



Groundwater Policy Development

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Groundwater Policy Development: What's New

- Groundwater Investigation and Characterization Guidance
- Groundwater Use Determination
- Groundwater Model Update
- Groundwater Characterization in Fractured Rock
- Compliance Point for Protection of Aquatic Receiving Environments



Groundwater Policy Development

Amended Technical Guidance 6 – Groundwater Use Determination at Contaminated Sites

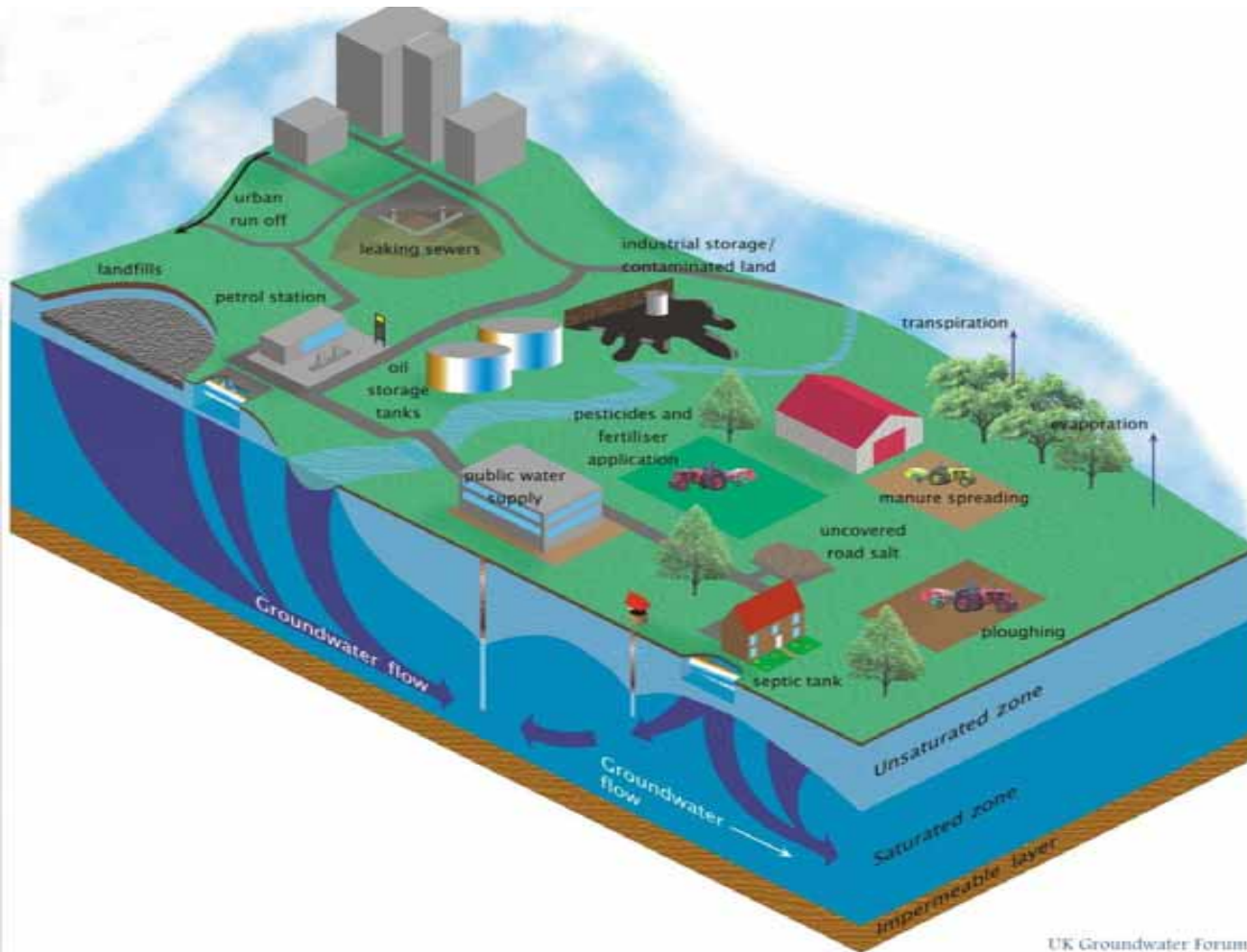
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Groundwater Use: Purpose

- To ensure that groundwater at a site is suitable for current and future use and is of adequate quality to protect adjacent uses.
- Provide clear reasoning and direction with respect to the procedure for establishing groundwater use at a site.

Groundwater Use: Overview



Groundwater Use : Overview

- There are four uses defined in the CSR for groundwater:
 - Drinking Water Use
 - Aquatic Life Water Use
 - Irrigation Water Use
 - Livestock Water Use
- TG6 helps the practitioner decide which water use will apply at a site, or even if “no water use” applies.
- Groundwater standards for clean up purposes are based on water use at a site.

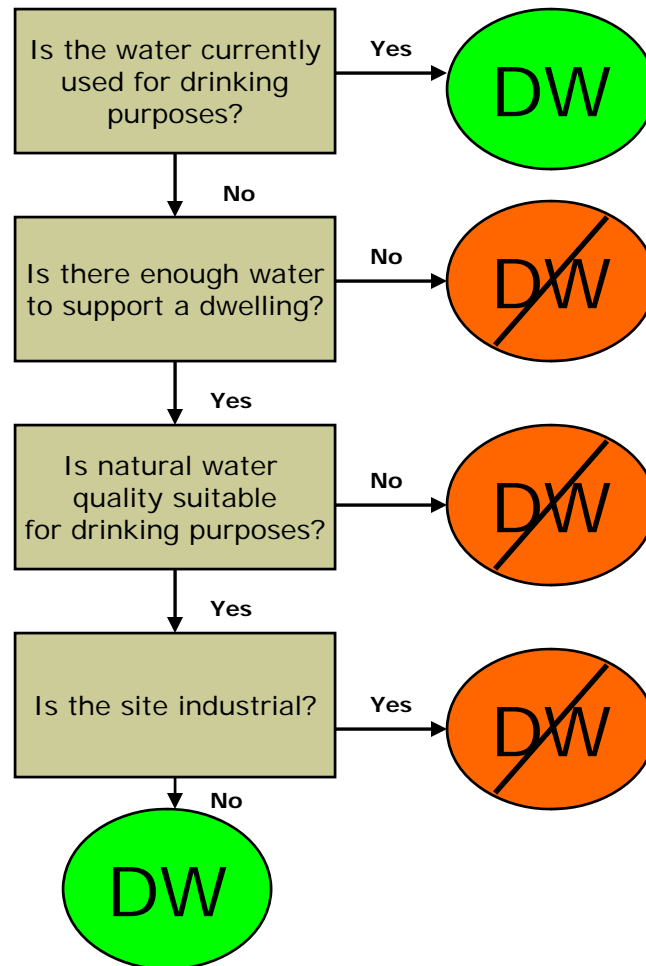
Groundwater Use: The “old” TG6

- Uses distance and travel times to receptors which can be overly conservative at times, at other times are not.
- Aquifer is considered “no water use” unless it is determined it has a use. e.g. if the aquifer is not currently used for DW, AW, IW, LW purposes... then it has no water use.
- Does not adequately address potential future groundwater use.

Groundwater Use: The “new” TG6

- Considers groundwater as a valuable future resource.
- Assumes that all groundwater uses apply at any given site until proven otherwise.
- Has more of a scientific basis, rather than arbitrary distance/travel time.
- Similar to Alberta, Washington, Ontario, US EPA, Health Canada draft policy for PQRA.

Groundwater Use: DW



Groundwater Use: DW

Is the aquifer currently used for drinking water?

- Drinking water use must apply at or near any site that currently uses its groundwater for drinking water purposes.
- The presence of drinking water wells (or surface water intake) must be established within 500 m of a contaminant source.
- Recommend: Refer to MoE database, door to door survey, local municipality.

Groundwater Use: DW

Can the aquifer produce enough water?

- Does the geological unit have a conductivity equal to or greater than 1×10^{-6} m/s?
- Can the geological unit yield enough water to supply a single family dwelling (1.3 L/min or 500 gallons/day)?
- If yes, then DW standards apply.

Groundwater Use: DW

Is the natural aquifer quality unsuitable for DW purposes?

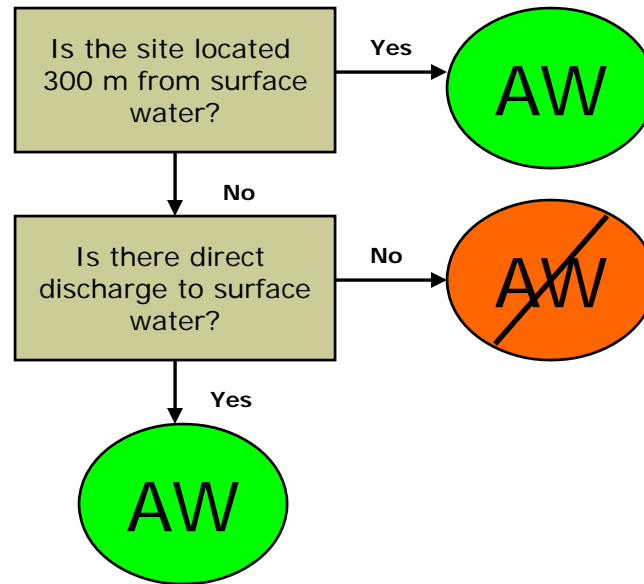
- Equal to or greater than 10,000 mg/L TDS is considered unsuitable for DW purposes.
- If commercially available technology can be reasonably employed to treat the water then the water is considered suitable for DW purposes.
- If groundwater quality is unsuitable for drinking water purposes, then DW does not apply.

Groundwater Use: DW

Is the site industrial?

- DW does not apply within the property lines of industrial areas unless groundwater is currently being used for drinking purposes.
- Drinking water use must be considered on neighbouring properties when contamination has migrated off-site.

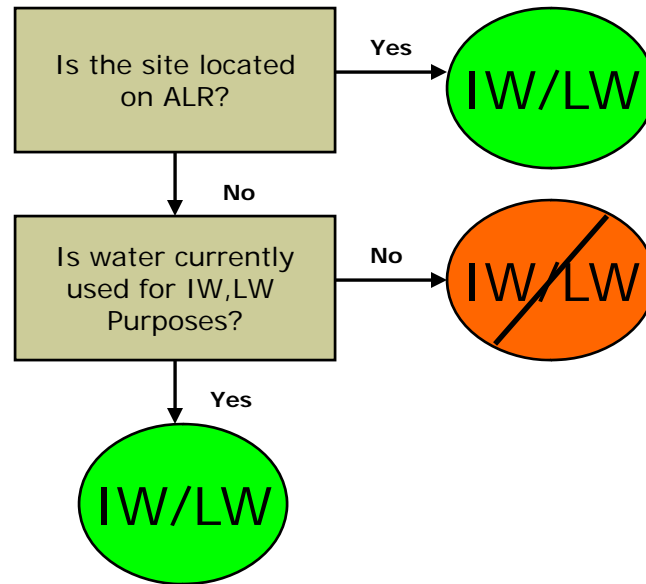
Groundwater Use: AW



Groundwater Use: AW

- AW applies to all groundwater located within 300 m of a surface water body.
- AW applies at sites where there is the potential for contaminated groundwater to discharge directly to a receiving water body (e.g. storm water discharge).
- Otherwise, AW does not apply.
- AW does not apply for deeper aquifers that are shown to discharge to surface water bodies at distances greater than 300 m from source.

Groundwater Use: IW, LW



Groundwater Use: IW and LW

- IW and LW applies if irrigation or livestock watering is located 500 m from contaminant source.
- If site is located on provincially zoned ALR then IW and LW applies.

Groundwater Use: Considerations

- Bedrock Aquifers
- Multiple Aquifers
- Municipal Water Management Plans



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Technical Guidance 15 – Compliance Point for Protection of Receiving Aquatic Environments

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- Provide guidance on appropriate use of the CSR AW standard and the BCWQG in proximity to surface water bodies containing aquatic life.
- Useful when assessing remediation strategies at contaminated sites

- In general, CSR AW standards are derived from the BCWQG (10x BCWQG)
- Standards were set with the assumption that water at a site will be diluted 10x before reaching the receiving environment

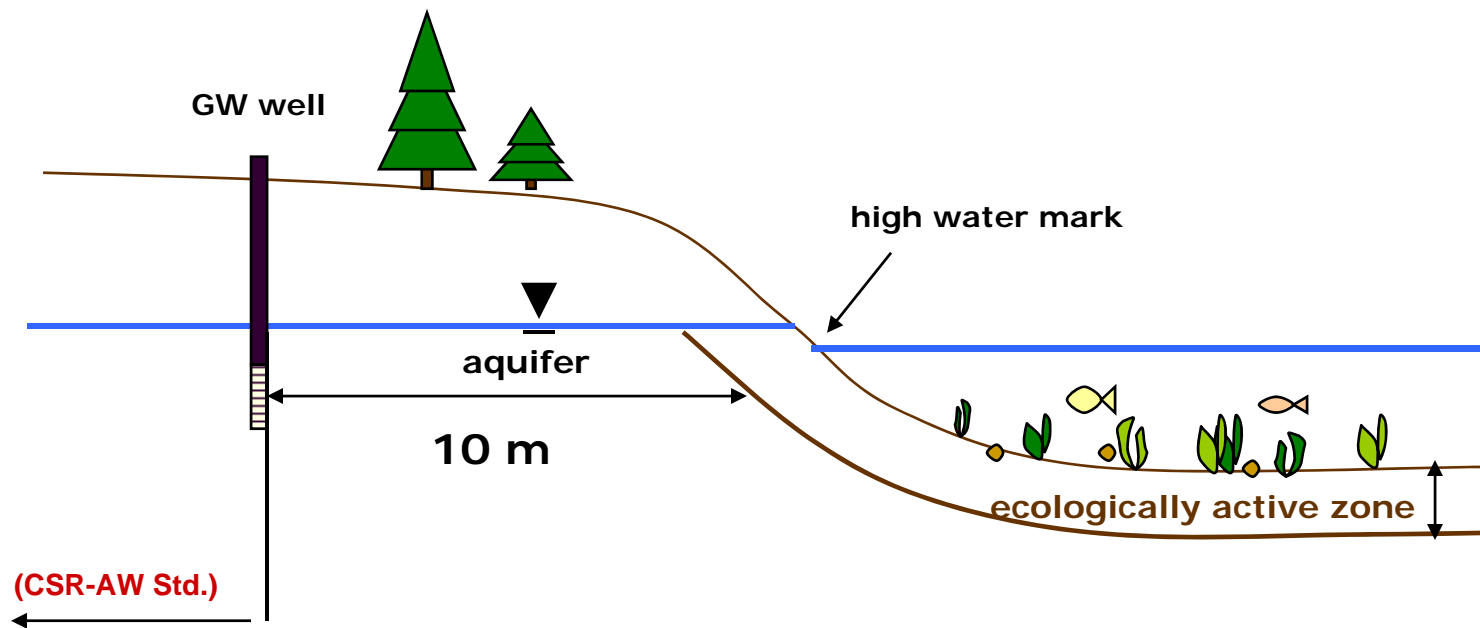
3 areas of compliance:

- Groundwater
- Ecologically Active Zone
- Surface Water

- The CSR AW standard is applied to groundwater located within 1 km or within the 50 year groundwater travel time (currently under review) to within 10 m of the **ecologically active zone** from the closest surface water containing aquatic life

Compliance: Groundwater

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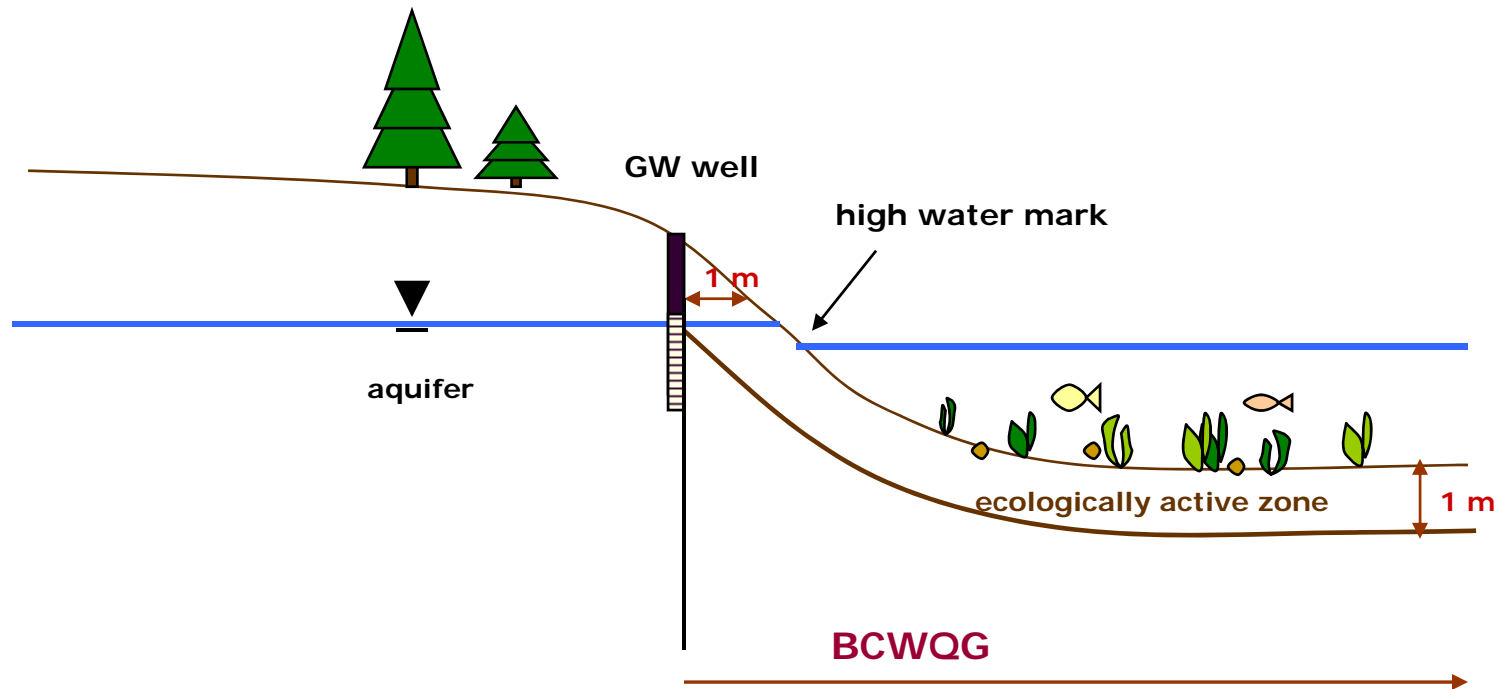


- Transition zone occurs where groundwater and surface water interact
- Transition zones often contain an ecologically active area where a variety of important ecological and physicochemical conditions and processes occur
- Ministry has defined the top 1 m of sediment as being ecologically active – “ecologically active zone”

- To ensure that the ecologically active zone is adequately protected, BCWQG should be met at 1 m inland of the high water mark or the last groundwater well before the receiving water body.

Compliance: Ecologically Active Zone

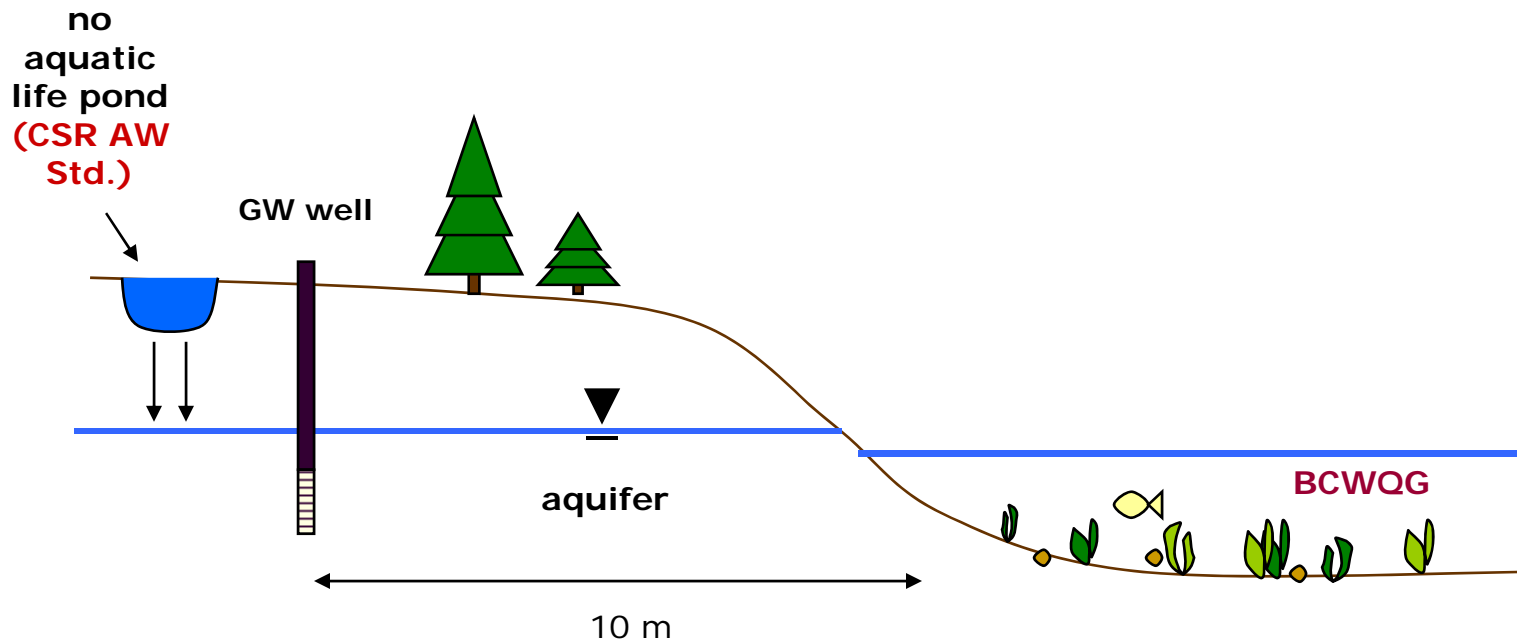
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- BCWQG apply to all surface water that supports aquatic life. 2 exceptions:
 1. Pooled water on a site located 10 m from the ecologically active zone that does not support aquatic life but is hydraulically connected by groundwater flow to a receiving water body
 2. Water on a site that does not support aquatic life but is hydraulically connected by surface flow to a receiving environment, but is not considered a receiving environment in itself (e.g. maintained watercourse)

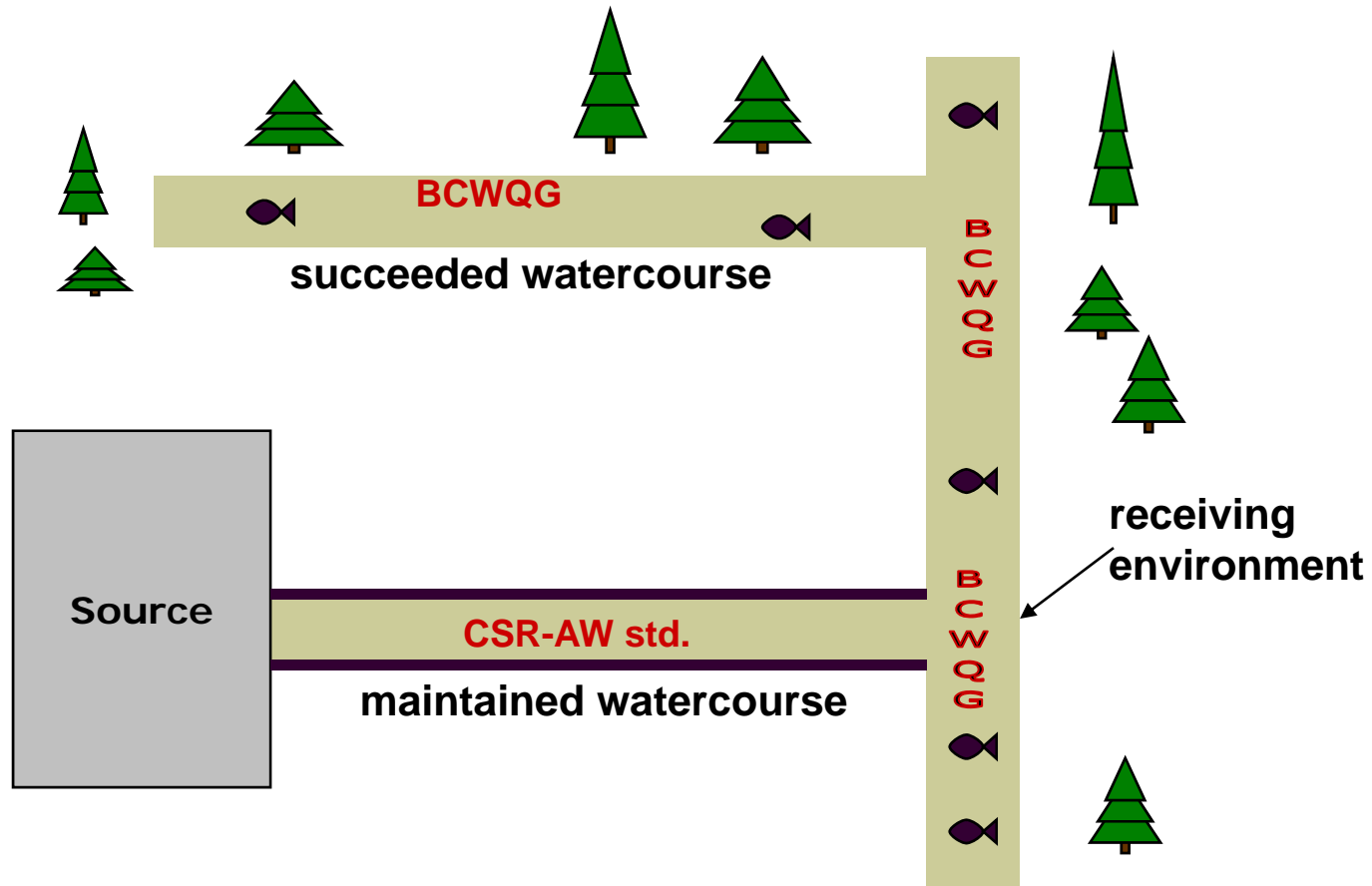
Compliance: Surface Water

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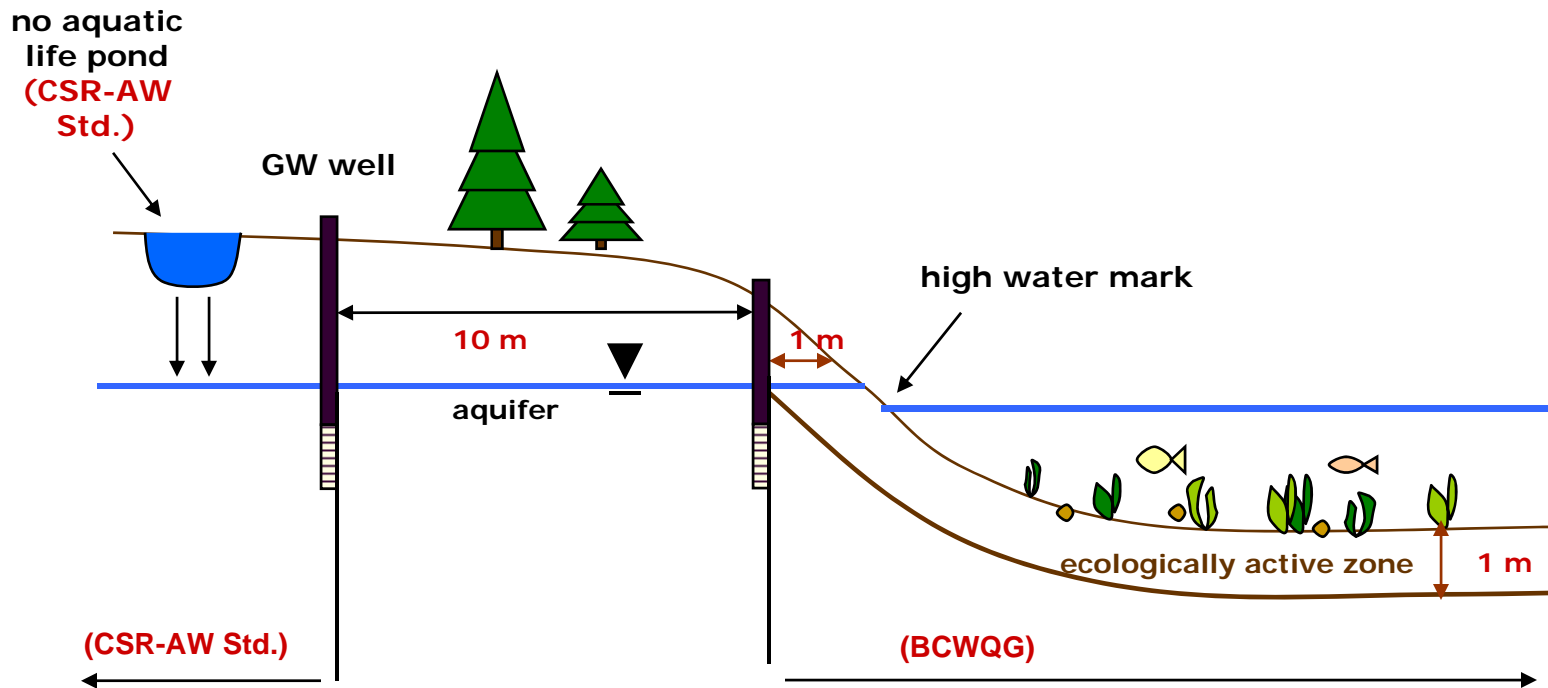
Compliance: Surface Water

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Compliance: Overview

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Policy Development:

Questions?

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