

Recreational Water

# ***Laboratory Testing***

**First District**



**Health Unit**

[www.fdh.u.org](http://www.fdh.u.org)

*Jayne Calavera, REHS  
Environmental Health Division*

*Bacteria and other microorganisms are consistently being introduced into pool water by bathers*



***Chlorine is added to pool water as a disinfectant.***

# *Disinfection*

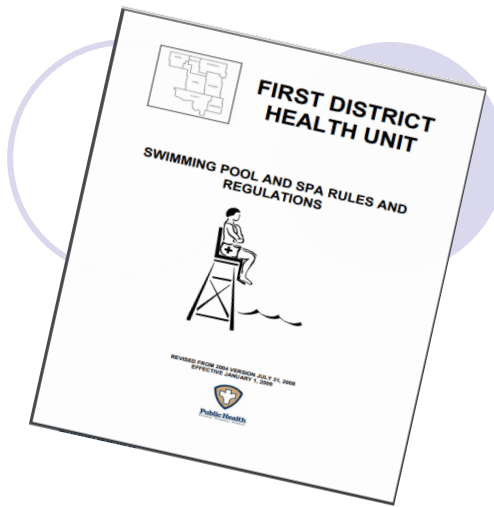
- *The process of destroying microorganisms that might cause disease.*
- Reduce or eliminate the chances of getting sick from aquatic venue water.
- In a perfect world, this would be 100% effective.



# Disinfection doesn't always work!

- Disinfection can be more or less effective due to many factors:
  - Type of aquatic venue
  - Bathing load
  - Temperature
  - Source water chemistry
  - Water balance
- Microbiological testing is used to confirm disinfection is effective.

# According to FDHU Pool and Spa Regulations...



- 1-2. Rule and Regulation No. 12 Section 2 of the FDHU requires that, during its months of operation, each public and semi-public aquatic facility shall submit a water sample taken from each aquatic venue to a laboratory certified by the North Dakota State Department of Health for bacteriological analysis.
  - A. If a certified lab other than the FDHU lab in Minot is used, a copy of the results shall be submitted to the Department.
  - B. A minimum of one sample per month shall be submitted for each pool and/or spa located at a facility. **Samples shall be submitted before the 15th day of the month each month.**
  - C. Samples shall be submitted each month that the aquatic venue is open for use by the public.

# FDHU CODE REQUIREMENTS

- Only test at labs certified by the state.
- If you use a lab other than the FDHU lab, must be approved by your inspector.
  - That lab must submit the results directly to FDHU.
  - FDHU must have results by the 17<sup>th</sup> of the month.
- Test must be for both coliforms/E. coli and a heterotrophic plate count.
- All water chemistry parameters must be within code parameters prior to collecting the water sample.
- Samples must be collected from the part of the aquatic venue where patrons are exposed to the water.
- Samples must be submitted to the lab before 4:00 pm on the 15<sup>th</sup> day of each month.
- Aquatic venues that have not submitted a sample by the required time shall be taken out of service and may not be placed back in service until they have a passing sample and have received approval from FDHU.



# More Code Requirements

- **Must have a passing test:**
  - For each month or fraction thereof the aquatic venue is in service.
  - Prior to being put into service at the beginning of the season (for seasonal aquatic venues).
  - At least 12 times each year (for non-seasonal aquatic venues).
  - Prior to being put back into service if the circulation system is off for 24 hours or more.
  - Prior to use if any part of the circulation system is replaced.
  - If an aquatic venue is not in service for 30 days or longer.

# The Calendar...

January						
S	M	T	W	R	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

February						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29		

March						
S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

April						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

May						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

June						
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

July						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

August						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

September						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

October						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

November						
S	M	T	W	T	F	S
				1	2	
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

December						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				


## FDHU 2024 Water Lab Schedule

<b>January</b>
01: New Year Holiday
15: Martin Luther King Day
<b>February</b>
19: Presidents' Day
<b>March</b>
27-29: Good Friday
<b>April</b>
<b>May</b>
27: Memorial Day
<b>June</b>
<b>July</b>
01-05: Independence Day
<b>August</b>
<b>September</b>
02: Labor Day
<b>October</b>
14-18: Staff Development
<b>November</b>
11: Veterans Day
25-29: Thanksgiving Holiday
<b>December</b>
23-27: Christmas Holiday
30-31: New Years Holiday
<b>RTCR coliform and E coli sample Receipt Schedule</b>
☐ Laboratory does not receive specimens. Contact lab at 837-5119 for submission options. Additional charges will apply.
☐ Laboratory open to receive samples.
☐ Laboratory closed



# The Paperwork...

- Fill out as completely as possible and return with each sample.
- Don't write on any part of the test kit other than the form.



**First District  
Health Unit**

**First District Health Unit**  
Environmental Laboratory  
801 11th Ave SW, Minot ND 58701  
Main Phone: 852-1370; OR  
Lab Direct: (701) 837-5119  
[www.fdh.u.org](http://www.fdh.u.org)  
**IGNORE LINE ON BOTTLE, FILL BOTTLE TO TOP**

**Water Testing  
Sample Submission**  
Received \_\_\_\_\_

Name/Company: \_\_\_\_\_ Phone: (\_\_\_\_) \_\_\_\_\_

Contact: \_\_\_\_\_ Email: \_\_\_\_\_

Mailing: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Send Results and Invoices By (Choose only one):  Mail (paper copies)  Email (electronic copies)

---

Date Collected:\* \_\_\_\_\_ Time Collected:\* \_\_\_\_\_ Collector: \_\_\_\_\_

Collection Point: \_\_\_\_\_  
\*Samples must arrive to lab within 30 hours of filling the bottle. If sample is over 24 hours old, notify lab personnel.

**Reason for Sample (Check One Box):**  
 Routine  Construction  Repeat (Original Location)  Repeat Upstream  Repeat Downstream  
 Special Purpose:  Repeat After Failed Test  Agency Req'd \_\_\_\_\_  Other \_\_\_\_\_

**Source**

Indicate the water source by checking the appropriate box on the left and filling in the corresponding information.

Public Water System # \_\_\_\_\_ RTCR \_\_\_\_\_

Private Supply (Circle One):  
Well Cistern Spring Other \_\_\_\_\_

Recreational Water (Circle One):  
Pool Spa Wading Other \_\_\_\_\_

Wastewater  
ID#/Site: \_\_\_\_\_

Other (explain): \_\_\_\_\_

On-Site Measurements

Free Chlorine	mg/L	Total Chlorine	mg/L
pH		Other	

Water Treatment (Private Supplies Only) (Check All That Apply):

Filter	Softener	RO	Other
--------	----------	----	-------

**Analysis Requested (Check box of desired analysis)** **2024**

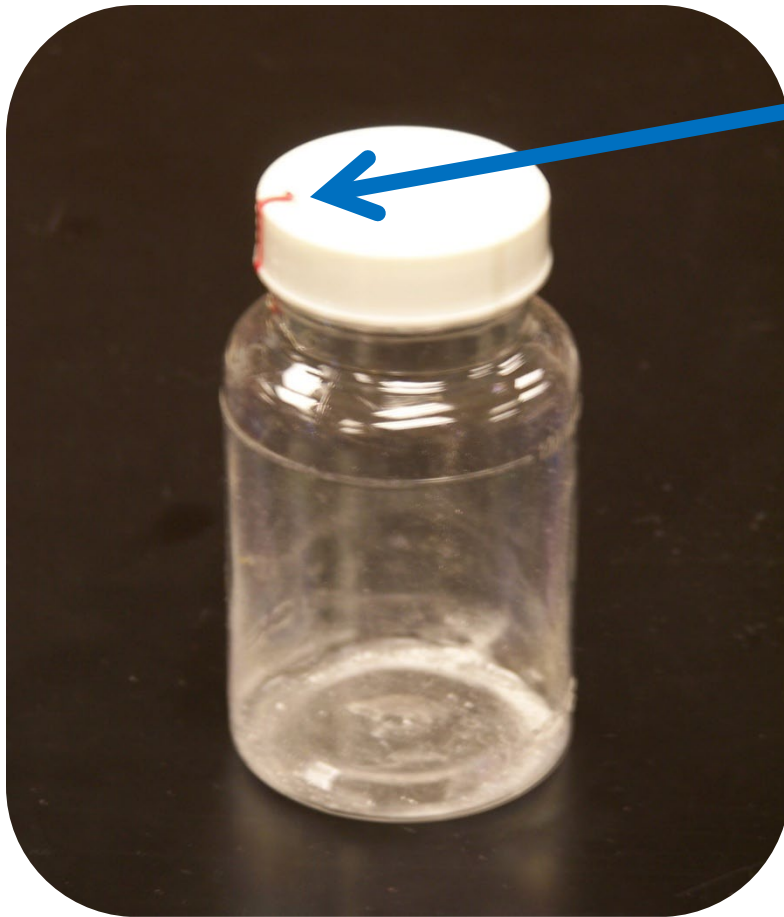
<input type="checkbox"/> Bacteriological Presence/Absence (standard test for drinking water - bottle provided)	\$ 30.00
<input type="checkbox"/> Bacteriological Quantification	\$ 45.00
<input type="checkbox"/> Recreational Water (pool, spa, splash pad)	\$ 35.00
<input type="checkbox"/> 18 Hour Bacterial Presence/Absence	\$ 45.00
Chemistry Analysis: (NOTE: BOTTLE NOT PROVIDED; 1 QUART MINIMUM REQUIRED)	
<input type="checkbox"/> Routine (pH, conductivity, total dissolved solids, total hardness, iron, manganese, nitrate, sodium, sulfate, chloride)	\$ 85.00
<input type="checkbox"/> Agricultural Water (pH, conductivity, total dissolved solids, hardness, calcium/magnesium, iron, sodium, chloride, nitrate)	\$ 60.00
<input type="checkbox"/> Livestock Water (pH, conductivity, total dissolved solids, sulfate, nitrate)	\$ 30.00
Optional: <input type="checkbox"/> Calcium/Magnesium <input type="checkbox"/> Chloride <input type="checkbox"/> Chlorine <input type="checkbox"/> Fluoride <input type="checkbox"/> Potassium	\$ 15.00 EACH

~ Notice ~  
 ~ Testing days for bacteriological samples are Monday, Tuesday and Wednesday by 4:00 p.m.  
 ~ Non-testing day fee is double standard fee. Non-testing day samples must have prior approval-call 837-5119

For Laboratory Use Only    Sample # \_\_\_\_\_    Total: \_\_\_\_\_    Received by: \_\_\_\_\_  
 Cash     Check# \_\_\_\_\_     CC \_\_\_\_\_

HWS-23

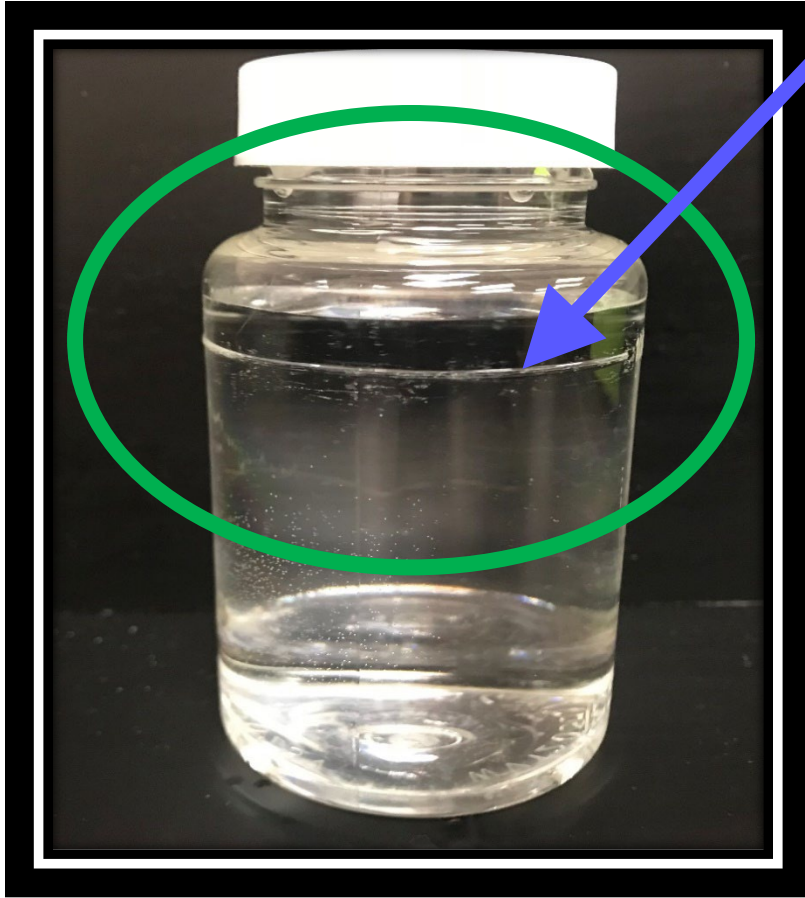
# ***The bottle...***



- Keep the bottle sealed until sample collection.
- **Remove seal** and cap. DO NOT TOUCH THE INSIDE OF CAP OR BOTTLE.
- Collect sample where water is 3-4 feet deep.
- Dip bottle 18 inches below the surface.
- Fill bottle to shoulder
- Replace cap

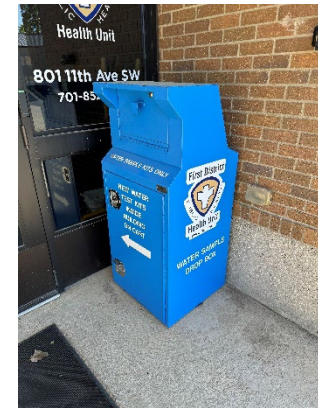
***Notice the line...***

***IGNORE IT!***



# ***FDHU Water Lab***

- FDHU – Door B – Big, blue water sample drop box.
- Pick up empty bottle(s) for the following month from the cart in the lobby.
- Testing days are **Mondays, Tuesdays, and Wednesdays by 4:00 pm.**
- Samples must arrive at lab within **30 hours** of collection.
- Older samples will not be analyzed.



# POOL SAMPLES ARE TESTED TWO WAYS

- Samples are tested for coliform bacteria and E. coli.
  - Colisure
  - Results in 48 hours
  - Any living coliforms/E. coli results in a failed test
- Samples are tested for heterotrophic bacteria.
  - Heterotrophic plate count
  - Results in 48 hours
  - Must have fewer than 200 living bacteria for a passing test

# The Results...



## First District Health Unit

Environmental Laboratory  
 P.O. Box 1268 801 11th Ave SW  
 Minot ND 58702  
 Phone: (701) 852-1376  
 Fax: (701) 852-5043  
 www.fdh.u.org

## Water Analysis

TESTING  
 123 TEST ST  
 MINOT ND 58701

PWS Name:  
 PWS #:

**Test #:** 181433      TESTING  
**Sample Date/Time:** 05/01/2018 9:00 AM      **Testing Date/Time:** 05/01/2018 11:00 AM  
**Collection Point:**      **Analysis Date/Time:** 05/03/2018 9:00 AM  
**Site:**  
**Source:** Swimming Pool Public      **Analyst:** LW  
**Sampling Reason:** Routine  
**Test Type:** Colisure P/A + HPC

**Results:**  
 Coliforms per 100 mL: Absent - Satisfactory  
 E. Coli Coliforms per 100 mL: Absent - Satisfactory  
 HPC (cfu/mL): <2 - Satisfactory

**Remarks:**

**Test #:** 181434      TESTING  
**Sample Date/Time:** 05/01/2018 9:00 AM      **Testing Date/Time:** 05/01/2018 11:00 AM  
**Collection Point:**      **Analysis Date/Time:** 05/03/2018 9:00 AM  
**Site:**  
**Source:** Spa Public      **Analyst:** LW  
**Sampling Reason:** Routine  
**Test Type:** Colisure P/A + HPC

**Results:**  
 Coliforms per 100 mL: Absent - Satisfactory  
 E. Coli Coliforms per 100 mL: Absent - Satisfactory  
 HPC (cfu/mL): 275 - **Unsatisfactory**

**Remarks:**

**Test #:** 181435      TESTING  
**Sample Date/Time:** 05/01/2018 9:00 AM      **Testing Date/Time:** 05/01/2018 11:00 AM  
**Collection Point:**      **Analysis Date/Time:** 05/03/2018 9:00 AM  
**Site:**  
**Source:** Wading Pool Public      **Analyst:** LW  
**Sampling Reason:** Routine  
**Test Type:** Colisure P/A + HPC

**Results:**  
 Coliforms per 100 mL: Present - **Unsatisfactory**  
 E. Coli Coliforms per 100 mL: Absent - Satisfactory  
 HPC (cfu/mL): 311 - **Unsatisfactory**

**Remarks:**

**Test #:** 181436      TESTING  
**Sample Date/Time:** 05/01/2018 9:00 AM      **Testing Date/Time:** 05/01/2018 11:00 AM  
**Collection Point:**      **Analysis Date/Time:** 05/03/2018 9:00 AM  
**Site:**  
**Source:** Swimming Pool Public      **Analyst:** LW  
**Sampling Reason:** Routine  
**Test Type:** Colisure P/A + HPC

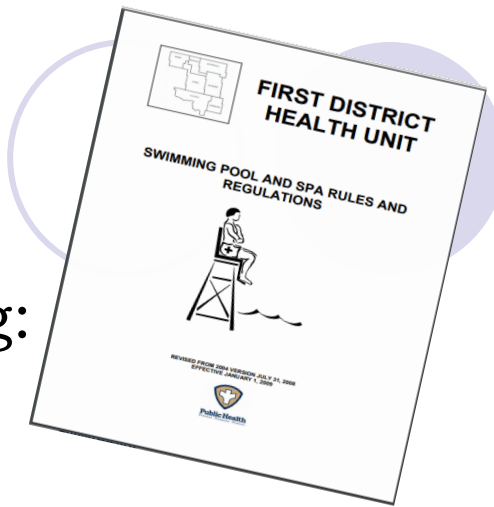
**Results:**  
 Coliforms per 100 mL: Present - **Unsatisfactory**  
 E. Coli Coliforms per 100 mL: Present - **Unsatisfactory**  
 HPC (cfu/mL): >738 - **Unsatisfactory**

**Remarks:**



# ***Failing sample...***

- Failing sample = any of the following:
  - HPC >200.
  - Coliform positive.
  - E.coli positive.
- Aquatic venues regulated by FDHU:
  - Take aquatic venue out of service.
  - Superchlorinate to at least 10ppm free chlorine above the normal operating level of free chlorine.
  - Maintain that chlorine level for 4 times the maximum allowed turnover time or 12 hours, whichever is longer.
  - Bring all water chemistry parameters to the levels specified in the code for normal operation.
  - Collect and submit a new sample (on a lab day).
  - If the new sample passes, verify with inspector that aquatic venue is cleared to be put back into service.



# Remember...

*Microbiological testing of aquatic venue water is a tool for verifying that your disinfection process is working.*

If you have questions regarding aquatic venue water testing, contact:

Jayme Calavera/FDHU Water Lab  
837-5119 or 721-0547

