

Potential Water Quality Criteria for CGWAs

Statewide Working Group, 5/15/2024
Eric Sivers, Water Quality Division Policy Analyst



SWG Focus Areas

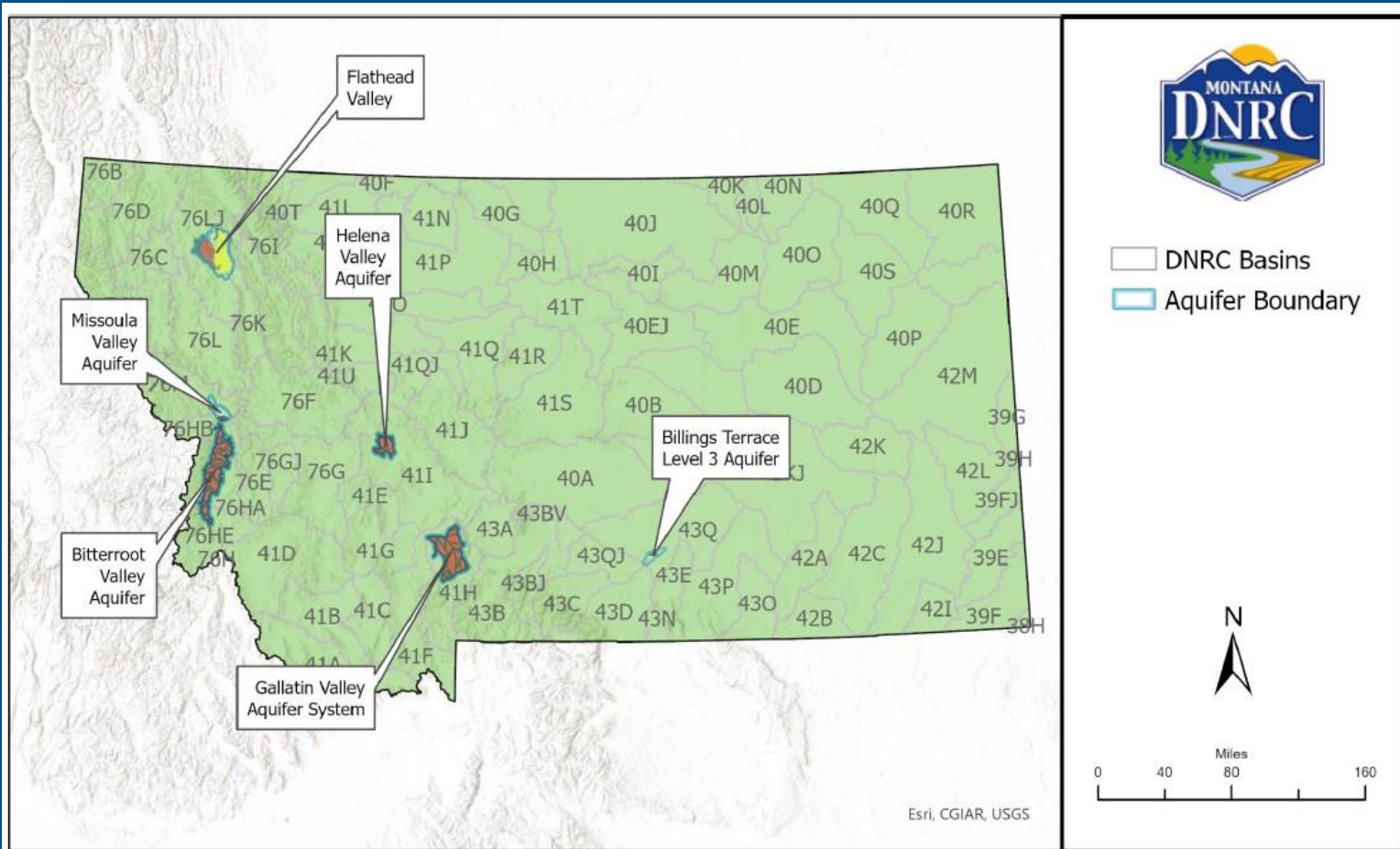


Figure 2: Location of focus areas- green, yellow, red draft (this in NOT final, just for example)

Water Quality Criteria

Framing the discussion:

DEQ				
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Aquifer Problem?		No, or Limited Problem	Moderate problem, enhanced study needed, some restrictions or controls are needed to reduce or reverse problem	Significant problem documented, restrictive controls are necessary to stop expansion of the problem
Groundwater Quality	Water quality in the source aquifer (groundwater track)	No documented water quality issues in the source aquifer	Detectable concentration of groundwater contaminants, but at safe levels below drinking water standards	Measured concentration of groundwater contaminants approaching or above drinking water standards
	Water quality in connected surface water (surface water track)	Groundwater use has no impact on surface water quality	Groundwater use potentially depletes surface water which may slightly exacerbate water quality issues	Groundwater use has documented/modeled depletion to surface water with measurable or modeled degradation of surface water quality beyond standards
DNRC				
Groundwater Quantity	Long-term record of water level data shows consistent decreases in water level in an aquifer that may indicate long-term over-extraction (non-sustainable aquifer).	No decreasing trend	A trend is observed but is statistically insignificant.	A statistically significant decreasing water level trend has been documented.
	Recharge (the transfer of atmospheric/surface water into the ground within the recharge area, an area of the aquifer where recharge is predominant over discharge). Consider local, subregional, and regional GW flow systems.	Recharge is from natural sources, is consistent or increasing, unaffected by extraction, and the recharge area is large.	Recharge is variable, and the variability is a result of climate, not extraction or artificial recharge. Recharge area is variable given source of recharge.	Natural recharge or artificial recharge is decreasing or, recharge is reliant on induced infiltration, or recharge area is affected by extraction, or the recharge area is small.
	Groundwater discharge trend, rate of discharge over time (e.g. decrease in baseflow for hydrologically connected sources).	No known information exists about groundwater discharge or no decreasing trend in groundwater discharge.	A groundwater discharge trend is observed but is statistically insignificant.	A statistically significant decrease in groundwater discharge has been documented.
	Aquifer storage potential (e.g., porosity, K, faulting/joint, saturated aquifer thickness, residence time of water, distance between hydrologic boundaries)	Formation or structure has a lot of storage or potential for storage (e.g. basin-fill alluvial aquifers).	Formation or structure with moderate storage or potential for storage.	Formation or structure with limited storage or potential for storage (e.g., bedrock aquifers, perched or shallow aquifers).

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Moderate problem, enhanced study needed, some restrictions or controls are needed to reduce or reverse problem	Significant problem documented, restrictive controls are necessary to stop expansion of the problem
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Recharge is variable, and the variability is a result of climate, not extraction or artificial recharge. Recharge area is variable given source of recharge.	Natural recharge or artificial recharge is decreasing or, recharge is reliant on induced infiltration, or recharge area is affected by extraction, or the recharge area is small.
A groundwater discharge trend is observed but is statistically insignificant.	A statistically significant decrease in groundwater discharge has been documented.
Formation or structure with moderate storage or potential for storage.	Formation or structure with limited storage or potential for storage (e.g., bedrock aquifers, perched or shallow aquifers).

Water Quality Criteria

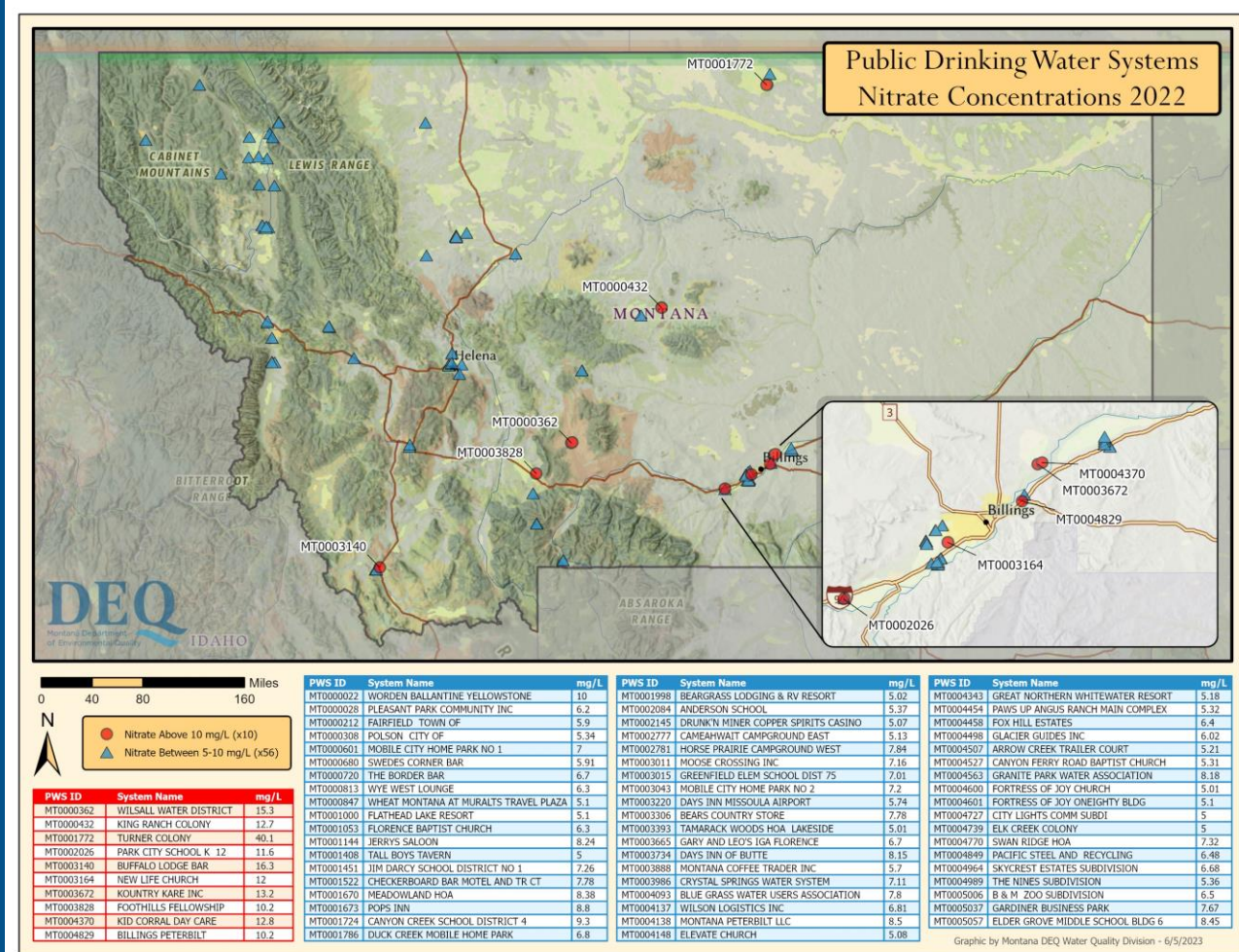
Challenges to characterizing GW quality

1. Lack of consistent monitoring / assessment framework
 - a. Groundwater
 - b. Surface water
2. Need for durable criteria that could apply for decades.

Examine these possibilities with existing tools:

- Public water supply groundwater data
- Septic system density
- Identified surface water quality issues and associated TMDLs
- Criteria in DEQ's rules

Public Water Supplies



Septic System Density

Source water delineation & assessments identified septic systems as a potential contaminant source. Hazard by density.

Table 8b. (MT SWPP Table 6) UNCONFINED AQUIFERS: Hazard of potential contaminant sources.

Potential Contaminant Source	High Hazard	Moderate Hazard	Low Hazard
Point Sources	Within 1 year TOT	Between 1 to 3 years TOT	Over 3 years TOT
Septic Systems	More than 300 per sq. mi.	50 – 300 per sq. mi.	Less than 50 per sq. mi.
Municipal Sanitary Sewer (percent land use)	More than 50 percent of region	20 to 50 percent of region	Less than 20 percent of region
Cropped Agricultural Land (percent land use)	More than 50 percent of region	20 to 50 percent of region	Less than 20 percent of region

Septic System Density

Multiple ways to determine this:

1. SWP reports used NRIS layer based on DOR data
2. MSL 2010 septic system density layer (census)
3. TMDLs used MSL structures layer

Surface Water & TMDLs

- DEQ has identified onsite wastewater as a contributor to 34 impaired waterbodies.
- DEQ has written 22 TMDLs including onsite wastewater in 11 documents.
- Caveat: DEQ's completed TMDLs reflects concerns over bull trout and Statewide TMDL Advisory Group priorities.
- SWG focus area TMDLs:
 1. Billings X
 2. Helena ✓ 2007
 3. Flathead Valley ✓ 2014
 4. Missoula & Bitterroot ✓ 2014
 5. Gallatin ✓ 2013

Nondegradation Rules

DEQ's nondegradation rules have a provision for restricting approval of septic systems, based on aquifer quality.

ARM 17.30.716 (6)(b)(iv)(A)

This criterion is established in rule and may present an off-the-shelf tool for assessing aquifer health.

Nondegradation Rules

(6) The department may determine that the categorical exclusion in (2) does not apply to lots within a specific geographic area. This determination must be based upon information submitted in a petition demonstrating that the categorical exclusions should not apply within that area.

(a) A petition submitted under this rule may be considered only if it is submitted by a local governing body, a local department or board of health, a local water quality district, or by either 10% or 20, whichever is fewer, of the landowners (or persons with a contract interest in land) within the affected geographic area.

(b) A petition submitted under this rule must contain the following information:

(i) a legal description of the petition area, which is the geographic area within which the categorical exclusions would not apply;

(ii) a detailed description of the soils, geology, and hydrogeology of the area described in (6) (b) (i) :

(iii) a current list of persons who either own or

(iv) data from ground water samples taken from wells that withdraw water from the uppermost aquifer underlying the petition area or from wells that withdraw water from the uppermost aquifer underlying an area within the same or adjacent county with similar climatic, soil, geologic, and hydrogeologic conditions and a density of individual sewage systems similar to that allowed in (2) (b) . The ground water data must demonstrate that one of the following conditions is met:

(A) nitrate as nitrogen concentrations exceed 5.0 mg/L in ground water samples from more than 25% of at least 30 wells that are not located within a standard mixing zone, as defined in ARM 17.30.517(1) (d) (i) .

(B) data from ground water samples collected at least three years apart from the same 15 wells indicate a statistically significant increase of greater than 1.0 mg/L in nitrate as nitrogen concentrations in the uppermost aquifer.

(c) Within 30 days of issue a preliminary decision, and describe the reasons must be mailed to the petitioner within the petition area and

(i) a description of the petition area;

(ii) a summary of the basis for the preliminary decision including any modifications to the boundaries of the petition area;

(iii) a description of the procedures for public participation and of the opportunity to comment prior to the department's final decision on the petition;

(iv) the ending dates of the comment period and the address where comments will be received;

(v) procedures for requesting a hearing; and

(vi) the name and telephone number of a person to contact for additional information.

(d) Within 60 days after the close of the public comment period, the department shall issue a final decision and provide written notice of its decision to the petitioner and to each person who submitted written comments. The final decision must set forth the department's reasons for granting or denying the petition and must include a response to all substantive comments received by the department during the public comment period or during any hearing.

(iv) data from ground water samples taken from wells that withdraw water from the uppermost aquifer underlying the petition area or from wells that withdraw water from the uppermost aquifer underlying an area within the same or adjacent county with similar climatic, soil, geologic, and hydrogeologic conditions and a density of individual sewage systems similar to that allowed in (2) (b) . The ground water data must demonstrate that one of the following conditions is met:

(A) nitrate as nitrogen concentrations exceed 5.0 mg/L in ground water samples from more than 25% of at least 30 wells that are not located within a standard mixing zone, as defined in ARM 17.30.517(1) (d) (viii) , for a septic system; or

(B) data from ground water samples collected at least three years apart from the same 15 wells indicate a statistically significant increase of greater than 1.0 mg/L in nitrate as nitrogen concentrations in the uppermost aquifer.

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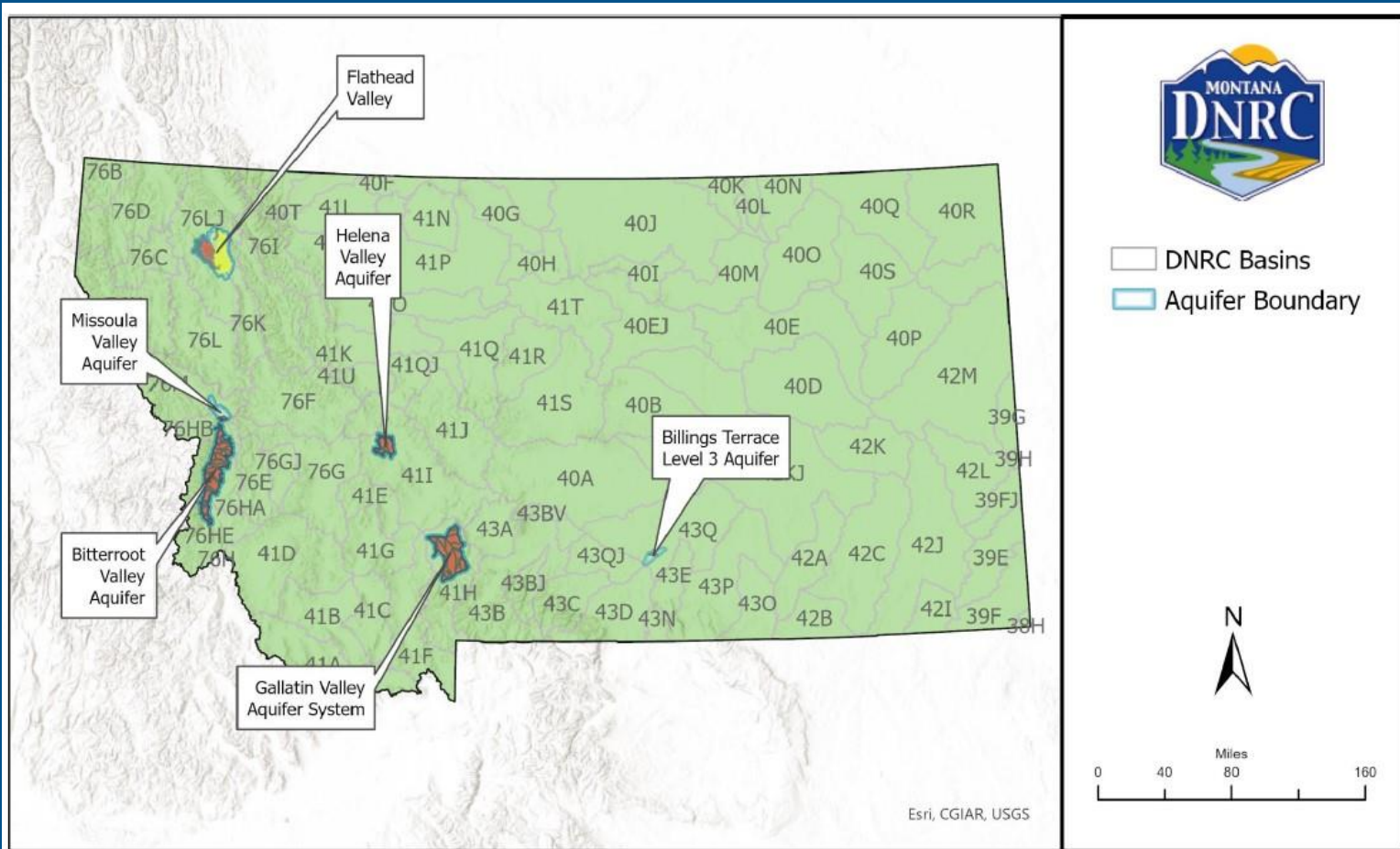


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Questions?

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