

UTAH DEPARTMENT of
ENVIRONMENTAL QUALITY
**DRINKING
WATER**

Public Drinking Water Rule Changes & The Impact of Improper Non-Public Water System Development

District Engineer

John L. Chartier, P.E.

Central District Engineer
Department of Environmental Quality

1. Division of Drinking Water
2. Division of Water Quality
3. Division of Environmental Response & Remediation
4. Division of Waste Management & Radiation Control
5. Division of Air Quality

DDW for Salt Lake and Surrounding Departments

Nathan Hall

John Chartier

Scott Hacking

Paul Wright



Presentation Topics

- I. DDW Design and Construction Rule Changes
- II. New Public Water System Definition Changes
- III. Planning for and Regulating Non-Public Water Systems
- IV. Consequences of Poor Water System Planning

Fire Flow Requirements



- Determined by **local fire code officials**
- Local fire code officials may determine that water systems are **not subject to retroactive fire flow requirements**
- **Fire hydrant laterals** shall be **6"** in diameter.
- Fire hydrant spacing is per the code official, but usually range between 200-500 feet.
- Adequate pipe sizing to deliver the fire flows.

Fire Storage Sizing Req't



- Required **if specified by the local code official or if hydrants intended for fire flow are installed.**
- PWS provide the required fire flow info to DDW.
- **When no direction is available** – use Appendix B of the 2015 International Fire Code. Fire flow shall not be less than **1,000 gpm for 60 minutes unless otherwise approved.**

Water & Sewer Line Separation



- **10 feet** is the **horizontal separation standard** and **18 inches** is the **vertical separation standard** (with the water line above the sewer)
- Additional information can be submitted with plan review where the 10' separation can not be met if:
 - ✓ there are no groundwater concerns,
 - ✓ the sewer pipe is in good condition, and
 - ✓ a horizontal separation of **at least 6'** is provided.
- Request for an exception to rule if your situation is different

Exception for Water & Sewer Line Separation

Additional information to be submitted for <6' separation:

1. **Reason** for not meeting the minimum separation standard
2. **Location** where the water and sewer line separation is not met
3. Horizontal and vertical **clearance** that will be achieved
4. **Sewer line info:** material, condition, size, age, type of joints, pressure class or thickness, whether the pipe is pressurized, etc.
5. **Water line info:** material, condition, size, age, type of joints, thickness or pressure class, etc.
6. **Groundwater** and soil conditions
7. Any **mitigation** effort(s)

Exception for Water & Sewer Line Separation

Plan Review Checklist — Minimum Separation Standards for Water and Sewer Lines

This list is for Division of Drinking Water **internal** use to review **acceptable design and exception requests** related to the minimum separation requirements in R309-550-7. Water systems should identify the following information, which will be used to assess the risk to public health and the degree of protection needed to justify approving the design or granting the exception.

- 1. Water System Name _____ Water System Number _____
- 2. Name, contact information, and job title of the person making the exception request or proposing the design *[This person must be a water system's representative or its agent.]*
- 3. Reason for not meeting the minimum separation standards (e.g., constraint due to road or existing utilities, etc.)
- 4. Location(s) where the water line and sewer line cross or do not meeting the minimum horizontal/vertical separation standards (e.g., station information, street or intersection names, address, building name, etc.)
- 5. Description of the crossing or how the minimum horizontal/vertical separation standards are not met (e.g., the sewer line is 6 inches above or under the water line; for 500 feet on Hayes Street, the edge of sewer pipe is only 6 feet from the edge of water pipe, etc.)
- 6. Minimum horizontal and vertical clearances between the sewer and the water lines, from edge of the pipe to edge of the pipe *[If the exact clearance is unknown but it is suspected that the design will not meet the minimum separation requirement, and if the water system wishes to obtain an exception in advance, DDW can consider granting an exception with a condition requiring that additional detailed information be submitted later based on field verification.]*
- 7. If available, a drawing or schematic of the water line and sewer line layout, showing minimum clearance, depth, etc.
- 8. Sewer line information — new or existing, pipe material, thickness or pressure class, diameter, joint type, pipe condition (e.g., new, old, recently videoed, etc.), pressurized or gravity feed, etc.
- 9. Water line information — new or existing, pipe material, thickness or pressure class, diameter, joint type, pipe condition (e.g., new, old, deteriorated, etc.), typical water pressure range, etc.
- 10. Ground water table conditions based on recent or nearby construction (e.g., known ground water table depth, very high or low ground water table, whether expected to encounter ground water during installation, etc.)
- 11. Proposed means to mitigate the risk (e.g., remove/replace the aged vitrified clay sewer pipe; replace the aged or cracked existing sewer pipe; use thicker or higher pressure class PVC instead of the typical thin-wall sewer pipe; install an in-situ lining to the existing sewer pipe for XX feet; center the sewer line over the crossing to keep the joints as far as possible from the water line; add plastic warning tape placed 12 inches above the sewer and/or the water line(s) to minimize possible damage during future excavations; use HDPE pipe for water line or sewer line to eliminate the joints *[if there is no sagging or lack-of-sufficient slope problems for HDPE sewer pipes]*; use restrained joints for water line and/or sewer line near the crossing.)

Plan Review Penalty Fee

If you build anything, they will come.

DBW

DDW

DDW

DDW

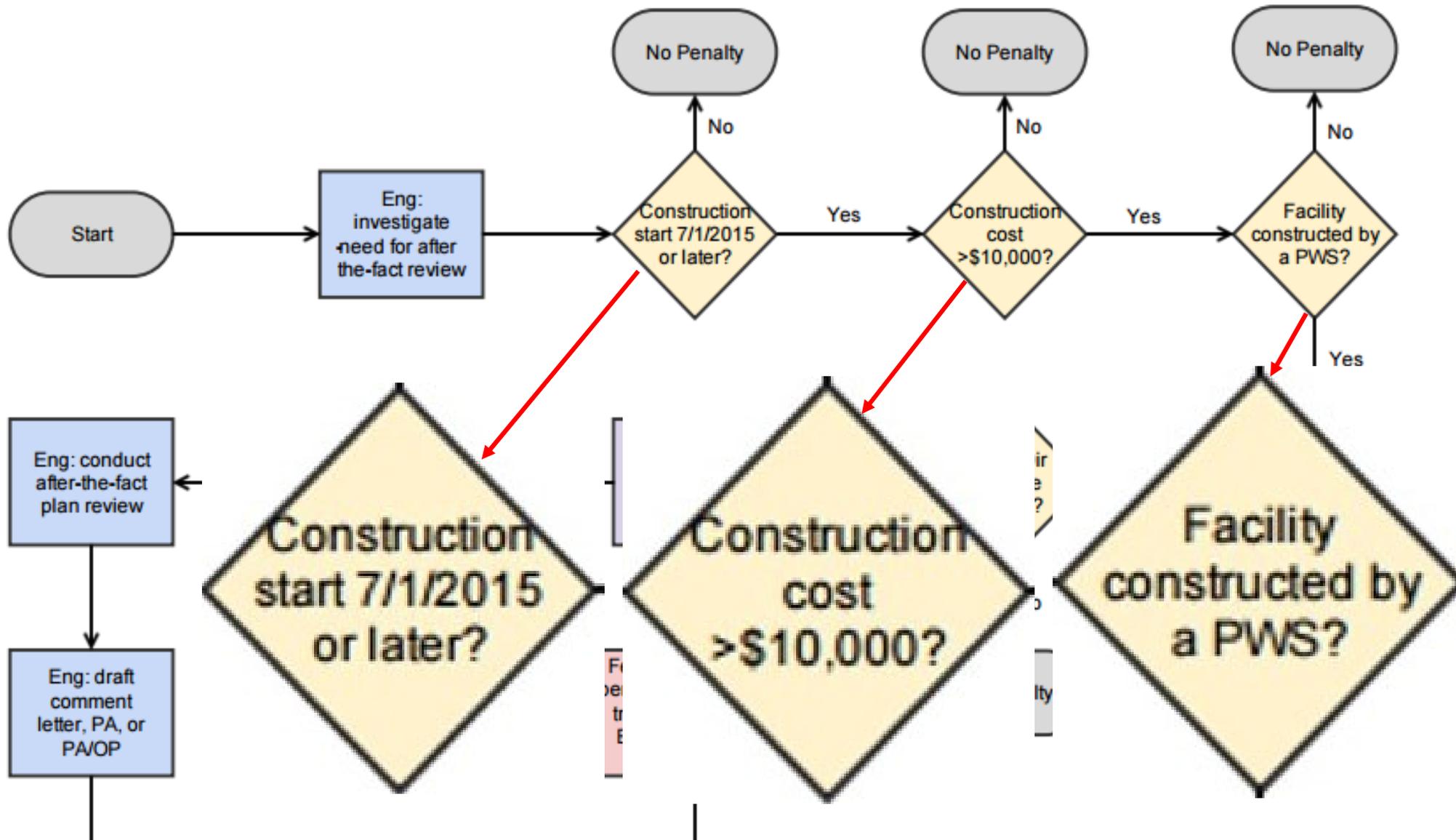
DDW

DDW

©TerrellAfterMath.com

Plan Review Penalty Fee

Division of Drinking Water Penalty Assessment Process for Construction without Plan Approval



Plan Review Waivers

Waivers are eligible for two types of projects:

1. Water Line Projects Included in an approved Master Plan (**Waiver A**)
2. Water Line Projects within sizing limits based on population (**Waiver B**)
 - ≤ 8 " pipe for population less than 3,300
 - ≤ 12 " pipe for population 3,300 to 50,000
 - ≤ 16 " pipe for population greater than 50,000

Plan Review Waiver A – Eligibility

Waiver Type **A Eligibility Conditions:**

(Both conditions must be met)

1. Water system's **standard installation drawings** meet R309-550 and approved by the Division
2. Water system's **Master Plan**, supported by hydraulic analysis, is approved by the Division

Plan Review Waiver B – Eligibility

Waiver Type B Eligibility Conditions:

(All 3 conditions must be met)

1. Water system's **standard installation drawings** meet R309-550 and approved by the Division
2. Water system has formally **designated a PE** as having direct responsibility **for the water system** in a letter to the Division
3. Water system has formally **designated a PE** as having direct responsibility for oversight of **hydraulic analysis** in a letter to the Division

Plan Review Waiver B – Options

Waiver Type **B** has two options:

1. Obtain a waiver for each water line project **prior to construction**
2. Obtain an **after-the-fact** waiver by formally tracking all qualified projects constructed throughout the year and submitting the waiver request **in January of the following year**

Plan Review Waiver – Advantages

1. Plan submittal and Plan Approval for each project are NOT required
 - Obtaining the waiver = Water System's PE or consultant takes the responsibility of overseeing the water line project(s) and compliance with regulations
2. Operating Permit NOT required

Minimum Water Main Size

- Without Fire Hydrants – 4-inch diameter or larger
- With Fire Hydrants
 - ✓ 8-inch diameter or larger
 - ✓ 6-inch diameter or larger (if supported by hydraulic analysis)

(4) Minimum Water Main Size.



For water mains not connected to fire hydrants, the minimum line size shall be 4-inch diameter. unless it serves picnic sites, parks, semi-developed camps, primitive camps or roadway rest-stops. Minimum water main size, serving a fire hydrant lateral, shall be 8-inch diameter unless a hydraulic analysis indicates that required flow and pressures can be maintained by smaller 6-inch lines.

Tank Interior Coating



- Followed manufacturer's directions **during curing**:
 - ✓ Curing **time**
 - ✓ Curing **temperature**
 - ✓ **Forced air ventilation**
- Assure that no tastes or odors, toxins or contaminants exceed MCL because of tank coating or repair
- Prior to placing a drinking water storage tank in service:
 - ✓ Complete cleaning, disinfection, and flushing procedures → obtain a **satisfactory bacteriological sample** result
 - ✓ Verify compliance with drinking water VOCs MCLs → obtain an analysis of **volatile organic compounds (VOCs)**

Booster Pump Serving Individual Service Connection

- Public Water Systems (PWS) shall not rely on individual service connection booster pumps to meet drinking water minimum pressure requirements
- **Fire jockey pumps**, which serve building fire sprinkler system and have been approved by fire code officials, are NOT considered “serving drinking water minimum pressure requirements”



The Basic PWS Definition

15 service connections

Under the same ownership or control

OR

Average 25 people daily for 60 days a year

Equivalent to 8 service connections

“Population Served” – 25 people

Sub-Metered Properties

- Definition — “Property owner bills tenants and pays water bill from a Public Water System (PWS)”
- Examples
 - Subdivisions
 - Planned Unit Development (PUDs)
 - Industrial or Commercial Complex
 - Condominium Complex
 - High Rise Buildings
 - Mobile Home Park
 - College Campus

Mobile Home Park

The Mobile Home Park is served by the City through a master meter. The local health department took a sample at the court which came back positive for E. coli. The parent system argued they should not have to take repeat samples because they were not liable for the poor quality distribution piping within the court. How should the Division of Drinking Water respond?



The Workgroup

- Internal
 - Engineers
 - Rules Staff
 - District Engineers
- External Stakeholders
 - Local Health Departments
 - Rural Water Association of Utah
 - Large and Small Water Systems

Current Working Proposal

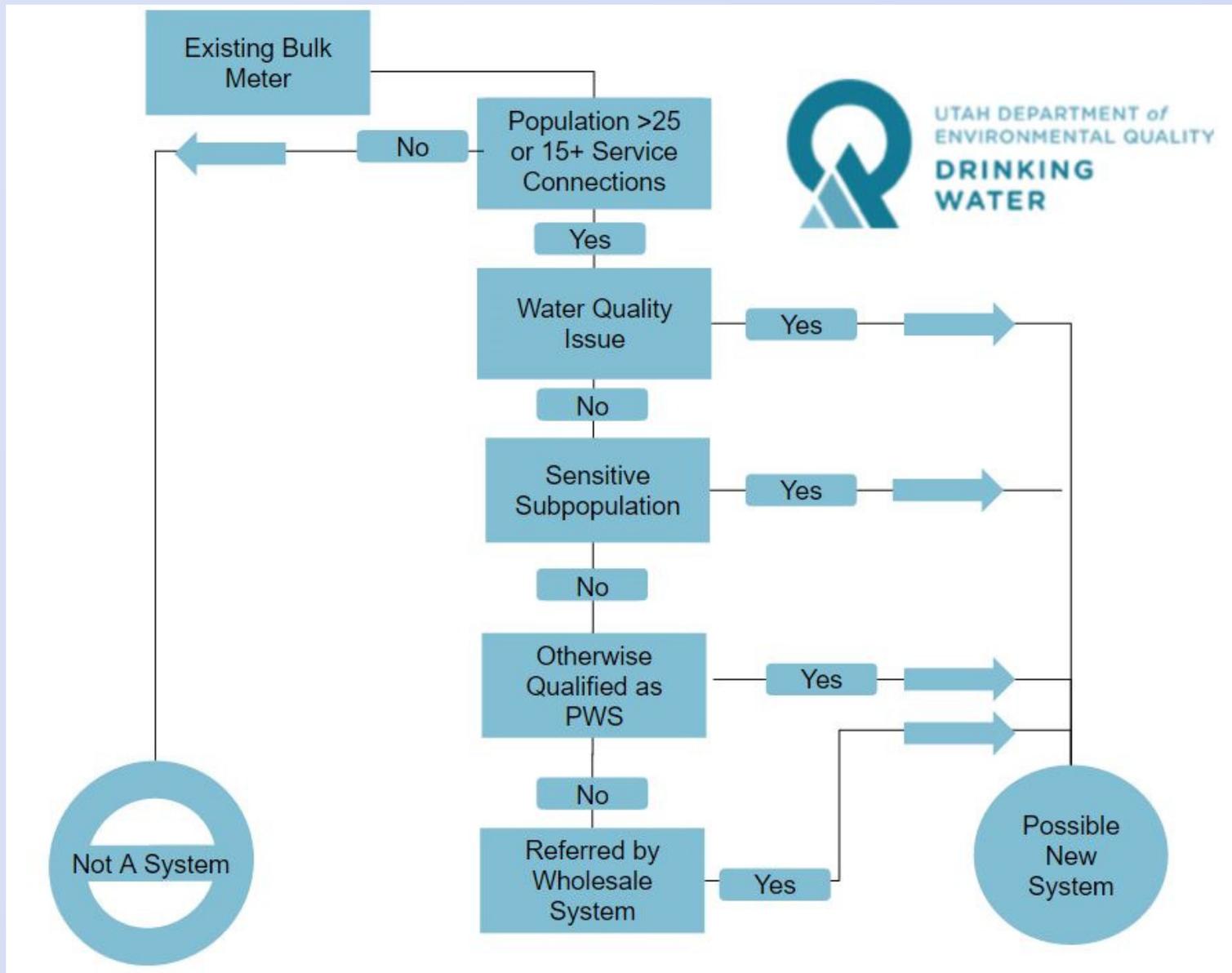
- Existing sub-metered properties are “grandfathered” however...
- A parent system has the option of referring the sub-system to the state for direct regulation
- New construction will have to meet construction standards
- Treatment Beyond the meter results in regulation, based on complexity
- A committee can assess and make recommendations to DDW Director
- Appeals must, by rule, go through an Administrative Law Judge

Existing Sub-Metered Properties

Will continue to exist as part of the existing wholesale system unless:

- Water quality issue
- Sensitive sub-populations served
- Connection otherwise qualifies as a PWS
- Referral by wholesale system

Existing Bulk Meter Flow Chart



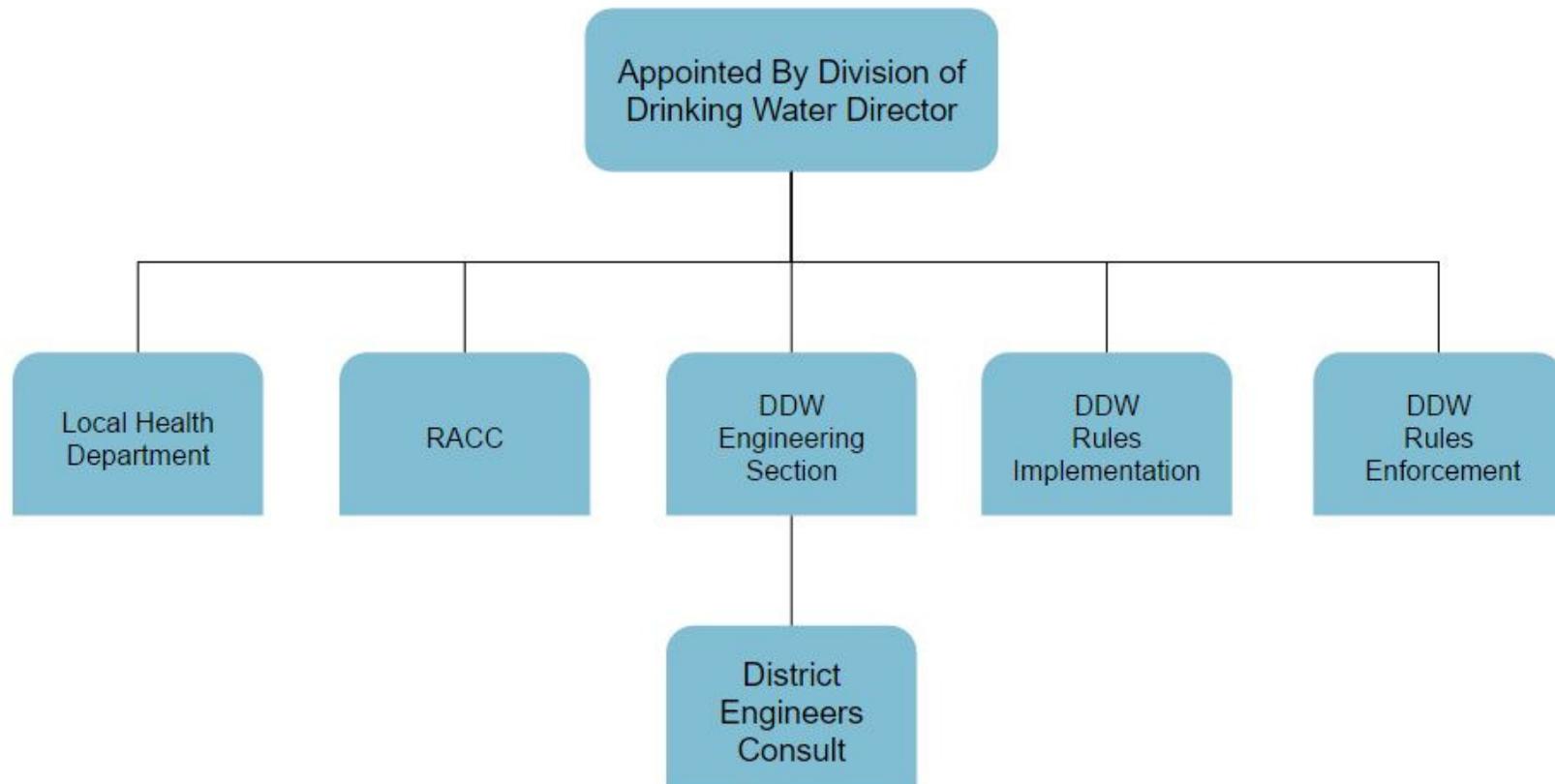
New Sub-Metered Properties

Decision: infrastructure acceptable to wholesale system, maintenance done by wholesale system and part of representative sampling plans (THMs, Cl₂ residuals, RTCR and lead /copper)

Yes – part of wholesale system

No – development independent PWS

Review Group



Planning for and Regulating Non-Public Water Systems



What is the Problem?

Small developments with central water systems constructed to minimal or no design standards.

PWS Definition

- Public Water System Definition:
- Culinary Water System, either public or privately owned, which has at least 15 service connections **or** serves an average of at least 25 people at least 60 days out of the year.

PWS Definition

- A ratio of **3.13 persons per connection** shall be used to calculate the individuals served unless, at the time of operation, more accurate information is available. The ratio is based on the statewide average persons per residence in the 2000 census.
- Notwithstanding the threshold for the number of service connections set forth in (a), **a drinking water system consisting of at least 8 service connections is considered to serve 25 people**, based on the ratio in (b)(i), and consequently is classified as a public drinking water system, unless, at the time of operation, more accurate data can be used.

Rules for Non-Public Systems?

- Responsibility of the Local Jurisdiction
 - Health Department
- 13 Health Departments Statewide
- 7 of 13 have Written Rules

Proposed Elements of a Non-Public Rule

- The rule is separated into two sections according to the number of proposed connections:
- 1st Section is 1 to 3 connections
- 2nd Section is 4 to 7 connections
- 8 or more connections will be assumed to be a Public Water System.

Requirements for 1 to 3 Connections

- Show evidence of sufficient water right
- Document the system can reliably supply sufficient water pressure and ensure water quality

Requirements for 1 to 3 Connections

- Map showing source location with defined buffer area
- Two or more connections shall have a shared source agreement

Shared Source Agreement

- The agreement defines:
 - Who owns the well
 - Who owns the property where the well is located and access easements
 - All connections will pay a user fee
 - How O&M costs will be assessed
 - When payments will be made
 - Connections can be terminated for non-payment

Requirements for 4 to 7 Connections

- These larger systems will have all of the same requirements as the 1 to 3 connection systems
- AND...Engineered drawings meeting minimum construction standards as defined in the Non-Public Rule

4 to 7 Connection System Design Requirements

- Well and Spring developments must be constructed in compliance with the PWS minimum standards.

4 to 7 Connection System Design Requirements

- Water storage requirements:
- Volume shall be sized for indoor, outdoor and fire flow demands if applicable

4 to 7 Connection System Design Requirements

- Distribution System Requirements:
 - Shall follow PWS design standards for transmission and distribution pipe lines
 - If fire hydrants are put in, then minimum fire flow shall be considered

Enforcement of the Non-Public Water System Rule

- Enforcement will be the responsibility of the Local Health Department
 - Building department, planning & zoning commissions

Having Approved Non-Public Water Systems

- Lending Institutions & Real Estate Companies
 - Require/want approved water systems
 - Disbelief at no regulation for small systems

Non-Public Water System Rule

- Protects homeowners
- Provides basic design and construction standards
- Saves money by constructing better quality system in the beginning

Grow Baby, Grow

- 2000 – platted as a 14-lot development (recreational homes)
- DDW did a courtesy review without issuing approval:
 - Well-seal not witnessed, no documentation
 - No PER or source protection
 - Well capacity not enough for 14 lots
 - ✓ Water right owned by one person
 - ✓ Service Agreement given to each person who then buys a lot
 - ✓ The Water Right is for only 0.25 ac-ft
 - No new source chemical information of the well water
 - Limited storage capacity (10,000 gallons)
 - Individual home booster pumps and cisterns

Grow Baby, Grow (continued)

SURPRISE!?!

- 2014 — the 14-lot development expanded to 39 lots
 - No notice to County Planners (that DDW is aware of)
 - No notice to DDW
 - No corresponding increase in facilities, capacities, or available water rights
- Public Health issues?
- In most cases now, purchasers must prove they have access to an approved water system to build on a lot

In Another County Not So Far Away

- Established in 1973; served 43 connections
- Pipe sizes ranged from 6” diameter to 1” diameter
 - Class 200 PVC pipe; No UL Listing
- No storage capacity
- Booster pump to maintain system pressure
- Poor service & low pressure — several users disconnected from the system and drilling own shallow wells
- 1995 appraisal
 - System valued at ~\$95,000
 - System replacement cost ~\$242,000
- 2015 estimated cost to come into compliance
 - ~\$1.62 million

Questions?

John L. Chartier, P.E.

(435) 896-5451

jchartier@utah.gov

Dept. of Environmental Quality