



# DEC GWUDISW Screening Guidance

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## PURPOSE STATEMENT

***This document serves only as guidance and does not supersede any current or future regulation or policy. Source water determinations are unique to each system and are reviewed on a case-by-case basis. Contact the local Drinking Water Program plan review engineer for clarification on specific project conditions.***

*The purpose of this guidance is to improve transparency on the methods used by the Department of Environmental Conservation's Drinking Water Program (Department) to determine the likelihood that a public water system (PWS) source is groundwater under the direct influence of surface water (GWUDISW). GWUDISW sources are subject to Surface Water Treatment Rules (SWTRs), as per [18 AAC 80.605](#). This guidance outlines the risk factors evaluated based on information provided to the Department through the plan review process, especially the information listed in [Checklist 3.1a Source – GWUDISW Determination](#).*

*The criteria outlined in this guidance are risk-based and are not definitive thresholds; professional judgement will be used to assess overall risk. The Department retains the authority to assign a final PWS source water determination at its discretion. Once a determination is made, the decision can be appealed via the process outlined in [18 AAC 15](#). A determination does not preclude the Department from reevaluating a PWS source for surface water influence in the event conditions under which a determination was made change or if additional information about the PWS source becomes available indicating the likelihood of direct influence of surface water.*

*Conservative assumptions are made when information needed to complete an evaluation is missing or inadequate. The Department may require additional data collection or use of advanced methods such as those outlined in the last section of [Checklist 3.1a Source – GWUDISW Determination](#) and in [18 AAC 80.605\(e\)](#). **Contact the reviewing Drinking Water Program office first to determine if these items are required, and to obtain approval of the data collection, analysis, and evaluation plan.***

## DEFINITIONS

**Surface water:** Defined in [40 CFR 141.2](#) and [18 AAC 80](#) as “all water which is open to the atmosphere and subject to surface runoff.”

**Groundwater:** Defined in [18 AAC 80](#) as “water beneath the surface of the ground...”

**GWUDISW:** Defined in [40 CFR 141.2](#) and adopted by [18 AAC 80](#) as “any water beneath the surface of the ground with significant occurrence of insects or other large macroorganisms, algae, or large-diameter pathogens such as *Giardia lamblia* or *Cryptosporidium*, or significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH which closely correlate to climatological or surface water conditions...”



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## SCREENING PROCESS

A PWS source is considered to have a high likelihood of being GWUDISW when it meets at least three of the criteria below (see Screening Criteria 1 – 5, in next section). The following exceptions describe when the Department will automatically determine the PWS source as being GWUDISW:

- Raw water quality testing shows the presence of *Giardia lamblia* or *Cryptosporidium*;
- There is a history of waterborne disease outbreaks caused by pathogens associated with surface water (e.g., giardiasis or cryptosporidiosis) and the outbreaks originated from the PWS source; or
- Infiltration galleries, as defined in [18 AAC 80.1990](#).

## SCREENING CRITERIA

- 1. Surface water proximity to the PWS source:** Evaluation of the horizontal distance between the PWS source and surface water is used to determine surface water influence when the PWS source is located within the distances and aquifer types described below:
  - a. Less than 500 feet, if in a fractured bedrock, karst (cavernous limestone), or layered volcanic aquifer;
  - b. Less than 200 feet, if in a coarse sand, or gravel and boulder aquifer;
  - c. Less than 100 feet, if in a sand and gravel aquifer; or
  - d. Less than 75 feet, if in a sand aquifer; and
  - e. Greater distances may be considered if there is limited or lack of aquifer information, or if other factors such as geologic anomalies and variable aquifer characteristics indicate the possibility of rapid transport of surface water towards the PWS source (e.g., presence of localized faults, karst spring, etc.)
- 2. Well opening depth:** Evaluation of the depth of well openings is used to determine the vertical proximity to surface water and is considered in evaluating influence by surface water if the following conditions are met:
  - a. The depth of the first opening in the well (e.g., bottom of casing, top of exposed screened interval, top of perforated casing interval, etc.) is less than 50 feet below ground surface; or
  - b. The difference in elevation between the opening in the well and the surface water is less than 50 feet (top or bottom of the well opening to the top or bottom of surface water, whichever provides the lesser distance), if the well is located within the distances and aquifer types described in Criterion 1 above.



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**3. Aquifer characteristics:** Evaluation of the following aquifer characteristics is used to determine risk of surface water influence. Aquifer characteristics are identified by the PWS source well log, proximal well logs, hydrogeologic studies, or other sources of information:

- a. **Confining layers:** Confining layers are subsurface layers made primarily of fine sediments (e.g., silt or clay), massive rock (i.e., fracture-free), or ice-rich sediment (e.g., permafrost) that slow or impede surface water migration to the aquifer. Evaluation of the following characteristics of confining layers are used to determine if they would present an effective barrier to surface water influence:
  - i. *Absent confining layers:* Confining layers are not identified above the first opening in the well, lithology descriptions are inconclusive, or other confining layer indicators are missing or inconclusive, such as the relative depth that water is first encountered in the borehole compared to the static water level in the completed well; or
  - ii. *Limited extent of confining layers:* The extent of identified confining layers is limited and does not extend beyond surface water located within the distances described in Criterion 1 above, as evidenced by nearby bedrock outcrops and/or an absence or thinning of confining layers as shown in proximal well logs or other sources of information.
- b. **Relative water levels and flow:** The following relative water elevations and flow are used to evaluate surface water influence by comparing them to nearby surface water or atmospheric conditions, taking into consideration any known or suspected variations due to pumping conditions, precipitation, or seasonal changes.
  - i. The static water table elevation in a PWS source located in an unconfined aquifer is similar to the water surface elevation of surface water located within the distances described in Criterion 1 above; or
  - ii. Variations in water yield (e.g. flow) at the PWS source are reflective of surface conditions, such that wet conditions or periods produce higher yield and dry conditions or periods produce lower yield.
- c. **Other pathways:** The following pathways for surface water, located within the distances described in Criterion 1 above, to bypass confining layers or other barriers to the migration of surface water to the aquifer are used to determine surface water influence:
  - i. *Nearby unregulated, abandoned, and/or improperly constructed boreholes and/or wells:* Such a pathway is deemed a risk factor based on professional judgement; or
  - ii. *Other artificial or natural pathways:* Incised drainages or channels; unlined pits, trenches, or other excavations, etc.; and not addressed by other criteria herein.

**4. Raw water quality:** Evaluation of raw water quality indicating surface water influence is based on existing data (e.g. routine testing) or data collected as part of the initial plan review submittal process. Water quality data associated with further GWUDISW evaluation beyond the initial plan review submittal process (e.g. targeted sampling for GWUDISW evaluation, or advanced water testing methods) must be collected in accordance with a water quality assessment plan submitted to and



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approved by the Department, and are outside the scope of this guidance. Water quality issues that may be used to screen for surface water influence may include:

- a. Repeated positive total coliform or *E-coli* sample results from the PWS source;
- b. Repeated high turbidity events/complaints that correlate to hydrologic events such as break-up of nearby river, large precipitation event, or flooding; or
- c. Rapid shifts or trends in water quality at the PWS source that can be correlated to similar changes in surface water located within the distances described in Criterion 1 above or hydrologic events. For example, rapid water temperature fluctuations that correlate to similar fluctuations in a nearby river, or a rapid reduction in specific conductance after a major rain event.

**5. PWS source construction:** Evaluation of the PWS source construction features that may contribute to higher risk of surface water influence includes the following (other conditions may be considered indicative of surface water influence at the Department's discretion):

- a. Well source
  - i. With a missing or loose sanitary seal;
  - ii. With improper surface or subsurface seal/grouting;
  - iii. With improper grading around the wellhead, flooding at or near the wellhead, or the wellhead is located in a low-lying area; or
  - iv. In a well pit/vault that is unprotected from surface runoff.
- b. Spring source
  - i. Missing or inadequately sealed enclosure;
  - ii. Missing or inadequately screened overflow or drain pipe; or
  - iii. Improper drainage of nearby surface water that could influence the spring source (e.g. rain runoff, snowmelt, etc.).