only minor amounts of scale buildup (or no buildup) on valves and injectors





Chemical Addition – Chemical Feed Pumps

- ☑ Ensure valves are replaced at least annually or as prescribed in manufacturer specifications
- ☑ **Ensure suction and discharge tubing is not clogged, discolored, or leaking**
- ☑ Ensure speed and stroke adjustments on diaphragm pumps are set within 20% and 90%
- ☑ **Ensure spare pump tubes for peristaltic pumps are available**





Chemical Addition – Chemical Feed Pumps

- ☑ Ensure that plastic tubing is as short as possible and sloped to permit draining
- ☑ Ensure pumps are calibrated using manufacturers' recommended procedures
- ☑ Ensure materials in contact with chemicals and surfaces are resistant to the aggressiveness of the chemical solution
- ☑ Flow-based chemical feed pumps are highly recommended





Chemical Addition – Chemical Feed Pumps

- ☑ Ensure chemical feed rates are proportional to flow
- ☑ Ensure there is a means to measure water flow provided to determine chemical feed rates
- ☑ Ensure there are provisions for measuring the quantities of chemicals used
- ☑ If more than one chemical is fed, ensure that chemical injection points are labeled
- ☑ Ensure adequate solution water and agitation of the chemical in the solution tank





Chemical Addition – Dry Chemical Feeders



- Volumetric dry chemical feeder
 - Feed rate based on volume
 - Good for chemicals with stable density
- Gravimetric dry chemical feeder
 - Feed rate based on weight
 - More accurate than volumetric feeders



Chemical Addition – Dry Chemical Feeders

- ☑ Ensure dry chemical feeders completely enclose chemicals to prevent emissions of dust to the operating room
- ☑ Ensure there are no signs of cracks or breaks in the dry chemical hopper
- ☑ Ensure feeders are calibrated using manufacturers' recommended procedures





Chemical Addition - Considerations

Sanitary Survey Checklist items and observations that may meet the definition of a Significant Deficiency.

Not limited to a deficiency "...that is causing or has the potential to cause the introduction of contamination into the water delivered to consumers."

- Chemical application points of the proper design at the proper location for the treatment process
- Chemical pump operation **on/off** with the flow of the water
- Chemical pump operation **adjust output** to changes in flow (i.e., flow-paced)
- Chemical feed systems designed to allow verification of output (e.g., pump **drawdown cylinders**, flow meter, inline analyzer)





Chemical Addition - Considerations

- Redundant feed pumps- should have redundant pumps for reliability purposes to allow one pump to be offline for service/repair
- Ensure adequate mixing allowed after chemical injection location
- **Alarms** and precautions should be in place to warn of over and underfeeding of chemical
- **Cybersecurity** considerations for SCADA used to control pumps
- Review daily log sheets for tracking of chemical feed rates and chemical use
- Ask the operator who is allowed to make changes to chemical feed pumps and how decisions are made





Chemical Addition - Considerations

- Specifics
 - Limited feed line length (e.g., viscous Polymers and coagulants)
 - Chase water use
 - Application location
- Proper containment in the event of a leak or overflow
 - Containment basins or double-walled tanks
- Process for the delivery of bulk chemicals
 - Signage on chemical building so it is clear where deliveries occur for each chemical
 - Spill containment at site of connection
 - Required operator to be onsite to oversee deliveries
 - Verification of chemical
 - Documentation of delivery





Questions and Discussion





3.6

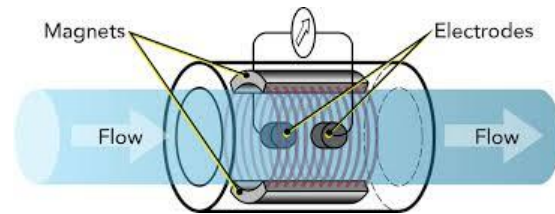
Surface Water Treatment - Pretreatment



Pretreatment – Raw Water Quantity Monitoring

☑ Ensure that a raw water flow meter is installed and used to monitor the amount of raw water being taken into the treatment plant

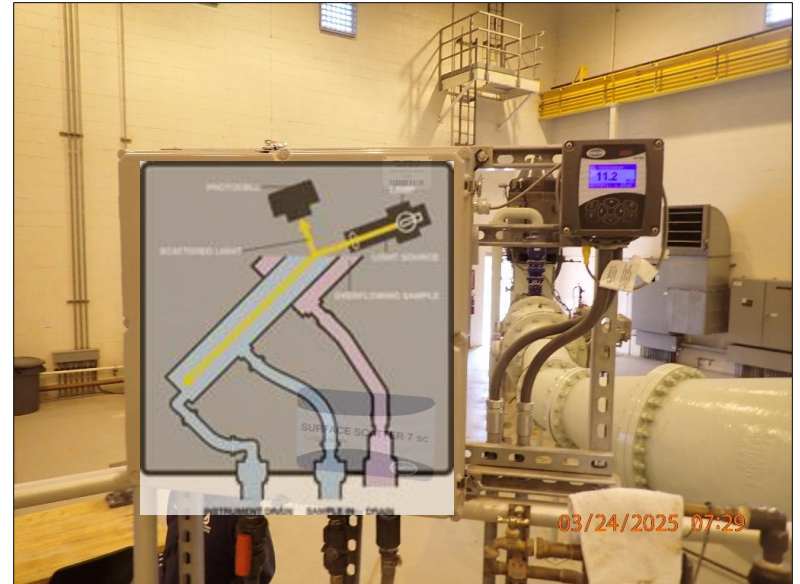
- Review flow records
- What is the frequency of equipment verification/calibration?
 - Inaccuracy relates to volume taken from source
 - Can also relate to flow-pacing of chemicals





Pretreatment – Raw Water Quality Monitoring

- ☑ Ensure that raw water turbidity is monitored continuously
 - Review turbidity records
 - Review other key operational parameters
 - pH
 - Temperature
 - Organics (UV254)
 - Is turbidity monitored at the intake or the plant?
 - How long does it take water from the sample line to reach the plant and how does that affect the result?





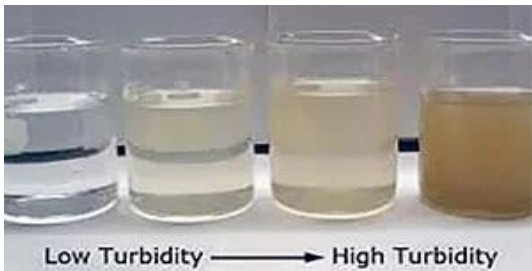
Pretreatment – Raw Water Quality Monitoring

☑ **Raw water turbidimeters must be calibrated at the frequency specified by the manufacturer**

- Manufacturer, contractor, or internally calibrated?
- Typically quarter

☑ **Ensure that unexpired standards are used to perform instrument calibration**

- Review expiration date on calibration solution bottles





Pretreatment – Pre-sedimentation

- ☑ Does the plant utilize pre-sedimentation?
 - Not used at many surface water plants
- ☑ Ensure that turbidity levels leaving the pre-sedimentation basin are less than the turbidity entering the basin
 - Pre-sedimentation basins are designed to capture some of the raw water turbidity
- ☑ Does the pre-sedimentation basins have a functional sludge removal apparatus?
 - Have O&M and management of the process



Albuquerque Water System Pre-sedimentation basin



Pretreatment – Pre-sedimentation

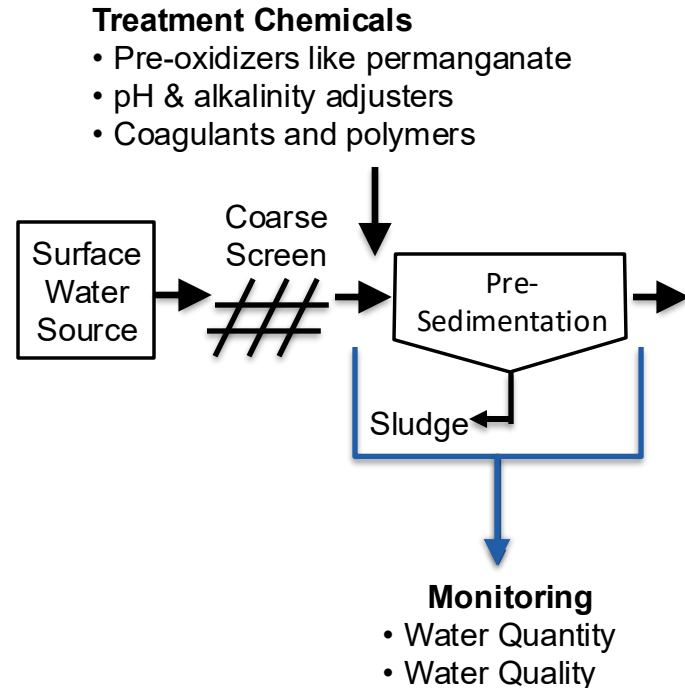
☑ What coagulants and aids are used in pretreatment?

☑ Ensure the plant has plant-specific strategies for determining an appropriate coagulant dose

- Coagulant dosing SOPs for pretreatment
- Turbidity goals

☑ Ensure coagulant chemicals are fed continuously during treatment plant operations

- Flow-paced chemical addition?





3.7

Surface Water Treatment – Flash Mix



Flash Mix

☑ If mechanical/rapid mix is utilized, ensure backup units or spare parts are available

- Are they installed, onsite, budgeted/located for immediate procurement?

☑ Operators should have a preventative maintenance program and schedule in place for the rapid or static mixers

- Equipment and procedure to access either type of unit

Maintenance Task	Operator	January				
		1/1/2024	1/8/2024	1/15/2024	1/22/2024	1/29/2024
Daily						
Inspect well sites	Operator	X	X	X	MM	SG
Inspect storage tank (routine)	Operator	X	X	X	SG	MM
Inspect chemical system	Operator	X	X	X	DR	DR
Weekly						
Weedwhack/weedkill storage tank area	Operator	NA	NA	NA	NA	NA
Calibrate chemical pump	Operator		X		SG	
Monthly						
Inspect generator, transfer switch, fuel tank.	Operator		X			
Inspect storage tank (periodic)	Operator			X	MM	
Semi-Annually						
Replace chemical tubing	Mechanic		X			
Clean chemical storage tank	Operator					MM
Annually						
Perform contracted well test	Well Co. #1	X				
Perform master meter calibration	Meter Co. #1		X			
Rebuild chemical feed pump	Mechanic					
Replace chemical tubing	Mechanic					
Distribution system hydrants inspected/tested.	Operator					
Distribution system valves inspected/exercised.	Operator		X			



Flash Mix

- ☑ CO will look for signs of rusting or calcium buildup on the inside or outside of the mixing unit
 - May not be able to inspect the inside
- ☑ All mechanical equipment for the mixers, including backup units, should be functioning properly
 - What is the quality control for the process?





Flash Mix Considerations

- Sanitary Survey Checklist items and observations that meet the definition of a Significant Deficiency.
 - Any deficiency that is “...*causing or has the potential for causing the introduction of contamination into the water delivered to consumers.*”
 - How critical is the flash mix to the process?
 - Does it have a redundant unit?
 - What is the procedure if the unit process fails?
 - Do they have a preventative maintenance schedule on it, and is it implemented?



3.8

Surface Water Treatment - Flocculation Process



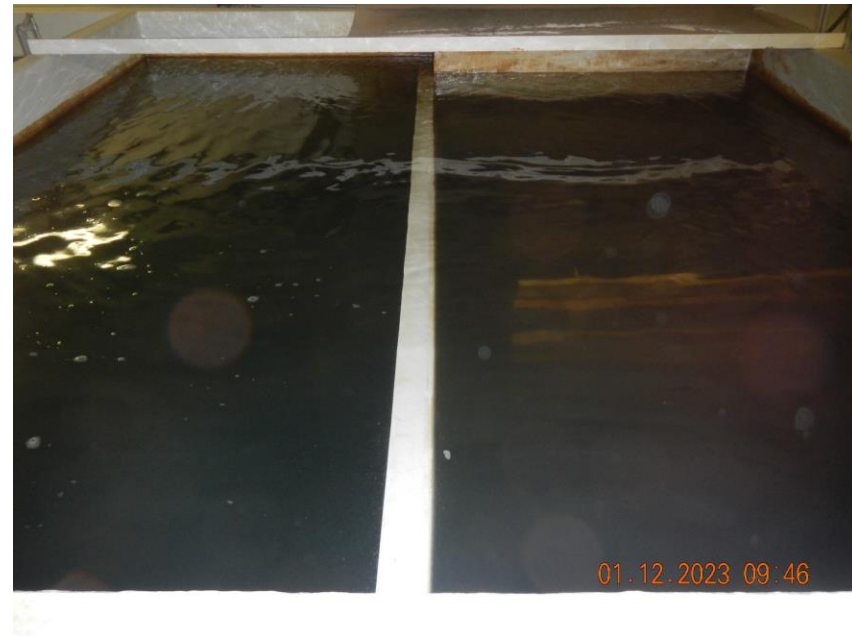
Flocculation

- ☑ Ensure flow is evenly distributed among the flocculation basins
- ☑ Is adequate mixing and floc formation achieved via the use of baffles within the flocculation units?
- ☑ Does the operator adjust mixing based on
 - Performance
 - Flow rate
 - Seasonal water temperature
 - Velocity Gradient (G) / Revolutions per Minute (RPM)



Flocculation

- ☑ Are holes or cracks visible in any of the baffles which would allow short-circuiting?
 - Short-circuiting causes a shorter mixing time, reducing floc formation.
- ☑ Does the system use mechanical mixing within the flocculation units?
 - What is the mixing rate?
- ☑ Ensure mechanical mixing equipment is functioning properly
- ☑ Are mechanical mixers in each parallel flocculation compartment operating at the same speed?





Flocculation

- ☑ Is the rate of mechanical mixing adjustable?
- ☑ If fluctuations in flow rate or seasonal water temperature affect floc formation, does the operator adjust the rate of mixing to compensate?
- ☑ Is a sediment/sludge blanket visible in any of the flocculators?
- ☑ Are visible floc particles forming within the flocculation units?





Flocculation

☑ Ensure instrumentation measuring flocculator motor speeds, flow rates, pH, alkalinity, and temperature is calibrated and functioning properly

- Follows manufacturer's recommendations?





Flocculation - Considerations

- Sanitary Survey Checklist items and observations that may meet the definition of a Significant Deficiency.
 - *Not limited to a deficiency "...that is causing or has the potential to cause the introduction of contamination into the water delivered to consumers".*
 - How critical is each unit in the process to treatment?
 - Does it have a redundant unit?
 - What is the procedure if the unit process fails? Complacency
 - Do they have a preventative maintenance schedule on it, and is it implemented?
 - Count RPMs
 - Is floc building in size?
 - Are motors leaking oil? Is the oil food grade?



Questions and Discussion





3.9

Surface Water Treatment – Sedimentation



Sedimentation

- ☑ Ensure flow is evenly distributed among the basins
- ☑ Are there areas of excessive turbulence within any of the basins?
 - Short-circuiting of flow in the basins will negatively impact their performance (uneven flow)
 - Surface Overflow rates





Sedimentation

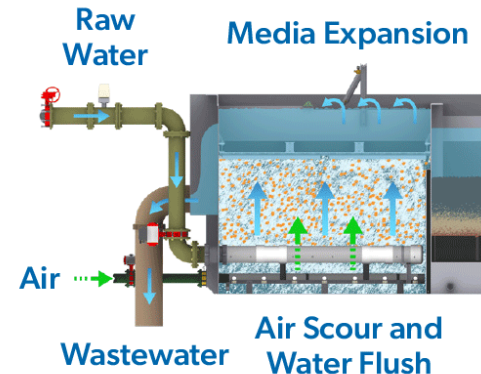
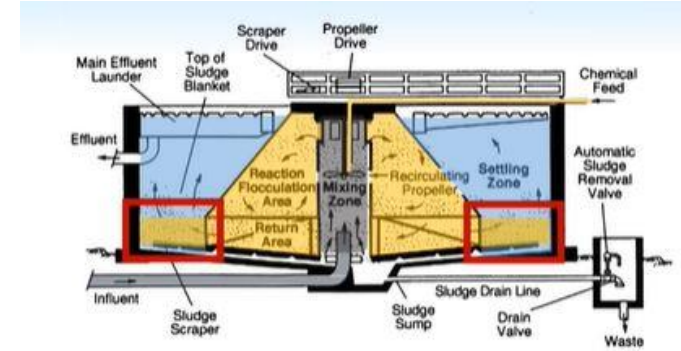
- ☑ Ensure sedimentation basins have a functional sludge removal apparatus or means to manually remove sludge
- ☑ Ensure basins are cleaned frequently enough to prevent excess sludge buildup and short circuiting
 - Frequency of sludge removal
 - Date of last sludge removal





Sedimentation

- ☑ If the plant utilizes an upflow-solids-contact clarifier, ensure that the sludge blanket remains in suspension but with enough freeboard to prevent the top of the blanket from reaching the bottom of the effluent troughs (carryover?)
- ☑ If the plant utilizes an adsorption clarifier, ensure that procedures are established to backflush the clarifier frequently enough to prevent noticeable floc carryover onto the filters





Sedimentation

- ☑ Address any visible cracks or other structural damage to the basins
- ☑ Ensure there is no plant life growing or fish swimming in any of the basins
- ☑ If the sedimentation basins are located outdoors, ensure that operators have preventative measures in place to prevent waterfowl from using the basin





Sedimentation

- ☑ If a continuous turbidity analyzer is used to measure settled water, ensure it is measuring at a representative point between the sedimentation basins effluent and the top of the filters
- ☑ If a continuous turbidity analyzer is NOT used to measure settled water turbidity, ensure that the PWS collects grab samples
 - How often are grab samples taken?
 - Sampling location?





Sedimentation

☑ Verify that turbidimeter used to measure settled water turbidity (continuous and/or grab) is calibrated at least quarterly using manufacturer specified procedures

- Calibration records
 - Digital or Hardcopy
 - Pass/Fail
 - Frequency

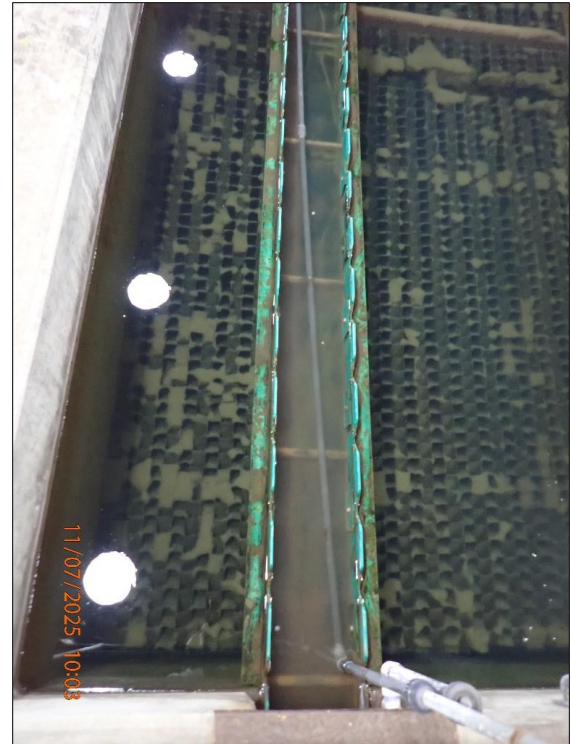


CALIBRATE	
USER PREP CAL	Calibration using 4000 NTU stock solution diluted to 20.00 NTU formazin.
STABLCAL CAL	Calibration using 20 NTU StablCal Stabilized Formazin Standard
VERIFICATION	Perform a verification, set the pass/fail criteria, and view the verification history.
0 ELECTRONICS	Zero electronics
CAL HISTORY	View the last 12 entered calibrations. Confirm to move to the next history entry. See section 5.6 on page 20 for more information.
CONFIGURE	
BUBBLE REJECT	Choose Yes or No to enable/disable bubble reject. Default: Yes
SIGNAL AVG	Choose no averaging or specify the amount of time for signal averaging. Available options are: no averaging, 6 sec., 30 sec., 60 sec., or 90 sec. Default is 30 seconds.
MEAS UNITS	Select the appropriate measurement units to display. Choose from mg/L, NTU, TE/F, FTU and Degree. Default: NTU
EDIT NAME	Enter up to a 12-digit name in any combination of symbols and alpha or numeric characters. Confirm when the entry is complete. The name will be displayed on the status line above the measurement value on the main display.
SET RESOLUTION	Set the number of significant digits to display. Default is three significant digits.
DATALOG INTRVL	Choose the amount of time between saving data points to the data log. Default: 15 min.; Options: 30 sec., 1 minute, 5 minutes, 10 minutes, or 15 minutes.
OFFSET	Enter an offset between -0.05 to 0.05 NTU. Values outside this range are not accepted.
DIAG/TEST	
SOFTWARE VERS.	Displays the software version number.
SERIAL NUMBER	Displays the serial number of the sensor.
INT TEMP	Displays the internal temperature of the sensor electronics in °C.
DEFAULT SETUP	Restores the sensor's factory default settings and invalidates the current calibration.
POWER CHECK	Displays the electrical statistics for the sensor.
SERVICE MODE	Choose On or Off to enable/disable service mode. Default: Off
SERVICE DIAGS	Passcode protected. Menu options only available to service personnel.



Sedimentation

- ☑ Ensure that settled water turbidity is less than the raw water turbidity and no more than 5 NTU
- ☑ The surface overflow rate should not exceed the design rate specified in the engineering approval
 - Dimensions of sedimentation basin and flow rates should be available to calculate overflow rate
- ☑ Flocs should not be visibly exiting the sedimentation basins into the filters





Sedimentation - Considerations

- Sanitary Survey Checklist items and observations that may meet the definition of a Significant Deficiency.
 - *Not limited to a deficiency "...that is causing or has the potential to cause the introduction of contamination into the water delivered to consumers".*
 - Condition of the Sedimentation Basins
 - Quality control measures are in place (e.g., settled water turbidity)
 - Flow control measures are in place (e.g., lack of short-circuiting)
 - Solids removal automated vs. manual operation
 - Redundancy



3.10

Filtration



Conventional Gravity Filters

- ☑ Combined filter effluent (CFE) turbidity measurements must be collected and recorded at least every four hours while the plant is in operation
- ☑ Ensure the CFE turbidity less than 0.3 NTU
- ☑ If the plant does not run continuously, ensure a CFE turbidity measurement is taken at each start-up and prior to shutting down





Conventional Gravity Filters

☑ **Individual filter effluent (IFE) turbidity measurements must be continuously monitored from each filter and recorded at least every 15 minutes**

☑ **Ensure flow is evenly distributed among the filters and verified with calibrated flow meters**

- Last date of calibration?

☑ **Are there ever rapid fluctuations in the flow through the filters?**

- Process control
- Impact on filtered water turbidity

☑ **The current filtration rate must not exceed the design rate of the filters**

- What is the filter flow rate?





Conventional Gravity Filters

- ☑ Ensure mudballs or other debris is not on top of the filter media
- ☑ Ensure obvious depressions or mounds of media are developing in any of the filters
- ☑ Ensure operators conduct filter inspections that include
 - Measuring media depth/freeboard
 - Collecting media samples
 - Visually inspecting media condition
 - Visually inspecting Surface wash arms/nozzles
 - Visually inspecting filter box and piping





Conventional Gravity Filters

- ☑ Ensure there is a written SOP outlining multiple criteria for determining when a filter backwash should occur
- ☑ What are the triggers for a backwash
 - Pressure head loss, volume filtered, runtime?
 - Did you observe a filter backwash?
 - Which filter?
- ☑ If air scour is utilized, ensure the surface wash arms are functioning properly
- ☑ The filter media should be visibly fluid during the high-rate filter wash





Conventional Gravity Filters

- ☑ Ensure backwash flow appear even across entire filter bed
- ☑ Ensure filter is not visibly losing media over the backwash trough during high-rate wash
 - Evidence of media loss may be visible without observing a backwash
- ☑ Is the filter visibly cleaner following the backwash?





Conventional Gravity Filters

☑ Following a backwash, do operators filter-to-waste for one full filter volume and then until turbidity levels are below regulatory limits?

- Is the water production started immediately after reaching low turbidity or wait until it stabilizes?

☑ If the plant does not have filter-to-waste capability, do the operators follow an alternate procedure?

☑ **Ensure all filter monitoring equipment, including turbidimeters, loss-of-head gauges, and effluent flow rate meters, are functioning properly**

☑ Leaks in any valves or pipes in the filter pipe gallery should be addressed

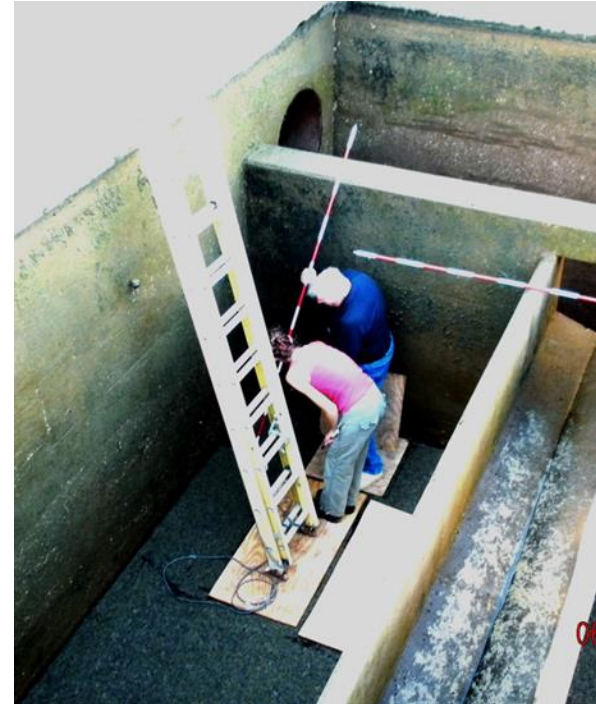




Filter Inspection

■ Backwash observations

- *Filter media expansion test*
- *Boils, dead spots, short-circuiting, cleanliness, media carryover*
- Backwash turbidity profile (clarity)
- Backwash sequence times (due for change)
- Filter-to-waste time (too short or long)
- Backwash rise calculation (accuracy of flowrate)
- Filter drawdown calculation (accuracy of flowrate)





Filter Inspection

■ Media condition

- *Depth of media – probe method*
- *Cleanliness – floc retention test*
- *Core sample – media interface*
- *Fines – sieve analysis*
- Freeboard
- Microscope observation
- Media testing – acid solubility (percent weight loss), uniformity coefficient, effective size

■ Underdrain

- *Media surface after drawdown*
- Excavation of trouble spots (Bucket/Box Method)



Filter Operation & Maintenance

Filter Inspection Form

Backwash Observations					
Fr	Fr		Fr	Fr	
M	M		M	M	
Drain Trough			Drain Trough		
M	M		M	M	
Fr	Fr		Fr	Fr	
Drain Trough			Drain Trough		
M	M		M	M	
Fr	Fr		Fr	Fr	
Drain Trough			Drain Trough		
M	M		M	M	
Fr	Fr		Fr	Fr	
Drain Trough			Drain Trough		
M	M		M	M	
Fr - Freeboard Height		Filter Console	M - Media Depth		

Note any of the following abnormalities on the diagram above using the notation in parentheses.

1. Uneven Air Scour (A~)
2. Boiling (B)
3. Dead Spots (+)
4. Carryover of Media (C^)
5. Mounding (M^)
6. Mud/Mudballs/Silt (m/s)
7. Craters (C ↓)
8. Cracks in Surface (K)

Backwash Comments:





Membrane Filtration

☑ Does the plant utilize strainers to help prevent damage to the membrane units?

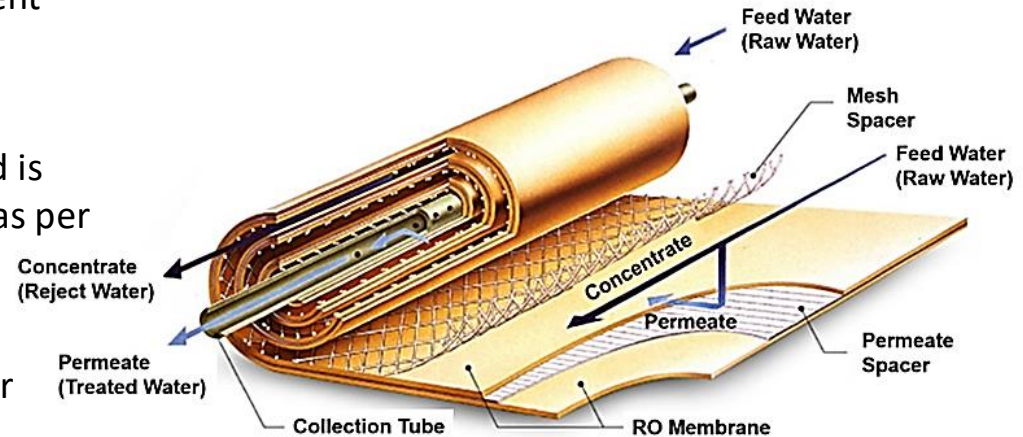
- Micron size?

☑ Ensure the strainer that is currently installed is the same size as what was originally installed, as per the manufacturer's specifications

- What about backups?

☑ Ensure strainers are flushed, washed, and/or cleaned

☑ If a second strainer is present, is this strainer used whenever the primary strainer is offline for service?





Membrane Filtration- Integrity Testing

■ Indirect Integrity Testing – Performance

- Exceedances of turbidity (0.15 NTU) trigger a Direct Integrity Test

■ Direct Integrity Testing - Pressure Decay Testing – Membrane Integrity Testing

- Membrane pressurized; pressure decay is monitored over time (psi/min)
- Routine Daily Test
- Document a failed test (greater than permit requirement) as to how it was resolved and returned to service
- Log Removal Value (LRV) less than permit requirement (for Crypto bin level) requires meeting it through CT determination

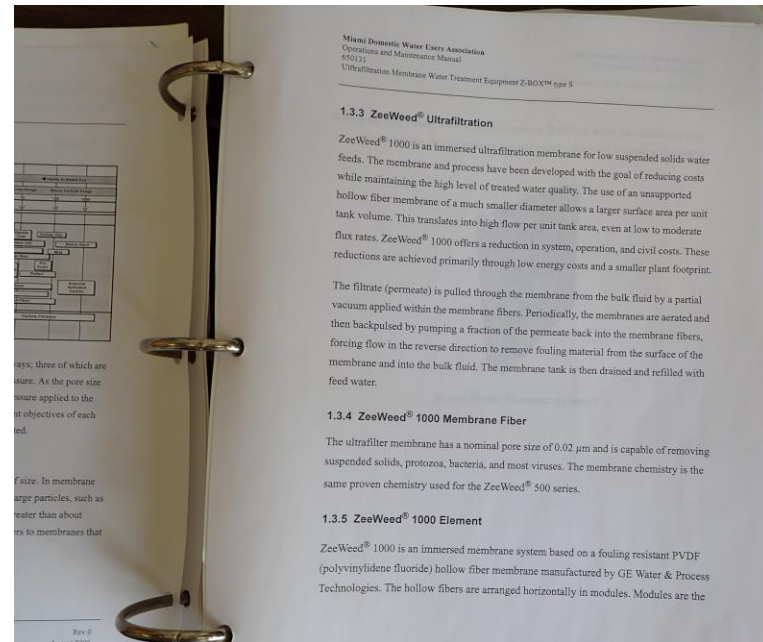
■ All the above subject to violation if not met



Membrane Filter Operation

■ Standard Operating Procedures (SOPs) should be in place and utilized for the following critical elements:

- Pretreatment process units
- Repeatable direct integrity testing determinations – w/ action steps
- Parameters to identify signs of membrane fouling
- Backwash procedure
- Clean-in-place
- Disposal of cleaning fluids and brines
- Optimization goals





Membrane - Maintenance

- **Maintenance Plan should be in place and implemented that includes the following critical elements:**
 - Preventative maintenance schedule
 - Work order system
 - Membrane repair/replacement (pinning/gluing)
 - Recordkeeping system
 - Inventory of critical spare parts
 - Professional service contractor contact information



Membrane Filtration

- ☑ If only one strainer is present, is the plant shutdown whenever the strainer is removed for service?
- ☑ **Ensure CFE turbidity measurements are collected and recorded at least every four hours while the plant is in operation**
- ☑ Ensure the CFE turbidity is less than 0.3 NTU
- ☑ If the plant does not run continuously, ensure a CFE turbidity measurement taken at each start-up and prior to shutting down





Membrane Filtration

- ☑ Ensure flow is evenly distributed among the membrane units and verified with calibrated flow meters
- ☑ Rapid fluctuations in the flow through the membrane units should be minimized
- ☑ Ensure the current membrane flux rate does not exceed the design rate specified in the engineering approval
 - Current membrane flux rate: gal/ft²/day (gfd) or L/m²/hr (lmh)

	A	B	C	G	H	I	J	K	L	M	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1	Options:		Project Units:																			
2	Project Configurations:																					
3	Site Name		Miami, NM																			
4	Membrane Type		legacy - ZW1000v3-500																			
7	Number of Modules		4																			
8																						
17				4.71																		
18				Production Information				Pressue Decay Test				Intermediate Values										
19	Date	Time	Notes	Qp	TMP	Temperature (Water)	PMITstart	PMITend	600	Level	LRV reported:	Qp	Permeate Flux	ALCR	Patm	Vsys	VCFavg	Δptest:	LRV (raw)			
20	(mm/dd/yyyy)	(hh:mm)		gpm	psi	°C	psi	psi	s	in		m³/s	gfd		psi	Pa	m3	psi/min	Pa/s			
21	8/1/2023	5:27 AM		31.0	9.0	19.9	8.97	8.72	600	43.90	>4.71	0.002	22.330	64.507	14.600	100.663	0.029	1.500	-0.002	-0.219	#NUM!	
22	8/2/2023	5:18 AM		31.0	8.8	20.0	8.83	8.43	600	43.90	>4.71	0.002	22.330	63.575	14.600	100.663	0.029	1.500	0.014	1.587	5.2575	
23	8/3/2023	5:18 AM		31.0	9.0	20.1	8.98	8.66	600	43.90	>4.71	0.002	22.330	63.896	14.600	100.663	0.029	1.500	0.005	0.595	5.6857	
24	8/4/2023	5:24 AM		31.0	8.8	20.1	8.79	8.37	600	43.90	>4.71	0.002	22.330	62.887	14.600	100.663	0.029	1.500	0.016	1.836	5.1895	



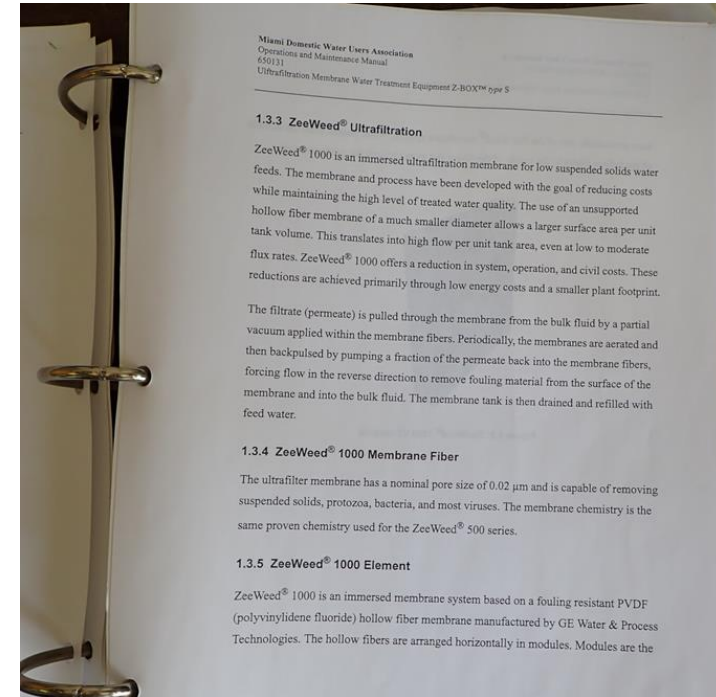
Membrane Filtration

- ☑ Ensure daily Log Removal Value (LRV) calculations are conducted for each membrane skid
- ☑ Ensure direct integrity testing is conducted on each membrane unit at least once each day that the unit is in operation
- ☑ Ensure pressure sensors used for direct integrity testing are calibrated as per the manufacturer's recommendations
- ☑ **Direct integrity testing must be conducted in accordance with regulatory requirements**
 - These will be unique to the water system
- ☑ When a membrane unit fails a direct integrity test, ensure the unit remain off-line until the operator has determined and resolved the cause of the failure



Membrane Filtration

- ☑ Ensure direct integrity test is performed whenever indirect integrity testing indicates decreased performance of a membrane unit?
- ☑ Ensure direct integrity testing is performed following any non-routine shutdown
- ☑ Ensure there a written SOP for operators to follow in the event of a failed pressure decay test (PDT)
- ☑ Is a maintenance clean conducted on each membrane unit?
 - Frequency and duration?





Membrane Filtration

- ☑ Ensure operators follow a written SOP that outlines criteria on how to determine when a clean-in-place (CIP) should occur
- ☑ **All chemicals that are used to conduct the maintenance clean and CIP must be approved under ANSI/NSF Standard 60 or equivalent**
- ☑ Are CIPs occurring on each membrane unit at a frequency consistent with manufacturer recommendations?



Membrane Filtration

- ☑ Ensure the effluent pH is measured after a CIP occurs, prior to returning the unit to service
- ☑ Ensure filter particle counters (if used) and pressure gauges are calibrated in accordance with manufacturer specifications
- ☑ **All filter Monitoring equipment including turbidimeters, loss-of-head gauges, and effluent flow rate meters must be functioning properly**



Filtration Considerations

- Sanitary Survey Checklist items and observations that may meet the definition of a Significant Deficiency.
 - *Not limited to a deficiency “...that is causing or has the potential to cause the introduction of contamination into the water delivered to consumers.”*
 - Performance (i.e., turbidity) - grab samples, online units, logsheets, SCADA, MORs
 - IFE 15-minute data 3-year retention requirement
 - Conditions – walls/troughs, mudballs, media
 - Backwash – Trigger values (i.e., turbidity, runtimes, headloss), flow rates, duration, clean?, restart performance
 - Flow rates
 - Filter maintenance (e.g., filter inspection program)
 - Design specifications
 - Backwash supply water or process water limitation
 - Performance Limiting Factors (PLFs)



Questions and Discussion





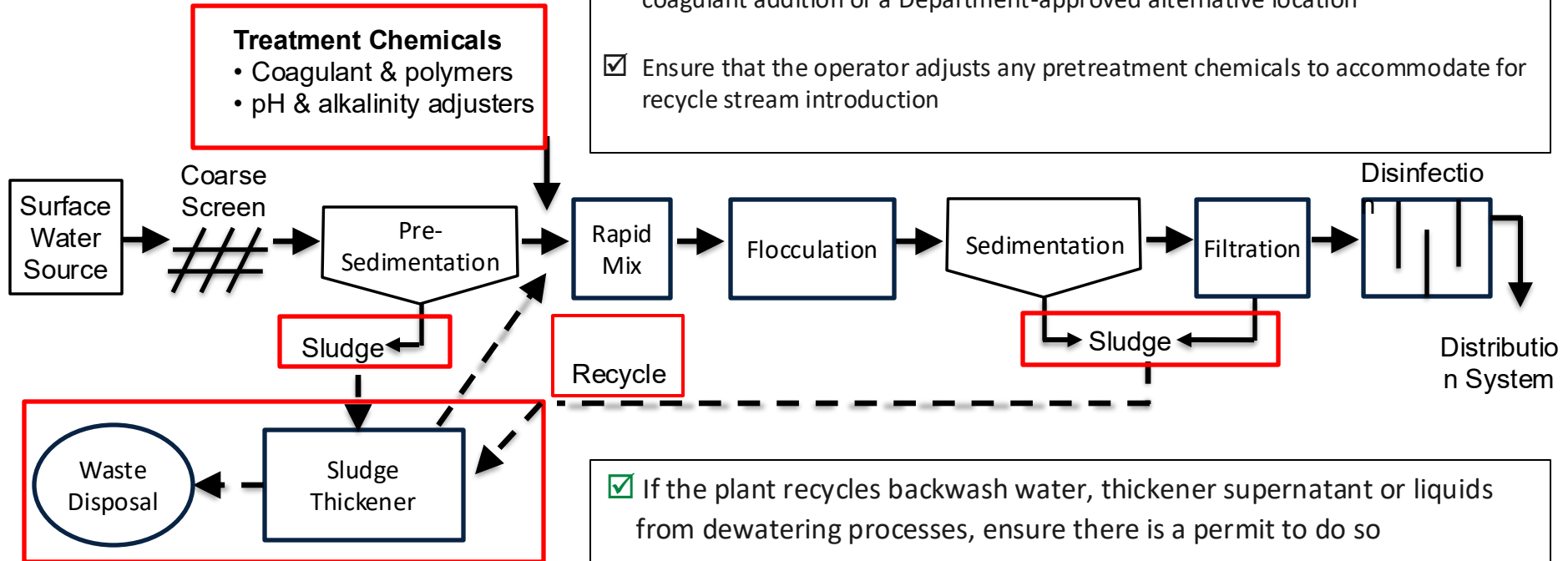
3.11

Waste Handling



Waste Handling

- ☑ Ensure all recycled products are reintroduced at “the head of the plant,” prior to coagulant addition or a Department-approved alternative location
- ☑ Ensure that the operator adjusts any pretreatment chemicals to accommodate for recycle stream introduction



- ☑ If the plant recycles backwash water, thickener supernatant or liquids from dewatering processes, ensure there is a permit to do so



Waste Handling – Recycling

- Recycling backwash water, thickener supernatant or liquids from dewatering processes can:
 - Reduce the amount of process water discharged during the treatment process
 - Increase the risk of reintroducing high concentrations of harmful pathogens that were just removed in the treatment process
 - *Cryptosporidium* oocysts are readily removed in sedimentation and filtration, but are not easily inactivated and can remain in the recycled water
 - Increase the amount of treatment chemicals required such as coagulant and disinfectant





Waste Handling– Recycling

- **Filter Backwash Recycling Rule (FBRR)** is intended to reduce the opportunity for recycle practices to adversely affect the performance of drinking water treatment plants and to help prevent microbes, such as *Cryptosporidium*, from passing through treatment systems and into finished drinking water
 - The FBRR has three main components:
 - **Reporting:** Requires a system to notify the State in writing about its recycle practices if the system is a Subpart H system, practices conventional or direct filtration, and recycles one or more of the regulated recycle streams
 - **Recycle Return Location:** Requires regulated recycle streams to be returned through all processes of a system's existing conventional or direct filtration system
 - **Recordkeeping:** Includes recordkeeping requirements related to recycling procedures.
- ☑ Ensure that the plants that recycle waste streams complete and maintain FBRR Record Keeping Forms



Waste Handling – Waste Disposal

- ☑ If the plant is discharging waste streams into a local surface water body, ensure that you have the proper permits to do so
- ☑ Ensure that a lack of waste-holding capacity does not prevent operators from backwashing filters when needed
 - Information about backwash volume per filter, backwashes per day, total waste-holding capacity, and waste disposal rate
- ☑ CO will want to know how the plant disposes of sludge removed from waste settling lagoons





Waste Handling - Considerations

- Sanitary Survey Checklist items and observations that may meet the definition of a Significant Deficiency.
 - *Not limited to a deficiency “...that is causing or has the potential to cause the introduction of contamination into the water delivered to consumers.”*
 - Is it being recycled back to the potable side of water treatment!? This triggers additional requirements through the Backwash Recycle Rule.
 - Flow measurement, Return to the ‘Head of the Plant’, Recordkeeping
 - Automation vs. manual operation
 - Treatment, disposal, sludge removal
 - Redundancy
 - Capacity



3.12

Treatment Plant Capacity



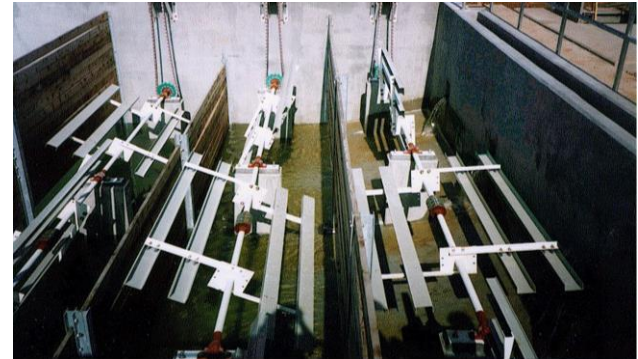
Treatment Plant Capacity – Flocculation Basins

☑ Determine the treatment plant dimensions for the flocculation basins

- ☑ Number of basins
- ☑ Dimensions of basins – length, width, depth
- ☑ Theoretical hydraulic detention time (HDT) (in minutes)

$$- HDT = \frac{\text{Functional Volume (gallons)}}{\text{Flow Rate } \left(\frac{\text{gallons}}{\text{minute}}\right)}$$

- ☑ Total flocculation basin volume (in gallons)

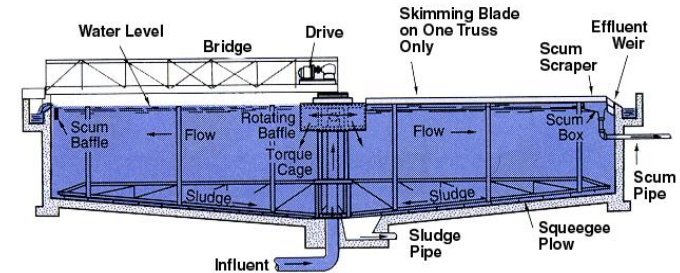




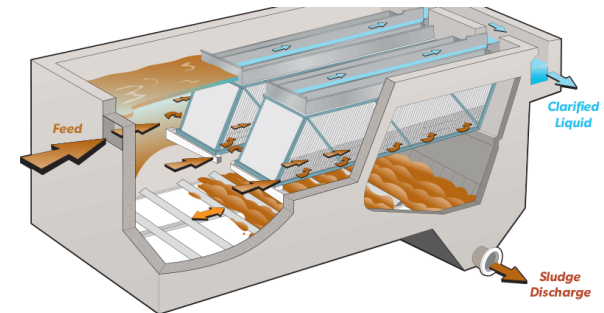
Treatment Plant Capacity – Sedimentation Basins

☑ Determine the treatment plant dimensions for the sedimentation basins

- ☑ Number of basins
- ☑ Dimensions of basins – length, width, depth
- ☑ Theoretical hydraulic detention time (HDT) (in minutes)
 - Based on maximum sedimentation design specifications
- ☑ Theoretical surface overflow rate (in gpm/ft^2)
 - Based on maximum sedimentation design specifications
- ☑ Total basin volume (in gallons)
- ☑ Total basin surface area (in ft^2)
- ☑ Total treatment plant hydraulic loading rate (gpm)
 - $$HLR_{Total} = \frac{(\#_{Floc\ basin} * V_{Floc\ basin}) + (\#_{sed\ basin} * V_{sed\ basin})}{HDT_{Floc\ basin}}$$
- ☑ Total treatment plant surface overflow rate (gpm)
 - $$SOR_{Total} = Area_{sed} * SOR_{theoretical}$$
- ☑ Treatment plant sedimentation rate (gpm)
 - Largest between HLR_{Total} and SOR_{Total}



Circular Sedimentation Basin



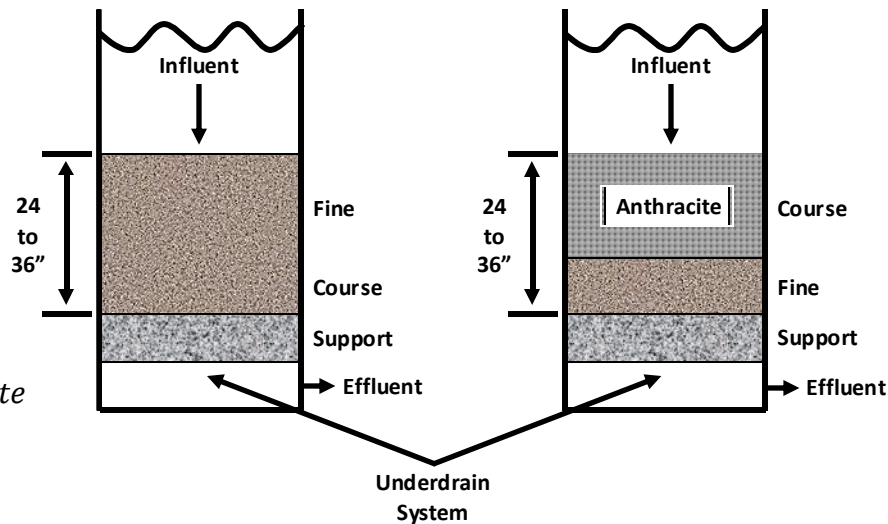
Laminar Tube/Plate Sedimentation Basin



Treatment Plant Capacity – Filtration

☑ Determine the treatment plant dimensions for the filters

- ☑ Number of filters
- ☑ Dimensions of basins – length, width
- ☑ Individual filter surface area
 - $Area_{Filter} = Length_{Filter} * Width_{Filter}$
- ☑ Total filter surface area
 - $Area_{total} = Area_{Filter} * \#_{Filter}$
- ☑ Theoretical filter rate (in $gpm/ft^2/filter$)
 - Based on maximum filter design specifications
- ☑ Individual filter capacity (gpm)
 - $Max\ flow_{Filter} = Area_{Filter} * Theoretical\ filter\ rate$
- ☑ Total treatment plant filter capacity
 - $Max\ flow_{Plant} = Max\ flow_{Filter} * \#_{Filter}$
- ☑ Treatment plant limiting component
 - Lowest value between plant sedimentation rate and plant filtration rate (gpm)





Capacity - Considerations

- Sanitary Survey Checklist items and observations that may meet the definition of a Significant Deficiency.
 - *Not limited to a deficiency "...that is causing or has the potential to cause the introduction of contamination into the water delivered to consumers."*
 - Has the capacity of each treatment process unit been maintained?
 - Flash mixer replacement to a different RPM
 - One of several flocculator paddle mixers out of service long-term
 - Sedimentation basin allowed to fill ½ full of sludge
 - Filter media allowed to operate at less than original 18" depth
 - Has the condition of each treatment process unit been maintained?
 - Cracked concrete, broken tube settlers, failed valves, etc.
 - Is each treatment process unit being actively operated?
 - Quality monitoring, instrumentation maintained, preventative maintenance, asset management



Questions and Discussion





3.13

Distribution System Review

- Mains
- Hydrants
- Valves
- Pumping stations
- Storage tanks
- Cross connections



Distribution System

☑ Ensure that a complete, up to date and accurate map of the distribution system is maintained.

- Sources
- Treatment Plants
- Pipelines
- Valves
- Storage tanks
- Pumping stations / disinfection stations
- Interconnections
- Need this for coliform monitoring





Distribution System

☑ Adequate pressure must be maintained throughout the distribution system.

- Distribution pressure >20 psi and <80 psi
- Active pressure monitoring
 - Note where pressure gages exist and pressure monitored: sources, pumps, or elsewhere
 - Pressure tested and documented during hydrant flushing?
- Main breaks or other events creating low pressure
 - Recent boil water notices





Distribution System

☑ Ensure that proper procedures are followed for disinfection of new distribution construction.

- Flushed, disinfected and sampled in accordance with the current editions of the American Water Works Association (AWWA) Standard C651-23

☑ Ensure that proper procedures are followed for disinfection of ongoing distribution repairs.

- Flushed, disinfected and sampled in accordance with the current editions of the AWWA Standard C651-23



Distribution System

☒ There should be adequate flush hydrants to flush the system

- Review distribution map
- Observe while touring the distribution system

☒ The distribution system should be flushed as needed to maintain water quality

- Hydrant flushing plan
- Scope and frequency of flushing
- Targeted flushing of dead ends and sections with water age issues
- Pressure monitoring

Fire Hydrant Inspection Report					
Geographic Location (coordinates): _____		Asset No.: _____			
Location Description: _____					
Brand/Manufacturer: _____		Model: _____		Year: _____	
Type of Hydrant: ☐ Wet Barrel ☐ Dry Barrel ☐ Standpipe ☐ Other: _____					
Hydrant Component Condition					
Caps:	Missing ☐	Replaced ☐	Greased ☐	Maintenance Needed ☐	Good condition ☐
Chains:	Missing ☐	Replaced ☐	Repaired ☐	Maintenance Needed ☐	Good condition ☐
Paint:		Replaced ☐		Maintenance Needed ☐	Good condition ☐
Operating Nut:		Replaced ☐	Greased ☐	Maintenance Needed ☐	Good condition ☐
Nozzles:		Repaired/Replaced ☐	Greased ☐	Maintenance Needed ☐	Good condition ☐
Side Nozzles Condition: _____					
Pumper Nozzle Condition: _____					
Isolation valve: Located ☐ Exercised: ☐ Yes / ☐ No Turns to Open: _____					
Condition: _____ Valve Inspection Form Completed: ☐ Yes / ☐ No					
Operation					
Operating Nut:	Turns to Open: _____		Direction to Open: ☐ Left / ☐ Right		
Condition: _____					
Pressure: _____	Static (psi): _____				
Flushed: _____	Nozzle(s) Used: ☐ Side / ☐ Pumper Percent Open: _____				
Flowrate: _____	Duration (minutes): _____		Water Used (gallons): _____		
Water Quality					
Clarity (describe characteristics of sediment and color): _____					
Time to clear: (describe time required to run the hydrant to clear condition): _____					
Test results: Chlorine (mg/L): _____ Other: _____					
Describe all defects that require maintenance:					

Inspected by: _____ Date: _____					
Defects Corrected by: _____ Date: _____					



Distribution System

☒ Distribution system valves should be exercised on a periodic basis

• Identify Characteristics

- Location – coordinates or description
- Size, depth, age, condition, direction operate
- Criticality

• Exercise

- 'Turned' vs. 'Exercised'
- Manual, Semi Manual, Automated
- Frequency – Annual, 5-Year?

• Maintenance

- Valve box cleanout/replacement
- Leaks
- Spare parts and replacements





Distribution – Isolation Valve Considerations

- Distribution system needs adequate number of isolation valves to control flow through the water mains
 - To turn the main flow on or off (valves opened or closed)
 - Allows isolation of mains for repair and maintenance
 - To redirect the main flow
 - Reduce water age
 - Unidirectional hydrant flushing





Distribution – O&M Considerations

- Is a backhoe available or how does system respond to line breaks on a 24/7 basis?
- Are typical repair materials kept in inventory?
- Have critical customers been identified?
- Should have asset inventory of water mains:
 - Type and quantity of piping materials
 - Age and condition of piping materials

Gray Cast Iron Pipe (CIP)



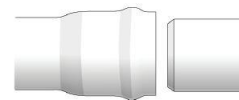
Steel Pipe



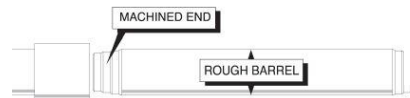
Ductile Cast Iron Pipe (DCIP)



PVC Pipe



Asbestos Cement (AC) Pipe



Wood Pipe





Distribution – O&M Considerations

- Main break log
 - Good information to help prioritize replacement for mains
- Main replacement program
- Customer meters
 - Important for adequate revenue
 - Can help with water conservation measures
- Leak detection
 - Track source meter vs. customer meter readings
 - Water audits?



3.14

Cross Connections



Cross Connections

- Cross connection means any unprotected actual or potential connection or structural arrangement between a public water system and any other source or system through which it is possible to introduce into any part of the public water system any contaminant or non-potable substance. 20.7.10.7 NMAC
- Cross-connections to a public water system or within a public water system shall be prohibited, unless the public water system is protected by a method acceptable to the department using either a device listed in the American society of sanitary engineering "prevention rather than cure" seal authorization booklet or a device acceptable to the department to prevent the back flow of water. 20.7.10.400 (P) NMAC



Cross Connections

- Backpressure is backflow caused by pressure in the customer's plumbing being greater than the pressure in the water supply piping.
 - The higher pressure in the customer's plumbing may be from a booster pump or heating boiler.
- Backsiphonage is backflow caused by a negative pressure (vacuum or partial vacuum) in the supply piping.
 - Backsiphonage occurs when system pressure is reduced below atmospheric pressure, similar to sipping water through a straw.



Cross Connections

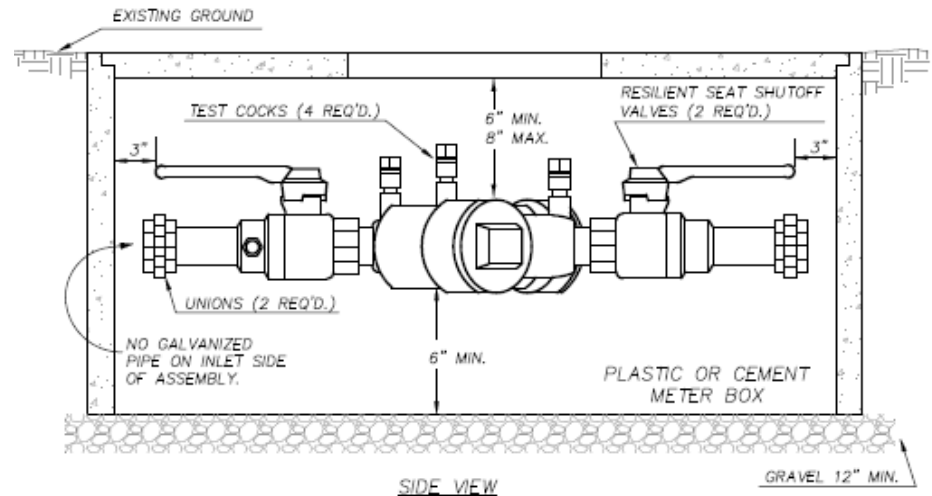
- Backflow device determined by hazard type
- Examples of high hazards:
 - Wastewater treatment plant or lift station
 - Chemical tanks used at the water treatment plant
 - Car wash
 - Laboratories
 - Refineries
 - Hospitals
- Need an air gap or reduced pressure backflow assembly for protection on high hazards





Cross Connections

- Examples of other hazards (typically not considered a high hazard):
 - Landscape irrigation system
 - Home with a hot tub
 - Restaurant
- Can use a double-check assembly for these instances





Cross Connections

☒ Does your water system serve one or more high health hazard premises with high potential for cross connections?

- Wastewater treatment plant or lift station
- Chemical tanks used at the water treatment plant
- Car wash
- Laboratories
- Refineries
- Hospitals

☒ Has your water system established the legal authority to implement a Cross Connection Control Program?

- City ordinance, resolution, by-laws





Cross Connections

☒ Has the purveyor designated someone to be in responsible charge of the Cross Connection Control Program?

- If yes, have they conducted a hazard evaluation to identify high health hazard premises?
- If yes, has the purveyor completed installation of a backflow prevention assembly on the service line to each identified high health hazard premise?

Water Utility Authority - Compliance Division
Backflow Prevention Assembly Test Report
Cross Connection Control Office - Southeast Water Reclamation Plant
630 N. 1st St., Albuquerque, NM 87102-2668
Office: 505-289-2417 Inspector: 505-289-2465 Fax: 505-289-2653 Email: backflow@waterwa.org

Previous Name: ABCWUA SUCDP RAW WATER PUMP STATION 0022917865
Premise Address: 9580 KELLY SUMMERS RD NW, ALBUQUERQUE, NM 87114-1810
Representative/Owner Name: [Blank] Phone No.: [Blank] Secondary Phone No.: [Blank] Email Address: [Blank]
Water Account No.: 4719885545
Water Meter Serial No.: 12710348

Assembly Type: RP Assembly Make: HATTS Assembly Model: 957 Assembly Size: 3 Assembly Serial No.: Q0164 Returned Assembly Serial No.: [Blank]
Specific Location of Assembly: 9580 KELLY SUMMERS RD NW | NW CORNER OF RWPS
Building: [Blank] Room: [Blank] Floor: [Blank]
Service Type: [Blank] Protection Type: ☒ Containment ☐ Isolation
JV accounts: [Blank]

	DC/DCDA/RP/RPDA Check Valve #1	DC/DCDA/RP/RPDA Check Valve #2	RP/RPDA Relief Valve	PVB/SVB
Initial Test	☒ Held at 10.0 PSID ☒ Closed Tight ☐ Leaked	☒ Held at 2.8 PSID ☒ Closed Tight ☐ Leaked	☒ Opened at 3.0 PSID ☐ Did Not Open ☒ Buffer 7.0 PSID	☐ Air Inlet Opened at ____ PSID ☐ Opened Fully ☐ Ck Valve Held at ____ PSID ☐ Leaked
New Parts & Repairs	☐ Cleaned ☐ Part Replaced	☐ Cleaned ☐ Part Replaced	☐ Cleaned ☐ Part Replaced	☐ Cleaned ☐ Part Replaced
Test After Repair	☐ Held at ____ PSID ☐ Closed Tight	☐ Held at ____ PSID ☐ Closed Tight	☐ Opened at ____ PSID ☐ Buffer ____ PSID	☐ Air Inlet Opened at ____ PSID ☐ Ck Valve Held at ____ PSID
Date of Test: 2025-03-19	Time of Test: 1300	Test Results: Pass		
Comments/Remarks: Performed flush under supervision of JT				
Gauge Manufacturer: Mid-West	Model: 845-S	Serial Number: 10200887	Calibration Date: 2024-12-22	
Tester Certification: ☒ I certify that I have tested the above backflow assembly in accordance with the Compliance Division, Cross Connection and Control Ordinance, and that the information is accurate to the best of my abilities. Employer Name: ABCWUA Tester's Name: ROBERT ROBERTS-ANTONE Tester's Title: [Blank] Cert. No.: 2878 Test Date: 2025-03-19				

03.25.2025 09:29



Cross Connections

☑ Ensure you have an adequate cross connection control program

- Requires judgement from the compliance officer (CO).
- Are there high hazard connections and no CCC plan?

☑ Examples of cross connections observed in the distribution system during the survey

- Hose connected to a spigot and submerged in a pool, hot tub, water trough, etc.
- Tanker truck filling at a hydrant without a backflow prevention assembly.

☑ Ensure any malfunctioning backflow prevention assemblies are serviced

- Water leaking around the assembly
- Water flowing from discharge port
- Broken or missing test port valves (plugged)



Cross Connection - Considerations

■ Hydrants

- Hydrant permit program
- Does the system have portable backflow prevention devices with meters for temporary installation to accommodate events, construction, etc.?
- Are the hydrants equipped with locks?





Cross Connection - Considerations

■ Air release valves

- Designed to release air at high points
- Commonly seen on well and booster pump discharge piping
- Could also be a combination air release/vacuum valve
- Discharge line from valve needs to be screened and terminate above-ground to prevent cross connection since it can pull a vacuum





Cross Connection - Considerations





Cross Connection Control Plans

- Is there a Cross Connection Control Plan?
- Key elements of a Cross Connection Control Plan
 - Water system must have legal authority through ordinance or bylaws
 - Ownership of devices
 - Most systems require installation behind the meter
 - Evaluate existing and new connections for level of hazard
 - Process to identify and eliminate hazard through installation of proper cross connection control device or assembly
 - Hire or contract properly certified personnel
 - Cross connection control specialist
 - Backflow prevention assembly tester



Cross Connection Control Plans

■ Key elements of Cross Connection Control Plan (continued)

- Procedure for backflow inspection and testing
 - Frequency of inspection and testing
 - How reports are documented to the water system
- Backflow incident response plan
- Public education
 - Important for the public to understand their responsibility in protecting the water system, especially for those customers designated as high hazard
- Recordkeeping and tracking of device testing, results, and follow-up



3.15

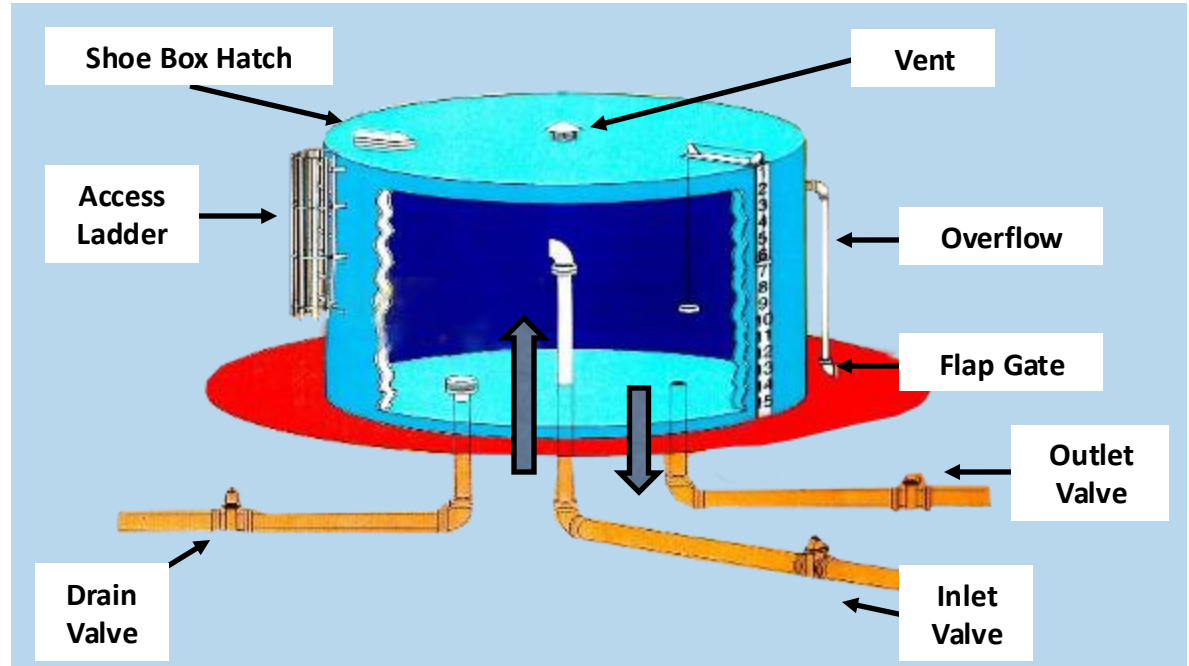
Finished Water Storage



Storage Tank Appurtenances

■ Key features

- Security
- Sample tap
- Isolation valves
- Access ladder
- Inlet/outlet configuration (Direct operation)
- Level gauge
- Hatches / Vents
- Overflow





Storage Tank Overflow

■ Overflow design – 10 States Standards

- Screened with “24-mesh non-corrodible screen”
 - Flap gate (internal mesh), tight seal
 - Duckbill, freezing precautions
- Extend down to 12” to 24” from ground
- Downturned
- Visible
- Splash plate
- Sized for > max filling rate





Storage Tanks

- Confirm all storage tanks in use are listed in DWW and include the correct capacity, material, and floating or direct.
- ☑ **Ensure the storage tank protected from unauthorized entry or vandalism**
 - Is the access hatch secured and locked?
 - Is the access ladder secured and locked?
 - Is the tank ladder and/or site fenced?
 - Is the tank free of damage or vandalism?
- ☑ **Ensure the storage tank roof free of any unprotected openings**
 - Conduit entry sealed?
 - Target cable entry sealed?
 - Holes or corroded metal at seams that could allow water to enter?



Storage Tanks Checklist





Storage Tanks

☑ Ensure the storage tank equipped with an access hatch

☑ Ensure the access hatch constructed and sealed to prevent the entry of contaminants

- Tight fitting seal and rubber gasket?
- Evidence of insects or animals inside hatch?
- Tank cleaning frequency

☑ Ensure there a dedicated air vent on the storage tank

☑ Ensure the air vent constructed to prevent the entry of contaminants

- Downturned to prevent water entry.
- #24 corrosion resistant steel mesh insect screen.
- Any damage to the vent structure?





Storage Tanks





Storage Tanks

☑ Ensure the overflow line constructed to prevent contaminants from entering the tank

- Answered by subsequent questions.

☑ Does the overflow line discharge near ground level?

- Discharges near ground level, 12"-24".

☑ Ensure the overflow line discharge area protected from potential erosion

- Riprap or concrete spill pad?

☑ Ensure the overflow pipe screened or fitted with an acceptable flap valve

- Duckbill valve, flap valve, or #24 corrosion-resistant steel mesh insect screen





Storage Tanks





Storage Tank

- ☑ Does the overflow line discharge into a storm drain or surface water?
 - Any risk of flooding and submerging the outlet?
- ☑ **Ensure the storage tank be isolated from the rest of the water system and be drained through a dedicated drain line**
- ☑ When was the tank inspected last? What is the tank cleaning frequency?
- ☑ **Has the tank been inspected in the past 3 years? Is there an inspection report available to confirm the inspection?**
 - Tank inspections are required every three years. These reports can inform additional findings.
 - **Note:** the Checklist macro will define a 'NO' response as a Significant Deficiency, however, report it as a Recommendation; when an inspection has not been completed within 5 years, report it as a Significant Deficiency.



Storage Tanks

- ☒ Does the tank size, operation, and piping configuration appear to provide adequate water turnover?
 - Separate inlet/outlet
 - Tank mixer or baffling
- ☒ Can the water level be lowered in the tank to improve turnover?
 - Consider seasonal operational changes
 - Ensure adequate water for fire and pressure
- ☒ Have any changes been made to the tank(s) operation to improve water quality?
 - New controls?
 - Mixing devices installed?
 - Changed inlet location and filling cycle operations?



Storage Tanks

☑ Does the storage tank foundation appear to be adequate and intact?

- Cracking or spalling of concrete foundation?
- Proper grading around foundation and protected from water running under tank.

☑ Does the tank contain any mixing mechanisms other than mixing during filling cycles?

- In-Tank Mixers, Air Bubble Mixers, and others.

☑ Is the tank in good operating condition

- Free of leaks, structural cracking, corrosion, concrete spalling?





Storage Tanks





Storage Tanks

☑ Are tank level measuring devices functioning accurately?

- Target Gauge, SCADA, Transducer

☑ Is the tank secure?

- Evidence of tampering, vandalism, or trespassing?





Storage Tanks - Considerations

Sanitary Survey Checklist items and observations that may meet the definition of a Significant Deficiency.

Not limited to a deficiency "...that is causing or has the potential to cause the introduction of contamination into the water delivered to consumers."

- Properly sized to meet average daily demand and maintain system pressure
- Adequate storage
 - Capacity (overflow) vs. Effective/Usable Volume
 - Too much or too little
 - 1-2 days for emergency
 - 3-5 best practice
- Redundancy, ability to drain to take a tank off-line for maintenance
- Recent tank inspection recommendations and observations
 - Review professional tank inspection report recommendations
 - Have recommendations been completed?



Storage Tanks - Considerations

- Age of tank and need for rehab or replacement
- Access to tank
 - Easement, road in good condition and accessible year-round
- Controls for tank levels, telemetry, and alarms
- Vegetation, excessive/uncontrolled, under or around the tank
- Interior floating debris/sheen, floor sediment
- Valve exercising



Questions and Discussion





3.16

Booster Pump Stations



Booster Pump Station Purpose

- Booster Pump Stations are essential components that are vulnerable to a lack of maintenance and security issues
 - Booster Pump Stations - flow
 - To convey potable water (to fill a tank, to a higher elevation)
 - To increase (boost) pressure
 - To provide peak demand flow (routine, or emergency-fire flow)
 - Booster Pump Stations – chemical disinfectant
 - To increase (boost) downstream chlorine residual
 - Multipurpose - a combination of the above
- ☑ CO will evaluate pump facility controls, O&M, sanitary concerns, and security concerns



Pump Station Management

■ Pump Station Management

- Proper design for the intended purpose
- Constructed and maintained to the design standards
- SOPs for routine and emergency operations
- Preventative maintenance procedures
- Asset management/inventory of pumps and equipment
- Security (e.g., locks, fencing, CCTV, intrusion alarms)
- Standby power procedures (O&M and ERP)





Booster Pump Station Features

- Redundant pumps
 - Meets peak daily demand w/largest pump out-of-service
- Controls/Alarms (local or remote)
 - Based on pressure (e.g., 40 psi > 75 psi)
 - Based on tank levels (e.g., 35 feet > 39 feet)
 - Continuous operation - 24/7
 - Lead / Lag / Alternating
 - Constant rate vs. Variable Frequency Drive (VFD)
- Isolation and check valves
- Pressure gauges (suction/discharge)
- Sample tap (smooth bore)
- Flow meter
- Standby power (fixed or portable)





Air Release/Vacuum Valves

- Air Release Valve
- Installation
 - Screened and downturned inlet/outlet
 - Vaults with adequate drainage





Booster Pumping Facilities and Controls

☒ Ensure booster pumps are in good working condition

- In operation while onsite?
- Leaking water?
- Corrosion?
- Pump/Motor oil?
 - Food grade NSF 60/ANSI standard?

☒ Ensure pumps and pump controls operational and adequate to prevent chronic water outages or premature pump failure?

- Is there pressure loss downstream?
- Are there redundant pumps or backup pumps available?
- Backup power?
- How are the pumps controlled?
 - Pressure switch
 - Manual operation
 - Timer





Booster Pumping Facilities and Controls

☒ Secure booster stations against unauthorized entry

- Locks on doors?
- Fenced area?
- Evidence of vandalism or unauthorized entry?

☒ Ensure pump stations is properly constructed and maintained

- Evidence of rodents or insect infestation?
- Standing water on floors?
- Floor drains or sump pumps?
- Damaged walls or roofing?
- Exposed insulation?





Booster Pumping Facilities - Considerations

- Look for any potential entry point for contaminants!
- Air relief/vacuum valves protected/screened?
- Taps w/hoses or other potential cross-connections?
- Adequate access/ frequently inspected?
- Are critical spare pumps or parts available?
- Protected from extreme heat/cold?
- Security measures in place?
- Has the station operated continuously/at capacity?
- Check suction and discharge pressures.
- Alternate power supply?





Pressure Tanks

- ☑ Ensure pressure tanks are maintained, and sanitary and security concerns addressed
 - Capacity and pressure rating
 - Location of pressure tank
 - Physical condition of tank, such as leaks or corrosion
 - NSF/ANSI 61 certified
- ☑ If air compressor is used, ensure the compressor is using oil-free type or food-grade oil





Pressure Tanks

- ☑ Ensure isolation valves to isolate pressure tanks for maintenance and repairs
- ☑ Ensure ASME pressure relief valve between pressure tank and any shutoff valve
- ☑ **Ensure the pressure tank is in good working condition**
 - Holds adequate pressure
 - Not leaking





Questions and Discussion





4

Post-Sanitary Survey Activities

- Requests for Additional Information or Clarification
- Timing and Delivery of the Sanitary Survey Report
- How to Read and Interpret the Sanitary Survey Report
- Developing and Submitting Responses to Deficiencies
- Corrective Action Plans and Follow-Up Expectations



What to Expect After Sanitary Survey

- Provide the compliance officer with any outstanding items, such as:
 - Requested documents
 - Photographs of tank roof features (access hatches and vents)
 - Photographs of any corrective actions
- The compliance officer may contact system representatives to clarify any questions
 - Confirm observations
 - Questions after review of submitted documentation
- No additional communication is necessary if there are no follow-up questions



What to Expect After Sanitary Survey

- Report will be delivered to the system representative 30 days after the on-site visit for groundwater systems and 45-days for surface water or GWUDI systems
- Check in with the compliance officer to check on the status of the sanitary survey report if it takes longer than expected



**2024
SANITARY SURVEY REPORT**

For

**Ruidoso Water System
NM3513114**

*Este informe contiene información importante acerca de su agua potable.
Haga que alguien lo traduzca para usted, o hable con alguien que lo entienda.*

Prepared by: Rocio Galvan- Compliance Officer
New Mexico Environment Department
1216 Mechem Drive
Ruidoso, NM 88345



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Ruidoso, NM 88345



Sanitary Survey Report – Cover Letter



MICHELLE LUSAN GRISHAM
GOVERNOR

JAMES C. KENNEY
CABINET SECRETARY

Notification provided via E-mail

November 20, 2024

Lynn Crawford; lynnrcrawford@ruidoso-nm.gov
Ruidoso Water System, NM3513114
313 Cree Meadows Rd
Ruidoso, NM 88345

RE: 2024 Sanitary Survey Report

Dear Lynn Crawford:

On October 16, 2024 and October 30, 2024 the New Mexico Environment Department Drinking Water Bureau (DWB) conducted a sanitary survey site visit at the Ruidoso Water System.

During the survey, three significant deficiencies were identified. Ruidoso Water System must submit a written Corrective Action Plan to DWB within 45 days of the sanitary survey cover letter date, indicating how and on what schedule the system will address significant deficiencies noted in the survey. For your convenience, a CAP form is included at the end of the sanitary survey report. Enter the date of completion or expected completion next to each deficiency listed. Sign and date the form prior to submittal.

Failure to correct and provide documentation of significant deficiency corrections within the established timeframes will result in treatment technique violations being issued to Ruidoso Water System.

NMED DWB appreciates your assistance in this matter and your compliance efforts to ensure protection of the State's drinking water. If you or members of your staff have any questions or need additional clarification concerning this report, please feel free to contact me at 505-469-5222 or by e-mail at rocio.galvan@env.nm.gov

Respectfully,

Rocio Galvan, Compliance Officer
Drinking Water Bureau
Water Protection Division

cc: Brandi Littleton, Compliance Supervisor (electronic)
Joe Savage, Surface Water Rule Administrator (electronic)
Electronic Central File

■ Cover Letter

- Date of sanitary survey
- Summary of significant deficiencies
- Corrective action plan requirements and deadline
 - This is typically 45 days after the letter date
- Applicable violations
- Contact information



Sanitary Survey Report – Report Body

INTRODUCTION

A sanitary survey enables the New Mexico Environmental Department Drinking Water Bureau (NMED DWB) to provide a comprehensive review of the components of a water system, to assess the operating condition and adequacy of the water system, and to determine if past recommendations have been implemented effectively. The Sanitary Survey encompasses eight specific elements that are evaluated during the survey. Those eight elements are:

- Source (Protection, Physical Components, and Condition);
- Treatment
- Distribution System
- Finished Water Storage
- Pumps/Pump Facilities and Controls
- Monitoring/Reporting/Data Verification
- Water System Management/Operations
- Operator Compliance with State Requirements

Each element may not be specifically mentioned within this report; however, a significant deficiency or area of concern will be noted if any issues are discovered with any of these eight (8) elements.

The Administrative Contact, for the Ruidoso Water System was given prior notification of the sanitary survey. The preliminary sanitary survey letter provided a list of required records which would be reviewed as part of the sanitary survey as well as a checklist for preparing for the sanitary survey. The letter requested that specific records be provided to the Compliance Officer prior to the sanitary survey.

The sanitary survey was conducted on October 16, 2024 by:
Compliance Officer Rocio Galvan
Compliance Officer Tim Willy
Compliance Supervisor Brandi Littleton

Surface Water survey was conducted on October 30, 2024 by:
Compliance Officer Joe Savage
Compliance Officer Debbie Jones
Compliance Officer Rocio Galvan
Compliance Officer Brandi Littleton

Also in attendance were system operators Randy Koehn and Terry Yarborough.

BACKGROUND

The previous sanitary survey at Ruidoso Water System was conducted on July 20, 2021 by Compliance Officer John Pijawka. During the previous sanitary survey, three significant deficiencies were cited. All significant deficiencies identified during the previous sanitary survey were corrected.

SYSTEM DESCRIPTION

The Ruidoso Water System is a surface water system with an approximate population of 16,777 with 7557 total service connections. The population for the Ruidoso Water System was calculated in accordance with 20.7.10.9.A NMAC. The Ruidoso Water System is classified as a community water system according to the New Mexico Drinking Water Regulations 20.7.10 NMAC. The water system consists of twelve wells, four raw water intakes, one reservoir, seven disinfection units, six pump stations, and eleven storage tanks.

Alto Lake Area:

North Fork Well #1 (004) is a pitless well that can produce an average of 170 gallons per minute (gpm). North Fork Well #3 (006) is a pitless well that can produce an average of 175 gpm. North Fork Well #4 (007) is a pitless well that can produce an average of 320 gpm. Green Well (016) is a pitless well that can produce an average 220 gpm. Apple Orchard Well (021) is a pitless well that can produce an average of 65 gpm. Brown Well is a pitless well that can produce an average of 30 gpm. Alto Well #1 (020) is a pitless well that can produce an average of 95 gpm. Fault Well is a pitless well that can produce an average of 50 gpm. All raw water produced from these wells flow through a commingled raw water line to the Alto Raw Water Intake (063).

The Eagle Creek #4 (017) is a spring that flows to the Eagle Creek Diversion (024) and through the Eagle Creek Desander (035). Desander raw water from the spring is then combined with the raw well water in the commingled raw water line.

Alto Well #2 (018) is a pitless well that can produce an average of 45 gpm. Alto Well #3 (070) is a pitless well that can produce an average of 45 gpm. All raw water produced from these wells flow to the Alto Reservoir Pump Station (052). From the pump station, water is pushed through the commingled raw water line to the Alto Raw Water Intake.

The Alto Reservoir (019) is currently inactive due to the recent forest fires and flooding in the area. When active, the surface water flows from the lake to the Alto Reservoir Pump Station then to the Alto Raw Water Intake.

From the Alto Raw Water Intake (063), raw water flows through the Alto SW Treatment Plant #3 (014). At the Alto SW Treatment Plant, raw water is treated conventionally with an ATS polymer solution that is injected prior to the flash mixer. Water then passes through a conventional flocculation basin, settling basin, settling tubes, and finally a mixed media gravity filtration. Sodium hypochlorite is injected after the settling basin for iron and manganese treatment through oxidation. After treatment the water flows to a clear well where it is disinfected with gaseous chlorine. Treated water is then boosted via three-125 horsepower booster pumps to the Alto West Tank (037) and Alto East Tank (038).

The Entry Point (EP) sample tap is located inside the Alto SW Treatment Plant #3 building and is labeled with a yellow tag.

The Alto East Storage Tank (038) is constructed of steel with a capacity of 5,000,000 gallons. The Alto West Storage Tank is constructed of steel with a capacity of 5,000,000 gallons. Both tanks are direct tanks in the system and are both scheduled for rehabilitation in 2025 due to damage during the wildfires.

- Review the report body and note any discrepancies
- Communicate discrepancies and errors with the compliance officer or NMED



Sanitary Survey Report Components

Significant Deficiency Summary

Significant Deficiencies:

A significant deficiency is defined as any deficiency that is causing or has the potential to cause a threat to public health [New Mexico Administrative Code (NMAC) 20.7.10.100 incorporating 40 Code of Federal Regulations (CFR) §141.403(a)(4) or § 141.723(b)].

1. **Significant Deficiency Code:** 004P Chemical dosage records are insufficient to ensure proper operation of the treatment plant

Regulatory Citation: 20.7.10.100 NMAC incorporating 40 CFR 141.723(b)

Significant Deficiency Description: The Ruidoso Water System does not formally calibrate, check calibration, or maintain calibration records for chemical addition pumps.

Required Corrective Action Plan: Ruidoso Water System must submit a written Corrective Action Plan to DWB within 45 days of the sanitary survey cover letter date.

Required Corrective Action: Ruidoso Water System must calibrate and routinely check calibration of all chemical addition pumps and document the results. Ruidoso Water System must detail the procedure in the O&M Plan. Ruidoso Water System must provide documentation acceptable to DWB to verify that this deficiency has been corrected.

2. **Significant Deficiency Code:** 001L Well head is susceptible to flooding.

Regulatory Citation: 20.7.10.100 NMAC incorporating 40 CFR 141.723(b)

Significant Deficiency Description:

- a) Alto Well #1 (020): No cement pad around well casing.
- b) Alto Well #2 (018): Inadequate seal of well casing cap.

Photographic Documentation:



■ Significant Deficiency Summary

- All observations categorized as significant deficiencies will be listed here
- Each finding will include:
 - Significant deficiency code used by NMED
 - Regulator Citation
 - State and/or federal
 - Description of the deficiency based on what was observed at the time of the sanitary survey
 - Required corrective action plan
 - Relevant photographs (when available)



Sanitary Survey Report Components

Notes and Recommendations Summary

Notes and Recommendations are defined as any issue which in the estimation of the DWB, is not currently significant enough to be considered as a Significant Deficiency, however, the issue should be further investigated or addressed by the water system so as to not negatively contribute to the poor operations, management, or adequacy of the water system. Recommendations may be escalated to significant deficiencies if they are not addressed before the next sanitary survey.

The following Notes & Recommendations were identified at the Ruidoso Water System water system during the survey.

1. **Note:** During the survey it was noted that the security fence, around the Cherokee Well and Cherokee Treatment Unit building, was damaged due to the recent flooding. Ruidoso Water System is actively working with other organizations to clear remaining debris near the well and treatment unit to rebuild security fence.



2. **Note:** The Alto East Storage Tank (038) and Alto West Storage Tank (039) are scheduled to be rehabilitated in 2025 due to fire damage.

Recommended Action: After rehabilitation, Ruidoso Water System should ensure that the storage tank level indicators are repaired or removed if on a SCADA system. If removed, Ruidoso Water System must ensure that the indicator cable hole is adequately sealed.

3. **Note:** The cement pad around the Green Well (016) casing is developing small cracks.

Recommended Action: Ruidoso Water System should repair the cement pad cracks to ensure an adequate sanitary seal of the well casing.

4. **Note:** Alto Reservoir (019) and the Grindstone Diversion (009) are currently inactive due to damage from wildfires and flooding. The Grindstone Reservoir has approximately one year of water available.

Recommended Action: Ruidoso Water System should notify NMED once the facilities are back in operation.

■ Notes & Recommendations Summary

- Observations that are not immediate threats to water quality, but if left unattended can become significant deficiencies
- Observations noted in previous sanitary surveys can be escalated to significant deficiencies if observed repeatedly
- Each note includes:
 - Description of the observation at time of inspection
 - Recommended action to address the observation



Sanitary Survey Report Components



Sanitary Survey Corrective Action Plan (CAP)

Surface water and GWUDI systems must submit a CAP within 45 days of the issuance of the sanitary survey report

PWSS Name	Ruidoso Water System
PWSS ID	NM3513114
Sanitary Survey Date:	October 16, 2024; October 30, 2024
Date report was issued:	November 20, 2024

Deficiency Listing– Shaded Section is to be filled out by water system representative

Deficiency Code	Description	Choose one and fill in date:	
		Date Deficiency was addressed	Expected date of completion
004P	Insufficient chemical dosage records		
001L	Alto Well #1 (020) no cement pad		
001L	Alto Well #2 (018)-inadequate well cap seal		
Comments:			

If a deficiency has been addressed, submit documentation to the compliance staff listed below.

Submit this form to:

Rocio Galvan at rocio.galvan@env.nm.gov

Corrective Action Plan submitted by:

Signature

Printed Name

Date

- Sanitary Survey Corrective Action Plan (CAP)
 - Lists each deficiency that requires a CAP
 - Identify the date each deficiency was addressed (if it has been addressed)
 - Identify expected date of completion (if not yet addressed)
 - CAP must be submitted to NMED within 45 days of the sanitary survey report
 - Documentation that shows a deficiency has been corrected must be submitted and can include work orders, purchase orders, and photographs



Questions and Discussion

Thank You!