# Appendix E: Section IV. Water Resources in the Yellowstone River Basin: Water Quality

# Water Quality In the Yellowstone River Basin

The Montana Department of Environmental Quality 303 d listing of water-quality impaired streams (draft 2014) is provided on the following pages. For a more complete and up-to-date description of the information see:

http://deq.mt.gov/wqinfo/cwaic/reports.mcpx



HUC 10070001	Yellowstone He	adwaters Waters	shed	Upper	Yellowst	one						
TMDL Planning Area	ID305B	Waterbody Name/Location	Category	y Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
Yellowstone River	MT43B001_010	YELLOWSTONE RIVER, Yellowstone Park Boundary to Reese Creek	5	4.79	MILES	B-1	N	F	N	F	Ammonia (Total) Arsenic Copper Lead	Highway/Road/Bridge Runoff (Non-construction Related) Impacts from Abandoned Mine Lands (Inactive) Natural Sources Source Unknown
											Nitrate/Nitrite (Nitrite + Nitrate as N) Sedimentation/Siltation	Subsurface (Hardrock) Mining Surface Mining
Yellowstone River	MT43B001_011	YELLOWSTONE RIVER, Wyoming border to Yellowstone National Park Boundary	5	8.68	MILES	A-1	N	x	N	x	Ammonia (Un-ionized) Arsenic Copper	HighwayiRoad/Bridge Runoff (Non-construction Related) Impacts from Abandoned Mine Lands (inactive) Natural Sources
											Nitrate/Nitrite (Nitrite + Nitrate as N) Sedimentation/Siltation	Source Unknown Subsurface (Hardrock) Mining Surface Mining
Paradise	MT43B002_010	REESE CREEK, Wyoming border to mouth (Yellowstone River)	4C	5.23	MILES	A-1	N	F	F	F	Fish-Passage Barrier	Source Unknown
Paradise	MT43B002_021	BEAR CREEK, 1/2 mile below Jardine Mine to mouth (Yellowstone River)	5	3.03	MILES	B-1	N	F	F	N	Low flow alterations Temperature, water	Flow Alterations from Water Diversions
Cooke City	MT438002_031	SODA BUTTE CREEK, McLaren Tallings to Wyoming Border	4A	4.86	MILES	B-1	N	x	x	F	Copper Iron Lead Manganese	Aold Mine Drainage Mine Tailings
Cooke City	MT438002_040	MILLER CREEK, headwaters to mouth (Soda Butte Creek)	4A	2.56	MILES	B-1	Ν	x	N	x	Aluminum Cadmium Copper Iron Lead Manganese	Acid Mine Drainage Mine Talings Natural Sources

F-Fully Supporting; T-Threatened; N-Not Fully Supporting; I-Insufficient Information; X-Not Assessed; -- Beneficial Use Not Assigned

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Д	ppend	lix A:	Impa	ired	W	aters
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HUC	10070002	Upper Yellowsto	ne Waters	shed	Upper `	Yellowst	one						
TMDL PI	lanning Area	ID305B	Waterbody Name/Location	Category	Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
Yellowsto	one River	MT43B003_010	YELLOWSTONE RIVER, Reese Creek	4C	119	MILES	B-1	N	x	x	x	Alteration in stream-side or littoral vegetative covers	Loss of Riparian Habitat
												Physical substrate habitat alterations	Site Clearance (Land Development or Redevelopment) Streambank Modifications/destablization
Yellowsto	one - Sweet Grass	MT43B004_011	OTTER CREEK, 2 ml downstream of Highway 191 bridge to mouth	4C	29.57	MILES	B-1	N	x	x	x	Other flow regime alterations	Impacts from Hydrostructure Flow Regulation/modification
			(Yellowstone River)									Physical substrate habitat alterations	
Yellowsto	one - Sweet Grass	MT43B004_012	OTTER CREEK, headwaters to 2 ml downstream of Highway 191 bridge	5	24.5	MILES	B-1	N	F	F	1	Alteration in stream-side or littoral vegetative covers Sedimentation/Siltation	Agricuiture
Yellowsto	one - Sweet Grass	MT43B004_021	BIG TIMBER CREEK, Swamp Creek to mouth (Yellowstone River)	4C	5.37	MILES	B-1	N	x	x	N	Low flow alterations	Impacts from Hydrostructure Flow Regulation/modification
Yellowsto	one - Sweet Grass	MT43B004_022	BIG TIMBER CREEK, headwaters downstream to Swamp Creek	5	26.75	MILES	B-1	Ν	F	Ν	I.	Alteration in stream-side or littoral vegetative covers	Agriculture
												Arsenic	Grazing in Riparian or Shoreline Zones
												Cadmium	Source Unknown
												Copper	
												Iron	
												Lead	
												Manganese	
												Nickel	
												Sedimentation/Siltation	
												Selenium	
												Solids (Suspended/Bedioad)	
Yellowsto	one - Sweet Grass	MT43B004_031	LOWER DEER CREEK, 4 mile upstream to mouth (Yellowstone River)	4C	4.43	MILES	B-1	N	x	x	N	Low flow alterations	Impacts from Hydrostructure Flow Regulation/modification
Yellowsto	one - Sweet Grass	MT43B004_041	UPPER DEER CREEK, Cartwright Guich to mouth (Yellowstone River)	4C	6.95	MILES	B-1	N	x	x	N	Low flow alterations	Impacts from Hydrostructure Flow Regulation/modification
Yellowsto	one - Sweet Grass	MT43B004_042	UPPER DEER CREEK, headwaters to Cartwright Guich	5	16.63	MILES	B-1	Ν	F	F	1	Alteration in stream-side or littoral vegetative covers	Grazing in Riparian or Shoreline Zones
												Solids (Suspended/Bedload)	Silvicuiture Activities
Paradise		MT43B004_051	BILLMAN CREEK, 1.3 miles upstream to mouth (Vellowstone River)	5	1.37	MILES	B-1	N	F	F	N	Excess Algal Growth	Agriculture
			mount (renowerine mixer)									Fish-Passage Barrier	Channelization

F-Fully Supporting; T-Threatened; N-Not Fully Supporting; I-Insufficient Information; X-Not Assessed; -- Beneficial Use Not Assigned

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HUC 10070002	Upper Yellowst	one Waters	shed	Upper	Yellowst	one						
TMDL Planning Area	ID305B	Waterbody Name/Location	Category	y Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
Paradise	MT43B004_051	BILLMAN CREEK, 1.3 miles upstream to	5	1.37	MILES	B-1	N	F	F	N	Nitrate/Nitrite (Nitrite + Nitrate as N)	Habitat Modification - other than Hydromodification
		mouth (Tellowsibne River)									Sedimentation/Siltation	Source Unknown
Paradise	MT43B004_052	BILLMAN CREEK, headwaters to 1.3	5	13.44	MILES	B-1	N	F	F	F	Combined Biota/Habitat Bioassessments	Agriculture
		miles above mouth (renowstone River)									Nitrate/Nitrite (Nitrite + Nitrate as N)	Channelization
											Sedimentation/Siltation	Source Unknown
Paradise	MT43B004_061	TOM MINER CREEK, Tepee Creek to	5	.73	MILES	B-1	N	F	F	N	Low flow alterations	Flow Alterations from Water Diversions
		mouth (Yellowstone River)									Temperature, water	
Paradise	MT43B004_071	MILL CREEK, National Forest boundary	4C	7.4	MILES	B-1	N	x	x	N	Low flow alterations	Agriculture
		to mouth (Yellowstone River)										Impacts from Hydrostructure Flow Regulation/modification
Paradise	MT43B004_081	PINE CREEK, 2.5 miles upstream to mouth (Yellowstone River)	4C	2.42	MILES	B-1	N	x	x	Ν	Low flow alterations	Impacts from Hydrostructure Flow Regulation/modification Imigated Crop Production
Paradise	MT43B004_090	SUCE CREEK, Absaroka-Beartooth Wildemess boundary to mouth (Yellowstone River)	4C	3.85	MILES	B-1	N	x	x	Ν	Low flow alterations	Impacts from Hydrostructure Flow Regulation/modification
Paradise	MT43B004_101	SIX MILE CREEK, National Forest boundary to mouth (Yellowstone River)	4C	6.19	MILES	B-1	N	x	x	N	Low flow alterations	Impacts from Hydrostructure Flow Regulation/modification
Paradise	MT43B004_102	SIX MILE CREEK, Absaroka-Beartooth Wildemess boundary to National Forest	5	2.54	MILES	B-1	Ν	х	х	x	Other anthropogenic substrate alterations	Loss of Riparian Habitat
		boundary									Sedimentation/Siltation	Placer Mining
Big Creek (Yellowstone)	MT43B004_111	BIG CREEK, National Forest boundary to mouth (Yellowstone River)	0 4C	4.25	MILES	B-1	N	x	x	N	Low flow alterations	Flow Alterations from Water Diversions
Paradise	MT43B004_120	MOL HERON CREEK, Yellowstone National Park boundary to mouth (Yellowstone River)	4C	9.03	MILES	B-1	N	F	F	F	Low flow alterations	Agriculture
Boulder - Big Timber	MT43B004_131	BOULDER RIVER, Clayton Ditch to	5	5.51	MILES	B-1	Ν	F	F	Ν	Copper	Impacts from Abandoned Mine Lands (Inactive)
		mouth (relowable river)									Iron	Irrigated Crop Production
											Lead	
											Low flow alterations	
											Silver	
Boulder - Big Timber	MT43B004_132	BOULDER RIVER, Natural Bridge and Falls (T3S R12E S26) to Clayton Ditch	5	27.84	MILES	B-1	N	F	F	F	Alteration in stream-side or littoral vegetative covers	Agriculture

F-Fully Supporting; T-Threatened; N-Not Fully Supporting; I-Insufficient Information; X-Not Assessed; -- Beneficial Use Not Assigned

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TMOL Planning Area         ID305B         Waterbody NamesLocation         Category         Size         Units         Lies Class         AGL         AG         DW         Rec         Cause Name         Source Name           Boulder - Big Timber         MT43B004_132         BOULDER RIVER, Natural Bridge and Frait (TIN R14E S34)         5         27.84         MILES         B-1         N         F         F         Chromium (total)         Grazing in Ripartan or Shoreline: Source Unknown           Boulder - Big Timber         MT43B004_133         BOULDER RIVER, confluence of the East Pork Boulder River to Natural bridge and Fais (T35 R12E S26)         5         24.08         MILES         B-1         N         F         F         Cooper         Source Unknown           Boulder - Big Timber         MT43B004_133         BOULDER RIVER, confluence of the East Pork Boulder River to Natural bridge and Fais (T35 R12E S26)         5         24.08         MILES         B-1         N         F         F         N         Cooper         Coal Mining Discharges (Permits Excess Algal Growth         Hardrock Mining Discharges (Permits Excess Algal Growth         Hardrock Mining Discharges (Permits Iron         Ead           Boulder - Big Timber         MT43B004_134         BOULDER RIVER, Readwaters to confluence of East Fork Boulder River         4A         9.02         MILES         B-1         N	HUC 10070002	Upper Yellowsto	ne Water	shed	Upper	Yellowst	one						
Boulder - Big Timber       MT43B004_132       BOULDER RIVER, Natural Bridge and Falls (T33 R12E 526) to Clayton Ditton (T1N R14E 034)       \$ 27.84       MILES       B-1       N       F       F       Chromium (total)       Grazing in Ripartan or Shoreine: Copper       Souther Unknown         Boulder - Big Timber       MT43B004_133       BOULDER RIVER, confluence of the East Fork Boulder River to Natural bridge and Falls (T3S R12E 026)       \$ 24.05       MILES       B-1       N       F       F       N       Copper       Souther Hind the Nitrate/Nitrine (Nitrite + Nitrate as N)       Nitrogen (Total)         Boulder - Big Timber       MT43B004_134       BOULDER RIVER, headwaters to confluence of The East Fork Boulder River to Natural bridge and Falls (T3S R12E 026)       \$ 24.05       MILES       B-1       N       F       F       N       Copper       Coal Mining Discharges (Permits)         Boulder - Big Timber       MT43B004_134       BOULDER RIVER, headwaters to confluence of East Fork Boulder River       4A       9.02       MILES       B-1       N       F       N       Copper       Coal Mining Discharges (Permits)         Boulder - Big Timber       MT43B004_134       BOULDER RIVER, headwaters to confluence of East Fork Boulder River)       4A       9.02       MILES	TMDL Planning Area	ID305B	Waterbody Name/Location	Categor	y Sizə	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
Copper Copper Source Unknown Trin Trine Cash (11 R14E 534) Copper Source Unknown Tron Lead Nickel Ni	Boulder - Big Timber	MT43B004_132	BOULDER RIVER, Natural Bridge and	5	27.84	MILES	B-1	N	F	F	F	Chromium (total)	Grazing in Riparian or Shoreline Zones
Boulder - Big Timber         NT43B004_133         BOULDER RIVER, confinance of the Satural bridge for Natural bridge for Nat			(T1N R14E S34)									Copper	Source Unknown
Lead Nickel Nickel Nickel Nickel Nitroper (Total) Nitroper (												Iron	
Boulder - Big Timber       MT43B004_133       BOULDER RIVER, confluence of the East Fork Boulder River to Natural bindge and Falls (T3S R12E S26)       S       24.08       MILES       B-1       N       F       F       N       Cooper       Coal Mining Discharges (Permiter River)       Hardrook Mining Discharges (Permiter River)       Hardrook Mining Discharges (Permiter River)       Hardrook Mining Discharges (Permiter River)       Excess Algal Growth       Hardrook Mining Discharges (Permiter River)       Hardrook Mining Discharges (Permiter River)       Excess Algal Growth       Hardrook Mining Discharges (Permiter River)       Source Unknown       Excess Algal Growth       Hardrook Mining Discharges (Permiter River)       Source Unknown       Excess Algal Growth       Hardrook Mining Discharges (Permiter River)       Source Unknown       Excess Algal Growth       Hardrook Mining Discharges (Permiter River)       Source Unknown       Excess Algal Growth       Hardrook Mining Discharges (Permiter River)       Excess Algal Growth       Hardrook Mining Discharges (Permiter River)       Source Unknown       Excess Algal Growth       Hardrook Mining Discharges (Permiter River)       Excess Algal Growth       Hardrook Mining Discharges (Permiter River)       Excess Algal Growth       Hardrook Mining Discharges (Permiter River)       Hardrook Mining Discharges (Permiter River)       Excess Algal Growth       Hardrook Mining Discharges (Permiter River)       Hardrook Mining Discharges (Permiter River)       Excess Algal Growth       Hardrook Mining Discharges (Permiter Riv												Lead	
Boulder - Big Timber       MT43B004_134       BOULDER RIVER, confluence of the East Fork Boulder River to Natural bridge and Falis (T3S R12E S26)       S       24.08       MILES       B-1       N       F       N       Copper       Call Mining Discharges (Permite Hardrock Mining Discharges (Permite Hardock Mining Discharges (Permite Hardrock Mining Discharges (Permit												Nickel	
Boulder - Big Timber       MT43B004_133       BOULDER RIVER, confluence of the East Fork Boulder River to Natural bindings and Fails (T3S R12E S26)       5       24.08       MILES       B-1       N       F       F       N       Copper       Copper       Coal Mining Discharges (Permitter Excess Algal Growth       Hardrook Mining Discharges (Permitter Excess Algal Growth       Hardrook Mining Discharges (Permitter Excess Algal Growth       Excess Algal Growth       Hardrook Mining Discharges (Permitter Excess Algal Growth       Excess Algal Growth       Hardrook Mining Discharges (Permitter Excess Algal Growth       Hardrook Mining Discharges (Permitter Excess Algal Growth       Hardrook Mining Discharges (Permitter Excess Algal Growth       Excess Algal Growth       Hardrook Mining Discharges (Permitter Excess Algal Growth       Hardrook M												Nitrate/Nitrite (Nitrite + Nitrate as N)	
Boulder - Big Timber       MT43B004_133       BOULDER RIVER, confluence of the East Fork Boulder River to Natural bridge and Falis (T35 R12E S26)       5       24.08       MILES       B-1       N       F       F       N       Copper       Coal Mining Discharges (Permiter Excess Algal Growth       Hardrook Mining Discharges (Permiter Excess Algal Growth       Lead       Nitrate/Nitrite (Nitrite + Nitrate as N)       Nitrate/Nitrite (Nitrite + Nitrate as N) <td></td> <td>Nitrogen (Total)</td> <td></td>												Nitrogen (Total)	
East Fork Boulder River to Natural bridge and Falls (T3S R12E S26) Boulder - Big Timber MT43B004_134 BOULDER RIVER, headwaters to confluence of East Fork Boulder River Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B04_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B04_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B04_141 EAST BOULDER RIVER, Elk Creek to Boulder - Big Timber MT43B04_141 EAST BOULDER RIVER BOULDER RIVER BOULDE	Boulder - Big Timber	MT43B004_133	BOULDER RIVER, confluence of the	5	24.08	MILES	B-1	N	F	F	N	Copper	Coal Mining Discharges (Permitted)
Boulder - Big Timber       MT43B004_134       BOULDER RIVER, headwaters to confluence of East Fork Boulder River       4       9.02       MILES       B-1       N       F       Copper       Impacts from Abandoned Mine Last intro         Boulder - Big Timber       MT43B004_134       BOULDER RIVER, headwaters to confluence of East Fork Boulder River       4       9.02       MILES       B-1       N       F       Copper       Impacts from Abandoned Mine Last intro         Boulder - Big Timber       MT43B004_141       EAST BOULDER RIVER, Elk Creek to Mine Mine Mine Mine Mine Mine Mine Mine			East Fork Boulder River to Natural bridge and Falls (T35 R12E S26)	2								Excess Algal Growth	Hardrock Mining Discharges (Permitted)
Lead Nitrate/Nitrite (Nitrite + Nitrate as N) Nitrogen (Total) Phosphorus (Total) Boulder - Big Timber MT43B004_134 BOULDER RIVER, headwaters to confluence of East Fork Boulder River 4 4 5 5 3 .14 MILES B-1 N F F N F N F N F N F N F N F N F N F												Iron	Source Unknown
Boulder - Big Timber       MT43B004_134       BOULDER RIVER, headwaters to confluence of East Fork Boulder River       4A       9.02       MILES       B-1       N       F       Copper       Impacts from Abandoned Mine Ling         Boulder - Big Timber       MT43B004_134       BOULDER RIVER, headwaters to confluence of East Fork Boulder River       4A       9.02       MILES       B-1       N       F       Copper       Impacts from Abandoned Mine Ling         Boulder - Big Timber       MT43B004_141       EAST BOULDER RIVER, Elik Creek to       5       3.14       MILES       B-1       N       F       N       Chiorophyli-a       Flow Alterations from Water Diver         Boulder - Big Timber       MT43B004_141       EAST BOULDER RIVER, Elik Creek to       5       3.14       MILES       B-1       N       F       N       Chiorophyli-a       Flow Alterations from Water Diver         Low flow alterations       Source Unknown       Source Unknown       Source Unknown       Source Unknown       Source Unknown												Lead	
Boulder - Big Timber       MT43B004_134       BOULDER RIVER, headwaters to confluence of East Fork Boulder River       4A       9.02       MILES       B-1       N       F       Copper       Impacts from Abandoned Mine La Iron         Boulder - Big Timber       MT43B004_141       EAST BOULDER RIVER, Elk Creek to 5       3.14       MILES       B-1       N       F       N       Copper       Impacts from Abandoned Mine La Iron         Boulder - Big Timber       MT43B004_141       EAST BOULDER RIVER, Elk Creek to 5       3.14       MILES       B-1       N       F       N       Chlorophyli-a       Flow Alterations from Water Diver         Boulder - Big Timber       MT43B004_141       EAST BOULDER RIVER, Elk Creek to 5       3.14       MILES       B-1       N       F       N       Chlorophyli-a       Flow Alterations from Water Diver         Low flow alterations       Source Unknown       K       Source Unknown       Source Unknown       Source Unknown												Nitrate/Nitrite (Nitrite + Nitrate as N)	
Boulder - Big Timber       MT43B004_134       BOULDER RIVER, headwaters to confluence of East Fork Boulder River       4A       9.02       MILES       B-1       N       F       Copper       Impacts from Abandoned Mine Ling         Boulder - Big Timber       MT43B004_134       BOULDER RIVER, Elk Creek to 5       3.14       MILES       B-1       N       F       Copper       Impacts from Abandoned Mine Ling         Boulder - Big Timber       MT43B004_141       EAST BOULDER RIVER, Elk Creek to 5       3.14       MILES       B-1       N       F       N       Chlorophyli-la       Flow Alterations from Water Diver         Boulder - Big Timber       MT43B004_141       EAST BOULDER RIVER, Elk Creek to 5       3.14       MILES       B-1       N       F       F       N       Chlorophyli-la       Flow Alterations from Water Diver         Low flow alterations       Source Unknown       K       Source Unknown       Source Unknown       Source Unknown												Nitrogen (Total)	
Boulder - Big Timber       MT43B004_134       BOULDER RIVER, headwaters to confluence of East Fork Boulder River       4A       9.02       MILES       B-1       N       F       N       F       Copper       Impacts from Abandoned Mine Ling         Boulder - Big Timber       MT43B004_131       EAST BOULDER RIVER, Elk Creek to 5       3.14       MILES       B-1       N       F       N       Chiorophyli-a       Flow Alterations from Water Diver         Boulder - Big Timber       MT43B004_141       EAST BOULDER RIVER, Elk Creek to 5       3.14       MILES       B-1       N       F       N       Chiorophyli-a       Flow Alterations from Water Diver         Low flow atterations       Source Unknown       Source Unknown       Source Unknown       Source Unknown       Source Unknown												Phosphorus (Total)	
Confluence of East Fork Boulder River Iron Lead Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to 5 3.14 MILES B-1 N F F N Chlorophyli-a Flow Alterations from Water Diver mouth (Boulder River) Low flow alterations Source Unknown	Boulder - Big Timber	MT43B004_134	BOULDER RIVER, headwaters to	4A	9.02	MILES	B-1	N	F	N	F	Copper	Impacts from Abandoned Mine Lands (Inactive)
Lead Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to 5 3.14 MILES B-1 N F F N Chlorophyli-a Flow Alterations from Water Divel mouth (Boulder River) Low flow alterations Source Unknown			confluence of East Fork Boulder River									Iron	
Boulder - Big Timber MT43B004_141 EAST BOULDER RIVER, Elk Creek to 5 3.14 MILES B-1 N F F N Chiorophyli-a Flow Alterations from Water Dive mouth (Boulder River) Low flow alterations Source Unknown												Lead	
mouth (Boulder River) Low flow alterations Source Unknown	Boulder - Big Timber	MT43B004_141	EAST BOULDER RIVER, Elk Creek to	5	3.14	MILES	B-1	N	F	F	N	Chlorophyll-a	Flow Alterations from Water Diversions
			mouth (Boulder River)									Low flow alterations	Source Unknown
Other anthropogenic substrate atterations Modifications/destab												Other anthropogenic substrate alterations	Streambank Modifications/destabilization
Sedimentation/Sittation												Sedimentation/Siltation	
Boulder - Big Timber MT43B004 142 EAST BOULDER RIVER, National Forest 4C 3.07 MILES B-1 N F I N Chiorophyli-a Adriculture	Boulder - Big Timber	MT43B004 142	EAST BOULDER RIVER, National Fores	it 4C	3.07	MILES	B-1	N	F		N	Chlorophyll-a	Agriculture
boundary to Elk Creek Low flow alterations Source Unknown		_	boundary to Elk Creek									Low flow alterations	Source Unknown
Yellowstone - Sweet Grass MT438004_150 SWEET GRASS CREEK, headwaters to 4C 79.33 MILES B-1 N F F I Alteration in stream-side or littoral Agriculture wond-bit (Vallowstone Bluer).	Yellowstone - Sweet Grass	MT43B004_150	SWEET GRASS CREEK, headwaters to mouth (Vellowstone Bluer)	4C	79.33	MILES	B-1	N	F	F	I.	Alteration in stream-side or littoral	Agriculture
mount (Tellowalune Civel) vegetative CovelS	Boulder - Big Timber	MT428005-010	BASIN CREEK backwater to mouth		1.55	MILES	B.1		~	×	*	vegetauve covers	
(Boulder River) (Boulder River)	ovaruer - big filliber	M1430003_010	(Boulder River)	-0	1.00	MILLO	01		^	^	^	Inn	

F-Fully Supporting; T-Threatened; N-Not Fully Supporting; I-Insufficient Information; X-Not Assessed; -- Beneficial Use Not Assigned

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HUC 10070002	Upper Yellowsto	ne Wate	rshed	Upper \	Yellowst	one							
TMDL Planning Area	ID305B	Waterbody Name/Location	Category	Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name	
Boulder - Big Timber	MT43B005_010	BASIN CREEK, headwater to mouth (Boulder River)	4A	1.55	MILES	B-1	N	x	x	x	Lead		

### Appendix A: Impaired Waters

н	JC 1007000	3 Shields	Water	shed	Upper	Yellowst	one						
тм	DL Planning Area	ID305B	Waterbody Name/Location	Categor	y Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
Shi	elds	MT43A001_011	SHIELDS RIVER, Cottonwood Creek to mouth (Yellowstone River)	4A	18.99	MILES	B-1	N	x	x	N	Alteration in stream-side or littoral vegetative covers Low flow alterations Physical substrate habitat alterations Sedimentation/Sitation	Agriculture Impacts from Hydrostructure Flow Regulation/modification Streambank Modifications/destabilization
Shi	elds	MT43A001_012	SHIELDS RIVER, headwaters to Cottonwood Creek	4A	44.99	MILES	B-1	N	x	x	N	Alteration in stream-side or littoral vegetative covers Low flow alterations Physical substrate habitat alterations Sedimentation/Siltation	Grazing in Riparian or Shoreline Zones Impacts from Hydrostructure Flow Regulationmodification Silviculture Activities Streambank Modifications/destabilization
Shi	elds	MT43A002_010	POTTER CREEK, headwaters to the mouth (Flathead Creek), T3N R9E S18	4A	27.76	MILES	B-1	N	F	F	F	Low flow alterations Sedimentation/Siltation Solids (Suspended/Bedioad)	Impacts from Hydrostructure Flow Regulation/modification
Shi	elds	MT43A002_020	ANTELOPE CREEK, headwaters to mouth (Shields River)	5	10.37	MILES	B-1	N	F	F	N	Alteration in stream-side or littoral vegetative covers Excess Algai Growth Solids (Suspended/Bedioad)	Agriculture Livestock (Grazing or Feeding Operations) Source Unknown
Shi	elds	MT43A002_031	COTTONWOOD CREEK, confluence of Trespass Creek to mouth (Shields River)	4C	18.32	MILES	B-1	N	F	F	N	Low flow alterations	Irrigated Crop Production
Shk	elds	MT43A002_040	ELK CREEK, headwaters to mouth (Shields River)	4C	3.83	MILES	B-1	N	x	x	x	Alteration in stream-side or littoral vegetative covers	Grazing in Riparian or Shoreline Zones
Shk	elds	MT43A002_051	ROCK CREEK, National Forest boundar to mouth (Shields River)	y 4C	14.34	MILES	B-1	N	F	F	N	Low flow alterations	Flow Alterations from Water Diversions

F-Fully Supporting; T-Threatened; N-Not Fully Supporting; I-Insufficient Information; X-Not Assessed; -- Beneficial Use Not Assigned

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HUC 10070004	Upper Yellowstor	ne-Lake Basin Waters	hed	Upper \	rellowsto	one						
TMDL Planning Area	ID305B	Waterbody Name/Location	Category	Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
Yellowstone River	MT43F001_011	YELLOWSTONE RIVER, City of Laurel	5	19.4	MILES	B-2	N	F	i.	N	Cause Unknown	Channelization
		PWS to City of Billings PWS									Chlorophyll-a	Crop Production (Crop Land or Dry Land)
											Nitrate/Nitrite (Nitrite + Nitrate as N)	Municipal Point Source Discharges
											Oll and Grease	Pipeline Breaks
											Other anthropogenic substrate alterations	Streambank Modifications/destablization
											Physical substrate habitat alterations	
Yellowstone - Sweet Grass	MT43F002_010	DUCK CREEK, headwaters to mouth	5	13.68	MILES	B-2	N	F	F	F	Alteration in stream-side or littoral	Channelization
		(Yellowstone River)									Low flow alterations	Drought-related Impacts
											Sedimentation/Siltation	Grazing in Riparian or Shoreline Zones
Yellowstone - Sweet Grass	MT43F002_021	CANYON CREEK, highway 532 to mouth (Yellowstone River)	4C	19.6	MILES	B-1	N	x	x	x	Other flow regime alterations	Flow Alterations from Water Diversions
Yellowstone - Sweet Grass	MT43F002_022	CANYON CREEK, headwaters to	5	29.7	MILES	B-2	Ν	F	F	F	Alteration in stream-side or littoral	Agriculture
		nignway 532									Low flow alterations	Channelization
											Oxygen, Dissolved	Drought-related Impacts
											Sedimentation/Siltation	
Yellowstone - Sweet Grass	MT43F002_040	VALLEY CREEK, headwaters to mouth	5	14.75	MILES	B-2	N	F	F	F	Alteration in stream-side or littoral	Agriculture
		(Yellowstone River)									Benthic-Macroinvertebrate	Channelization
											Bioassessments Other flow regime alterations	Drought-related Impacts
											Oxygen, Dissolved	Irrigated Crop Production
											Sedimentation/Siltation	Loss of Riparian Habitat
Lake Basin - Spidei	MT43F003_010	BIG LAKE	5	2583	ACRES	B-2	N	N	N	x	Salinity	Agriculture
Lake Basin - Spidel	MT43F003_020	HAILSTONE LAKE	5	114.7	ACRES	B-2	N	N	N	x	Salinity	Agriculture
Lake Basin - Spidel	MT43F003_030	HALFBREED LAKE	5	211	ACRES	B-2	N	N	N	x	Salinity	Agriculture

F-Fully Supporting; T-Threatened; N-Not Fully Supporting; I-Insufficient Information; X-Not Assessed; -- Beneficial Use Not Assigned

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Appendix	A:	Impaired	Waters
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HUC	10070005	Stillwater	Waters	shed	Upper	Yellowst	one						
TMDL PI	lanning Area	ID305B	Waterbody Name/Location	Categor	y Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
Cooke Cl	ity	MT43C001_010	STILLWATER RIVER, headwaters to	4A	21.69	MILES	B-1	N	F	N	х	Copper	Acid Mine Drainage
			Flood Creek									Iron	Highway/Road/Bridge Runoff (Non-constructio
												Manganese	Related) Impacts from Abandoned Mine Lands (Inactive
												Sedimentation/Siltation	Mine Tallings
												pH	Natural Sources
Stillwater	- Columbus	MT43C001_020	STILLWATER RIVER, Forest Service Boundary to the mouth (Yellowstone	5	45.59	MILES	B-1	N	F	N	F	Cadmium	Hardrock Mining Discharges (Permitted)
			River), T2S R20E S20									Chromium (total)	Impacts from Abandoned Mine Lands (Inactive
												Copper	Natural Sources
												Cyanide	Source Unknown
												Mercury	Watershed Runoff following Forest Fire
												Nickel	
												Nitrate/Nitrite (Nitrite + Nitrate as N)	
Stillwater	- Columbus	MT43C002_010	LODGEPOLE CREEK, headwaters to	5	5.91	MILES	B-1	N	F	F	N	Chlorophyli-a	Irrigated Crop Production
			mouth (Castle Creek)									Nitrate/Nitrite (Nitrite + Nitrate as N)	Rangeland Grazing
													Source Unknown
Stillwater	- Columbus	MT43C002_020	BAD CANYON CREEK, headwaters to mouth (Stillwater River)	4C	11.34	MILES	B-1	F	F	F	N	Chiorophyli-a	Rangeland Grazing
Stillwater	- Columbus	MT43C002_030	CASTLE CREEK, headwaters to the	5	8.29	MILES	B-1	Ν	F	F	Ν	Chlorophyli-a	Livestock (Grazing or Feeding Operations)
			S29									Nitrate/Nitrite (Nitrite + Nitrate as N)	Source Unknown
													Upstream Source
Stillwater	- Columbus	MT43C002_041	GROVE CREEK, confluence of South	5	5.23	MILES	B-1	N	F	F	N	Alteration in stream-side or littoral	Grazing in Riparian or Shoreline Zones
			mouth (Stillwater River), T3S R18E S34									Chlorophyll-a	Irrigated Crop Production
												Phosphorus (Total)	Loss of Riparian Habitat
												Sedimentation/Siltation	Natural Sources
Stillwater	- Columbus	MT43C002_050	FISHTAIL CREEK, headwaters to mouth	5	14.8	MILES	B-1	N	F	F	F	Iron	Source Unknown
			(west Kosebud Creek)									Lead	
Stillwater	- Columbus	MT43C002_070	JOE HILL CREEK, headwaters to mouth (Stilwater River)	5	13.16	MILES	B-1	N	F	F	N	Chiorophyli-a	Flow Alterations from Water Diversions

F-Fully Supporting; T-Threatened; N-Not Fully Supporting; I-Insufficient Information; X-Not Assessed; -- Beneficial Use Not Assigned

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HUC 10070005 Stilly	vater	Watershed	Upper	Yellowst	one						
TMDL Planning Area ID3	05B Waterbody Name/Location	Categ	ory Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
Stillwater - Columbus MT43	C002_070 JOE HILL CREEK, headwate (Stilwater River)	rs to mouth 5	13.16	MILES	B-1	N	F	F	N	Low flow alterations Sedimentation/Siltation	Irrigated Crop Production
Stillwater - Columbus MT43	C002_061 BUTCHER CREEK, highway (Rosebud Creek)	78 to mouth 5	22.02	MILES	B-1	N	F	F	x	High Flow Regime Physical substrate habitat alterations Solids (Suspended/Bedioad)	Streambank Modifications/destabilization Transfer of Water from an Outside Watershed
Stilwater - Columbus MT43	COO2_082 BUTCHER CREEK, headwat highway 78	ers to 5	4.98	MILES	B-1	N	F	F	N	Chlorophyli-a Fish-Passage Barrier Phosphorus (Total) Sedimentation/Siltation Solids (Suspended/Bedload)	Hydrostructure Impacts on Fish Passage Natural Sources Source Unknown
Stillwater - Columbus MT43	C002_090 WEST ROSEBUD CREEK, h to mouth (Rosebud Creek)	eadwaters 5	40.45	MILES	B-1	N	F	F	F	Benthic-Macroinvertebrate Bloassessments	Source Unknown
Stillwater - Columbus MT43	C002_100 ROSEBUD CREEK, East and Branches to mouth (Stillwater	1 West 5 River)	3.93	MILES	B-1	N	F	F	F	Benthic-Macroinvertebrate Bioassessments	Source Unknown
Cooke City MT43	C002_140 DAISY CREEK, headwaters t (Stilwater River)	io mouth 4A	1.94	MILES	B-1	N	N	N	N	Aluminum Cadmium Copper Iron Lead Manganese Sedimentation/Sitation Zinc	Acid Mine Drainage Highway/Road/Bridge Runoff (Non-construction Related) Impacts from Abandoned Mine Lands (Inactive) Mine Tailings Natural Sources

F-Fully Supporting; T-Threatened; N-Not Fully Supporting; I-Insufficient Information; X-Not Assessed; - - Beneficial Use Not Assigned

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Appendix A:	Impaired	Waters
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HUC 10070006	Clarks Fork Yell	lowstone Water	shed	Upper	Yellowst	one						
TMDL Planning Area	ID305B	Waterbody Name/Location	Category	Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
Clarks Fork Yellowstone	MT43D001_011	CLARKS FORK YELLOWSTONE	5	43.32	MILES	B-2	N	N	i.	N	Ammonia (Total)	Habitat Modification - other than Hydromodificati
		RIVER, Bridger Creek to mouth (Yellowstone River)									Chiorophyli-a	Impacts from Hydrostructure Flow
											Copper	Regulation/modification Irrigated Crop Production
											Iron	Source Unknown
											Lead	Streambank Modifications/destabilization
											Low flow alterations	
											Mercury	
											Nitrate/Nitrite (Nitrite + Nitrate as N)	
											Nitrogen (Total)	
											Phosphorus (Total)	
											Physical substrate habitat alterations	
											Solids (Suspended/Bedioad)	
											Temperature, water	
Cooke City	MT43D001_020	CLARKS FORK YELLOWSTONE	4A	5.06	MILES	B-1	N	F	F	x	Cadmium	Acid Mine Drainage
		RIVER, headwaters to Montana Border									Copper	Impacts from Abandoned Mine Lands (Inactive)
											Lead	Mine Tailings
											Silver	
											Zinc	
											рн	
Clarks Fork Yellowstone	MT43D002_010	ELBOW CREEK, headwaters to mouth	5	38.57	MILES	B-1	N	F	F	N	Alteration in stream-side or littoral	Animal Feeding Operations (NPS)
		(Clarks Fork)									vegetative covers Chiorophyli-a	Grazing in Riparian or Shoreline Zones
											Nitrate/Nitrite (Nitrite + Nitrate as N)	Irrigated Crop Production
											Nitrogen (Total)	Rangeland Grazing
											Sedimentation/Siltation	
											Solids (Suspended/Bedload)	
Clarks Fork Yellowstone	MT43D002 020	BEAR CREEK, headwaters to mouth	5	21.14	MILES	B-1	N	F	F	N	Alteration in stream-side or littoral	Impacts from Abandoned Mine Lands (Inactive)
	-	(Clarks Fork)									vegetative covers	

F-Fully Supporting; T-Threatened; N-Not Fully Supporting; I-Insufficient Information; X-Not Assessed; -- Beneficial Use Not Assigned

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HUC 10070006	Clarks Fork Yel	llowstone Waters	shed	Upper	Yellowst	one						
TMDL Planning Area	ID305B	Waterbody Name/Location	Categor	y Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
Clarks Fork Yellowstone	MT43D002_020	BEAR CREEK, headwaters to mouth	5	21.14	MILES	B-1	N	F	F	N	High Flow Regime	Loss of Riparian Habitat
		(Clarks Fork)									Iron	Rangeland Grazing
											Nitrate/Nitrite (Nitrite + Nitrate as N)	Transfer of Water from an Outside Watershe
											Phosphorus (Total)	
											Sedimentation/Siltation	
Clarks Fork Yellowstone	MT43D002_031	BLUEWATER CREEK, unnamed	5	11.41	MILES	B-1	N	F	F	N	Chiorophyll-a	Agriculture
		tributary at T6N R24E S7 NWNE to mouth (Clarks Fork Yellowstone River)									Nitrate/Nitrite (Nitrite + Nitrate as N)	Animal Feeding Operations (NPS)
											Phosphorus (Total)	Aquaculture (Permitted)
											Sedimentation/Siltation	Irrigated Crop Production
											Solids (Suspended/Bedload)	
Clarks Fork Yellowstone	MT43D002_050	RED LODGE CREEK, headwaters to	4C	17.93	MILES	B-1	N	F	F	F	Alteration in stream-side or littoral	Crop Production (Crop Land or Dry Land)
		Cooney Reservoir									vegetative covers	Grazing in Riparian or Shoreline Zones
Clarks Fork Yellowstone	MT43D002_060	RED LODGE CREEK, Cooney Reservoir to mouth (Rock Creek)	5	12.07	MILES	B-1	N	x	x	x	Organic Enrichment (Sewage) Biological Indicators Other flow regime alterations	Impacts from Hydrostructure Flow Regulation/modification Streambank Modifications/destablization
											Physical substrate habitat alterations	
Clarks Fork Yellowstone	MT43D002_070	WILLOW CREEK, headwaters to mouth	5	36.46	MILES	B-1	N	x	x	x	Low flow alterations	Irrigated Crop Production
		(Cooney Reservoir)									Sedimentation/Siltation	
Clarks Fork Yellowstone	MT43D002_080	WEST RED LODGE CREEK, Absaroka- Bearlooth Wilderness boundary to mouth	5	14.39	MILES	B-1	N	F	F	F	SedImentation/Siltation	Natural Sources
		(Red Lodge Creek)										Source Unknown
Clarks Fork Yellowstone	MT43D002_100	SILVERTIP CREEK, Wyoming border to	5	21.77	MILES	B-1	N	N	N	F	Alteration in stream-side or littoral	Channelization
		mouth (Clarks Fork Yellowstone River)									vegetative covers Nitrogen (Total)	Dam or Impoundment
											Other flow regime alterations	Grazing in Riparian or Shoreline Zones
											Oxygen, Dissolved	Loss of Riparian Habitat
											Phosphorus (Total)	Natural Sources
											Polycyclic Aromatic Hydrocarbons (PAHs) (Aquatic Ecosystems) Solids (Suspended/Bedioad)	Petroleum/natural Gas Production Activities (Permitted) Pipeline Breaks

F-Fully Supporting; T-Threatened; N-Not Fully Supporting; I-Insufficient Information; X-Not Assessed; -- Beneficial Use Not Assigned

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HUC 10070006	Clarks Fork Ye	llowstone Watersh	ned	Upper	Yellowst	one						
TMDL Planning Area	ID305B	Waterbody C Name/Location	Category	Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
Clarks Fork Yellowstone	MT43D002_100	SILVERTIP CREEK, Wyoming border to	5	21.77	MILES	B-1	N	N	N	F	Specific Conductance	Rangeland Grazing
		moun (Clarks Pork Felowstone River)									Temperature, water	Upstream Source
											Total Dissolved Solids	
											Turbidity	
Cooke City	MT43D002_110	FISHER CREEK, headwaters to mouth	4A	3.34	MILES	B-1	N	N	N	N	Aluminum	Acid Mine Drainage
		(Clarks Fork Fellowstone River)									Cadmium	Highway/Road/Bridge Runoff (Non-construct
											Copper	Impacts from Abandoned Mine Lands (inacti
											Iron	Mine Tallings
											Lead	
											Manganese	
											Sedimentation/Siltation	
											Silver	
											Zinc	
											рн	
Clarks Fork Yellowstone	MT43D002_120	ROCK CREEK, Red Lodge Creek to	4C	16.02	MILES	B-1	N	x	x	N	Low flow alterations	Flow Alterations from Water Diversions
		mouth (Clarks Fork)										Irrigated Crop Production
Clarks Fork Yellowstone	MT43D002_131	ROCK CREEK, West Fork Rock Creek to	4C	27.47	MILES	B-1	N	x	x	N	Low flow alterations	Flow Alterations from Water Diversions
		Red Lodge Creek										Irrigated Crop Production
Clarks Fork Yellowstone	MT43D002_140	COTTONWOOD CREEK, headwaters to	5	19.57	MILES	B-1	N	F	F	F	Alteration in stream-side or littoral	Agriculture
		the mouth (Clarks Fork of Yellowstone), T3S R24E S24									vegetative covers Oxygen, Dissolved	Drought-related Impacts
											Solids (Suspended/Bedioad)	Grazing in Riparian or Shoreline Zones
Clarks Fork Yellowstone	MT43D002_180	SOUTH FORK BRIDGER CREEK,	5	9.39	MILES	B-1	N	F	N	F	Arsenic	Grazing in Riparian or Shoreline Zones
		Headwaters to mouth (Bridger Creek)									Iron	Natural Sources
											Sedimentation/Silitation	Source Unknown

F-Fully Supporting; T-Threatened; N-Not Fully Supporting; I-Insufficient Information; X-Not Assessed; -- Beneficial Use Not Assigned

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Appendix	A: In	npaired	Waters
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HUC 10070007	Upper Yellowst	tone-Pompeys Pillar Water	shed	Middle	Yellows	tone						
TMDL Planning Area	ID305B	Waterbody Name/Location	Categor	y Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
Yellowstone River	MT43F001_010	YELLOWSTONE RIVER, City of Billings	5	10.62	MILES	B-3	N	F	N	N	Arsenic	Agriculture
		PWS to Huntley Diversion Dam									Benthic-Macroinvertebrate	Municipal Point Source Discharges
											Dissolved oxygen saturation	Natural Sources
											Excess Algal Growth	Pipeline Breaks
											Nutrient/Eutrophication Biological Indicators Oil and Grease	
											Periphyton (Aufwuchs) Indicator Bioassessments Solids (Suspended/Bedioad)	
Yellowstone River	MT43Q001_011	YELLOWSTONE RIVER, Huntley	5	58.31	MILES	B-3	N	1	1	N	Ammonia (Un-Ionized)	Agriculture
		Diversion Dam to mouth of Big Hom River									Oil and Grease	Industrial Point Source Discharge
											Sedimentation/Siltation	Irrigated Crop Production
											Total Dissolved Solids	Municipal Point Source Discharges
												Natural Sources
												Pipeline Breaks
Yellowstone - Lower	MT43Q002_010	FLY CREEK, Crow Indian Reservation	5	55.68	MILES	C-3	N	-	-	N	Alteration in stream-side or littoral	Agriculture
Bighorn		boundary to mouth (Yellowstone River)									vegetative covers Chlorophyll-a	Dam or Impoundment
											Nitrate/Nitrite (Nitrite + Nitrate as N)	Drought-related Impacts
											Nitrogen (Total)	Loss of Riparian Habitat
											Oxygen, Dissolved	
Lake Basin - Spidel	MT43Q003 010	SPIDEL WATERFOWL PRODUCTION	5	659.8	ACRES	B-1	N	N	N	x	Other anthropogenic substrate alterations	Highways, Roads, Bridges, Infrasturcture (New
	_	AREA									Salinity	Construction) Non-Irrigated Crop Production
											Selenium	

F-Fully Supporting; T-Threatened; N-Not Fully Supporting; I-Insufficient Information; X-Not Assessed; - - Beneficial Use Not Assigned

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Append	Appendix A: Impaired Waters												
	HUC 10070008	Pryor	Waters	shed	Middle	Yellowst	one						
	TMDL Planning Area	ID305B	Waterbody Name/Location	Category	Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
	Yellowstone - Lower Bighorn	MT43E001_010	PRYOR CREEK, Interstate 90 bridge to mouth (Yellowstone River)	5	14.98	MILES	C-3	N	-		N	Benthio-Macroinvertebrate Bioassessments Low flow alterations	Flow Alterations from Water Diversions Irrigated Crop Production Source Unknown
	Yellowstone - Lower Bighorn	MT43E001_011	PRYOR CREEK, Crow Reservation Boundary to Interstate 90 bridge	5	2.88	MILES	B-1	N	F	F	N	Excess Algal Growth Low flow alterations Sedmentation/Sitation	Agriculture Flow Alterations from Water Diversions Natural Sources Sources Outside State Jurkslotton or Borders Upstream Source

HUC 10080010	Bighorn Lake	Wate	rshed	Middle	Yellows	tone						
TMDL Planning Area	ID305B	Waterbody Name/Location	Category	Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
Bighorn Lake - Shoshone	MT43P002_010	CROOKED CREEK, headwaters to	4C	15.07	MILES	B-1	N	x	x	x	Physical substrate habitat alterations	Agriculture

### Appendix A: Impaired Waters

HUC 10080015	Lower Bighom	Water	shed	Middle	Yellows	tone						
TMDL Planning Area	ID305B	Waterbody Name/Location	Category	/ Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
Yellowstone - Lower	MT43R001_010	BIGHORN RIVER, Crow Indian Res.	5	40.02	MILES	B-2	x	F	N	x	Lead	Source Unknown
bignom	m Boundary to mouth (Ye	boundary to moduli (relowisione River)									Mercury	
Bighorn Lake - Shoshone	MT43R001_020	BIGHORN RIVER, Yellowtall Afterbay Dam to Crow Indian Reservation boundary at 4S 32E Sec 34/27 boundary	5	14.5	MILES	B-1	N	F	x	x	Nitrogen (Total)	Source Unknown
Yellowstone - Lower	MT43R002_010	TULLOCK CREEK, Crow Indian	5	58.83	MILES	C-3	Ν	-	-	F	Alteration in stream-side or littoral	Dam or impoundment
bignoin		River)									Iron	Flow Alterations from Water Diversions
											Low flow alterations	Irrigated Crop Production
											Nitrogen (Total)	Loss of Riparian Habitat
											Phosphorus (Total)	Natural Sources
											Sedimentation/Siltation	Rangeland Grazing

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HUC	10090101	Upper Tongue	Water	shed	Middle	Yellows	tone						
TMDL P	lanning Area	ID305B	Waterbody Name/Location	Categor	ry Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
Tongue		MT428001_010	TONGUE RIVER, Wyoming border to Tongue River Reservoir	5	5.9	MILES	B-2	N	F	F	F	Iron Low flow alterations	Impacts from Hydrostructure Flow Regulation/modification Irrigated Crop Production
													Natural Sources
Tongue		MT428001_020	TONGUE RIVER, Tongue River Dam to Prairie Dog Creek	4C	22.05	MILES	B-2	N	F	F	I	Low flow alterations	Streambank Modifications/destabilization Impacts from Hydrostructure Flow Regulation/modification Irrigated Crop Production
Tongue		MT428001_021	TONGUE RIVER, Prairie Dog Creek to Hanging Woman Creek	4C	12.27	MILES	B-3	N	ī	I	ı.	Low flow alterations	Streamoank Mooincations/destabilization Impacts from Hydrostructure Flow Regulation/modification Infigated Crop Production
													Streambank Modifications/destabilization
Tongue		MT42B002_031	HANGING WOMAN CREEK, Stroud Creek to mouth (Tongue River)	5	18.27	MILES	C-3	N	N	-	1	Iron	Grazing in Riparian or Shoreline Zones
												Low flow alterations	Irrigated Crop Production
												Salinity	Natural Sources
												Sedimentation/Siltation	Rangeland Grazing
													Streambank Modifications/destabilization
Tongue		MT42B002_032	HANGING WOMAN CREEK, Wyoming border to Stroud Creek	5	31.37	MILES	C-3	Ν	N	-	1	Low flow alterations	Irrigated Crop Production
			bolder to Stroub Greek									Salinity	Natural Sources
Tongue		MT42B003_010	TONGUE RIVER RESERVOIR	5	2158.5	ACRES	B-2	Ν	I.	1	1	Chlorophyll-a	Irrigated Crop Production
												Oxygen, Dissolved	Municipal Point Source Discharges
												Solids (Suspended/Bedioad)	

F-Fully Supporting; T-Threatened; N-Not Fully Supporting; I-Insufficient Information; X-Not Assessed; -- Beneficial Use Not Assigned

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IIX A:	Impaired	Waters											
HUC	10090102	Lower Tongue	Wate	ershed	Middle	Yellows	tone						
TMDL PI	ianning Area	ID305B	Waterbody Name/Location	Categor	ry Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
Tongue		MT42C001_011	TONGUE RIVER, Twelve Mile Dam to	5	20.9	MILES	B-3	N	N	N	i.	Cadmium	Dam Construction (Other than Upstream Flo
			mouth (Yellowstone River)									Copper	Control Projects) Impacts from Hydrostructure Flow
												Iron	Regulation/modification Irrigated Crop Production
												Lead	Natural Sources
												Low flow alterations	Streambank Modifications/destabilization
												Nickel	
												Salinity	
												Solids (Suspended/Bedioad)	
												Sulfates	
												Zinc	
Tongue		MT42C001_013	TONGUE RIVER, Hanging Woman	5	74.97	MILES	B-3	N	F	F	1	Iron	Impacts from Hydrostructure Flow
			Creek to Beaver Creek									Low flow alterations	Regulation/modification Irrigated Crop Production
												Solids (Suspended/Bedioad)	Natural Sources
													Streambank Modifications/destablization
Tongue		MT42C001_014	TONGUE RIVER, Beaver Creek to	5	72	MILES	B-3	N	F	F	1	Iron	Impacts from Hydrostructure Flow
			Twelve Mile Dam, T6N R48E S29									Low flow alterations	Regulation/modification Irrigated Crop Production
												Solids (Suspended/Bedioad)	Natural Sources
													Streambank Modifications/destabilization
Tongue		MT42C002_020	OTTER CREEK, headwaters to mouth	5	108.1	MILES	C-3	N	N	-	1	Alteration in stream-side or littoral	Agriculture
		_	(Tongue River)									vegetative covers Iron	Grazing in Riparian or Shoreline Zones
												Salinity	Highways, Roads, Bridges, Infrasturcture (N Construction) Natural Sources
													Site Clearance (Land Development or Redevelopment)
Tongue		MT42C002_061	PUMPKIN CREEK, headwaters to Litt	e 5	87.68	MILES	C-3	Ν	Ν	-	1	Low flow alterations	Irrigated Crop Production
			Pumpuh Creek									Salinity	Natural Sources
												Temperature, water	

F-Fully Supporting; T-Threatened; N-Not Fully Supporting; I-Insufficient Information; X-Not Assessed; - - Beneficial Use Not Assigned

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HUC 10090102	Lower Tongue	Waters	shed	Middle	Yellowst	one						
TMDL Planning Area	ID305B	Waterbody Name/Location	Category	Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
Tongue	MT42C002_062	PUMPKIN CREEK, Little Pumpkin Creek to the mouth (Tongue River)	5	92.19	MILES	C-3	N	N	-	T	Low flow alterations Salinity Temperature, water	Irrigated Crop Production Natural Sources

#### Appendix A: Impaired Waters HUC 10100003 Rosebud Watershed Middle Yellowstone TMDL Planning Area ID305B Waterbody Name/Location Category Size Units Use Class AQL AG DW Rec Cause Name Source Name Rosebud MT42A001\_011 ROSEBUD CREEK, boundary at \$28/29 4C 4.28 MILES C-3 N - - X Physical substrate habitat alterations Loss of Riparian Habitat T6N R42E to mouth (Yellowstone River) Rosebud MT42A001\_012 ROSEBUD CREEK, Northern Cheyenne 5 111.77 MILES C-3 N - - X Other Dam Construction (Other than Upstream Flood Reservation boundary to boundary at \$28/29 T6N R42E Control Projects)



Append	lix A: I	mpaired \	Naters											
	HUC	10090207	Middle Powder	Water	shed	Lower	Yellowst	one						
	TMDL Pla	anning Area	ID305B	Waterbody Name/Location	Category	Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
	Powder		MT42J001_010	POWDER RIVER, Wyoming border to Little Powder River	5	78.21	MILES	C-3	x	N	-	x	Salinity	Natural Sources Source Unknown

F-Fully Supporting; T-Threatened; N-Not Fully Supporting; I-Insufficient Information; X-Not Assessed; -- Beneficial Use Not Assigned

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1	HUC	10090208	Little Powder	Water	shed	Lower	Yellowst	one						
T	FMDL Pla	anning Area	ID305B	Waterbody Name/Location	Category	Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
P	owder		MT421001_010	LITTLE POWDER RIVER, Wyoming border to mouth (Powder River)	5	63.31	MILES	C-3	x	N	-	x	Salinity	Natural Sources Source Unknown

### Appendix A: Impaired Waters

HUC 100902	09 Lower Powder	Waters	shed	Lower	Yellowst	one						
TMDL Planning Are	ea ID305B	Waterbody Name/Location	Category	Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
Powder	MT42J003_011	POWDER RIVER, Little Powder River to Mizpah Creek	5	99	MILES	C-3	x	N	-	x	Salinity	Natural Sources Source Unknown
Powder	MT42J003_012	POWDER RIVER, Mizpah Creek to mouth (Yellowstone River)	5	45.33	MILES	C-3	x	N	-	x	Salinity	Natural Sources Source Unknown
Powder	MT42J004_010	STUMP CREEK, headwaters to mouth (Powder River)	5	29.77	MILES	C-3	х	N	-	х	Salinity	Natural Sources

# Appendix A: Impaired Waters

HUC 10090210	Mizpah	Water	shed	Lower \	ellowst	one						
TMDL Planning Area	ID305B	Waterbody Name/Location	Category	Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
Powder	MT42J005_011	MIZPAH CREEK, headwaters to Corral Creek	5	131.98	MILES	C-3	x	N		x	Salinity	Natural Sources
Powder	MT42J005_012	MIZPAH CREEK, Corral Creek to the mouth (Powder River)	5	22.98	MILES	C-3	x	Ν	-	x	Salinity	Natural Sources

HUC 10100001	Lower Yellowst	one-Sunday Water	shed	Lower	Yellowst	one						
TMDL Planning Area	ID305B	Waterbody Name/Location	Categor	y Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
Middle Yellowstone Tributaries	MT42K002_060	DEADMAN CREEK, headwaters to mouth (North Fork Sunday Creek)	5	17.28	MILES	C-3	N	-		F	Phosphorus (Total)	
Middle Yellowstone Tributaries	MT42K002_070	STELLAR CREEK, headwaters to mouth // ittle Porcupine Creek)	n 5	42.96	MILES	C-3	Ν	-	-	Ν	Cadmium	Rangeland Grazing
		(enter foroupine oreen)									Chiorophyli-a	Source Unknown
											Phosphorus (Total)	
											рн	
Middle Yellowstone	MT42K002_080	NORTH FORK SUNDAY CREEK,	5	33.76	MILES	C-3	N	-	-	F	Sedimentation/Siltation	Channelization
Tributaries		Custer/Rosebud County border to mouth (Sunday Creek)	1								Sodium	Crop Production (Crop Land or Dry Land)
											Solids (Suspended/Bedload)	Natural Sources
											Specific Conductance	
											Total Dissolved Solids	
Middle Yellowstone	MT42K002 090	SARPY CREEK, Crow Indian	5	89.35	MILES	C-3	N			F	Nitrate/Nitrite (Nitrite + Nitrate as N)	Grazing in Riparian or Shoreline Zones
Tributaries	_	Reservation Boundary to mouth (Yellowstone River)									Nitrogen (Total)	Non-Irrigated Crop Production
		(									Phosphorus (Total)	
										_		
Tributaries	MT42K002_110	to mouth (Armelis Creek)	рs	32.36	MILES	C-3	N	-	-	F	Nitrate/Nitrite (Nitrite + Nitrate as N)	Agriculture
											Nitrogen (Total)	
											Specific Conductance	Transfer of Water from an Outside Watershed
											Total Dissolved Solids	
Middle Yellowstone Tributaries	MT42K002_160	LITTLE PORCUPINE CREEK, headwaters to mouth (Yellowstone River	5 n)	118.8	MILES	C-3	Ν	-	-	Ν	Chlorophyll-a	Rangeland Grazing
		(	.,								Nitrate/Nitrite (Nitrite + Nitrate as N)	Source Unknown
											Nitrogen (Total)	
											Phosphorus (Total)	
											Total Dissolved Solids	
Middle Yellowstone Tributaries	MT42K002_170	EAST FORK ARMELLS CREEK, headwaters to Colstrip	4C	24.67	MILES	C-3	N	-	-	F	Alteration in stream-side or littoral vegetative covers	Surface Mining

F-Fully Supporting; T-Threatened; N-Not Fully Supporting; I-Insufficient Information; X-Not Assessed; -- Beneficial Use Not Assigned

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HUC	10100004	Lower Yellowst	one Water	shed	Lower	Yellowst	one						
TMDL P	lanning Area	ID305B	Waterbody Name/Location	Categor	y Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
Yellowst	one River	MT42M001_011	YELLOWSTONE RIVER, Lower Yellowstone Diversion Dam to North Dakota border	5	53.67	MILES	B-3	N	F	F	F	Alteration in stream-side or littoral vegetative covers Chromium (total)	Impacts from Hydrostructure Flow Regulation/modification Irrigated Crop Production
												Copper	Natural Sources
												Fish-Passage Barrier	Rangeland Grazing
												Lead	Source Unknown
												Nitrogen (Total)	Streambank Modifications/destabilization
												Phosphorus (Total)	
												Sedimentation/Siltation	
												Total Dissolved Solids	
												рн	
Yellowst	one River	MT42M001_012	YELLOWSTONE RIVER, Powder River to Lower Yellowstone Diversion Dam	4C	76.73	MILES	B-3	N	F	x	x	Fish-Passage Barrier	Dam Construction (Other than Upstream Flood Control Projects)
Lower Ye	ellowstone	MT42M002_010	BENNIE PEER CREEK, North Dakota border to mouth (Yellowstone River)	4C	10.17	MILES	C-3	N	-	-	N	Alteration in stream-side or littoral vegetative covers	Channelization Highways Roads Bridges Infrasturcture (New
												Physical substrate habitat alterations	Construction) Irrigated Crop Production
Lower Ye	ellowstone	MT42M002_020	FOURMILE CREEK, headwaters to	5	29.74	MILES	C-3	N	-	-	N	Chlorophyll-a	Dam or Impoundment
			North Dakota border									Nitrate/Nitrite (Nitrite + Nitrate as N)	Source Unknown
												Nitrogen (Total)	
												Other flow regime alterations	
												Total Dissolved Solids	
Lower Ye	ellowstone	MT42M002 030	FIRST HAY CREEK, headwaters to	5	33.37	MILES	C-3	N	-		N	Copper	Hydrostructure Impacts on Fish Passage
			mouth (Yellowstone River)									Fish-Passage Barrier	Irrigated Crop Production
												Iron	Source Unknown
												Lead	Transfer of Water from an Outside Watershed
												Nitrate/Nitrite (Nitrite + Nitrate as N)	
												Nitrogen (Total)	
												Other flow regime alterations	
												Phosphorus (Total)	

F-Fully Supporting; T-Threatened; N-Not Fully Supporting; I-Insufficient Information; X-Not Assessed; -- Beneficial Use Not Assigned

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ppend	lix A:	Impaired V	Vaters												
	HUC	10100004	Lower Yellowstor	ne I	Waters	shed	Lower \	/ellowsto	one						
	TMDL P	lanning Area	ID305B	Waterbody Name/Location		Category	Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
	Lower Ye	ellowstone	MT42M002_030	FIRST HAY CREEK, headwater mouth (Yellowstone River)	s to	5	33.37	MILES	C-3	N	-		N	Solids (Suspended/Bedioad) Total Dissolved Solids	
	Lower Ye	ellowstone	MT42M002_040	LONE TREE CREEK, confluenc North Fork to mouth (Yellowston	e of te River)	5	17.27	MILES	C-3	N	-	-	N	Alteration in stream-side or littoral vegetative covers Chicrophyli-a liron Nitrate/Nitrite (Nitrite + Nitrate as N) Other flow regime alterations Solids (Suspended/Bedicad)	Channelization Habitat Modification - other than Hydromodification Irrigated Crop Production
	Lower Ye	elowstone	MT42M002_051	FOX CREEK, headwaters to mo (Yellowstone River), T22N R59E	uth E S19	5	49.85	MILES	B-2	Ν	N	N	N	Arsenic Excess Algal Growth Iron Lead Low flow alterations Mercury Nitrogen (Total) Phosphorus (Total) Phosphorus (Total) Physical substrate habitat alterations Solids (Suspended/Bedioad) Suifates Total Dissolved Solids	Channelization Irrigated Crop Production Natural Sources Source Unknown
	Lower Ye	ellowstone	MT42M002_052	NORTH FORK FOX CREEK, he to mouth (Fox Creek), T22N R50	eadwatere 8E S21	5 5	20.32	MILES	B-2	N	N	N	N	Arsenic Excess Algal Growth Iron Lead Low flow alterations Mercury Nitrogen (Total)	Channelization Irrigated Crop Production Natural Sources Source Unknown

F-Fully Supporting; T-Threatened; N-Not Fully Supporting; I-Insufficient Information; X-Not Assessed; - - Beneficial Use Not Assigned

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Appendix A: Impaired Waters

HU	C 1	10100004	Lower Yellowstor	ne	Waters	shed	Lower \	ellowsto	one						
TMD	L Plan	ining Area	ID305B	Waterbody Name/Location		Category	Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
Lowe	r Yello	wstone	MT42M002_052	NORTH FORK FOX CREEK, h	headwaters	5	20.32	MILES	B-2	N	N	N	N	Phosphorus (Total)	
				to mouth (Fox Creek), 122N R	58E S21									Physical substrate habitat alterations	
														Solids (Suspended/Bedioad)	
														Sulfates	
														Total Dissolved Solids	
Lowe	r Yello	wstone	MT42M002_060	O'BRIEN CREEK, North Dakot	a border	5	15.53	MILES	C-3	N	-	-	N	Excess Algal Growth	Animal Feeding Operations (NPS)
				to modul (renomedance revery										Nitrate/Nitrite (Nitrite + Nitrate as N)	Irrigated Crop Production
														Selenium	
Lowe	r Yello	wstone	MT42M002_070	CRANE CREEK, headwaters to (Vallowstone River T21N R588	o mouth	5	24.25	MILES	C-3	Ν	-	-	F	Alteration in stream-side or littoral	Channelization
				(reloadere ravel, renardou	2 020)									Other flow regime alterations	Irrigated Crop Production
														Sedimentation/Siltation	
Lowe	r Yello	wstone	MT42M002_080	SMITH CREEK, headwaters to (Yellowstone River)	mouth	4C	45.57	MILES	C-3	N	-	-	F	Fish-Passage Barrier	Low Water Crossing
Lowe	r Yello	wstone	MT42M002_100	COTTONWOOD CREEK, head	dwaters to	5	21.99	MILES	C-3	Ν	-	-	F	Cadmium	Channelization
				mouth (Yellowstone River)										Fish-Passage Barrier	Flow Alterations from Water Diversions
														Iron	Hydrostructure Impacts on Fish Passage
														Physical substrate habitat alterations	Natural Sources
															Source Unknown
Lowe	r Yello	wstone	MT42M002_110	BURNS CREEK, headwaters to (Yellowstone River)	o mouth	5	53.66	MILES	C-3	Ν	-	-	Ν	Chlorophyll-a	Crop Production (Crop Land or Dry Land)
				(relowatorie ruver)										Fish-Passage Barrier	Hydrostructure Impacts on Fish Passage
														Iron	Irrigated Crop Production
														Nitrogen (Total)	Natural Sources
														Other flow regime alterations	
														Phosphorus (Total)	
														Solids (Suspended/Bedload)	
Lowe	r Yello	wstone	MT42M002_120	MORGAN CREEK, headwaters (Yellowstone River)	s to mouth	4C	19.8	MILES	C-3	N	•	-	F	Alteration In stream-side or littoral vegetative covers	Grazing in Riparian or Shoreline Zones
Lowe	r Yello	wstone	MT42M002_130	GLENDIVE CREEK, headwate mouth (Yellowstone River)	rs to	5	55.89	MILES	C-3	N	•	-	F	Alteration in stream-side or littoral vegetative covers	Grazing in Riparian or Shoreline Zones

F-Fully Supporting; T-Threatened; N-Not Fully Supporting; I-Insufficient Information; X-Not Assessed; - - Beneficial Use Not Assigned

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lix A: In	npaired	Waters												
HUC 1	0100004	Lower Yellowsto	one	Waters	shed	Lower '	Yellowst	one						
TMDL Plan	ning Area	ID305B	Waterbody Name/Location		Category	Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
Lower Yellow	wstone	MT42M002_130	GLENDIVE CREEK, headwaten	s to	5	55.89	MILES	C-3	N	-	-	F	Cadmium	Natural Sources
			mouth (Yellowstone River)										Chromium (total)	Source Unknown
													Copper	
													Iron	
													Lead	
													Nickel	
													Selenium	
													Solids (Suspended/Bedioad)	
													Zinc	
Lower Yellow	wstone	MT42M002_141	CEDAR CREEK, 26 miles upstr	eam to	5	27,49	MILES	C-3	N	-		x	Alteration in stream-side or littoral	Grazing in Riparian or Shoreline Zones
			mouth (Yellowstone River)										vegetative covers Arsenic	Natural Sources
													Copper	Spills from Trucks or Trains
													Iron	
													Lead	
Lower Yellow	wstone	MT42M002_142	CEDAR CREEK, tributary conflu	ence at	5	20.13	MILES	C-3	N	-		F	Copper	Natural Sources
			12N 57E S35 to tributary conflue 13N 56E S27	ence at									Iron	
													Lead	
													Selenium	
Lower Yellov	vstone	MT42M002_150	CABIN CREEK, headwaters to r	mouth	5	102.54	MILES	C-3	N	-	-	F	Nitrogen (Total)	Dam or Impoundment
			(Yellowstone River)										Oxygen, Dissolved	Natural Sources
													Sedimentation/Siltation	Rangeland Grazing
Lower Yellow	vstone	MT42M002_180	SEARS CREEK, headwaters to	mouth	5	15.15	MILES	C-3	N	-	-	N	Alteration in stream-side or littoral	Channelization
			(Yellowstone River)										vegetative covers Copper	Hydrostructure Impacts on Fish Passage
													Excess Algal Growth	Irrigated Crop Production
													Fish-Passage Barrier	Rangeland Grazing
													High Flow Regime	Source Unknown
													Iron	Transfer of Water from an Outside Waters
			F-Fully Supporting; T-Threate	aned; N-	•Not Fully S	Supporting	; I-Insuffic	ient inform	ation; 3	X-No	ot Asses	ised;	Beneficial Use Not Assigned	
													-	
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Append	ix A: I	mpaired \	Vaters											
	HUC	10100004	Lower Yellowston	e Water	shed	Lower \	ellowsto	one						
	TMDL Pla	nning Area	ID305B	Waterbody Name/Location	Category	Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
	Lower Yell	owstone	MT42MD02_180	SEARS CREEK, headwaters to mouth (Yellowstone River)	5	15.15	MILES	C-3	N	-	-	N	Lead Solids (Suspended/Bedioad)	

HUC 10100005	O' Fallon	Waters	shed	Lower \	/ellowst	one						
TMDL Planning Area	ID305B	Waterbody Name/Location	Category	Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
O' Fallon	MT42L001_010	PENNEL CREEK, headwaters to mouth (O'Fallon Creek)	5	65.97	MILES	C-3	N	-		F	Total Dissolved Solids	Source Unknown
O' Fallon	MT42L001_020	SANDSTONE CREEK, headwaters to mouth (O'Fallon Creek)	5	72.78	MILES	C-3	N	-	•	F	Nitrate/Nitrite (Nitrite + Nitrate as N) Nitrogen (Total)	Agriculture Municipal Point Source Discharges

# Water Quality : U.S. Geological Survey Information



National Water Quality Assessment (NAWQA)

Figure IV. Median concentrations of coliform bacteria are highest in urban and agricultural areas. (Source: Peterson and others, 2004.)



Figure IV. Median concentrations of coliform bacteria are highest in the spring and summer. (Source: Peterson and others, 2004.)



Figure IV. Median concentrations of radon in water samples from Quaternary and Tertiary aquifers in the Yellowstone River Basin were higher than in other NAQWA study units in the United States. (Source: Peterson and others, 2004.)



Figure IV. Sources of nitrogen and phosphorous in the Yellowstone River Basin are predominately nonagricultural, as estimated from nationwide analysis using the SPARROW model (Smith and others 1997—as reported by Peterson and others, 2004.)



Figure IV. concentrations of nitrate in mountain streams were less than concentrations for other developed areas. Concentrations of nitrate were largest in basin streams (Peterson and others, 2004.)



Figure 19. Periphyton chlorophyll-a concentrations during August 2000 exceeded screening-level criteria for the protection of designated uses listed by the Montana Department of Environmental Quality (2003).

Phosphorus concentrations in streams in undeveloped and mixed land-use areas are among the largest in the Nation

Flow-weighted average concentrations of total phosphorus at sites on the Little Powder River, Powder River, and Clarks Fork Yellowstone River ranked in the upper 11 percent of their respective land-use categories and the upper 13 percent of all samples collected during 1993–2001 in NAWQA studies across the Nation. Land in the Little Powder River and Powder River Basins is primarily undeveloped rangeland, whereas the Clarks Fork Yellowstone River Basin includes a variety of land uses, such as residential, agricultural, and undeveloped areas. The high concentrations of phosphorus in soils and high suspended-sediment concentrations in the streams are the primary causes of the large concentrations of total phosphorus in samples from undeveloped areas. In areas of mixed land use, human-related sources are important. For example, Smith and others (1997) estimated that fertilizer and manure contributed 45 percent of phosphorus to the Clarks Fork Yellowstone River.





Figure 13. Suspended-sediment concentrations generally increase with the percentage of rangeland.



Figure 14. Suspended-sediment yields were largest in basin and plains streams that have little vegetation and soils that are susceptible to erosion.

# Herbicide concentrations in surface water were among the lowest in the Nation

Concentrations of herbicides in samples from five mixed land-use stream sites in the Yellowstone River Basin were relatively low compared to samples from 42 stream sites draining mixed land-use settings across the Nation. Concentrations measured at Yellowstone River Basin sites ranked in the lowest 25 percent of concentrations measured nationwide and were similar to the ranking for sites in the adjacent States of Idaho and Utah. Concentrations of herbicides in samples from the five sites in the Yellowstone River Basin ranked 145th or lower when compared to 153 streams sites that drain agricultural, urban, or mixed land-use settings across the Nation. The low concentrations in this basin most likely reflect the low use of herbicides, particularly when compared to herbicide use in the Midwest and Eastern United States.



### EXPLANATION

Herbicide use-in pounds per acre of agricultural land

- Highest (greater than 0.406)
- Medium (0.090 to 0.406)
- Lowest (less than 0.090)
- No reported use

Sum of herbicide concentrations-75th percentile, in micrograms per liter

- Highest 25 percent (greater than 1.070)
- Middle 50 percent (0.093 to 1.070)
- Lowest 25 percent (less than 0.093)

### Aquatic-life guidelines

O Bold outline indicates exceedance of a guideline by one or more herbicides. Number is percentage of samples that exceeded a guideline within a 1-year period. Percentages less than 20 are not labeled.





Concentrations of pesticide compounds in fish from the Yellowstone River Basin were low to moderate compared to the rest of the Nation

Fish-tissue samples from 6 of 10 sites draining undeveloped land in the Yellowstone River Basin contained no detectable concentrations of organochlorine insecticide compounds, such as DDE and chlordane. Those sites included rangeland sites and forested mountain sites. This finding is consistent with national findings. About 50 percent of 165 sites in undeveloped areas sampled by NAWQA during 1992–2001 contained no detectable concentrations of pesticides (map A). Pesticide concentrations in fish from areas of mixed land uses in the Yellowstone River Basin were in the second-highest 56 percent on a national basis (map B). None of the concentrations of pesticides in fish tissue from the basin was in the highest 25 percent nationally nor did they exceed guidelines for the protection of fish-eating wildlife. Similarly, concentrations of organochlorine pesticides in bed sediment, PCBs in fish tissue and bed sediment, and semivolatile organic compounds in bed sediment generally were low in the basin, compared to national concentrations.



### Appendices Yellowstone River Basin Water Plan - 2014



**Figure 20.** The high percentage of pollution-intolerant mayflies, stoneflies, and caddisflies indicates good water quality and habitat conditions in the upper and lower sections of the Yellowstone River, but a lower percentage indicates degraded conditions in the middle sections.



Figure 15. Herbicides were detected more often than insecticides in streams and aquifers.







**Figure 21**. Map of the conterminous U.S. showing long-term mean annual flow-weighted dissolved-solids concentrations, predicted from the national SPARROW model of dissolved-solids transport.

Powder and Tongue River Water Quality Trend Analysis

Previous trend analyses generally used non-parametric statistical methods (for example, the seasonal Kendall analysis), which are robust and generally do not require extensive data sets, to test for monotonic trends (single direction through the entire trend period). Parametric trend analysis procedures, which are more rigorous and sometimes require more extensive data sets, present alternative trend-analysis approaches to non-parametric procedures (Vecchia, 2005; Hirsch and others, 1982). The U.S. Geological Survey (USGS) in cooperation with the Montana Department of Natural Resources and Conservation, conducted this study to test for temporal trends in water quality using two parametric trends analysis methods: a joint time-series model (TSM; Vecchia, 2005) for concentration and streamflow; and ordinary least squares regression (OLS) of concentration on time, streamflow, and season. Also, this study included sites in Montana and Wyoming in the Tongue and Powder River watersheds. The trend analysis includes an extended period of record (water years 1980–2010) to represent a recent historic context for evaluating any trends that might be potentially attributable to CBM development.

Table 1. Info	ormation for selected s	ampling sites in the Rosebud Creek, Tongue River, and Powder R	iver watersheds, Montana and Wyoming.										
[Abbreviati	ions: OLS, ordinary le	east squares regression on time, streamflow, and season; TSM	I, time-series model]										
Site number (fig. 1)	USGS site identification number	USGS site name	Abbreviated site name	Drainage area, in square miles	General Site Classification								
			Rosebud Creek watershed										
1	06295113	Rosebud Creek at reservation boundary, near Kirby, Mont.	Rosebud Creek at reservation boundary	123	Rosebud Creek								
	Tongue River watershed												
2	06299980	Tongue River at Monarch, Wyo.	Tongue River at Monarch	478	Tongue River mainstem								
3	06305500	Goose Creek below Sheridan, Wyo.	Goose Creek	392	Tongue River mountain tributary								
4	06306250	Prairie Dog Creek near Acme, Wyo.	Prairie Dog Creek	358	Tongue River plains tributary								
5	06306300	Tongue River at State line, near Decker, Mont.	Tongue River at State line	1,453	Tongue River mainstem								
6	06307500	Tongue River at Tongue River Dam, near Decker, Mont.	Tongue River at Tongue River Dam	1,770	Tongue River mainstem								
7	06307600	Hanging Woman Creek near Birney, Mont.	Hanging Woman Creek	470	Tongue River plains tributary								
8	06307616	Tongue River at Birney Day School, near Birney, Mont.	Tongue River at Birney Day School	2,621	Tongue River mainstem								
9	06307740	Otter Creek at Ashland, Mont.	Otter Creek	707	Tongue River plains tributary								
10	06308400	Pumpkin Creek near Miles City, Mont.	Pumpkin Creek near Miles City	697	Tongue River plains tributary								
11	06308500	Tongue River at Miles City, Mont.	Tongue River at Miles City	5,379	Tongue River mainstem								
			Powder River watershed										
12	06313500	Powder River at Sussex, Wyo.	Powder River at Sussex	3,090	Powder River mainstem								
13	06317000	Powder River at Arvada, Wyo.	Powder River at Arvada	6,050	Powder River mainstem								
14	06324500	Powder River at Moorhead, Mont.	Powder River at Moorhead	8,086	Powder River mainstem								
15	06324970	Little Powder River above Dry Creek, near Weston, Wyo.	Little Powder River above Dry Creek	1,237	Little Powder River								
16	06325500	Little Powder River near Broadus, Mont.	Little Powder River near Broadus	1,974	Little Powder River								
17	06326500	Powder River near Locate, Mont.	Powder River near Locate	13,068	Powder River mainstem								



Figure 1. Location of selected sampling sites, coal-bed methane (CBM) wells, and monitoring wells in CBM seams in the Tongue River and Powder River watersheds, Montana and Wyoming.



Figure S4.12. Fitted trends determined by using the time-series model (TSM) for selected constituents and properties for Powder River at Arvada, Wyo. (Site 12) based on analysis of data collected during water years 1980–2010. [Abbreviations: μS/cm, microsiemens per centimeter at 25° Celsius]

<sup>1</sup>"Estimated alkalinity" data were developed by selecting either alkalinity or acid-neutralizing-capacity (ANC) measurements, depending primarily on which measurement was available for a given sample, as discussed in the section of this report "Sampling and Analytical Methods."



Figure S4.13. Fitted trends determined by using the time-series model (TSM) for selected constituents and properties for Powder River at Moorhead, Mont. (Site 13) based on analysis of data collected during water years 1980–2010. [Abbreviations: μS/cm, microsiemens per centimeter at 25° Celsius]

<sup>1</sup>"Estimated alkalinity" data were developed by selecting either alkalinity or acid-neutralizing-capacity (ANC) measurements, depending primarily on which measurement was available for a given sample, as discussed in the section of this report "Sampling and Analytical Methods."



Figure S4.4. Fitted trends determined by using the time-series model (TSM) for selected constituents and properties for Tongue River at State line, near Decker, Mont. (Site 4) based on analysis of data collected during water years 1980–2010. [Abbreviations:  $\mu$ S/cm, microsiemens per centimeter at 25° Celsius]

FLOW-ADJUSTED VALUES, IN INDICATED UNITS OF MEASUREMENT

<sup>1</sup>"Estimated alkalinity" data were developed by selecting either alkalinity or acid-neutralizing-capacity (ANC) measurements, depending primarily on which measurement was available for a given sample, as discussed in the section of this report "Sampling and Analytical Methods."

For main-stem Tongue River sites analyzed by using the TSM and downstream from substantial CBMextraction activities [Tongue River at State line (site 4), Tongue River at Tongue River Dam (site 5), Tongue River at Birney Day School (site 7), and Tongue River at Miles City (site 10)], generally small significant or nonsignificant decreases in most constituents are indicated for period 1. For period 2 for these sites, the TSM trend results do not allow confident conclusions concerning detection of effects of CBM-extraction activities on stream water quality. Detection of significant trends in major-ion constituents and properties for period 2 generally was infrequent, and direction, magnitudes, and significance of fitted trends were not strongly consistent with relative differences in water quality between stream water and CBM-produced water. The TSM indicated significant or generally large magnitude increases in median values of sodium adsorption ratio (SAR), sodium, and alkalinity for period 2 for sites 5 and 7, which might indicate potential effects of CBM-extraction activities on stream water. However, other factors, including operations of Tongue River Reservoir, irrigation activities, contributions of saline groundwater, and operations of the Decker coal mine, confound confident determination of causes of detected significant trends for sites 5 and 7. For all main-stem Tongue River sites, trends for period 2 generally are within ranges of those for period 1 before substantial CBMextraction activities.

For main-stem Powder River sites analyzed by using the TSM [Powder River at Sussex (site 11), Powder River at Arvada (site 12), Powder River at Moorhead (site 13), and Powder River near Locate (site 16)], significant or generally large magnitude decreases in median values of SAR, sodium, estimated alkalinity<sup>2</sup>, chloride, fluoride, specific conductance, and dissolved solids are indicated for period 1. Patterns in trend results for period 1 for main-stem Powder River sites are consistent with effects of Salt Creek oil-brine reinjection that started in 1990. Trend results for all main-stem Powder River sites downstream from substantial CBM-extraction activities (sites 12, 13, and 16) indicate evidence of potential effects of CBM-extraction activities on stream water quality, although evidence is stronger for sites 12 and 13 than for site 16. Evidence in support of potential CBM effects includes significant increases in median values of SAR, sodium, and estimated alkalinity for period 2 for sites 12, 13, and 16 that are consistent with relative differences between stream water and CBM-produced water. Significant increases in median values of these constituents for period 2 are not indicated for Powder River at Sussex (site 11) upstream from substantial CBM-extraction activities. In interpreting the trend results, it is notable that the fitted trends evaluate changes in median concentrations and also notable that changes in median concentrations that might be attributed to CBM-extraction activities probably are more strongly evident during low to median streamflow conditions than during mean to high streamflow conditions. This observation is relevant in assessing trend results in relation to specific water-quality concerns, including effects of water-quality changes on irrigators and effects on stream biota and ecology.

<sup>&</sup>lt;sup>2</sup> Estimated alkalinity data were developed by selecting either alkalinity or acid neutralizing capacity (ANC) measurements, depending primarily on which measurement was available for a given sample, as discussed in the section of this report "Sampling and Analytical Methods."