DEPARTMENT OF ENVIRONMENTAL QUALITY
Water Quality Division

Montana Pollutant Discharge Elimination System (MPDES) ▪ Fact Sheet

Permit Number:	MT0020656
Permittee:	Hinsdale Water and Sewer District
Receiving Water:	Milk River
Facility Information:	Hinsdale County Water and Sewer Wastewater Treatment Plant 446 Ohio Street, Hinsdale, MT 59241
Facility Contact:	Kay Fjeld, Operator P.O. Box 55, Hinsdale, MT 59241
Type of Facility:	Public Owned Treatment Works, Minor
Number of Outfalls:	1 (For fee determination only)
Outfall Name:	001 (Treated domestic wastewater)
Outfall Location:	48.39658, -107.0831
Fact Sheet Date:	November 16, 2020

I. Overview and Summary of Proposed Changes

The Montana Department of Environmental Quality (DEQ) proposes to renew the Montana Pollutant Discharge Elimination System (MPDES) permit for Hinsdale County Water and Sewer District (Hinsdale) Wastewater Treatment Facility, MT0020656. This fact sheet details the legal requirements and technical rationale associated with developing effluent limits, monitoring and reporting requirements, and special conditions which are specific to Hinsdale.

A. Permit Status

- August 1, 2012 — Previous permit (2012-Permit) became effective
- January 30, 2016 — DEQ received permit renewal application (Forms 1 and 2A)
- December 28, 2016 — DEQ received applicable fees
- March 9, 2016 — DEQ issued a notice of completeness and administratively extended the 2012-Permit past the expiration date

B. Proposed Changes to Permit Conditions

- The monitoring requirement for cadmium is removed.
- The monitoring requirement for zinc is removed.
- The monitoring requirement for copper is removed.
- A weekly visual monitoring requirement for oil sheen presence is added
- Oil and grease concentration limit of 10 mg/L is added.

- Dilution granted for ammonia (acute, chronic), nitrate + nitrite (human health), and copper (acute, chronic). A 2.5% dilution of the 7Q10 for acute standards and 10% dilution of the 7Q10 for chronic and human health standards will be applied.
- Effluent limit for nitrate + nitrite (as N) is removed.
- Quarterly background monitoring for nitrate + nitrite is added.
- The monitoring requirement for total nitrogen and total phosphorus will be reduced from year-round monthly monitoring to seasonal (July, August, September) monthly monitoring.

II. Facility Information

A. Facility Description and Design Criteria

Hinsdale County Water and Sewer District (Hinsdale) operates an activated sludge extended aeration package wastewater treatment facility (WWTF) for the unincorporated town of Hinsdale, Montana. The WWTF was installed in 2004, on the north end of town immediately adjacent to the old facility, the town park, and the banks of the Milk River. The WWTF was designed for a population of approximately three hundred (300) residents, and was projected to last until the year 2020. The WWTF has an average design flow rate of 0.03 million gallons per day (mgd) and a peak design flow of 0.12 mgd. **Figure 1** provides an overview of the treatment process.

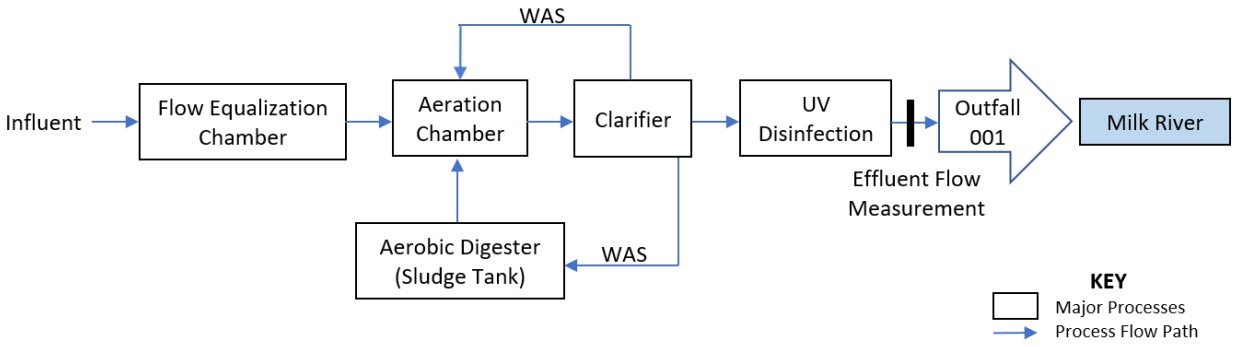

Figure 1. Hinsdale WWTF Process Diagram

Intake and Pretreatment

- The WWTF receives domestic wastewater from approximately two-hundred and fifty (250) residents with approximately one-hundred and forty (140) service connections.
- Hinsdale does not maintain a United States Environmental Protection Agency (US EPA) approved industrial pretreatment program. Standard pretreatment language will be included in the renewed permit

Treatment and Finishing

- Influent enters the flow equalization chamber through a bar screen. A mini lift station within the equalization chamber is designed to allow for measurement of influent flow through tracking hours of pump use. DEQ notes that this method of flow measurement can only result in a time-averaged influent flow value and is not suitable for flow proportional composite sampling, which requires time-of-sample flow measurement.
- After equalization, wastewater enters the aeration chamber where it is mixed with waste activated sludge (WAS) for secondary treatment.
- The mixed liquor then enters the clarifier.
- Effluent sent to the laboratory building is passed through the ultraviolet (UV) disinfection system.

- From the UV system, finished effluent is continuously discharged to the Milk River.
- Effluent flow is measured using an ultrasonic flow meter located just after UV treatment in the waste stream.

Residuals Handling and Waste Streams

- Residuals handling consists of the aerobic digester (sludge tank) and recirculation to the aeration system
- WAS from the clarifier is recycled into the aeration basin or wasted to an aerobic digester for treatment and annual land application.
- The aerobic digester is decanted monthly, and original design requires decanted liquid to be recirculated to the head of the aeration system.

B. Existing Permit Requirements

The effluent limits for Hinsdale WWTF established in the 2012-Permit are presented in **Table 1**.

Table 1. 2012-Permit Effluent Limits – Outfall 001

Parameter	Units	Average Monthly Limit	Average Weekly Limit
Biochemical Oxygen Demand (BOD_5)	mg/L	30	45
	lbs/day	7.5	11.3
	% Removal	85	NA
Total Suspended Solids (TSS)	mg/L	30	45
	lbs/day	7.5	11.3
	% Removal	85	NA
E. coli	cfu/100 mL	126	252
	cfu/100 mL	630	1260
Nitrate + Nitrate, as N	mg/L	-	10(1)
pH	s.u.	6.0-9.0	

(1) 10 mg/L Nitrate + Nitrite, as N is a maximum concentration not to be exceeded in any effluent sample.

C. Effluent Quality

Effluent data from January 2018 – August 2020 was selected to represent the period of record (POR), and is representative of the facility's effluent quality. Hinsdale reported effluent monitoring data on monthly discharge monitoring reports through NetDMR and this data is summarized in **Table 2**. DEQ used this best available data to establish permit limits, even though compliance inspection reports identified improper sampling, monitoring, recording, and recording errors. DEQ requested and reviewed the data from the laboratory reports and corrected the reporting errors for analytical use.

Table 2. Hinsdale Effluent Characteristics, January 2018-August 2020

Parameter	Units	Minimum Value	Maximum Value	Average Value	Sample Size
Flow Rate, Monthly Average	mdg	0.008	0.027	0.013	30
Temperature	°C	6.40	17.6	11.7	30

Table 2. Hinsdale Effluent Characteristics, January 2018-August 2020					
Parameter	Units	Minimum Value	Maximum Value	Average Value	Sample Size
Conventional Pollutants:					
5-Day Biochemical Oxygen Demand (BOD_5)	mg/L	3.00	44.0	6.56	32
	%	82.0	99.0	96.6	30
	lb/day	0.20	3.90	0.70	30
Total Suspended Solids (TSS)	mg/L	1.00	7.00	3.38	32
	%	88.0	99.0	97.1	30
	lb/day	0.10	0.90	0.36	30
E. coli, April - October	org/100mL	2.00	7.00	4.00	3[(2)]
E. coli, November - March	org/100mL	1.00	4.00	2.40	2[(2)]
Oil and Grease	mg/L	0.40	1.00	0.88	5
pH	s.u.	6.30	8.24	7.81	30
Nonconventional Pollutants:					
Total Ammonia, as N	mg/L	0.05	19.6	3.74	32
Nitrate + Nitrite, as N	mg/L	0.01	23.0	6.04	32
Total Kjeldahl Nitrogen	mg/L	0.60	19.8	4.41	32
Total Nitrogen, as N	mg/L	2.50	25.3	11.4	30
	lb/day	0.055	4.43	1.23	30
Total Phosphorus, as P	mg/L	0.12	2.75	1.59	30
	lb/day	0.01	0.30	0.16	30
Total Recoverable Cadmium[(3)]	µg/L	0.08	0.15	0.08	32
Total Recoverable Copper	µg/L	6.00	87.0	26.7	32
Total Recoverable Zinc	µg/L	10.0	90.0	42.2	32

[(1)] All data is for effluent characteristics, unless indicated as influent

[(2)] Several samples within this period of record had a qualifier code "H," indicating that the sample holding time had been exceeded. Samples with a qualifier code "H" were not included in the sample group.

[(3)] Twenty-nine "non detect" results were reported at a Reporting Limit (RL) of 0.08 µg/L

D. Compliance History

DEQ completed one Compliance Evaluation Inspection (CEI) for Hinsdale during the permit cycle. DEQ's September 10, 2019 violation letter stated that the inspection found Hinsdale was not properly operating and maintaining all facilities and systems of treatment and control. The report specifically cited failure to

- properly operate and maintain all facilities and systems,
- conduct analysis,
- preserve and analyze samples,
- calculate and report monitoring results,
- and maintain records.

Hinsdale submitted a response addressing the findings in the CEI report. DEQ evaluated the written response, and determined the proposed work to be considered major maintenance that could impact the treatment process. As a result, a professional engineer would need to assess and direct required improvements.

In correspondence dated February 20, 2020, Hinsdale wrote that they had applied for a planning grant through The Department of Natural Resources, which, if successful, would allow them to obtain professional engineer services needed to address the necessary maintenance. At the time of writing this fact sheet, DEQ has not received any notification regarding the status of the application and/or upgrades to the facility.

III. Technology-Based Effluent Limits (TBELs)

Technology-based effluent limitations (TBELs) represent the minimum treatment requirements implemented in MPDES permits. The limits are based on widely available technologies to treat pollutants and must be met prior to dilution.

A. Applicable Effluent Limit Guidelines

Secondary treatment standards are defined in terms of effluent quality as measured by pH, 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), and percent removal of BOD_5 and TSS. These standards are based on application of biological treatment.

B. National Secondary Treatment Standards (NSS)

NSS are based on demonstrated performance of a properly designed and operated municipal wastewater treatment system.

BOD_5 effluent history:

- From 2015-2020, the 95th percentile of monthly average BOD_5 was 13 mg/L.
- In the 2012 permit, effluent limits were set to NSS for BOD_5 (30 mg/L monthly avg).

TSS effluent history:

- From 2015-2020, the 95th percentile of monthly average TSS was 6 mg/L.
- In the 2012 permit, effluent limits were set to NSS for TSS (30 mg/L monthly avg).

Based on the facility's performance, the fact that it is a mechanical plant, and the variety of improper sampling, monitoring, recording, and reporting errors identified in the DEQ compliance inspection, the facility will be held to NSS for BOD_5 and TSS (**Table 4**).

C. Mass-based Effluent Limits

Effluent limits must be expressed in terms of mass, and are identified as load (lb/day). Hinsdale's load limits were calculated by multiplying the facility's average daily design flow and the national secondary treatment standards for concentration of each pollutant by a conversion factor:

- *BOD_5 and TSS monthly average load = 0.03 mgd x 30* $\frac{mg}{L}$ *x 8.34* $\frac{lb \bullet L}{Mgal \bullet mg}$ *= 7.506* $\frac{lb}{day}$
- *BOD_5 and TSS weekly average load = 0.03 mgd x 45* $\frac{mg}{L}$ *x 8.34* $\frac{lb \bullet L}{Mgal \bullet mg}$ *= 11.259* $\frac{lb}{day}$

Load limits for BOD_5 and TSS will apply to the effluent, and the monthly average load limit will be maintained at the more stringent of the nondegradation load allocations or mass-based loading limits, as discussed next.

D. Nondegradation Load Allocations

Montana's Nondegradation Policy prevents degradation of state waters and ensures that existing uses continue to be achieved. Sources that comply with the conditions of their permit and do not exceed the limits from a permit issued by DEQ prior to April 29, 1993 are not considered new or increased sources.

Nondegradation load values are compared to the actual average loads discharged from the facility from the past five years. The long-term averages in **Table 3** demonstrate that Hinsdale discharges within the proposed load-based effluent limits; therefore, this facility is not considered a new or increased source.

Table 3. Comparison of Nondegradation and Actual Mass Loading

Parameter	Load (lb/day)	Actual Average Monthly Load (lb/day)				
		2015	2016	2017	2018	2019
BOD_5	7.5	4.1	6.2	3.7	3.6	3.7
TSS	7.5	2.4	2.7	3.2	2.8	2.7

E. Final Technology-Based Effluent Limits

The renewed permit will retain TBELs based on National Secondary Standards for BOD_5 and TSS, as shown in **Table 4**. Technology-based limits for pH remain between 6.0-9.0 standard units.

Table 4. Technology-Based Effluent Limits[(1)] for Outfall 001

Parameter	Units	Effluent Limits	
		Average Monthly	Average Weekly
5-Day Biochemical Oxygen Demand (BOD_5)	mg/L	30	45
	% Removal	85	-
	lb/day	7.5	11.3
Total Suspended Solids (TSS)	mg/L	30	45
	% Removal	85	-
	lb/day	7.5	11.3
pH	s.u.	6.0-9.0 (instantaneous)	

(1) See definition section at end of permit for explanation of terms

IV. Water Quality-Based Effluent Limitations

Permits are required to include Water Quality-Based Effluent Limits (WQBELs) when TBELs are not adequate to protect state water quality standards. WQBELs are developed for each parameter demonstrating reasonable potential to cause or contribute to an excursion from any water quality standard, including narrative criteria.

A. Scope and Authority

The Montana Water Quality Act states that a permit may only be issued if DEQ finds that it will not result in pollution of state waters. MPDES permits shall include limits on all pollutants which will cause, or have reasonable potential to cause, an excursion of any numeric or narrative water quality standard. The purpose of this section is to provide a basis and rationale for establishing effluent limits that will protect designated uses of the receiving water based on Montana water quality standards and water use classifications.

B. Applicable Water Quality Standards

1. B-3 Classification Standards

Hinsdale's discharge to Milk River is subject to the specific water quality standards of B-3 waters.

2. ***General Prohibitions***
   The discharge from Hinsdale must comply with general prohibitions (narrative standards) which require that state waters, including mixing zones, must be free from substances that will:
   - settle to form objectionable sludge deposits or emulsions beneath the surface of the water or upon adjoining shorelines;
   - create floating debris, scum, a visible oil film (or be present in concentrations at or in excess of 10 milligrams per liter), or globules of grease or other floating materials;
   - produce odors, colors or other conditions as to which create a nuisance or render undesirable tastes to fish flesh or make fish inedible;
   - create concentrations or combinations of materials which are toxic or harmful to human, animal, plant or aquatic life; and
   - create conditions which produce undesirable aquatic life.

C. Pollutants of Concern

Parameters are identified as a pollutant of concern for the following reasons:
- Listed as TBELs
- Identified as needing WQBELs in the previously issued permit
- Identified as present in effluent monitoring or otherwise expected to be present in the discharge
- Associated with impairment which may or may not have a wasteload allocation (WLA) in a total maximum daily load (TMDL)

Parameters that may cause or contribute to a violation of water quality standards include those found in **Table 5.** Identification of a pollutant of concern (POC) is not an indication that WQBELs are necessary, but an indication that further evaluation is required.

Table 5. Identification of Pollutants of Concern for WQBELs Consideration

Parameter	Basis for POC Identification
Conventional Pollutants:	
BOD_5, TSS, pH	TBEL, previous permit
E. coli	Limit, previous permit; impairment
Oil and Grease	Permit monitoring
Nonconventional Pollutants:	
Total Ammonia, Total Nitrogen, Total Phosphorus	Known present
Nitrate + Nitrite, as N	Limit, previous permit
Total Nitrogen, as N	Known present
Total Phosphorus, as P	Known present

D. Receiving Water: Milk River

Hinsdale WWTF discharges wastewater to Milk River, a tributary to the Missouri River. Effluent leaves the WWTF lab building through a 6 inch pipe leading to a manhole approximately 20 feet to the east. From the manhole, effluent travels approximately 500 feet to discharge into the Milk River at the end of a pipe which is typically submerged.

1. *Receiving Water Summary*

The following information is used to develop water quality based effluent limits (WQBELs):

- Water Use Classification: B-3
- Basin: Lower Missouri
- Watershed: Milk
- USGS Hydrologic Unit Code: 10050012
- MT Stream Segment Identification Number: MT40O001_010
- 7Q10: 22.74 cfs
- Impairments (2018 303(d) list): Yes; *E. coli*, lead, mercury
- Dilution ratio: 1105:1

2. *Water Use Classification*

Milk River and its tributaries are classified as B-3 according to Montana Water Use Classifications. Waters classified B-3 are to be maintained suitable for:

- drinking, culinary, and food processing purposes, after conventional treatment;
- bathing, swimming, and recreation;
- growth and propagation of non-salmonid fishes and associated aquatic life, waterfowl and furbearers;
- agricultural and industrial water supply

3. *Impairments*

Milk River is listed as impaired on the 2018 303(d) list, citing partial support for drinking water and primary contact recreation. Probable causes are *E. coli*, lead, and mercury, with sources most likely being agriculture and dam/impoundment. No TMDLs have been completed for the Milk River at the time of writing of this Fact Sheet.

E. Applicable Water Quality Standards and Ambient Stream conditions

Each waterbody classification has numeric and narrative water quality standards designed to ensure that beneficial uses are protected.

1. *Instream Pollutant Concentrations*

The 2012-permit required Hinsdale to conduct background monitoring for several parameters. Nitrate + Nitrite was not included in the facility's background monitoring requirements, but upstream monitoring data for the parameter was available on STORET for a Water Quality Portal station (MDEQ_WQ_WQX-M45MILKR11) located on the Milk River at Hinsdale Town Park. Ambient water quality data for Milk River is summarized in **Table 6**.

Table 6. Milk River Upstream Water Quality and Comparison to Water Quality Standards

Summary of Receiving Water Quality Data				Water Quality Standards		
Parameter	Unit	Number of Samples	75th Percentile	Aquatic Life Standards		Human Health
				Acute	Chronic	
pH	s.u.	66	8.41	6.0-9.0		
Temperature	°C	66	15.6	Monitoring requirement only		
Nitrate+Nitrite, as N	mg/L	2	0.18	-	-	10.0
Total Ammonia, as N	mg/L	22	0.08	2.50	1.18	-
Cadmium	µg/L	22	0.80	4.00	1.00	5.00
Copper	µg/L	10	12.0	29.0	18.0	1300

Table 6. Milk River Upstream Water Quality and Comparison to Water Quality Standards						
Summary of Receiving Water Quality Data				Water Quality Standards		
Parameter	Unit	Number of Samples	75th Percentile	Aquatic Life Standards		Human Health
				Acute	Chronic	
Zinc	µg/L	22	18.0	229	229	-
Total Hardness, as CaCO3	mg/L	21	215[(1)]	Monitoring requirement only		

[(1)] 25th percentile for hardness

2. Low Flow

DEQ methodology to determine annual 7Q10 values typically identifies gages suitable for comparison located on the receiving water. Hinsdale is located on the Milk River. Flow data recorded from 1977 through the present are available for a stream gage (06164510) located on the Milk River approximately 25 river miles upstream from the discharge near Saco, Montana. These data result in a 7Q10 value of 22.74 cfs using USGS StreamStat equations. There are no known flow controls between this location and the discharge. There are additional volume inputs from Beaver and Rock Creeks between USGS gage 06164510 and the facility, but historical data shows that these contributions are insignificant, and were not considered to alter the flow regime.

F. Mixing Zone

A mixing zone is an area where the effluent mixes with the receiving water and certain water quality standards may be exceeded. A mixing zone is granted on a case-by-case basis, must be the smallest practicable size with definable boundaries, and have a minimum effect on water uses. Mixing zones are not granted for technology-based standards. Acute aquatic life standards for any parameter may not be exceeded in any portion of the mixing zone unless DEQ specifically finds that allowing minimal initial dilution will not threaten or impair existing beneficial uses. An effluent in its mixing zone may not block passage of aquatic organisms nor may it cause acutely toxic conditions. Aquatic life chronic, aquatic life acute, and human health standards may not be exceeded outside a designated mixing zone. Any previously allowed mixing zone will remain designated in a renewed permit unless there is evidence that the previously allowed mixing zone will impair existing or anticipated uses.

DEQ has determined that allowing dilution for ammonia (acute and chronic standards), nitrate + nitrite (human health standard), and copper (acute and chronic standards) will not threaten or impair existing beneficial uses. The discharge is not located in significant fish spawning or nursery habitat. The discharge is small, relative to the receiving water, and will not block fish passage or cause acutely toxic conditions. There are no drinking water intakes near the discharge. DEQ finds that granting a minimal amount of dilution is appropriate, as summarized in **Table 7**.

Table 7. Percentage of 7Q10 Allowed for Dilution		
Parameter	Standard	Allowed Dilution (%)
Ammonia	Acute	2.5
	Chronic	10
Nitrate + nitrite	Human Health	10
Copper	Acute	2.5
	Chronic	10

G. Reasonable Potential Analysis

The reasonable potential (RP) analysis predicts the impact of the discharge on the receiving water under design conditions, and WQBELs are developed for each parameter that demonstrated RP to cause an exceedance of a water quality standard. DEQ uses a statistical approach outlined in Chapter 3 of EPA's *Technical Support Document for Water Quality-based Toxics* Control (*EPA's TSD Manual*) to determine RP for individual pollutants:

$$Q_rC_r = Q_sC_s + Q_dC_d \text{ (}\textit{Equation 1}\text{)}$$

Q_r = resulting in-stream flow after discharge ($Q_s + Q_d$; mgd)
C_r = resulting downstream pollutant concentration (after available dilution; mg/L, or µg/L for metals)
Q_s = receiving water flow rate above point of discharge (mgd)
C_s = upstream receiving water pollutant concentration (mg/L, or µg/L for metals)
Q_d = effluent flow rate (facility design flow rate; mgd)
C_d = effluent pollutant concentration (mg/L, or µg/L for metals)

1. ***Critical Effluent Concentration (C_d) Calculation:*** The facility's maximum reported effluent concentration (C_{max}) is converted into the projected critical effluent concentration (C_d). This accounts for variation in the effluent.

   - A statistical TSD 3-2 multiplier is determined by the data set, coefficient of variation (CV) and sample size at the 95th percentile confidence interval. A default CV of 0.6 is used with less than 10 samples.
   - The TSD 3-2 multiplier is then applied to the facility's maximum reported effluent concentration (C_{max}) to determine the critical effluent concentration (C_d) (**Table 8**).
   - **Table 8** shows that oil and grease, cadmium, and zinc have lower C_d values than aquatic life water quality standards, and therefore do not have reasonable potential. However, further analysis is required for total ammonia, nitrate + nitrite, and copper.

Table 8. Projected Critical Effluent Concentration (Cd)

	Projected Critical Effluent Concentration						Water Quality Standard		
	CV	Sample Size	→	3-2 TSD Mult	• C_{max} =	**C_d**	Aquatic Life Acute	Aquatic Life Chronic	Human Health
					(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Oil and Grease[1]	0.27	5		1.5	1	**1.5**	10	10	10
Total Ammonia	1.63	32		1.41	19.6	**27.6**	**2.53**	**1.18**	**-**
Nitrate + Nitrite	0.93	32		1.27	23	**29.14**	**-**	**-**	**10**
					(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Cadmium	0.15	32		1.05	0.15	**0.16**	4	1.5	5
Copper	0.65	32		1.19	87	**104**	**28.8**	**17.9**	**1300**
Zinc	0.35	32		1.11	90	**100**	229	229	-

[1] State waters must be free from concentrations at or in excess of 10 mg/L

2. ***Critical upstream flow (Q_s) Calculation:*** Next, the critical upstream flow (Q_s) is determined from the 7Q10 of Milk River and the available dilution as discussed in section V(D) (**Table 9**).

Table 9. Critical Upstream Flow (Qs)				
	7Q10 Low Flow (mgd)	•	Dilution %	= Q_s (mgd)
Ammonia, Acute	14.7		2.50	0.37
Ammonia, Chronic	14.7		10.0	1.47
Nitrate+Nitrite, HH	14.7		10.0	1.47
Copper, Acute	14.7		2.50	0.37
Copper, Chronic	14.7		10.0	1.47
Copper, HH	14.7		0	0

3. ***C_r is Compared to the Water Quality Standard:*** Equation 1 is rearranged to solve for the receiving water pollutant concentration (C_r) with the variables specific to Hinsdale WWTF and Milk River. If the projected critical effluent concentration is greater than the water quality standard (C_r > WQS), reasonable potential exists, and a WQBEL must be established for those parameters.

   - **Table 10** shows that the C_r value is less than the water quality standards for ammonia, nitrate + nitrite, and copper. Therefore, **reasonable potential does not exist**, and **WQBELs are not needed**.

Table 10. Receiving Water Pollutant Concentration and RP Analysis									
	Projected Receiving Water Pollutant Conc. (C_r)					Reasonable Potential			
	(C_s (mg/L)	Q_s) + (mgd)	(C_d (mg/L)	Q_d) / (mgd)	(Q_r) (mgd)	C_r (mg/L)	< or >	WQS (mg/L)	RP? (yes/no)
Ammonia, Acute	0.09	0.37	27.60	0.03	0.40	2.17	<	2.53	**no**
Ammonia, Chronic	0.09	1.47	27.60	0.03	1.50	0.64	<	1.18	**no**
Nitrate+Nitrite, HH	0.18	1.47	29.14	0.03	1.50	0.76	<	10.00	**no**
	(µg/L)	(mgd)	(µg/L)	(mgd)	(mgd)	(µg/L)		(µg/L)	(yes/no)
Copper, Acute	6.00	0.37	104	0.03	0.40	13.4	<	28.8	**no**
Copper, Chronic	6.00	1.47	104	0.03	1.50	7.96	<	17.9	**no**
Copper, HH	6.00	0.00	104	0.03	0.03	104	<	1300	**no**

V. Final Pollutant Evaluation

A. Conventional Pollutants:

1. ***BOD and Total Suspended Solids (TSS)***: The facility provides a significant reduction in biological material and suspended solids through secondary treatment.
   - No additional limits are necessary – TBELs adequately control this pollutant and the TBELs protect the beneficial uses of the Milk River.

2. ***pH***: The 2012-issued permit requirements for pH will be continued.
   - pH must be maintained between 6.0 and 9.0 standard units.
   - For compliance purposes, any single analysis beyond this limit will be considered a violation of the permit.

3. ***Oil and Grease***: Montana regulations require state waters be free from substances attributable to municipal dischargers that will result in concentrations of oil and grease at or in excess of 10 mg/L.
   - This limit of 10 mg/L will be added in the renewal permit.

- The requirement to observe the discharge each week for an oil and grease sheen and to collect and analyze an oil and grease sample if a sheen is observed will be added in the renewal permit.
- Semiannual monitoring is maintained in the renewal permit.

4. ***E. coli Bacteria Limits***: The applicable standards for *E. coli* for class B-3 waters are:
   - April 1 through October 31, of each year, the geometric mean number of the microbial species *E. coli* must not exceed 126 organisms per 100 milliliters (org/100 mL), nor are 10% of the total samples during any 30-day period to exceed 252 org/100 mL; and
   - November 1 through March 31, of each year, the mean number of *E. coli* organisms should not exceed 630 org/100 mL and 10% of the samples during any 30-day period may not exceed 1,260 org/100 mL

   The receiving water is listed on the 2018, 303(d) impaired list for *E. coli*. The existing permit limits and monitoring requirements for *E. coli* are maintained in this renewal.

B. Nonconventional Pollutants:

1. ***Temperature***: The standards for B-3 classified waters are based on the naturally occurring water temperature. The receiving water is not listed as impaired for temperature. Monthly effluent and background temperature monitoring of temperature will continue to be required in the renewed permit.

2. ***Total Ammonia***: Background pH, temperature data, and the presence/absence of salmonids and early life stages of fish are used to determine ammonia water quality standards. Salmonids are documented as present within the segment of the Milk River to which Hinsdale discharges (MFISH). The permittee was required to collect this data from an appropriate background location on a monthly basis in the 2012-permit. Additionally, the 2012-permit required monthly effluent monitoring of Total Ammonia, as well as quarterly background monitoring.

   Hinsdale will be required to continue existing monitoring to ensure compliance with the water quality standard.
   - Quarterly background and monthly effluent monitoring of total ammonia will continue to be required.

3. ***Nitrate + Nitrite***: DEQ proposes to remove WQBELs for Nitrate + Nitrite for this permit. However, monthly effluent monitoring will continue to be required and quarterly background monitoring will be added to ensure compliance with the water quality standard.

   The requirement above is less stringent than the requirements in the 2012-permit. Relaxation (or "backsliding") of existing limits is only allowed under certain conditions, as described in the anti-backsliding provisions in the federal Clean Water Act and the Code of Federal Regulations. In this case, the removal of the limit reflects new information regarding effluent and ambient data, as well as a better characterization of the receiving water low flow. This new information meets the requirements to allow the relaxation of effluent limits.
   - The effluent limit of 10 mg/L will be removed.
   - Monthly effluent monitoring of Nitrate + Nitrite, as N will continue to be required.
   - Quarterly background monitoring of Nitrate + Nitrite will be added.

4. ***Nutrients, Total Nitrogen (TN) and Total Phosphorus (TP):*** Montana regulations require state waters be free from substances attributable to municipal discharges that will create

conditions which produce undesirable aquatic life. The Milk River is not listed as impaired for nutrients and ratio of 7Q10 to facility design flow 490:1. DEQ finds no evidence that Hinsdale's discharge is producing undesirable aquatic life. Seasonal (July 1 to September 30) effluent and upstream monthly monitoring will be required in the renewed permit.

- Monthly monitoring of total nitrogen and total phosphorus during the months of July, August, and September will be required.

C. Toxic Pollutants

1. ***Cadmium***: Reasonable potential to exceed water quality standards for cadmium has not been demonstrated, and monitoring for this parameter will be discontinued in the renewed permit.
   - Reasonable potential does not exist, further monitoring will not be required.

2. ***Copper***: With an allowed 2.5% dilution allowance for acute standards, and 10% allowance for chronic standards, copper does not demonstrate reasonable potential to exceed water quality standards. Therefore, no effluent limit will be set. Monthly effluent monitoring and quarterly receiving water background sampling will be discontinued in the renewed permit.
   - Reasonable potential does not exist, further monitoring will not be required.

3. ***Lead***: Though the receiving water is impaired for lead, effluent sampling in the previous POR (2007-2011) showed that RP for lead did not exist. Therefore, monitoring of lead was not included in the 2012-permit. The permit renewal will not include a monitoring requirement.
   - Monitoring will not be required.

4. ***Mercury***: Though the receiving water is impaired for mercury, effluent sampling in the previous POR (2007-2011) showed that RP for mercury did not exist. Therefore, monitoring of mercury was not included in the 2012-permit. The permit renewal will not include a monitoring requirement.
   - Monitoring will not be required.

5. ***Zinc***: Reasonable potential to exceed water quality standards for zinc has not been demonstrated, and monitoring for this parameter will be discontinued in the renewed permit.
   - Reasonable potential does not exist, further monitoring will not be required.

VI. Final Effluent Limits

The final effluent limits are a combination of the more stringent of the technology-based and water quality-based effluent limits developed. The final effluent limits in **Table 11** will be applied to the discharge at Outfall 001 beginning on the permit effective date and lasting through the term of the permit.

- There shall be no discharge of floating solids or visible foam other than in trace amounts
- There shall be no discharge which causes visible oil sheen in the receiving stream
- There shall be no discharge that settles to form objectionable sludge deposits or emulsions beneath the surface of the water or upon adjoining shorelines.

Table 11. Effluent Limits -- Outfall 001				
Parameter	Units	Average Monthly Limit[(1)]	Average Weekly Limit[(1)]	Maximum Daily Limit
5-Day Biochemical Oxygen Demand (BOD_5)	mg/L	30	45	-
	% Removal	85	-	-
	lb/day	7.5	11.3	-
Total Suspended Solids (TSS)	mg/L	30	45	-
	% Removal	85	-	-
	lb/day	7.5	11.3	-
E. coli, April - October	org/100 mL	126	252	-
E. coli, November - March	org/100 mL	630	1,260	-
Oil and Grease	mg/L	-	-	10
pH	s.u.	Within the range of 6.0 - 9.0		-
[(1)] See Definitions section at the end of the permit for explanation of terms.				

VII. Monitoring and Reporting Requirements

A. Requirement to Monitor and Report

Hinsdale must monitor their effluent. The samples collected and analyzed must be representative of the volume and nature of the facility's discharge. The Required Reporting Value (RRV) is DEQ's best determination of a level of analysis that can be achieved by the majority of commercial, university, or governmental laboratories using EPA-approved methods or methods approved by DEQ.

- Monitoring will start with the effective date of the permit and last for the duration of the permit cycle
- All analytical procedures must comply with the specifications of 40 CFR Part 136.
- Hinsdale must submit monitoring results electronically through NetDMR for each month. Each month's data must be submitted by the 28th of the following month
- Monitoring must meet the requirements with sample type and frequency as presented in **Table 14**, and required reporting values (RRVs) as presented in Circular DEQ-7.

B. Monitoring Locations, Frequency, Sample Type, and Calculations

Starting with the effective date of the permit and lasting for the duration of the permit cycle, self-monitoring must be conducted at the following locations, unless another location is requested and approved by DEQ in writing.

1. ***Influent Monitoring:*** Influent analyte samples may be collected from the influent manhole structure located just before the equalization cells or just before the bar screen located at the influent entry point to the equalization cells. For the purposes of composite sampling, influent flow should be measured in a manner that provides a reasonable accurate quantification of flow at the time each aliquot is obtained. Acceptable methods of influent flow measurement for the permittee include:
    i. use of a weir gage (if available) in the influent manhole structure
    ii. manual measurement of influent flow at the end of the influent flow pipe prior to the bar screen

iii. influent flow calculation through fill timing in the initial equalization chamber (e.g. timing pump off cycle between float switches set at depths representing a known volume). The use of flow averaging calculations through pump runtime logging is not an acceptable means of measuring the instantaneous flow required for composite sampling purposes.

2. ***Effluent Monitoring – Outfall 001:*** Effluent analyte samples will continue to be taken at the inline well between the UV system and the effluent flow gage in the laboratory building. Effluent flow will be monitored using the continuous flow monitor installed over the flume in the laboratory building

Table 12. Influent and Effluent Monitoring Requirements

Parameter	Unit	Sample Location	Sample Frequency	Sample Type[1]	RRV
Flow	mgd	Influent	Monthly[2]	Instantaneous	-
	mgd	Effluent	Continuous	[3]	-
Biochemical Oxygen Demand (BOD_5)	mg/L	Influent[4]	Monthly	Composite	2
	mg/L	Effluent	Monthly	Grab	2
	% Removal	Effluent	Monthly	Calculated	-
	lbs/day	Effluent	Monthly	Calculated	-
Total Suspended Solids (TSS)	mg/L	Influent[4]	Monthly	Composite	10
	mg/L	Effluent	Monthly	Grab	10
	% Removal	Effluent	Monthly	Calculated	-
	lbs/day	Effluent	Monthly	Calculated	-
pH	s.u.	Effluent	Monthly	Instantaneous	0.1
Temperature	°C	Effluent	Monthly	Instantaneous	0.1
E.coli	cfu/100 ml	Effluent	Monthly	Grab	1/100mL
Oil Sheen Presence	Presence	Effluent	Weekly	Observation	-
Oil and Grease	mg/L	Effluent	Semiannual	Grab	1.0
Total Ammonia, as N	mg/L	Effluent	Monthly	Grab	0.07
Nitrate + Nitrite, as N	mg/L	Effluent	Monthly	Grab	0.02
Total Kjeldahl Nitrogen, as N	mg/L	Effluent	Monthly	Grab	0.225
Total Nitrogen, as N[5][6]	mg/L	Effluent	Monthly	Calculated	0.01
	lbs/day	Effluent	Monthly	Calculated	-
Total Phosphorus, as P[6]	mg/L	Effluent	Monthly	Grab	0.001
	lbs/day	Effluent	Monthly	Calculated	-

[1] See Definition section at end of permit for explanation of terms.
[2] Permittee shall record instantaneous flow at time each aliquot is taken for BOD5 and TSS influent samples for the purposes of flow proportional compositing. Influent flow values will not be reported on DMRs but should be retained in permittee's bench records
[3] Permittee shall report daily maximum and monthly average flow on DMR
[4] Samples must be collected at specified frequency even if no discharge occurs in the monitoring period
[5] Calculated as the sum of Nitrate + Nitrite (as N) and Total Kjeldahl Nitrogen concentration.
[6] Monitoring required July, August and September monthly only.
[7]

3. ***Background Monitoring Requirements:*** The background sampling point must be:
   - upstream of the discharge
   - on the main stem of the receiving water (i.e. not from a peripheral feature such as a vernal swale)
   - at a location expected to be both outside the influence of the discharge and representative of the receiving water

Table 13. Background Monitoring Requirements

Parameter	Unit	Sample Location	Sample Frequency	Sample Type[(1)]	RRV
pH	s.u.	Receiving Water	Monthly	Instantaneous	0.1
Temperature	°C	Receiving Water	Monthly	Instantaneous	0.1
Total Ammonia, as N	mg/L	Receiving Water	Quarterly	Grab	0.07
Nitrate + nitrite, as N	mg/L	Receiving Water	Quarterly	Grab	0.02
Total Hardness (as $CaCO_3$)	mg/L	Receiving Water	Quarterly	Grab	-

[(1)] See Definition section at end of permit for explanation of terms.

4. ***Additional Reporting Requirements:*** Load and percent removal calculations are required.

VIII. Public Participation

DEQ issued Public Notice No. MT-20-20 dated December 14, 2020. The public notice states that a tentative decision has been made to issue an MPDES permit to the Permittee and that a draft permit, fact sheet and environmental assessment (EA) have been prepared. Public comments are invited any time prior to the close of the business on January 15, 2021. Comments may be directed to:

Department of Environmental Quality
Water Protection Bureau
PO Box 200901
Helena, MT 59620
or
DEQWPBPublicComments@mt.gov

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 and issue a final decision within sixty days of the close of the public comment period or as soon as possible thereafter.

All persons, including the applicant, who believe any condition of a 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).

A. Notification of Interested Parties

Copies of the public notice were mailed to the discharger, state and federal agencies and interested persons who have expressed an interest in being notified of permit actions. A copy of the distribution list is available in the administrative record for this permit. In addition to mailing

the public notice, a copy of the notice and applicable draft permit, fact sheet and EA were posted on DEQ's website for 30 days.

Any person interested in being placed on the mailing list for information regarding this MPDES permit should contact DEQ, reference this facility, and provide a name, address, and email address.

B. Public Hearing

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.

C. Permit Appeal

After the close of the public comment period, DEQ will issue a final permit decision. A final permit decision means a final decision to issue, deny, modify, revoke and reissue, or, terminate a permit. A permit decision is effective 30 days after the date of issuance unless a later date is specified in the decision, a stay is granted, or the applicant files an appeal pursuant to 75-5-403, MCA.

The Applicant may file an appeal within 30 days of DEQ's action to the following address:

Secretary, Board of Environmental Review
Department of Environmental Quality
1520 East Sixth Avenue
PO Box 200901
Helena, Montana 59620-0901

D. Additional Information

Requests for additional information or questions regarding this permit should be directed to the Water Protection Bureau at 406-444-5546.

IX. Information Sources

Administrative Rules of Montana Title 17 Chapter 30 – Water Quality

- Subchapter 2 - *Water Quality Permit and Application Fees.*
- Subchapter 5 - *Mixing Zones in Surface and Ground Water*.
- Subchapter 6 - *Montana Surface Water Quality Standards and Procedures.*
- Subchapter 7 - *Nondegradation of Water Quality.*
- Subchapter 12 - *Montana Pollutant Discharge Elimination (MPDES) Standards*.
- Subchapter 13 - *Montana Pollutant Discharge Elimination (MPDES) Permits.*

CWAIC: Clean Water Act Information Center, Department of Environmental Quality. 2019. Accessed October 2020.

Federal Water Pollution Control Act (Clean Water Act), 33 U.S.C. §§ 1251-1387, October 18, 1972, as amended 1973-1983, 1987, 1988, 1990-1992, 1994, 1995 and 1996.

Interstate Engineering, 2002. Hinsdale County Water and Sewer District Wastewater System Improvements

MFISH Mapper. Accessed October 2020.

Montana Code Annotated (MCA), Title 75-5-101, *et seq.*, "Montana Water Quality Act."

Montana DEQ. 2019. *Department Circular DEQ-7, Montana Numeric Water Quality Standards.*

Montana DEQ. 2019. Compliance Inspection Report, Hinsdale Wastewater Treatment Plant

Montana DEQ. Montana Pollutant Discharge Elimination System (MPDES) Permit Number MT0020656

- Administrative Record
- Renewal Application Forms DEQ-1 and EPA Form 2A, 2016

US Code of Federal Regulations, 40 CFR Parts 122-125, 130-133, & 136.

Prepared by: Hannah New
Date: November 2020