Hawaii State Department of Health
Safe Drinking Water Branch

The Water Spot

June 2009

Volume 13, Issue 3

Hot!

Special points of interest:

- Are you prepared for the Ground Water Rule?
- FYI - the Economic Stimulus Package.
- Don't miss the last free NRWA training sessions.
- How to perform a CT calculation.

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Are You Ready for the Ground Water Rule?

The Department of Health, Safe Drinking Water Branch (SDWB) is providing this notification of the applicability of the United States Environmental Protection Agency's (EPA) Ground Water Rule (GWR) to all regulated public water systems that utilize a ground water source. The Rule does not apply to public water systems that combine all of their ground water with surface water or with ground water under the direct influence of surface water prior to treatment under the Surface Water Treatment Rule. In addition, a determination from the EPA on the applicability of this Rule to regulated PWSs using catchment systems is pending. Roughly 130 regulated public water systems, serving over 1,300,000 persons, will be affected by this new rule. The Ground Water Rule was published in the Federal Register on November 8, 2006.

Water systems that have ground water sources may be susceptible to fecal contamination. In many cases, fecal contamination can contain disease causing pathogens. The GWR will provide increased protection against such pathogens.

The Rule's targeted, risk-based approach relies on four major components:

(1) Periodic sanitary surveys of systems that require the evaluation of eight critical elements of a public water system, and the identification of significant deficiencies (e.g., a well baseplate with unprotected openings into the well);

(2) Triggered source water monitoring for fecal contamination when:

(a) A system does not provide at least 4-log virus inactivation, removal or a State-approved combination thereof before the first customer; and

(b) The system obtains a total coliform positive result in one of its monthly bacteriological samples under the existing Total Coliform Rule;

(3) Corrective action for any system with a significant deficiency or source water fecal contamination; and

(4) Compliance monitoring to ensure that the installed treatment technology reliably achieves 99.99 percent (4-log) inactivation or removal of viruses before the first customer.

Ground water systems must comply with the requirements of the GWR beginning on December 1, 2009. The two primary compliance paths of the GWR, Compliance Monitoring and Triggered Source Water Monitoring, are summarized below.

Important DATE!

Compliance Monitoring

Affected water systems are required to notify the SDWB by September 1, 2009, if the water system provides 4-log virus removal or inactivation at or before the first customer. The 4-log virus removal or inactivation must be satisfactorily documented through description of the treatment processes, chlorine contact time (CT) calculations, and/or other information as required by the SDWB. The water system will be required to conduct compliance monitoring in accordance with SDWB -specified parameters (e.g., minimum chlorine disinfectant residual based on submitted CT calculations or State-

To Do:

See Ground Water Rule, Page 2

Ground Water Rule

Continued From Page 1

specified compliance monitoring parameters for approved alternative treatment technologies). Water systems not performing compliance monitoring will be subject to triggered source water monitoring.

Triggered Source Water Monitoring

Affected water systems that do not provide 4-log virus removal or inactivation will be subject to triggered source water monitoring beginning December 1, 2009. If the water system is notified of a total coliform positive result under routine Total Coliform Rule monitoring, the water system must take a State-specified fecal indicator sample at each groundwater source contributing to the Total Coliform positive location within 24 hours of being notified of the total coliform positive result. The SDWB strongly recommends that water systems subject to triggered source water monitoring and having more than two ground water sources, prepare a Triggered Source Water Monitoring Plan and have the plan approved by the SDWB before November 1, 2009, to identify triggered source sampling locations and sampling protocols. Ground water source sampling locations must be upstream of any treatment, including disinfection. Sampling protocols should consider shipment to and analysis by a private laboratory, as the State Laboratories Division may not be able to accommodate overtime and weekend analysis due to budgetary constraints. Wholesale and consecutive systems are also affected by this Rule.

Ground water sources that are found to be fecal indicator positive may be subject to corrective actions. Corrective actions include:

Providing an alternate source of water; eliminating the source of fecal contamination; or providing 4-log virus removal or inactivation at or before the first customer.

Alternatively, if required by the State, PWSs must be in compliance with a corrective action plan until the contamination problem is resolved, including the implementation of immediate State-approved interim measures to protect public health.

Additional components of the GWR include the reporting of uncorrected significant deficiencies and fecal indicator positive source results in a PWS' yearly consumer confidence report or CCR. For initial clarification, all uncorrected significant deficiencies identified after December 1, 2009 and remaining uncorrected as of December 31, 2009 must be reported in the system's 2009 CCR, due by July 1, 2010.

At the option of the State, assessment monitoring for fecal contamination may be required of high risk systems. The SDWB will notify high risk systems of this requirement separately, including monitoring frequency and duration.

A GWR Monitoring flowchart is included for your reference. The SDWB recommends that water systems consider and plan for their options prior to the December 1, 2009, implementation date.

"…the SDWB sponsored 51 small water system staff to attend the conference."

AWWA Hawaii Section Conference Highlights

The winning Wood Valley / Hawaiian Beaches team deliberate during the Top Ops competition.

The AWWA Hawaii Section held their 35th Annual Conference at the Sheraton Waikiki on May 13-15, 2009. The three-day event was jam-packed with competition, technical presentations, exhibits and networking opportunities.

This year, in a continuing effort to support small water systems by providing technical assistance through training opportunities and on-site assistance via the Circuit Rider Program, the SDWB sponsored 51 small water system staff to attend the conference.

In the Pipe Tapping competition, the **HBWS Women** repeated their title from last year. The **Hawaii DWS Men's** team edged out the competition and won the title.

The 25th Annual "Ono Water" Contest included small systems serving less than 1,000 people. **Kalaupapa National Historical Park** holds the new title of "Ono-est" water!

In a competition for the smartest operators, the Top Ops Contest crowned the **Wood Valley / Hawaiian Beaches** team the winners.

Congratulations to all of this year's participants and winners!

GROUNDWATER RULE MONITORING (Effective December 1, 2009)

Providing 4-log virus inactivation or removal before 1st customer?

No

TC+ sample from routine TCR monitoring

Within 24 hours of notification of TC+ sample[1], take 1 sample per groundwater source[2] in use at the time of the TC+ sample. Analyze for fecal indicator.

Fecal-indicator **positive** sample?

No → No other requirements.

Yes

Take 5 additional samples for each groundwater source that tested fecal-indicator positive.

SDWB exercises discretion to bypass.

Repeat fecal indicator sample **positive**?

No → Notify Public of Tier 1 violation under triggered source water monitoring

Yes

State will require **CORRECTIVE ACTIONS**

CORRECTIVE ACTIONS may include:

- Provide an alternate source of water (e.g. hauled water, emergency interconnection, drill a new well)
- Eliminate source of fecal contamination (e.g. shock chlorinate the well, re-case the well, seal up or re-build the spring box, remove the contaminating activity)
- Provide 4-log virus inactivation or removal before the 1st customer (Triggered Source Water Monitoring will cease & Compliance Monitoring will begin)

In addition, you must notify the public of a Tier 1 violation under triggered source water monitoring.

LEGEND:

SDWB = Safe Drinking Water Branch, Department of Health

TC+ = Total coliform positive sample

TCR = Total Coliform Rule

4-log = 99.99%

CT = the residual disinfectant concentration (C) in mg/L x the contact time (T) in minutes.

[1] Failing to complete triggered source water monitoring is a Tier 3 violation.

[2] The State may approve an alternate sampling location as follows: 1) after treatment; or 2) representative of well water quality (e.g. 1 sample for a well field).

[3] Failing to perform compliance monitoring is a Tier 3 violation.

[4] Continuous interval is considered to be every 15 minutes.

Yes

Provide at least 4-log virus inactivation or removal before the 1st customer.

4-log virus **removal** → Use of membranes or alternative technologies will require pilot testing and case-by-case State requirements for approval and compliance monitoring.

Call SDWB to discuss. 586-4258.

4-log virus **inactivation**

Calculate the CT that you are currently providing. Use EPA Tables E-7 (free chlorine) and E-13 (chloramines) along with pH, water temperature, baffling factor and the volume of the contacting vessel (tank or pipe).

Do you already provide 4-log virus inactivation?

Yes → Notify SDWB by September 1, 2009 of provision of 4-log virus inactivation or removal and, receive SDWB-approval of minimum required disinfectant concentration & sample point location (or other SDWB compliance monitoring requirements for membranes or alternative technologies)

No

Calculate the minimum required chlorine or chloramines concentration required (similar to above calculation).

You may need to modify your clearwell, disinfectant or operations to achieve the 4-log CT. Modifications may include:

- Build a new clearwell
- Build a larger tank
- Add baffling
- Increase disinfectant residual
- Move monitoring point.

→ Notify SDWB by September 1, 2009 of provision of 4-log virus inactivation or removal and, receive SDWB-approval of minimum required disinfectant concentration & sample point location (or other SDWB compliance monitoring requirements for membranes or alternative technologies)

Compliance monitoring[3]:

- Continuously[4] monitor disinfectant concentration for systems serving 3,300 or more people
- Daily monitoring of disinfectant concentration for systems serving less than 3,300, during the peak hour flow
- Other compliance monitoring requirements for membranes or alternative technologies

Notify State if minimum disinfectant concentration (or other required parameters) are not met for a period longer than 4 hours by the end of the next business day (Tier 2 violation)

Revised: April 22, 2009

The Hawaii Chapter of the American Backflow Prevention Association

Announces

Summer Cross Connection Control Seminars and Examinations

Monday - August 17th

One Day Review Seminar for Inspectors & Testers

8:00 – 8:45	RP Test Procedures
8:45 – 9:30	DC Test Procedures
10:00 – 10:45	PVB & SVB Test Procedures
10:45 – 11:30	Common Tester Errors
11:30 – 12:00	Test Equipment Review
1:00 – 1:45	ABPA Tester & Specialist Requirements
1:45 – 2:30	Hydraulic Review of Backflow
3:00 – 3:45	How to Conduct a Cross Connection Survey
3:45 – 4:30	Water Service Connection Types and Their Hazards

Cost: $20 includes lunch

Call Gary Kong at Delco Sales to sign up 842 -7900

Tuesday - August 18th

One Day Review Seminar & Test for ABPA Proctors

Proctors call Mike Fitzgerald 330-6093

Wednesday - August 19th

General Tester & ABPA Specialist Exams

Applications need to be in by July 17th !

Visit http://abpa.org/ for forms

Call Mike Fitzgerald at 330-6093 for more information.

Aloha

What's New With Water Systems

Volume 13, Issue 3

PWS 145, Pohakuloa Training Area, Reactivated

The Pohakuloa Training Area (PTA) water system, located on the lower slopes of Mauna Kea on the island of Hawaii, was inactivated in 1996 because it used only hauled water to serve consumers. The SDWB has determined that PTA shall again be classified as an active regulated public water system because its new microfiltration plant has recently been approved and will be used to treat the source spring water provided to its consumers. The effective date of system activation was April 1, 2009.

Pural Water Specialty Company, Inc., owner of the water system, successfully started up a new Zenon Homespring membrane microfiltration plant at the PTA water system.

Congratulations, Pural, on the successful completion and start up of the new water treatment plant!

Mickey Mento, Harold Hart (Team Leader), & James Fukunaga stand in front of their new microfiltration plant at Pohakuloa Training Area.

What's new with your water system? Let us know, and we'll cover the story.

PWS 117, Hawaiian Beaches, Adds New Source

The Hawaiian Beaches water system, on April 22, 2009, successfully started up a new groundwater source after years of planning and construction. Along with a new well, a new "Fusion" glass lined steel storage tank was added. The "Fusion" tank is the first of it's kind in the state.

System owners have also filed with the PUC in an effort to change to metered rates for a more equitable billing system.

With all the improvements, Hawaiian Beaches Water Company will be able to provide more dependable service and increased capacity for everyone in the Hawaiian Beaches subdivision in Pahoa on the Big Island.

Congratulations, Hawaiian Beaches for the successful completion and start up of the new source and tank!

The "Fusion" tank under construction at Hawaiian Beaches water system.

Proud owners, Kate Prescott and Mark Prescott stand in front of their new tank.

Counties Receive Economic Stimulus Package Funds

The American Recovery and Reinvestment Act of 2009 (ARRA) was signed into law on February 17, 2009 and allocates an additional $19.5 million to the Hawaii DWSRF program. The additional funds are expected to be loaned to each of the four county water systems for their eligible drinking water projects in the form of zero percent interest rate loans with total principal forgiveness. The counties agreed to take an equal share of the ARRA funds and abide by the unique conditions associated with ARRA.

Construction of drinking water projects using ARRA funds must start or be under contract by February 17, 2010. However, the four county water managers agreed to start construction of their projects by June 17, 2009, which is the date ARRA has set forth as a goal for the states to use at least 50 percent of the ARRA funds. Projects that appear to not be able to start construction or be under contract by February 17, 2010, will have their ARRA funds reallocated to other shovel-ready projects in any county.

ARRA-funded projects are required to be constructed with iron, steel, and manufactured goods produced in the United States. This provision is required to be included in the Request for Proposal or solicitation of bids. Counties may request an individual waiver for products that are unable to meet this provision. National waivers may be available for certain types of projects, classes of loan recipients, or categories of iron and steel.

At least 20 percent of the ARRA funds are required to be invested in "Green Projects", which are projects that address green infrastructure, water or energy efficiency improvements, or other environmentally innovative ideas. Some projects, such as pipeline replacements, may require a business case to justify their identification as a green project. Hawaii DWSRF will be working closely with project engineers of those types of projects to prepare a business case, when needed.

The Davis-Bacon Act, which is a federal law that requires contractors who receive federal funds to pay prevailing wages to their employees in the locality where the work is performed, applies to ARRA-funded projects. It appears that all of Hawaii's counties already incorporate the state's version of the Davis-Bacon Act into their contracts.

"The American Recovery and Reinvestment Act . . . allocates an additional $19.5 million to the Hawaii DWSRF program."

CCR Reminder on Lead Specific Information

Please remember to include the following mandatory educational language concerning lead in drinking water and its effect on children in your 2009 Consumer Confidence Report (CCR) which is due July 1.

"If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. [NAME OF UTILITY] is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead."

A system may write its own educational statement but only after consultation with the State.

The Federal Government has mandated that all CCRs must now include this lead specific health information. If you forget to include this language in your CCR, it will require re-publishing.

June 2009

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1 Start of Lead & Copper Monitoring Period	2	3	4	5	6
7	8	9	10 CT Report Due TCR Report Due	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

July 2009

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1 CCR Due O & E Plan Due	2	3	4
5	6	7	8	9	10 CT Report Due MRDL Report Due TCR Report Due Enhanced Coagulation Report Due	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28 WTPO Exam	29	30	31	

August 2009

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8
9	10 CT Report Due TCR Report Due	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25 Board of Certification Meeting	26	27	28	29
30	31					

Quarterly Schedule

- 6/1 Start of Lead & Copper Monitoring Period Systems notified in March
- 6/10 CT Report Due Surface Water Systems
- 6/10 TCR Report Due Systems who complete their own tests
- 7/1 CCR Due Community Systems
- 7/1 Operations & Emergency Plan Due Surface Water Systems
- 7/10 CT Report Due Surface Water Systems
- 7/10 MRDL Report Due Disinfection Systems
- 7/10 TCR Report Due Systems who complete their own tests
- 7/10 Enhanced Coagulation Report Due Conventional Treatment Systems
- 7/28 WTPO Exam All Islands
- 8/10 CT Report Due Surface Water Systems
- 8/10 TCR Report Due Systems who complete their own tests
- 8/25 Board of Certification Meeting SDWB Honolulu Office 10:00 am

Announcement!

DSO & WTPO Training

Sponsored by NRWA

JULY 2009

WTPO Certification Test Review
at 9:00am - 4:00pm

s	m	t	w	t	f	s
			1	2	3	4
5	6 Kauai	7	8 Oahu *	9	10 Molokai	11
12	13 Maui	14 Hilo	15	16 Kona	17	18
19	20	21	22	23	24	25
26	27	28 EXAM	29	30	31	1

AUGUST 2009

Source Water Protection at 9:00am - 12:00noon
Basic O&M at 1:00pm - 4:00pm

s	m	t	w	t	f	s
2	3 Kauai	4	5 Oahu *	6	7 Molokai	8
9	10 Maui	11 Hilo	12	13 Kona	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

SEPTEMBER 2009

Operator Math at 9:00am - 12:00noon
Pumps & Motors at 1:00pm - 4:00pm

s	m	t	w	t	f	s
		1	2	3	4	5
6	7	8	9	10	11	12
13	14 Kauai	15	16 Oahu *	17	18 Molokai	19
20	21 Maui	22 Hilo	23	24 Kona	25	26
27	28	29	30			

WTPO Certification Test Review by Randy Caskey
This will be a six hour review that covers topics related to the test required for water treatment plant operator certification.

Source Water Protection by Bill O'Connell
This course will review reasons for a program, methods of protection & setting up a program.

Basic Operations & Maintenance by Dale Pierson
This material will be aimed at O&M procedures common to treatment and distributions systems. Setting up an O&M program will also be covered.

Operator Math by Matt Holmes
This course will cover solving math problems directly related to water system operations.

Pumps & Motors by Chris Lovelace
This course will cover various types of pumps and motors and their repair and maintenance.

Contact NRWA for more information:
Paul Strope (405)412-4274
Jerry Biberstine (303)748-5992

CEUs Offered

No Registration Required

FREE

LOCATIONS

Kauai - Department of Water Board Room, 4398 Pua Loke St., Lihue, Kauai, 96766
Oahu - State Laboratories Division Auditorium, 2725 Waimano Home Rd., Pearl City, Oahu, 96782
Molokai - Department of Hawaiian Homelands, Kulana Oiwi Bldg., 600 Maunaloa Hwy, Kaunakakai, Molokai, 96748
Maui - State Building Conference Room B, 54 High St., Wailuku, Maui, 96793
Hilo - Environmental Health Services Facility Conference Room, 1582 Kamehameha Ave., Hilo, Hawaii, 96720
Kona - NELHA, 73-4460 Queen Kaahumanu Hwy., Kailua-Kona, Hawaii 96740

Operator Certification

DSO Exam Pass Rate Improves

Excellent

The April DSO exam was held at five sites on Oahu, Maui, Kauai, and the Big Island, both Kona and Hilo.

Out of the 54 operators that sat for the exam, 20 passed, raising the overall pass rate from 25% in January to 37%. The passing rates by grade are shown in the table.

The Hawaii examinees number one area in need of improvement is math. Operating equipment such as blowers, chemical feeders, motors, pumps and valves is the next overall stumbling block on the exam. The third area requiring overall improvement is installing equipment such as hydrants, meters, piping, shoring, taps, valves, and water mains.

Grade	Passed	Examinees	Passing Rate
1	10	19	53%
2	9	19	47%
3	1	9	11%
4	0	7	0%
Total	20	54	37%

Overall DSO pass rate improves to 37%.

Individualized reports on the areas needing improvement will be provided in each examinee notification letter after Board approval.

Application Deadlines to be Strictly Enforced

Important DATE!

Exam	Apps. Due	Exam Date
WTPO	4/28/09	7/28/09
DSO	7/27/09	10/27/09
WTPO	10/26/09	1/26/10
DSO	1/27/10	4/27/10

Applications submitted after due dates for specific exams will be held until the subsequent Board meeting. Applicants will have to wait up to six months for the next exam. No exceptions will be made.

Last Chance for NRWA Training in 2009

The schedule for the last set of National Rural Water Association (NRWA) training courses has been finalized, concluding the free training series sponsored by the NRWA for 2009. See the prior page for the July thru September schedule.

For those groups of operators that are unable to attend because of work scheduling, the NRWA Circuit Rider program representative, Jim Watts, may be contacted to arrange special training sessions of the same courses. Course topics and content will be identical, and CEU credit for these sessions has also been approved by the Board. Jim Watts may be contacted at 360-941-2959.

Advertisement flyers on these trainings, as well as any future trainings, will be emailed instead of snail mailed to all who have submitted current email addresses. There will be no mail-outs from now on. Submit your email addresses to Jodi Yamami.

UPDATE

Operator Certification's URL Has Changed

The URL for the Operator Certification website has been shortened to

http://hawaii.gov/drinkingwater/opcert

Don't forget to bookmark it as a favorite so you can keep checking back for the latest information.

Math Whiz

1. How many gallons per minute is 24 cubic feet per second?
2. What is the pressure at the base of a tank if the water level is 13.5 feet deep?
3. What is the volume of a 250 foot long section of a 10 inch diameter pipe?
4. What is the chlorine residual in a system that uses a chlorine dosage of 1.56 mg/L and has a chlorine demand of 0.92 mg/L?
5. How many pounds of chlorine are required to treat 33 MG if the dosage is 1.78 mg/L?

Answers: (1) 10,771 gal/min, (2) 5.84 psi, (3) 1019 gallons, (4) 0.64 mg/L, (5) 490 lbs

Contact Operator Certification

Contact: Jodi Yamami
Phone: 808-586-4263
Fax: 808-586-4351
Email: jodi.yamami@doh.hawaii.gov

http://hawaii.gov/drinkingwater/opcert

CT Calculations 101

In preparation for the upcoming Ground Water Rule monitoring soon to take effect, water systems who have decided to provide at least 4-log virus inactivation of their ground water sources prior to the first customer will be required to calculate the Chlorine Contact Time (CT) and notify SDWB by September 1, 2009 of provision of 4-log virus inactivation, and receive SDWB approval of minimum required disinfectant concentration and sample point location.

An example of one type of CT calculation follows. Each water system will have unique parameters, therefore baffling factors and CTreq values will have to be carefully selected from the tables in each situation.

If 4-log virus inactivation can not be achieved under the current mode of operation, the calculated parameters must be reworked. This means you may need to modify your clearwell, disinfectant or operations to achieve the 4-log CT. Modifications may include building a new clearwell, building a larger tank, adding baffling, increasing disinfectant residual and/or moving the monitoring point.

More detailed examples of CT calculations will be posted on the SDWB website. Also, the Engineering Section is available for your technical questions.

Ground Water Rule is fast approaching. Don't miss the September 1st deadline. Perform your CT calculations now and get SDWB approval.

CT Formulas & Factors Cheat Sheet

Table 3-2 Baffling Factors

Factor	Description
0.1	None, agitated basis, very low length to width ratio, high inlet and outlet flow velocities. Enclosed circular or rectangular tank with single inlet and outlet line. Enclosed circular or rectangular tank with inlet on top and outlet on the bottom, either directly below or on the same side as the inlet line.
0.3	Single or multiple unbaffled inlets and outlets, no intra-basin baffles. Enclosed circular or rectangular tank with inlet on top and outlet on the bottom on the opposite wall.
0.5	Baffled inlet or outlet with some intra-basin baffles.
0.7	Perforated inlet baffle, serpentine or perforated intra-basin baffles, outlet weir or perforated launders.
1	Very high length to width ratio (pipeline flow), perforated inlet, outlet, and intra-basin baffles.

Table B-2 CTreq values for 4-log virus inactivation of viruses by free chlorine in mg/L•min

Temperature (°C)	pH	
	6-9	10
0.5	12	90
5	8	60
10	6	45
15	4	30
20	3	22
25	2	15

$$Total\ detention\ time = \frac{Lowest\ operating\ volume}{Peak\ flow}$$

NOTE: The operating volume should be taken during peak hour demand but the lowest operating volume may be substituted with SDWB approval.

$$Contact\ time = Total\ detention\ time \times Baffling\ factor$$

$$CT\ calc = Residual\ chlorine\ concentration \times Contact\ time$$

$$Inactivation\ Ratio = \frac{CT\ calc}{CT\ req}$$

$$4\log virus\ inactivation\ check: \quad Inactivation\ ratio \times 4\ \geq 4 \rightarrow OK!$$

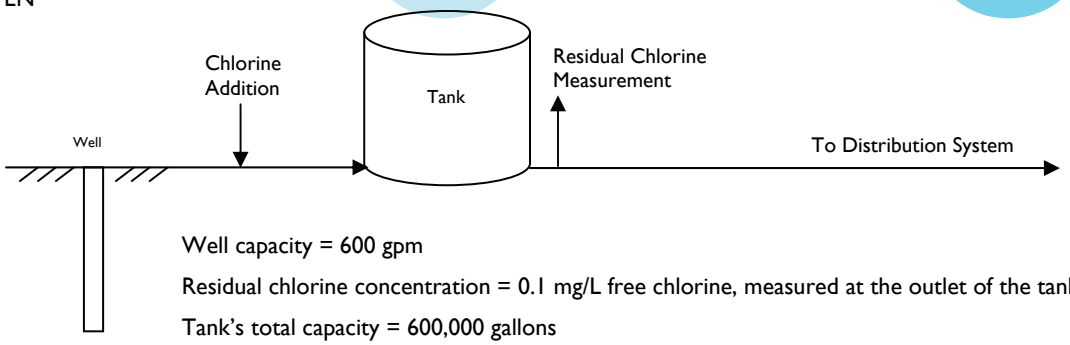
$$4log\ virus\ inactivation\ check: \quad Inactivation\ ratio \times 4\ < 4 \rightarrow Rework\ Calculated\ Parameters$$

CT Calculation Example

QUESTION

Is the water system providing 4-log virus inactivation using 12.5% sodium hypochlorite?

GIVEN



Well capacity = 600 gpm

Residual chlorine concentration = 0.1 mg/L free chlorine, measured at the outlet of the tank

Tank's total capacity = 600,000 gallons

Tank's lowest operating volume = 200,000 gallons

Peak hour flow = 1,200 gpm

Tank has no baffles with a separate inlet and outlet with high inlet and outlet flow velocities.

pH = 6.8

Temperature = 25°C

NOT RELEVANT

The well capacity has no bearing on the peak flow of the water system.

Using the tank's total capacity will increase results and not cover the most conservative situation when the tank is at its lowest operating volume.

SOLUTION

From Table 3-2, Baffling factor = 0.1

From Table B-2, CTreq = 2 mg/L•min

Peak flow = 1,200 gpm

$$Total\ detention\ time = \frac{Lowest\ operating\ volume}{Peak\ flow} = \frac{200{,}000\ gal}{1{,}200\ \frac{gal}{min}} = 166.67\ min$$

$$Contact\ time = Total\ detention\ time \times Baffling\ factor = 166.67\ min \times\ 0.1 = 16.67\ min$$

$$CT\ calc = Residual\ chlorine\ concentration \times Contact\ time = 0.1\ \frac{mg}{L} \times 16.67\ min = 1.67\ \frac{mg}{L} \cdot min$$

$$Inactivation\ ratio = \frac{CT\ calc}{CT\ req} = \frac{1.67\ \frac{mg}{L} \cdot min}{2\ \frac{mg}{L} \cdot min} = 0.84$$

$$Inactivation\ ratio = 0.8$$

NOTE: Round to 1 decimal place.

$$4log\ virus\ inactivation\ check: \quad Inactivation\ ratio \times 4 = 0.8 \times 4 = 3.2$$

$$4log\ virus\ inactivation\ check: \quad 3.2 < 4 \rightarrow Rework\ Calculated\ Parameters$$

Answer: NO, 4-log virus inactivation is not being provided. Rework calculated parameters.

"Don't miss the September 1st deadline. Perform your CT calculations now and get SDWB approval."

Hawaii State Department of Health Safe Drinking Water Branch

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Room 308
Honolulu, HI
96814-4920

Phone: 808-586-4258
Fax: 808-586-4351
E-mail: SDWB@doh.hawaii.gov

The mission of the Safe Drinking Water Branch of the Department of Health is to safeguard public health by protecting Hawaii's drinking water sources (surface water and groundwater) from contamination and assure that owners and operators of public water systems provide safe drinking water to the community. This mission is accomplished through the administration of the Safe Drinking Water Program, Underground Injection Control Program (UIC), Groundwater Protection Program (GWPP), and the Drinking Water State Revolving Fund (DWSRF).

We're on the Web!
http://hawaii.gov/health/environmental/water/sdwb/index.html

We provide access to our activities without regard to race, color, national origin (including language), age, sex, religion, or disability. Write or call our Affirmative Action Officer at Box 3378, Honolulu, HI 96801-3378 or at 808-586-4616 (voice) within 180 days of a problem.

LINDA LINGLE
Governor of Hawaii

CHIYOME LEINAALA FUKINO, M.D.
Director of Health

LAURENCE K. LAU
Deputy Director for Environmental Health

F.Y.I.

SDWB Up Close - Engineering Section

Who's who in the SDWB Engineering Section?

Mike Miyahira

As the leader of the group, **Mike Miyahira** is in charge of riding herd on the rest of the Engineering Section. He works with all consultants and water system staff. With a shortage of engineers, the Ground Water Rule also falls under Mike's purview.

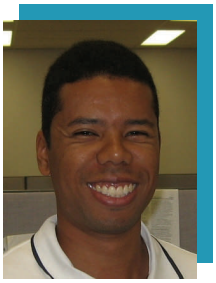
Craig Watanabe

Craig Watanabe is primarily responsible for implementing the rules relating to surface water systems: SWTR and LT1/LT2 ESWTR. He also leads the efforts of the Stage 1 & 2 Disinfection By-Products Rule.

The Lead and Copper Rule is implemented by **Jennifer Nikaido**. She also leads the efforts of the Capacity Development Strategic Plan which involves improving the technical, managerial, and financial capacity of new and existing regulated public water systems.

Jennifer Nikaido

Alain Carey's primary function is to administer the DWSRF program which provides funds for public water system improvements.


Alain Carey

Together, they all share in the responsibilities of reviewing new and modified system approvals and new source approvals, along with conducting sanitary surveys and answering public inquiries.

The Engineering Section is a busy bunch but will always have time to talk with you when you need technical assistance.