

**DEPARTMENT OF ENVIRONMENTAL QUALITY
Environmental Assessment**

Water Protection Bureau

Name of Project: Bozeman #9 Town Pump - Huffine Lane

Type of Project: Proposed discharge of treated domestic wastewater to ground water under the Montana Ground Water Pollution Control System (MGWPCS) permit program.

Location of Project: Southeast Section 08, Township 02 South, Range 5 East
Latitude: 45.67207, Longitude: -111.13411

City/Town: Bozeman

County: Gallatin

Description of Project: A determination has been made by DEQ to issue a new Montana Ground Water Pollution Control System (MGWPCS) permit to Bozeman Gooch Hill RE LLC for the proposed Bozeman #9 Town Pump - Huffine Lane facility. The proposed MGWPCS permit authorizes the collection, treatment, and discharge of treated wastewater into Class I ground water. All beneficial uses of the aquifer will be maintained.

The proposed treatment and discharge system will be located in between Bozeman and Four Corners on Huffine Lane (US Highway 191). The approximate address is 8440 Huffine Lane. All wastewater components will be located on property controlled by the Applicant.

The scope of this EA addresses the installation and operation of the proposed wastewater treatment and disposal system. The magnitude and significance of potential impacts are summarized below (bullet #26). Maps of the project are provided below.

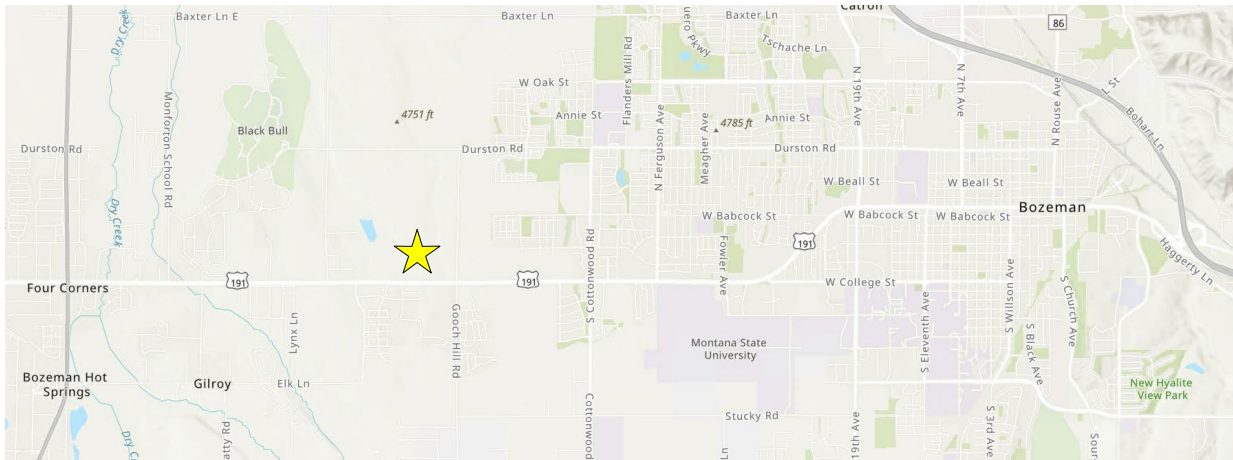


Figure 1. Regional Map



Figure 2. Vicinity Map

Agency Action and Applicable Regulations: The proposed action is to issue an individual MGWPCS permit that contains limitations, monitoring, and reporting requirements designed to protect the environment and public health. The associated MGWPCS fact sheet document (DEQ, 2022) further addresses these concerns and discusses the permitting actions in more detail. The permit is issued under the authority of the Montana Water Quality Act.

Summary of Issues: The permitting action is to regulate the discharges of pollutants to state waters from the proposed and regulated facility. Issuance of an individual discharge permit will require the permittee to implement, monitor, and manage practices to prevent pollution.

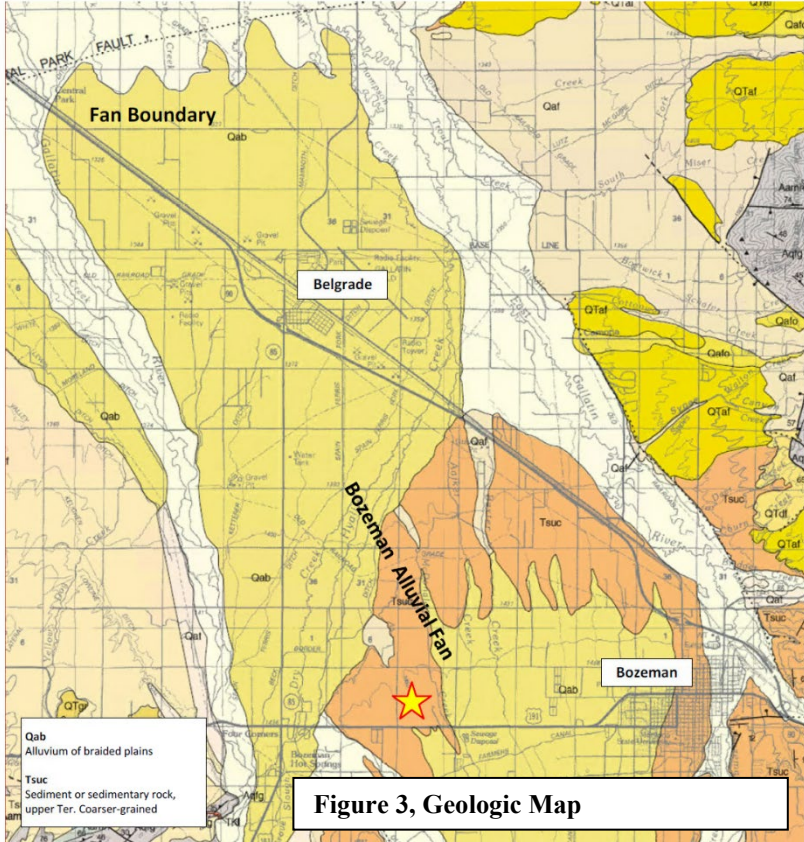
Affected Environment & Impacts of the Proposed Project:

Y = Impacts may occur (explain under Potential Impacts).

N = Not Present or No Impact will likely occur.

| IMPACTS ON THE PHYSICAL ENVIRONMENT | |
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| RESOURCE | [Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES |
| <p>1. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE: Are soils present which are fragile, erosive, susceptible to compaction, or unstable? Are there unusual or unstable geologic features? Are there special reclamation considerations?</p> | <p>[N]</p> <p>No significant impacts were identified by DEQ after a review of the Application, Research, and other Government Agency References in development of the Tentative Determination documents for the current MGWPCS (Montana Ground Water Pollution Control System) permit action (DEQ, 2022).</p> <p>A geotechnical investigation has been performed for the project. Prior to construction, DEQ will review soil data to determine that proper infiltration from the drainfield is met under the Sanitation in Subdivisions Act and/or the Public Water Supply Act.</p> <p>The proposed facility is located within the Bozeman Fan which is generally characterized to be braided alluvium deposits. The fan deposits start at the foothills of the Gallatin Mountains (South of Bozeman) and trends North, terminating approximately three miles North of the City of Belgrade. These sediment deposits are defined as unconsolidated coarse- to fine- grained sediment deposits of present streams. Shallow tertiary sediment deposits may overlie the alluvial deposits in the area of the proposed discharge site. These sediments include silt loam and silt clay. The underlying aquifer appears to be in the sand and gravel deposits of the alluvial fan (Figure 3).</p> |
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IMPACTS ON THE PHYSICAL ENVIRONMENT



2. WATER QUALITY, QUANTITY AND DISTRIBUTION: Are important surface or groundwater resources present? Is there potential for violation of ambient water quality standards, drinking water maximum contaminant levels, or degradation of water quality?

[N]
No significant impacts were identified by DEQ after a review of the Application, Research, and other Government Agency References in development of the Tentative Determination documents for the current MGWPCS permit action (DEQ, 2022).

In order to maintain beneficial uses of the aquifer, DEQ performed an analysis on the potential impacts that this project may have on the aquifer. The resulting projections indicate that the nitrate levels downgradient of the drainfield will meet water quality standards and that all beneficial uses will be maintained.

The facility covered under this permit must show evidence of treatment capable of meeting the established effluent limitation which was derived from the most restrictive ground water quality standards and significance criteria. This effluent limitation, along with special conditions and standard conditions of the permit has been developed to maintain the beneficial uses of all state ground

IMPACTS ON THE PHYSICAL ENVIRONMENT

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| | <p>waters including drinking water. Facilities must be able to meet this restrictive effluent limitation prior to discharge.</p> <p>A ground water monitoring network was established as part of the Applicant’s requirement to study site-specific hydrogeology at the facility. This network will be maintained to provide ongoing monitoring of the health of the aquifer as part of the MGWPCS permit. All reported data is available to the public.</p> <p>All discharge disposal structures must meet the minimum set back requirements which includes surface water, flood plains, ditches and springs. The applicant is encouraged to contact and consult with the Public Water, Subdivision and State Revolving Fund programs at DEQ: https://deq.mt.gov/water/Programs/eng</p> <p>Construction activities may impact water quality by contributing discharges of sediment to surface waters. The applicant may be required to obtain permit coverage under a Montana Pollutant Discharge Elimination System (MPDES) General Permit for Storm Water Discharges Associated with Construction Activity. The applicant may be required to develop and implement a Storm Water Pollution Prevention Plan (SWPPP) which includes best management practices to protect nearby surface waters. Additional information can be found at the following website: https://deq.mt.gov/water/assistance</p> |
| <p>3. AIR QUALITY: Will pollutants or particulate be produced? Is the project influenced by air quality regulations or zones (Class I airshed)?</p> | <p>[N]</p> <p>No significant impacts were identified by DEQ after a review of the Application, Research, and other Government Agency References in development of the Tentative Determination documents for the current MGWPCS permit action (DEQ, 2022).</p> <p>Best management practices are encouraged during construction of the treatment system and drainfield to mitigate particulates produced. For additional information, the applicant is encouraged to contact the Montana DEQ Air Resources Management Bureau: http://deq.mt.gov/Air</p> |

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4. VEGETATION COVER, QUANTITY AND QUALITY: Will vegetative communities be significantly impacted? Are any rare plants or cover types present?

[N]

No significant impacts were identified by DEQ after a review of the Application, Research, and other Government Agency References in development of the Tentative Determination documents for the current MGWPCS permit action (DEQ, 2022).

Based on a search of the Natural Heritage Database, there are no plant species listed as either S1 (at high risk), S2 (at risk), LE (listed endangered), or LT (listed threatened) within the immediate vicinity of the proposed facility.

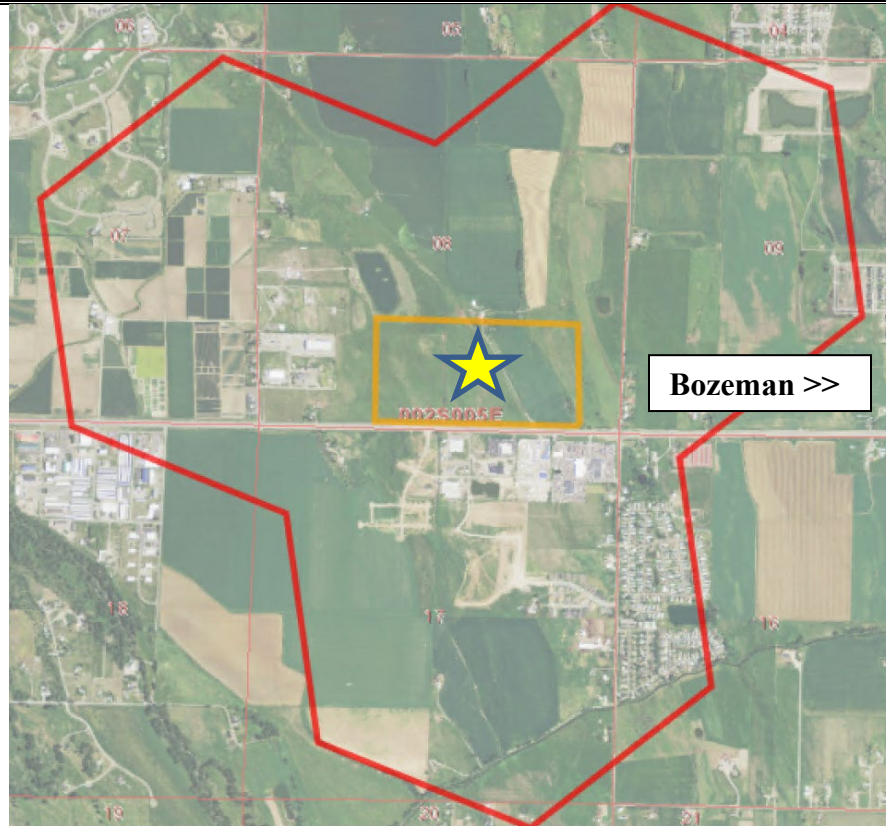
(<http://fieldguide.mt.gov/statusCodes.aspx#msrc:rank>).

There are three species of concern listed as being observed in the surrounding region. They are as follows:

- Dwarf Purple Monkeyflower (*Mimulus nanus*) is listed as S2 and was last observed in 1894 to the East of the project area near Bozeman.
- Fendler Cat's-eye (*Cryptantha fendleri*), S2, last observed in 1894 near Bozeman.
- Whipple's Beardtongue (*Penstemon whippleanus*), S2, last observed in 1961 near Bozeman.

The Natural Heritage site report map of the species is provided below. The orange area in the center of the map represents the location of the proposed facility site.

IMPACTS ON THE PHYSICAL ENVIRONMENT



5. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS: Is there substantial use of the area by important wildlife, birds or fish?

[N]

No significant impacts were identified by DEQ after a review of the Application, Research, and other Government Agency References in development of the Tentative Determination documents for the current MGWPCS permit action (DEQ, 2022).

Based on a search of the Natural Heritage Database, there are no animal species listed as either S1 (at high risk), S2 (at risk), LE (listed endangered), or LT (listed threatened) in the immediate vicinity of the proposed facility.

(<http://fieldguide.mt.gov/statusCodes.aspx#msrc:rank>).

There are seven species of concern listed as being observed in the surrounding region. They are as follows:

- Grizzly Bear (*Ursus arctos*) is listed as S2 and LT regionally within their general habitat.
- Suckley Cuckoo Bumble Bee (*Bombus suckleyi*), S1, last observed in 1985 to the East of the project near Bozeman.
- Hooked Snowfly (*Isocapnia crinita*), S2, last observed in 1988 near Bozeman.

IMPACTS ON THE PHYSICAL ENVIRONMENT

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| | <ul style="list-style-type: none"> • Alberta Snowfly (<i>Isocapnia integra</i>), S2, last observed in 1990 near Bozeman. |
| <p>6. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES: Are any federally listed threatened or endangered species or identified habitat present? Any wetlands? Species of special concern?</p> | <p>[N] No significant impacts were identified by DEQ after a review of the Application, Research, and other Government Agency References in development of the Tentative Determination documents for the current MGWPCS permit action (DEQ, 2022).</p> <p>Please refer to #4 and #5 above. The land has been used historically for agricultural practices.</p> <p>All discharge disposal structures must meet the minimum set back requirements which include surface water, flood plains, ditches and springs. The applicant is encouraged to contact and consult with the Public Water, Subdivision, or State Revolving Fund programs at DEQ: http://deq.mt.gov/Water/SurfaceWater/DesignApprovals</p> <p>Site and habitat inventories for the applicable species were recommended in consultation with the Montana Natural Heritage Program. The applicant is encouraged to contact and consult with this program or other Natural Resource Information Programs available at the Montana State Library: http://nris.msl.mt.gov/</p> |
| <p>7. SAGE GROUSE EXECUTIVE ORDER: Is the project proposed in core, general or connectivity sage grouse habitat, as designated by the Sage Grouse Habitat Conservation Program (Program) at: https://sagegrouse.mt.gov/</p> | <p>[N] No significant impacts were identified by DEQ after a review of the Application, Research, and other Government Agency References in development of the Tentative Determination documents for the current MGWPCS permit action (DEQ, 2022).</p> <p>The project site is not listed as being located within sage grouse habitat. DEQ referred to the Habitat and Occurrence mapping program at https://sagegrouse.mt.gov/projects/. If there are questions about Sage Grouse at this site, the applicant must contact and consult with the Sage Grouse Habitat Conservation Program at: https://sagegrouse.mt.gov/.</p> |

IMPACTS ON THE PHYSICAL ENVIRONMENT

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| <p>8. HISTORICAL AND ARCHAEOLOGICAL SITES: Are any historical, archaeological or paleontological resources present?</p> | <p>[N] No significant impacts were identified by DEQ after a review of the Application, Research, and other Government Agency References in development of the Tentative Determination documents for the current MGWPCS permit action (DEQ, 2022).</p> <p>A general recommendation by the Montana State Historic Preservation Office (MSHPO) states that in the event that cultural materials are inadvertently discovered, the permittee should contact the MSHPO office for investigation.</p> |
| <p>9. AESTHETICS: Is the project on a prominent topographic feature? Will it be visible from populated or scenic areas? Will there be excessive noise or light?</p> | <p>[N] No significant impacts were identified by DEQ after a review of the Application, Research, and other Government Agency References in development of the Tentative Determination documents for the current MGWPCS permit action (DEQ, 2022).</p> <p>The wastewater treatment facility will be enclosed within buildings located on pre-disturbed lands previously used for agriculture practices. The proposed drainfields may be subsurface and largely not visible.</p> |
| <p>10. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR, OR ENERGY: Will the project use resources that are limited in the area? Are there other activities nearby that will affect the project? Will new or upgraded power line or other energy source be needed?</p> | <p>[Y] Construction of the facility may result in a greater local demand for water from the local aquifer.</p> <p>The regional shallow aquifer is the source for most of the water wells in the area. Upon treatment, the wastewater is discharged to the subsurface eventually migrating back to the aquifer.</p> |
| <p>11. IMPACTS ON OTHER ENVIRONMENTAL RESOURCES: Are there other activities nearby that will affect the project?</p> | <p>[N] No significant impacts were identified by DEQ after a review of the Application, Research, and other Government Agency References in development of the Tentative Determination documents for the current MGWPCS permit action (DEQ, 2022).</p> |

IMPACTS ON THE HUMAN ENVIRONMENT

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| <p>12. HUMAN HEALTH AND SAFETY: Will this project add to/or reduce health and safety risks in the area?</p> | <p>[N] No significant impacts were identified by DEQ after a review of the Application, Research, and other Government Agency</p> |
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| IMPACTS ON THE HUMAN ENVIRONMENT | |
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| | References in development of the Tentative Determination documents for the current MGWPCS permit action (DEQ, 2022). |
| 13. INDUSTRIAL, COMMERCIAL AND AGRICULTURAL ACTIVITIES AND PRODUCTION: Will the project add to or alter these activities? | [Y] The facility will be built on land that may have been historically used for agricultural purposes. |
| 14. QUANTITY AND DISTRIBUTION OF EMPLOYMENT: Will the project create, move or eliminate jobs? If so, estimated number. | [Y] The construction of the wastewater collection, treatment, and disposal system may result in the creation of several temporary jobs for construction. The operation and maintenance of the wastewater treatment system may also result in permanent jobs. |
| 15. LOCAL AND STATE TAX BASE AND TAX REVENUES: Will the project create or eliminate tax revenue? | [Y] The project may change the land use for the proposed area of the facility. |
| 16. DEMAND FOR GOVERNMENT SERVICES: Will substantial traffic be added to existing roads? Will other services (fire protection, police, schools, etc.) be needed? | [N] No significant impacts were identified by DEQ after a review of the Application, Research, and other Government Agency References in development of the Tentative Determination documents for the current MGWPCS permit action (DEQ, 2022). |
| 17. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS: Are there State, County, City, USFS, BLM, Tribal, etc. zoning or management plans in effect? | [N] No significant impacts were identified by DEQ after a review of the Application, Research, and other Government Agency References in development of the Tentative Determination documents for the current MGWPCS permit action (DEQ, 2022). |
| 18. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES: Are wilderness or recreational areas nearby or accessed through this tract? Is there recreational potential within the tract? | [N] No significant impacts were identified by DEQ after a review of the Application, Research, and other Government Agency References in development of the Tentative Determination documents for the current MGWPCS permit action (DEQ, 2022). |
| 19. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING: Will the project add to the population and require additional housing? | [N] No significant impacts were identified by DEQ after a review of the Application, Research, and other Government Agency References in development of the Tentative Determination documents for the current MGWPCS permit action (DEQ, 2022). |
| 20. SOCIAL STRUCTURES AND MORES: Is some disruption of native or traditional lifestyles or communities possible? | [N] No significant impacts were identified by DEQ after a review of the Application, Research, and other Government Agency |

| IMPACTS ON THE HUMAN ENVIRONMENT | |
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| | References in development of the Tentative Determination documents for the current MGWPCS permit action (DEQ, 2022). |
| 21. CULTURAL UNIQUENESS AND DIVERSITY: Will the action cause a shift in some unique quality of the area? | [N] No significant impacts were identified by DEQ after a review of the Application, Research, and other Government Agency References in development of the Tentative Determination documents for the current MGWPCS permit action (DEQ, 2022). |
| 22. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES: | [N] No significant impacts were identified by DEQ after a review of the Application, Research, and other Government Agency References in development of the Tentative Determination documents for the current MGWPCS permit action (DEQ, 2022). |
| 23(a). PRIVATE PROPERTY IMPACTS: Are we regulating the use of private property under a regulatory statute adopted pursuant to the police power of the state? (Property management, grants of financial assistance, and the exercise of the power of eminent domain are not within this category.) If not, no further analysis is required. | [N] No significant impacts were identified by DEQ after a review of the Application, Research, and other Government Agency References in development of the Tentative Determination documents for the current MGWPCS permit action (DEQ, 2022). |
| 23(b). PRIVATE PROPERTY IMPACTS: Is the agency proposing to deny the application or condition the approval in a way that restricts the use of the regulated person's private property? If not, no further analysis is required. | [N] No significant impacts were identified by DEQ after a review of the Application, Research, and other Government Agency References in development of the Tentative Determination documents for the current MGWPCS permit action (DEQ, 2022). |
| 23(c). PRIVATE PROPERTY IMPACTS: If the answer to 23(b) is affirmative, does the agency have legal discretion to impose or not impose the proposed restriction or discretion as to how the restriction will be imposed? If not, no further analysis is required. If so, the agency must determine if there are alternatives that would reduce, minimize or eliminate the restriction on the use of private property, and analyze such alternatives. The agency must disclose the potential costs of identified restrictions. | [N] No significant impacts were identified in #23b. |

24. **Description of and Impacts of other Alternatives Considered:**

- A. No Action: Under the “No Action” alternative, the Department would not issue this ground water discharge permit. “No Action” may decrease the likelihood of the creation of a centralized wastewater system. Without the creation of a centralized system, ongoing (on-site) monitoring of the health of the aquifer is not likely.
- B. Approval with Modification: The Department has not identified any necessary modifications to grant approval. The centralized wastewater treatment system is capable of meeting the most restrictive standards prior to discharge (at end-of-pipe).

25. **Cumulative Effects:**

DEQ evaluated the fate of nitrogen (in the form of nitrate) associated with the discharge of wastewater from the proposed facility. DEQ recognizes that ground water and surface waters are hydraulically connected in the Gallatin Valley. Research indicates that the principal surface and ground water discharge point of the Gallatin Fan is the Gallatin River located approximately 12 miles downgradient from the proposed outfall.

DEQ performed an attenuation study to determine potential losses of nitrogen due to naturally occurring denitrifying conditions in the subsurface. The result of the evaluation is as follows. The Gallatin River generally flows in parallel with the receiving aquifer (Slagle, 1995). The Bozeman Fan (receiving aquifer) terminates approximately 12 miles to the North-Northwest near where Interstate I-90 crosses the Gallatin River (2002, Vuke). Using Darcy’s Law, it takes approximately 11 to 17 years for ground water to travel from the project site to this area (Freeze, 1979). During that time, nitrate naturally decays from biogeochemical processes that occur in the aquifer (McCray, 2005). DEQ performed three analyses with the following results:

- Nitrate will decay to non-detect levels (0.01 mg/L) within 8,985 to 13,933 feet of the outfall, which is approximately 10.3 to 9.4 miles away from the Gallatin River.
- Nitrate will decay to below the numerical surface water quality standard (0.3 mg/L) within 3,768 to 5,843 feet of the outfall, which is approximately 11.4 to 11 miles away from the Gallatin River. *[At the time of drafting, numeric surface water standards were no longer in effect due to recent legislation. In order to preserve the analyses moving forward, DEQ will be conservative and temporarily use the former aquatic standard listed in 2019’s Circular DEQ-7.]*
- Nitrate will decay to natural ambient levels (1 mg/L, conservatively) within 1,922 to 2,980 feet of the outfall. This occurs at approximately 11.7 to 11.4 miles away from the Gallatin River.

DEQ was conservative in these predictions as it did not include additional reduction that occurs in the vadose and hyporheic zones. These projection tables are included in Appendix E of the MGWPCS Fact Sheet document (DEQ, 2022).

There are only three houses located within one mile downgradient of the proposed outfall. Aquifer impacts from the discharge of these two septic systems within this large area is seen as negligible due to dilution and natural attenuation. In addition, impacts

from any potential upgradient source may also be negligible as ambient nitrate concentrations are well within natural occurring levels (1-2 mg/L).

DEQ considered the direct, secondary, and cumulative environmental impacts of the construction and operation of the facility and found no significant adverse effects on water quality, the human environment, and the physical environment. The DEQ analysis included the cumulative impact from other past and present actions.

These projections also demonstrate that nitrate in ground water will not result in degradation of the nearest surface water. It also determined that measurable impacts to surface water is not expected.

All major discharge permitting actions, including the current action and any future actions, will include any substantive information derived from public input relating to potential impacts on the human environment and on water quality. All future actions related to this current action will be addressed by DEQ through additional discharge permitting process procedures. Any actions that are outside the purview of the discharge permit may not be addressed by DEQ until the next permitting action takes place.

To protect beneficial uses, there shall be no increase of a pollutant to a level that renders the waters harmful, detrimental, or injurious. Therefore, no wastewaters may be discharged such that the wastewater either alone or in combination with other wastes will violate or can reasonably be expected to violate any standard. The allowable discharge will be derived from a mass-balance equation that determines the assimilative capacity of the receiving aquifer. Testing of the aquifer was completed to determine the existing impacts of all upgradient discharge sources. This ambient data represents the cumulative impacts of all existing upgradient discharges in the receiving aquifer.

A ground water monitoring network has been established that will provide for long-term monitoring of the aquifer. The ground water data collected will provide continual monitoring of the health of the aquifer including the impacts of any upgradient dischargers. This data is made available to the public for their viewing and will be used by DEQ to update future permit limitations. In addition, any update to limitations, including cumulative effect analyses, will be noticed to the public and will undergo public comment.

Long-term monitoring and reporting, renewed analysis and updates of permit conditions, and public notice and comment procedures is a benefit to having a system that is covered under a Pollution Control System permit.

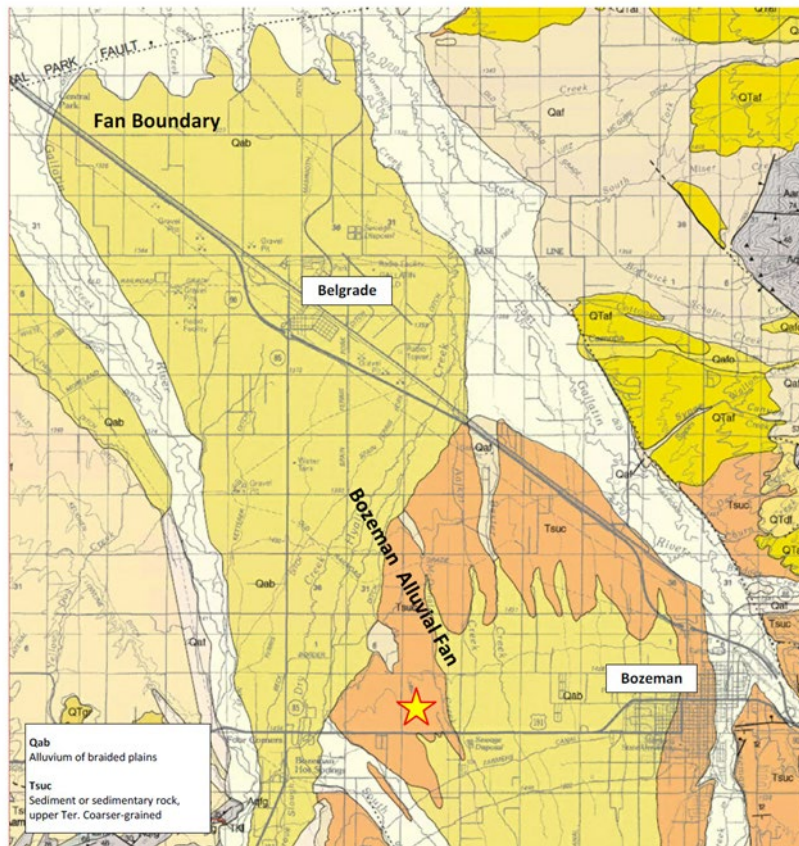


Figure 4. Geologic Map

26. **Summary of Magnitude and Significance of Potential Impacts:**

Impacts were assessed with the assumption that the facility will comply with the terms and conditions of the permit. Violations of the permit could lead to significant adverse impacts to state waters. Violations of the permit are not an effect of the agency action since the permit itself forbids such activities. However, the Department has taken steps to ensure that violations do not occur. The Department provides technical assistance to permittees for operation and maintenance, and also in understanding and implementing the requirements of the permit. The Department also conducts periodic inspections of permitted facilities, and identifies potential problems with design or management practices. If violations of the permit do occur, the Department will take appropriate action under the Montanan Water Quality Act. Enforcement sanctions for violations of the permit include injunctions, civil and administrative penalties, and cleanup orders.

27. **Preferred Action Alternative and Rationale:** The preferred action is to issue an individual MGWPCS discharge permit. This action is preferred since the permit provides a regulatory mechanism for protecting ground water quality by applying limitations and long-term monitoring requirements.

Recommendation for Further Environmental Analysis:

EIS More Detailed EA No Further Analysis

Rationale for Recommendation: An EIS is not required under the Montana Environmental Policy Act because the project lacks significant adverse and cumulative effects to the human and physical environment.

28. **Public Involvement:**

Legal notice information for water quality discharge permits are listed at the following website: <http://deq.mt.gov/Public/notices/wqnotices>. Public comments on this proposal are invited any time prior to close of business on **March 8, 2023**. Comments may be directed to:

DEQWPBPublicComments@mt.gov

or to:

Montana Department of Environmental Quality
Water Protection Bureau
PO Box 200901
Helena, MT 59620

All comments received or postmarked prior to the close of the public comment period will be considered in the formulation of the final permit. DEQ will respond to all substantive comments pertinent to this permitting action and may issue a final decision within thirty days of the close of the public comment period.

All persons, including the applicant, who believe any condition of the draft permit is inappropriate, or that DEQ's tentative decision to deny an application, terminate a permit, or prepare a draft permit is inappropriate, shall raise all reasonably ascertainable issues and submit all reasonably available arguments supporting their position by the close of the public comment period (including any public hearing). All public comments received for this draft permit will be included in the administrative record and will be available for public viewing during normal business hours.

Copies of the public notice are mailed to the applicant, state and federal agencies, and interested persons who have expressed interest in being notified of permit actions. A copy of the distribution list is available in the administrative record for this draft permit. Electronic copies of the public notice, draft permit, fact sheet, and draft environmental assessment are available at the following website:
<http://deq.mt.gov/Public/notices/wqnotices>.

Any person interested in being placed on the mailing list for information regarding this permit may contact the DEQ Water Protection Bureau at (406) 444-5546 or email DEQWPBPublicComments@mt.gov. All inquiries will need to reference the permit number (MTX000292), and include the following information: name, address, and phone number.

During the public comment period provided by the notice, DEQ will accept requests for a public hearing. A request for a public hearing must be in writing and must state the nature of the issue proposed to be raised in the hearing.

29. **Persons and/or Agencies Consulted or Referenced in the Preparation of this Analysis:**

40 CFR § 136. Guidelines Establishing Test Procedures for the Analysis of Pollutants. 2011.

Administrative Rules of Montana, Title 17, Chapter 30, Water Quality:

- Subchapter 2 - Water Quality Permit Fees.
- Subchapter 5 – Mixing Zones in Surface and Ground Water.
- Subchapter 7 – Nondegradation of Water Quality.
- Subchapter 10 – Montana Ground Water Pollution Control System.
- Subchapter 13 – Montana Pollutant Discharge Elimination System.

Bauder, J.W., et. al. 1993. Physiographic and land use characteristics associated with nitrate nitrogen in Montana ground water: *Journal of Environmental Quality*, v. 22, 99. 255-262.

Brady, N.C. and R. R. Weil. 2004. *Elements of the Nature and Properties of Soils* 2nd Edition. Prentice Hall. Upper Saddle River, NJ.

Crowley et al., 2017. Montana Bureau of Mines and Geology (MBMG), Principal Aquifers of Montana, MBMG Hydrogeologic Map 11.

Department of Environmental Quality, Water Quality Circulars:

- Circular DEQ-2 – Design Standards for Wastewater Facilities.
- Circular DEQ-4 – Montana Standards for On-Site Subsurface Sewage Treatment Systems.
- Circular DEQ-7 – Montana Numeric Water Quality Standards, Required Reporting Values, and Trigger Values.

Driscoll, F.G. 1986. *Groundwater and Wells* 2nd Edition. Johnson Division. St. Paul, Minnesota.

Fetter, C.W., *Applied Hydrogeology*, 1994.

Freeze, R., and Cherry, J., *Groundwater*, 1979.

Kendy, E. and R.E. Tresch. 1996. *Geographic, Geologic, and Hydrologic Summaries of Intermontane Basins of the Northern Rocky Mountains, Montana*. USGS Water-Resources Investigations Report: 96-4025.

Montana Bureau of Mines and Geology, Ground-Water Information Center, GWIC state well database, <http://mbmaggwic.mtech.edu>.

Montana Bureau of Mines and Geology, Standard Procedures and Guidelines for Field Activities, Open-File Report 746, p.96. <http://www.mbmng.mtech.edu/mbmgcat/catmain.asp>

Montana Department of Environmental Quality, Montana Ground Water Pollution Control System MTX000292. 2022 Administrative record.

Montana Code Annotated, Title 75, Chapter 5, *Montana Water Quality Act*, 2011.

National Research Council, 1996. Use of Reclaimed Wastewater. Chapter 5, Public Health Concerns About Infectious Disease Agents, Use of Reclaimed Water and Sludge in Food Crop Production. Washington, DC: The National Academies Press. <https://doi.org/10.17226/5175>.

Ohio Environmental Protection Agency, Technical Guidance Manual for Ground Water Investigations. 2007. http://www.epa.ohio.gov/ddagw/gw_support.

U.S. Environmental Protection Agency, Effluent Limitation Guidelines, <http://water.epa.gov/scitech/wastetech/guide/>, 2013.

U.S. Environmental Protection Agency, Guidance Manual for Developing Best Management Practices <http://www.epa.gov/npdes/pubs/owm0274.pdf>, 1993.

U.S. Environmental Protection Agency, 2018. Exposure Pathways to High-Consequence Pathogens in the Wastewater Collection and Treatment Systems. EPA/600/R-18/221. Office of Research and Development, Homeland Security Research Program, Cincinnati, OH 45268.

U.S. Environmental Protection Agency, 1991. Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells. EPA160014-891034. Office of Research and Development, Las Vegas, NV.

U.S. Environmental Protection Agency, 2013. Monitoring for Microbial Pathogens and Indicators. Tech Notes 9, National Nonpoint Source Monitoring Program. Developed for U.S. Environmental Protection Agency by Tetra Tech, Inc., Fairfax, VA.

U.S. Environmental Protection Agency, 2010. NPDES Permit Writers' Manual, 833-K-10-001.

U.S. Environmental Protection Agency. Protecting Underground Sources of Drinking Water from Underground Injection. Large-Capacity Cesspools. <https://www.epa.gov/uic/large-capacity-cesspools>.

U.S. Environmental Protection Agency, 2002b. Onsite Wastewater Treatment Systems Manual, 625/R-00/008, Office of Research and Development and Office of Water. Washington, DC.

U.S. Environmental Protection Agency, 1991. Suggested Operating Procedures for Aquifer Pumping Tests. EPA-540/S-93/503. Office of Research and Development, Washington, DC.

U.S. Environmental Protection Agency, 1991. Technical Support Document for Water Quality-Based Toxics Control (TSD). EPA-505/2-90-001. Office of Water, Washington, DC.
www.epa.gov/npdes/pubs/owm0264.pdf

U.S. Environmental Protection Agency, 2009. Unified Guidance: Statistical Analysis of Ground Water Data. EPA-530/R-09-007. Office of Resource Conservation and Recovery, Washington, DC.

U.S. Geological Survey, Basic Ground Water Hydrology,
<http://pubs.usgs.gov/wsp/2220/report.pdf>, 2016.

U.S. Geological Survey, Groundwater Basics, <http://water.usgs.gov/ogw/basics.html>, 2016.

U.S. Geological Survey, Hydrogeology of the Helena Valley-Fill Aquifer System, West-Central Montana. Briar, D., and Madison, J. 1992. Water-Resources Investigations Report 92-4023.

Woessner, W., Troy, T., Ball, P. and D.C. DeBorde. 1998. Virus Transport in the Capture Zone of a Well Penetrating a High Hydraulic Conductivity Aquifer Containing a Preferential Flow Zone: Challenges to Natural Disinfection. In Proc. Source Water Protection Int., Dallas, TX. 28–30 Apr. 1998. National Water Research Inst., Fountain Valley, CA.

Vuke, et al., Montana Bureau of Mines and Geology, Geologic Map of the Gallatin Valley, Bozeman 30' x 60' Quadrangle, Southwestern Montana. Open File No. 469, 2007.

Vuke, et al., Montana Bureau of Mines and Geology, Geologic Map of Montana, Geologic Map 62, 2007.

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