MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
MONTANA POLLUTANT DISCHARGE ELIMINATION SYSTEM

Fact Sheet

Permittee:	City of Livingston
Permit No.:	MT0020435
Receiving Water:	Yellowstone River
Facility Information:	
Name	City of Livingston Wastewater Treatment Plant
Location	330 Bennett St. Livingston, MT 59047 Park County 45.67459 N, 110.54084 W
Facility Contact	Dan Emter, Plant Foreman 330 Bennett St. Livingston, MT 59047
Fee Information:	
Number of Outfalls	1
Outfall – Type	001 – Major Publicly-Owned Treatment Works

I. Permit Status

This fact sheet has been drafted for renewal of Montana Pollutant Discharge Elimination System (MPDES) permit no. MT0020435 for the City of Livingston (City) Wastewater Treatment Plant (WWTP). The existing permit was issued September 22, 2009, became effective on November 1, 2009, was modified on March 19, 2012, and expired on October 31, 2014. The 2012 modification to the permit was performed to install total residual chlorine (TRC) limits as the facility determined the addition of chlorination was necessary to meet *Escherichia coli (E. coli)* effluent limits.

The Montana Department of Environmental Quality (DEQ) received an application from the City for renewal of MT0020435 on May 5, 2014. DEQ replied with a notice of deficiency dated May 12, 2014, that identified several issues with the application. DEQ received updated application information from the City on July 21, 2014, and deemed the application complete and the 2009-issued permit to be administratively continued in a letter dated July 24, 2014.

II. Facility Information

A. Facility Description

The City of Livingston WWTP is a major publicly owned treatment works (POTW) originally constructed in 1960 with one primary clarifier, two anaerobic digesters, and sludge drying beds. In 1980, the WWTP was upgraded with 12 rotating biological contactors (RBCs), two secondary clarifiers, and a chlorine contact basin. In 2000, grit removal and ultraviolet (UV) disinfection systems were added. The facility has an average daily design flow of 2.0 million gallons per day (mgd). A summary of the current facility design criteria are provided in **Table 1**.

Table 1: Current Design Criteria Summary	
Facility Description: Primary & Secondary Clarification, Rotating Biological Contactors, Ultraviolet (UV) & chlorine disinfection	
Construction Date: 1960	Modification Date: 1980, 1985, 2000, 2012
Design Population: 10,500	Current Population: 7,200
Design Flow, Average (mgd): 2.0	Design Flow, Maximum Day (mgd): 5.0
Design BOD Removal (%): 85	Design BOD Load (lbs/day/1,000 sf): 2.1
Design SS Removal (%): 85	Design SS Load (lbs/day): NA
Influent Flow (mgd): 0.78 mgd (2012 avg)	Influent Flow Source: Stahly 2014
Collection System Combined [ ] Separate [X]	Estimated I/I: 25,000–50,000 gallons per day
SSO Events (Y/N): N	Bypass Events (Y/N): Y
Disinfection (Y/N): Y	Type: UV and Chlorination Systems
Discharge Method: Continuous	
Sludge Disposal: Composting	

Influent flow rate is measured in using a Parshall flume in a manhole near the headworks building. Effluent flow rate is measured using a Parshall flume located between the UV system and the chlorine contact chamber. Both flumes have electronic metering. A 24-inch line carries effluent from the chlorine contact chamber to the final point of control at Outfall 001 at the Yellowstone River. **Figure 1** is a representation of flow through plant processes and **Figure 2** provides an aerial view of labelled plant treatment installations (Stahly 2014).

The 2009 permit required submission to DEQ by January 1, 2014, of plans and schedules for funding, designing, and construction of upgrades required to meet proposed ammonia limits during the next permit cycle. The permittee fulfilled this requirement on December 31, 2013. This information was updated with submission of a preliminary engineering report (PER, Stahly 2014) with its renewal application. The PER indicates that the RBC system has reached the end of its useful life. The PER recommends upgrade to or replacement alternatives for the following systems:

- secondary treatment,
- disinfection, and
- biosolids digestion.

Additionally, the PER provides recommendations upgrade to or addition of:

- influent pump electrics,
- primary clarifiers,
- solids handling, and
- biosolids composting.

The permittee has also indicated in its renewal application that it plans to replace perforated manhole covers with less permeable lids to reduce infiltration/inflow (I/I).

The City of Livingston maintains its own pretreatment program rules (Livingston Code of Ordinances, Chapter 14, Article IV) and receives wastewater from two industrial users: Industrial Towel and Cover Supply and Wilcoxson's Ice Cream. The U.S. Environmental Protection Agency (EPA) has stated that neither of these industrial users appears to have the potential to cause pass-through, interference, or violate a pretreatment standard. EPA does not consider either of these industrial users to be significant industrial users.

B. Effluent Characteristics

Effluent characteristic data as reported on discharge monitoring reports (DMRs) for a period of record (POR) from July 2010 through November 2015 are provided in **Tables 2 and 3**.

Table 2: Effluent Characteristics [1] – July 2010 through November 2015

Parameter	Location	Units	2009 Permit Limit [2]	Minimum Value	Maximum Value	Average Value	Number of Samples
Flow, Daily Average[3]	Influent	mgd	[4]	0.57	2.45	1.0	60
	Effluent	mgd	[4]	0.67	2.5	1.1	60
5- Day Biochemical Oxygen Demand (BOD_5) [3]	Influent	mg/L	[4]	129	398	290	60
	Effluent	mg/L	45/30	11	31.4	17.3	60
	NA	% removal	85	90	97	94	60
	Effluent	lbs/day	675/450	60	238	125	60
Total Suspended Solids (TSS) [3]	Influent	mg/L	[4]	164	446	326	60
	Effluent	mg/L	45/30	10	22	15.4	60
	NA	% removal	85	93	97	95	60
	Effluent	lbs/day	675/450	1.31	232	109	60
Escherichia coli [3]	Effluent	cfu/100mL	252/126 [5,6]	2.9	1,313	158	36
Escherichia coli [3]	Effluent	cfu/100mL	1,260/630 [6,7]	13.5	381	133	25
pH [3]	Effluent	s.u.	6-9	7.0	8.0	7.5	120
Temperature [3]	Effluent	ºC	[4]	8	20.6	13.9	60
Total Residual Chlorine[3]	Effluent	mg/L	0.011	0	0.01	0	32
Total Ammonia, as N	Effluent	mg/L	[4]	1.4	30.8	12.4	308
Total Kjeldahl Nitrogen	Effluent	mg/L	[4]	3	38	15	287
Nitrate + Nitrite, as N	Effluent	mg/L	[4]	0.04	15.5	6.3	287
Total Nitrogen	Effluent	mg/L	[4]	8.7	38.3	21.5	287
		lbs/day[3]	[4]	46	294	155	60
Total Phosphorus	Effluent	mg/L	[4]	1.4	7.3	3.8	287
		lbs/day[3]	[4]	8	49.2	26.2	60
Oil and Grease	Effluent	mg/L	[4]	ND	3	0.8[8]	26
Total Dissolved Solids	Effluent	mg/L	[4]	429	590	527	21

Footnotes: ND = Not Detected, NA = Not Available
(1) Statistical values based on individual values reported on DMRs when available. Average reported values used when no others available.
(2) Average Weekly Limit/Average Monthly Limit.
(3) Data sourced from DMRs; all other data taken from Energy Labs reporting system–Energy Source.
(4) No limit in 2009 permit; monitoring requirement only.
(5) Sample period is April 1 to October 31.
(6) Geometric average.
(7) Sample period is November 1 through March 31.
(8) Half reporting limit substituted for values reported as ND at reporting limit.

Table 3: Effluent Characteristics – July 2010 through November 2015

Parameter	Units	Minimum Value	Maximum Value	Average Value	Number of Samples	Reporting Limit(s)
Antimony, Total Recoverable	µg/L	ND	NA	NA	11	1
Arsenic, Total Recoverable	µg/L	2	5	4	11	1
Beryllium, Total Recoverable	µg/L	ND	NA	NA	11	1
Cadmium, Total Recoverable	µg/L	ND	NA	NA	12	0.1, 0.2, 0.6
Chromium, Total Recoverable	µg/L	ND	NA	NA	11	10
Copper, Total Recoverable	µg/L	21	90	43.5	12	1
Lead, Total Recoverable	µg/L	ND	NA	NA	12	1, 0.5
Mercury, Total Recoverable	µg/L	ND	NA	NA	11	0.1
Nickel, Total Recoverable	µg/L	ND	NA	NA	12	10
Selenium, Total Recoverable	µg/L	1	2	NA	11	1
Silver, Total Recoverable	µg/L	ND	NA	NA	11	1
Thallium, Total Recoverable	µg/L	ND	NA	NA	11	1
Zinc, Total Recoverable	µg/L	30	70	42.5 (1)	12	10
Cyanide, Total	µg/L	ND	NA	NA	11	5
Phenols, Total	µg/L	10	60	33	11	10
Hardness, Total (as $CaCO_3$)	mg/L	196	278	240	32	1
Benzo(a)anthracene	µg/L	ND	0.11	NA	4	0.10, 10
Benzo(a)pyrene	µg/L	ND	0.13	NA	4	0.10, 10
Benzo(k)fluoranthene	µg/L	ND	0.14	NA	4	0.10, 10
Chloroform	µg/L	ND	0.19 (2)	NA	4	0.50
Chrysene	µg/L	ND	0.14	NA	4	0.10, 10
Di(2-ethylhexyl)Phthalate	µg/L	ND	47	NA	4	5.0, 10
Indeno(1,2,3-cd)pyrene	µg/L	ND	0.21	NA	4	0.10, 10
Phenanthrene	µg/L	ND	0.19	NA	4	0.10, 0.20, 10
Toluene	µg/L	ND	0.55	NA	4	0.50

Footnotes: ND = Not Detected, NA = Not Available
(1) Half reporting limit substituted for values reported as ND at reporting limit.
(2) Laboratory estimated value below reporting limit.

The permittee performed 18 whole effluent toxicity (WET) tests during the period of record. Seven tests failed without, but all tests passed with, pH drift control measures. For the purposes of compliance, DEQ considers these all to be passing WET tests.

C. Compliance History

DEQ performed five compliance inspections at the facility between 2009 and 2015, with the following findings:

- June 10 & 11, 2010: *E. coli* exceedances as well as failure to report the *E. coli* correctly.
- December 17, 2010: inspection did not identify any violations that were not already being addressed by an Administrative Order on Consent (AOC).
- December 8, 2011: failure to maintain records of required information and failure to correctly report sample results.
- December 31, 2013: failure to perform monitoring correctly (samples not delivered to laboratory at correct temperature and on-ice); failure to correctly report sampling results for nitrate plus nitrite, total Kjeldahl nitrogen, total nitrogen, biochemical oxygen demand, and *E. coli*; and failure to perform WET on a correct two-day progression schedule.
- December 23, 2015: monitoring data for the month of July 2014 was not reported correctly, monitoring records were not being maintained correctly – the spreadsheet used to calculate DMR values had repetitive errors found throughout the time periods inspected, and sample dates/times were not being recorded correctly for composite samples.

The permittee entered into an AOC, Docket No. WQ-10-07 with the Department on September 10, 2010. The AOC was written to address violations due to exceedance of permit effluent limitations (*E. coli*) and failure to submit required monitoring information completely and within required timeframes. In a letter dated May 13, 2013, DEQ stated that the permittee had fulfilled the requirements of the AOC and that the enforcement case would be closed.

III. Technology-Based Effluent Limits

Federal regulations define minimum treatment requirements for secondary treatment, or the equivalent, for POTWs. Secondary treatment is 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.

The proposed technology-based effluent limits (TBELs) found in **Table 4** are based on these national secondary standards, and remain unchanged from the 2009 permit cycle. (Note that the TSS weekly average limit provided in the 2009 permit of 65 mg/L was a typographical error and should have been 45 mg/L. This was correctly stated in the fact sheet supporting the 2009 permit.)

Effluent limits must be expressed in terms of mass (mass/time), except for certain conditions, such as pH or temperature. For municipal treatment plants, mass-based limits are based on average daily design flow for the facility.

The mass-based limits for the Livingston WWTP are calculated as follows:

Load (lbs/day) = Design Flow (mgd) x Concentration (mg/L) x Conversion Factor (8.34)

BOD_5:

30-day	Load = 2.0 mgd x 30 mg/L x 8.34	=	500 lbs/day
7-day	Load = 2.0 mgd x 45 mg/L x 8.34	=	751 lbs/day

TSS:

30-day	Load = 2.0 mgd x 30 mg/L x 8.34	=	500 lbs/day
7-day	Load = 2.0 mgd x 45 mg/L x 8.34	=	751 lbs/day

Table 4: Outfall 001 Proposed TBELs

Parameter	Units	Average Monthly Limit	Average Weekly Limit	Rationale
5-Day Biochemical Oxygen Demand	mg/L	30	45	40 CFR Part 133.102(a)
	lbs/day	500	751	
	% removal	85 (1)	NA	
Total Suspended Solids	mg/L	30	45	40 CFR Part 133.102(b)
	lbs/day	500	751	
	% removal	85 (1)	NA	
pH	s.u.	6.0-9.0 (instantaneous)		40 CFR Part 133.102(c)

Footnotes:
(1) The arithmetic mean of the values for BOD_5 or TSS for effluent samples collected in a period of 30 consecutive days shall not exceed 15% of the arithmetic mean of the values for influent samples collected at approximately the same time during the same period (85% removal).

TBELs will be maintained at the more stringent of the nondegradation allocation or the mass-based load limit calculated above. The 2009 permit continued mass-based nondegradation load limits for BOD_5 and TSS which are more stringent than national secondary standards; the monthly average nondegradation limits will be retained in this proposed permit renewal. Since nondegradation reflects longer averaging time, the average weekly limit will reflect the mass-based load limit developed above.

IV. Water Quality-Based Effluent Limits

A. Scope and Authority

Permits are required to include water quality-based effluent limits (WQBEL) when technology-based effluent limits are not adequate to protect state water quality standards. Montana water quality standards require that no wastes may be discharged that can reasonably be expected to violate any state water quality standards. Montana water quality standards also define both water use classifications for all state waters and numeric and narrative standards that protect those designated uses.

B. Receiving Water

Wastewater is discharged from the facility to the Yellowstone River. The facility discharges to a stream segment located within the Upper Yellowstone watershed as identified by U.S. Geological Survey (USGS) Hydrological Unit Code (HUC) 10070002 and Montana Assessment Unit MT43B003_010. The receiving water is classified as B-1 according to Montana Water Use Classifications. Waters classified B-1 are to be maintained suitable for drinking, culinary, and food processing purposes, after conventional treatment; bathing, swimming, and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply.

The stream segment to which the facility discharges is listed as impaired in DEQ's Draft 2016 and the Final 2014 *Water Quality Integrated Reports* (Clean Water Act Information Center, CWAIC). This segment does not fully support aquatic life uses due to the following probable causes: physical substrate habitat alterations and alteration in stream-side or littoral vegetative covers.

Except for nutrients, the critical upstream flow value is the 7-day average expected to occur every 10 years (7Q10) of 760 cubic feet per second (cfs), which is equivalent to 491 mgd. This value was determined using most current data published by the U.S. Geological Survey (USGS) for gaging station number 06192500, which is located in the Yellowstone River near the Montana Secondary Highway 540 bridge, approximately seven river miles upstream from the facility's discharge (USGS 2015).

DEQ uses the seasonal 14-day average expected to occur every five years for these parameters (14Q5) for total nitrogen (TN) and total phosphorus (TP). The seasonal 14Q5 for this gaging station is 1,527 cfs (July – October) (USGS 2015).

Ambient Water Quality Data

Table 5 provides a summary of the ambient water quality data used in assessing Reasonable Potential (RP) to exceed the water quality standards in the Yellowstone River, and to develop any necessary effluent limits designed to protect these standards.

Table 5. Yellowstone River - Ambient Water Quality Monitoring Data

Parameter	Units	75th Percentile	Number of Samples	Monitoring Data Source
Hardness	mg/L	55.3 (1)	4	MDEQ_WQ_WQX-Y03YELSR26
pH	s.u.	8.6	2 months	Y03YELSR26: 8/1/2012 – 10/1/2012 (2)
Temperature	°C	17.7	2 months	Y03YELSR26: 8/1/2012 – 10/1/2012 (2)
Arsenic, Total Recoverable	µg/L	24	13	MDEQ_WQ_WQX-Y03YELSR26
Copper, Total Recoverable	µg/L	1	4	MDEQ_WQ_WQX-Y03YELSR26
Total Ammonia as N	mg/L	ND (3)	2	MDEQ_WQ_WQX-Y03YELSR26
$NO_3 + NO_2$	mg/L	0.07	6	MDEQ_WQ_WQX-Y03YELSR26
Total Nitrogen as N (summer)	mg/L	0.18	3 (4)	MDEQ_WQ_WQX-Y03YELSR26
Total Phosphorus as P (summer)	mg/L	0.017	3 (5)	MDEQ_WQ_WQX-Y03YELSR26

Footnote: ND = nondetect
(1) Hardness is the 25th percentile.
(2) Data provided by Mike Suplee, MT DEQ Water Quality Standards Section, June 2016.
(3) Detection limit assumed to be 0.05 mg/L, which is the typical reporting limit for ammonia.
(4) The 75th percentile of TN results for five samples April –October or three samples during the summer months of August – October were both 0.18 mg/L.
(5) The 75th percentile of TP results for six samples April – December was 0.024 mg/L; the results for three samples during summer months of August – October was 0.017 mg.L.

C. Applicable Water Quality Standards

Discharges to surface waters classified B-1 are subject to the specific water quality standards of Administrative Rules of Montana (ARM) 17.30.623, Department Circulars DEQ-7 (Numeric Water Quality Standards) and 12A (Base Numeric Nutrient Standards), and the general provisions of ARM 17.30.635 through 637. In addition to these standards, dischargers are subject to ARM 17.30 Subchapter 5 (Mixing Zones) and Subchapter 7 (Nondegradation).

D. Mixing Zone

A mixing zone is an area where effluent mixes with the receiving water and certain water quality standards may be exceeded. Mixing zones must have the smallest practicable size, a minimum practicable effect on water uses, and definable boundaries. DEQ will determine the appropriateness of a mixing zone when applied for and will grant a mixing zone, deny the mixing zone, or grant an alternative or modified mixing zone. Rules governing the granting of mixing zones are found in Montana Code Annotated (MCA) 75-5-301 and in ARM 17.30.501 *et seq*.

No mixing zone will be granted that will impair beneficial uses. Acute standards may not be exceeded in any part of the mixing zone unless DEQ finds that minimal initial dilution will not threaten or impair beneficial uses.

Mixing zones allowed under a permit issued prior to April 29, 1993, will remain in effect unless there is evidence that previously allowed mixing zones will impair existing or

anticipated uses. However, DEQ removed the existing mixing zone from the Livingston WWTP permit in the 2009 renewal due to lack of information supporting its re-issuance, and concern regarding the location of the discharge on the lower flow/slower moving west (left) side of a sandbar in the river. DEQ clarified that Livingston could apply for a mixing zone by submitting waterbody assessment as part of a permit application (see 2009 Fact Sheet section IV.D).

On June 14, 2016, DEQ received a water quality assessment from the City as part of a request for a mixing zone. Review of the submittal indicates that the beneficial uses of the Yellowstone River can be maintained and the Water Quality Assessment Factors can be met with the granting of a standard mixing zone. DEQ considered the following factors in granting this mixing zone:

(1) Standard mixing zones may be authorized to facilities that discharge a mean annual flow of less than one million gallons per day to a stream segment with a dilution ratio greater than or equal to 100:1.
   - The mean annual discharge flow from the WWTP was 0.85 mgd over the past six years (2010 – 2016) based on data reporting on the facility's DMRs; and
   - The discharge flow rate was slightly over one mgd (1.003 mgd mean annual flow) for one of the six years, and one year that was close (0.0983 mgd); however, the City does not expect the population and resulting demand on the WWTP to increase in the foreseeable future. Furthermore, the highest flow years correspond to years with significant rainfall due to ground water inflow –these years are also likely more dilute. If the WWTP's mean annual discharge flow rate increases to above 1.0 mgd (three to five year average) then a standard mixing zone cannot be granted. As a result, the City will need to submit information to request a source-specific mixing zone or no dilution will be granted.

(2) The dilution ratio for the WWTP (7Q10: average daily design flow of the facility) is 491 mgd: 2.0 mgd (= 245.5:1) which is greater than 100:1 criteria.

As described above the WWTP meets the criteria for a standard mixing zone. Standard mixing zone rules allow up to 100% of the 7Q10 to be granted as the available chronic dilution, and DEQ grants up to 10% of the chronic mixing zone for an acute mixing zone for facilities with a dilution ratio greater or equal to 100:1; or the standard mixing zone rules allow up to 25% of the 7Q10 to be granted as the available chronic dilution with 2.5% of the chronic mixing zone for an acute mixing zone for facilities with a dilution ration less than 100:1. Because mixing zones must have the smallest practicable size and a minimum practicable effect on water uses, the Livingston WWTP is on the upper end of the applicability size cutoff for a standard mixing zone, and the morphology of the Yellowstone River is such that the river undergoes channel migration and variable flow patterns due to a proximate sandbar, DEQ determined that the appropriate dilution allowance for ammonia is in the mid-range with acute dilution granted at 2.5% of the 7Q10 for ammonia and chlorine, and chronic and human health dilution granted at 25% of the 7Q10 for ammonia, chlorine, and other parameters such as N+N and toxics.

DEQ will also grant the full seasonal 14Q5 dilution flow of 1,527 cfs to evaluate Reasonable Potential (RP) and develop nutrient limits. These dilution allowances will be used to evaluate RP and develop effluent limits as described below in section IV.E. DEQ could consider granting additional dilution as part of a permit modification or permit renewal that includes a satisfactory mixing zone study.

The chronic, human health, and nutrient mixing zone length will extend 2,500 feet, which is ten times the estimated stream width at low flow of 250 feet. The acute mixing zone length will extend 250 feet. Aquatic life-chronic, aquatic life-acute, human health, and nutrient standards may not be exceeded outside of the mixing zones.

E. Basis for Water Quality-Based Effluent Limits (WQBELs)

MPDES permit limitations must control all pollutants which will cause, or have RP to cause or contribute to an excursion above any state water quality standard, including narrative criteria. Parameters typically present in municipal wastewater that may cause or contribute to a violation of water quality standards include: conventional pollutants such as biological material (as measured by BOD_5), TSS, pH, oil & grease, and pathogenic bacteria; non-conventional pollutants such as ammonia, nitrogen, and phosphorus; and toxic pollutants such as Total Residual Chlorine (TRC) and metals.

DEQ uses a mass balance equation (see *Equation 1*) to determine RP and develop WQBELs, based on *EPA's Technical Support Document for Water Quality-based Toxics Control, March 1991* (TSD), EPA/505/2-90-001.

$$C_r = \frac{Q_d C_d + Q_s C_s}{Q_d + Q_s} \qquad \textit{(Equation 1)}$$

Given:

C_r = the resulting receiving water concentration
Q_d = critical discharge rate (POTW average daily design flow)
Q_s = critical receiving water low flow (available dilution of 7Q10 or seasonal 14Q5)
C_d = critical effluent pollutant concentration (maximum discharge concentration x TSD multiplier)
C_s = critical ambient pollutant concentration (Yellowstone River 75th percentile concentration)

RP for the WWTP discharge to cause exceedances of a WQBEL for the Yellowstone River is evaluated using *Equation 1*, and presented in **Attachment A**. The critical effluent concentration is obtained following the method recommended by the TSD. A multiplier is determined using Table 3-2 in the TSD (based on the data set, coefficient of variation, and sample size at the 95% confidence interval.) The critical effluent concentration equals the maximum effluent concentration reported by the facility multiplied by the TSD multiplier.

WQBELs must be developed for any parameter for which there is RP to cause or contribute to exceedances of instream numeric or narrative water quality standards. To establish WQBELs for an existing discharger DEQ first calculates Wasteload Allocations (WLAs). As shown in *Equation 2*, the mass-balance equation can be arranged to calculate the WLA (C_{WLA}) so that the discharge does not cause or contribute to an exceedance of the applicable water quality standard under critical conditions.

$$C_{WLA} = \frac{Q_r C_r - Q_s C_s}{Q_d} \qquad (\textit{Equation 2})$$

The WLAs are then translated into average monthly limitations (AMLs) and maximum daily limitations (MDLs) using TSD multipliers, and is presented in **Attachment B**.

The following subsections discuss the basis for the RP analyses and WQBELs in this permit.

1. Conventional Pollutants

   BOD_5, TSS, and pH – These parameters are typical effluent quality indicators for municipal wastewater treatment facilities and are regulated as TBELs (see section III of this Fact Sheet). The facility provides a significant amount of control for biological material, solids, and pH through secondary treatment meeting national secondary standards and no additional limits are necessary.

   Oil and Grease –The 2009 permit included an oil and grease instantaneous maximum limit of 10 mg/L. During the POR, the average oil and grease concentration was 1.0 mg/L and the maximum was 5.1 mg/L. The limit and monitoring (see section VI of this Fact Sheet) will be retained in the proposed permit.

   Escherichia coli (*E. coli*) **Bacteria** – Pathogens are known municipal wastewater contaminants. The state has promulgated *E. coli* standards to protect the beneficial uses of receiving waters from pathogens. The standards for B-1 classified waters are:

   > April 1 through October 31 of each year – the geometric mean number of *E. coli* must not exceed 126 cfu per 100 mL and 10% of the total samples may not exceed 252 cfu per 100 mL during any 30-day period; and
   >
   > November 1 through March 31 of each year – the geometric mean number of *E. coli* must not exceed 630 cfu per 100 mL and 10% of the total samples may not exceed 1,260 cfu per 100 mL during any 30-day period.

   These criteria will be included in the proposed permit average monthly and average weekly limits along with regular monitoring (see section VI of this Fact Sheet).

2. Non-conventional Pollutants

   Total Residual Chlorine (TRC) – Chlorine is a toxic parameter with an acute aquatic life standard of 19 µg/L and a chronic aquatic life standard of 11 µg/L. As a result of the inability to meet *E. coli* limits with the UV system, the permittee resumed the use of chlorination to control pathogen pollution in its effluent. DEQ modified the 2009 permit on March 19, 2012, to include a 0.011 mg/L (11 µg/L) average monthly limit and a 0.019 mg/L (19 µg/L) instantaneous maximum limit for TRC.

   With the submittal of the standard mixing zone request as part of this renewal, DEQ re-evaluated the TRC limits with consideration of the mixing zone granting 2.5% acute and 25% chronic dilution. Calculation of the proposed end-of-pipe TRC limits based on *Equation 2* (see **Attachment B)** results in the following proposed TRC limits: 74 µg/L AML and 136 µg/L MDL. Regular monitoring for TRC will be required and analytical

results less than the Required Reporting Value (RRV) in Circular DEQ-7, currently 100 µg/L, will be considered in compliance with the AML.

Total Ammonia as N: –Circular DEQ-7 includes ammonia aquatic life standards developed based on a combination of pH and temperature of the receiving stream, the presence or absence of salmonid fish species, and the presence or absence of fish in early life stages. DEQ reviewed upstream data in order to evaluate the ambient pH and temperature of the river (see **Table 5**). The only ambient data available after 1999 was from August and September 2012, taken at monitoring station Y03YELSR26. Furthermore, the Yellowstone River in the vicinity of the Livingston WWTP discharge is classified as B-1 water, which is suitable for growth and propagation of salmonid fishes. Although the water quality assessment report submitted June 2016 concluded that the salmonids are not believed to spawn in this section of the Yellowstone River, this receiving water is known salmonid habitat.

Table 6 summarizes the development of the ammonia water quality standards for the Yellowstone River in this area:

Table 6: Total Ammonia-Nitrogen Water Quality Standards for Yellowstone River

Condition	Period	Salmonids Present	Early Life Stages	Ambient Conditions (1)		Water Quality Standard (mg/L) (2)
				pH (s.u.)	Temperature (°C)	
Acute Criterion	Annual	Yes	NA	8.6	NA	1.77
Chronic Criterion	Annual	NA	Yes	8.6	17.7	0.75

Footnotes: NA – Not Applicable
(1) Based on 75th percentile of data. Note that the two months of monitoring were in the warmest months of the year; annual monitoring would likely result in a lower critical temperature and result in a slightly higher chronic ammonia standard.
(2) Acute and chronic standards based on Department Circular DEQ-7 (August, 2012)

The two upstream samples taken in 2012 were nondetect; DEQ will assume the critical upstream ammonia concentration (C_s) is half of the detection limit (assumed to be half of 0.05 mg/L, or 0.025 mg/L).

DEQ followed the estimation procedures described in EPA's TSD to estimate the critical effluent concentration (C_d) based on the results of 308 effluent ammonia samples:

C_d = Highest observed (31 mg/L) x TSD multiplier (0.7) = 21 mg/L ammonia

Using the above calculated concentrations (C_s and C_d) and flow rates (Q_s based on 2.5% of the 7Q10 and Q_d) in *Equation 1*, the resulting downstream pollutant concentration (C_r) is calculated as 3.0 mg/L. As this is greater than both the acute and chronic ammonia standards developed in Table 6, DEQ finds that the WWTP has RP to exceed the ammonia standards and a WQBEL is required (see **Attachment A**).
As discussed above, the mass-balance equation used in the RP analysis can be arranged to calculate the WLA (C_{WLA}) so that the discharge does not cause or contribute to an

exceedance of the applicable water quality standard under critical conditions (see *Equation 2*). These WLAs are then translated into maximum daily limitations (MDLs) and average monthly limitations (AMLs) using TSD multipliers. The calculation of the proposed end-of-pipe ammonia limits of 6.2 mg/L AML and 12.5 mg/L MDL based on TSD method are presented in **Attachment B**.

Nitrate plus Nitrite (N+N): Nitrate and nitrite are toxic components of total nitrogen, which is a common constituent of municipal wastewater. The human health standard for N+N is 10 mg/L. WQBELs for N+N were not installed in the 2009 permit, but weekly monitoring was required. The available effluent data set for N+N for the POR contains 287 quantified values. Using EPA TSD methods, given the maximum observed N+N concentration for the POR of 15.5 mg/L and a CV for the data set of 0.51, the appropriate multiplier is 0.73 resulting in a critical effluent concentration of 11.2 mg/L. Using *Equation 1* for the RP analysis, the resulting critical downstream pollutant concentration of 0.2 mg/L is less than the Human Health Standard (HHS) of 10 mg/L, as presented in **Attachment A**. DEQ finds the WWTP does not have RP to exceed the N+N standard and no limit is required. Periodic monitoring of the effluent will be required.

Total Nitrogen: Total nitrogen (TN) is a nutrient which can lead to excessive algal and aquatic vegetation growth and is common constituent of municipal wastewater. DEQ has not yet developed a TN water quality standard for the Upper Yellowstone River in Circular DEQ-12A. Furthermore, the segment to which the facility discharges is not listed as impaired for nutrients. Based on these considerations, a TN limit is not needed at this time.

However, the City is currently upgrading their WWTP and projected effluent limits would be useful. The TN water quality standard for the Upper Yellowstone River is under development; it is projected to be between 0.300 mg/L and 0.655 mg/L, based on the standards for proximate tributaries and downstream. Until the final TN standard is promulgated, DEQ believes 0.400 mg/L TN (August 1 – October 31) is a reasonable interpretation of the narrative. DEQ conducted a projected RP analysis based on the projected TN standard of 0.400 mg/L and the following:

- C_d – The City was required to conduct weekly monitoring of TN. The maximum reported TN effluent concentration for the 18 summer months (August through October) during the POR was 38 mg/L. Using EPA TSD methods the appropriate multiplier is 0.97 resulting in a critical effluent concentration of 37 mg/L.
- C_s – the 75th percentile TN concentration upstream was 0.18 mg/L (three summer samples).
- Q_s – the seasonal 14Q5 is 1,527 cfs.

Using *Equation 1*, the resulting critical downstream concentration is calculated to be 0.25 mg/L, which is less than the projected TN standard of 0.40 mg/L and signifies that the WWTP does not have RP to exceed the projected TN standard as presented in **Attachment A**. Monitoring of the effluent and the ambient condition will be required for this permit to conduct RP analysis for the next renewal.

Total Phosphorus: Total phosphorus (TP) is a nutrient which can lead to excessive algal and aquatic vegetation growth and is common constituent of municipal wastewater. DEQ

has not yet developed a TP water quality standard for the Upper Yellowstone River in Circular DEQ-12A. Furthermore, the segment to which the facility discharges is not listed as impaired for nutrients. Based on these considerations, a TP limit is not needed at this time.

However, the City is currently upgrading their WWTP and projected effluent limits would be useful. The TP water quality standard for the Upper Yellowstone River is under development; it is projected to be between 0.030 mg/L and 0.055 mg/L, based on the standards for proximate tributaries and downstream. Until the final TP standard is promulgated, DEQ believes 0.040 mg/L TP (August 1 – October 31) is a reasonable interpretation of the narrative. DEQ conducted a projected RP analysis based on the projected TP standard of 0.040 mg/L and the following:

- C_d – The City was required to conduct weekly monitoring of TP. The maximum reported TP effluent concentration for the 18 summer months (August through October) during the POR was 7.3 mg/L. Using EPA TSD methods the appropriate multiplier is 0.97 resulting in a critical effluent concentration of 7.0 mg/L.
- C_s – the 75th percentile TP concentration upstream is 0.017 mg/L.
- Q_s – the seasonal 14Q5 is 1,527 cfs.

Using *Equation 1*, the resulting critical downstream concentration is calculated to be 0.031 mg/L, which is less than the projected TP standard of 0.040 mg/L and signifies that the WWTP does not have RP to exceed the projected TP standard as presented in **Attachment A.** Monitoring of the effluent and the ambient condition will be required for this permit to conduct RP analysis for the next renewal.

3. Toxic Pollutants

Parameters for which sampling during the POR did not result in any values above detection levels were not considered parameters of concern (POCs) and are not included in the discussion below.

Arsenic: Sample results indicate a maximum concentration of 5 µg/L of arsenic was detected in the facility's effluent for 11 samples taken during the POR. As the upstream concentration in the Yellowstone River is greater than the HHS of 10 µg/L, there is no assimilative capacity and no dilution available. RP analysis using EPA TSD methods results in a projected critical effluent concentration of 6.2 µg/L which is lower than the HHS – therefore, there is no RP and no arsenic limits will be included in the proposed permit.

Copper: The total recoverable copper acute standard is 8.0 µg/L and chronic standard is 5.6 µg/L, based on the 25th percentile ambient hardness of 55.3 mg/L as $CaCO_3$. The ambient copper concentration (75th percentile) is 1.0 µg/L for four upstream samples taken by DEQ in 2013. As there is assimilative capacity, DEQ will grant dilution with 25% of the 7Q10 for a standard chronic mixing zone; however there is no acute dilution granted for metals from the WWTP.

There was a maximum concentration of 90 µg/L of copper in the facility's effluent for 12 samples taken during the POR and reported on DMRs. Using EPA TSD methods results in a calculated critical effluent concentration of 135 µg/L total recoverable copper. Furthermore, using *Equation 1* with no acute dilution granted the resulting critical downstream concentration of total recoverable copper remains 135 µg /L (see **Attachment A**). The critical resulting downstream concentration is greater than both the acute and the chronic standards; this signifies that the WWTP has RP and WQBELs are required.

However, calculated copper effluent limits and will not be included in the proposed permit for the following reasons:

- The current wastewater treatment system was not designed to remove copper from the wastewater. The City has imminent plans for a WWTP upgrade, which is expected to improve the effluent quality prior to the next renewal cycle.
- Copper in POTW wastewater typically results from corrosion of plumbing material used in drinking water distribution systems. Corrosion control is an effective method to prevent copper from entering the system and may be implemented during this permit cycle.
- The acute Long Term Average (LTA) is more conservative than the chronic LTA; therefore, the acute condition drives the permit effluent limits. No acute dilution credit is provided for parameters that do not degrade as part of a standard mixing zone. The City may request to modify their permit to provide an acute source-specific mixing zone in the future, if they conduct a mixing zone study and submit sufficient information.

Based on the above, the proposed permit will include a schedule requiring the permittee to investigate corrosion control and other alternatives, including treatment, to reduce copper in the effluent.

Phenanthrene: The 2009 permit required semi-annual monitoring during 2013 and 2015 for semi-volatiles, including phenanthrene. The highest concentration detected was 0.19 µg/L; however, the other three samples were reported as non-detect (one at a reporting limit of 0.1 µg/L and two samples at a reporting limit of 10 µg/L, which is not sufficient to meet the RRV of 0.2 µg/L as identified in the 2012 Circular DEQ-7). However, Circular DEQ-7 does not provide any standards for phenanthrene, therefore there is no basis for conducting an RP analysis or further monitoring at this time.

Phenols: The 2009 permit required semi-annual monitoring for total phenols. The highest phenol concentration out of 11 samples was 60 µg/L. RP analysis using EPA TSD methods results in a critical effluent concentration of 90 µg/L. This concentration is less than the HHS of 300 µg/L, which is the only phenol standard in Circular DEQ-7.

There is no RP to exceed this standard, and a limit for phenols will not be included in the proposed permit.

Toluene: The 2009 permit required semi-annual monitoring during 2013 and 2015 for semi-volatiles, including toluene. The highest toluene concentration for the four samples

was 0.55 µg/L. RP analysis using EPA TSD methods results in a critical effluent concentration of 1.4 µg/L. This concentration is less than the HHS of 1,000 µg/L, which is the only toluene standard in Circular DEQ-7. There is no RP to exceed this standard, and a limit for toluene will not be included in the proposed permit.

4. Carcinogenic Pollutants

Chloroform: The 2009 permit also required semi-annual monitoring during 2013 and 2015 for volatile organic compounds, including chloroform. A quantified maximum effluent concentration of 0.19 µg/L was detected; the other three samples were reported as non-detect at a reporting limit of 0.5 µg/L, which is sufficient to meet the RRV of 0.9 µg/L as identified in the 2012 Circular DEQ-7.

RP analysis using EPA TSD methods (EPA 1991) based on the reporting limit as the maximum effluent concentration for the POR, results in a critical effluent concentration of 1.3 µg/L. This concentration is less than the only applicable standard, a HHS of 57 µg/L. RP has not been demonstrated and a limit for chloroform will not be included in the proposed permit.

Semi-volatiles: The 2009 permit required twice annual monitoring during 2013 and 2015 for carcinogens, including the following six semi-volatiles:

- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(k)fluoranthene
- Chrysene
- Di(2-ethylhexyl)phthalate (also known as bis(2-ethylhexyl)phthalate)
- Indeno(1,2,3-cd)pyrene

Each of the above parameters had at least one “detect” out of the four samples. **Table 7** compares the highest monitoring result “detect” for each parameter to the respective HHS, which shows that, without mixing, the discharge concentration was above the HHS. **Table 7** also includes the critical downstream concentration, after mixing, based on an RP analysis using *Equation 1* with 25% of the 7Q10 granted for dilution, which indicates that none of the six parameter had RP based on the highest detect.

However, as all six parameters had nondetects (ND), the table also includes the highest detection limit for comparison against the RRV and HHS. If the effluent concentration is assumed to be equivalent to the highest detection limit, then five of the six parameters would have RP to exceed the standard. Furthermore, the detection limit was well above the RRV.

Table 7: Reasonable Potential Analysis for Carcinogens

Parameter	µg/L			RP?	µg/L		Possible RP at ND?
	HHS	Max (with Detect)	C_r (with dilution)		RRV	Highest ND	
Benzo(a)anthracene	**0.038**	0.11	0.0046	**No**	0.10	10 (2 samples)	**Yes**
Benzo(a)pyrene	**0.038**	0.13	0.0054	**No**	0.06	10 (2 samples)	**Yes**
Benzo(k)fluoranthene	**0.038**	0.14	0.0058	**No**	0.10	10 (2 samples)	**Yes**
Chrysene	**0.038**	0.14	0.0058	**No**	0.10	10 (2 samples)	**Yes**
Indeno(1,2,3-cd)pyrene	**0.038**	0.21	0.0090	**No**	0.08	10 (2 samples)	**Yes**
Di(2-ethylhexyl)phthalate	**6.0**	47	2.0	**No**	2.0	10	**Yes**

The City is required to monitor these parameters, at or below the RRV, three times prior to the next permit renewal as part of the semi-volatile suite required to be reported on EPA Form 2A for sources > 1 mgd. An updated RP analysis will be conducted at that time.

5. Whole Effluent Toxicity (WET)

   As stated at the end of section II.B above, the permittee did not exhibit whole effluent toxicity during the POR; therefore, RP to exceed the narrative standard for toxic conditions found at ARM 17.30.637(1)(d) has not been demonstrated. No WET limits will be included in the proposed permit, but monitoring requirements for WET will continue as described in section VI.B below.

6. Nondegradation

   New or increased sources, as defined in ARM 17.30.702, are subject to Montana Nondegradation Policy (75-5-303, MCA) and regulations (ARM 17.30.701 *et seq.*). DEQ will continue to maintain nondegradation average monthly limits for BOD_5 and TSS to ensure compliance with the nondegradation rules as shown in **Table 8**. Average weekly limits are not subject to nondegradation review, and the TBEL average weekly load limit will be the applicable limit.

Table 8: Nondegradation Load Limits

Parameter	Units	Average Monthly Limit
5-Day Biochemical Oxygen Demand	lbs/day	450
Total Suspended Solids	lbs/day	450

Discharges in excess of these limits would be considered a new or increased source and subject to the provisions of Montana's Nondegradation Policy. The average monthly nondegradation limits are more restrictive than the TBELs described in section III above and will be continued in the proposed permit, along with associated monitoring requirements.

V. Final Effluent Limits

Effluent limitations or conditions in reissued permits must be at least as stringent as those in the existing permit, with certain exceptions. Federal regulations require permits to contain the more stringent TBEL or WQBEL limitation applicable to an individual pollutant. DEQ considered the proposed permit limits to ensure that they were as stringent as previous limits, or met the anti-backsliding requirements.

Beginning on the effective date and lasting through the term of the permit, the discharge from Outfall 001 shall, at a minimum, meet the effluent limits presented in **Table 9**:

Table 9: Proposed Final Effluent Limits

Parameter	Units	Effluent Limitations (1)			
		Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit	Instantaneous Maximum Limit
5-Day Biochemical Oxygen Demand	mg/L	30	45	--	--
	lbs/day	450	751	--	--
	% removal	85	--	--	--
Total Suspended Solids	mg/L	30	45	--	--
	lbs/day	450	751	--	--
	% removal	85	--	--	--
pH (2)	s.u.	--	--	--	6.0 – 9.0
Oil and Grease	mg/L	--	--	--	10
E. coli bacteria –summer (3)(5)	cfu/100ml	126	252	--	--
E. coli bacteria –winter (4)(5)	cfu/100ml	630	1,260	--	--
Total Residual Chlorine (6)	µg/L	74	--	136	--
Ammonia, Total as N (7)	mg/L	6.2	--	12.5	--

Footnotes:
1. See definitions in the permit.
2. Effluent pH shall remain between 6.0 and 9.0 (instantaneous minima and maxima). For compliance purposes, any single analysis and/or measurement beyond this limitation shall be considered a violation of the conditions of this permit.
3. This limit applies from April 1 through October 31.
4. This limit applies from November 1 through March 31.
5. The geometric mean of the samples taken for the sample period (monthly or weekly) may not exceed these values.
6. Samples results indicating non-detect at a reporting limit equal to or less than the RRV found in DEQ-7 will be considered in compliance with these limits.
7. The ammonia limits will become effective five (5) years from the effective date of the permit.

There shall be no discharge of floating solids or visible foam in other than trace amounts. There shall be no discharge which causes visible oil sheen in the receiving stream [ARM 17.30.637(1)(b)].

VI. Monitoring Requirements

A. Influent/Effluent Monitoring

All analytical procedures must comply with the specifications of 40 CFR Part 136 and the analyses must meet any Required Reporting Values (RRVs) listed in Circular DEQ-7 unless otherwise specified. Samples shall be collected, preserved and analyzed in accordance with approved procedures listed in 40 CFR Part 136.

Starting with the effective date of the permit and lasting for the duration of the permit cycle, self-monitoring of influent will be conducted at the Parshall flume in a manhole near the headworks building, and self-monitoring of the effluent discharged at Outfall 001 shall be conducted the Parshall flume located between the UV system and the chlorine contact chamber, unless another location is requested and acknowledged by DEQ in writing.

Samples will reflect the nature and effect of the discharge at the frequency presented in **Table 10**.

Table 10: Monitoring and Reporting Requirements

Parameter	Monitoring Location	Units	Sample Type(1)	Minimum Sample Frequency	Reporting Metric	Required Reporting Value (2)
Flow	Effluent	mgd	Instantaneous(3)	Continuous	Daily Maximum Monthly Flow	NA
5-Day Biochemical Oxygen Demand	Influent	mg/L	Composite	3/Week	Weekly Average Monthly Average	NA
	Effluent	mg/L	Composite	3/Week		
	NA	% Removal(4)	Calculated	Monthly	Monthly Average	
	Effluent	lbs/day	Calculated	Monthly	Weekly Average Monthly Average	
Total Suspended Solids	Influent	mg/L	Composite	3/Week	Weekly Average Monthly Average	NA
	Effluent	mg/L	Composite	3/Week		
	NA	% Removal(4)	Calculated	Monthly	Monthly Average	
	Effluent	lbs/day	Calculated	Monthly	Weekly Average Monthly Average	
pH	Effluent	s.u.	Instantaneous	Daily	Daily Maximum Daily Minimum	NA
Oil Sheen	Effluent	Presence	Observation	Daily	Present/Absent	NA
Oil and Grease	Effluent	mg/L	Grab	Monthly (5)	Monthly Maximum	NA
E. coli bacteria	Effluent	cfu/100 ml	Grab	3/Week	Weekly Average Monthly Average	NA
Total Residual Chlorine(6)	Effluent	µg/L	Grab	Daily	Daily Maximum Monthly Average	100
Total Ammonia, as N	Effluent	mg/L	Composite	3/Week	Daily Maximum Monthly Average	0.070

Table 10: Monitoring and Reporting Requirements

Parameter	Monitoring Location	Units	Sample Type[1]	Minimum Sample Frequency	Reporting Metric	Required Reporting Value [2]
Nitrate + Nitrite, as N	Effluent	mg/L	Composite	Monthly	Weekly Maximum Monthly Average	0.020
Nitrate + Nitrite, as N – summer [7]				Weekly [8]		
Total Kjeldahl Nitrogen [7]	Effluent	mg/L	Composite	Weekly [8]	Weekly Maximum Monthly Average	0.225
Total Nitrogen, as N [3]	Effluent	mg/L	Calculated	Weekly [8]	Weekly Maximum Monthly Average	NA
	Effluent	lbs/day	Calculated	Monthly [8]	Monthly Average	NA
Total Phosphorus, as P	Effluent	mg/L	Composite	Weekly [8]	Weekly Maximum Monthly Average	0.003
	Effluent	lbs/day	Calculated	Monthly [8]	Monthly Average	NA
Whole Effluent Toxicity, Acute	Effluent	% Effluent	Composite	Semiannual	Pass/Fail	NA
Copper, Total Recoverable	Effluent	µg/L	Composite	Monthly	Daily Maximum Monthly Average	2

Footnotes: NA=Not applicable
1. See Definition section at end of permit for explanation of terms.
2. See Circular DEQ-7 or DEQ-12A for more information on RRVs. Analysis must achieve these, or lower, reporting limits.
3. Requires recording device or totalizer.
4. Percent (%) removal shall be calculated using the monthly average values.
5. Oil & grease analysis must be conducted monthly plus anytime a visual sheen is observed in the effluent.
6. The Permittee is only required to sample for total residual chlorine if chlorine is used as a disinfectant in the treatment process. If chlorine is *not* used, indicate on the monthly report "NODI CODE = 9" (Conditional monitoring not required this period).
7. The total nitrogen concentration may be analyzed by either persulfate digestion, or by the sum of total Kjeldahl nitrogen plus nitrate+nitrite; the RRV for the selected method must be sufficient for detecting the TN concentration or meet the lowest RRV. If persulfate digestion is used, the Permittee is not required to conduct the weekly summer sampling for N+N or TKN.
8. Nutrient sample collection required only during the summer months of August, September, and October.

B. Whole Effluent Toxicity Requirements

Water quality standards require that state water be free from substances attributable to municipal waste that create conditions which are harmful or toxic to human, animal, plant or aquatic life, and provides the basis for whole effluent toxicity (WET) requirements in MPDES permits. The following endpoints define acute and chronic toxicity as measured in a WET test:

- Acute toxicity occurs when, during an acute WET test, 50 percent mortality is observed for any tested species at any effluent concentration (i.e., LC50 < 100% effluent)
- Chronic toxicity occurs when, during a chronic WET test, the 25% inhibition concentration (IC25) for any tested species is less than or equal to the percent effluent represented by the effluent concentration in the receiving water after accounting for any allowable dilution.

When DEQ determines there is reasonable potential for a discharge to cause acute and/or chronic toxicity, the MPDES permit includes limits for WET based on one, or both, of the endpoints above.

The dilution ratio (Yellowstone River 7Q10 : WWTP average daily design flow) is over 200:1. Therefore, since the dilution ratio is greater than 100:1, the appropriate WET test is for acute toxicity. The 2009 permit required quarterly acute WET testing using two species. After passing two-species testing for four consecutive quarters the permittee was granted their request to reduce WET testing to quarterly, alternating species. The WWTP has passed all WET tests conducted during the POR. A reduction in WET testing frequency is granted to provide some economic relief to permittees who have demonstrated a lack of whole effluent toxicity through appropriate testing, as the facility has done.

Therefore, reduced testing frequency will be continued in the proposed permit. However, DEQ has determined that a more appropriate reduction is semiannual acute WET testing using two species. The costs associated with this testing should be similar to quarterly single-species acute testing, but the use of two species will provide results with significantly more validity. Therefore, semiannual two-species acute WET testing will be required in the proposed permit.

Confirmation of acute toxicity in the effluent will trigger the standard toxicity identification/toxicity reduction (TIE/TRE) requirements of the permit. Standard WET language will be included in the permit and will describe the test methods, test conditions, endpoints, test acceptability criteria, reporting requirements, and accelerated testing-TIE/TRE requirements.

C. Sludge Requirements

The use or disposal of sewage sludge must be in conformance with 40 CFR Part 503.

D. Instream Monitoring

Instream monitoring will be required in the proposed permit as found in **Table 11**. Monitoring must take place at a consistent location upstream and outside the influence of Outfall 001 with the sample type, frequency, and RRV as identified below. The value shall be reported on the facility's DMRs.

Table 11: Instream Monitoring and Reporting Requirements

Parameter	Units	Sample Type(1)	Minimum Sample Frequency	Required Reporting Value(2)
Total Nitrogen (3)	mg/L	Grab or Calculated	Monthly (4)	0.07
Total Phosphorus	mg/L	Grab	Monthly (4)	0.003
Total Ammonia, as N	mg/L	Grab	Quarterly	0.070
pH	su	Instantaneous	Quarterly	NA
Temperature	°C	Instantaneous	Quarterly	NA
Hardness	mg/L	Grab	Quarterly	NA
Copper, Total Recoverable	µg/L	Grab	Quarterly	2

Footnotes:
(1) See Definition section at end of permit for explanation of terms.
(2) See Circulars DEQ-7 and DEQ-12A for more information on RRVs. Analysis must achieve these, or lower, reporting limits.
(3) The ambient total nitrogen concentration may be analyzed by either persulfate digestion or by the sum of total Kjeldahl nitrogen plus nitrate+nitrite; the RRV for the selected method must be sufficient for detecting the TN concentration or meet the lowest RRV.
(4) Nutrient sample collection required monthly during the summer months of August, September, and October.

The permittee may choose to collect ambient data for additional parameters during the compliance schedule. This data is likely to be needed if the permittee will be seeking a mixing zone for that parameter.

VII. Nonsignificance Determination

As stated in section IV.E.6 above, the monthly nondegradation load limits previously established for the facility will be maintained in the proposed permit. In this way, discharges from the facility are restricted to nonsignificant changes in water quality, and the facility is not a new or increased source of pollutants.

VIII. Special Conditions/Compliance Schedules

MPDES regulations authorize the use of compliance schedules to give permittees additional time to achieve compliance with the Montana Water Quality act and rules adopted thereunder. Schedules developed under this provision must require compliance by the permittee “as soon as possible” and may not extend the date for final compliance beyond compliance dates established by the federal CWA. Compliance schedules that exceed one year from the date of permit issuance must set forth interim requirements and the dates for their achievement.

The permittee has demonstrated RP to exceed the applicable WQBELs for ammonia and total recoverable copper. In order for the City to complete review and construction of an upgraded plant, DEQ has allowed for a five year compliance schedule. The actions listed in **Table 12** below must be completed on or before the respective scheduled completion dates.

Table 12: Compliance Schedule

	Action	Frequency	Report Due Date[1]
Ammonia:			
1	The City shall submit an annual progress report to DEQ, for actions taken to meet the future ammonia limits for the previous year, as well as projected efforts for the upcoming year.	Annual	January 28, 2017 and annually thereafter until Action item 2 is due.
2	The City shall meet the new ammonia limits.	Single Event	Due five years from the effective date of the permit.
3	The City shall submit a final report on the efforts achieved in meeting the new limits	Single Event	Due within thirty (30) days after Action item 2.
Total Recoverable Copper:			
4	The City shall submit an annual progress report to DEQ, for actions taken the previous year and projected efforts for the upcoming year, on total recoverable copper. The effort should include, but is not limited to: • identifying sources and relative contributions of copper to the wastewater influent and evaluating the feasibility of upstream controls for these sources (such as water supply corrosion inhibition); • evaluating the effectiveness of copper removal from the upgraded WWTP; • summarizing the upstream monitoring results for total recoverable copper (at or below the RRV) as well as upstream hardness; • evaluating the potential for acute and chronic source-specific mixing zones; and • predicting whether the WWTP will be able to meet any necessary total recoverable copper limits during the next renewal cycle.	Annual	January 28, 2017 and annually thereafter until Action item 2 is due.
5	The City shall submit a complete report to DEQ that includes a summary of the total recoverable copper evaluation and reduction efforts.	Single Event	Due five years from the effective date of the permit.

Footnotes:
1. This notification must be postmarked or electronically submitted to DEQ on or before the scheduled due date.

The completion of all actions or deliverables must be reported to DEQ at the address listed in Part II.D of the permit and in accordance with the signatory requirements of Part IV.G of the permit. The permittee may choose to use this compliance period to perform a mixing zone study to gather the information required by the ARM 17.30.518. As stated in section VI.D above, if the permittee plans to request a mixing zone request for certain parameters as part of its compliance strategy, ambient data for these parameters should be collected during the compliance schedule.

IX. Public Participation

A. Public Notice

In accordance with ARM 17.30.1372, DEQ issued Public Notice No. MT-16-19 dated August 1, 2016. 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 August 30, 2016. 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) under ARM 17.30.1372.

B. 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.

C. 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 (ARM 17.30.1373).

D. 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 pursuant to ARM 17.30.1379, 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

E. Additional Information

Requests for additional information or questions regarding this permit should be directed to the Water Protection Bureau at 406-444-3080.

X. Information Sources

CWAIC: Clean Water Act Information Center, Department of Environmental Quality, (http://deq.mt.gov/Water/WQPB/cwaic (accessed 2016)

DEQ 2014: *Final Water Quality Integrated Report* (May 2014)

DEQ 2012: Department of Environmental Quality, Circular DEQ-7, Montana Numeric Water Quality Standards (October 2012)

DEQ 2014: Department of Environmental Quality, Circular DEQ-12A, Montana Base Numeric Nutrient Standards (July 2014)

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