Permit Rationale

Date: 1/5/2015 (Revised 11/2/2015 compliance)

Permit Writer: Marlon

Facility Name: Montezuma City of STP

Location: County: Poweshiek
Latitude: 41 degrees 34 minutes 38 seconds
Longitude: 92 degrees 32 minutes 15 seconds

Region/ FO: 5, Des Moines

Design:

Discharge to Unnamed Creek:

Date Constructed: Upgrade: 1999
Flow: ADW: 0.30 MGD; AWW: 1.25 MGD; MWW: 2.5 MGD
BOD5 900 lbs./day, P.E. 5389
TKN: 80 lbs/day
Source: Construction Permit 99-243-S dated May 3, 1999; Schedule G dated July 1, 1998

Treatment Plant Description: Three cell aerated lagoon with floating aerators in cells 1 and 2. There is a floating baffle wall in cells 2 and 3.

Wasteload allocation: See attached documents dated June 29, 2000 and November 7, 2013.

Antidegradation: The design capacities listed in the request form for this WLA are the same as those listed in the construction permit issued May 3, 1999, there are no new contributors or processes that would contribute new pollutants of concern and the outfall location has not changed. The WLA/Limits based on the current WQS are more stringent than those in the current permit except for the month of January's maximum concentrations for ammonia nitrogen. By including the current more stringent January maximum concentrations from the June 29, 2000 WLA, antidegradation review will not be required.

Impaired Waterbody: North Skunk River has two segments impaired for bacteria and chromium and further downstream of the discharge route the Skunk River has a segment impaired for bacteria.
TMDLs for the impaired segments listed above have not been scheduled at this time. Please note that upon the completion of the future TMDLs, more stringent and/or additional limits may be given to this facility. Information on impaired streams in Iowa and approved TMDLs can be found at the following website:
http://www.iowadnr.gov/Environment/WaterQuality/WatershedImprovement/WatershedResearchData.aspx

Table 1 (Effective from permit issuance to permit expiration):

Parameter	Season	7-day avg **mg/L**	30-day avg **mg/L**	30-day max **mg/L**	7-day avg **lbs/day**	30-day avg **lbs/day**	daily max **lbs/day**	min	max
$CBOD_5$	yearly	40	25	---	417	261	---	---	---
TSS	yearly	120	80	---	1251	834	---	---	---
DO	yearly	---	---	---	---	---	---	5.0	---
pH	yearly	---	---	---	---	---	---	6.5	9.0

Table 2 (Effective from permit issuance to 51 months after permit issuance):

Parameter	Season	7-day avg **mg/L**	30-day avg **mg/L**	daily max **mg/L**	7-day avg **lbs/day**	30-day avg **lbs/day**	daily max **lbs/day**
Ammonia (N)	monthly	As specified in WLA dated June 29, 2000					

Table 3 (Effective from 52 months from permit issuance to permit expiration):

Parameter	Season	7-day avg **mg/L**	30-day avg **mg/L**	daily max **mg/L**	7-day avg **lbs/day**	30-day avg **lbs/day**	daily max **lbs/day**
Ammonia (N)	monthly	As specified in WLA dated June 29, 2000 and November 7, 2013					
E. coli (geomean)		---	630	---	---	---	---

Basis for limits: $CBOD_5$ is consistent with standard secondary treatment requirements with mass limits based on design flows. TSS is equivalent to secondary treatment standards with mass limits based on design flows. *E. coli*, DO, ammonia nitrogen and pH are based on the attached WLA dated November 7, 2013 except for ammonia nitrogen's January maximum concentrations that will use the June 29, 2000 WLA, as it is more stringent.

Ammonia nitrogen limits in the November 7, 2013 WLA have been included in the final limits and are more stringent than previous permit, except for the month of January's maximum concentrations. The draft NPDES permit will use the more stringent permit limits based on the WLA dated June 29, 2000 for January's maximum concentrations. Based on the submitted test results from the City of Montezuma and past monthly reporting it appears that the new standard will not always be met. In fact, the current ammonia limits are not always met during the colder months of the year. Therefore a compliance schedule will be added. According to the schedule construction of the upgraded facility will be completed by [51 months after permit issuance]. They will be required to achieve compliance with final ammonia nitrogen limits by [52 months after permit issuance]. Interim limits for ammonia nitrogen will be included in the draft permit based on the June 29, 2000 WLA.

A sample for *E. coli* was submitted by the city with a lab analysis dated June 19, 2013. The result was 29 organisms/100mL. In October 2012, the Field Office took a grab of the final effluent and the analysis was 840 organisms/100mL. The facility discharges into a Class (A2) water body. The WLA dated November 7, 2013 includes *E. coli* limit in a Class (A2) water body as a Geometric Mean of 630 org./100 ml and a Sample Maximum of 235 org./100 ml from March 15th through November 15th. The criteria apply at "end-of-pipe". However, the recent chapter 62 revision that became effective on Oct. 14, 2009 states "…that the daily sample maximum criteria for E. coli set forth in Part E of the 'Supporting Document for Iowa Water Quality Management Plans' shall not be used as an end-of-pipe permit limitation." Therefore, only the geometric mean

limit of 630 org./100 ml applies to this facility. Since the facility cannot meet the proposed ammonia nitrogen limits, the facility will have to determine what method of ammonia nitrogen removal it will use and then choose a suitable method of disinfection. A compliance schedule for installing disinfection for *E. coli* is included in the draft NPDES permit. According to the schedule, construction of the disinfection will be completed by [51 months after permit issuance]. They will be required to achieve compliance with final *E. coli* limits (630 org./100mL geometric mean) by [52 months after permit issuance]. Due to the inability of Montezuma STP to disinfect until disinfection equipment is installed, I will not be proposing an interim limit for *E. coli*. At this time, it is unknown if the City will install chlorine or UV disinfection. If the city installs chlorine disinfection, the permit will be reopened to include total residual chlorine limits.

The results of sulfate and chloride samples tested in June 2013 were 50.8 mg/L and 49.5 mg/L respectively. The November 7, 2013 WLA specifies average sulfate and chloride limits of 1,514 mg/L and 389 mg/L respectively. The resulting value for sulfate and chloride are significantly lower than the WQS of the allowable discharge for these limits as set in the November 7, 2013 WLA, therefore no limits or monitoring are proposed in the permit as there is no reasonable potential for the city's effluent to violate the WQS.

The Montezuma STP was also required to test for dissolved oxygen (DO), nitrate + nitrite nitrogen, Total Kjeldahl Nitrogen (TKN), oil and grease, and phosphorus.

The DO result was 10.2 mg/L taken November 27, 2013. Modeling conducted in the November 7, 2013 WLA determined that the effluent from the facility must maintain a minimum DO of 5.0 mg/L to ensure a minimum DO of 5.0 mg/L in stream for an allowed maximum effluent CBOD5 of 40mg/L. Monitoring and the limit will be included in the permit to ensure compliance.

The oil and grease sample was 5 mg/L taken November 27, 2013. We only have a narrative standard for oil and grease. In most cases if oil and grease is below 10 mg/L, there should not be a visible sheen.

The following samples were taken June 19, 2013. The sample result for phosphorus was 0.61 mg/L. There are no Water Quality Standards (WQS) for phosphorus. The average nitrate + nitrite nitrogen sample result was 0.20 mg/L. The standard for nitrate applies only to Class "C" waters that are used for drinking water which Unnamed Creek to which the Montezuma STP discharges is not. The average TKN sample result was 3.06 mg/L. There are no WQS for TKN. Based on information currently available the Department cannot make a reasonable potential determination for the narrative WQS in IAC 567-61.2(3) specific to nitrogen and/or phosphorus. However, NPDES permits are protective of Iowa's narrative standards that apply at all times to all surface waters regardless of whether or not the standards are specifically included in the permit. The Department is addressing nitrogen and phosphorus discharges from point sources through the Iowa Nutrient Reduction Strategy.

Part B of the permit application requires expanded effluent testing. All effluent tests were below the required limits as set in the November 7, 2013 WLA. No monitoring or limits are required.

Backsliding: The permit has been reviewed for anti-backsliding according to sections 303(d)(4) and 402(o) of the Clean Water Act and 40 CFR 122.44. All limits and conditions proposed in this permit are at least as stringent as those in the previous permit. Backsliding is not occurring.

Effluent toxicity: Toxicity tests have not been conducted by US EPA Region VII. The Department is incorporating toxicity and limits testing into the permit as per revised Rule 567 IAC 63.4(455B) which became effective June 19, 1991. The dilution percentages for effluent toxicity testing specified in the November 7, 2013 WLA are 100% effluent. An annual monitoring frequency is specified in the permit.

Monitoring Basis: Compliance and operational monitoring are based on Chapter 63 IAC, Tables II and III. Category 3,001-15,000 PE. The DO monitoring is based on best professional judgment and set as the same as the $CBOD_5$ and ammonia nitrogen, due to DO's relationship to these two parameters, at two times per week.

Special Monitoring: See page 9 of the permit for the ammonia nitrogen total nitrogen and *E. coli* special monitoring language.

Sludge: Sludge will be land applied according to Chapter 567 IAC 67 land application rules, or otherwise disposed of in accordance with federal regulations specified in 40 CFR Part 503. No adverse environmental impacts have been identified.

Compliance Schedule: (*E. coli* & ammonia nitrogen): Per Subrule 567 IAC 64.7(4) the Department is authorized to include schedules of compliance in NPDES permits. Due to the inability to comply with the proposed *E. coli* and ammonia nitrogen limits, a compliance schedule to upgrade the facility is necessary. The timeframe (52 months from permit issuance) is deemed to result in compliance as soon as possible for ammonia nitrogen due to the time it takes to conduct anti-deg review, design the project, obtain the appropriate permits, secure funding, construct the equipment, and obtain a level of operation. **NOTE: The compliance schedule is revised for additional time required for analyzing existing and projected future facility flows that includes an aggressive sump pump disconnection program.**

Additional Comments: The permit contains a requirement for the City to conduct a two year feasibility study to determine the facility's ability to remove nutrients (total nitrogen and total phosphorus). The requirement is in based on the 2013 Iowa Nutrient Reduction Strategy. The facility is required to evaluate the feasibility and reasonableness of reducing the amounts of nitrogen and phosphorus discharged into surface water. The report shall be submitted no later than *[24 months from permit issuance date]*.