

DATE: February 7, 2002, Revised April 26, 2012, March 11, 2015

TO: Office of Drinking Water Staff

FROM: John J. Aulbach II, PE, Director
Office of Drinking Water

SUBJECT: SURVEILLANCE & REGULATIONS - Sanitary Surveys

Project Leader: Susan E. Douglas *A&D*

Revision Highlights:

1. Required frequency of sanitary surveys has been changed for groundwater systems.
2. Electronic filing of complete sanitary survey reports has been added.
3. Instructions to copy fluoridation information from the sanitary survey report for the Division of Dental Health Fluoridation Coordinator have been deleted.
4. Clarification has been added that Source Water Assessment and Protection Plans shall be reviewed as part of the source element of the sanitary survey.

SUMMARY STATEMENT

This guidance in this memo provides procedures and forms to implement Sanitary Surveys. The Sanitary Survey is a core function of the Public Water System Supervision program implemented by the VDH-Office of Drinking Water. The Sanitary Survey of all waterworks is required by federal and state rules and regulations originating from the Safe Drinking Water Act.

TABLE OF CONTENTS

1. PURPOSE..... 4

2. SCOPE..... 4

3. FREQUENCY OF SURVEYS 6

4. SANITARY SURVEY PROCESS 7

 4.1. IMMINENT HEALTH THREATS 7

 4.2. SAFETY CONCERNS..... 8

 4.3. ROUTINE SANITARY SURVEY PROCESS FLOW DIAGRAM..... 9

5. SANITARY SURVEY REPORTS..... 10

 5.1. GROUNDWATER SYSTEMS OWNER’S REPORT OR TRANSMITTAL LETTER 10

 5.2. GROUNDWATER SYSTEMS PART I - SYSTEM BACKGROUND 11

 5.3. GROUNDWATER SYSTEMS PART II – SYSTEM SURVEY INFORMATION (FIELD NOTES) 11

 5.4. SANITARY SURVEY FORMAT FOR SURFACE WATER AND GUDI SOURCE WATERWORKS. 12

 5.5. SURFACE WATER SYSTEMS PART I - SYSTEM BACKGROUND & FINDINGS 12

 5.6. SURFACE WATER SYSTEMS PART II - A..... 12

 5.7. SURFACE WATER SYSTEMS PART II - B..... 12

 5.8. SURFACE WATER SYSTEMS PART II - C..... 13

 5.9. SURFACE WATER SYSTEMS PART II – D..... 13

 5.10. SANITARY SURVEY REPORT FOR CONSECUTIVE & TNC SYSTEMS..... 13

6. SDWIS UPDATE 13

7. DISTRIBUTION OF SANITARY SURVEY REPORTS..... 13

8. SIGNIFICANT DEFICIENCIES..... 14

9. CORRECTIVE ACTION PLANS..... 15

10. CORRECTIVE ACTION PLAN FOLLOW-UP..... 15

11. SIGNIFICANT DEFICIENCIES AND VIOLATION NOTICES 16

TABLES

TABLE 1: MINIMUM SANITARY SURVEY FREQUENCY ESTABLISHED BY ODW.....7

TABLE 2: SIGNIFICANT DEFICIENCIES AND VAC VIOLATIONS.....16

**ATTACHMENTS
(REPORT FORMS AND LETTERS)**

**These attachments are posted separately on the ODW server at
:\03-Memos\301-Active Working Memos\301.02-Forms Letters Manuals**

ATTACHMENT A: GROUNDWATER SYSTEM OWNER'S REPORT

ATTACHMENT B: GROUNDWATER SYSTEM INSPECTION REPORT

ATTACHMENT C: SURFACE WATER & GUDI SYSTEM INSPECTION REPORT

ATTACHMENT D: CONSECUTIVE SYSTEM INSPECTION REPORT

ATTACHMENT E: TRANSIENT NON-COMMUNITY (TNC) SYSTEM INSPECTION
REPORT

ATTACHMENT F: LIST OF POTENTIAL SIGNIFICANT DEFICIENCIES

ATTACHMENT G: TRANSMITTAL LETTER FOR SANITARY SURVEY REPORT WITH
SIGNIFICANT DEFICIENCY & CAP

ATTACHMENT H: TRANSMITTAL LETTER WITH NOV

ATTACHMENT I: MONITORING HISTORY - R&R REPORT INSTRUCTIONS

1. PURPOSE

Sanitary surveys performed by ODW staff are a vital part of our mission to ensure all people in Virginia have access to an adequate supply of affordable, safe drinking water that meets federal and state drinking water standards. A sanitary survey of every waterworks is required by the EPA for compliance with the Groundwater Rule and the Enhanced Surface Water Treatment Rules. The information gathered may be used to identify compliance with State and Federal regulations and to identify significant deficiencies requiring corrective action.

2. SCOPE

Safe drinking water depends on many factors. An adequate sanitary survey is categorized into **EIGHT ESSENTIAL ELEMENTS**. These elements are described below.

1. Source(s)

Surface Water: Includes intake structure and all valves and piping to WTP, and *associated pumping facilities*¹

Ground Water: Includes well, well casing, grout, valves, and piping to treatment plant (if treated) or to raw water tap (if not treated), *including the well pump*¹.

Spring: Includes spring box, controls, valves, *and associated pumping facilities*¹.

Included in this element is the review and update of all Source Water Assessments and Protection plans.

2. Treatment

Treatment is any chemical or physical processing of water that alters or enhances water quality in any way. This includes

- Chemical addition systems (chemical metering pumps, pumps for chemical feeders, day tanks, or chemical mixing tanks, and pumps for chemical transfer, etc.) to treat raw water or finished water anywhere in the system
- Aeration or agitation within the pipes or any vessel, pond, reservoir or basin
- Sedimentation, Adsorption or Exchange processes
- Filtration (including backwash and all appurtenances)

3. Distribution System

Includes all piping and appurtenances following the treatment plant (or entry point tap) to convey finished water to consumers. Includes air release valves, fire hydrants, yard hydrants, blow off valves, sampling stations, meters, isolation valves, backflow prevention devices (RPZ, etc.).

¹ Italicized items are included under this category for field inspection efficiency. This differs from the EPA Guidance Manuals, which combine ALL pumps into one category.

4. Finished Water Storage

All finished water storage vessels following treatment, including: clearwell, hydropneumatic tanks, atmospheric storage tanks, bladder tanks, etc.

5. Pumps, Pump Facilities and Controls

Includes intermediate pumps, finished water pumps at the treatment plant and booster pumps in the distribution system.

6. Monitoring and Reporting (M&R) and Data Verification

Includes source and finished water quality data (bacteriological, physical, chemical, and radiological). Much of this element will be performed in preparation for the site visit, such as review of:

- a. Sampling Schedules
- b. Compliance sample results
- c. Violations and Public Notice Completion
- d. Monthly or quarterly Operation Reports
- e. Past Sanitary Surveys and Photos
- f. All required monitoring plans and reports
- g. Permits and Description Sheets

This task also includes all field sampling and data collection conducted by ODW during the sanitary survey for verification of performance (not compliance with the SDWA).

7. Management & Operations

Management and operations effect the overall water quality and reliability of the entire system. Some items that are included in this element are verification of:

- a. Corrective actions made in response to deficiencies cited, and all other recommendations from previous surveys.
- b. An effective cross-connection control program at the plant(s) and in the distribution system.
- c. Complaint history and response.
- d. Water loss and water audits performed. This includes an evaluation of the total amount of water produced/purchased vs. the total amount of water billed by the waterworks for revenue. AWWA recommends that routine water audits be conducted over a time period of at least 12 months. ODW has determined that >30% Leakage (Real Losses) to be a potential Significant Deficiency. More information on water loss terms and water audits can be found on the ODW server at:
:\06-Technical Resources\665-Water Accountability & Leakage
- e. Asset Management Programs. This process includes the assessment of the current state of facilities and equipment owned and operated by the waterworks, and planning and scheduling maintenance, repair, and replacement at the lowest appropriate costs. Although state and federal regulations currently do not require

asset management programs, they are encouraged. EPA information available on their website:

- Asset Management Best Practice Guide
- Check Up Program for Small Systems (CUPSS) – Asset management software
- Asset Management: A Handbook for Small Systems – STEP Guide Series
- Taking Stock of Your Water System: A Simple Asset Inventory for Very Small Drinking Water Systems
- Building an Asset Management Team
- Asset Management for Local Officials

Separate Capital Improvement Programs (CIP) may also be developed by waterworks or public utilities.

- f. Operational supplies
- g. Onsite laboratory
- h. Emergency Management Plan. Every community waterworks, including consecutive systems, must have a current Emergency Management Plan for Extended Power Outages, as required by the *Waterworks Regulations*. It must be kept current and be readily accessible. The waterworks must certify in writing to the appropriate ODW Field Office that they have completed the plan. Specific information required in the plan is described in the *Regulations*.

8. Operator Compliance

The qualifications of system personnel must match Water System classification including the number of personnel and coverage of personnel when out sick or on vacation, according to the *Waterworks Regulations* and DPOR requirements.

During the survey ODW staff should courteously and thoroughly question the operators to determine their knowledge of the facility and its processes, the operator's ability to reliably operate the waterworks, and the attention paid to process control and maintenance. Performance of field tests is encouraged and results of those tests should be noted in the report.

3. FREQUENCY OF SURVEYS

All of the eight elements are necessary for a thorough survey, but not all elements may be necessary or evaluated at each survey. The Interim Enhanced Surface Water Treatment Rule and the Ground Water Rule require States to complete sanitary surveys at the following minimum frequency:

- Community waterworks: every 3 years²
- Non-community waterworks: every 5 years

ODW has established a more frequent sanitary survey schedule, based on water source. No element shall be surveyed less than every 3 years. ODW's required sanitary survey frequency schedule is given in Table 1.

² The frequency may be reduced to every 5 years if the State determines that a community waterworks has outstanding performance.

TABLE 1
SANITARY SURVEY FREQUENCY ESTABLISHED BY ODW, Months
(Report Template Section Shown in Parentheses)

ELEMENT: WW TYPE	1 Source	2 Treatment	3 Distribution	4 Storage	5 Pumps	6 M&R	7 Mgmt	8 Operator
GW, no Treatment	36 (Part II)	N/A	36 (Part I)	36 (Part II)	36 (Part II)	36 (Part I)	36 (Part I)	36 (Part I)
GW, with Treatment	24 (Part II)	24(Part II)	24 (Part I)	24 (Part II)	24 (Part II)	24 (Part I)	24(Part I)	24 (Part I)
Surface Water & GUDI	12 (Part II-B)	12 (Part II-A)	36 (Part II-B)	36 (Part II-B)	36 (Part II-B)	12 (Part I, II-C)	36 (Parts II-C, II-D)	12 (Part I)
Consecutive	N/A	36 (Part II)	36 (Part I)	36 (Part II)	36 (Part II)	36 (Part I)	36 (Part I)	36 (Part I)

Completed element evaluations shall be documented on written sanitary survey reports and in the State Drinking Water Information System (SDWIS) database.

4. SANITARY SURVEY PROCESS

The procedures needed to perform a Sanitary Survey are depicted in section 4.3 Sanitary Survey Process Flow Diagram. These major activities are included: scheduling, file and database review, field inspection, survey report completion, supervisor review including verification of Significant Deficiencies and Violations, and database updates.

4.1. Imminent Health Threats

During the course of a site visit, if the inspector believes that the waterworks is under an imminent health threat (e.g. one or more barriers have been compromised, and chemical or microbial contamination is believed to be occurring), then the inspector must contact his/her supervisor to discuss the situation and decide on an appropriate course of action. Findings that may indicate an imminent health threat include:

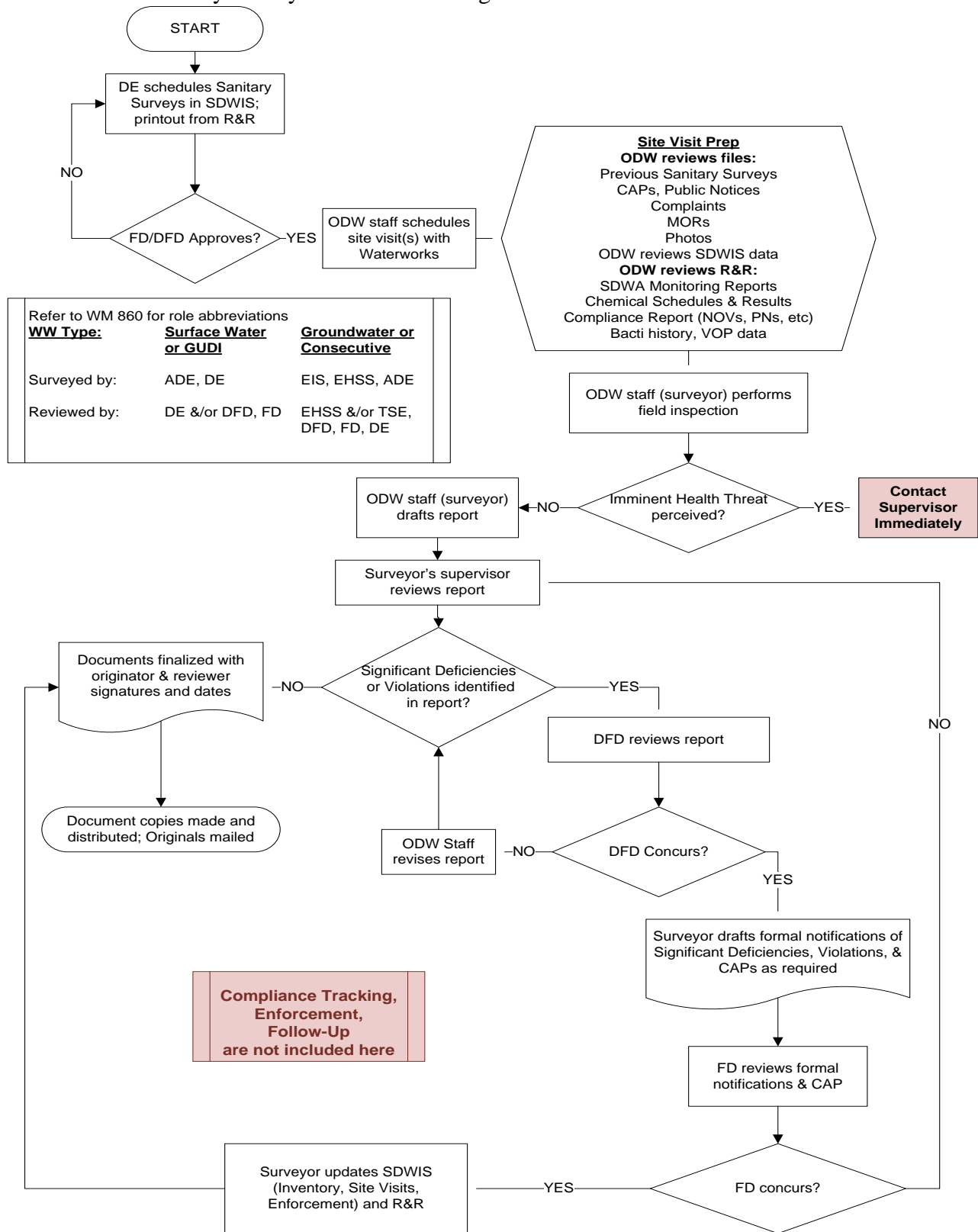
- Well flooding/ surface water intrusion
- Contamination of source or finished water from a chemical spill or cross-connection
- Unapproved use of a groundwater source without acceptable water quality data
- Zero or negative system pressure
- Major water main break/interruption
- Inadequate disinfection / log inactivation not achieved / minimum chlorine residual not maintained
- Elevated filtered water turbidities
- Unprotected openings in finished water tanks with evidence of contamination (intrusion by birds, insects, etc.)

If the Field Director and Local Health Director support the issuance of a Special Notice, the inspector should assist the waterworks with preparation of the notice. The inspector should provide technical assistance on site to correct the problem, whenever possible. Depending on the severity of the situation, the inspector may need to end the inspection and schedule a follow-up site visit.

4.2. Safety Concerns

The inspector shall not enter confined spaces or climb elevated structures such as tanks. The inspector must use other methods and devices, such as binoculars, mirrors and lighting, to make field observations.

4.3 Routine Sanitary Survey Process Flow Diagram



5. SANITARY SURVEY REPORTS

The attached sanitary survey report forms are for use in conducting and reporting the results of sanitary surveys.

The forms have been designed to

- provide uniformity of surveys,
- ensure completeness of the surveys,
- facilitate recordkeeping and SDWIS updates,
- allow follow-up surveys by other staff if necessary,
- provide owners/operators with a separate and concise notification of deficiencies,
- motivate owners/operators to take corrective action for recommendations,
- develop a Corrective Action Plan, if a significant deficiency exists, and
- provide a record for future surveys, for emergency situations, or when technical assistance is needed.

Part I of the report template is mandatory and shall not be modified. The subsequent sections are generated from field visits and may need to be customized for the particular waterworks surveyed.

If the template does not provide sufficient space, then place numbers in boxes where comments are required, and write the comments at the bottom of the page or on another sheet, to be included with the report.

The report can be brief or as detailed as necessary, with extra sheets added for narrative, to convey to the owner the deficiencies that exist. If the written report differs from the on-site discussion during the survey, the owner/operator must be phoned to notify of the change(s) and the reason(s).

5.1. Groundwater Systems Owner's Report or Transmittal Letter

The owner's report has been tailored to stand on its own without the full Sanitary Survey report. It includes minimal background information: date and type of survey, a listing of those in attendance, the next scheduled samples, and next scheduled inspection, and the most significant comments/findings. A template is provided in Attachment A.

Alternatively, the full sanitary survey report may be sent to the owner with a transmittal letter. If a Significant Deficiency is found during the Sanitary Survey, then the full report (Parts I and II) must be sent with a Significant Deficiency notification letter and Corrective Action Plan, as shown in Attachment G. If a violation is found during the Sanitary Survey, then the full report (Parts I and II) must be sent with the violation notice, as shown in Attachment H.

5.2. Groundwater Systems Part I - System Background

This section of the sanitary survey report reflects Essential Element numbers 6, 7, and 8. A template is provided in Attachment B and includes the following:

- General Information
- Compliance History
- Monitoring History
- Source Water Assessment Status (every source; includes C, NTNC, TNC Water Systems)
- Source Water Protection Status (only CWS; includes Wholesalers and Consecutives)

Completion of this section is mandatory. "Compliance History" is self-explanatory and should be completed before conducting the field inspection. Compliance dates may be obtained by running the R&R "System Data Dates" report. "Monitoring History" should be generated from R&R "Chemical Schedule" reports. See Attachment I for instructions to generate the Monitoring History report from R&R and paste into the sanitary survey report.

5.3. Groundwater Systems Part II – System Survey Information (Field Notes)

This portion of the report is intended to be used during the onsite review of the water source, facilities, equipment, operation, and maintenance of the waterworks. A template is also provided in Attachment B, and includes forms for wells and spring sources, and typical groundwater treatment processes.

In cases where other treatment processes are present, the staff will need to develop their own process-specific checklist(s) for inclusion in the survey report. The list(s) should follow the general format of that for fluoridation, including a review of the past 12 months' operation reports to determine effectiveness of treatment, questions pertaining to potential health threats (usually cross-connection control), physical facilities required by the *Waterworks Regulations*, and operational considerations. The staff should consult with the Deputy Field Director to assure that the pertinent items are included in the lists, and shared with other field offices as well as the Central Office for inclusion in future revisions to the template(s).

Staff are encouraged to take digital photographs of the facilities, and prepare piping diagrams or schematics. This information can be valuable to the staff in finalizing the survey report. It may also be an important future reference and may be incorporated into the Engineering Description Sheet of the Waterworks Operation Permit. Photos and schematics should be copied into the correspondence file after each inspection.

Performing field tests such as chlorine residual, pH, alkalinity, hardness, iron, manganese, etc. should be considered during surveys of most groundwater systems. Field tests may also be warranted during a complaint investigation, when requested by the owner/operator, or for the purpose of evaluating a treatment process. If the owner's report is prepared, then include the results of all field tests; otherwise document the results with the inspection form of the related waterworks facilities.

Problem solving must be approached systematically. Only after a thorough evaluation of all system components is completed, should recommended actions be reported to the

owner/operator. Staff with limited experience or simply unable to confidently interpret the survey findings should defer to more experienced ODW staff for resolution.

5.4. Sanitary Survey Format for Surface Water and GUDI Source Waterworks

The sanitary survey report forms in Attachment C are for use in conducting and reporting the results of sanitary surveys performed at waterworks served by conventional surface water plants and membrane systems, excluding Reverse Osmosis.

This report form is designed to cover both performance of the physical facilities and the operational and managerial institutions which govern the facilities. The purpose of the form is to provide a means to look at the necessary unit processes at the treatment plant and at associated facilities elsewhere, and to look at the programs which need to be in place to ensure proper operation, maintenance, planning and funding of those facilities on an on-going basis.

5.5. Surface Water Systems Part I - System Background & Findings

This part includes the following topics, which are researched and completed *before* the field inspection:

- Construction & operation permits
- Operation reports
- Complaints
- Monitoring History
- Compliance History
- Enforcement Actions
- VOP performance
- Source Water Assessment Status (every source; includes C, NTNC, TNC Water Systems)
- Source Water Protection Status (only CWS; includes Wholesalers and Consecutives)

Following the sanitary survey the findings (especially deficiencies) are summarized in this section. It is recommended that the VOP performance summary from R&R be printed and shared with the Designated Operator (DO) during the routine site visit.

5.6. Surface Water Systems Part II - A

This part includes field observations on the following topics:

- Unit Process Evaluations (Treatment)
- Finished Water Facilities (Clearwell)

5.7. Surface Water Systems Part II - B

This part includes field observations on the following topics:

- Raw Water Intake / Surface Source Evaluation
- Spring Source Evaluation (if declared GUDI)
- Source Water Assessment (potential sources of contamination)
- Source Water Protection Plan / implementation

5.8. Surface Water Systems Part II - C

This part includes field observations on the following topics:

- Distribution System Evaluation
- Cross Connection Control Program
- Distribution Storage
- Distribution Pump Station(s)

5.9. Surface Water Systems Part II – D

This part includes the following topics:

- System Management & Operations
- Financial

5.10 Sanitary Survey Report for Consecutive & TNC Systems

Consecutive system sanitary surveys may include up to seven of the eight Essential Elements:

1. Distribution System
 2. Finished Water Storage
 3. Pumps, Pump Facilities and Controls
 4. Monitoring & Reporting and Data Verification
 5. Water System Management and Operations
 6. Operator Compliance
 7. Treatment - this would be added to Part II
- these are found in Part II*
- These are found in Part I*

A template for a consecutive waterworks sanitary survey report is provided in Appendix D. One for TNC waterworks is provided in Appendix E.

6. SDWIS UPDATE

Upon completion of the sanitary survey report, the SDWIS - “Site Visits” module must be updated. Refer to the *SDWIS Users Manual* for specific data entry instructions.

7. DISTRIBUTION OF SANITARY SURVEY REPORTS

The entire report form for surface water and GUDI systems will be forwarded to the waterworks owner and to operations supervisor. For groundwater systems, the owner and/or operations supervisor may receive a full copy of the inspection report or a copy of the Owner’s Report. **The ODW Central Office shall receive complete sanitary survey reports** in electronic file format (PDF). Report files should be posted to the specific Field Office subfolder, by calendar year, in <\\odwsrv1\odwshare\12-Sanitary Survey Reports>

Files shall be named using the following format: PWSID#_SS_yyyy_mm_dd, where the date (yyyy_mm_dd) is the day that the survey was performed. By example, a sanitary survey for the City of Richmond WTP, performed on May16, 2014, would be titled: 4760100_SS_2014_05_16.

For all federally-owned waterworks, a copy of the opening/summary section of the report or the owner’s letter is to be mailed by the field office to:

Federal Facilities Program (3EC00)
Office of Enforcement, Compliance and Environmental Justice
US Environmental Protection Agency, Region 3
1650 Arch Street
Philadelphia, PA 19103
Phone: (215) 814-2148
Fax: (215) 814-2905

All sanitary survey reports shall be written, reviewed, and sent out of the Field Office within 30 calendar days of the survey.

8. SIGNIFICANT DEFICIENCIES

Significant Deficiency means any defect in a waterworks' design, operation, maintenance, or administration, as well as any failure or malfunction of any system component that may cause, or have the potential to cause, an unacceptable risk to health or that could affect the reliable delivery of safe drinking water.

All Significant Deficiencies identified by ODW staff during sanitary surveys must be corrected. A list of potential Significant Deficiencies is provided in Attachment F. (This list is also provided in SDWIS to facilitate data entry of Significant Deficiencies.) The list represents several possible Significant Deficiencies for waterworks but cannot account for all of the possible Significant Deficiencies for all waterworks. ODW staff may also determine event-specific Significant Deficiencies as appropriate.

If a staff member performing a sanitary survey observes one of these deficiencies, concurrence must be obtained from the Deputy Field Director prior to finalizing the report and formally notifying the waterworks owner. The observed deficiency shall be subject to the following questions in order to confirm that it is a Significant Deficiency:

- Does the deficiency cause the potential for acute and chronic contaminants to be introduced into the drinking water?
- If left uncorrected will the deficiency cause the potential for the introduction of contaminants into the drinking water at some time in the future, that has the potential for acute or chronic health effects?
- Does the deficiency affect treatment in a manner that increase the potential risk to public health?
- Does the deficiency cause the introduction of contaminants into the drinking water, that has the potential for acute or chronic health effects?

Within 30 days ODW must notify the waterworks owner in writing of a confirmed significant deficiency, as well as sending a full copy of the sanitary survey report. Use the sample

Significant Deficiency notification letter and Corrective Action Plan in Attachment G. If a Significant Deficiency exists, then Corrective Action is required.

9. CORRECTIVE ACTION PLANS

Draft Corrective Action Plans (CAP) will usually be generated by ODW staff and included with the formal notification of a significant deficiency. The transmittal letter must inform the waterworks owner to review, sign and return the proposed CAP within 45 days. The waterworks owner may revise the proposed CAP (with ODW review and approval) or develop an owner generated CAP (see below). The CAP will include a list of specific activities, along with a schedule, to correct any significant deficiencies. CAPs are enforceable schedules of compliance and must include the following:

1. A statement of the deficiency
2. The action(s) necessary to correct the deficiency
3. Detailed schedule with begin dates and deadlines for each step to correct the deficiency
4. A statement that the waterworks will notify the appropriate field office, in writing, within 30 days of completing individual scheduled actions.

Corrective Action Plans may include the following:

1. Proposed interim measures to prevent a recurrence
2. Source of funding, if necessary
3. Any follow-up actions

If the waterworks owner desires to develop the CAP, field office staff must advise the waterworks owner that:

- A 30 day period to consult with ODW regarding the Corrective Action(s) is allowed and
- A subsequent 15 day period to submit to ODW a written CAP is also allowed.

CAPs will be given the highest priority for review as they address a potential threat to public health. CAP submittals will be acted on within 30 days of receipt. CAP action items and associated completion dates must be logged in SDWIS for compliance tracking.

10. CORRECTIVE ACTION PLAN FOLLOW-UP

Within 120 days of receiving written notification of a Significant Deficiency, the waterworks owner must complete all Corrective Actions or be in compliance with the schedule of activities in an approved CAP. Waterworks owners should complete CAP corrective action(s) within 120 days. Failure to complete Corrective Actions or meet individual approved schedule deadlines is a Treatment Technique violation. However, if reasonable events preclude the meeting of a deadline, the CAP may be revised, and no violation would be incurred.

The waterworks owner must notify ODW within 30 days of completing any required Corrective Actions. Logging of all deadlines for actionable items must be done in SDWIS for tracking purposes.

Onsite inspections will be conducted by Field Office staff after notification from a waterworks that a CAP has been completed. The inspection must be conducted within 30 days of notification from the waterworks. A written report of the inspection will document and inform the waterworks of ODW's concurrence or non-concurrence with the waterworks that the completed corrective action(s) meet(s) the intent of the CAP.

11. SIGNIFICANT DEFICIENCIES AND VIOLATION NOTICES

Virginia Administrative Code (VAC) violations that have also been identified as Potential Significant Deficiencies are listed in Table 2.

TABLE 2
SIGNIFICANT DEFICIENCIES AND VAC VIOLATIONS

VAC Violation (WM 908)	Significant Deficiency
B1 – Failure to Follow Approved BSSR or TSWMP	MR04 – Sampling not in accordance with BSSR
B2 – Lacks Properly Licensed Operator	OC01 – Number and Class of Operators do not meet WW Regulations
C6 – Less Than 20 psi at Service Connection	DS01 – Distribution pressure falls below 20 psi
C3 – Reliability problem; examples in WM 908 Attachment 2:	
<ul style="list-style-type: none"> Failure to reliably maintain treatment or chemical addition – chlorination 	TR05 – Failure to maintain continuous disinfection TR06 – Minimum chlorine residual not maintained to meet CT TR07 – Entry point chlorine residual < 0.2 mg/L
<ul style="list-style-type: none"> Failure to reliably maintain treatment or chemical addition – corrosion control 	TR11 – Inadequate continuous treatment
<ul style="list-style-type: none"> Failure to maintain infrastructure – well seal 	SO04 – Sanitary seal or pitless adapter well cap missing or defective
<ul style="list-style-type: none"> Failure to maintain infrastructure – storage tanks 	FW01 – Tank not watertight FW02 – Roof/Access hatches not watertight FW03 – Tank structurally unsound FW04 – Vent improperly screened FW05 – Overflow improperly screened or protected from contamination FW06 – Drain improperly screened or protected from contamination
<ul style="list-style-type: none"> Failure to maintain infrastructure – distribution system 	DS03 – Distribution leakage rate > 30%

When a VAC Violation is identified in the sanitary survey, it should be issued, per WM 908. When the Deputy Field Director confirms that the item is also a Significant Deficiency, then the Significant Deficiency data must be entered into SDWIS, and “associated” to the violation.

If the waterworks is non-compliant with the Corrective Action Plan because it fails to meet a schedule deadline or resolve a corrective action to the satisfaction of ODW, a Treatment Technique violation has occurred. Refer to the [SDWIS Users Manual](#) for further instructions.

Treatment technique violations require a Tier 2 Public Notice. Public Notice templates (Tiers 1, 2 and 3) are provided on the ODW server at <\\Odwsrv1\odwshare\13-Public Notice & NOV Templates>

END OF MEMO

{VDH-ODW Letterhead}

(Groundwater)(Consecutive) System Sanitary Survey Report

DATE

To: *Owner Name*
Waterworks Name
Address
City, State, Zip Code

SUBJECT:
Waterworks:
PWSID:

Survey Date:

Present at Survey:

Next Survey Scheduled For:

Future Sampling Requirements: See attached *(or insert table here)*

As a result of the sanitary survey noted above, the Department offers the following comments. Should you have questions or desire to discuss our findings, or desire a copy of the inspector's field evaluation notes, please contact us at *(phone number)*.

1. *Comment*
2. *Comment*
3. *Comment*

Please visit our web site at <http://www.vdh.virginia.gov/ODW/>. There you will find helpful information on water sampling and testing, operator licensing and training, consumer education, project funding and **many other topics, as well as, links to other key websites and Virginia's *Waterworks Regulations*.**

Survey By:

Name
Title

Attachment *(with owner & operator letters only)*

cc: *Name of Operator* (copy of attachment)
VDH-ODW-Central Office
County Health Department, Attention: <<*Name of Health Director*>>
County Administrator

**VIRGINIA DEPARTMENT OF HEALTH
OFFICE OF DRINKING WATER
GROUNDWATER SYSTEM SANITARY SURVEY REPORT**

SUBJECT:
WATERWORKS:
PWSID:

PART I - SYSTEM BACKGROUND
GENERAL INFORMATION

Owner Name:	Waterworks Class:
Type of Waterworks:	
Contact Name:	
Contact Address:	
Contact Phone Number:	

D.O. License Class:	D.O. Has Required License:
D.O. Legal Name:	License No./Exp. Date:

Inspection By:	Inspection Date:
Time Spent:	Last Inspection Date:
Date to Reviewer:	Reviewed by/Date:
Date to Reviewer:	Reviewed by/Date:
Inspection Type:	
Present at Inspection:	
Facilities Inspected:	

Operation Permit Effective Date:	Waterworks Description Sheet Date:
Permit Up-to-Date?	Description Sheet Up-to-Date?
No. Connections:	Population Served:
Avg. Daily Production:	Operation Permit Capacity:
Exceeds 80% Operation Permit Capacity? (max. 3 consecutive months): If yes, explain:	
Treatment Provided:	
SDWIS Inventory Information Current:	

Comments:

COMPLIANCE HISTORY

Shaded Boxes	Indicate a potential Significant Deficiency	
REVISED TOTAL COLIFORM & GROUNDWATER RULES		
<ul style="list-style-type: none"> BSSP Approved: 	<i>(Yes/No)</i>	<i>(Date)</i>
<ul style="list-style-type: none"> # of routine samples/monitoring period & frequency 		
<ul style="list-style-type: none"> Is plan current & appropriate for distribution system & population? 		
<ul style="list-style-type: none"> Is monitoring frequency correct? 		
<ul style="list-style-type: none"> Rotates and uses approved sites? 		
<ul style="list-style-type: none"> Measures chlorine residual for all samples, if chlorine is added? 		
<ul style="list-style-type: none"> RTCR Level 1 or 2 Assessments since last Survey? 		
<ul style="list-style-type: none"> Disinfection required? (adequate contact time) 		
<ul style="list-style-type: none"> Source # / Name (if multiple sources, list) 		
<ul style="list-style-type: none"> 4-Log virus inactivation required? 		
<ul style="list-style-type: none"> Source # / Name (if multiple sources, list) 		
<ul style="list-style-type: none"> 4-Log virus inactivation provided? 		
<ul style="list-style-type: none"> Source # / Name (if multiple sources, list) 		
<ul style="list-style-type: none"> On-line chlorine analyzers required for chlorine residual? 		
ROUTINE RAW WATER BACTERIOLOGICAL MONITORING <i>(checked over past 12 months)</i>		
<ul style="list-style-type: none"> Required? 		
<ul style="list-style-type: none"> o If "Yes", Frequency: 		
<ul style="list-style-type: none"> # of <i>E. coli</i> positive Samples 		
<ul style="list-style-type: none"> # Samples with Total Coliform >50 CFU/100 mL 		
GUDI DETERMINATION	RESULT	DATE
<ul style="list-style-type: none"> Source # / Name 		
SOURCE WATER ASSESSMENT PERFORMED		
<ul style="list-style-type: none"> Source # / Name 		
SOURCE WATER PROTECTION		
<ul style="list-style-type: none"> Written source water protection plan? 		
DDBP RULES - (Community & NTNC, Disinfectant Used)		
<ul style="list-style-type: none"> Monitoring Plan approved and current? 		
<ul style="list-style-type: none"> Monitoring frequency required: 		
<ul style="list-style-type: none"> Operational Evaluation Level exceeded? 		
Comments:		

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

PHASE II/V RULE		
Waivers current for <u>all</u> entry points?		
CONSUMER CONFIDENCE REPORTS (Community only)		
• Final report issued by deadline?		
• Certification Statement Received?		
LEAD & COPPER RULES (Community & NTNC)		
• Materials Survey/Sampling Plan Approved:	<i>(Yes/No)</i>	<i>(Date)</i>
• Water Quality Parameter (WQP) routine monitoring required? (Mandatory for > 50,000 population) ○ If yes, WQPs meet quality and frequency requirements?		
• Have Action Levels (90%) been exceeded in past? ○ If so, when?		
• Public Education requirements met if required?		
• Optimized Corrosion Control Treatment (OCCT) required? ○ If "Yes", is Operational Control Monitoring performed and acceptable?		
• All consumer notice requirements met?		
CROSS-CONNECTION CONTROL PROGRAM		
• Approved:	<i>(Yes/No)</i>	<i>(Date)</i>
• Inspected Records This Visit		
○ Program Active		
○ Satisfactory		
(MONTHLY) OPERATION REPORTS		
• All submitted for past 12 months?		
• Operational treatment parameters monitored?		
• All required data reported?		
EMERGENCY MGMT. PLAN for Extended Power Outage (Community only)		
• Verification received?	<i>(Yes/No)</i>	<i>(Date)</i>
• Current?		
ASSET MANAGEMENT (recommendation)		
• Written Plan Developed?		
• Routine Maintenance Performed?		
Comments:		

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

ENFORCEMENT		DATE
• Administrative/Consent Order in Effect:		
• Violations / Enforcement Actions Since Last Survey:		
• Owner issued Public Notice as required?		
• Active Corrective Action Plan?		
o If “Yes”, is waterworks on schedule?		
• SDWIS Violation & Enforcement Action, Public Notification data current?		
COMPLAINTS SINCE LAST INSPECTION:		
• If yes, summarize:		
Comments:		

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

MONITORING HISTORY

Insert R&R report - Next Chemical Sample Due. See WM 851, Attachment G for instructions.

If field notes are sent with the owner’s report, the Next Chemical Sample Due report does not need to be included in both this section and the owner’s report.

PART II - SYSTEM SURVEY INFORMATION (Field Notes)

Shaded Boxes Indicate a potential Significant Deficiency

COMBINED SECTIONS

- A. SOURCE - WELL
- B. WELL HOUSE
- C. STORAGE - PNEUMATIC TANK(S)
- D. CHEMICAL FEED SYSTEMS – SAFETY/GENERAL
- E. DISINFECTION
- F. NEW ACTIVITIES OR POLLUTION SOURCES
- G. STORAGE - ATMOSPHERIC TANK(S)
- H. BOOSTER PUMP STATION(S)

INDIVIDUAL SECTIONS

- I. SOURCE - SPRING / SPRING ENCLOSURE / PUMP FACILITIES
- J. DISTRIBUTION SYSTEM
- K. METER & VALVE VAULT(S)
- L. CONTINUOUS CHLORINE ANALYSIS
- M. ULTRAVIOLET LIGHT UNITS
- N. CORROSION CONTROL or SEQUESTRATION
- O. IRON & MANAGNESE CONTROL (KMnO_4 - GREENSAND FILTERS)
- P. FLUORIDATION
- Q. ION EXCHANGE
- R. REVERSE OSMOSIS

[It is not necessary to include this page in a completed Sanitary Survey Report](#)

A. SOURCE (WELL # / NAME)		C. STORAGE - PNEUMATIC TANK(S) (NAME/ LOCATION) (Tank Volume)		E. DISINFECTION	
Sanitary Casing Seal /Cap				Disinfectant	
Elbowed Casing Vent/Screened		Type: Pre-Pressurized or Hydro-Pneumatic		ANSI Certified/NSF Approved / "GRAS"	
12" Casing Extension		Drain Protected from Contamination		Feeder Condition	
Concrete Pad (6' Square)		Pressure Gauge/Reading		Spare Feeder/Repair Parts	
Well Lot Condition (50 ft Radius)		Pressure Operating Range		Room Ventilation	
Protected from Flood Waters/Runoff		Sight Glass/Level Indicator		Contact Tank in service	
Discharge Check Valve		Sample Tap Available		Contact Tank Condition	
Discharge Shut-Off Valve		Pressurizing System		Injection Line Condition (Scale Build-Up, etc.)	
Valved Blow-Off		Vacuum Relief Valve		Solution Tank Condition	
Raw Water Sample Tap		Pressure Relief Valve		Solution Tank Covered	
Water Level Gauge or Transducer		Air Relief Valve		Feeder Activation/Operation	
Operable Water Meter/Reading		Exterior Condition		Weight (gas) or Volume/Depth (OCI) Scale	
Permitted Capacity (gp)		Normal Pump Cycling		Number Full Cylinders (Gas Only)	
Pumping Rate Observed (gpm)		Tank Watertight, Structurally Sound		Booster Pump(s)	
Pumping Average hrs/day		Flushed/Cleaned Date		Residual Test Equipment	
Permitted Source Capacity Exceeded?		Dept. of Labor & Industry Exp. Date (>120 gal.)		Free Residual, mg/l	
Discharge Head Observed (psi)				Field test ≈ MOR residuals	
All Weather Access					
B. WELL HOUSE		D. CHEM. FEED SYSTEMS SAFETY / GENERAL		F. NEW ACTIVITIES OR POLLUTION SOURCES within 1000 ft radius of well that present a significant/acute health risk.	
Adequate Protection		Do any chemical storage and handling facilities offer potential for explosions?		Activity or Pollution Source	Approx. Distance from Well
Proper Storage Only (Non-toxic & Non-explosive)		Is adequate safety equipment provided for chemical handling (i.e. rubber gloves, breathing apparatus, goggle, aprons, etc.)?			
Cross-Connections Exist?		Are Material Data Safety Sheets (MSDS) available?			
Lighting		Are hazardous chemical containers labeled?			
Heating		Is adequate chemical storage area provided?			
Electrical Wiring (Safety)		Are there approved backflow prevention devices installed to isolate process water from finished water?			
Floor Drain		Does the waterworks have adequate employee safety			
All-Weather Access					
Wellhead Accessible					
Locked					
Clean/Uncluttered					
Emergency Power Available					
Comments:					

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

G. STORAGE - ATMOSPHERIC TANK(S) (NAME/LOCATION) (Tank Volume)		H. BOOSTER PUMP STATION(S) (NAME/LOCATION)	
WATER QUALITY PROTECTION		PUMP STATION LOT	
Structure Watertight		Upkeep Adequate	
Vent Shielded and Screened		Surface Water Diverted Away	
Drain Satisfactory, Protected		Access Road Maintained	
Tank Overflow		PUMP STATION BUILDING	
• Screened		Light Operable	
• Air Gap Provided at Outlet		Ventilation Operable	
• Splash Pad/Erosion Protection		Heating Operable	
Roof Hatch Watertight		Pump Gland Piped to Drain	
Sidewall Access Watertight		Concrete Floor	
Accesses Locked/Bolted		Screened Floor Drain	
Other Tank Openings Curbed and Sleeved		Locked	
Other Tank Openings Covered		Deterioration &/or Damage Evident	
Maintenance/Repair Date		Storage of Toxic Chemicals	
Frequency/Date of Professional Tank Survey (Recommended ~5 yr)		PUMP STATION OPERATIONS	
Frequency/Date of Routine Tank Survey (Recommended ~1yr)		No. of Pumps in Operation	
Tank(s) Appear Structurally Sound		All Pumps Operable	
Properly Modified for Antennae?		Pump Controls:	
WATER QUALITY MAINTENANCE		• Automatic	
Sample Tap Available		• Manual	
Frequency Samples Collected		Pump Alternation:	
Floating Debris Observed		• Automatic	
Good Turnover Potential		• Manual	
Flushed/Cleaned Date		Flow Meter Operable	
OPERATION		Low Pressure Cut-off	
Tank Level Controls Operable		Alarm Operable	
Automatic or Manual		Compound Gauges Operable	
Tank Level Recorded		Cross Connections are Present	
Automatic Recorder Operable		PUMP MAINTENANCE	
CORROSION CONTROL		Pump Service Schedule	
Routine Interior Inspections Scheduled		Pump Service Recorded	
Interior Corrosion Visible		Discharge Gate Valve	
Exterior Corrosion Visible		Suction Gate Valve	
Cathodic Protection Operable		Check Valve	
SAFETY		Emergency Power Available	
Interior/Exterior Ladder Condition		COMMENTS:	
Interior/Exterior Ladder Guard			
Adequate Railing Available			
Safety Belt Available			
LOT			
Upkeep			
Access Road Maintained			
Surface Water Diverted			
Fence Condition Good			
Access Locked			

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

I. SOURCE - SPRING / SPRING ENCLOSURE / PUMP FACILITIES		
	SPRING # / NAME	SPRING # / NAME
Construction Sufficient to Prevent Contamination		
Protected From Flooding		
Spring Overflow Screened		
Spring Lot		
All-Weather Access		
No Cross Connections		
Clean/Uncluttered		
Improper Storage of Contaminants		
Spring Enclosure Condition/Acceptable		
Spring Enclosure Protected (Lot Fenced)		
Locked		
Electrical Wiring (safety)		
Lighting		
Heating		
Entry Point Tap Available		
Raw Water Sampling Tap		
Discharge Check Valve		
Discharge Shut-Off Valve		
Valve Discharge to Waste		
Operable Water Meter		
Spring Yield - gpm (if available)		
Emergency Power available		
Comments:		

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

J. DISTRIBUTION SYSTEM EVALUATION	
Pipe Material(s):	
Individual Service Meters provided?	
○ If yes, routine calibration & replacement program in effect?	
Flushing Provisions (hydrants, blow-offs, etc.) available?	
Routine Flushing Program in practice?	
○ If yes, describe:	
Isolation valves exercised?	
○ If yes, describe:	
Air/vacuum relief valves checked for operability?	
○ If yes, describe:	
Pressure monitoring of distribution system?	
○ If yes, describe:	
Adequate Pressure Maintained Throughout? (>20 psi @ peak flow)	
Problems/Complaints in past year: <input type="checkbox"/> taste & odor <input type="checkbox"/> pressure <input type="checkbox"/> turbidity/sediment <input type="checkbox"/> color <input type="checkbox"/> service interruptions <input type="checkbox"/> other Describe:	
Pipe Repair - proper disinfection/sampling procedures used?	
Re-chlorination practiced? (If yes, see separate Re-Chlorination table in this report.)	
FIRE PROTECTION PROVIDED?	
How often are Fire Flow Tests conducted (with fire dept.)?	
How often are hydrants checked for operability?	
Are fire hydrants "NFPA-coded" to indicate maximum available fire flow?	
○ If yes, is operator familiar with fire hydrant "code"?	
Are operators familiar with tank levels necessary to provide target fire flow for target duration?	
Does waterworks have routine procedures for contacting local fire department(s) to verify available fire flow and duration?	
MANAGEMENT	
Plans/Sketches/Maps with valve & master meter locations?	
Records maintained (should be kept for 3 years minimum): <input type="checkbox"/> Repairs <input type="checkbox"/> Flushing <input type="checkbox"/> Hydrant Testing <input type="checkbox"/> Fire Flow Tests <input type="checkbox"/> Water Audits <input type="checkbox"/> Complaints	
How often are Water Audits conducted?	
Leakage rates > 30%? Explain:	
Comments: (Include information on water accountability).	

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

K. METER AND VALVE VAULT(S)	<i>NAME/LOCATION</i>	<i>NAME/LOCATION</i>
Vault Drain Functioning		
Sample Tap		
Access (Ladder, etc.)		
Locked Access		
Bypass piping		
Pressure gauges (PRV and altitude valve)		
Air/vacuum valve protected from contamination		
Comments:		

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

L. CONTINUOUS CHLORINE ANALYSIS	<i>NAME/LOCATION</i>
Grab Sampling	
<ul style="list-style-type: none"> Are grab samples collected at least weekly for routine calibration checks for each on-line analyzer? 	
<ul style="list-style-type: none"> Is a sample tap for grab samples located as close as feasible to where samples enter the on-line analyzer? 	
<ul style="list-style-type: none"> What method is used to analyze grab samples? 	
<ul style="list-style-type: none"> Is the method acceptable? 	
Calibration	
<ul style="list-style-type: none"> Are results of calibration checks within the larger of +/- 0.1 mg/l or +/- 15%? 	
<ul style="list-style-type: none"> Are emergency calibration checks performed as soon as possible when an on-line chlorine analyzer indicates a large (<50%) unexpected change in chlorine residual concentration? 	
<ul style="list-style-type: none"> Are records of calibration recorded and maintained for 3 years? 	
On-line Analyzers	
<ul style="list-style-type: none"> Does each analyzer have the readout at its installation and continuous recording (hard copy chart or electronic data)? 	
<ul style="list-style-type: none"> Is data recorded at least every 15 minutes? 	
<ul style="list-style-type: none"> Is an alarm activated when chlorine concentration is outside normal operating range? If yes, what are the alarm settings? Minimum: Maximum: 	
Do all chemical reagents and standards for on-line analyzers and grab sample methods have an unexpired shelf life?	
Comments:	

M. ULTRAVIOLET LIGHT UNITS	<i>NAME/LOCATION</i>
Does the UV Unit appear to be functioning?	
Is the bulb changed according to the manufacturer's recommended schedule?	
Comments:	

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

N. CORROSION CONTROL or SEQUESTRATION	<i>NAME/LOCATION</i>
Type Treatment (ortho/poly/blend – phosphate, pH/alkalinity adjustment, calcite contactor, silicate, etc.): & purpose	
Back Siphonage Protection Provided	
Safety Eyewear and Clothing Provided	
Chemical(s) Meet ANSI / NSF Standards	
Equipment Literature Available	
Equipment Condition	
Equipment Operation Adequate	
Spare Feeder/Metering Pump	
Proper Mixing Downstream of Chemical Addition	
Adequate Mixing Provided for Chemical Slurries	
Separate Feeder/Storage Room Provided	
Suitable Chemical Storage (30 days minimum)	
Suitable Sampling Taps (upstream, downstream)	
Calcite Addition Based Upon (calcite contactor)	
Disposal of Backwash Waste (downflow calcite contactor)	
Appropriate & Operable Testing Equipment	
Comments:	

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

O. IRON & MANGANESE CONTROL (KMnO₄ – GREENSAND FILTER, OTHER-specify)	<i>NAME/LOCATION</i>
Cross-Connection Protection – KMnO ₄ Mixing Tank	
Safety Eyewear and Clothing Provided	
Chemicals meet ANSI / NSF Standards	
Equipment Literature Available	
Equipment Condition	
Equipment Operation Adequate	
Continuous or Batch KMnO ₄ Addition	
Spare Metering Pump Provided	
pH Adjustment	
KMnO ₄ Addition Follows pH Adjustment	
Supplemental Oxidants (aeration, chlorine, other)	
If Aeration, How Provided	
Is Disinfection Provided	
Suitable Sampling Taps (prior to KMnO ₄ , influent, effluent)	
Suitable KMnO ₄ Storage (30 days minimum)	
Is KMnO ₄ stored away from organic materials (explosion hazard)?	
Backwash (gravity from system/storage, pumped, other)	
No. Backwash Pumps	
Air Wash Provided	
Disposal of Backwash Waste	
Appropriate & Operable Testing Equipment	
Comments:	

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

P. FLUORIDATION¹				
Month	Dose Range (mg/L)	Split Sample Results		
		Waterworks	Other	Acceptable²?
January				
February				
March				
April				
May				
June				
July				
August				
September				
October				
November				
December				

P. FLUORIDE ACID	NAME/LOCATION
Anti-siphon protection	
Long gloves, apron, boots & goggles/face shield	
Room ventilation	
Carboy vented to outdoors	
Carboy openings sealed	
Separate feeder/storage room	
Chemicals meet NSF standards	
Feeder condition	
Injection line condition	
Weighing scale/recorder	
Feeder activation/operation	
Back pressure sustaining valve	
Fluoride Ion Test Equipment	
Fluoride Ion Concentration	
Comments:	

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

¹ Review monthly operation reports and fluoride split sample reports for the past 12 months.

² Within 10% (specific ion electrode) or ± 0.2 (SPADNS)

P. FLUORIDE SATURATOR	<i>NAME/LOCATION</i>
Anti-Siphon vacuum breaker on make-up water line (upflow saturator)	
Air gap on make-up water line (downflow saturator)	
Particulate respirator, gloves, goggles, coveralls	
Chemicals meets ANSI / NSF standards	
Operational water meter on make-up water line (between softener and saturator, if applicable)	
Water meter read and volume recorded daily	
Softener Provided	
Upflow Saturator Pick-up Float Assembly	
Frequency of softener regeneration/replacement	
Hardness of make-up water (mg/l as CaCO ₃)	
Minimum of 12 inches of fluoride chemical in saturator	
Metering pump and controls operating properly	
Back pressure sustaining valve	
Saturator Cleaning Frequency	
Fluoride Ion Test Equipment	
Fluoride Ion Concentration	
Adequate Cross Connection Control	
Comments:	

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

Q. ION EXCHANGE	<i>NAME/LOCATION</i>
Treatment Purpose (softening, Fe/Mn removal, other)	
Cross-Connection Protection – Water Inlet to Brine Tank	
Chemicals meet NSF Standards	
Equipment Literature Available	
Equipment Condition	
Equipment Operation Adequate	
Bypass for Blending	
Regeneration (automatic, manual)	
Backwash (gravity from system/storage, pumped, other)	
No. Backwash Pumps	
Suitable Sampling Taps (influent, effluent, blended)	
Corrosion Problem Due to Salt Storage/Usage	
Suitable Salt Storage (30 days minimum)	
Salt Storage/Brine Tank Separated from Vulnerable Equipment	
Disposal of Brine Waste	
Appropriate & Operable Testing Equipment	
Comments:	

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

R. REVERSE OSMOSIS		<i>NAME/LOCATION</i>		
	Satisfactory?		Comments	
	Yes	No		
Treatment purpose			(Fluoride removal, Desalination, other)	
Number & configuration			(Pre-filters, RO units)	
Equipment condition				
Equipment operation			(Actual Feed Rate = gpm; Recovery = %; Design Feedrate = gpm; Recovery = %)	
O&M manual available				
Bypass for blending			(Treated = % <i>or</i> gpm; Bypassed = % <i>or</i> gpm)	
Flowmeters			Location	Reading Condition
•				
•				
Pressure gauges			Location	Reading Condition
•				
•				
Test equipment			(Equipment; Availability; Condition)	
Performance Monitoring			Parameter	Frequency Value
Element replacement			(Schedule or condition; Date last replaced)	
Chemical Pretreatment			Refer to table below	
Chemicals meet NSF 60				
Concentrate Disposal			(Location, Condition)	
Field test results - Applied water - Recovered water - Blended water			Temp pH Na F Other	

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

R. REVERSE OSMOSIS (Cont.)					
Pretreatment Chemical	Function	Conc.	Feedrate	Storage Location/Quantity	Remarks
	Acid for pH adjustment				
	Antiscalant				
	Sequestration of Fe & Mn				
Comments:					

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

SUBJECT: <<County>>
WATERWORKS: <<Waterworks Name>>
PWSID:

«Owner Name»
«Address»
«Address»

Dear «Owner Name»:

On {date}, {name} conducted a sanitary survey of your waterworks. Enclosed is a copy of the report developed as a result of that survey. Please note our list of comments and recommendations on page __ of the inspection report. Additional items may be found in the body of the report.

If you have questions on the report or would like to discuss my findings, please do not hesitate to contact me. This office would like to thank the staff at the {waterworks name} for their assistance and professionalism during the inspection.

Sincerely,

{Name & Title}

Enclosure

cc: VDH-ODW-Central Office
County Health Department, Attention: <<Name of Health Director>>
County Administrator

ATTACHMENT C - Surface Water & GUDI SYSTEMS - PART I - SYSTEM BACKGROUND & FINDINGS

**VIRGINIA DEPARTMENT OF HEALTH
OFFICE OF DRINKING WATER
SUBPART H SYSTEM SANITARY SURVEY REPORT**

SUBJECT:
WATERWORKS:
PWSID:

PART I - SYSTEM BACKGROUND & FINDINGS

GENERAL INFORMATION

Owner Name:	Waterworks Class:
Type of Waterworks:	
Contact Name:	
Contact Address:	
Contact Phone Number:	

DO License Class:	DO Has Required License:
DO Legal Name:	DO License No./ Exp. Date:

Inspection By:	Inspection Date:
Time Spent:	Last Inspection Date:
Date to Reviewer:	Reviewed by/Date:
Date to Reviewer:	Reviewed by/Date:
Inspection Type: :	
Present at Inspection:	
Facilities Inspected:	

Operation Permit Effective Date:	Waterworks Description Sheet Date:
Permit Up-to-Date?	Description Sheet Up-to-Date?
No. Connections:	Population Served:
Avg. Daily Production:	Operation Permit Capacity:
Exceeds 80% Operation Permit Capacity? (max. 3 consecutive months)	
If yes, explain:	
Treatment Provided:	
SDWIS Inventory Information Current:	

COMPLIANCE HISTORY

ATTACHMENT C - Surface Water & GUDI SYSTEMS - PART I - SYSTEM BACKGROUND & FINDINGS

Shaded boxes indicate a potential Significant Deficiency

REVISED TOTAL COLIFORM RULE		
• BSSP Approved:	<i>(Yes/No)</i>	<i>(Date)</i>
• # of routine samples/monitoring period & frequency		
• Is plan current & appropriate for distribution system & population?		
• Is monitoring frequency correct?		
• Rotates and uses approved sites?		
• Measures chlorine residual for all samples, if chlorine is added?		
• RTCR Level 1 or 2 Assessments since last Survey?		
DDBP RULES (Community & NTNC)		
• Monitoring Plan approved and current?	<i>(Yes/No)</i>	<i>(Date)</i>
• Monitoring frequency required:		
• Operational Evaluation Level exceeded?		
ESWT RULES		
• Disinfection Profile submitted with Operation Reports or available for review?		
• LT2 Rule - Round 1	<i>Bin #</i>	<i>(Date)</i>
• LT2 Rule - Round 2	<i>Bin #</i>	<i>(Date)</i>
• Treatment upgrades required?		
• If yes, describe:		
PHASE II/V RULE		
• Waivers current for <u>all</u> entry points?		
CONSUMER CONFIDENCE REPORTS (Community only)		
• Final report issued by deadline?		
• Certification Statement Received?		
LEAD & COPPER RULES (Community & NTNC)		
• Materials Survey/Sampling Plan Approved:	<i>(Yes/No)</i>	<i>(Date)</i>
• Water Quality Parameter (WQP) routine monitoring required? (Mandatory for > 50,000 population) <ul style="list-style-type: none"> ○ If yes, WQPs meet quality and frequency requirements? 		
• Have Action Levels (90%) been exceeded in past? <ul style="list-style-type: none"> ○ If so, when? 		
• Public Education requirements met if required?		
• Optimized Corrosion Control Treatment (OCCT) required? <ul style="list-style-type: none"> ○ If "Yes", is Operational Control Monitoring performed and acceptable? 		
• All consumer notice requirements met?		

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

ATTACHMENT C - Surface Water & GUDI SYSTEMS - PART I - SYSTEM BACKGROUND & FINDINGS

CROSS-CONNECTION CONTROL PROGRAM		DATE
• Approved:		
• Inspected Records This Visit ¹		
○ Program Active ²		
○ Satisfactory ³		
(MONTHLY) OPERATION REPORTS		
• All submitted for past 12 months		
• Operational treatment parameters monitored?		
• All required data reported?		
EMERGENCY MGMT. PLAN for Extended Power Outage (Community only)		
• Verification received?	<i>(Yes/No)</i>	<i>(Date)</i>
• Current?		
SOURCE WATER ASSESSMENT PERFORMED		
• Source: # / Name		
• Source: # / Name		
ENFORCEMENT		
• Administrative/Consent Order in Effect:	<i>(Yes/No)</i>	<i>(Date)</i>
• Violations / Enforcement Actions Since Last Survey ⁴		
• Owner issued Public Notice as required?		
• Active Corrective Action Plan?	<i>(Yes/No)</i>	<i>(Date)</i>
○ If yes, is waterworks on schedule?		
• SDWIS Violation & Enforcement Action, Public Notification data current?		
COMPLAINTS SINCE LAST INSPECTION		
• If YES, summarize:		
Comments:		

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

¹ See Part C for additional questions

² Based on Part C questions

³ Based on Part C questions

⁴ If yes, ODW staff shall review Violations from R&R database and include listing here.

Revised April 1, 2016 (Part I template only). Changes shown in red.

ATTACHMENT C - Surface Water & GUDI SYSTEMS - PART I - SYSTEM BACKGROUND
& FINDINGS

MONITORING HISTORY

Insert R&R report - Next Chemical Sample Due. See WM 851, Attachment G for instructions.

ATTACHMENT C - Surface Water & GUDI SYSTEMS - PART I - SYSTEM BACKGROUND & FINDINGS

SUMMARY

PROBLEMS IDENTIFIED AT LAST INSPECTION

CORRECTED?

Inspection Date / Comment # / Description
Inspection Date / Comment # / Description
Inspection Date / Comment # / Description
Inspection Date / Comment # / Description
Inspection Date / Comment # / Description

Yes or No / explain
Yes or No / explain
Yes or No / explain
Yes or No / explain
Yes or No / explain

NEW COMMENTS FROM THIS INSPECTION

(Significant deficiencies shall be noted in transmittal letter with CAP requirements).

Attachments: [] Part II-A [] Part II-B [] Part II-C [] Part II-D

cc/Att: (designated operator) [] Part II-A [] Part II-B [] Part II-C [] Part II-D

cc: _____ Health Department
VDH – ODW Central
VDH – Dental Health

PART II-A
UNIT PROCESS EVALUATIONS
(Shading Identifies a Potential Significant Deficiency)

FACILITIES INSPECTED:

- A. MICRO / NANO / ULTRA - CLASS MEMBRANE FILTRATION
- B. RAPID MIX
- C. FLOCCULATION/SLOW MIX
- D. SEDIMENTATION
- E. SUPERPULSATORS
- F. SOLIDS CONTACT CLARIFIER
- G. ABSORPTION CLARIFIER
- H. FILTRATION
- I. FINISHED WATER FACILITIES
- J. CHEMICAL FEED FACILITIES - GENERAL
- K. CHLORINE GAS
- L. HYPOCHLORITE
- M. FLUORIDE ACID
- N. FLUORIDE SATURATOR
- O. AMMONIA
- P. CHLORINE DIOXIDE
- Q. OZONE
- R. OPERATIONAL/PERFORMANCE DATA
- S. OPERATIONAL/LABORATORY/STAFF MONITORING PROCEDURES
- T. WASTE HANDLING
- U. EMERGENCY POWER
- V. UV DISINFECTION
- W. GAC CONTACTORS
- X. VIRGINIA OPTIMIZATION PROGRAM REVIEW

SUPPLEMENTAL AND USEFUL WORKSHEETS

(Use of these worksheets is optional)

Jar Test Results

Filter Drop Test Worksheet

A. MICRO / ULTRA / NANO - CLASS MEMBRANE FILTRATION

1. Raw Water Holding Tank and Pump Station

Tank Overflow, Drain and Vent Properly Screened. Yes No
 No. of Raw Water Pumps Provided: _____ No. in Operation: _____
 Pump house/room condition? Satisfactory Unsatisfactory

2. Pre-Screen/Pre-Filter

No. Provide: _____ No. In Operation: _____
 Mode of Operation: Series Parallel
 Pore Size Rating: _____ μ
 Headloss across Pre-Screen/Pre-Filter in use: _____ psi
 Headloss which initiates automatic cleaning/flushing: _____ psi
 Cleaning Frequency: _____ Date Last Cleaned: _____
 Overall appearance/performance: Satisfactory Need Attention

3. Required Pretreatment Chemical added to Raw Water Yes No NA

CHEMICAL APPLIED	APPLICATION POINT	FEED RATE

Chemicals Meet ANSI / NSF Standard 60 or "GRAS": Yes No

4. Membrane Filters

Class of Membrane: Micro Ultra Nano Manufacturer _____
 No. of Membrane Units Provided: _____ No. In Operation: _____
 No. of Membrane Modules/Unit: _____
 Design Capacity of each Unit: _____ System Design Capacity: _____
 Design flux rate: _____
 Exceeds permitted filter loading rate? Yes No

5. Mode of Operation: Series Parallel

6. Membrane Unit Appurtenances (operable and in good operating condition)

All Valves/Controls Yes No NA
 Pressure Gauges Yes No NA
 Filter Rate-of-Flow Indicator Yes No NA
 Filter Rate-of-Flow Controls Yes No NA
 Backwash Rate-of-flow Indicator Yes No NA
 Feed Pump(s) Yes No NA
 Backwash Pump(s) Controls Yes No NA
 PLC/Solenoids Yes No NA
 Adequate Spare Parts Inventory Yes No NA

7. Transmembrane pressure: Unit # _____ psi Unit # _____ psi
8. Unit Alarm Set Point: _____ psi for _____ seconds
Shutdown Alarm Operational: Yes No
Unit Shutdown Set Point: _____ psi for _____ seconds

9. No. of In-Line Turbidimeters: _____ No. In Operation: _____
Raw/Feed Water Unit # _____: _____ NTU
Raw/Feed Water Unit # _____: _____ NTU
Raw/Feed Water Plant Shutdown Set Point: _____ NTU
Shutdown Alarm Operational: Yes No
Raw/Feed Water Turbidimeter Recording Unit(s) Operational: Yes No NA
Product Water Unit # _____: _____ mNTU
Product Water Unit # _____: _____ mNTU
Product Water Unit # _____: _____ mNTU
Product Water Plant Shutdown Set Point: _____ mNTU
Shutdown Alarm Operational: Yes No
Product Water Turbidimeter Recording Unit(s) Operational: Yes No NA
In-Line Turbidimeter Calibration Frequency: _____
Date(s) of Last Calibration: _____

10. Direct integrity test (DIT) - observed conditions:
Frequency of direct integrity test: _____
Start pressure: _____ psi
Stabilization period: _____ minutes () NA
Date of Last Test: _____ Initial pressure: _____ psi Final pressure: _____ psi
Pressure decay rate: _____ psi/minute
Alarm set point: _____ psi/minute
Shutdown set point: _____ psi/minute
DIT conducted after diagnostic testing, scheduled maintenance, or repair: () Yes () No

10. Membrane Flushing (Reverse Filtration/Backwashing) based on:
 Plant Startup
 Excess Pressure Differential (from Pressure Hold Test) [_____ psi drop over _____ minutes]
 Transmembrane Pressure (_____ psi) Product Water Turbidity [_____ ntu]
 Time [_____ minutes] N/A
Air Scrub performed during flushing? Yes No NA

11. Air Supply System NA
No. of Air Compressors Provided: _____ No. in Operation: _____
Air Regulating Valves Operational: Yes No
Required Minimum Air Pressure Setting: _____ psi Plant Shutdown Setting: _____ psi
Pressures meeting required minimums: Yes No
Manual Air Gauges Operable: Yes No
Compressor condensation drain lines open and screened: Yes No
Auto Plant Shutdown for low air pressure operable: Yes No

12. Clean In Place (CIP) System

- Frequency: _____ Last Performed: _____
 CIP Frequency: _____ Last Performed: _____
 Clean In Place Tank Heater Operable: Yes No
 Clean In Place Tank Satisfactory: Yes No
 Chemical Feed Pumps Provided: Yes No
 Cleaning Products: _____
 Cleaning Chemicals meet NSF Standard 60 Yes No
 CIP Manual Control Valves Operable: Yes No
 Recirculation Pump Operable: Yes No
 Spare recirculation pump available: Yes No
 PH Meter Operable: Yes No
 Membrane Integrity Test performed after CIP Yes No

Mini-Clean (Enhanced Flux Maintenance) Practiced? Yes No
 Frequency: _____

13. Frequency of Sonic Testing: _____ Date Last performed: _____

14. Normal Filter Module Replacement Frequency: _____
 Date Filter Modules Last Replaced: _____ No. Replaced: _____

15. Filter backwash wastewaters discharged to: lagoons holding tank/sand beds
 other (describe): _____

16. Ultimate discharge of waste flows: _____

17. Evaluation of Giardia cyst inactivation for Membrane Plants

Required log Giardia inactivation by disinfection: _____ [0.5 log or as designated by WOP]

Post-filter CT operating data:

Parameter	Required (min/max)	Observed	Comments
Free residual chlorine, mg/L			
pH			
Temperature, C			
Clearwell water depth, ft			
Flow rate, gpm			

Do the "observed" CT data in the above tables indicate that 3-log Giardia inactivation is being achieved by filtration plus post-filter disinfection processes? Yes No

18. Do the CT data from the daily logs since the last inspection indicate continuous adequate Giardia inactivation by filtration plus post-filter disinfection processes? Yes No

19. In-line Chlorine Residual Monitor & Recorder Operable: Yes No

Does the Recorder feature meet the requirements for 'continuous' recording? Yes No

Does the chlorine residual monitor have an alarm? Yes No

Is there a 'warning' alarm set point chlorine residual level? Yes No

Does the alarm have a plant auto shutdown set point and shut down capability ? Yes No

B. RAPID MIX

1. Number of units: _____ Number in service: _____
2. Type of mixing provided: conventional static in-line Other _____
3. Operable mixer available to meet mixing requirements Yes No N/A
4. If conventional units:
Variable speed control operational? Yes No N/A
Evidence of vortexing? Yes No
Proper mixing obtained? Yes No
5. Chemicals being applied, point(s) of application:

Chemical Applied	Application Point	Feed Rate

6. Spare mixer provided? Yes No
7. General performance: satisfactory needs attention
8. Physical condition of unit: satisfactory needs attention

COMMENTS:

C. FLOCCULATION/SLOW MIX

1. Number of basins: _____ Number in service: _____
2. Mode of operation: series parallel NA
3. All mixers operational? Yes No
4. Operable mixers available to meet mixing requirements: Yes No
5. Variable speed control operational? Yes No NA
6. Tapered flocculation practiced? Yes No NA
7. Isolation of basins/continued plant operation? Yes No NA
8. Are proper baffles/compartments provided? Yes No
9. Evidence of vortexing/basin short-circuiting? Yes No
10. Overall floc formation: good fair poor undetectable
- Floc type/appearance: pin floc fluffy sweepfloc other_____
11. Are polymers used? Yes No
12. General performance: satisfactory needs attention
13. Physical condition of unit: satisfactory needs attention

COMMENTS:

D. SEDIMENTATION

1. No. of basins provided: _____ No. in operation: _____

2. Proper flow distribution between basins? Yes No

3. Signs of short circuiting/overloads? Yes No

4. Evidence of floc shear at stilling wall? Yes No

5. Floc carry-over observed? Yes No

6. Floc settleability: satisfactory needs attention

7. Sludge removal: manual mechanical

If manual: _____ times/year; last cleaned: _____ next schedule cleaning _____

If mechanical, is equipment operable: Yes No

Excessive sludge accumulation: Yes No

If "Yes", estimate sludge blanket depth: _____

8. Chemicals added, application point(s):

Chemical Applied	Application Point	Feed Rate

9. General performance: satisfactory needs attention

10. Physical condition of unit: satisfactory needs attention

E. SUPERPULSATORS (*replaces FLOCCULATION AND SEDIMENTATION*)

1. No. of units provided: _____ No. in operation: _____
2. Proper flow distribution between basins? Yes No
3. Can each unit be sampled at multiple levels? Yes No
4. Chemicals being applied, point(s) of application:

Chemical Applied	Application Point	Feed Rate

5. Signs of short circuiting/overloading? Yes No
6. Are settleability tests run? _____ Recorded? _____
7. Sludge blanket established? Yes No
8. Sludge blanket appearance: Dispersed Normal Unusual Color (septic)
9. Sludge depth measurement tool available?
Blanket depth: Unit No. 1 = _____ Unit No. 2 = _____
10. Sludge removal:
Basins last cleaned date: _____
Controlled manually or by time clock? Explain. _____
Mechanical removal equipment operable? Yes No
Evidence of sludge carryover to filters? Yes No
11. "Vacuum" Pumps- Number Provided: _____ Number Operable: _____
12. Overall appearance/performance: satisfactory needs attention

F. SOLIDS CONTACT CLARIFIER (*replaces FLOCCULATION AND SEDIMENTATION*)

1. No. of units provided: _____ No. in operation: _____

2. Floc carry-over observed? Yes No

3. Media cleaning / Sludge removal: manual backflush/removal automated backflush/removal

4. How often are units sludge wasted: _____

Backflush/wasting based on: head loss _____ feet

time _____ hours

turbidity _____ NTU

5. Chemicals added, application point(s):

Chemical Applied	Application Point	Feed Rate

6. General performance: satisfactory needs attention

7. Physical condition of unit: satisfactory needs attention

COMMENTS:

G. ABSORPTION UNIT CLARIFIER_ (replaces FLOCCULATION AND SEDIMENTATION)

1. No. of units provided: _____ No. in operation: _____
2. Clarifier media type: synthetic beads floc blanket other : _____
3. Media in good condition, stable? Yes No
 Date media last replaced (where applicable): _____
4. Media retention screen in good condition? Yes No N/A
5. Floc carry-over observed? Yes No
6. How often are units sludge wasted: _____
 Backflush/wasting based on: head loss _____ feet
 time _____ hours
 turbidity _____ NTU
7. Is air scour provided and operable? Yes No NA
8. Chemicals added, application point(s):

Chemical Applied	Application Point	Feed Rate

9. General performance: satisfactory needs attention
10. Physical condition of unit: satisfactory needs attention

COMMENTS:

H. FILTRATION

1. No. of filters provided: _____ No. in operation: _____

2. Filter media: sand sand/anthracite sand/anthracite/garnet other _____

Date media last added or changed: _____

Frequency media depth checked: _____

Frequency operator checks filtration rate: _____ Date last checked _____

Values observed for individual filters:

Filter No.	Effluent Turbidity (NTU)	Loading Rate (gpm/ft ²)

Design: _____ gpm at _____ gpm/ft²

Exceeds permitted rate? Yes No

Was filtration rate checked? Yes No

(see attached worksheet)

3. Filter appurtenances operable and in good condition?

Last Calibrated

All valves/controls: Yes No _____

Filter rate-of-flow controls: Yes No _____

Filter rate-of-flow indicator / recorder: Yes No _____

Loss of head indicator / recorder: Yes No _____

Surface wash: Yes No NA

If yes, backflow preventer provided? Yes No NA

Air scour: Yes No NA

Backwash pump(s)/controls: Yes No _____

Backwash rate-of-flow indicator: Yes No _____

4. Filter backwash practices:

Filter backwash based on plant established maximum values: Yes No

Filter backwash based on: head loss _____ feet
 time _____ hours
 turbidity _____ NTU
 particle counts _____ particles/ _____ ml: size range _____

Average/maximum before backwash (over past 3 months):

filter run times: _____ hours

head loss: _____ feet

turbidity: _____ NTU particles: _____ / _____

Filter backwash observed? Yes No

Satisfactory? Yes No NA

Frequency operator checks backwash rate: _____ Date last checked: _____

5. Filter-to-waste practiced: Yes No NA

Is filter to waste at design filtration rate? Yes No

Average filter-to-waste (rewash) time: _____

Is turbidity monitored during filter-to-waste? Yes No NA

Criteria established for filter-to-waste: duration _____

Are particles counted/monitored during procedure? Yes No

6. Is filter backwashed after any/all shutdowns? Yes No

If "No", does operator start filter with filter-to-waste after filter has been idle, before delivering flows to system? Yes No

7. General performance: satisfactory needs attention

8. Physical condition of units: satisfactory needs attention

COMMENTS:

I. FINISHED WATER FACILITIES

1. Clear well

Access protected from contamination Yes No

Overflow protected from contamination/flooding Yes No

Adequate drain Yes No

Screened vent(s) Yes No

Watertight roof/cover Yes No

Hatch(s) secure Yes No

Viewing port with light Yes No

Sediment present Yes No

Last cleaned: _____

Physical condition: satisfactory needs attention

2. Finished water pumps: NA

Number of pumps provided: _____

Number of pumps operable: _____

Number of pumps in use: _____

Pressure gauges provided/operable _____ psig Yes No

Flow meter operable Yes No

Pumping rate: _____ MGD

Physical conditions: satisfactory needs attention

3. Is clearwell water level monitored/controlled? Yes No NA

4. Are level sensors operable? Yes No NA

5. Chemicals added, point(s) of application:

Chemical Applied	Application Point	

6. Approved backflow device to isolate process water at treatment plant from distribution system?
 Yes No

COMMENTS:

J. CHEMICAL FEED FACILITIES – GENERAL

The following chemicals are fed at this facility:

Note to evaluator: May delete chemicals that are not applicable. Add/replace chemicals with 'Trade Name' and/or 'Chemical Name' where applicable.

Chemical	No. of Feeder/Pumps Available / In Service	Chemical	No. of Feeder/Pumps Available / In Service
<input type="checkbox"/> alum		<input type="checkbox"/> KMnO ₄	
<input type="checkbox"/> ferric salt		<input type="checkbox"/> activated carbon	
<input type="checkbox"/> ferrous salt		<input type="checkbox"/> fluoride	
<input type="checkbox"/> polymer (coag. aid)		<input type="checkbox"/> phosphate	
<input type="checkbox"/> polymer (filter aid)		<input type="checkbox"/> chlorine	
<input type="checkbox"/> lime		<input type="checkbox"/> ammonia	
<input type="checkbox"/> caustic		<input type="checkbox"/> ozone	
<input type="checkbox"/> soda ash		<input type="checkbox"/> sodium chlorate (ClO ₂ generation)	
<input type="checkbox"/> other			

Chemicals certified to meet NSF Standard 60?

Yes No

2. Any chemical feed changes that could affect Pb/Cu monitoring? Yes No

3. All feeders in good condition? Yes No

Adequate ventilation provided? Yes No

4. Adequate backflow prevention on solution water? Yes No

Date last inspected?

Anti-siphon devices on feed lines? Yes No

5. Feeders calibrated on a regular basis? Yes No
(Recommend quarterly)

Frequency operators calibrate feeders: _____

Date last calibrated: _____

Frequency operators check calibrations: _____

Date last checked: _____

6. Adequate chemical storage area provided (space, spill prevention)? Yes No

7. Is CORROSION CONTROL practiced at this facility? Yes No

If Yes, indicate method(s): pH/alkalinity adjustment

corrosion inhibitor

other: _____

8. Physical condition of chemical feed facilities: satisfactory needs attention
9. Do any of the chemical storage or handling facilities offer potential for explosions? Yes No
10. Other safety problems for the operators or public noted? Yes No
Describe:
- Comments:

K. CHLORINE GAS

1. Adequate ventilation Yes No
2. Cylinders chained Yes No
3. Panic hardware Yes No
4. Cylinder repair kit Yes No
5. Chlorine scales operable Yes No
6. Automatic change-over provided/operable Yes No
7. Regulator vent properly installed/screened Yes No
8. Leak detection provided/operable (type:_____) Yes No
9. Outside entrance/exit Yes No
10. Room gas-tight, floor drains sealed Yes No
11. Breathing apparatus available Yes No

L. HYPOCHLORITE

1. Solution tank in good condition Yes No
2. Solution tank covered Yes No
3. Drain provided Yes No
4. Spill containment adequate Yes No
5. Stored away from organics and acids Yes No
6. Gloves, apron & eye protection Yes No
7. Eyewash/safety shower provided Yes No

M. FLUORIDE ACID

- 1. Weighing scale and recorder provided and in good condition Yes No
- 2. Long gloves, apron & goggles/face shield provided Yes No
- 3. Flowmeter/fluoride feed pacer/other control system provided, in good operating condition Yes No
- 4. Anti-siphon protection (Back pressure sustaining valve) Yes No
- 5. Feeder/metering pump operable and in good condition Yes No
- 6. Injection line in good condition Yes No
- 7. Separate feeder/storage room Yes No
- 8. Room ventilation adequate Yes No
- 9. Carboy/tank vented to outdoors Yes No
- 10. Carboy/tank openings sealed Yes No
- 11. Chemical meets NSF standards Yes No

N. FLUORIDE SATURATOR

- 1. Anti-Siphon vacuum breaker on make-up water line (upflow) Yes No NA
- 2. Air gap on make-up water line (downflow) Yes No NA
- 3. Back pressure sustaining valve Yes No
- 4. Particulate respirator, gloves, goggles, coveralls Yes No
- 5. Operational water meter on make-up water line (between softener and saturator, if applicable) Yes No
- 6. Water meter read and volume recorded daily Yes No
- 7. Frequency of softener regeneration/replacement: _____ NA
- 8. Upflow saturator pick-up float assembly operational Yes No
- 9. Metering pump and controls operating properly Yes No
- 10. Fluoride Ion Test Equipment in good condition Yes No
- 12. Hardness of make-up water (mg/L as CaCO₃):
 - Water softener provided and in good operating condition Yes No NA
 - Softener effluent hardness maintained <75 mg/l Yes No NA
- 13. Minimum 12 inches of sodium fluoride in saturator? Yes No NA
- 14. Saturator cleaning frequency: _____
- 15. Room ventilation adequate Yes No
- 16. Chemical meets NSF standards Yes No

O. AMMONIA

1. Adequate ventilation? Yes No
2. Panic hardware? (Gas supply only) Yes No NA
3. Cylinder repair kit? (Gas supply only) Yes No NA
4. Outside entrance/exit? (Gas supply only) Yes No NA
5. Are there any brass, bronze or other copper alloy fittings used or present in the ammonia feed system?
Yes No
6. Injection points stainless steel end-type diffusers with corporation stops? Yes No
7. Ammonia metering pumps provided: Yes No Working? Yes No
8. Chlorine to Ammonia feed ratio: _____ Adequate? Yes No
9. Discharge gauges provided on metering pump discharge piping? Yes No
Working? Yes No
10. Discharge gauge pressures reading: _____psi
11. Feed facility ventilation adequate? Yes No
12. Ammonia leak detection monitor available? Yes No
Working? Yes No
13. Ammonia storage tank condition: satisfactory needs attention
14. Ammonia storage tank sight level gauge provided? Yes No
Working? Yes No
15. Ammonia storage tank pressure gauge provided? Yes No
Working? Yes No
Reading: _____psi
16. Recirculation connection to displace the ammonia vapors back into the delivery truck when filling the tank provided? Yes No
Condition: satisfactory needs attention
17. Ammonia storage tank spill containment structure condition: satisfactory needs attention

P. CHLORINE DIOXIDE

1. Type of Generation Facility:

- Conventional, Chlorine Gas + water + Sodium Chlorite
- Solid Matrix Generator
- Acid Boosted = HOCl+ Cl₂+ NaCl
- Other: _____

2. Chlorine gas flow control system: (refer to G. CHLORINE GAS)

3. Acid Feed Control System

4. Sodium Chlorite liquid feed control system

5. Chlorine Dioxide Generation Facility and Control System

6. Electronic Scales: Last Calibration Date: _____

Clear of debris and water? Yes No

7. Reactor Cartridges: NaCl₂ Maximum Weight: ____lbs

Weight Observed Reactor 1: Reactor 2:

8. Operating within Spec Yes No

9. Storage satisfactory? Yes No

10. Adequate ventilation? Yes No NA

11. Piping and components constructed of non-corrosive material? Yes No

12. Quick Disconnect couplings installed? Yes No

13. Humidifier Installed? _____ Operable? Yes No NA

14. Leak detection: Yes No NA Type: _____

15. Operating Temperature Specifications: Minimum Temp: _____ F Maximum Temp: _____ F

Observed: _____ F Operating within Spec? Yes No NA

16. Alarm set points and interlocks:

Low Air Flow Set Point: _____ SCFM_ Operable Yes No NA

Low Differential Pressure: _____ " HG Operable Yes No NA

Low vacuum: _____ " HG Operable Yes No NA

Low Temperature: _____ F Operable Yes No NA

17. Have standard operating procedures for the ClO₂ generation been submitted to and approved by ODW?
 Yes No

18. Were the standard operating procedures readily available at the inspection? Yes No NA

19. Has an operations and maintenance manual been submitted to VDH-ODW? Yes No NA

20. Chlorine Dioxide Maximum Production Observed: _____

Operating within Spec: Yes No NA

21. Chlorine Dioxide Generation and Feed Rate

GENERATING AGENT	APPLICATION POINT	GENERATION FEED RATE
Chlorine		
Sodium Chlorite(NaCl2)		
CHEMICAL APPLIED	APPLICATION POINT	PRODUCTION RATE
Chlorine Dioxide		

22. Generator yield and balance data:

PRODUCTION YIELD CALCULATIONS

CE = measured generator effluent concentration of ClO₂: _____ ppm

M = production rate of ClO₂, lb/day: _____ lb/day

F = water flow rate through generator, gpm: _____ gpm (Note: this is the raw water flow)

C = calculated concentration

(Note: Use this data to determine if the system is in balance for generation vs applied dose.)

$C = \{m/(24h/d)/(2.2 \text{ kg/lb})\} * (10^6 \text{ mg/kg}) / F * (3.785 \text{ L/gal}) * (60 \text{ min/h}) =$ _____ ppm

Does the measured, CE, ClO₂ value compare to the calculated, C, value from above?

Yes No NA

If no, any changes made, interferences identified, etc: _____

23. ClO₂ concentration entry point system: measured: _____ ppm

Frequency of analysis: Daily Weekly Monthly Other

Analysis method:

Amperometric Method I, 4500-ClO₂ C

Amperometric Method II, 4500-ClO₂ D

DPD Method, 4500 – ClO₂ E

24. Chlorite ion concentration: __ ppm N/A, Not currently feeding

(Samples are required daily by the waterworks and monthly by a certified lab)

Daily At plant - DPD Method, 4500 – ClO₂ E , Result: _____ ppm

Monthly - USEPA Method 300.0, Ion Chromatography

Last Test Performed: _____ By: _____ Result: _____

25. Do any of the chemical storage or handling facilities offer potential for explosions? Yes No

26. Is gas mask available: Yes No Location: _____

Last Checked:

27. Other safety problems for operators or public noted? Yes No

If yes, describe:

Q. OZONE

1. Ozone Components

No. of _____ gal LOX Tanks	Provided: _____	In Service: _____
No. of Vaporizers	Provided: _____	In Service: _____
No. of _____ ppd Generators	Provided: _____	In Service: _____
No. of Contact Chambers	Provided: _____	In Service: _____

2. Diffusers Last Inspected: ___/___/___

3. Ozone Monitoring

Continuous Monitoring Provided: Yes No

Probe Calibration: _____ (must be per Toolbox GM App C.)

Probe Last Calibrated: ___/___/___

Frequency of Calibration Checks: _____ (must be at least weekly)

Portable Monitors used? Yes No

If so: Last Calibrated ___/___/___ Availability: On-site / Central location / Call in _____

Type of Portable Monitor/Kit: _____

Uses an approved method? Yes No

4. Chemical Feed to Contact Chamber(s) and Disinfection Performance

Chemical Applied	Raw Feed	Feed Rate	Initial Residual *
Ozone	_____ scfm at _____ %	_____ mg/L	_____ mg/l

*Location of first measurement: _____

Disinfectant Applied	CT	Giardia Inactivation	Virus Inactivation
Ozone	_____ mg/l-min	_____ -log	_____ -log

Current Ozone Control Method: _____ Dose Control or CT Control
 _____ (Effluent or Log-Integration) Method Calculation Verified: ___/___/___ (date)

5. Hydraulic Efficiency (Baffling) Factor: _____

6. Tracer Study Performed: Yes No ___/___/___(date)

7. Is dosing adequate to meet CT requirements? Yes No

8. Have CT requirements been consistently met with Ozone since last inspection? Yes No

9. Monthly Operational Report ozone and CT credit data complete and satisfactory? Yes No

10. Have Giardia and virus CT requirements been met for the facility (all disinfectants)? Yes No

11. Ozone Destruct Units Operational (air borne): Yes No

12. Ozone Quench Operational (aqueous): Yes No

13. Ambient Ozone detectors operational Yes No

14. Describe the ozone residual monitoring points:

15. Describe the reliability of the power supply for the ozone generators:

16. Describe the alarms that would notify the operator in the event of a low ozone event. Describe the actions to be taken, either automatically or manually to address a low ozone event, which could result in inadequate CT:

COMMENTS

R. OPERATIONAL/PERFORMANCE DATA

Constant Monitoring Equipment	Operable	Inline Reading	Bench Reading	Corresponds To Desk Unit	Computer Reading	Corresponds To Computer
raw pH						
flash mix pH						
finished pH						
raw turbidity						
sed basin 1 turbidity						
sed basin 2 turbidity						
filter 1 turbidity						
filter 2 turbidity						
filter 3 turbidity						
finished turbidity						
finished chlorine						

1. At time of inspection (*Check last lab bench instrument values*)

Parameter	RAW Frequency/ Results	APPLIED ¹ Frequency/ Results	FINISHED Frequency/ Results
Free Cl ₂ (mg/L)			
Turbidity (NTU)			
pH			
Alkalinity (mg/L as CaCO ₃)			
Hardness (mg/L as CaCO ₃)			
Temperature °C			
Fluoride (mg/L)			
Iron (mg/L)			
Manganese (mg/L)			
Other (CO ₂ , PO ₄ , etc.)			

Plant flow at time of inspection: Raw Water _____MGD Finished Water _____MGD

¹ Replace with FILTRATE if membrane treatment

S. OPERATIONAL/LABORATORY STAFF MONITORING PROCEDURES

1. Hours plant is operated per day:
2. Designated Operator (DO) - Hours/Day present:

List all operators and their classification that work at this facility:

Name (as shown on license)	License Class	License Number	Expiration Date	Remarks

Is the staffing in accordance with the Waterworks Regulations? Yes No

3. How are operating decisions made and communicated?

Are there criteria and procedures established for plant shut down in case of unit process failure or upset or in event of significant overall quality degradation? Yes No

4. RECORDS RETENTION in accordance with *Regulations*? Yes No

5. Are daily log/data sheets readily available? Yes No

Were these daily log/data sheets reviewed? Yes No

Are the daily log/data sheets adequate? Yes No

Is the frequency of operational data collection adequate? Yes No

Are there any obvious problems noted from the log entries? Yes No

6. How is the COAGULATION PROCESS controlled?

Pilot Filter

Jar Tests

Zeta Meter

Streaming Current Monitor

Were coagulation control procedures observed / discussed? Yes No

Were the procedures adequate? Yes No

7. Is equipment in good condition?

pH meter Yes No

Jar test machine Yes No

Zeta meter Yes No NA

Pilot filters Yes No NA

Streaming current monitor Yes No NA reading (if applicable): _____

Particle counter/monitor Yes No NA

8. What is the frequency of (combined) FILTER EFFLUENT TURBIDITY monitoring?

___ times per shift continuous

Is this frequency adequate (at least every 4 hours)? Yes No NA

Are continuous monitoring units operational? Yes No NA

Are the on-line (continuous) units calibrated at least quarterly? _____ Yes No NA

Do continuous monitor readings correspond to desk-top unit readings? Yes No NA

Does each filter effluent have an individual continuous turbidity monitor? Yes No

Does the filter effluent turbidity monitoring system have alarm set points? Yes No

Alarm set point(s): _____ Alarm type: _____

Is data recorded at least every 15 minutes? Yes No

Is data kept for 3 years? Yes No

Desk-top turbidimeter manufacturer: _____ Model No. _____

Date last calibrated: _____

Calibration date posted: Yes No

Date bulb last changed: _____ Spare bulb on hand? Yes No

Condition of cuvettes: _____

Primary standard used: Stablcal Formazin Amco AEPA-

Expiration Date of primary standard: _____

Secondary standard used: _____

Age of secondary standard: _____

Date secondary last compared to primary: _____

Turbidity-free water available? Yes No

9. Method of CHLORINE RESIDUAL monitoring: _____

Continuous residual monitor operational? (required for Population > 3,300) Yes No NA

Does each analyzer have the readout at its installation and continuous recording (hard copy chart or electronic data)? Yes No

Is data recorded at least every 15 minutes? Yes No

Is an alarm activated when chlorine concentration is outside normal operating range? Yes No

Set limits: Min: _____ Max: _____

Are grab samples collected at least weekly for routine calibration checks for each on-line analyzer? Yes No

Is a sample tap for grab samples located as close as feasible to where samples enter the on-line analyzer? Yes No

What method is used to analyze grab samples? _____

If system serves $\leq 3,300$, frequency of residual monitoring (Grab Sampling): _____

Expiration date of colorimeter gel standards: _____

Frequency of monitoring satisfactory? Yes No

Free chlorine residual measured and reported? Yes No

Calibration Checks performed? Yes No

If yes,

Are results of calibration checks within the larger of +/- 0.1 mg/l or +/- 15%? Yes No

Are emergency calibration checks performed as soon as possible when an on-line chlorine analyzer indicates a large ($\geq 50\%$) unexpected change in chlorine residual concentration?

Yes No NA

Are records of calibration recorded and maintained for 3 years? Yes No

Do all chemical reagents and standards for on-line analyzers and grab sample methods have an unexpired shelf life? Yes No

Chlorine residual necessary to meet CT requirements: _____ mg/l free chlorine

Location of measurement: _____

Staff aware of the required minimum residual? Yes No

Is this concentration being continuously met? Yes No

If No, is staff checking other parameters/taking appropriate steps to ensure CT requirements are being met on continuous basis? Yes No NA

10. Are adequate LAB EQUIPMENT AND REAGENTS available to run necessary operational tests?

Yes No

Are reagents dated? Yes No

Are test procedures appropriate? Yes No

Are desk-top units calibrated at appropriate intervals? Yes No

Does plant have LABORATORY CAPABILITY for:

algae counts and identification? Yes No

threshold odor determinations? Yes No

iron and manganese analyses? Yes No

Overall appearance of laboratory: satisfactory needs attention

11. FLUORIDE test utilized: _____

Equipment in good condition? Yes No NA

Standards up-to-date? Yes No NA

Is a continuous analyzer provided? Yes No NA

Do continuous analyzer reading correspond to test kit readings? Yes No NA

Frequency of continuous monitoring unit calibration: _____

12. Is CONTINUOUS pH monitoring equipment provided and in good condition? Yes No NA
Do continuous monitor readings correspond to desk-top readings? Yes No NA
Frequency of continuous monitoring unit calibration: _____

13. Adequate BACKFLOW PREVENTION devices at sinks, etc. Yes No
Frequency of RPZ testing: _____ Date of last test: _____

T. WASTE HANDLING

1. Filter backwash, rewash, and settling basin wastewaters discharged to:

lagoons holding tank/sand beds other _____

2. Ultimate discharge of waste flows: _____

3. Provisions for water recycle to head of plant? Yes No

4. Is FILTER BACKWASH RECYCLE practiced? Yes No NA

Is recycle stream monitored for flow? Yes No* NA

Is recycle stream monitored for quality parameters? Yes No* NA

*Recycled filter backwash that is not measured is a Significant Deficiency

Recycle Flowrate (total range): _____

% of Raw Water Flow (should be < 10%): _____

Is approved treatment provided for recycle flows? Yes No* NA

If Yes, Describe: _____ *

Recycled flow should be returned to the plant headworks. If additional approved treatment is not in service, it is a Significant Deficiency

VDH approval date: _____

5. Are floor drains in chemical storage and feed areas separated from waste flow streams?

Yes No NA

COMMENTS:

U. EMERGENCY POWER

- Portable generator connection(s). Identify generator supplier:
- Permanent equipment installed
- No Provisions

Use remaining table for permanent installations only:

Fuel: Diesel gasoline Propane gas Natural gas

Generator Rating: KWH

- % of Total Power Demand met %
- Describe water production capability & critical elements supplied:

Power transfer switch: Manual Automatic

If auto switch provided, does operator know how to manually switch power source? Yes No N/A

Fuel Supply - Level %

Fuel Supply - Approx. Duration hrs

Diesel Gasoline Fuel Tanks:

- Fuel tank a minimum of 50 feet from any well or 100 feet from intake Yes No
- Containment provided for fuel tank Yes No
- Leak detection provided Yes No
- Fuel tank double walled Yes No
- Refueling protected from spills Yes No
- Evidence of fuel leaks Yes No

How often is the Emergency Power exercised?

Duration?

How often is the transfer switch exercised?

Duration?

Maintenance records of engine and generators kept Yes No

Maintenance records reviewed during inspection Yes No N/A

- Adequate? Yes No N/A

General Condition: Good Fair Poor

Comments:

V. ULTRAVIOLET (UV) DISINFECTION

1. UV Units

Type of Units: Low Pressure Medium Pressure
 Control Strategy: Calculated Dose Control UV Intensity Set Point Control
 No. of UV Reactors: _____ No. of UV Reactors in Operation: _____
 Reactor Arrangement: Series Parallel
 No. of Bulbs/Reactor: _____ No. of Bulbs in Operation: _____
 Design Capacity of each Reactor: _____ MGD Total System Design Capacity: _____ MGD

Observed Reactor # 1 Flow (MGD)	Observed Reactor # 2 Flow (MGD)	Observed Reactor # 3 Flow (MGD)

2. UV Reactor Appurtenances (operable and in good operating condition)

Upstream and Downstream Isolation Valves/Reactor Yes No
 Feed Pumps Yes No NA
 Flow Meter/Reactor Yes No NA
 High Flow/Reactor Alarm Yes No NA
 Air Release and Vacuum Relief Valves Provided Yes No
 Sample Taps (Upstream/Downstream each Reactor) Yes No NA
 Drains at each reactor Yes No
 Safety Glasses with UV protection Available Yes No
 Automatic Lamp Cleaning System Operational Yes No NA
 Lamp Chemical Cleaning solutions meet NSF 60? Yes No NA
 Water Level Sensor with Automatic Reactor Shutoff Operational Yes No
 Lamp/Lamp Ballast Failure Sensor with Automatic Reactor Shutoff Operational Yes No
 High Temperature Sensor with Automatic Reactor Shutoff Operational Yes No
 Bench UV Spectrophotometer Operational Yes No NA
 Adequate Spare Parts Inventory Yes No NA

3. No. of Inline UV Intensity Sensors: _____ No. in Operation: _____ NA

UV Intensity Reading - Reactor #1: _____ W/m²
 UV Intensity Reading - Reactor #2: _____ W/m²
 Required UV Intensity for Disinfection Credits: _____ W/m²
 Low UV Intensity Alarm Set Point: _____ W/m²
 UV Intensity Alarm(s) Operational For Reactors In Service: Yes No
 Dates Inline Sensors Last Calibrated (Required monthly): Sensor #1: _____ Sensor#2: _____
 Reference Sensor Provided/Operational: Yes No No. provided: _____
 Date(s) when Reference Sensor(s) Last Calibrated: _____
 UV Intensity Sensor Recorder(s) Operable: Yes No

4. No. of Inline UV Transmittance (UVT) Analyzers: _____ No. in Operation: _____ NA

UVT Reading – Reactor #1: _____% Calculated Dose: _____ mJ/cm²
 UVT Reading – Reactor #2: _____% Calculated Dose: _____ mJ/cm²

Low UVT Alarm Set Point: _____ %

UVT Alarm(s) Operational For Reactors In Service: Yes No

Required Dose/Reactor for Disinfection Credits: _____ mJ/cm²

Low Calculated Dose Alarm Set Point: _____ mJ/cm²

UV Calculated Dose Alarm(s) Operational For Reactors In Service: Yes No

Date(s) UVT Analyzers Calibrated with Bench Spectrophotometer: _____ (Required Weekly)

Date UV Spectrophotometer last calibrated: _____ Meets mfctr specified interval: Yes No

UVT Analyzer Recorder(s) Operable: Yes No

W. GRANULAR ACTIVATED CARBON (GAC) CONTACTORS

Note to Evaluator: Refer to AWWA B604 - *Granular Activated Carbon* for more detailed configuration, testing, handling, and disposal guidelines.

1. Specific contaminants targeted for removal by carbon Yes No
2. Operator is aware of the purpose of treatment Yes No
3. Cumulative flow through carbon is logged Yes No
4. Cumulative flow since last change-out < change-out interval practiced during initial testing Yes No
5. Operations/Management staff aware of carbon change-out interval (should be cumulative flow, not time) Yes No
6. Current flow rate through carbon \leq flow rate during initial testing. (Reduced EBCT may allow breakthrough of less readily-adsorbed contaminants) Yes No
7. Water system is testing treated water quality to confirm effectiveness of GAC Yes No
 - a. Results of most recent laboratory testing satisfactory Yes No
 - b. Date of last testing/Testing frequency is satisfactory
8. Raw testing indicates that there is no significant increase of contaminants over conditions during initial testing (otherwise need to increase finished/post-first stage monitoring and possibly change-out freq.) Yes No
9. Head loss across filter is satisfactory (if high may trigger backwash, high head loss breaks up carbon) Yes No
10. Backwash frequency and procedure is satisfactory (operator should check backwash wastewater for media) Yes No
11. Date of last media level check/frequency
12. Carbon depth is adequate (shouldn't be significantly < during initial testing; carbon can be lost during BW) Yes No
13. GAC Media NSF-61 certified, meets AWWA B604 Yes No
14. Suitable storage for replacement carbon if onsite (dry, no source of ignition, no strong oxidants) Yes No
15. Equipment configuration adequate (sample taps, means of controlling backwash process, air release) Yes No
16. Equipment condition adequate Yes No
17. Proper disposal of spent carbon Yes No

Comments:

X. VIRGINIA OPTIMIZATION PROGRAM REVIEW ²

Virginia Optimization Program Goal	Filter-months met in past 12 months from <u>MM/20XX</u> to <u>MM/20XX</u>	Filter-months met in preceding 12 months from <u>MM/20XX</u> to <u>MM/20XX</u>	Improvement Shown?
Clarified Water Turbidity (use clarifier-months rather than filter-months) ≤ 1.0 NTU when monthly average raw water turbidity ≤ 10.0 NTU ≤ 2.0 NTU when monthly average raw water turbidity > 10.0 NTU	A	B	C
Filtered Water Turbidity ≤ 0.3 NTU in 100% of filtered water readings	D	E	F
Filtered Water Turbidity ≤ 0.1 NTU in 95% of filtered water readings	G	H	I
Filtered Water Turbidity ≤ 0.1 NTU when filter returned to service after each backwash	J	K	L
Filtered Water Turbidity peak ≤ 0.3 NTU in backwash recovery period for each backwash	M	N	O
Length of backwash recovery period ≤ 15 minutes for each backwash	P	Q	R

COMMENTS:

² Discuss VOP performance summary with operator during sanitary survey. Complete table in accordance with following instructions prior to Sanitary Survey or use R&R Report.

Instructions

Box A:

- The ‘time frame’ is the 12 months preceding the month the inspection is conducted (example inspection in April 2011-preceding 12 months are April 2010 to March 2011).
- ‘Filter – months’ is the number of sedimentation basins the plant has in operation each month that meets the raw water turbidity criteria for that month totalized for the 12 month time frame. Examples:

- WTP has two sedimentation basins and both in service every month and both meet the “ ≤ 1.0 NTU when monthly average raw water turbidity ≤ 10.0 NTU” criteria all 12 months; data entered is 24 of 24.
- WTP has three sedimentation basins and all three in service every month; 2 months the criteria is “ ≤ 1.0 NTU when monthly average raw water turbidity ≤ 10.0 NTU” and 10 months the criteria is “ ≤ 2.0 NTU when monthly average raw water turbidity > 10.0 NTU”. The total number of filter- months is 36 – 6 months of ≤ 1.0 NTU and 30 months of ≤ 2.0 NTU. However, none of the basins for the ≤ 1.0 NTU months met the criteria but all the basins met the criteria for all the ≤ 2.0 NTU months; data entered is 30 of 36.

Box B – Same as Box A regarding evaluation of data but the date range evaluated is the 13th to 24th month preceding the month the inspection is performed (example inspection in April 2011-preceding 13th to 24th months are April 2009 to March 2010).

Box C – Answer ‘yes’ or ‘no’ or ‘N/A’ as to whether or not the number of filter-months achieving performance goal in Box A is greater than Box B.

Box D:

- The ‘time frame’ is the 12 months preceding the month the inspection is conducted (example inspection in April 2011-preceding 12 months are April 2010 to March 2011).
- ‘Filter – months’ is the number of filters the plant has in operation each month that meets the individual Filtered Water Turbidity ≤ 0.3 NTU in 100% of turbidimeter determinations performance goal for that month totalized for the 12 month time frame. Examples:
 - WTP has two filters and both in service every month and both meet the Filtered Water Turbidity ≤ 0.3 NTU in 100% of turbidimeter determinations performance goal all 12 months; data entered is 24 of 24.
 - WTP has three filters and all three in service every month; 2 filters met the goal for 12 months and 1 filter met the goal for 11 months; data entered is 35 of 36.
 - WTP has three filters; 2 in service every month and 1 in service 10 months; the total filter months is 34; all filters met the goal each month; data entered is 34 of 34

Box E - Same as Box D regarding evaluation of data but the date range evaluated is the 13th to 24th month preceding the month the inspection is performed (example inspection in April 2011-preceding 13th to 24th months are April 2009 to March 2010).

Box F - Answer ‘yes’ or ‘no’ or ‘N/A’ as to whether or not the number of filter-months achieving performance goal in Box D is greater than Box E.

Box G - The ‘time frame’ is the 12 months preceding the month the inspection is conducted and the ‘Filter – months’ is the number of filters the plant has in operation each month that meets the individual Filtered Water Turbidity ≤ 0.1 NTU in 95% of turbidimeter determinations performance goal for that month totalized for the 12 month time frame.

Box H - Same as Box G regarding evaluation of data but the date range evaluated is the 13th to 24th month preceding the month the inspection is performed.

Box I - Answer ‘yes’ or ‘no’ or ‘N/A’ as to whether or not the number of filter-months achieving performance goal in Box G is greater than Box H

The remaining Boxes (J through R) follow the same pattern for filters as Boxes D through I but for different performance goals.

Virginia Optimization Program Goal	Why is the VOP goal not met in each clarifier-month or filter-month? What are the operator’s plans to improve WTP performance?
Clarified Water Turbidity (use clarifier-months rather than filter-months) ≤ 1.0 NTU when monthly average raw water turbidity ≤ 10.0 NTU ≤ 2.0 NTU when monthly average raw water turbidity > 10.0 NTU	Typically meeting goals – did not meet during 1 month of previous 12 months (February 2009 – 92.54% of samples were ≤ 1.0 NTU with an average raw turbidity of 8 NTU). Severe storms pushed the raw water turbidity much higher than normal for four days resulting in not meeting the ≤ 1.0 NTU goal. The goal was achieved the 3 rd and 4 th day of the event. Recommend the operator on duty during the first two days of the event be better trained to handle the extreme turbidity spike.
Filtered Water Turbidity ≤ 0.3 NTU in 100% of filtered water readings AND Filtered Water Turbidity ≤ 0.1 NTU in 95% of filtered water readings	N/A – Meeting goals
Filtered Water Turbidity ≤ 0.1 NTU when filter returned to service after each backwash	The rewash filtering rate of flow is unknown. The diameter of the rewash and filter rate of flow control valve is the same as are the associated pipe diameters. The rewash valve is a manually operated gate valve on stem extending up through the floor to the filter room. The operators fully open the rewash valve during rewash at all times – Recommend operator perform filter drop tests to determine the number of valve turns it takes to match the filter rewash rate to the filtration rate.
Filtered Water Turbidity peak ≤ 0.3 NTU in backwash recovery period for each backwash	N/A – Meeting goals
Length of backwash recovery period ≤ 15 minutes for each backwash	N/A – Meeting goals

Instructions

This area is a discussion of operator’s diagnosis of shortcomings, and plans to improve facility performance. The inspecting engineer may find that the operator has no diagnosis or plan. In this case, the engineer should enter his assessment of why the goal was not met and state his recommendation for a change that may result in meeting the goal. The below table has examples of possible entries by the inspecting engineer; do not assume these examples are for the same WTP.

Jar Test Results
(Optional)

Plant: _____

Date: _____

Performed By: _____

Raw Water Characteristics:

pH _____
 Temperature _____ °F
 Turbidity _____ NTU (Turb.)
 Alkalinity _____ (mg/L as CaCO₃) (Alk.)
 Total Hardness _____ (mg/L as CaCO₃) (TH)

Jar No.	Coag. Dose (mg/L)	Alk. Adj. (mg/L)	Floc Forming	Floc Settling Charac.	Settled pH	Settled Alk.	Settled TH	Settled Turb.
1								
2								
3								
4								
5								
6								

Coagulant Used: _____ Alkalinity Adjustment: _____

_____ RPM for _____ minutes; _____ RPM for _____ minutes;
 Settling Time: _____ minutes

Filter Drop Test Worksheet
(Optional)

Plant: _____

Date: _____

Inspected By: _____

No. of Filters: _____

Filter Box Area: _____

Gullet Area: _____

Effective Filter Surface Area: _____

Volume Filtered: _____

Filter No.	Time For 6" Drop	Calc. Filter Rate	Indicated Filter Rate	Head Loss Indicated	Head Loss Measured

**PART II - B
RAW WATER SOURCE**

(Shading Identifies a Potential Significant Deficiency)

A. RAW WATER INTAKE / SURFACE SOURCE EVALUATION

Source Name: _____

1. Intake located on: stream/free flowing river reservoir
2. Observed (visible) water quality: clear turbid colored _____
 other _____

3. Conditions (Activities or pollution sources) in the immediate intake area that represent a potential health risk:

Yes No

Describe: _____

4. Observed conditions of surrounding area: _____

5. Reservoir level/stream flow: normal high low

6. For in-stream intake:
check dam provided: Yes No
condition of check dam: _____
stream flow monitoring provided: Yes No

7. Condition of intake structure: _____
screen provided: manual mechanical none
condition of screen: good average poor
number of intake levels provided: ___ depths: _____
drawoff depth/level being used: _____
access provided to intake structure: _____
method of cleaning screen: _____
is it operable/used: _____

8. Raw water pumps
number provided: _____ number operable: _____
number in use: _____ pumping rate: _____

pump station subject to flooding: Yes No

protected against trespassing/vandalism: Yes No

B. SPRING / SPRING ENCLOSURE / PUMP FACILITIES

1. SPRING

Construction Sufficient to Prevent Contamination? Yes No

Protected From Flooding? Yes No

Spring Overflow Screened? Yes No

Cross Connections present? Yes No

2. LOT

All-Weather Access? Yes No

Clean/Uncluttered? Yes No

Improper Storage of Contaminants? Yes No

Fenced? Yes No

Locked?

3. SPRING ENCLOSURE

Electrical Wiring satisfactory needs attention

Lighting satisfactory needs attention

Heating satisfactory needs attention

4. PUMPS & APPURTENANCES PRESENT & OPERABLE

Entry Point Tap Yes No

Raw Water Sampling Tap Yes No

Discharge Check Valve Yes No

Discharge Shut-Off Valve Yes No

Valve Discharge to Waste Yes No

Operable Water Meter Yes No

Observed Pumping Rate (gpm) Discharge Head (psi)

Pump(s) Controlled By

COMMENTS/FIELD TEST RESULTS:

C. SOURCE WATER ASSESSMENT/PROTECTION

1. List land use activities of concern found but not listed in Zone 1 for the original source water assessment.

LUA TYPE	RISK	NAME OF PROPERTY OWNER	OWNER ADDRESS	LATITUDE/LONGITUDE

2. Source Water Protection:

Does the waterworks have a written source water protection plan? Yes No

If "Yes":

Has the source water protection plan been submitted for review? Yes No

When was the last evaluation performed? _____

Has there been sufficient additional development in the watershed to warrant a revised source water protection plan? Yes No

Discuss:

If "No":

Has a schedule been established to develop a plan? Yes No

What is nature of watershed?

agricultural industrial forested residential

How is the watershed controlled/protected?

ordinances owned by waterworks zoning other _____

What is size of the watershed? _____

Percent of watershed protected/controlled: _____ %

Any sources of pollution in proximity of intakes: _____

Discuss:

3. Does waterworks have a spill response plan? Yes No

Has it been tested? Yes No

4. Has there been a contamination event since last survey? Yes No

Date of evaluation: _____

If "Yes", discuss (source, materials and quantities involved, effects on plan and distribution system, etc.):

Comments:

PART II -C
DISTRIBUTION SYSTEM, CROSS-CONNECTION CONTROL, STORAGE,
PUMPING, METER & VALVE VAULTS

(Shading Identifies a Potential Significant Deficiency)

A. DISTRIBUTION SYSTEM EVALUATION

1. Distribution System Survey

a. Map of distribution system available Yes No
Frequency of map updates: _____

b. Materials used:
 ductile iron cast iron asbestos cement galvanized
 PVC HDPE other _____

Valve guide available Yes No

2. Water audit conducted Yes No

Accountability determined? Yes No

If Yes, _____% accountability

Leakage rates >30% (poses unacceptable risk of back siphonage) Yes No

Discuss problem(s), resolution:

Systematic leak detection program Yes No

Systematic leak repair program Yes No

Meter repair program Yes No

Records maintained Yes No

3. Distribution system routinely flushed Yes No

Frequency: _____

Records maintained Yes No

4. Fire hydrants operational status checked Yes No

By whom: _____

Frequency: _____

Records maintained Yes No

Flow tested Yes No

Flow "coded" (NFPA, other) Yes No

5. Valve exercise program

Valves checked for operability Yes No

Frequency: _____

Records maintained Yes No

ATTACHMENT C - SURFACE WATER & GUDI SYSTEM INSPECTION REPORT

6. Corrosion control program

Piping conditions examined

Yes No

Water stability determined

Yes No

Method: _____ Frequency: _____

Other corrosivity/corrosion control tests performed

Method: _____ Frequency: _____

7. Air/vacuum valves

Checked for operability Yes No Frequency: _____

Protected from contamination Yes No

8. Distribution system problems

Problems/complaints logged by owner in past year Yes No

taste & odor discolored water/sediment in water

pressure problems (<20 psi) service interruptions

other _____

9. Records kept for three years Yes No

10. Is rechlorination practiced? Yes No

11. Does waterworks have a General Permit for water line construction? Yes No

If "Yes" expiration date: _____

If "Yes" are annual reports/updated maps being submitted ? Yes No

COMMENTS:

ATTACHMENT C - SURFACE WATER & GUDI SYSTEM INSPECTION REPORT

B. CROSS CONNECTION CONTROL PROGRAM

1. Does utility/plant have an approved Cross-Connection Control Program? Yes No

Date of approval: _____

Person in responsible charge: _____

a. Annual surveys made (all customers) in accordance with the approved program? Yes No

b. Backflow prevention devices tested in accordance with the approved program? Yes No

c. All booster/jockey/fire pumps in system equipped with low pressure cut-off switches on suction lines? Yes No

2. Are inspection/test records maintained? Yes No

Location: _____

Records maintained for 10 years? Yes No

Were records reviewed? Yes No

Are records satisfactory? Yes No

Comments:

C. METER / VALVE VAULTS(s)

METER/VALVE VAULT	NAME/LOCATION	NAME/LOCATION
Vault Drain Functioning		
Sample Tap		
Access (Ladder, etc.)		
Locked Access		
Bypass piping		
Pressure gauges (PRV and altitude valve)		
Air/vacuum valve protected from contamination		
Comments:		

ATTACHMENT C - SURFACE WATER & GUDI SYSTEM INSPECTION REPORT

D. DISTRIBUTION STORAGE (ATMOSPHERIC TANKS)¹

Shading Identifies a Potential Significant Deficiency)

STORAGE TANK	NAME/LOCATION	NAME/LOCATION
WATER QUALITY PROTECTION		
Structure Watertight		
Vent Shielded and Screened		
Drain Satisfactory, Protected		
Tank Overflow		
<ul style="list-style-type: none"> • Screened 		
<ul style="list-style-type: none"> • Air Gap Provided at Outlet 		
<ul style="list-style-type: none"> • Splash Pad /Erosion Protection 		
Roof Hatch Watertight		
Sidewall Access Watertight		
Accesses Locked/Bolted		
Other Tank Openings Curbed, Sleeved, Covered		
Maintenance/Repair Date		
Frequency/Date of Professional Tank Survey (recommend~5 yr)		
Frequency/Date of Routine Tank Survey (recommend ~1 yr)		
Tank(s) Appear Structurally Sound		
Properly modified for Antennae?		
WATER QUALITY MAINTENANCE		
Sample Tap Available		
Frequency Samples Collected		
Floating Debris Observed		
Good Turnover Potential		
Flushed/Cleaned Date		
OPERATION		
Tank Level Controls Operable		
Automatic, Manual or Both		
Tank Level Recorded		
Automatic Recorder Operable		
CORROSION CONTROL		
Routine Interior Inspections Scheduled		
Interior Corrosion Visible		
Exterior Corrosion Visible		
Cathodic Protection Operable		
SAFETY		
Interior/Exterior Ladder Condition		
Interior/Exterior Ladder Guard		
Adequate Railing Available		
Safety Belt Available		
LOT		
Upkeep		
Access Road Maintained		
Surface Water Diverted		
Fence Condition Good		
Access Locked		

¹ Confirm with owner when unable to verify by physical inspection.

ATTACHMENT C - SURFACE WATER & GUDI SYSTEM INSPECTION REPORT

E. DISTRIBUTION – PUMP STATION² (Shading Identifies a Potential Significant Deficiency)

PUMP STATION	NAME/LOCATION	NAME/LOCATION
PUMP STATION LOT		
Upkeep Adequate		
Surface Water Diverted Away		
Access Road Maintained		
PUMP STATION BUILDING		
Light Operable		
Ventilation Operable		
Heating Operable		
Pump Gland Piped to Drain		
Concrete Floor		
Screened Floor Drain		
Locked		
Deterioration &/or Damage Evident		
Storage of toxic chemicals		
PUMP STATION OPERATIONS		
No. of Pumps in Operation		
All Pumps Operable		
Pump Controls: Manual / Automatic		
Pump Alternation: Manual / Automatic		
Flow Meter Operable		
Low Pressure Cut-off		
Alarm Operable		
Compound Gauges Operable		
Discharge Gate Valve Present/Operable		
Suction Gate Valve Present/Operable		
Check Valve Present/Operable		
Cross Connections are present		
PUMP MAINTENANCE		
Pump Service Schedule		
Pump Service Recorded		
EMERGENCY POWER AVAILABLE		
HYDROPNEUMATIC TANK	NAME/LOCATION	NAME/LOCATION
Type: Pre-pressurized or Hydro-Pneumatic		
Pressure Gauge / Reading		
Pressurizing System		
Pressure Operating Range		
Sight Glass / Level Indicator		
Drain protected from contamination		
Pressure Relief Valve		
Vacuum Relief Valve		
Air Relief Valve		
Exterior Condition		
Dept. of Labor & Industry Exp. Date (>120 gal)		
Tank Watertight, Structurally Sound		
Flushed/Cleaned Date		

² Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

PART II - D
SYSTEM MANAGEMENT AND ADMINISTRATION

A. COMMUNICATION & TRAINING

1. Is the system's management familiar with the system's facilities and their needs? Yes No
2. Clear lines of communication established with managers, plant and system operators? Yes No
3. Operational policies clear and communicated/made available to operating staff? Yes No
4. Good communication between the Designated Operator and other operating staff (particularly shift supervision)? Yes No
5. Are personnel adequately trained? Yes No
6. Is there an active, on-going staff training program, either in-house or outside? Yes No

B. STAFFING

7. Are sufficient staff (plant, system, and laboratory) provided? Yes No
8. Will system be adequately staffed in case of illness or vacation? Yes No
9. Are there problems with personnel turnover? Yes No

C. OPERATON & MAINTENANCE

10. Are shift supervisors held responsible for all decisions made while on duty? Yes No
11. Does Designated Operator and shift supervisors have 24-hour access to management staff capable of authorizing emergency expenditures? Yes No
12. Are preventative maintenance tasks scheduled and performed? Yes No
13. Has an Operations & Maintenance Manual been prepared for the plant and system? Yes No
14. Is there an established safety program?
Is the manual kept up-to-date? Yes No

D. PLANNING & BUDGETS

15. Does management have plans for addressing system growth or regulatory requirements for improvements? Yes No
16. Has an Asset Management Plan been developed? Yes No
17. Are sufficient funds allocated for system maintenance and upkeep? Yes No
18. Is a reserve fund established to cover necessary replacements or Capital Improvements? Yes No
19. Are new connections to the system notified of current or unresolved problems? Yes No
20. Has an emergency response plan been established for the entire waterworks?
Has the plan been tested? Yes No
Is the plan routinely updated? Yes No

ATTACHMENT C - SURFACE WATER & GUDI SYSTEM INSPECTION REPORT

Is an emergency power generator capable of powering 100% plant?

Yes No

Are the pump stations equipped with emergency power?

Yes No

COMMENTS:

**VIRGINIA DEPARTMENT OF HEALTH
OFFICE OF DRINKING WATER
CONSECUTIVE SYSTEM SANITARY SURVEY REPORT**

SUBJECT:
WATERWORKS:
PWSID:

PART I - SYSTEM BACKGROUND
GENERAL INFORMATION

Owner Name:	Waterworks Class:
Type of Waterworks:	
Contact Name:	
Contact Address:	
Contact Phone Number:	
Wholesaler:	

D.O. License Class:	D.O. Has Required License:
D.O. Legal Name:	License No./Exp. Date:

Inspection By:	Inspection Date:
Time Spent:	Last Inspection Date:
Date to Reviewer:	Reviewed by/Date:
Date to Reviewer:	Reviewed by/Date:
Inspection Type:	
Present at Inspection:	
Facilities Inspected:	

Operation Permit Effective Date:	Waterworks Description Sheet Date:
Permit Up-to-Date?	Description Sheet Up-to-Date?
No. Connections:	Population Served:
Avg. Daily Production:	Operation Permit Capacity:
Exceeds 80% Operation Permit Capacity? (max. 3 consecutive months): If yes, explain:	
Treatment Provided:	
SDWIS Inventory Information Current:	

Comments:

COMPLIANCE HISTORY

Shaded Boxes	Indicate a potential Significant Deficiency	
REVISED TOTAL COLIFORM & GROUNDWATER RULES		
<ul style="list-style-type: none"> • BSSP Approved: 	<i>(Yes/No)</i>	<i>(Date)</i>
<ul style="list-style-type: none"> • # of routine samples/monitoring period & frequency 		
<ul style="list-style-type: none"> • Is plan current & appropriate for distribution system & population? 		
<ul style="list-style-type: none"> • Is monitoring frequency correct? 		
<ul style="list-style-type: none"> • Rotates and uses approved sites? 		
<ul style="list-style-type: none"> • Measures chlorine residual for all samples, if chlorine is added? 		
<ul style="list-style-type: none"> • RTCR Level 1 or 2 Assessments since last Survey? 		
<ul style="list-style-type: none"> • Disinfection required? (adequate contact time) 		
<ul style="list-style-type: none"> • 4-Log virus inactivation required? 		
<ul style="list-style-type: none"> • 4-Log virus inactivation provided? 		
<ul style="list-style-type: none"> • On-line chlorine analyzers required for chlorine residual? 		
<ul style="list-style-type: none"> • Procedure for wholesaler notification of TC + results (groundwater purchasers only) 		
DDBP RULES (Community & NTNC, Disinfectant Used)		
<ul style="list-style-type: none"> • Monitoring Plan approved and current? 	<i>(Yes/No)</i>	<i>(Date)</i>
<ul style="list-style-type: none"> • Monitoring frequency required: 		
<ul style="list-style-type: none"> • Operational Evaluation Level exceeded? 		
CONSUMER CONFIDENCE REPORTS (Community only)		
<ul style="list-style-type: none"> • Final report issued by deadline 		
<ul style="list-style-type: none"> • Certification Statement Received? 		
LEAD & COPPER RULES (Community & NTNC)		
<ul style="list-style-type: none"> • Materials Survey/ Sampling Plan Approved: 	<i>(Yes/No)</i>	<i>(Date)</i>
<ul style="list-style-type: none"> • Water Quality Parameter (WQP) routine monitoring required? (Mandatory for > 50,000 population) <ul style="list-style-type: none"> ○ If yes, WQPs meet quality and frequency requirements? 		
<ul style="list-style-type: none"> • Have Action Levels (90%) been exceeded in past? <ul style="list-style-type: none"> ○ If so, when? 		
<ul style="list-style-type: none"> • Public Education requirements met if required? 		
<ul style="list-style-type: none"> • Optimized Corrosion Control Treatment (OCCT) required? <ul style="list-style-type: none"> ○ If “Yes”, is Operational Control Monitoring performed and acceptable? 		
<ul style="list-style-type: none"> • All consumer notice requirements met? 		
Comments:		

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

CROSS-CONNECTION CONTROL PROGRAM		
• Approved:	(Yes/No)	(Date)
• Inspected Records This Visit		
○ Program Active		
○ Satisfactory		
(MONTHLY) OPERATION REPORTS		
• All submitted for past 12 months		
• Appropriate operational treatment parameter monitoring		
• All required information/analyses reported		
EMERGENCY MGMT. PLAN for Extended Power Outage (Community only)		
• Verification received?	(Yes/No)	(Date)
• Current?		
ASSET MANAGEMENT (recommendation)		
• Written Plan Developed?		
• Routine Maintenance Performed?		
ENFORCEMENT		
• Administrative Order in Effect:	(Yes/No)	(Date)
• Violations / Enforcement Actions Since Last Survey:		
• Owner issued Public Notice as required?		
• Active Corrective Action Plan?	(Yes/No)	(Date)
○ If “Yes”, is waterworks on schedule?		
• SDWIS Violation & Enforcement Action, Public Notification data current?		
COMPLAINTS SINCE LAST INSPECTION:		
• If yes, summarize:		
Comments:		

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

MONITORING HISTORY

Insert R&R report - Next Chemical Sample Due. See WM 851, Attachment G for instructions.

If field notes are sent with the owner’s report, the Next Chemical Sample Due report does not need to be included in both this section and the owner’s report.

PART II - SYSTEM SURVEY INFORMATION (Field Notes)

Shaded Boxes

Indicate a potential Significant Deficiency

- A. DISTRIBUTION SYSTEM EVALUATION
- B. STORAGE – ATMOSPHERIC TANK(S)
- C. BOOSTER PUMP STATION(S)
- D. STORAGE – PNEUMATIC TANK(S)
- E. METER & VALVE VAULT(S)
- F. RE-CHLORINATION STATION(S)
- G. CONTINUOUS CHLORINE ANALYSIS

[It is not necessary to include this page in a completed Sanitary Survey Report](#)

A. DISTRIBUTION SYSTEM EVALUATION	
Pipe Material(s):	
Individual Service Meters provided?	
○ If yes, routine calibration & replacement program in effect?	
Flushing Provisions (hydrants, blow-offs, etc.) available?	
Routine Flushing Program in practice?	
○ If yes, describe:	
Isolation valves exercised?	
○ If yes, describe:	
Air/vacuum relief valves checked for operability?	
○ If yes, describe:	
Pressure monitoring of distribution system?	
○ If yes, describe:	
Adequate Pressure Maintained Throughout? (>20 psi @ peak flow)	
Problems/Complaints in past year: <input type="checkbox"/> taste & odor <input type="checkbox"/> pressure <input type="checkbox"/> turbidity/sediment <input type="checkbox"/> color <input type="checkbox"/> service interruptions <input type="checkbox"/> other Describe:	
Pipe Repair - proper disinfection/sampling procedures used?	
Re-chlorination practiced? (If yes, see separate Re-Chlorination table in this report.)	
FIRE PROTECTION PROVIDED?	
How often are Fire Flow Tests conducted (with fire dept.)?	
How often are hydrants checked for operability?	
Are fire hydrants coded to indicate maximum available fire flow?	
○ If yes, is operator familiar with fire hydrant code index?	
Are operators familiar with tank levels necessary to provide target fire flow for target duration?	
Does waterworks have routine procedures for contacting local fire department(s) to verify available fire flow and duration?	
MANAGEMENT	
Plans/Sketches/Maps with valve & master meter locations?	
Records maintained (should be kept for 3 years minimum): <input type="checkbox"/> Repairs <input type="checkbox"/> Flushing <input type="checkbox"/> Hydrant Testing <input type="checkbox"/> Fire Flow Tests <input type="checkbox"/> Water Audits <input type="checkbox"/> Complaints	
How often are Water Audits conducted?	
Leakage rates > 30%? Explain:	
Comments:	

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

B. STORAGE - ATMOSPHERIC TANK(S)	<i>NAME/LOCATION Tank Volume</i>	<i>NAME/LOCATION Tank Volume</i>
WATER QUALITY PROTECTION		
Structure Watertight		
Vent Shielded and Screened		
Drain Satisfactory, Protected		
Tank Overflow		
• Screened		
• Air Gap Provided at Outlet		
• Splash pad / Erosion Protection		
Roof Hatch Watertight		
Sidewall Access Watertight		
Accesses Locked/Bolted		
Other Tank Openings Curbed and Sleeved		
Other Tank Openings Covered		
Maintenance/Repair Date		
Frequency/Date of Professional Tank Survey (recommended ~5 yr). Explain.		
Frequency/Date of Routine Tank Survey (recommended ~1 yr). Explain.		
Tank(s) Appear Structurally Sound		
Properly modified for Antennae?		
WATER QUALITY MAINTENANCE		
Sample Tap Available		
Frequency Tank Samples Collected		
Floating Debris Observed		
Good Turnover Potential		
Flushed/Cleaned Date		
OPERATION		
Tank Level Controls Operable		
Automatic or Manual		
Tank Level Recorded		
Automatic Recorder Operable		
CORROSION CONTROL		
Routine Interior Inspections Scheduled		
Interior Corrosion Visible		
Exterior Corrosion Visible		
Cathodic Protection Operable		
SAFETY		
Interior/Exterior Ladder Condition		
Interior/Exterior Ladder Guard		
Adequate Railing Available		
Safety Belt Available		
LOT		
Upkeep		
Access Road Maintained		
Surface Water Diverted		
Fence Condition Good		
Access Locked		
Comments:		

C. BOOSTER PUMP STATION(S)	<i>NAME/LOCATION</i>	<i>NAME/LOCATION</i>
PUMP STATION LOT		
Upkeep Adequate		
Surface Water Diverted Away		
Access Road Maintained		
PUMP STATION BUILDING		
Light Operable		
Ventilation Operable		
Heating Operable		
Pump Gland Piped to Drain		
Concrete Floor		
Screened Floor Drain		
Locked		
Deterioration &/or Damage Evident		
Storage of toxic chemicals		
PUMP STATION OPERATIONS		
No. of Pumps In Operation		
All Pumps Operable		
Pump Controls:		
• Automatic		
• Manual		
Pump Alternation:		
• Automatic		
• Manual		
Flow Meter Operable		
Low Pressure Cut-off		
Alarm Operable		
Compound Gauges Operable		
Cross Connections are present		
PUMP MAINTENANCE		
Pump Service Schedule		
Pump Service Recorded		
Discharge Gate Valve		
Suction Gate Valve		
Check Valve		
Comments:		

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

D. STORAGE - PNEUMATIC TANK(S)	<i>NAME/LOCATION</i>	<i>NAME/LOCATION</i>
Type: <i>Pre-Pressurized or Hydro-Pneumatic</i>		
Drain protected from contamination		
Pressure Gauge / Reading		
Pressure Operating Range		
Sight Glass / Level Indicator		
Sample Tap Available		
Pressurizing System		
Vacuum Relief Valve		
Pressure Relief Valve		
Air Relief Valve		
Exterior Condition		
Normal Pump Cycling (not “water logged”)		
Tank Watertight, Structurally Sound		
Flushed/Cleaned Date		
Dept. of Labor & Industry Exp. Date (>120 gal.)		
Comments:		

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

E. METER AND VALVE VAULT(S)	<i>NAME/LOCATION</i>	<i>NAME/LOCATION</i>
Vault Drain Functioning		
Sample Tap		
Access (Ladder, etc.)		
Locked Access		
Bypass piping		
Pressure gauges (PRV and altitude valve)		
Air/vacuum valve protected from contamination		
Comments:		

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

F. RE-CHLORINATION STATIONS	<i>NAME/LOCATION</i>	<i>NAME/LOCATION</i>
Disinfectant		
ANSI Certified / NSF Approved / “GRAS”		
Feeder Condition		
Spare Feeder/Repair Parts		
Safety Features/ Precautions adequate to protect operator and public		
Room Ventilation		
Injection line condition (scale build up, etc.)		
Solution tank condition		
Solution tank covered		
Feeder Activation/Operation		
Weight (gas) or volume/depth (OCI) scale		
Number full cylinders (gas systems)		
Booster Pump(s)		
Residual test equipment		
Free residual, mg/l		
Inspection field test ≈ Monthly Operation Report residuals?		
Comments:		

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

**VIRGINIA DEPARTMENT OF HEALTH
OFFICE OF DRINKING WATER
GROUNDWATER SYSTEM SANITARY SURVEY REPORT
TRANSIENT NON-COMMUNITY**

SUBJECT:
WATERWORKS:
PWSID:

PART I - SYSTEM BACKGROUND
GENERAL INFORMATION

Owner Name:	Waterworks Class:
Type of Waterworks: Transient Noncommunity (circle one) <i>Year round / Seasonal</i>	
Contact Name:	
Contact Address:	
Contact Phone Number:	

D.O. License Class:	D.O. Has Required License:
D.O. Legal Name:	License No./Exp. Date:

Inspection By:	Inspection Date:
Time Spent:	Last Inspection Date:
Date to Reviewer:	Reviewed by/Date:
Date to Reviewer:	Reviewed by/Date:
Inspection Type:	
Present at Inspection:	
Facilities Inspected:	

Operation Permit Effective Date:	Waterworks Description Sheet Date:
Permit Up-to-Date?	Description Sheet Up-to-Date?
No. Connections:	Population Served:
Avg. Daily Production:	Operation Permit Capacity:
Exceeds 80% Operation Permit Capacity? (max. 3 consecutive months): If yes, explain:	
Treatment Provided:	
SDWIS Inventory Information Current:	

Comments:

COMPLIANCE HISTORY

Shaded Boxes	Indicate a potential Significant Deficiency	
REVISED TOTAL COLIFORM & GROUNDWATER RULES		
• BSSP Approved:	<i>(Yes/No)</i>	<i>(Date)</i>
• Seasonal Startup Plan Approved:	<i>(Yes/No/NA)</i>	<i>(Date)</i>
• # of routine samples/monitoring period & frequency		
• Is plan current & appropriate for distribution system & population?		
• Is monitoring frequency correct?		
• Sampled in accordance with approved plan?		
• Seasonal Startup Procedures Completed Since Last Visit?		
• RTCR Level 1 or 2 Assessments since last Survey?		
• Disinfection required? (adequate contact time)		
• 4-Log virus inactivation required?		
• 4-Log virus inactivation provided?		
• On-line chlorine analyzers required for chlorine residual?		

ROUTINE RAW WATER BACTERIOLOGICAL MONITORING <i>(checked over past 12 months)</i>		
• Required?		
○ If “Yes”, Frequency:		
• # of <i>E. coli</i> positive Samples		
• # Samples with Total Coliform > 50 CFU/100 mL		

GUDI DETERMINATION	RESULT	DATE
• Source # / Name		
• Source # / Name		

SOURCE WATER ASSESSMENT PERFORMED	DATE
• Source # / Name	
• Source # / Name	

SOURCE WATER PROTECTION	DATE
• Written source water protection plan?	
Comments:	

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

CROSS-CONNECTION CONTROL PROGRAM		
• Approved	(Yes/No)	(Date)
• Inspected Records This Visit		
• Program Active		
• Satisfactory		

OPERATION REPORTS	
• All submitted for past 12 months	
• Appropriate operational treatment parameter monitoring	
• All required information/analyses reported	

ENFORCEMENT		
• Administrative Order in Effect:		
• Violations / Enforcement Actions Since Last Survey:		
• Owner issued Public Notice as required?		
• Active Corrective Action Plan?		
○ If “Yes”, is waterworks on schedule?		
• SDWIS Violation & Enforcement Action, Public Notification data current?		

COMPLAINTS SINCE LAST INSPECTION:
• If yes, summarize:
Comments:

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

MONITORING HISTORY

Insert R&R report - Next Chemical Sample Due. See WM 851, Attachment G for instructions.

If field notes are sent with the owner's report, the Next Chemical Sample Due report does not need to be included in both this section and the owner's report.

PART II - SYSTEM SURVEY INFORMATION (Field Notes)

Shaded Boxes Indicate a potential Significant Deficiency

COMBINED SECTIONS

- A. SOURCE - WELL
- B. WELL HOUSE
- C. STORAGE PNEUMATIC TANK(S)
- D. CHEMICAL FEED SYSTEMS – SAFETY/GENERAL
- E. DISINFECTION
- F. NEW ACTIVITIES OR POLLUTION SOURCES
- G. STORAGE - ATMOSPHERIC TANK(S)
- H. BOOSTER PUMP STATION(S)

INDIVIDUAL SECTIONS

- I. SOURCE - SPRING / SPRING ENCLOSURE / PUMP FACILITIES
- J. DISTRIBUTION SYSTEM
- K. CONTINUOUS CHLORINE ANALYSIS
- L. ULTRAVIOLET LIGHT UNITS
- M. CORROSION CONTROL TREATMENT
- N. IRON & MANGANESE CONTROL (KMnO₄ - GREENSAND FILTERS)
- O. SOFTENING (CATION EXCHANGE USING NaCl)
- P. REVERSE OSMOSIS

It is not necessary to include this page in a completed Sanitary Survey Report

A. SOURCE (WELL # / NAME)		C. STORAGE - PNEUMATIC TANK(S) (NAME/ LOCATION) (Tank Volume)		E. DISINFECTION	
Sanitary Casing Seal /Cap				Disinfectant	
Elbowed Casing Vent/Screened		Type: Pre-Pressurized or Hydro-Pneumatic		ANSI Certified/NSF Approved / "GRAS"	
12" Casing Extension		Drain Protected from Contamination		Feeder Condition	
Concrete Pad (6' Square)		Pressure Gauge/Reading		Spare Feeder/Repair Parts	
Well Lot Condition (50 ft Radius)		Pressure Operating Range		Room Ventilation	
Protected from Flood Waters/Runoff		Sight Glass/Level Indicator		Contact Tank in service	
Discharge Check Valve		Sample Tap Available		Contact Tank Condition	
Discharge Shut-Off Valve		Pressurizing System		Injection Line Condition (Scale Build-Up, etc.)	
Valved Blow-Off		Vacuum Relief Valve		Solution Tank Condition	
Raw Water Sample Tap		Pressure Relief Valve		Solution Tank Covered	
Water Level Gauge or Transducer		Air Relief Valve		Feeder Activation/Operation	
Operable Water Meter/Reading		Exterior Condition		Weight (gas) or Volume/Depth (OCl) Scale	
Permitted Capacity (gpd)		Normal Pump Cycling		Number Full Cylinders (Gas Only)	
Pumping Rate Observed (gpm)		Tank Watertight, Structurally Sound		Booster Pump(s)	
Pumping Average hrs/day		Flushed/Cleaned Date		Residual Test Equipment	
Permitted Source Capacity Exceeded?		Dept. of Labor & Industry Exp. Date (>120 gal.)		Free Residual, mg/l	
Discharge Head Observed (psi)				Field test ≈ MOR residuals	
All Weather Access		D. CHEM. FEED SYSTEMS SAFETY / GENERAL		F. NEW ACTIVITIES OR POLLUTION SOURCES within 1000 ft radius of well that present a significant/acute health risk.	
B. WELL HOUSE		Do any chemical storage and handling facilities offer potential for explosions?		Activity or Pollution Source	Approx. Distance from Well
Adequate Protection		Is adequate safety equipment provided for chemical handling (i.e. rubber gloves, breathing apparatus, goggle, aprons, etc.)?			
Proper Storage Only (Non-toxic & Non-explosive)		Are Material Data Safety Sheets (MSDS) available?			
Cross-Connections Exist?		Are hazardous chemical containers labeled?			
Lighting		Is adequate chemical storage area provided?			
Heating		Are there approved backflow prevention devices installed to isolate process water from finished water?			
Electrical Wiring (Safety)		Does the waterworks have adequate employee safety training?			
Floor Drain					
All-Weather Access					
Wellhead Accessible					
Locked					
Clean/Uncluttered					
Emergency Power Available					
Comments:					

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

G. STORAGE - ATMOSPHERIC TANK(S) (NAME/LOCATION) (Tank Volume)		H. BOOSTER PUMP STATION(S) (NAME/LOCATION)	
WATER QUALITY PROTECTION		PUMP STATION LOT	
Structure Watertight		Upkeep Adequate	
Vent Shielded and Screened		Surface Water Diverted Away	
Drain Satisfactory, Protected		Access Road Maintained	
Tank Overflow		PUMP STATION BUILDING	
• Screened		Light Operable	
• Air Gap Provided at Outlet		Ventilation Operable	
• Splash Pad/Erosion Protection		Heating Operable	
Roof Hatch Watertight		Pump Gland Piped to Drain	
Sidewall Access Watertight		Concrete Floor	
Accesses Locked/Bolted		Screened Floor Drain	
Other Tank Openings Curbed and Sleeved		Locked	
Other Tank Openings Covered		Deterioration &/or Damage Evident	
Maintenance/Repair Date		Storage of Toxic Chemicals	
Frequency/Date of Professional Tank Survey (Recommended ~5 yr)		PUMP STATION OPERATIONS	
Frequency/Date of Routine Tank Survey (Recommended ~1yr)		No. of Pumps in Operation	
Tank(s) Appear Structurally Sound		All Pumps Operable	
Properly Modified for Antennae?		Pump Controls:	
WATER QUALITY MAINTENANCE		• Automatic	
Sample Tap Available		• Manual	
Frequency Samples Collected		Pump Alternation:	
Floating Debris Observed		• Automatic	
Good Turnover Potential		• Manual	
Flushed/Cleaned Date		Flow Meter Operable	
OPERATION		Low Pressure Cut-off	
Tank Level Controls Operable		Alarm Operable	
Automatic or Manual		Compound Gauges Operable	
Tank Level Recorded		Cross Connections are Present	
Automatic Recorder Operable		PUMP MAINTENANCE	
CORROSION CONTROL		Pump Service Schedule	
Routine Interior Inspections Scheduled		Pump Service Recorded	
Interior Corrosion Visible		Discharge Gate Valve	
Exterior Corrosion Visible		Suction Gate Valve	
Cathodic Protection Operable		Check Valve	
SAFETY		Emergency Power Available	
Interior/Exterior Ladder Condition		COMMENTS:	
Interior/Exterior Ladder Guard			
Adequate Railing Available			
Safety Belt Available			
LOT			
Upkeep			
Access Road Maintained			
Surface Water Diverted			
Fence Condition Good			
Access Locked			

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

I. SOURCE - SPRING / SPRING ENCLOSURE / PUMP FACILITIES		
	SPRING # / NAME	SPRING # / NAME
Construction Sufficient to Prevent Contamination		
Protected From Flooding		
Spring Overflow Screened		
Spring Lot		
All-Weather Access		
No Cross Connections		
Clean/Uncluttered		
Improper Storage of Contaminants		
Spring Enclosure Condition/Acceptable		
Spring Enclosure Protected (Lot Fenced)		
Locked		
Electrical Wiring (safety)		
Lighting		
Heating		
Entry Point Tap Available		
Raw Water Sampling Tap		
Discharge Check Valve		
Discharge Shut-Off Valve		
Valve Discharge to Waste		
Operable Water Meter		
Spring Yield - gpm (if available)		
Emergency Power available		
Comments:		

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

L. ULTRAVIOLET LIGHT UNITS	<i>NAME/LOCATION</i>
Does the UV Unit appear to be functioning?	
Is the bulb changed according to the manufacturer's recommended schedule?	
Comments:	

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

M. CORROSION CONTROL or SEQUESTRATION	<i>NAME/LOCATION</i>
Type Treatment (ortho/poly/blend – phosphate, pH/alkalinity adjustment, calcite contactor, silicate, etc.): & purpose	
Back Siphonage Protection Provided	
Safety Eyewear and Clothing Provided	
Chemical(s) Meet ANSI / NSF Standards	
Equipment Literature Available	
Equipment Condition	
Equipment Operation Adequate	
Spare Feeder/Metering Pump	
Proper Mixing Downstream of Chemical Addition	
Adequate Mixing Provided for Chemical Slurries	
Separate Feeder/Storage Room Provided	
Suitable Chemical Storage (30 days minimum)	
Suitable Sampling Taps (upstream, downstream)	
Calcite Addition Based Upon (calcite contactor)	
Disposal of Backwash Waste (downflow calcite contactor)	
Appropriate & Operable Testing Equipment	
Comments:	

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

N. IRON & MANGANESE CONTROL (KMnO₄ – GREENSAND FILTER, OTHER-specify)	<i>NAME/LOCATION</i>
Cross-Connection Protection – KMnO ₄ Mixing Tank	
Safety Eyewear and Clothing Provided	
Chemicals meet ANSI / NSF Standards	
Equipment Literature Available	
Equipment Condition	
Equipment Operation Adequate	
Continuous or Batch KMnO ₄ Addition	
Spare Metering Pump Provided	
pH Adjustment	
KMnO ₄ Addition Follows pH Adjustment	
Supplemental Oxidants (aeration, chlorine, other)	
If Aeration, How Provided	
Is Disinfection Provided	
Suitable Sampling Taps (prior to KMnO ₄ , influent, effluent)	
Suitable KMnO ₄ Storage (30 days minimum)	
Is KMnO ₄ stored away from organic materials (explosion hazard)?	
Backwash (gravity from system/storage, pumped, other)	
No. Backwash Pumps	
Air Wash Provided	
Disposal of Backwash Waste	
Appropriate & Operable Testing Equipment	
Comments:	

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

O. ION EXCHANGE	<i>NAME/LOCATION</i>
Treatment Purpose (softening, Fe/Mn removal, other)	
Cross-Connection Protection – Water Inlet to Brine Tank	
Chemicals meet NSF Standards	
Equipment Literature Available	
Equipment Condition	
Equipment Operation Adequate	
Bypass for Blending	
Regeneration (automatic, manual)	
Backwash (gravity from system/storage, pumped, other)	
No. Backwash Pumps	
Suitable Sampling Taps (influent, effluent, blended)	
Corrosion Problem Due to Salt Storage/Usage	
Suitable Salt Storage (30 days minimum)	
Salt Storage/Brine Tank Separated from Vulnerable Equipment	
Disposal of Brine Waste	
Appropriate & Operable Testing Equipment	
Comments:	

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

P. REVERSE OSMOSIS			NAME/LOCATION		
	Satisfactory?		Comments		
	Yes	No			
Treatment purpose			(Fluoride removal, Desalination, other)		
Number & configuration			(Pre-filters, RO units)		
Equipment condition					
Equipment operation			(Actual Feed Rate = gpm; Recovery = %; Design Feedrate = gpm; Recovery = %)		
O&M manual available					
Bypass for blending			(Treated = % <i>or</i> gpm; Bypassed = % <i>or</i> gpm)		
Flowmeters			Location	Reading	Condition
•					
•					
Pressure gauges			Location	Reading	Condition
•					
•					
Test equipment			(Equipment; Availability; Condition)		
Performance Monitoring			Parameter	Frequency	Value
Element replacement			(Schedule or condition; Date last replaced)		
Chemical Pretreatment			Refer to table below		
Chemicals meet NSF 60					
Concentrate Disposal			(Location, Condition)		
Field test results - Applied water - Recovered water - Blended water			Temp	pH	Na F Other

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

Q. REVERSE OSMOSIS (Cont.)					
Pretreatment Chemical	Function	Conc.	Feedrate	Storage Location/Quantity	Remarks
	Acid for pH adjustment				
	Antiscalant				
	Sequestration of Fe & Mn				
Comments:					

Y = Yes; N = No; NA = Not Applicable; N/I = Not Inspected; None = None; OK = Acceptable

ATTACHMENT F - LIST OF POTENTIAL SIGNIFICANT DEFICIENCIES

Shaded cells indicate Potential Significant Deficiencies for Surface Water Treatment only.

Sanitary Survey Element	SDWIS Category Code	Description (included in SDWIS; max. 95 characters)
Source	SO	SO01-Potential contamination source or activity within 50 ft of well
Source	SO	SO02-Potential contamination of well from surface water runoff
Source	SO	SO03-Well has not been approved by VDH-ODW
Source	SO	SO04-Sanitary seal or pitless adapter well cap missing or defective
Source	SO	SO05-Spring box construction deficient; susceptible to contamination
Source	SO	SO06-Existing demand exceeds source pumping rate
Source	SO	SO07-Existing demand exceeds source "safe yield"
Source	SO	SO08-Existing demand exceeds intake components' hydraulic capacity
Treatment	TR	TR01-Filter loading exceeds permitted rate ¹
Treatment	TR	TR02-Filter flow controls inoperable or improperly calibrated ¹
Treatment	TR	TR03-Filter backwash rate or duration inadequate ¹
Treatment	TR	TR04-Filter backwash pump controls inoperable or improperly calibrated ¹
Treatment	TR	TR05-Failure to maintain continuous disinfection
Treatment	TR	TR06-Minimum chlorine residual not maintained to meet CT
Treatment	TR	TR07-Entry point chlorine residual < 0.2 mg/L ²
Treatment	TR	TR08-Chemicals not certified to ANSI/NSF 60 Standard or GRAS
Treatment	TR	TR09-Chemical storage or handling present risk of explosions
Treatment	TR	TR10- Unprotected or improperly protected cross-connections ³
Treatment	TR	TR11-Inadequate continuous treatment for MCL or TT requirements
Treatment	TR	TR12-Coagulant/Coagulant Aid improperly applied
Treatment	TR	TR13-Mixer inoperable or inadequate
Treatment	TR	TR14-No floc formation
Treatment	TR	TR15-Excess sludge accumulation
Treatment	TR	TR16-Disinfection profile unavailable or not understood by Operator ⁴
Distribution System	DS	DS01-Distribution pressure falls below 20 psi at the service connection
Distribution System	DS	DS02-Failure to have active Cross-Connection Control Program

¹ All filter types

² SWTR requirement

³ A cross-connection control device is missing or is inadequate

⁴ 40 CFR 141.172 (b)(6) states: "The system must retain disinfection profile data in graphic form, as a spreadsheet, or in some other format acceptable to the State for review as part of the sanitary surveys conducted by the State."

40 CFR 141.16 (b)(3)(iv) states: "When conducting sanitary surveys for systems required to comply with the disinfection profiling requirements in § 141.172 of this chapter, the State must also review the disinfection profile as part of the sanitary survey."

ATTACHMENT F - LIST OF POTENTIAL SIGNIFICANT DEFICIENCIES

Finished Water Storage ⁵	FW	FW01-Tank not watertight
Finished Water Storage	FW	FW02-Roof / Access hatches not watertight
Finished Water Storage	FW	FW03-Tank structurally unsound
Finished Water Storage	FW	FW04-Vent improperly screened
Finished Water Storage	FW	FW05-Overflow improperly screened or protected from contamination
Finished Water Storage	FW	FW06-Drain improperly screened or protected from contamination
Finished Water Storage	FW	FW07-Potential contamination of finished water from surface water runoff
Pumps (facilities and controls)	PU	PU01-Critical pump equipment inoperable
Pumps (facilities and controls)	PU	PU02-Unprotected or improperly protected cross-connections
M&R & Data Verification	MR	MR01-Not using certified lab for compliance testing
M&R & Data Verification	MR	MR02-No BSSR approved by VDH-ODW
M&R & Data Verification	MR	MR03-No TSWMP approved by VDH-ODW
M&R & Data Verification	MR	MR04-Sampling not in accordance with BSSR
M&R & Data Verification	MR	MR05-Sampling not in accordance with TSWMP
Management & Operations	SM	SM01-ODW-required operation testing not performed / recorded
Management & Operations	SM	SM02-Lab log and data sheets not readily available ⁶
Operator Compliance	OC	OC01-Number and Class of Operators do not meet WW Regulations

⁵ Includes clearwells

⁶ Applicable to surface water and GUDI treatment facilities, and GW systems required to meet 4-log virus inactivation.

«Date»

NOTICE OF SIGNIFICANT DEFICIENCY (IES)

SUBJECT: <<County>>
WATERWORKS: <<Waterworks Name>>
PWSID:

«Owner Name»
«Address»
«Address»

Dear «Owner Name»:

On {date}, {name of the inspector} of this office conducted a sanitary survey of your waterworks. Enclosed is a copy of the report developed as a result of that survey.

The following Significant Deficienc(y)(ies) (was)(were) identified during this inspection:

{itemize deficiency-ies here}

(If ODW issues CAP):

Enclosed is a proposed Corrective Action Plan (CAP) for your review; please sign and return if acceptable. If you wish to make changes to the CAP please contact this Office immediately. The final, signed CAP must be submitted to this Office by {date of letter plus 45 days} for review and approval. You are required to notify this Office within 30 days of completion of each action item. The CAP must be fully implemented within 120 calendar days from the date of this letter. Once all of the actions listed in the CAP have been completed, this Office must conduct a follow-up inspection to verify elimination of the Significant Deficiency in accordance with the CAP.

(If waterworks owner generates CAP):

You are required to contact this Office by {date of letter plus 30 days} to establish how and on what schedule the Significant Deficiency will be addressed. A written Corrective Action Plan (CAP) must be submitted to this Office by {15 days later}, for review and approval. The CAP must outline the steps necessary to correct the Significant Deficiency, and be fully implemented within 120 calendar days from the date of this letter.

You are required to notify this Office within 30 days of completion of each action item. Once the actions listed in the CAP have been completed, this Office must conduct a follow-up inspection to verify elimination of the Significant Deficiency in accordance with the CAP.

Your failure to respond as requested by the above deadlines may force VDH to pursue enforcement action in order to protect public health.

<<Owner Name>>

Page 2

Please visit our web site at www.vdh.virginia.gov/drinkingwater. There you will find helpful information on water sampling and testing, operator licensing and training, consumer education, project funding and many other topics, as well as, links to other key websites and Virginia's *Waterworks Regulations*. If you have questions, please do not hesitate to contact me.

Sincerely,

District Engineer

Enclosure(s)

cc: VDH-ODW-Central Office
County Health Department, Attention: <<Name of Health Director>>
County Administrator

CORRECTIVE ACTION PLAN

Waterworks Name
PWSID #####

The following (interim and) corrective actions must be implemented by the (Name of waterworks owner) because the (Name of waterworks) waterworks has been found to have the following significant deficiency(ies):

Itemize deficiencies here.....

A. INTERIM ACTION REQUIREMENTS [if applicable]

Include interim action requirements as necessary

B. CORRECTIVE ACTION REQUIREMENTS

The following corrective actions and schedules will be followed by the (Name of waterworks). As each action item is completed, the status will be reported in writing to the VDH-ODW.

ACTION ITEMS	START DATE	COMPLETION DATE
Include corrective action item(s) necessary to correct the significant deficiency	Immediately	Target 120 days from CAP issuance

(I)(Name of waterworks owner entity) agree(s) to fully implement the above (interim and) corrective actions to bring (my)(name of waterworks) waterworks into compliance with the Commonwealth of Virginia Waterworks Regulations.

Waterworks Owner/Agent

Date

NOTICE OF VIOLATION*

****NOTE: If compliance schedules or corrective action plans are developed, they should be included with a separate violation notice attached to the transmittal letter without this heading.***

SUBJECT: <<County>>
WATERWORKS: <<Waterworks Name>>
PWSID:

«Owner Name»
«Address»
«Address»

Dear «Owner Name»:

On {date}, {name of the inspector} of this office conducted a sanitary survey of your waterworks. Enclosed is a copy of the report developed as a result of that survey. Please note our list of comments and recommendations on page ___ of the inspection report.

This Notice is to advise you that the subject waterworks appears to be in violation of the Commonwealth of Virginia *Waterworks Regulations* as follows:

{Itemize Violations found}

If you have questions on the report or would like to discuss my findings, please do not hesitate to contact me.

Sincerely,

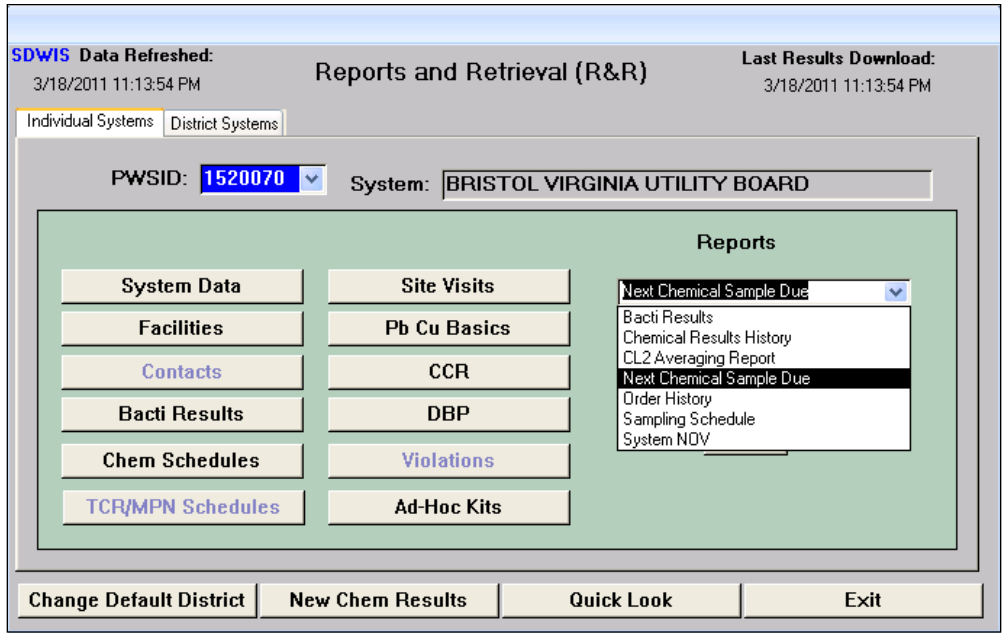
District Engineer

Enclosure

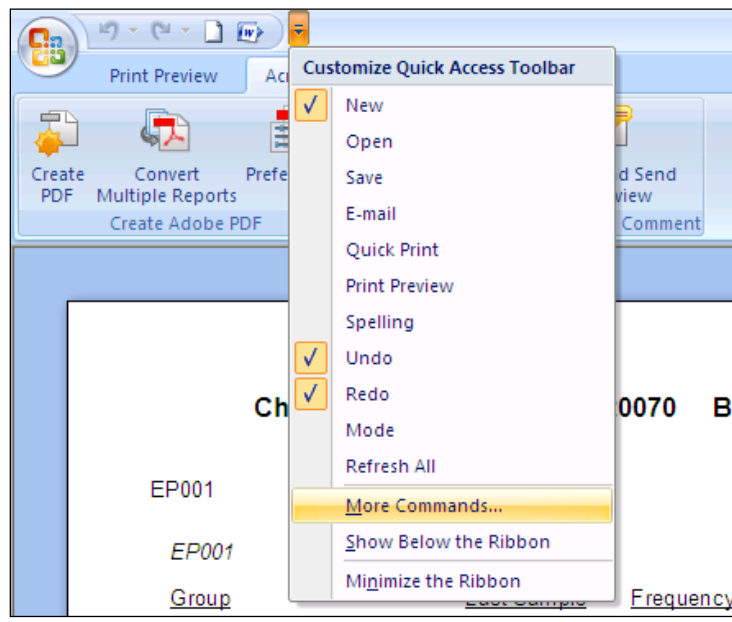
cc: VDH-ODW-Central Office
County Health Department, Attention: <<Name of Health Director>>
County Administrator

Sanitary Survey Monitoring History – R&R Report Instructions (Microsoft Access 2007)

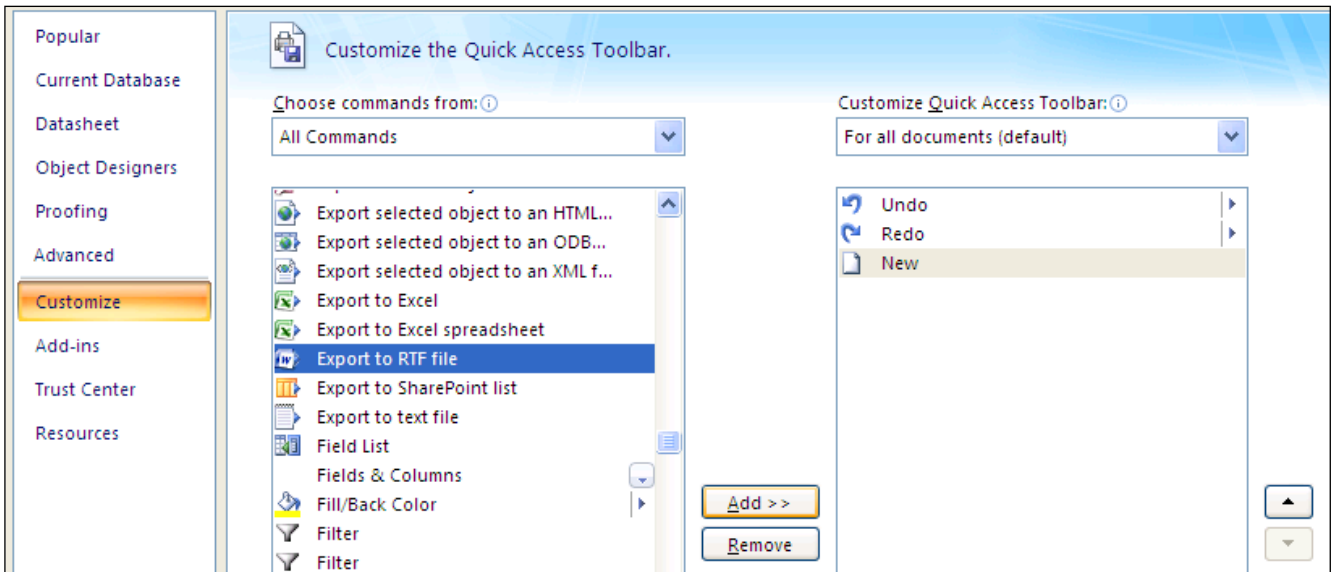
- Choose the appropriate PWSID under the *Individual Systems* tab.
- Choose Next Chemical Sample Due under the *Reports* bar, click Run.
- Chemical Schedule for corresponding PWSID will appear.



- Click the down arrow near the top left of the report (*Customize Quick Access Toolbar*) and select More Commands.



- In the *Choose commands from* dropdown tab, select All Commands.
- Click Export to RTF file, then Add, then OK.



- Click Browse to choose the file export location, name the file, check the box to open the file after the export is complete, and click OK.
- Copy and paste the report into your sanitary survey by highlighting the exported report, right click and choose Copy, then right click and choose Paste in your sanitary survey report.
- Modify font and font size as needed.

NOTICE OF VIOLATION

Date

SUBJECT: COUNTY
Water- Waterworks Name
PWSID No.

{ Waterworks Contact & Address }

Dear {Contact}:

This Notice is to advise that you appear to be in violation of the *Ground Water Rule (GWR)* adopted by the Virginia Department of Health. 12VAC5-590-421.A.1 of the *Waterworks Regulations* requires the waterworks owner to meet these Treatment Technique requirements. Because your waterworks has *{explain why waterworks was required to take corrective action}*.

{Explain what prompted this NOV – failure to take corrective action, failure to contact ODW and develop a CAP}

As the owner of the waterworks, you are required to comply with these regulations.

Required Actions

Public Notice: requires owners of waterworks to give notice of violations to its consumers and to report violations to VDH. Attached to this letter is an example notice for consumers.

The *GWR* characterize this as a Tier 2 violation event. You are required to notify consumers that the prescribed monitoring was not performed, as follows:

- Distribute a notice to consumers no later than **{Date}**.
- The notice to consumers must be mailed or directly delivered to each customer receiving a bill, and to other service connections served by your waterworks.
- If your waterworks serves consumers who do not pay water bills, or who do not have service connection addresses (apartment dwellers, university students, or nursing home patients, for example) you must also use other delivery methods to provide notice to these consumers as well. Examples of other methods include (but are not limited to) notice publication in local newspapers, delivery of multiple copies to apartment buildings, or posting the notice in public places served by the system.
- Until the violation is resolved, you must give a copy of the notice to all new billing units or new customers, before or at the time service begins.
- Repeat distribution of the notice quarterly, for as long as the violation persists.

Draft Notice: Attached is a draft notice for you to distribute to consumers. You may use this notice as is, or modify it to better meet your situation, as long as the information is accurate and the notice contains all of the

required elements and mandated language. If you decide to change the notice, we suggest that you contact this Office to verify that your proposed changes meet the requirements of the *GWR*.

Public Notice Confirmation: Within ten (10) days of completing public notification, but no later than **{Date}**, you must provide this Office with a copy of the notice you distribute, along with the signed certification of completion indicating the distribution date and methods used. Failure to distribute public notice and report to the Virginia Department of Health (VDH) may be a violation of the *GWR*. A certification form is enclosed for your use.

Follow-up Actions: *{Describe follow up actions required to bring the waterworks into compliance}*

Any violation of these federal regulations may result in an enforcement action being taken by the VDH

If you have questions, please call.

Sincerely,

District Engineer

Enclosure

cc: VDH-Central
County Health Department, Attn: , MD, Director
County Administrator

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

{Waterworks Name} Did Not Meet Treatment Technique Requirements

Our water system recently violated a drinking water standard. Although this situation does not require that you take immediate action, as our customers, you have a right to know what happened, what you should do and what we did to correct the situation.

{Description of what happened including specific actions that the waterworks failed to accomplish within the required time frame}

What should I do?

- **You do not need to boil your water or take other actions.** We do not know of any contamination, and none of our testing has shown disease-causing organisms in the drinking water.
- People with severely compromised immune systems, infants, and some elderly may be at increased risk. These people should seek advice about drinking water from their health care providers. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at 1 (800) 426-4791.

What does this mean?

The lack of chlorine residual has no health effects on its own. However, the lack of chlorine residual can allow other organisms (bacteria, viruses, and parasites) to have an impact on health. Those impacts may include symptoms such as nausea, cramps, diarrhea, and associated headaches. These symptoms are not caused only by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice.

What is being done?

{Describe the actions that the waterworks is taking to address the TT requirements}

For more information, please contact **{Waterworks Contact information}**

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by **{Waterworks name}**.

State Water System ID#:

Date distributed: _____