



EPA Region 7 TMDL Review

TMDL ID:MO_0212

State: MO

Document Name:

INDIAN CAMP CREEK

Basin(s): UPPER MISSISSIPPI-SALT (CUIVRE RIVER BASIN)

HUC(s): 07110008, 7110008

Water body(ies): INDIAN CAMP CR., INDIAN CAMP CREEK

Tributary(ies):

Pollutant(s): INORGANIC SEDIMENT

Submittal Date: 1/4/2010

Approved: Yes

Submittal Letter

State submittal letter indicates final Total Maximum Daily Load(s) (TMDL) 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 [40 CFR § 130.7(c)(1)]. Include date submitted letter was received by EPA, date of receipt of any revisions, and the date of original approval if submittal is a phase II TMDL.

This TMDL document was formally submitted by the Missouri Department of Natural Resources (MDNR). The United States Environmental Protection Agency (EPA) received this document by mail on January 4, 2010. Revisions to this document were received by email on January 27, 2010.

Water Quality Standards Attainment

The water body's loading capacity (LC) for the applicable pollutant is identified and the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources is described. TMDL and associated allocations are set at levels adequate to result in attainment of applicable water quality standards (WQS) [40 CFR § 130.7(c)(1)]. A statement that WQS will be attained is made.

When the WQS is expressed as a narrative value, a measurable indicator of the pollutant may be selected to express the narrative as a numeric value. There are many quantitative indicators of sediment, such as total suspended solids (TSS), turbidity, and bedload sediment, which are appropriate to describe sediment in rivers and streams. TSS was selected as the numeric target for this TMDL because it enables the use of the highest quality data available, including permit conditions and monitoring data. The TMDL was determined using a load duration curve (LDC). The limited data and lack of a biological assessment indicate the need for an explicit margin of safety (MOS). Ten percent of the LC was set aside for the MOS. This reduction in sediment protects the warm water aquatic life use of the stream and the TMDL should result in WQS attainment.

The LC is defined by a LDC set at the 25th percentile of the TSS condition calculated from all data available in the ecological drainage unit (EDU). The LC is set at 0.117 tons per day of TSS at the 50th percentile of flow.

Numeric Target(s)

Submittal describes applicable WQS, including beneficial uses, applicable numeric and/or narrative criteria. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, site specific if possible, was developed from a narrative criterion and a description of the process used to derive the target is included in the submittal.

Designated Beneficial Uses:

- Livestock and wildlife watering;

- Protection of warm-water aquatic life;
- Protection of human health (fish consumption); and
- Whole body contact recreation - Category B.

The impaired use is: Protection of warm-water aquatic life.

The impairment of Indian Camp Creek is based on exceedances of the general criteria contained in Missouri's WQS, 10 CSR 20-7.031(3)(A), (C) and (G), which state:

- (A) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses.
- (C) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor, or prevent full maintenance of beneficial uses.
- (G) Waters shall be free from physical, chemical, or hydrologic changes that would impair the natural biological community.

When water quality criteria are expressed as a narrative, a measurable indicator of a pollutant may be selected to express the narrative as a numeric value. There are many quantitative indicators of sediment, such as TSS, turbidity, and bedload sediment, which are appropriate to describe sediment in rivers and streams. A concentration of TSS was selected to represent the numeric target for this TMDL because it enables the use of the highest quality available data and is included in permit requirements and monitoring data.

Pollutant(s) of concern

An explanation and analytical basis for expressing the TMDL through surrogate measures (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae) is provided, if applicable. For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and margin of safety (MOS) that do not exceed the LC. If submittal is a phase II TMDL there are refined relationships linking the load to WQS attainment. If there is an increase in the TMDL there is a refined relationship specified to validate the increase in TMDL (either load allocation (LA) or waste load allocation (WLA)). This section will compare and validate the change in targeted load between the versions.

In cases where sufficient pollutant data for the impaired stream is not available a reference approach is used. In this approach, the target for pollutant loading is the 25th percentile of the EDU condition calculated from all data available within the EDU in which the water body is located. Therefore, the 25th percentile is targeted as the TMDL LDC. An established link between TSS and sediment was used to define this TMDL as a numeric value. A measurement of TSS concentration is the sum of all organic and inorganic suspended solids, inorganic sediment concentration in the water column is at most equal to that of TSS. Assuming the ratio of inorganic sediment to TSS is constant for a particular watershed and during a specific event, any reduction in one would parallel that of the other. TSS concentration may therefore be used as the target for the inorganic sediment impairment. The WLA, LA, and MOS are set to not exceed the LC.

Source Analysis

Important assumptions made in developing the TMDL, such as assumed distribution of land use in the watershed, population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources, are described. Point, nonpoint and background sources of pollutants of concern are described, including magnitude and location of the sources. Submittal demonstrates all significant sources have been considered. If this is a phase II TMDL any new sources or removed sources will be specified and explained.

There are thirty facilities in the Indian Camp Creek watershed that have national pollutant discharge elimination system (NPDES) permits through the state of Missouri. Twelve of the permits within the watershed are site specific, six are general permits, and 12 are storm water permits.

Site specific permits

Facility	Permit Number	Design Flow Million Gallons/Day
MODOT, I-70 Rest Area	MO087190	0.0230
MAWC - Warren/Lincoln #1	MO098817	0.0800
MAWC - Warren/Lincoln #2	MO100358	0.0800
JZ Disposal Demo Landfill	MO108103	0.0010

Orchard Farm Parc	MO109495	0.0110
North Oak Sewer District	MO109673	0.0500
Pleasant Oak Mobile Home	MO110680	0.0195
Shannon's Little River Farm	MO113042	0.0030
Country Horizon MHP	MO113387	0.0030
Gables Apartments	MO113786	0.0030
Midway Village MHP	MO117269	0.0187
Faith Christian Fellowship	MO129721	0.0055

Observations made by MDNR, have identified the JZ Landfill site (MO0108103) as the primary point source contributor of inorganic sediment to Indian Camp Creek. Erosion concerns at the JZ Landfill area and the presence of a gully have also been noted. JZ Landfill discharges directly to the impaired segment of Indian Camp Creek.

General and storm water permits are issued based on the type of activity occurring and are issued to activities similar enough to be covered by a single set of requirements.

General Permits

Facility	Permit Number	Design Flow Million Gallons/Day
MFA Bulk Plant-Wright City	MOG350142	0.00
Lafarge North America	MOG490906	0.00
Schreiter Concrete	MOG490648	0.00
Incline Village Lake	MOG690021	0.00
Masterson & Assoc North	MOG821041	0.00
Wright City Meat Company	MOG822167	0.00

Storm Water Permits

Facility	Permit Number	Design Flow Million Gallons/Day
North Oak Estates Sewage Treatment Facility	MOR103880	storm water
Vacant Land Development	MOR104988	storm water
Autumn Ridge	MOR107735	storm water
Providence Estates-Phase 9	MOR108300	storm water
Falcons Crest	MOR108661	storm water
Gettysburg Commons	MOR109E48	storm water
Hickory Trails	MOR109V20	storm water
I-70 West Industrial Park	MOR10A767	storm water
Hickory Hollow	MOR10A870	storm water
Steve Herr Subdivision	MOR10B007	storm water
Progress Parkway	MOR10B138	storm water
Warrenton Athletic Complex	MOR10C388	storm water

There are many quantitative indicators of sediment, such as TSS, turbidity, and bedload sediment, which are appropriate to describe sediment in rivers and streams. For purposes of this TMDL, sources accounted for as nonpoint sources of sediment include: runoff from agricultural nonpoint sources and lower density livestock populations.

Overland runoff during rain events can easily carry sediment from both feed lots and cropland to the stream. A certain amount of sediment enters the stream naturally due to normal fluvial processes, accounting for the natural background level of inorganic sediments. Human impacts on the land have increased erosion of sediment into streams.

There are no state-permitted concentrated animal feeding operations (CAFOs), in the watershed, but the presence of lower density livestock populations could also be contributing to the sediment load in Indian Camp Creek. Livestock tend to concentrate near feeding and watering areas causing those areas to become barren of plant cover, increasing the possibility of erosion during a storm event.

Cropland adjacent to and draining into Indian Camp Creek could be contributing to the stream's inorganic sediment impairment. Anywhere land is exposed, soil will erode into the stream and increase turbidity and inorganic sediment concentrations. Grassland and cropland land uses make up approximately 22 percent of the Indian Camp Creek watershed. Forest and woodland is the predominant land use type accounting for more than 45 percent of the watershed cover. Urban areas account for 7.4 percent of the total watershed area.

Based on the information before us, the states decision to apply the discharges associated with unpermitted sources to the LA, as opposed to the WLA for purposes of this TMDL is acceptable. The decision to allocate these sources to the LA does not reflect any determination by EPA as to whether these discharges are, in fact, unpermitted point source discharges within this watershed. In addition, by approving these TMDLs with some sources treated as LAs, EPA is not determining that these discharges are exempt from NPDES permitting requirements. If sources of the allocated pollutant in this TMDL are found to be, or become, NPDES-regulated discharges, their loads must be considered as part of the calculated sum of the WLA in this TMDL. WLA in addition to that allocated here is not available.

Any CAFO that does not obtain an NPDES permit must operate as a no discharge operation. Any discharge from an unpermitted CAFO is a violation of Section 301. It is EPA's position that all CAFOs should obtain an NPDES permit because it provides clarity of compliance requirements, authorization to discharge when the discharges are the result of large precipitation events (e.g., in excess of 25-year and 24-hour frequency/duration) or are from a man-made conveyance. However, many large CAFOs (mostly the poultry and swine sectors) contend that they do not discharge nor propose to discharge therefore are not required to obtain an NPDES permit. It is EPA's opinion that many of the "no discharge" CAFOs do not have adequate land application area to ensure the agronomic uptake of land applied waste or are not designed, constructed, operated or maintained so that they do not discharge or propose to discharge. Furthermore, there are many animal feeding operations (AFOs) that meet the definition of a medium CAFO (i.e., discharge via a man-made conveyance) but are unpermitted and have not limited their impact on waters by applying Best Professional Judgment to effluent reductions.

Permitted CAFOs identified in this TMDL are part of the assigned WLA. AFOs and unpermitted CAFOs are considered under the LA because we do not currently have enough detailed information to know whether these facilities are required to obtain NPDES permits. This TMDL does not reflect a determination by EPA that such facility does not meet the definition of a CAFO nor that the facility does not need to obtain a permit. To the contrary, a CAFO that discharges or proposes to discharge has a duty to obtain a permit. If it is determined that any such operation is an AFO or CAFO that discharges, any future WLA assigned to the facility must not result in an exceedance of the sum of the WLAs in this TMDL as approved.

All known sources have been considered.

Allocation - Loading Capacity

Submittal identifies appropriate WLA for point, and load allocations for nonpoint sources. If no point sources are present the WLA is stated as zero. If no nonpoint sources are present, the LA is stated as zero [40 CFR § 130.2 (i)]. If this is a phase II TMDL the change in LC will be documented in this section.

The JZ Landfill facility (MO0108103) discharges to the impaired segment of Indian Camp Creek and has been identified by MDNR as the most significant source of inorganic sediment loading to the stream. The total WLA is set at 0.0189 tons per day of TSS for all percentile flow exceedance. The entire LC for TSS during critical low-flow conditions (95 percent flow exceedance) can be allocated among point sources within the Indian Camp Creek watershed due to the lack of pollutant contributions from precipitation induced surface water runoff. The LC is dependent on flow. The explicit MOS is set at ten percent. The LA is equal to the LC minus the total WLA minus the MOS at all percentile flow exceedances.

WLA Comment

Submittal lists individual WLAs for each identified point source [40 CFR § 130.2(h)]. If a WLA is not assigned it must be shown that the discharge does not cause or contribute to WQS excursions, the source is contained in a general permit addressed by the TMDL, or extenuating circumstances exist which prevent assignment of individual WLAs. Any such exceptions must be explained to a satisfactory degree. If a WLA of zero is assigned to any facility

it must be stated as such [40 CFR § 130.2(i)]. If this is a phase II TMDL any differences in phase I and phase II WLAs will be documented in this section.

The total WLA is set at 0.0189 tons per day of TSS at all flow conditions. JZ Landfill facility's (MO0108103) WLA is calculated using the permitted facility design flow and the TSS maximum daily limit. The TSS WLA for the JZ Landfill facility is 0.0003 tons per day.

The eleven other site specific permits discharging domestic wastewater do not significantly contribute to the water quality impairment relative to inorganic sediment. No net reduction in current permit limits is required for domestic waste water treatment facilities within the watershed and WLAs for these facilities are set at current permit limits and conditions.

Facilities within the watershed with general or storm water permits, have WLAs set at present loads and listings of permit-specific best management practices. Compliance with these permit conditions should result in sediment loading at or below applicable targets.

LA Comment

Includes all nonpoint sources loads, natural background, and potential for future growth. If no nonpoint sources are identified the LA must be given as zero [40 CFR § 130.2(g)]. If this is a phase II TMDL any differences in phase I and phase II LAs will be documented in this section.

The LA is set equal to the LC minus the WLA (0.189 tons per day) minus the MOS at all percentile flow exceedances. For example, at the 50th percentile of flow (median flow) the LC is 0.117 tons per day of TSS, the WLA is 0.0189 tons per day of TSS, and the MOS is 0.0117 tons per day of TSS. The LA is 0.0864 tons per day of TSS.

$LA = LC (0.117 \text{ tons per day}) - WLA (0.0189 \text{ tons per day}) - MOS (0.0117 \text{ tons per day}) = 0.0864 \text{ tons per day.}$

Margin of Safety

Submittal describes explicit and/or implicit MOS for each pollutant [40 CFR § 130.7(c)(1)]. If the MOS is implicit, the conservative assumptions in the analysis for the MOS are described. If the MOS is explicit, the loadings set aside for the MOS are identified and a rationale for selecting the value for the MOS is provided. If this is a phase II TMDL any differences in MOS will be documented in this section.

An explicit ten percent MOS has been applied to all flow conditions. For example, at the 50th percentile of flow (median flow) the LC is 0.117 tons per day and the MOS is 0.0117 tons per day of TSS. The ten percent MOS accounts for uncertainties in scientific and technical understanding of water quality in natural systems.

Seasonal Variation and Critical Conditions

Submittal describes the method for accounting for seasonal variation and critical conditions in the TMDL(s) [40 CFR § 130.7(c)(1)]. Critical conditions are factors such as flow or temperature which may lead to the excursion of WQS. If this is a phase II TMDL any differences in conditions will be documented in this section.

The impairment of Indian Camp Creek is due to inorganic sediments being carried into the water body through storm water runoff. These conditions are more likely to occur during seasonal periods having significant precipitation. The TMDL LDC represents flow under all possible stream conditions. The advantage of a LDC approach is that it avoids the constraints associated with using a single-flow critical condition during the development of the TMDL. Because the TMDL is applicable under all flow conditions, it is also applicable for all seasons. Seasonal variation is therefore implicitly taken into account within the TMDL calculations.

Public Participation

Submittal describes required public notice and public comment opportunity, and explains how the public comments were considered in the final TMDL(s) [40 CFR § 130.7(c)(1)(ii)].

EPA regulations require that TMDLs be subject to public review (40 CFR 130.7). The public notice period was from November 12, 2009 to December 12, 2009. Various groups received the public notice announcement. MDNR also posted the notice, the sediment TMDL information sheet, and this TMDL document on MDNR's Web site. Announcement of the public notice period for this TMDL was issued as a press release to local media outlets in the proximity of the Indian Camp Creek watershed. Any comments received and MDNR's responses to those comments will be maintained in the MDNR Indian Camp Creek TMDL file. Two comments

were received and responded to.

Monitoring Plan for TMDL(s) Under Phased Approach

The TMDL identifies a monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of WQS, and a schedule for considering revisions to the TMDL(s) (where phased approach is used) [40 CFR § 130.7].

Post-TMDL monitoring is usually scheduled and carried out by MDNR approximately three years after the approval of the TMDL or in a reasonable time period following completion of permit compliance schedules and the application of new effluent limits. Additionally, any available volunteer water quality monitoring or permittee instream monitoring that occurs on Indian Camp Creek will be used for screening purposes to compare the stream's current condition with future, post-TMDL conditions. MDNR will also routinely examine physical habitat, water quality, invertebrate community, and fish community data collected by the Missouri Department of Conservation under its Resource Assessment and Monitoring Program. This program randomly samples streams across Missouri on a five to six year rotating schedule.

Reasonable Assurance

Reasonable assurance only applies when less stringent WLAs are assigned based on the assumption of nonpoint source reductions in the LA will be met [40 CFR § 130.2(i)]. This section can also contain statements made by the state concerning the state's authority to control pollutant loads.

Reasonable assurances are not required within this TMDL because all permitted point sources have received a WLA that is set to meet WQS. MDNR has the authority to issue and enforce Missouri State Operating Permits. Inclusion of effluent limits derived from TMDL WLAs into a state permit, and at least quarterly monitoring of the effluent reported to MDNR, should result in compliance with WQS. Inorganic sediment reduction efforts relating to nonpoint sources can be found in Section 6.2 of the TMDL document.