
**UPPER JEFFERSON RIVER TMDL PLANNING AREA:
2010 WATER CHEMISTRY AND CHLOROPHYLL
MONITORING**

Sampling and Analysis Plan - Addendum

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This document constitutes an addendum to the Sampling and Analysis Plan (SAP) for nutrient and metal source assessment and loading estimates for selected streams in the Upper Jefferson River TMDL planning area (TPA). This SAP Addendum provides sampling and analysis guidance for a portion of the Upper Jefferson River TMDL Project (PP# MO8-TMDL-02). This SAP Addendum includes water chemistry sampling in the Lower Jefferson TPA in order to fully understand the metals loading to the entire length of the Jefferson River.

1.0 INTRODUCTION AND BACKGROUND

The Upper and Lower Jefferson TPA's are located in the Missouri River Watershed. The Jefferson River is a major tributary of the Missouri River. The Ruby, Big Hole and Beaverhead rivers converge to form the Jefferson River near the town of Twin Bridges. The downstream extent of the Upper Jefferson TPA is near the town of Cardwell and the Jefferson River's confluence with the Boulder River. The downstream extent of the Lower Jefferson TPA is near the town of Three Forks and the Jefferson River's confluence with the Madison River and Gallatin River which forms the Missouri River. The Jefferson River has only one ADB segment (the whole river is a segment). Therefore, the purpose of this addendum is to add metals monitoring in the Jefferson River and significant tributaries to the original 2010 monitoring SAP (**Map A-1, Appendix A-1**). The TMDL planning areas includes portions of Broadwater, Silver Bow, Madison and Gallatin counties.

The Jefferson River is identified for copper and lead impairments on Montana's 2008 impaired waters list. Metals sources include natural and historic mining activities. Cherry Creek, Whitetail Creek, Willow Creek, Boulder River and the South Fork Boulder River are identified for various metal related impairments on Montana's 2008 impaired waters list. The goal of the sampling project is to understand which tributaries are contributing to metal loads in the Jefferson River. The data may also support splitting the Jefferson River into two ADM segments, which would more closely align with the TPA boundaries.

Thirteen sites have been added to the original SAP to evaluate the Jefferson River for impairment (**Table A-1, Appendix A**). The original SAP covered only the tributaries entering the Jefferson River in the Upper Jefferson TPA. These new sites are located in both the Upper and Lower Jefferson TPA's. These sites also include the mainstem of the Beaverhead River, Big Hole River, Ruby River, and Jefferson River. Sample sites were added to the South Fork Boulder River and Willow Creek just upstream of their confluence with the Jefferson River to evaluate the chemistry of these tributaries. A sample site has also been added on the Jefferson Slough above the confluence with the Jefferson River. This could help identify potential sources from the Golden Sunlight mine, which is upslope of the Jefferson Slough. . The Boulder River is also listed for metals impairment and is being sampled concurrently as part of the Boulder-Elkhorn TPA metals assessment.

Map A-1

Upper Jefferson TMDL Planning Area (including lower Jefferson River)

Legend

- 2010 Metal Sample Sites (Additional)
- 2010 Metals Sites (USGS Stream Gage)
- Upper Jefferson TPA

0 2.5 5 10 Miles

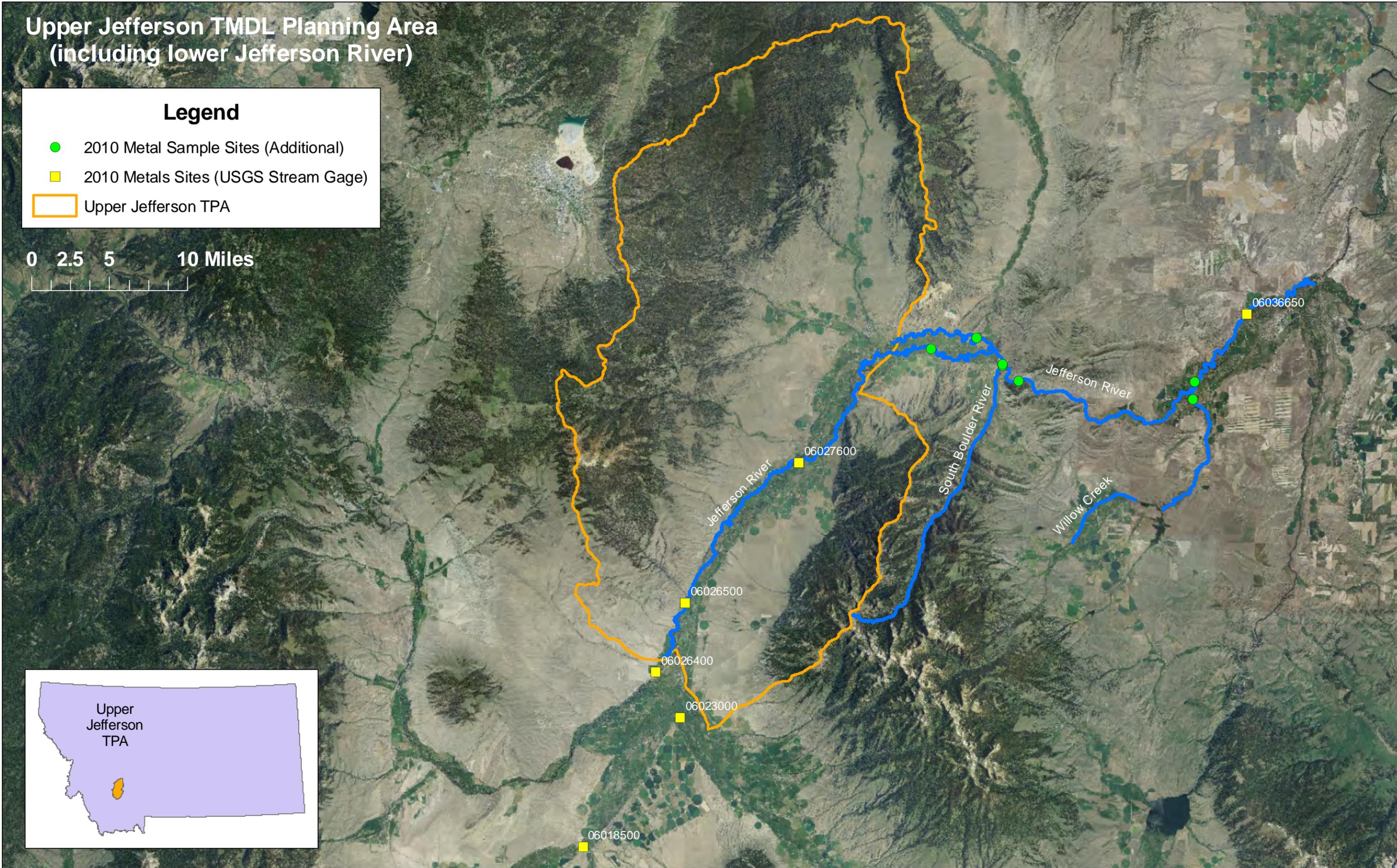
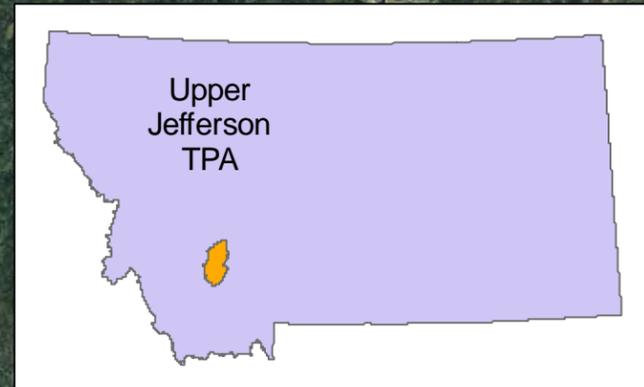


Table A-1

STREAM	Station ID	Site ID	Latitude	Longitude	Comments	Discharge	TSS	As	Cd	Cu	Fe	Hg	Pb	Zn	Hardness	TR Metals Digestion	
Beaverhead	USGS Gage 6018500	BEAV-01	45.383396	-112.452834	Metals		x	x	x	x	x		x	x	x	x	
Big Hole	USGS Gage 6026400	BIGH-01	45.548246	-112.365236	Metals		x	x	x	x	x		x	x	x	x	
Ruby	USGS Gage 6023000	RUBY-01	45.507004	-112.330917	Metals		x	x	x	x	x		x	x	x	x	
Jefferson	USGS Gage 6026500	JEFF-07	45.613376	-112.329421	Metals		x	x	x	x	x		x	x	x	x	
Jefferson	USGS Gage 6027600	JEFF-06	45.747222	-112.185556	Metals		x	x	x	x	x		x	x	x	x	
Jefferson	USGS Gage 6036650	JEFF-01	45.897159	-111.595718	Metals		x	x	x	x	x		x	x	x	x	
Jefferson	Jefferson River below Pipestone Creek	JEFF-05	45.856816	-112.014484	Metals	x	x	x	x	x	x		x	x	x	x	
Jefferson	Jefferson River below Boulder River	JEFF-04	45.844269	-111.919444	Metals	x	x	x	x	x	x		x	x	x	x	
Jefferson	Jefferson River below South Boulder River	JEFF-03	45.829620	-111.896742	Metals	x	x	x	x	x	x		x	x	x	x	
Jefferson Slough	Jefferson Slough above Boulder River	JEFS-01	45.868326	-111.954358	Metals	x	x	x	x	x	x		x	x	x	x	
Willow Creek	Jefferson River below Willow Creek	JEFF-02	45.833681	-111.662694	Metals	x	x	x	x	x	x		x	x	x	x	
South Fork Boulder	South Fork Boulder River lower	SFBD-01	45.843172	-111.918503	Metals	x	x	x	x	x	x	x	x	x	x	x	
Willow Creek	Willow Creek lower	WILL-01	45.816874	-111.665042	Metals	x	x	x	x	x	x		x	x	x	x	
TOTAL SITES						7	13			13			13	13	13	13	
Duplicate # 1 metals							x	x	x	x	x	x	x	x	x	x	
Blank #1 metals							x	x	x	x	x	x	x	x	x	x	
TOTAL COUNT						7	15			15			15	15	15	15	

All metals analysis are total recoverable.