



## EPA Region 7 4B Rationale

**Water body ID(s):** MO\_2786

**State:** MO

**Water body Names(s):** MCKENZIE CREEK

**Pollutant(s):** BOD, LOW DISSOLVED OXYGEN

**HUC(s):** 11010007

**Basin:** UPPER WHITE - UPPER BLACK RIVER BASIN

**Tributary(ies):**

**First Listing Cycle:** 1998

**Submittal Date:** 2/4/2009

**Approved:** Yes

### Submittal Letter

*State submittal letter indicates final Maximum Daily Load(s) for specific pollutant(s)/water(s) were adopted by the state, and submitted to EPA for approval under section 303(d) of the Clean Water Act. Include date submitted letter was received by EPA and date of receipt of any revisions.*

The United States Environmental Protection Agency (EPA) received this submittal, for the impairment Low Dissolved Oxygen (DO), with cover letter, check list, final permit, fact sheet, water quality review sheet, water quality data, consent decree, and instream monitoring data on February 4, 2009, from the Missouri Department of Natural Resources (MDNR). An e-mail from MDNR with additional information was received October 7, 2009, with four attachments.

### Concern

*A statement of the problem causing the impairment.*

The sole source of the impairment is the Piedmont Waste Water Treatment Facility (WWTF), Permit Number MO-0047341. McKenzie Creek is a tributary to the Black River; is a 2.5 mile segment, class P stream, located in Wayne County. The stream segment of interest begins 30 yards above the Piedmont Lagoon and extends through the town of Piedmont Missouri, ending 2.4 miles below the Piedmont Lagoon. The beneficial uses of McKenzie Creek include; Livestock and Wildlife Watering (LWW), Protection of Warm Water Aquatic Life and Human Health associated with fish consumption (AQL).

Violations of numeric water quality standards (WQS) have been observed. The City of Piedmont WWTF has been in non-compliance in the past for exceeding the existing National Pollutant Discharge Elimination System (NPDES) permit effluent limits. The water quality data survey reports by MDNR for August 2000, June 2001 and July 2001 were included. Observations and findings showed the industrial user to the Piedmont WWTF, Windsor Foods, discharges a high biological oxygen demand (BOD) load to the WWTF (historically 936 to 8110 milligrams per liter (mg/L)). This high level of BOD is likely causing significant reductions in DO levels in McKenzie Creek directly downstream of the Piedmont WWTF. Based on the documented violations during MDNRs inspection, MDNR issued the City of Piedmont a notice of violation No. 18407 SE.

The Abatement Order on Consent (AOC) No. 997 between the City of Piedmont and MDNR was entered on January 21, 2009. The objectives of the AOC are to; 1) require the City of Piedmont to provide interim upgrades and/or operational changes that will enable the city to comply with the NPDES permit, Clean Water Act (CWA) and Missouri Clean Water Law (MCWL); 2) and require the City of Piedmont, to provide later upgrades or replacement of the WWTF that will enable its effluent to meet the new limits.

The previous NPDES permit effluent limits for BOD were 65 mg/L weekly average and 45 mg/L monthly average. The waste load allocation (WLA) for BOD was established by Parsons Corporation in 2005 and used the QUAL2K model. The BOD load, resulted in violations of the DO criterion, were modeled based upon meeting 5.0 mg/L of DO in McKenzie Creek. By meeting the 5.0 mg/L of DO criterion in McKenzie

Creek, should result in attainment of the numeric WQS for the protection of the Aquatic Life designated use.

There are two facilities in the upper McKenzie Creek watershed, but comprise three outfalls to the stream segment (Gads Hill Quarry has two, Piedmont Industrial Park has one). Because of their low flow and distance upstream of the Piedmont WWTF (4 miles); Gads Hill Quarry and Piedmont Industrial Park are not significant contributors to low DO below the WWTF. Two storm water outfalls are upstream of the WWTF, one is 3.5 miles upstream, the other is 7.6 miles upstream of WWTF. Based on the data received from MDNR these two storm water outfalls are not considered to contribute to low DO impairment.

On September 14, 2007, MDNR staff conducted additional monitoring and investigation to determine if there was low DO upstream of the WWTF. About 2.5 miles upstream of the WWTF outfall, the morning DO was 7.8 mg/L, while it was 1.7 mg/L at the outfall and 3 mg/L at 1.6 miles below the outfall. Later in the day, the DO readings were 8.3, 2.8 and 6.9 mg/L respectively at these locations. Based on the DO measurements, MDNR concludes that low DO is not an issue upstream of the WWTF.

### **Implementation Strategy**

*A description of the proposed implementation strategy and supporting pollution controls necessary to achieve WQS, including the identification of point and nonpoint source loadings that when implemented assure the attainment of all applicable WQS.*

A permit was reissued on July 3, 2008. The permit sets interim weekly and monthly average limits for BOD of 65 mg/L weekly average and 45 mg/L monthly average, and total suspended solids (TSS) 110/70 mg/L, respectively. The permit set final limits are stricter than the previous permit limits. The final BOD limits are set at 20 mg/L daily maximum and 10 mg/L monthly average, TSS is set at 45 mg/L weekly and 30 mg/L monthly average, ammonia daily maximum at 6.1 mg/L (May 1-October 31) and 9.6 mg/L (November 1- April 30), oil & grease daily maximum at 15 mg/L and 10 mg/L monthly average, fecal coliform of 1000 colony forming unit (cfu)/100 milliliters (ml) daily maximum and 400 cfu/100 ml monthly average, total residual chlorine at 0.016 mg/L daily maximum and 0.008 mg/L monthly average, and chloride 383 mg/L daily maximum and 191 mg/L monthly average.

DO is the WQS that is exceeded in McKenzie Creek. BOD is the parameter used to determine the impact that wastewater will cause on DO levels in a receiving stream. There is no numeric criterion in the Missouri WQS for BOD. Since DO cannot be allocated, but does have a numeric criterion, DO is linked to BOD. BOD may be found in the specific criterion section of the Missouri WQS at 10 CSR 20-7.031(4)(J) which states; "Water contaminants shall not cause the DO to be lower than the levels described in Table A or as indicated in paragraph (4)(A)3". Table A DO in stream is 5.0 mg/L for warm water and cool water fisheries; and 6.0 mg/L for cold water fisheries.

BOD is of concern because it can cause low levels of DO in receiving waters. The Piedmont WWTF has to meet the requirements of a discharge permit issued by MDNR. Their previous permit limits for BOD are 65/45 (weekly/monthly average) mg/L. The DO WQS of 5 mg/L will be achieved by limiting the BOD in the effluent to 20 mg/L for daily maximum and 10 mg/L monthly average. The WLA study for BOD was conducted for the Piedmont WWTF under contract by Parson Corporation in 2005. A steady state water quality model (QUAL2K) was constructed and calibrated from the data and used to determine a BOD WLA protective of water quality in McKenzie Creek.

### **Time**

*An estimate or projection of the time when WQS will be met.*

The Missouri State Operating Permit (MSOP) for Piedmont WWTF was issued on July 3, 2008. The new effluent limits will go into effect three years after issuance (July 3, 2011) and by meeting them, the WQS should be achieved in McKenzie Creek on July 4, 2011.

### **Schedule**

*A reasonable schedule for implementing the necessary pollution controls.*

A permit was issued on July 3, 2008. The final effluent limits are effective three years from the date of permit issuance (July 3, 2011) which becomes effective July 4, 2011. The City of Piedmont is currently under enforcement action because the Piedmont WWTF cannot meet limits for BOD and TSS. Abatement Order on Consent (AOC) No. 997 between the City of Piedmont and MDNR was signed January 21, 2009.

The AOC, regarding violations of the MCWL, is requesting the City of Piedmont shall: 1) within fifteen (15) days clearly mark outfall #001 in the field, 2) take corrective action so as to ensure that all aerators at the WWTF are operable on or before May 1, 2009, and continue to maintain the aerators to ensure that they continue to operate properly, 3) within sixty (60) days of the effective date (July 3, 2008) of the permit, a report should be submitted to MDNR for review, 4) on or before May 31, 2010, submit to MDNR for review and approval an engineering report. The City of Piedmont shall implement the schedule as approved by MDNR in its approval letter and comply with all effluent limitations contained in the permit on or before July 4, 2011, 5) fully implement all of the requirements of Appendix A of the AOC, Wastewater Collection and Treatment System Management Program, and if required, complete improvements to its collection system that work toward eliminating incidents of Sanitary Sewer Overflows (SSO) from its collection system and bypasses at the WWTF, and 6) in the period of time from the effective date of the AOC, until the new upgraded WWTF is completed, the WWTF should operate at all times to produce the best effluent quality possible.

The requirements of Appendix A of the AOC are: 1) Information Collection and Utilization; SSO bypass and basement backup tracking and data management system (Tracking and Management System). Within ninety (90) days of the effective date of the AOC, the City of Piedmont shall submit to MDNR, for review and approval, a description of a written or electronic Tracking and Management System that documents information regarding SSO events, bypasses and backup, 2) Inflow and Infiltration (I/I) Assessment and Reduction Plan; Immediately upon the effective date of AOC, the City of Piedmont shall begin monitoring and documenting inflow data from both influent lines to the WWTF, 3) maintenance and repair program; within 270 days if the effective date of the AOC, the City of Piedmont shall develop a maintenance and repair program for the City of Piedmont collection system, 4A) the City of Piedmont shall verbally notify MDNR within twenty-four (24) hours from the time the City becomes aware of any discharges from the WWTF that receives less than secondary treatment, regardless of whether or not the discharge is a violation of the City's MSOP and each SSO event, 4B) Semi annual reporting; If the City of Piedmont is required to implement an I/I assessment and reduction plan as describe in section 3 of Appendix A, immediately upon MDNR's approval the City shall submit in writing to MDNR a six (6) month status report on or before the 28th day of April and October every year until termination of the AOC, and 5) requesting termination of reporting requirements; upon successful completion of all construction activities identified within the approved I/I assessment and reduction plan under section 3 of Appendix A; full and successful implementation of all actions required pursuant to sections 2 and 4 of Appendix A; and reporting as required by section 5 of Appendix A, the reporting requirements of Appendix A shall remain in effect until a written notice of termination is issued by an authorized representative of MDNR.

The WLA's for the City of Piedmont's WWTF for outfall #001: The final limits are set at 20 mg/L daily maximum and 10 mg/L monthly average for BOD, 45 mg/L weekly and 30 mg/L monthly averages for TSS, 6-9 standard unit (SU) daily maximum and monthly average for pH, 6.1 mg/L (May 1-October 31) and 9.6 mg/L (November 1- April 30) for ammonia, 15 mg/L daily maximum and 10 mg/L monthly average for oil & grease, 1000 cfu/100 ml daily maximum and 400 cfu/100 ml monthly average for Fecal Coliform , 0.016 mg/L daily maximum and 0.008 mg/L monthly average for total residual chlorine, and 383 mg/L daily maximum and 191 mg/L monthly average of chloride. The monitoring reports will be submitted monthly to MDNR. The sampling frequency for flow will be once per day and reports for BOD, TSS, pH, Ammonia as N, Temperature, Fecal Coliform, Chlorine, and oil and grease, will be submitted twice per month to MDNR. The permit also states that there shall be no discharge of floating solids or visible foam in other than trace amounts. The Whole Effluent Toxicity (WET) test monitoring reports will be submitted annually.

The WLA's for the City of Piedmont WWTF for outfall #002: The flow limits are set at 0.1 millions of gallons per day (MGD) daily maximum, 360 mg/L daily maximum equivalent to 300 pounds/day (lbs/day) of BOD, 150 mg/L daily maximum equivalent to 125 lbs/day of TSS, 6-9 SU daily maximum and the monthly average for pH, and 54 mg/L daily maximum equivalent to 45 lbs/day of oil & grease. The monitoring reports will be submitted monthly to MDNR. The sampling frequency for flow will be once per day and reports for BOD, TSS, pH and oil and grease will be submitted twice per month to MDNR.

## **Monitoring**

*A description of, and schedule for, monitoring milestones for tracking and reporting progress to EPA on the implementation of the pollution controls.*

Ambient stream monitoring by MDNR will be scheduled after the new limits go into effect, to determine if the impairment has been eliminated. In addition, the permit requires monthly instream monitoring of DO downstream of outfall #001 to ensure permit limits are being achieved.

**Commitment to Revise**

*A commitment to revise, as necessary, the implementation strategy and pollution controls if progress towards meeting WQS is not being shown.*

A reopener clause (included in section D (3), page 7) has been included in the permit to allow for stricter effluent limits if monitoring shows that WQS are not being achieved.

**\*\*\*\*\*Pollution control requirements in the submittal\*\*\*\*\***

National Pollution Discharge and Elimination System (NPDES) and Abatement Order on Consent (AOC) No. 997 between the City of Piedmont and MDNR was signed January 21, 2009