Water Sampling and the FDA Produce Safety Rule as of January 2020

They way it stands right now, how to do it right, and some of the why

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Produce Safety ALLIANCE

Recent FDA Announcements – Agricultural Water

SUPPLEMENTAL MATERIAL

Version: 12-7-17

FDA Proposed Rule: Water Compliance Dates

Business Size	Compliance Dates For Most Produce	Proposed Water Related Compliance Dates
All other businesses (>$500K)	1/26/18	1/26/22
Small businesses (>$250K-500K)	1/28/19	1/26/23
Very small businesses (>$25K-250K)	1/27/20	1/26/24

- According to the Proposed Rule issued Sept. 2017, compliance dates for all agricultural water requirements allow for an additional four years.
- For example, 'all other businesses' would have until 2022 to ***begin*** taking their water samples.

Revised 10/28/17

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FDA Water Compliance Date Extension

In September 2017, FDA published a Proposed Rule called *Standards for the Growing, Harvesting, Packing, and Holding of Produce for Human Consumption; Extension of Compliance Dates for Subpart E.*

- If implemented, extends ALL provisions of Subpart E (Agricultural water) including the safe and sanitary quality requirement, the annual inspection requirement, and the postharvest water monitoring requirements
- The reason given for this extension is "*to address questions about the practical implementation of compliance with certain provisions and to consider how we might further reduce the regulatory burden or increase flexibility while continuing to achieve our regulatory objectives, in keeping with the Administration's policies.*"
- Until more is known, the following water requirements outlined in this module are the Rule.

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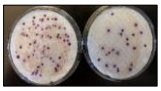
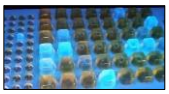
FDA Water Compliance Date Extension: What Growers Should Do in the Meantime

- Continue water testing
  - To better understand water quality
  - To meet buyer and audit requirements
- Develop water management strategies to identify and reduce risks such as conducting surveys of water sources
- If growers have never tested their water, they should start testing or at least consider the benefits
  - Test for quantified generic *E. coli*
  - Test before using the water
  - Test during frequent use periods





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When will water sampling be enforced?

FDA STATEMENT

Statement from FDA Commissioner Scott Gottlieb, M.D., and Deputy Commissioner Frank Yiannas on advancing new tools and science for implementing agricultural water requirements for produce safety

As FDA finalizes previously proposed extensions to compliance dates for agricultural water requirements, the agency is providing an update on how it is using the additional time to ensure the feasibility of federal requirements and incorporate lessons lea

For Immediate Release:

March 15, 2019

Statement From:

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PSR Definitions

- Agricultural Water
  - Any water that is likely to come in contact with covered produce during growing activities.
  - Common examples
    - Irrigation water
    - Pesticide or fertilizer application
- Post Harvest Water
  - Any water that is likely to come in contact with covered produce or after harvest.
  - Common examples
    - Washing
    - Cooling (Ice)

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Helpful Definitions

- **Agricultural water** must be safe and of adequate sanitary quality for its intended use.
  - **Agricultural water** means water used in covered activities on covered produce where water is intended to, or is likely to, contact covered produce or food contact surfaces.
  - **Covered produce** means produce that is subject to the requirements of the Produce Safety Rule. The term "covered produce" refers to the harvestable or harvested part of the crop.

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Agricultural Water Example

Water Source	Crop	Application Purpose	Application Method	Is this Agricultural Water?
Pond	Squash	Irrigation	Overhead	Yes, if summer squash (no for winter squash since it is not covered produce)

Step 1: Is this crop covered produce?

Answer: For Summer Squash, yes and for Winter Squash, no

Step 2: Is a direct application method used?

Answer: Yes, because the water is intended to, or likely to, contact covered produce

Step 3: Is this Agricultural Water?

Answer: Yes, for summer squash
No, for winter squash

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Is this Agricultural Water?

Lettuce

Overhead irrigation

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Is this Agricultural Water?

Citrus

Drip irrigation

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Is this Agricultural Water?

Apples

Pesticide application

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Is this Agricultural Water?

Strawberries

Trickle

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Is this Agricultural Water?

Potatoes

Overhead Irrigation

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Is this Agricultural Water?

Carrots

Drip irrigation

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If you do not have "Agricultural Water" on your farm you don't need to do testing.

Getting Sampling Right

- Be prepared before you go to take the sample
  - Correct supplies and know before you go
- Proper sampling technique (no contamination)
  - Get the sample the right way
  - Don't get it dirty!
  - labeling
- Proper transfer to the lab
  - Timing is paramount
- What to do after getting results
  - What if the numbers come back bad?

- https://www.sampling.com/TeleScoop.html

Before you go, Be prepared

- Items you'll need
  - Sterile Gloves
  - Note Pad and Pen
  - Tape and marker
  - Sample bottles
  - Sample collection stick (or other useful device)
  - Cooler and Ice
- Know where to go
  - Know your water system and where to properly take samples
- Know what to do
  - Be ready to take a sample the right way
- Call your lab ahead of time
  - Do they do the correct test?

What to do when you get there

- Setup and Assess
  - Get all your sampling materials all setup on the truck tailgate, or trunk of your car.
  - Make sure you can get to the sample site
  - Fill out your lables
- Get ready to take the sample
  - Assemble your sample apparatus (sampling pole)
  - Get your sample bottle ready, Do Not Open Yet!
  - Put on your single use sample gloves

Take the sample

- Go to the sample site
- Open the sample bottle
- Properly fill the sample bottle
  - The technique is different depending on the source/site

Different types of sample collection

- Canal, ditch, river, Open water source
- Well Head
- Drip Irrigation

Canal, Ditch, River, Open Water Source

- Open you sample bottle
- Dunk the sample bottle upside down into the center of the water source, or into the moving current if you can't reach the center.
- Go halfway down into the current
- Turn the bottle up under the water towards the current
- Raise the bottle out of the water
- Check to ensure you have a large enough sample
- Immediately close the lid and seal the sample
- Put the sample on Ice

Well Head

- Go to the small valve at the well head
- Open the valve and let the water flow for several seconds
- Catch the water in the open sample bottle from the flowing stream of water
- Check to be sure that the sample size is large enough
- Immediately close and seal the sample
- Put the sample on Ice

Drip Irrigation

- This sample should be taken at the main line, or at a sand filter, or other location at the main distribution point of the field, **not** at the end of the line
  - A sample at the end of the line is not representative of the entire field.
- Similar to the well head, open a valve and allow the water to flow for several seconds
- Catch water in the open sample bottle from the flowing stream of water
- Check the sample to ensure a full 100 ml has been captured
- Immediately close and seal the sample bottle
- Put the sample on ice

Get it right the first time or you'll do it again!

- Get setup at the sampling site and make sure you're ready
- Common mistakes to avoid
  - Not getting enough water
  - Not labeling your sample
  - Not putting it on ice
  - Getting it to the lab too slow
  - Accidentally cross contaminating your sample
    - Not putting on gloves
    - Opening the bottle too soon
    - Touching the inside of the sample bottle
    - Sneezing in the bottle

Get it to the lab Pronto!

- Make sure you have already talked to the lab
- Samples must be processed within 6 hours of being taken
  - Don't show up with your sample at 5:00 pm it probably won't get done in time.
- If it doesn't get to the lab on time your results will be inaccurate
- If the temperature of the sample during transport is too warm your results will be inaccurate

Resources

- https://ucfoodsafety.ucdavis.edu/pre-post-harvest/produce-preharvest/agricultural-water
- https://www.nemi.gov/methods/method_summary/5583/
  - How long to hold before analyzing

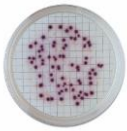
Acceptable Lab Methods

- Not all labs do the correct testing methods
- When the rule first came out there was only 1 acceptable method
  - It was obsolete and nobody in Utah could do it.

FDA Fact Sheet: Equivalent Water Testing Methodologies

Equivalent methods to EPA Method 1603 (membrane filtration with modified mTEC), include:

- Membrane filtration methods (colony forming units, or CFU)
  - mTEC agar (EPA 2010, APHA 2012, ASTM 2000)
  - mColiBlue ampules (Hach method 10029)
  - mEndo followed by NA-MUG agar (APHA 1997)
  - MI agar (EPA 2012)



- Most Probable Number (MPN) methods
  - Colilert (using Quantitray 2000 tray)
  - Colilert 18 (using Quantitray 2000 tray)

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Lab

- There are 9 acceptable methods, these 3 are the ones most labs will do
  - 7. Hach Method 10029 for Coliforms – Total and *E. coli*, using m-ColiBlue24 Broth PourRite Ampules.
  - 8. IDEXX Colilert Test Kit, but **only** if using IDEXX Quanti-Tray/2000 for quantification.
  - 9. IDEXX Colilert-18 Test Kit, but **only** if using IDEXX Quanti-Tray/2000 for quantification.
- #8 is the most common one that is performed in labs in Utah

List of labs in Utah that do these tests

- We are currently building the list
- Most waste water treatment facilities can do this test
- All municipal water sources either do this test, or ship it near by to be done
- Farms are allowed to buy the equipment and do this test themselves (cost about 5000 dollars)

What do you do with your results?

- Know what the numbers mean for you and what you'll need to do
  - Is the water good, or bad?
  - If it is bad how bad is it
- Build your Microbial Water Quality Profile
- Do you need to follow any corrective actions?

Test Result Numbers

- They come in CFU/100ml
- Test results are specific to certain types of bacteria
- Regulation thresholds
  - 126 CFU/100ml For irrigation water (Agricultural Water)
  - 0 CFU/100ml for wash water (Post Harvest Water)

Microbial Water Quality Profile

- Gives farms numerical values to determine the quality of their water over time.
- Takes 1 year to create for well water
- Takes 4 years to create for surface water
- Complicated math, there are resources to help with this

Corrective Actions

112.45

"(a) If you have determined or have reason to believe that your agricultural water is not safe or of adequate sanitary quality for its intended use as required under § 112.41 and/or if your agricultural water does not meet the microbial quality criterion forthe specified purposes as required under §112.44(a), you must immediately discontinue that use(s), and before you may use the water source and/or distribution system again for the intended use(s)"

Corrective Actions

- It Continues and gives several options of how to move forward
  - Read section 112.45
- The easiest option is water withdrawal.

- acceptable standard of 0.5 Log die off per day. Number of days from last watering to harvest

0 Days	1 Day	2 Days	3 Days	4 Days
0-126	127-393	394-1,228	1,229-3,837	3,838-11,990

Sampling (bottle goes in opening down, then is turned over under water, and then brought up)

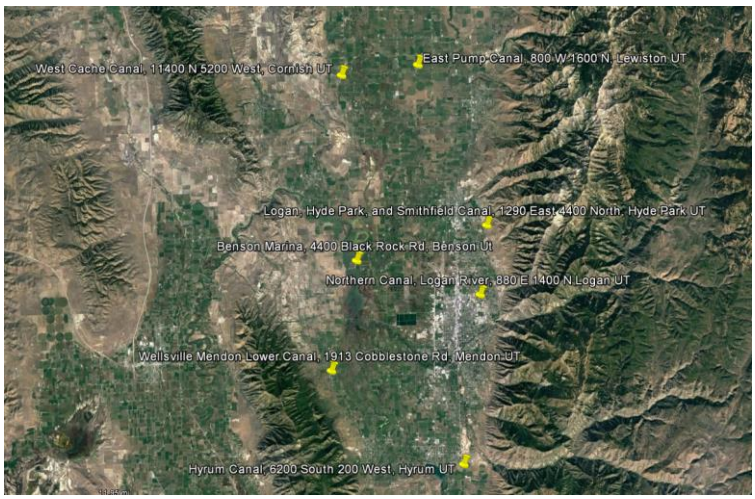


Taun would not wade the canal for front view pictures

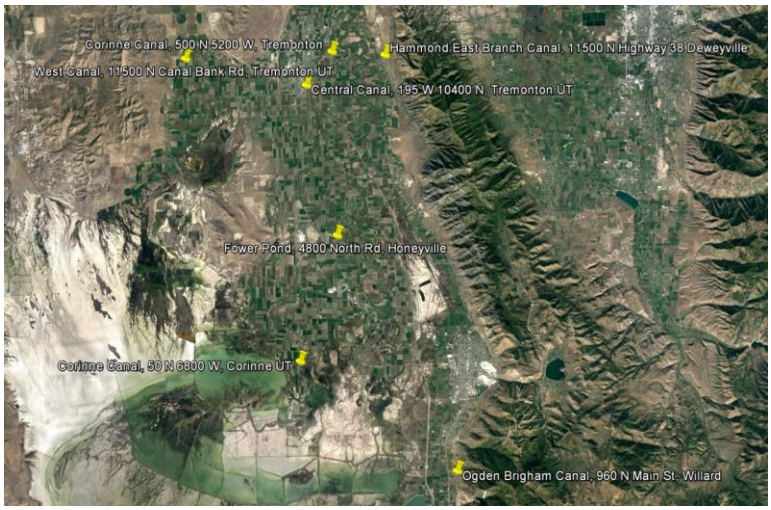
Procedures

- After obtaining the sample keep sample cool until it can be processed. Cooler with ice packs then refrigerate (below 8° C).
- Process same day, 8 hour time frame from sampling.
- We processed almost 300 samples using various methods.
- Generally in the food industry – The standard is no E. coli which is much easier to determine than to count E. coli.

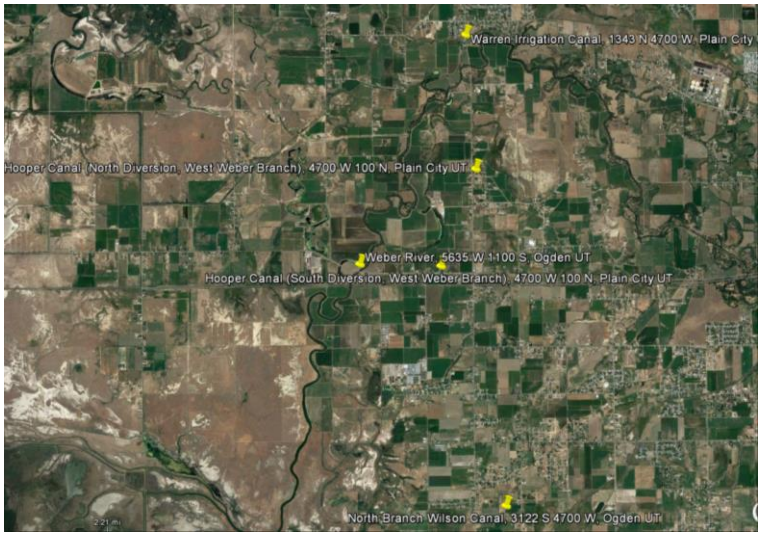
Cache County Sites



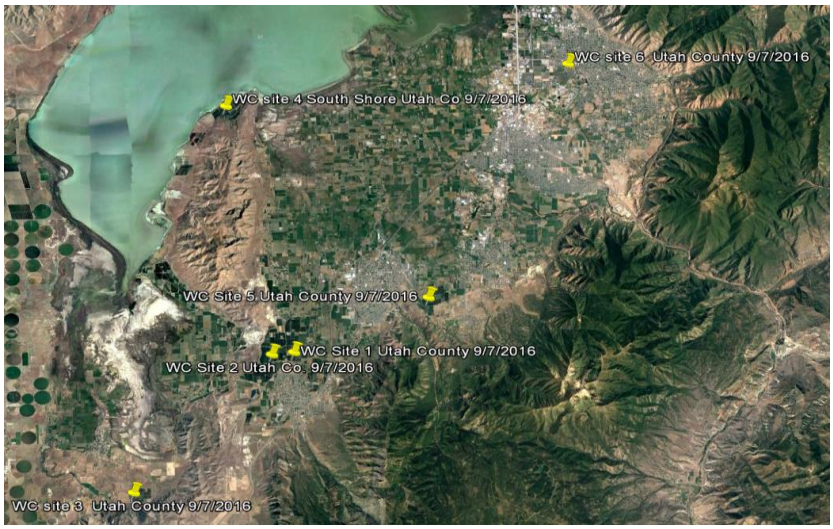
Box Elder County Sites



Weber County



Utah County Sites



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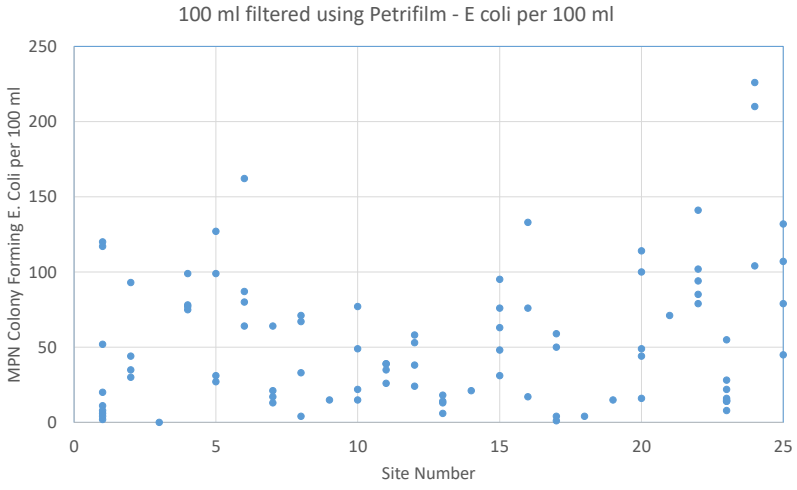
Summary of Results (Petri)



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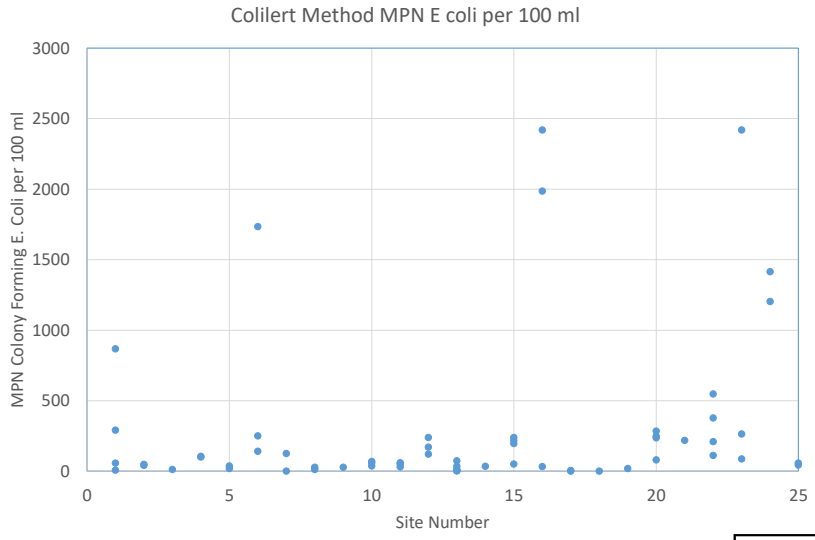
Summary of results (Colilert Method)



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Petri. filtered 100 ml

E. Coli colonies per 100 ml (Counted on petri from 100 ml of water filtered through disk filter)

Site	No. Samples	Average	Geo mean
Cherry Hill Farm Pond, 16920 S 9700 W, Goshen UT	1	0.0	0.0
USU Student Organic Farm	1	0.0	0.0
South Shore Pond, Lincoln Beach Dr, Spanish Fork UT	1	4.0	4.0
Ogden Brigham Canal, 960 N Main St, Williard Ut	4	28.5	10.4
Logan, Hyde Park, and Smithfield Canal, 1290 East 4400 North, Hyde Park UT (Naomi Peak Vineyards)	4	12.8	11.8
Highline Canal, 2170 W Highline Canal Rd, Payson UT	1	15.0	15.0
Strawberry Canal, 6000W Strawberry Canal Rd, Santaquin UT	1	15.0	15.0
Wellsville Mendon Lower Canal, 1913 Cobblestone Rd, Mendon UT	8	21.5	15.7
Benson Marina, 4400 Black Rock Rd, Benson Ut	9	37.8	15.8
Mcmullin Pond, 5600 W Strawberry Canal RD, Santaquin UT	1	21.0	21.0
Fower Pond, 4800 North Rd, Honeyville Ut	4	28.8	23.3
Hammond East Branch Canal, 11500 N Highway 38, Deweyville Ut	4	43.8	28.1
Hooper Canal (North Diversion, West Weber Branch) 4700 W 100 N Plain City UT	4	40.8	33.4
Hooper Canal (South Diversion, West Weber Branch) 1150 S 5000 W Plain City UT	4	34.8	34.3
Hyrum Canal, 6200 South 200 West, Hyrum UT	4	43.3	40.9
Central Canal, 195 W 10400 N, Tremonton Ut	4	50.5	45.5
Warren Irrigation Canal (Tom Pavarro Diversion) 1343 N 4700 W, Plain City UT	5	64.6	52.4
Northern Canal, Logan River, 880 E 1400 N, Logan UT	3	75.3	55.6
Corinne Canal, 500 N 5200 W, Tremonton Ut	4	71.0	57.0
North Branch, Wilson Canal, 3122 S 4700 W, Ogden UT	5	62.6	58.4
Wayne Highline, 850 South 400 West, Springville UT	1	71.0	71.0
Corinne Canal 50 N 6800 W, Corinne Ut	4	82.3	81.7
West Canal, 11500 N Canal Bank Rd, Tremonton Ut	4	90.8	84.2
East Pump Canal, 800 W 1600 S, Lewiston UT	4	98.3	92.2
Weber River 5635 W 1100 S Ogden, UT	5	100.2	98.1
West Cache Canal, 11400 N 5200 West, Cornish, UT (Trenton)	3	180.0	170.3

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Colilert Quanti-Tray 2000 Method

E. Coli (Most Proable Number) colonies per 100 ml of water - Colilert Quanti-Tray 2000 method.

Site Name and Location	site #	Count	Average	Geo Mean
South Shore Pond, Lincoln Beach Dr, Spanish Fork UT	18	1	2.0	2.0
Ogden Brigham Canal, 960 N Main St, Williard Ut	17	2	3.2	6.3
Logan, Hyde Park, and Smithfield Canal, 1290 East 4400 North, Hyde Park UT (Naomi Peak Vineyards)	13	6	22.4	11.7
Cherry Hill Farm Pond, 16920 S 9700 W, Goshen UT	3	1	12.2	12.2
Hammond East Branch Canal, 11500 N Highway 38, Deweyville Ut	8	2	20.5	19.2
Strawberry Canal, 6000W Strawberry Canal Rd, Santaquin UT	19	1	20.1	20.1
Corinne Canal, 500 N 5200 W, Tremonton Ut	5	2	28.2	26.9
Highline Canal, 2170 W Highline Canal Rd, Payson UT	9	1	28.5	28.5
Mcmullin Pond, 5600 W Strawberry Canal RD, Santaquin UT	14	1	35.5	35.5
Central Canal, 195 W 10400 N, Tremonton Ut	2	2	44.6	44.4
Hooper Canal (South Diversion, West Weber Branch) 1150 S 5000 W Plain City UT	11	3	47.9	46.1
West Canal, 11500 N Canal Bank Rd, Tremonton Ut	25	2	51.5	51.0
Hooper Canal (North Diversion, West Weber Branch) 4700 W 100 N Plain City UT	10	3	56.3	54.6
Benson Marina, 4400 Black Rock Rd, Benson Ut	1	4	305.6	101.8
Corinne Canal 50 N 6800 W, Corinne Ut	4	2	102.8	102.7
Fower Pond, 4800 North Rd, Honeyville Ut	7	2	62.7	125.4
North Branch, Wilson Canal, 3122 S 4700 W, Ogden UT	15	4	176.5	151.1
Hyrum Canal, 6200 South 200 West, Hyrum UT	12	3	177.2	170.6
Warren Irrigation Canal (Tom Pavarro Diversion) 1343 N 4700 W, Plain City UT	20	4	212.3	191.2
Wayne Highline, 850 South 400 West, Springville UT	21	1	218.7	218.7
Weber River 5635 W 1100 S Ogden, UT	22	4	311.7	263.7
Wellsville Mendon Lower Canal, 1913 Cobblestone Rd, Mendon UT	23	3	923.8	383.0
East Pump Canal, 800 W 1600 S, Lewiston UT	6	3	707.9	393.9
Northern Canal, Logan River, 880 E 1400 N, Logan UT	16	3	1479.4	537.4
West Cache Canal, 11400 N 5200 West, Cornish, UT (Trenton)	24	2	1308.5	1304.2

I can help!

- David Call
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- NDFS 207 D
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- We will be creating a video on how to take a water sample and it will be posted on the website. www.producesafety.Utah.gov