Montana Department of Environmental Quality

Water Protection Bureau
P.O. Box 200901
Helena, MT 59620-0901

PERMIT FACT SHEET

MONTANA GROUND WATER POLLUTION CONTROL SYSTEM (MGWPCS)

Permittee:	Peak Health and Wellness Center LLC.
Permit Number:	MTX000213
Permit Type:	Domestic wastewater
Application Type:	Renewal
Facility Name:	Peak Health and Wellness Center
Facility Location:	SW ¼ S2, T12N, R20W, Missoula County Latitude: 46.82423°, Longitude: -114.07780°
Facility Address:	5000 Blue Mountain Road, Missoula, MT 59804
Facility Contact:	Charlie Eiseman, Partner; Jason Rice, Territorial Landworks
Treatment Type:	Level 2
Receiving Water:	Class I Ground Water
Number of Outfalls:	1
Outfall / Type:	001 / subsurface pressurized drainfield
Effluent Type:	Domestic strength wastewater
Mixing Zone:	Standard
Effluent Limit Type:	WQBEL
Effluent Limits:	Outfall 001, Total nitrogen: 0.76 lbs/day Outfall 002, Total nitrogen: 0.29 lbs/day Outfall 003, Total nitrogen: 0.13 lbs/day
Flow Rate:	Outfall 001, Design maximum: 12,136 gpd Outfall 002, Design maximum: 4,500 gpd Outfall 003, Design maximum: 2,000 gpd
Effluent sampling:	Quarterly, EFF-001, EFF-002, EFF-003
Ground water sampling:	Outfall 001 – MW-B3, Quarterly Outfall 002 – One monitoring well down gradient. Quarterly Outfall 003 – One monitoring well down gradient. Quarterly
Fact Sheet Date:	September 2020
Prepared By:	Darryl Barton

1.0 PERMIT INFORMATION

DEQ issues MGWPCS permits for a period of five years. The permit may be reissued at the end of the period, subject to reevaluation of the receiving water quality and permit limitations. This fact sheet provides the basis for DEQ's decision to renew a MGWPCS wastewater discharge permit to Peak Health and Wellness Center LLC. for the Peak Health and Wellness Center wastewater treatment system.

1.1 APPLICATION

DEQ received an application for permit renewal on March 20, 2020. Renewal fees accompanied the application. The application was deemed incomplete and notification was sent April 15. Supplementary information was provided by the applicant. DEQ reviewed the submittal and issued a completeness letter on May 8, 2020.

1.2 PERMIT HISTORY

Peak Health & Wellness Center LLC was issued a permit to discharge August 1, 2009. The renewal permit (prior permit) became effective November 1, 2015.

1.3 CHANGES TO THIS PERMIT

The effluent limitation for nitrogen has been recalculated to reflect updated ambient nitrogen concentration. This permit contains effluent limitations for the new source. Effluent limits are discussed in **Section 5**. This permit contains significance projections in relation to an increased flow and new source being developed by the applicant (**Section 3**). Groundwater monitoring for the increased flows and the new source has changed. Groundwater monitoring is discussed in **Section 6**.

2.0 FACILITY INFORMATION

2.1 LOCATION

Peak Health and Wellness is a fitness facility about one mile south of Missoula on the north side of Highway 93 South. In addition to the fitness center, the treatment system receives water from a tennis facility, and the Watson's Children Shelter. The property is about 10 acres of commercial land. B&M Zoo LLC owns the property that contains the Watson Children's Center. This property is being subdivided into 18 residential lots over two phases: B&M Zoo (Phase 1) and Vaeroy Addition Subdivision (Phase 2). The design capacity for the system is 12,136 gpd. Currently, the system has enough capacity to connect Phase 1 discharge to the current system and outfall. Phase 2 will be developing a new outfall to handle wastewater discharge.

Figure 1. Location of Peak Health and Wellness Center

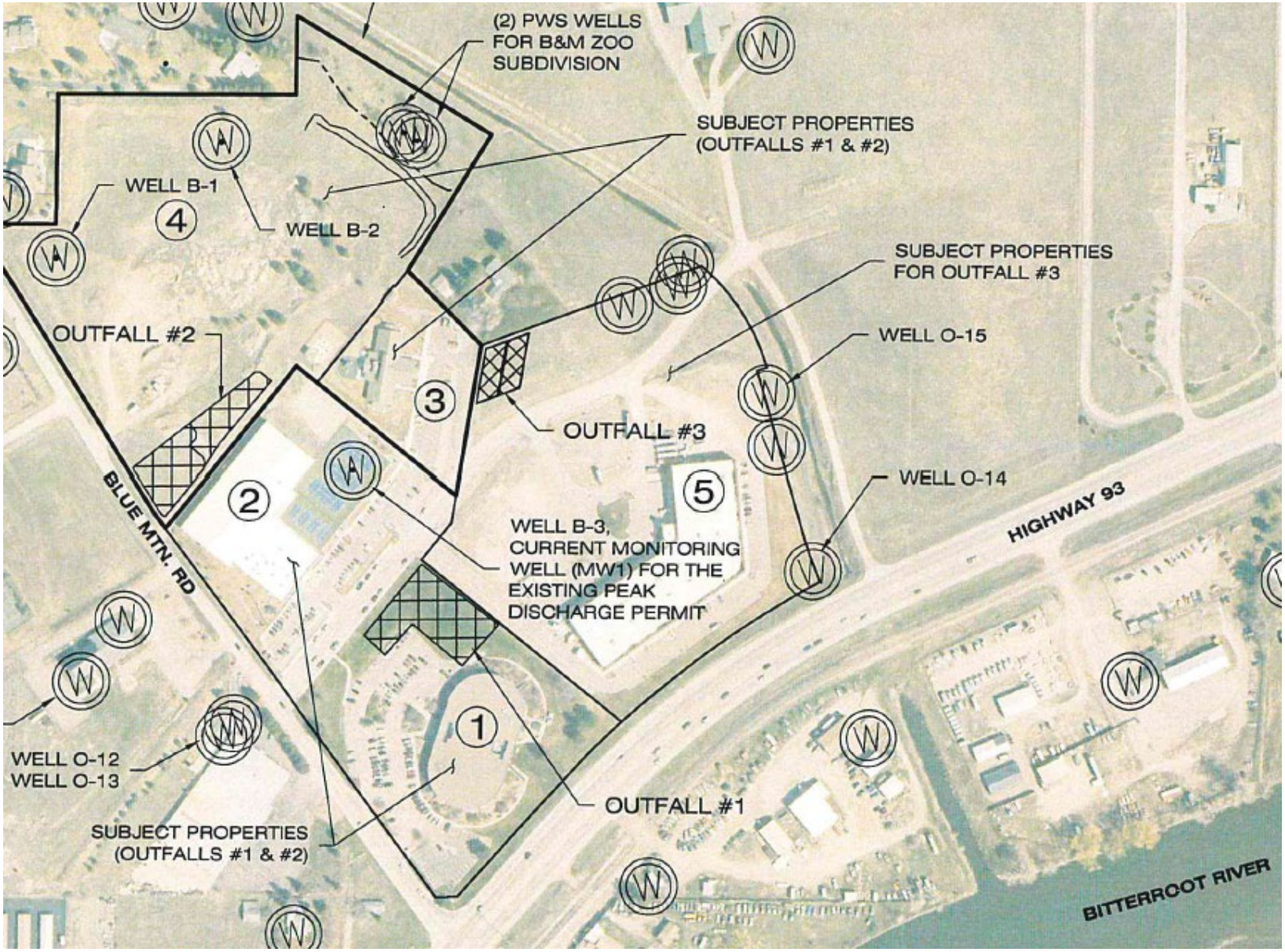


Figure 2. Peak Health Site Plan

Figure 3. Peak Facilities & Wastewater System

Wastewater travels from gravity mains to septic tanks connected in series, to a lift station from the lowest facility that pumps to an intermediate lift station which receives effluent from two additional facilities and pumps the combined effluent to the treatment facility. The treatment facility consists of a distribution tank discharging to two sequencing batch reactors (SBRs). The SBRs send a portion of the effluent to a sludge management system, and some to a feed tank. The solids are removed from the SBR sludge holding tank and hauled to Missoula wastewater treatment plant for disposal. The feed tank passes the treated effluent to a dosing tank that discharges to a subsurface pressurized multi-zone drainfield (Outfall 001). No mixing zone was granted for this facility. The system has an ultra-violet (UV) disinfection system that has been used intermittently over the years.

Effluent sampling is conducted at the drainfield dose tank (EFF-001). Flow is measured at FM-001, a Sea Metrics IP80 Series flow meter that is located in the crawl space of the pump house after the dose tank. The system discharges treated wastewater at a maximum design rate of 12,136 gpd. Monitoring and sampling requirements are further discussed in **Section 6**.

Figure 4 is a line drawing of the collection, treatment, and disposal process.

2.2 OPERATIONS

System operations are summarized below in **Table 1**.

Table 1. Collection, Treatment, and Disposal Summary

Collection	
Contributing sources:	Current – 3 commercial. Proposed – 18 single family residences
Standard industrial code(s) of sources:	7991 Physical Fitness Facilities; 8322 Individual and Family Social Services; 4941 Water Supply; 1522 Residential Buildings, Other Than Single-Family; 6512 Operators of Nonresidential Buildings
Collection method:	Gravity-driven sewer lines and pump lift station
Flow measurement:	Sea Metrics IP80 Series flow meter (FM-001)
Flow volume:	Average daily design flow: 8,319 gallons per day Maximum daily design flow: 12,136 gallons per day
Treatment	
Treatment level:	Level 2
Treatment technology:	Septic tanks, Sequence Batch Reactors (2), and four pressure-dosed drainfields.
Treatment location:	Latitude 46.82641°, Longitude -114.07903°
Disposal	
Method of disposal:	Infiltration to ground water
Disposal structure:	Subsurface drainfield (Outfall 001)
Outfall location:	Latitude 46.82498°, Longitude -114.07811°

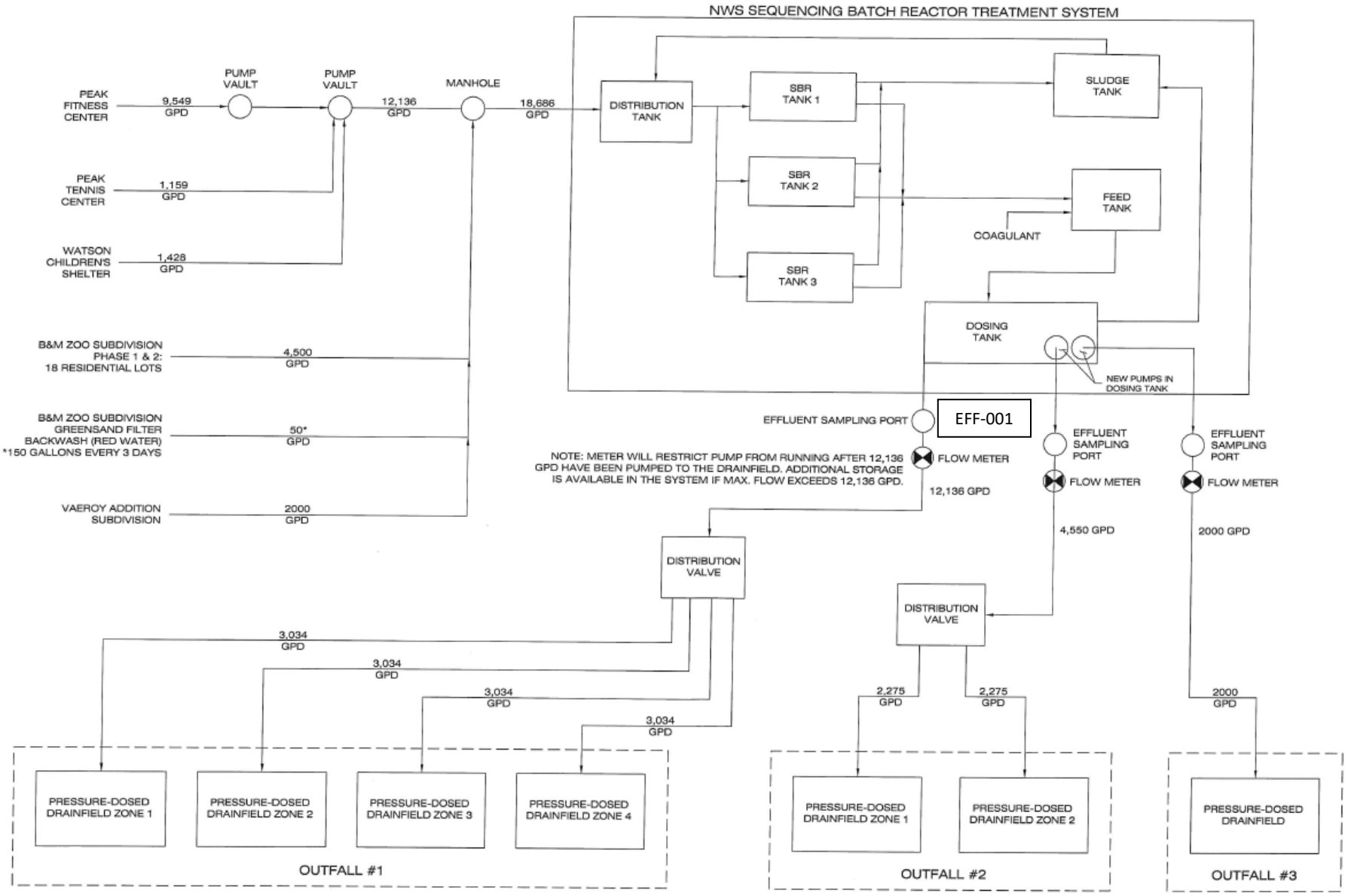


Figure 4. Wastewater Treatment System Line Diagram.

2.3 EFFLUENT CHARACTERISTICS

DEQ requires a permit applicant to disclose the quality of the effluent so that DEQ may evaluate the potential for pollution of state water. During the previous permit cycle, the facility sampled and reported effluent quality criteria to DEQ in the form of discharge monitoring reports (DMRs). These data are summarized below in **Table 2**. The majority of the concentrations are reported in units of milligrams per liter (mg/L), which is equivalent to one part per million.

It is important to note that the water quality from this system has been excellent. The water coming from the system is probably of higher quality than local groundwater and may be improving groundwater quality. This is rare among wastewater systems across the state. Groundwater data has been collected in the vicinity of the system since 2002. Specific conductivity in five area monitoring wells averaged 326 µS/cm. Specific conductivity in the monitoring well downgradient of the system's discharge outfall (MW-B3) averaged 23.6 µS/cm from 2015-2020. The same well, MW-B3, had conductivity of 399 µS/cm in 2003 and 235 µS/cm in 2007. More detailed information in **Appendix C**.

Table 2: Effluent Quality – Outfall 001. DMR Results

Parameter[1]	Location	Units	Reported Minimum Value	Reported Average Value	Reported Maximum[2] Value	# of Samples
Flow rate, Discharge	FM-001	gpd	2,007	5,865	9,534	18
Nitrogen, Nitrate + Nitrite (as N)	EFF-001	mg/L	0.02	1.96	5.45	18
Nitrogen, Ammonia	EFF-001	mg/L	0.08	1.33	7.50	18
Nitrogen, Total Kjeldahl (as N)	EFF-001	mg/L	0.60	2.83	9.40	18
Nitrogen, Total (as N)	EFF-001	mg/L	2.10	4.82	10.3	18
		lbs/day	0.06	0.24	0.62	18

Footnotes:

DMR = Self-Reported Discharge Monitoring Reports

EFF-001: Effluent sample site located at dose tank.

FM-001: Effluent flow meter located at dose tank.

Period of Record: 11/2015 through 03/2020.

(1) Conventional and nonconventional pollutants only, table does not include all possible toxics.

(2) Maximum value recorded of all quarterly reported Daily Maximum Values.

2.4 GEOLOGY

The Missoula basin, in the area of the Peak Health facility, primarily consists of a thick deposit of Tertiary and Quaternary alluvium bounded by Tertiary sedimentary units which create the foothills above the valley. The location of the Peak Health facility is at the nonconforming contact between these two major rock types. The site is capped by 50 feet to 150 feet of Quaternary alluvium grading into Tertiary sediment containing the major aquifer for the valley.

Geological formations in the area include Shepard and Snowslip formations; Shepard formation: tan-weathering, dolomitic, green siltite and argillite in couplets and microlaminae. Thickness as much as 3,609 ft. Snowslip

formation: green and red siltite and argillite in couplets. Thickness as much as 3,937 ft. Geologic age is considered Middle Proterozoic.

Soils in the area of the drainfield consist Grantsdale loam in the western portion and Bighorn gravelly loam in the eastern portion. Soils of these classifications consist of loams with gravel and sand concentration increasing with depth. These soils provide excellent drainage and adequate filtration of drainfield discharges. Restrictive layers are typically found at greater than 80-inches of depth. Soil information is found in **Appendix A**.

2.5 HYDROGEOLOGY

The Missoula valley is an intermountain basin surrounded by Precambrian and Cambrian bedrock and Tertiary sediments and floored with Tertiary and Quaternary sediments. The Quaternary sediments are fluvial, alluvial, colluvial, glacio-lacustrine and generally are sorted into three main strata. The Quaternary sediments form the framework for the principal aquifer of the valley. Ground water is produced from all formations of the Missoula Valley. Ground water flow is generally to the northwest. Potentiometric surface and ground water flow maps indicate five sub systems in the Missoula aquifer, based on recharge and discharge areas and flow directions. Recharge to the aquifer is from the Clark Fork River, the creeks of the valley sides and the adjacent Tertiary sediments and bedrock highlands. Peak aquifer recharge is during the late spring and early summer. Aquifer response to recharge and discharge, as indicated by well water levels, depends upon the magnitude of the source of recharge, the well's proximity to the source, the hydrogeologic nature of the aquifer, and the effects of human consumption. Missoula valley ground water is calcium-bicarbonate type. The inorganic chemical analyses results corroborate a multiple system aquifer with different sources of recharge.

Important hydrogeologic characteristics are summarized below in **Table 3**.

Table 3. Hydrogeologic Summary

Average depth to ground water	39 feet
General ground water flow direction	N10°W, flow direction may change seasonally due to impact and flow of Bitterroot River.
Hydraulic conductivity	0.242 feet per day
Hydraulic gradient	0.0047 feet/feet
Nearest surface water	Bitterroot River (943 feet)
Nearest downgradient surface water	Blue Mountain Irrigation Ditch (about 670 feet)

2.6 GROUND WATER MONITORING WELLS

There is one monitoring well associated with this permit: MW-B3. This well is plotted on **Figure 2** and **Figure 3**. Monitoring well construction details are provided below in **Table 4**. MW-B3 is located in the tennis court area on the north side of Buckhouse Lane about 250feet northeast and downgradient of Outfall 001.

Table 4. Monitoring Well Summary

Monitoring Well MW-B3	
Location- latitude/longitude:	Latitude: 46.82576° Longitude: -114.07880°
Location- narrative:	Tennis court area on the north side of Buckhouse Lane
Rationale:	Down gradient water quality
Depth; screened interval:	Total depth of 39 feet
Notes:	Two other wells will be used in this permit to monitor water quality down gradient of new outfalls.

If a DEQ-approved monitoring well is abandoned, destroyed or decommissioned, or is no longer able to be sampled due to fluctuations in the ground water table, the permittee must install or designate a new well to replace the abandoned, destroyed, decommissioned, or non-viable well.

2.7 GROUND WATER QUALITY CHARACTERISTICS

Water sampling results from MW-B3 are provided below in **Table 5**. Based on the 98 microsiemens per centimeter (µS/cm) specific conductance, the receiving water is Class I ground water. Data reported in the table is taken from the permit renewal application.

Table 5: Ground Water Monitoring Results - MW-B3

Parameter	Units	Minimum	Average	Maximum(2)	# of Samples
Chloride (as Cl)	mg/L	ND	ND	ND	14
Escherichia coli Bacteria	CFU/100 ml	< 1	24.3	260.0	12
Nitrogen, Nitrate + Nitrite (as N)	mg/L	ND	0.03	0.1	14
Nitrogen, Total Kjeldahl (as N)	mg/L	ND	0.5	0.9	14
Organic Carbon	mg/L	1.1	1.8	3.8	11
pH	s.u.	6.6	6.9	7.8	11
Specific Conductivity (@ 25°C)	µS/cm	12.0	23.6	98.0	14
Static Water Level (SWL)	ft-bgs	38.0	43.0	56.0	14
Total Dissolved Solids (TDS)	mg/L	ND	10.8	59.0	11

Footnotes:
MW- B3 represents water quality down gradient of Outfall 001
Source of data - Application Form GW-2 and supplemental materials.
ND - not detected
bgs = below ground surface
CFU = Colony Forming Units
s.u. = standard units
Period of Record: 11/2015 through 03/2020.
(1) Refer to Fact Sheet for the existing location of the monitoring well
(2) Maximum value recorded of all monthly or quarterly reported values.

3.0 WATER QUALITY STANDARDS AND NONDEGRADATION

Part of DEQ's mission is to protect, sustain, and improve the quality of state waters. Water quality standards provide the basis for effluent limits that DEQ applies to discharge permits (**Section 5**). These standards include three components: designated uses, water quality criteria, and nondegradation policy. DEQ protects all designated uses of state water by basing effluent limits on the most restrictive water quality limitations, intended to protect the most sensitive uses.

3.1 Designated Uses

There has been extensive groundwater testing of the site. Specific conductivity averaged 292 µS/cm in 46 groundwater samples taken. The receiving water is considered Class I ground water and therefore a high-quality water of the State. Class I ground waters must be maintained suitable for the following uses with little or no treatment:

- Public and private drinking water supplies
- Culinary and food processing purposes
- Irrigation
- Drinking water for livestock and wildlife
- Commercial and industrial purposes

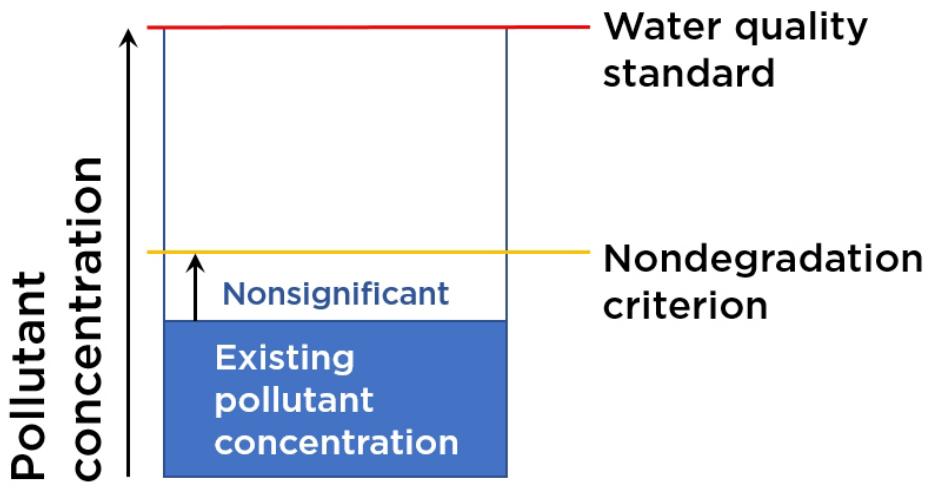
DEQ protects all the assigned beneficial uses by protecting the most sensitive. Drinking water is the most sensitive use of this receiving water.

3.2 Water Quality Criteria

Montana has water quality standards for both surface water and ground water. The numeric criteria for each are different because they must support different uses. DEQ writes permits to protect the most sensitive, thereby protecting all uses. DEQ's ground water standard for nitrate is 7.5 mg/L, as is the standard for nitrate + nitrite (as nitrogen). Class I ground water must be maintained suitable for use as a drinking water supply with little or no treatment, and therefore must meet the corresponding human health standard of 7.5 mg/L total nitrogen. These water quality standards may not be exceeded outside a designated mixing zone (**Section 4**).

3.3 Nondegradation

Montana's nondegradation policy is intended to preserve the existing condition of high-quality state waters. Any water whose existing condition is better than the water quality standards must be maintained in that high quality. Nondegradation policy allows discharges to cause only nonsignificant changes in water quality. Changes in water quality that are deemed significant require an authorization to degrade. An authorization to degrade is not an authorization to pollute; the water quality standard must not be exceeded.



DEQ must determine whether the proposed discharge will result in significant changes in water quality.

3.4 NONSIGNIFICANCE

The proposed permit authorizes an increased source that may result in a change of existing water quality. DEQ must determine whether these water quality changes are significant. Some nonsignificant activities are specified in the Administrative Rules of Montana; other activities are evaluated for significance according to a process provided in the Rules. DEQ evaluated the significance of this discharge using the criteria and methods described below.

Ground Water Nonsignificance Criteria

For this discharge to ground water, the following nonsignificance criteria are relevant:

Nitrogen

Under Montana statute, ground water total nitrogen at or below 7.5 mg/L at the downgradient end of the outfall is a nonsignificant change in water quality, so long as the discharge does not cause degradation of surface water. The nearest downgradient surface water body is the Blue Mountain irrigation ditch. By design, irrigation ditches are losing channels. However, DEQ uses this nearby and minor waterbody for nondegradation analysis as a conservative measure. Using the nonsignificance criterion of 7.5 mg/L, DEQ established effluent limits that cause the discharge to comply with ground water nonsignificance/nondegradation criteria at the end of the system. This is discussed in detail in **Section 5.1**. Significance determination calculations are found in **Appendix B**. Water quality changes as a result of this system are considered nonsignificant.

Phosphorus

A total phosphorus surface water breakthrough time of greater than 50 years is a nonsignificant change in water quality. The phosphorus criterion requires an analysis to determine a breakthrough time. Breakthrough occurs when the subsurface soils lose their capability to adsorb any more phosphorus, and it reaches surface water. Using these conservative estimates, DEQ's phosphorus breakthrough analysis estimates that phosphorus discharged to ground water may reach surface water (Blue Mountain irrigation ditch) in 87 years. Predicted phosphorus breakthrough greater than 50 years is considered nonsignificant.

4.0 MIXING ZONE

DEQ has not authorized a mixing zone for this permitted system.

5.0 PERMIT CONDITIONS

Discharge permits include conditions that ensure compliance with the Montana Water Quality Act and the regulations used to implement it. These conditions include effluent limits as well as any special conditions that DEQ deems necessary to protect the quality of the receiving water.

Montana's numeric water quality standards are published in Circular DEQ-7. Water quality criteria applicable to this permit are summarized in **Table 7**. The permit establishes effluent limits that will meet water quality

standards and nondegradation criteria, thereby protecting beneficial uses and existing high-quality waters. The most restrictive criteria in **Table 7** provide the basis for the effluent limits.

Table 7. Applicable Ground Water Quality Criteria

Parameter	Human Health Standard	Beneficial Use Support	Nondegradation Criteria
Nitrate + nitrite (as Nitrogen[N])	10 mg/L	-	-
Total Nitrogen	-	10 mg/L	7.5 mg/L
Total Phosphorus	-	-	> 50-year breakthrough

This discharge permit includes numeric WQBELs that restrict the strength and volume of the discharge. The ground water nonsignificance criteria (**Section 3.4**) provide the basis for the limits. DEQ calculates WQBELs by rearranging the mixing zone equation (**Section 4**) and solving for the effluent concentration that satisfies the water quality criteria. DEQ evaluates and recalculates the limits using updated water quality data as part of every permit renewal cycle. In this way, DEQ protects the receiving water quality by continually assessing cumulative impacts to the receiving water.
DEQ calculated the effluent limits using the same method as for the previous permit. DEQ uses updated ambient ground water quality data to re-evaluate the receiving water quality and the assimilative capacity for dilution.

5.1 TOTAL NITROGEN EFFLUENT LIMIT

The nonsignificance criterion of 7.5 mg/L is the most restrictive of the water quality criteria applicable to this permit; therefore, it is the water quality target for this effluent limit. DEQ established the final WQBEL for this discharge by back-calculating the effluent concentration that results in 7.5 mg/L at the end of the system. Available dilution is determined by recent ground water quality sampling of the receiving water. Ambient total nitrogen averaged 0.22 mg/L. DEQ calculates an effluent limit that protects receiving water quality and beneficial uses according to the following equation:

$$\underline{\text{Equation 1:}}\ C_{lmt} = C_{std} + D(C_{std} - C_{gw})$$

Where:

C_{lmt} = effluent limitation concentration
C_{std} = limiting water quality criterion = 7.5 mg/L
C_{gw} = ambient receiving ground water concentration = 0.22 mg/L
D = dilution ratio (Q_{gw} / Q_{eff})
Q_{gw} =ground water flux at the end of the mixing zone = 0
Q_{eff} = average maximum daily discharge = 17,886 gpd

The result for C_{lmt} is 7.5 mg/L. This is the final WQBEL expressed as a concentration. Load limits are more appropriate for discharges to ground water since the long-term loading is the greater concern in absence of aquatic life considerations. Additionally, load limits inherently control both the strength and volume of the discharge. A discharge of 17,886 gallons per day containing 7.5 mg/L total nitrogen is equivalent to 1.12 pounds per day. DEQ calculates an effluent load limit that protects receiving water quality and beneficial uses according to the following equation:

$$Llmt = DCeff * Ceff * CON$$

Where:
Llmt = effluent limitation-load limit
DCeff = design capacity of wastewater treatment system (gpd)

Ceff = allowable effluent concentration
CON = conversion factor [$8.34*10^{-6}$]

= (12,136 gpd) x (7.5 mg/L) x ($8.34*10^{-6}$)

Load limit (lbs/day) Outfall 001 = 0.76 lbs./day

Using the same approach effluent limits can be calculated for Outfall 002 and Outfall 003.

(4,550 gpd) x (7.5 mg/L) x ($8.34*10^{-6}$) = 0.29 lbs./day

Load limit (lbs/day) Outfall 002 = 0.29 lbs./day

Load limit (lbs/day) Outfall 003 = (2,000 gpd) x (7.5 mg/L) x ($8.34*10^{-6}$) = **0.13 lbs./day.**

5.2 TOTAL PHOSPHORUS EFFLUENT LIMIT

The prior permit did not contain an effluent limit for phosphorus. As part of the significance determination for the increased source proposed for this permit, DEQ determined that phosphorous discharged to ground water would reach the nearest downgradient surface water (Blue Mountain irrigation ditch) in 87 years. A phosphorous breakthrough time of more than 50 years is considered insignificant. So, there will not be a phosphorus limit in this permit.

Table 8: Effluent Limits - Outfall 001

Outfall	Parameter	Units	Daily Maximum
Outfall - 001	Total Nitrogen (as N)	lbs / day	0.76
Outfall - 002	Total Nitrogen (as N)	lbs / day	0.29
Outfall - 003	Total Nitrogen (as N)	lbs / day	0.13

Footnotes:
(1) See definition in Part V of permit.

5.3 SPECIAL CONDITIONS

A special condition of the previous permit is ground water monitoring down gradient of Outfall 001 at monitoring well MW-B3. With the development of two new outfalls a requirement of this permit is the use of one monitoring well down gradient of each of the new outfalls to monitor ground water quality. There are many wells already installed on the property. Use of a prior well is acceptable if it is downgradient of the outfall. Ground water monitoring requirements are discussed in more detail in **Section 6.2**.

6.0 MONITORING AND REPORTING REQUIREMENTS

DEQ requires effluent and ground water monitoring to assure compliance with the effluent limitations and therefore water quality standards. Effluent monitoring and ground water monitoring is required as a condition of this permit. All monitoring and sampling required by this permit must be representative; therefore, the permit identifies specific monitoring locations. Monitoring requirements and rationale are summarized below.

6.1 EFFLUENT MONITORING

This permit includes numeric effluent limitations with specific magnitudes and durations to ensure the discharge will not cause or contribute to an exceedance of an applicable water quality standard (see **Section 3**). Accordingly, the permittee is required to monitor and report at a specified frequency in order to demonstrate compliance with these limitations.

Effluent samples and discharge flow measurements must be representative of the nature and volume of the effluent. The effluent sample location (EFF-001) is located at the drainfield dose tank as shown in **Figure 4**. The permittee is required to maintain and report flow measurements using a flow-measuring device capable of measurements that are within 10 percent of the actual flow. The flow measuring device (FM-001) is located after the drainfield dose tank prior to discharge in the drainfield. The flow measuring device must be in operating condition prior to discharge. A new flow measuring device (FM-002) must be installed and in operating condition prior to discharge to Outfall 002.

Effluent monitoring and reporting requirements are summarized in **Table 9**. All analytical methods must be in accordance with the Code of Federal Regulations, 40 CFR Part 136 for each monitored parameter.

Table 9: Effluent Monitoring and Reporting Requirements*

Parameter	Monitoring Location	Units	Sample Type(1)	Minimum Sampling Frequency	Reporting Requirements(1)(2)	Report Frequency	Rationale
Flow Rate(3)(4)	Flow Meter	Gpd	Continuous	Continuous	Daily Max and Quarterly Average	Quarterly	Permit Compliance/ Effluent Characterization
Nitrate + Nitrite (as N)	Dose Tank	mg/L	Grab	1/Quarter	Daily Max and Quarterly Average	Quarterly	Permit Compliance/ Proper O&M
Total Ammonia (as N)	Dose Tank	mg/L	Grab	1/Quarter	Daily Max and Quarterly Average	Quarterly	Proper O&M
Total Kjeldahl Nitrogen (as N)	Dose Tank	mg/L	Grab	1/Quarter	Daily Max and Quarterly Average	Quarterly	Permit Compliance
Total Nitrogen (as N)(4)	Dose Tank	mg/L	Calculate	1/Quarter	Daily Max and Quarterly Average	Quarterly	Permit Compliance

Footnotes:

*** Notice is required to begin use of the new outfalls. DEQ will require separate monitoring reports for each outfall.**

(1) See definitions in Part IV of the permit.

(2) Daily Maximum: Report highest measured daily value for the reporting period on Discharge Monitoring Report (DMR) form.

(3) If no discharge occurs during the reporting period, "No Discharge" shall be recorded on the DMR report form.

(4) Total Nitrogen is the sum of the Nitrate + Nitrite and Total Kjeldahl Nitrogen parameters.

6.2 GROUND WATER MONITORING

Ground water monitoring includes both water quality sampling and water level monitoring. The previous permit required ground water monitoring at MW-B3, which is a groundwater monitoring well down gradient of Outfall 001. This permit also requires ground water monitoring to provide long term ambient and downgradient characterization of the aquifer. Ground water monitoring will be required at monitoring well MW-B3 and one monitoring well down gradient of each of the other outfalls. Data collected via ground water monitoring will be used for aquifer characterization in future permit renewals and for permit compliance. Sampling and reporting requirements shall commence upon the effective date of the permit. All three outfalls must be monitored for groundwater quality with a monitoring well that is considered down gradient from the outfall. Use of existing wells or installation of new wells will be required. A plan for groundwater monitoring must be submitted to DEQ prior to discharge from the proposed Outfall 002. All analytical methods must be in accordance with the Code of Federal Regulations, 40 CFR Part 136 for each monitored parameter.

Ground water monitoring and reporting requirements are summarized in **Table 10**.

Table 10: Ground Water Monitoring and Reporting Requirements

Parameter [(1) (2)]	Units	Sample Type	Minimum Sampling Frequency	Reporting Requirements [(3) (4)]	Reporting Frequency
Chloride (as Cl)	mg/L	Grab	Quarterly	Quarterly	Quarterly
Escherichia coli Bacteria	CFU / 100 ml	Grab	Quarterly	Quarterly	Quarterly
Nitrogen, Nitrate + Nitrite (as N)	mg/L	Grab	Quarterly	Quarterly	Quarterly
Nitrogen, Total Kjeldahl (TKN)	mg/L	Grab	Quarterly	Quarterly	Quarterly
Specific Conductivity @ 25º C	µsS/cm	Grab	Quarterly	Quarterly	Quarterly
Static Water Level (SWL) [(5)]	Feet (fbmp)	Instantaneous	Quarterly	Quarterly	Quarterly

Footnotes:

CFU = Colony Forming Units

ft-bmp = feet below measuring point

At no time shall the permittee mark or state "no discharge" on any monitoring well DMR form.

(1) Parameter analytical methods shall be in accordance with the Code of Federal Regulations, 40 CFR Part 136

(2) See definitions in Part V of the permit.

(3) Daily Maximum: Report highest measured daily value for the reporting period on Discharge Monitoring Report (DMR) form.

(4) The geometric mean must be reported if multiple samples are taken during a reporting period.

(5) Measuring point for SWL measurements shall be from top of casing and measured to within 1/100th of one foot.

COMPLIANCE SCHEDULE

A compliance schedule is included to allow a reasonable opportunity for the permittee to attain and maintain compliance with the permit special conditions. The actions listed in **Table 11** must be completed on or before the respective scheduled completion dates. A report documenting each respective action must be received by DEQ on or before the scheduled reporting date. Completion of all actions or deliverables must be reported to DEQ in accordance with Part II.D and Part IV.G of the permit.

Table 11: Compliance Schedule

Permit Condition	Action	Scheduled Completion Date of Action (1)	Scheduled Report Due Date. (2) (3)
Part I.E.1	Complete a plan for designating or installation of monitoring wells.	*Within 180 days of the effective date of the permit.*	*Due on or before the 28th day of the month following the completion date.*
Part I.E.1	Develop and implement (or update) a site specific Sampling and Analysis Plan (SAP) for monitoring and sampling ground water monitoring wells.	*Within 180 days of the effective date of the permit.*	*Due on or before the 28th day of the month following the completion date.*
Part I.E.1	Install monitoring wells if necessary.(4)	*Prior to discharge from the new outfall.*	*Due on or before the 28th day of the month following the completion date.*

Footnotes:

(1) The actions must be completed on or before the scheduled completion dates.

(2) The written report documenting monitoring well installation, must include final location, drilling methods used, borehole lithologic log, well construction details, *elevation of measuring point, and the depth to the top contact of the first ground water bearing zone.* This information must be included for each respective monitoring well.

(3) Sampling parameters required for each respective monitoring well as listed within Table 10.

(4) Outfall 002 and Outfall 003 must have one monitoring well down gradient of each outfall. Use an existing well or install a new well.

PUBLIC NOTICE

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 December 4, 2020. 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 (MTX000213), 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.

APPENDIX A – SOIL INFORMATION

Missoula County Area, Montana (MT638)

Missoula County Area, Montana (MT638)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
16	Bigarm gravelly loam, 0 to 4 percent slopes	18.4	37.9%
17	Bigarm gravelly loam, 4 to 15 percent slopes	5.0	10.3%
44	Grantsdale loam, 0 to 2 percent slopes	22.7	46.7%
136	Newbar very gravelly loamy sand, 0 to 2 percent slopes	2.4	5.0%
138	Water-Riverwash complex	0.0	0.0%
Totals for Area of Interest		**48.6**	**100.0%**

Missoula County Area, Montana

44—Grantsdale loam, 0 to 2 percent slopes

Map Unit Setting

- *National map unit symbol:* 4wcb
- *Elevation:* 2,700 to 5,200 feet
- *Mean annual precipitation:* 10 to 19 inches
- *Mean annual air temperature:* 39 to 45 degrees F
- *Frost-free period:* 90 to 120 days
- *Farmland classification:* Prime farmland if irrigated

Map Unit Composition

- *Grantsdale and similar soils:* 85 percent
- *Minor components:* 15 percent
- *Estimates are based on observations, descriptions, and transects of the map unit.*

Description of Grantsdale

Setting

- *Landform:* Stream terraces
- *Down-slope shape:* Linear
- *Across-slope shape:* Linear

- *Parent material:* Coarse-silty over sandy and gravelly alluvium

Typical profile

- *Ap - 0 to 9 inches:* loam
- *Bw - 9 to 17 inches:* loam
- *Bk - 17 to 32 inches:* loam
- *2C - 32 to 60 inches:* very gravelly loamy sand

Properties and qualities

- *Slope:* 0 to 2 percent
- *Depth to restrictive feature:* More than 80 inches
- *Natural drainage class:* Well drained
- *Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 1.98 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Calcium carbonate, maximum in profile:* 15 percent
- *Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
- *Available water storage in profile:* Moderate (about 6.3 inches)

Interpretive groups

- *Land capability classification (irrigated):* 2c
- *Land capability classification (nonirrigated):* 3c
- *Hydrologic Soil Group:* B
- *Ecological site:* Upland Grassland (R043BP818MT)
- *Hydric soil rating:* No

Minor Components

Alberton

- *Percent of map unit:* 5 percent
- *Landform:* Stream terraces
- *Down-slope shape:* Linear
- *Across-slope shape:* Linear
- *Ecological site:* Sandy (Sy) 10-14" p.z. (R044XW126MT)
- *Hydric soil rating:* No

Desmet

- *Percent of map unit:* 4 percent
- *Landform:* Stream terraces
- *Down-slope shape:* Linear
- *Across-slope shape:* Linear
- *Ecological site:* Silty (Si) 10-14" p.z. (R044XW125MT)
- *Hydric soil rating:* No

Moiese

- *Percent of map unit:* 4 percent
- *Landform:* Stream terraces
- *Down-slope shape:* Linear
- *Across-slope shape:* Linear
- *Ecological site:* Shallow to Gravel (SwGr) 10-14" p.z. (R044XW136MT)
- *Hydric soil rating:* No

Somewhat poorly drained soils

- *Percent of map unit:* 2 percent

- *Ecological site:* Subirrigated (Sb) 10-14" p.z. (R044XW128MT)
- *Hydric soil rating:* No

Missoula County Area, Montana

16—Bigarm gravelly loam, 0 to 4 percent slopes

Map Unit Setting

- *National map unit symbol:* 4wbb
- *Elevation:* 2,600 to 6,200 feet
- *Mean annual precipitation:* 10 to 19 inches
- *Mean annual air temperature:* 39 to 45 degrees F
- *Frost-free period:* 70 to 120 days
- *Farmland classification:* Prime farmland if irrigated

Map Unit Composition

- *Bigarm and similar soils:* 85 percent
- *Minor components:* 15 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

Description of Bigarm

Setting

- *Landform:* Stream terraces
- *Down-slope shape:* Linear
- *Across-slope shape:* Linear
- *Parent material:* Alluvium

Typical profile

- *A1 - 0 to 11 inches:* gravelly loam
- *A2 - 11 to 15 inches:* very gravelly loam
- *Bw - 15 to 40 inches:* very gravelly sandy loam
- *C - 40 to 60 inches:* extremely gravelly loamy sand

Properties and qualities

- *Slope:* 0 to 4 percent
- *Depth to restrictive feature:* More than 80 inches
- *Natural drainage class:* Somewhat excessively drained
- *Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 1.98 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Available water storage in profile:* Low (about 5.5 inches)

Interpretive groups

- *Land capability classification (irrigated):* 4e
- *Land capability classification (nonirrigated):* 4e
- *Hydrologic Soil Group:* B
- *Ecological site:* Upland Grassland (R043BP818MT)
- *Hydric soil rating:* No

Minor Components

Grantsdale

- *Percent of map unit:* 5 percent

- *Landform:* Stream terraces
- *Down-slope shape:* Linear
- *Across-slope shape:* Linear
- *Ecological site:* Silty (Si) 15-19" p.z. (R044XW184MT)
- *Hydric soil rating:* No

Moiese

- *Percent of map unit:* 3 percent
- *Landform:* Stream terraces
- *Down-slope shape:* Linear
- *Across-slope shape:* Linear
- *Ecological site:* Shallow to Gravel (SwGr) 10-14" p.z. (R044XW136MT)
- *Hydric soil rating:* No

Cobbly surface layers

- *Percent of map unit:* 3 percent
- *Ecological site:* Silty (Si) 15-19" p.z. (R044XW184MT)
- *Hydric soil rating:* No

Stony surface layers

- *Percent of map unit:* 2 percent
- *Ecological site:* Silty-Droughty (SiDr) 15-19" p.z. (R044XW186MT)
- *Hydric soil rating:* No

Poorly drained soils

- *Percent of map unit:* 2 percent
- *Landform:* Drainageways
- *Down-slope shape:* Linear
- *Across-slope shape:* Linear
- *Ecological site:* Wet Meadow (WM) 10-14" p.z. (R044XW127MT)
- *Hydric soil rating:* Yes

APPENDIX B – SIGNIFICANCE PROJECTIONS

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ)

Montana Ground Water Pollution Control System

Ground Water Dilution Projection (GWDP) - Nondegradation Significance Analysis

These projections estimate the parameter concentrations in the aquifer downgradient of the subsurface discharge. After dilution with ground water, the projected concentration is compared to the respective significance criteria in determining nonsignificant changes in water quality (ARM 17.30.715).

Site Name:	Peak Health and Fitness - OUTFALL 002
Location:	Missoula
Permit #:	MTX000213, Outfall 002
Notes:	Design Capacity = design flow gpd; design flow ft³/d
	These calculations are for the following parameter of interest: Nitrate
	These calculations use the most restrictive ground water standard.
	These calculations do not credit potential losses due to chemical transformation.
	These calculations do not credit potential losses due to attenuation.

Projected Concentration Calculation

$$Cr = \frac{(Qd)(Cd) + (Qs)(Cs)}{Qd + Qs}$$

The Activity is Not Significant if Cr < Significance Criteria

GWDP(a) - Ground Water Nitrate Projection at the End of the Outfall.

Qd =	**602**	ft³/d	Design capacity - effluent flow rate
Cd =	**1.96**	mg/L	Concentration - effluent (treated wastewater)
	670	ft	Length of ground water dilution zone
	0	ft	Thickness of dilution zone
	200	ft	Outfall width, perpendicular to ground water flow direction
	200	ft	Projected width of downgradient dilution zone
	0	ft²	Cross sectional area of dilution zone (A)
	0.242	ft/d	Hydraulic conductivity (K)
	0.0047	ft/ft	Hydraulic gradient (I)
Qs(Qgw) =	**0**	ft³/d	Ground water volume (Qgw)
Cs =	**0.22**	mg/L	Ambient nitrate concentration in ground water
Cr =	**1.96**	mg/L	Projected concentration - end of the mixing zone
Sign. Criteria =	**7.5**	mg/L	Nonsignificance Criteria, ARM 17.30.715
Sign. Activity?	**<7.5**	mg/L	**The activity is not significant**

GWDP(b) - Ground Water Nitrate Projection just prior to the Downgradient Surface Water.

Qd =	**602**	ft³/d	Design capacity - effluent flow rate
Cd =	**1.96**	mg/L	Concentration - effluent (treated wastewater)
	670	ft	Length of ground water dilution zone
	0	ft	Thickness of dilution zone
	200	ft	Outfall width, perpendicular to ground water flow direction
	200	ft	Projected width of downgradient dilution zone
	0	ft²	Cross sectional area of dilution zone (A)
	0.242	ft/d	Hydraulic conductivity (K)
	0.0047	ft/ft	Hydraulic gradient (I)
Qs(Qgw) =	**0**	ft³/d	Ground water volume (Qgw)
Cs =	**0.22**	mg/L	Ambient nitrate concentration in ground water
Cr =	**1.96**	mg/L	Projected concentration - just prior to surface water
Sign. Criteria =	**7.5**	mg/L	Nonsignificance Criteria, ARM 17.30.715
Sign. Activity?	**<7.5**	mg/L	**The activity is not significant**

GWDP(c) - Distance in Ground Water from the discharge source where the Significance Criteria for Nitrate is met.

Qd =	**602**	ft³/d	Design capacity - effluent flow rate
Cd =	**1.96**	mg/L	Concentration - effluent (treated wastewater)
	670	ft	Length of ground water dilution zone
	0	ft	Thickness of dilution zone
	200	ft	Outfall width, perpendicular to ground water flow direction
	200	ft	Projected width of downgradient dilution zone
	0	ft²	Cross sectional area of dilution zone (A)
	0.242	ft/d	Hydraulic conductivity (K)
	0.0047	ft/ft	Hydraulic gradient (I)
Qs(Qgw) =	**0**	ft³/d	Ground water volume (Qgw)
Cs =	**0.220**	mg/L	Ambient nitrate concentration in ground water
Cr =	**1.96**	mg/L	Projected concentration
Sign. Criteria =	**7.5**	mg/L	Nonsignificance Criteria, ARM 17.30.715
Distance =	**0**	ft	**Distance needed to meet the significance criteria**

Projections performed by Darryl Barton on August 28, 2020

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ)

PHOSPHOROUS BREAKTHROUGH ANALYSIS

SITE NAME:	Peak Health and Wellness Center
COUNTY:	Missoula
Permit #:	MTX000213
NOTES:	Variables used are based on conservative measurements
	Design Capacity = 17,886 gpd

VARIABLES	DESCRIPTION	VALUE	UNITS
Lg	Length of Primary Drainfield as Measured Perpendicular to Ground Water Flow	200	ft
L	Length of Primary Drainfield's Long Axis	243	ft
W	Width of Primary Drainfield's Short Axis	12	ft
B	Depth to Limiting Layer from Bottom of Drainfield Laterals*	39	ft
D	Distance from Drainfield to Surface Water	670	ft
T	Phosphorous Mixing Depth in Ground Water (0.5 ft for coarse soils, 1.0 ft for fine soils)**	0.5	ft
Ne			
Sw	Soil Weight (usually constant)	100	lb/ft3
Pa	Phosphorous Adsorption Capacity of Soil (usually constant)	200	ppm
#I	Number of proposed wastewater treatment systems	1	
CONSTANTS			
PI	Phosphorous Load per proposed wastewater treatment system	46	lbs/yr
X	Conversion Factor for ppm to percentage (constant)	1.0E+06	
EQUATIONS			
Pt	Total Phosphorous Load = (PI)(#I)	46	lbs/yr
W1	Soil Weight under Drainfield = (L)(W)(B)(Sw)	11372400	lbs
W2	Soil Weight from Drainfield to Surface Water = [(Lg)(D) + (0.0875)(D)(D)] (T)(Sw)	8663938	lbs
P1	Total Phosphorous Adsorption by Soils = (W1 + W2)[(Pa)/(X)]	4007	lbs
SOLUTION			
BT	**Breakthrough Time to Surface Water = P / Pt**	87	years

APPENDIX C – GROUNDWATER QUALITY

Well	Conductivity µS/cm	Distance[1] ft
B1	258	954
B2	420	938
O11	308	560
O12	323	301
O13	321	329
Avg all wells	**326**	
B3 2003	399	241
B3 2007	235	241
B3 2015-2020	**23.6**	**241**

Footnotes:

1. Distance from Peak Health and Wellness Discharge (Outfall 001)

APPENDIX D – REFERENCES

40 CFR § 136 – Guidelines Establishing Test Procedures for the Analysis of Pollutants. 2017.

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 6 – Surface Water Quality Standards and Procedures.
- Subchapter 7 – Nondegradation of Water Quality.
- Subchapter 10 – Montana Ground Water Pollution Control System.
- Subchapter 13 – Montana Pollutant Discharge Elimination System.

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

Cherry, J.A. and Freeze, R. A. 1979. Groundwater, Prentice-Hall Inc., Englewood Cliffs, J.J.

Department of Environmental Quality. 2009. Administrative Record of Montana Ground Water Pollution Control System (MGWPCS) permit application and supplemental materials, Peak Health and Wellness MTX000213.

Department of Environmental Quality. 2015. Administrative Record of Montana Ground Water Pollution Control System (MGWPCS) permit application and supplemental materials, Peak Health and Wellness MTX000213.

Department of Environmental Quality. 2019. Administrative Record of Montana Ground Water Pollution Control System (MGWPCS) permit application and supplemental materials, Peak Health and Wellness MTX000213.

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. 2001. Applied Hydrogeology 4th Edition. Prentice Hall. Upper Saddle River, NJ.

Ground-Water Information Center (GWIC), Montana Bureau of Mines and Geology. Retrieved 2020 from GWIC database, http://mbmggwic.mtech.edu.

Montana Code Annotated (MCA), Title 75, Chapter 5, Montana Water Quality Act. 2017.
Smith, Clifford A. Hydrogeology of the central and northwestern Missoula Valley. 1992. University of Montana

U.S. Department of Agriculture, Natural Resources Conservation Service. 2020. National Cooperative Soil Survey. Retrieved from http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm.

U.S. Environmental Protection Agency, Effluent Limitation Guidelines, http://water.epa.gov/scitech/wastetech/guide/, 2019.

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

U.S. Environmental Protection Agency. 2010. Office of Wastewater Management. NPDES Permit Writers Manual. 833-K-10-001.

USGS website – Geologic units in Missoula county, Montana. 2020. https://mrdata.usgs.gov/geology/state/fips-unit.php?code=f30063

U.S. Geological Survey, Basic Ground Water Hydrology, http://pubs.usgs.gov/wsp/2220/report.pdf, 2010.

U.S. Geological Survey, Groundwater Resources, http://water.usgs.gov/ogw/basics.html, 2020.

Weight, W. D. and J. L. Sonderegger. 2001. Manual of Applied Field Hydrogeology. McGraw-Hill. New York.