

# The Ground Water Rule

## Significant Deficiencies

Eric McPhee,  
Sanitary Engineer 3  
DPH-Drinking Water Section

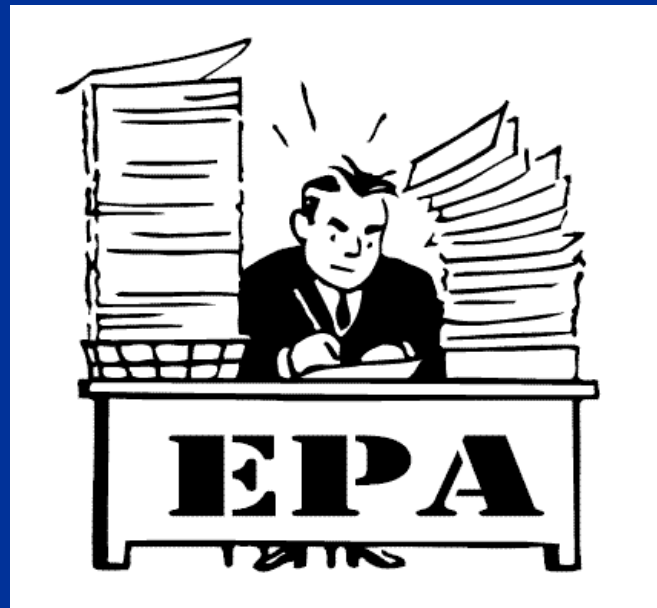


Drinking Water Section

## Background:

# What is the Ground Water Rule?

EPA Rule designed to improve control of microbial pathogens in groundwater systems, which will increase public health protection.



# Who is affected?

Public water systems of all classifications that use groundwater sources\*.



\*GWUDI and SWTR treated wells are exempt

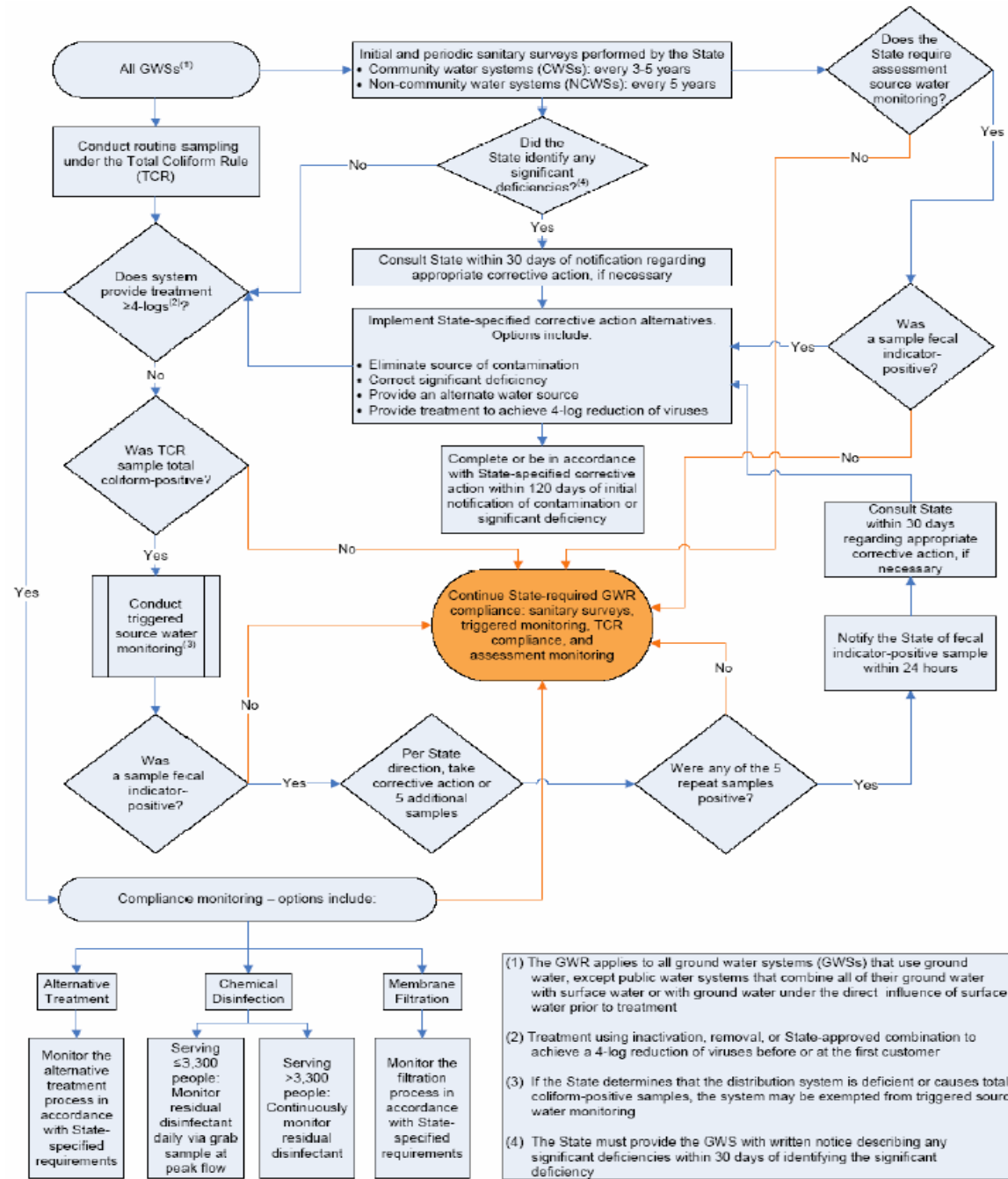
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💧 The Ground Water Rule will be effective  
on **DECEMBER 1, 2009.**

# What is it?

- 💧 The Ground Water Rule establishes a risk-targeted approach to identify ground water systems that are susceptible to fecal contamination.
- 💧 Fecal indicators in a drinking water supply are an indication of the potential presence of microbial pathogens that may pose a threat to public health.

### Exhibit 2.1 Summary of System GWR Requirements



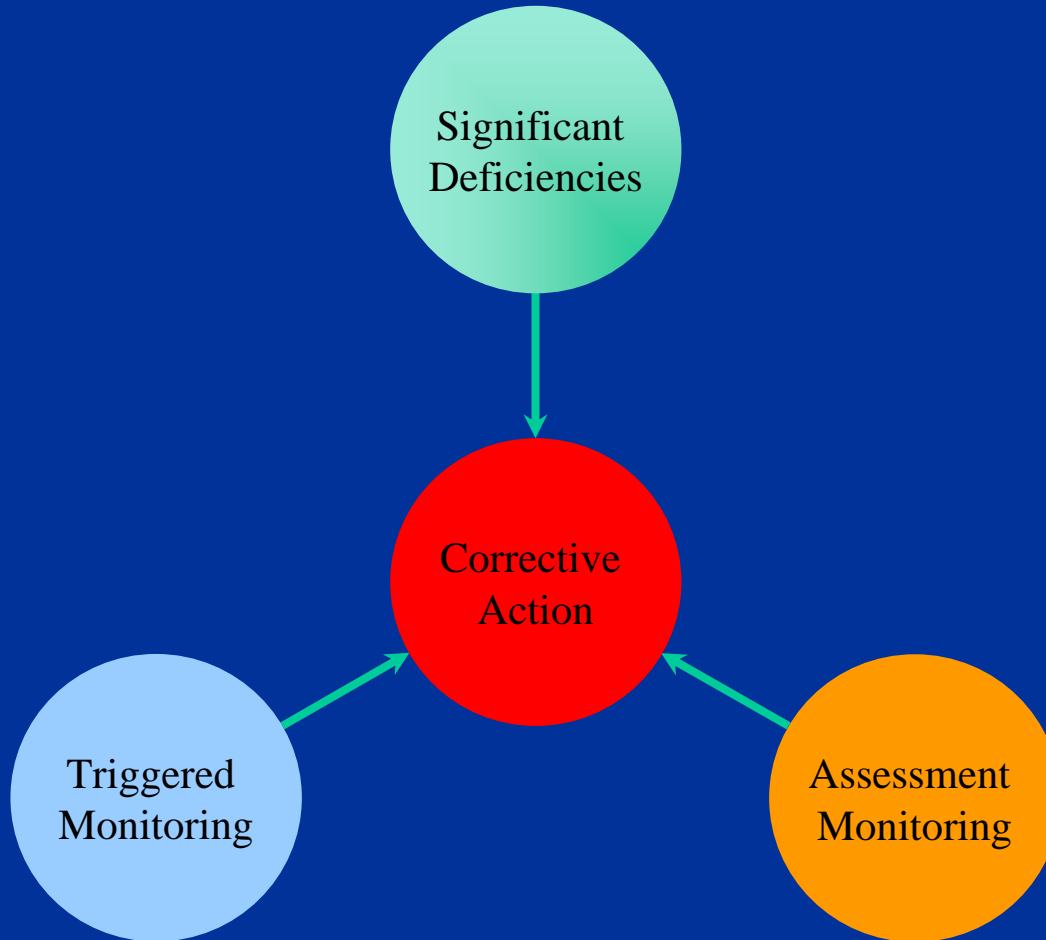
(1) The GWR applies to all ground water systems (GWSs) that use ground water, except public water systems that combine all of their ground water with surface water or with ground water under the direct influence of surface water prior to treatment

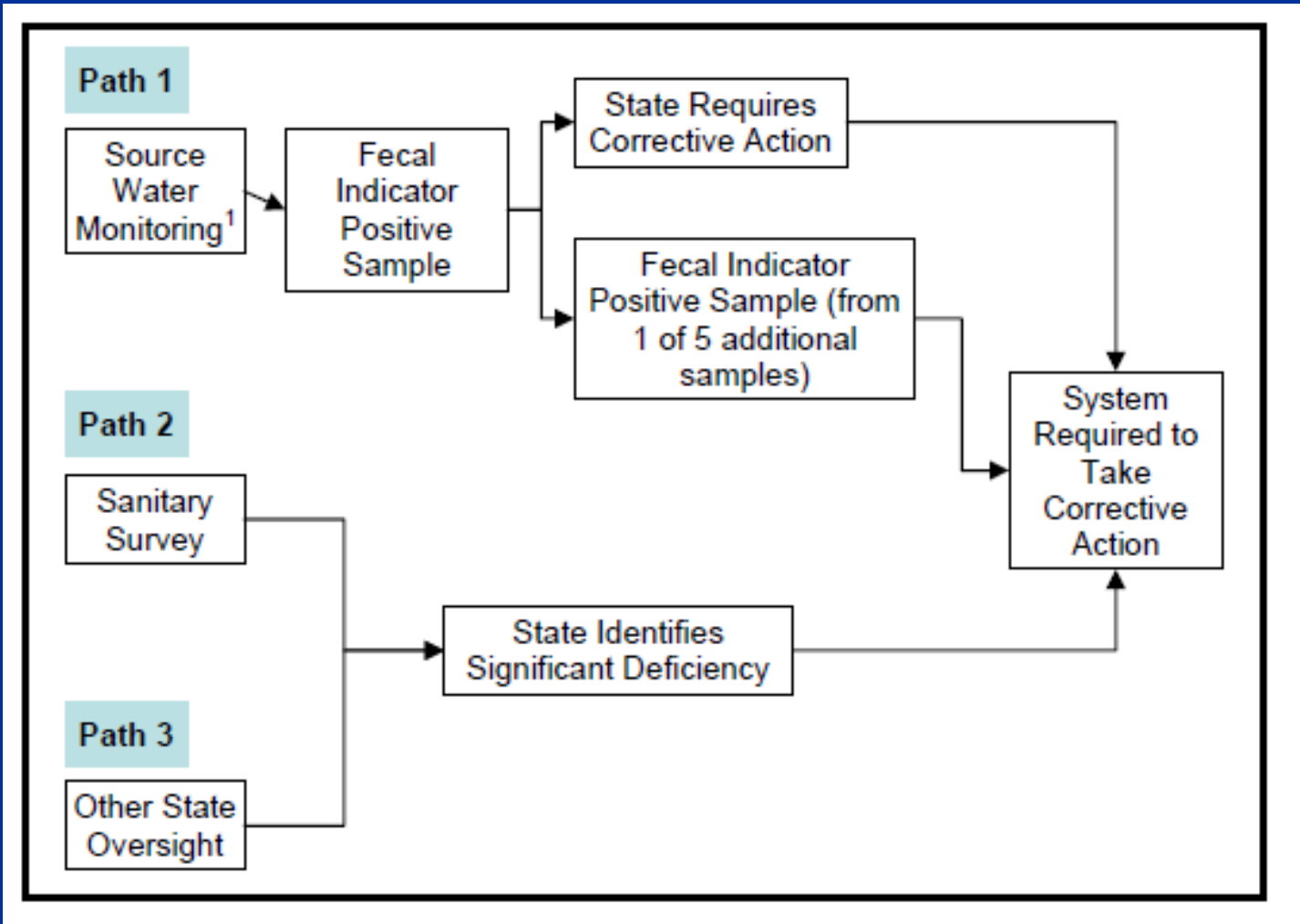
(2) Treatment using inactivation, removal, or State-approved combination to achieve a 4-log reduction of viruses before or at the first customer

(3) If the State determines that the distribution system is deficient or causes total coliform-positive samples, the system may be exempted from triggered source water monitoring

(4) The State must provide the GWS with written notice describing any significant deficiencies within 30 days of identifying the significant deficiency

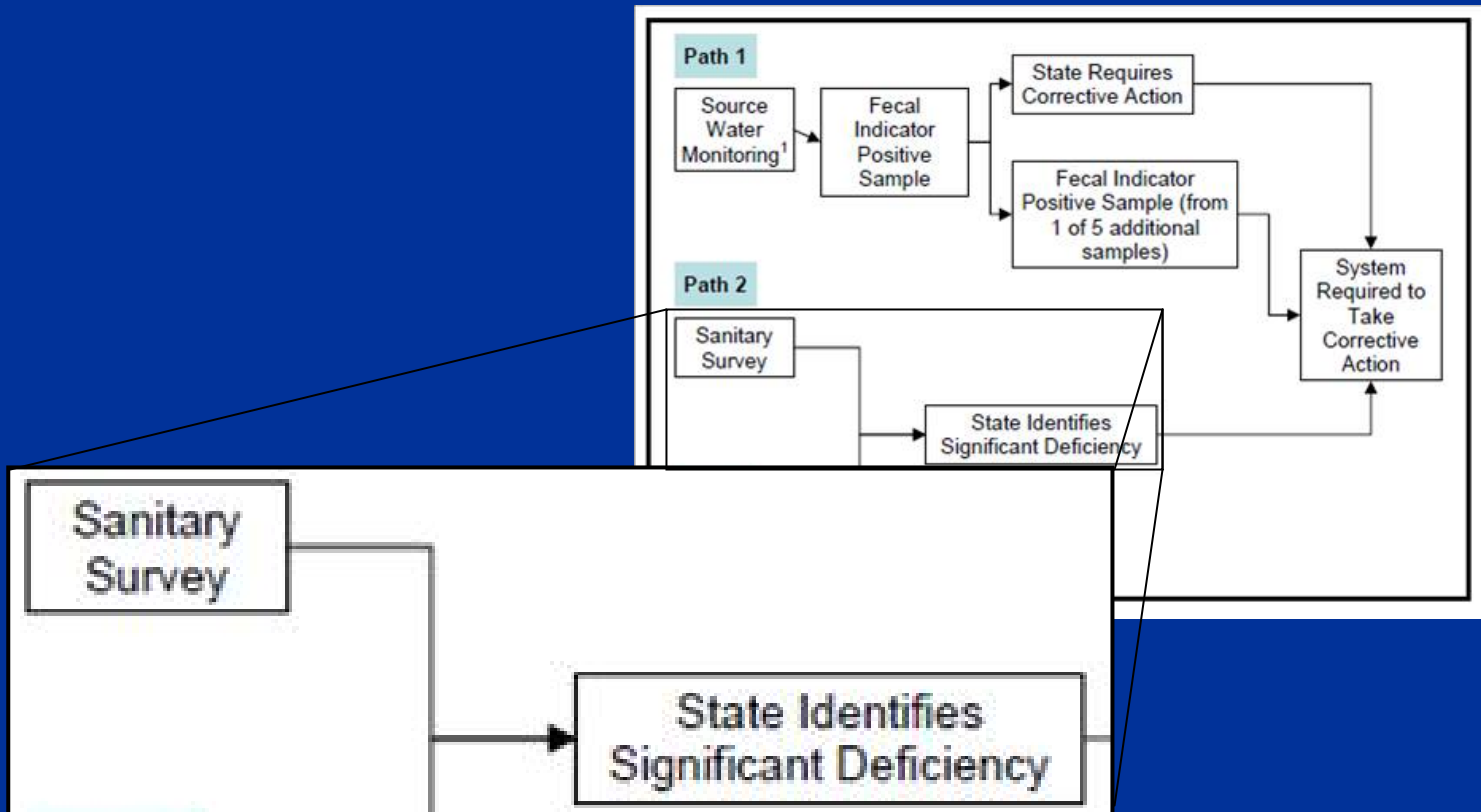
# The Gist of the GWR







# Sanitary Surveys → Significant Deficiencies



# Significant Deficiencies/Sanitary Surveys

- 💧 EPA recognized that sanitary surveys are an important tool for identifying potential vulnerabilities to fecal contamination at groundwater systems.
- 💧 Studies correlated correction of sanitary survey deficiencies to a decrease in total coliform, fecal coliform and e.coli.

# Significant Deficiencies/Sanitary Surveys

- 💧 EPA also found that deficiencies identified during a sanitary survey frequently remained uncorrected at the next survey.
- 💧 One study found that as many as 60% of deficiencies identified during surveys were also identified at the previous survey.

# Significant Deficiencies/Sanitary Surveys

- 💧 The GWR will be the first time that federal requirements for sanitary surveys of all groundwater systems will be mandated.
- 💧 This includes a required frequency for sanitary surveys of all GWSs and identification of “Significant Deficiencies”.

# What are Significant Deficiencies?

## Significant Deficiencies

- Significant Deficiencies are:  
“anything that is causing, or has the potential for causing, the introduction of contamination into the water system”
- Significant Deficiencies are typically identified during sanitary surveys

Significant  
Deficiencies

# Significant Deficiencies

- Significant Deficiencies are associated with the eight elements of a sanitary survey:
  - Source;
  - Treatment;
  - Distribution System;
  - Finished Water Storage;
  - Pumps, Pump Facilities, And Controls;
  - Monitoring, Reporting, And Data Verification;
  - System Management And Operation; And
  - Operator Compliance With State Requirements.
- Each state must have at least one Significant Deficiency for each of the eight elements.

Significant  
Deficiencies

# Significant Deficiencies

- Significant Deficiencies must be corrected in accordance with the 'Corrective Action' component of the GWR.

# Examples?

## Source

### Significant Deficiency - Inadequate Source Construction

- \* The well vent is not shielded and screened so as to prevent the entrance of contaminants into the well.
- \* The well casing is not free from flaws or defects and/or exhibits signs of significant deterioration indicating that the sanitary or structural integrity of the casing is impaired.
- \* The pipe segments used for the well casing are not joined watertight as approved by the Department.
- \* The casing or side walls of a dug well are not constructed of watertight concrete. Joints between concrete casing tiles shall be watertight.
- \* The casing or side walls of a dug well do not extend at least ten feet below the ground surface.
- \* The cover of a dug well is not constructed of substantial, reinforced concrete or other material approved by the Department.
- \* A watertight joint is not provided between the casing and cover of a dug well.
- \* The opening, manhole or hatch cover of a dug well is not sealed watertight and/or overlapping to prevent the entrance of any foreign matter or substance.
- \* The annular space between the casings and gravel pack is not protected by a watertight covering to prevent any foreign matter or substance from entering the well through the gravel pack.
- \* Equipment, piping or appurtenances, including well caps, are not joined watertight to the well casing at the point of entrance to the well.
- \* The foundation of a turbine pump is not constructed such that the well opening is adequately covered and all openings through the base are sealed watertight.
- \* The well vent is not provided with sufficient vertical clearance to prevent submergence from any possible high water level.
- \* The well pit is not constructed and/or maintained watertight (including all conduits, piping, appurtenances or similar connections) or suitably drained via a gravity drain (or a sump pump system if a gravity drain is not feasible) to insure dry, sanitary conditions.
- \* There is no raw water sampling tap installed.

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# Examples?

## Treatment

### Significant Deficiency - Inadequate Treatment Application/Monitoring

- \* Inadequate disinfection CT when disinfection is necessary or required by the Department and/or due to a history of bacteria contamination.
- \* Inadequate chemical treatment efficacy monitoring, including but not limited to: fluoride residual, and chlorine residual.

### Significant Deficiency - Inadequate Capacity

- \* Lack of redundant mechanical components including but not limited to chemical feed pumps, when disinfection is required by the Department and/or due to a history of bacterial contamination.

### Significant Deficiency - Inadequate Treatment System Construction

- \* Inadequate treatment capacity on a fully functioning treatment system when treatment is required by the Department and/or for an MCL exceedance. This includes chemical feed systems not feeding chemicals proportional to flow where source water flow rates vary at the point of chemical injection.
- \* No fail safe provisions provided to prevent chemical overfeed during no flow situations.
- \* Treatment systems with unprotected cross connections, including but not limited to: make-up water lines, carrying water lines, and backwash discharge lines.

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# Examples?

## Finished water storage

### Significant Deficiency - Inadequate Tank Construction/Location

- \* Storage tanks not covered (RCSA Section 19-13-B102(f)(5)(D)).
- \* Storage tanks not adequately protected from contamination, stormwater, or precipitation including, but not limited,
  - a. Concrete storage tanks with failing joint seams.
  - b. Appurtenant penetrations through and connections with storage tanks not sealed watertight.
  - c. Improper grading above buried storage tanks leading to surface water ponding or runoff on top of the tanks.
  - d. Access hatches and manholes not sealed watertight and/or not constructed properly with curbing and overlapping covers or equivalent protection.
- \* Vents and overflows not provided or not properly sealed with a screened cap valve, or duckbill valve to prevent entry of birds, vermin, or other foreign matter.
- \* Overflow pipes directly connected to sanitary sewer or to storm drainage systems (RCSA Section 19-13-B102(f)(5)(A)).
- \* In-ground storage tanks located within 25 feet from the nearest watercourse or storm drain or other source of pollution where the bottom of the storage tank is not located at a higher elevation than the highest water mark of the watercourse or storm drain.
- \* In-ground storage tanks located within 50 feet from the nearest sewage disposal system or sanitary sewer where the bottom of the storage facility is not located at a higher elevation than the top of the sewage disposal system or sanitary sewer. (If the sanitary sewer is constructed in accordance with the technical standards for subsurface sewage disposal systems pursuant to RCSA Section 19-13-B103d, the 50 foot separation distance may be reduced to 25 feet.)

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# Guidance Document

## Significant Deficiency

The well casing is not free from flaws or defects and/or exhibits signs of significant deterioration indicating the sanitary or structural integrity of the casing is impaired. Applies to SW   
Applies to GW

## Description/Summary

RCSA Section 19-13-B51f(b) requires that the casing or side walls of a dug well be constructed of well-constructed concrete to a depth of at least ten feet below the ground surface. This significant deficiency could include: casing that does not extend at least 10' below the ground surface, cracks or holes in concrete and/or missing or inadequate seals between concrete well tiles. A dug well does not incur a significant deficiency solely for having a casing that is less than 4" thick.

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Corrective Action Options	Verification	Documentation	Verification	Corrective Action
Correct all Significant Deficiencies	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Eliminate Source of Contamination	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Provide Alternate Source of Supply	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Provide Treatment	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

- Interim Measures appropriate
- Corrective Action Plan possible Timetable
- DPH prescribes Corrective Action and Timetable 0 Days

## Additional Comments

Interim measures may be necessary if there is evidence that surface water is infiltrating the well. A corrective action plan is appropriate if the system will provide an alternate source of water. If the system can adequately document the repairs through correspondence and photographs, a site visit would not be necessary.

Significant  
Deficiencies

# GWSs with a Significant Deficiency

- 💧 If a significant deficiency is identified, the state must notify the GWS in writing within 30 days (likely at the time of the survey)
- 💧 Corrective action is required within the timeframe provided in the notification.

Significant  
Deficiencies

# GWSs with a Significant Deficiency

- 💧 Failure to correct the significant deficiencies will result in a treatment technique violation.
- 💧 Public Notification will be required if significant deficiencies are not corrected within the corrective action timeframe.

# Example of Significant Deficiency Identification and Timeline



# Example Timeline



- ◆ DWS Conducts Survey with Groundwater System (GWS).

# Example Timeline, cont'd

## 💧 Significant Deficiency Identified





# Example Timeline

- Well pit with evidence of flooding.
- Well subject to submergence and therefore at an elevated risk of contamination.



- The next presentation will provide more examples.

# DWS Notification to GWS within 30 Days

- 💧 Either a written notification at the time of the survey, a letter, or in the sanitary survey report.
- 💧 The notification will clarify what actions must be taken and what the timeframes are.

## Example Timeline, cont'd

- 💧 GWS must 'consult' with DWS within 30 days of the notification to determine appropriate corrective action.



Unless....

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## Example Timeline, cont'd

- 💧 ...DWS instructs the system to implement a specific Corrective Action

# Corrective Action Options

- 💧 Complete corrective action within prescribed timeframe, or
- 💧 Submit a corrective action plan (within 60 days of Sig. Def. notification) for DWS approval.
- 💧 More on corrective action later...



# Corrective Action Options

- 💧 DWS may mandate immediate interim corrections to protect public health.



# Questions?