UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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Ref: 8EPR-EP

September 22, 2008

Mr. Art Compton
Director
Planning, Prevention and Assistance Division
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

Re: TMDL Approvals
Middle Blackfoot – Nevada Creek

Dear Mr. Compton:

We have completed our review of the total maximum daily loads (TMDLs) as submitted by your office for the Middle Blackfoot – Nevada Creek TMDL Planning Area (TPA). The TMDLs are included in the document entitled *Middle Blackfoot-Nevada Creek TMDLs and Water Quality Improvement Plan* transmitted to us for review and approval in correspondence dated August 29, 2008, and signed by you. In accordance with the Clean Water Act (33 U.S.C. 1251 *et. seq*.), we approve all aspects of the TMDLs as developed for the Middle Blackfoot – Nevada Creek TPA. Enclosure 1 to this letter provides a summary of the elements of the TMDLs and Enclosure 2 provides details of our review of the TMDLs.

Based on our review, we feel the separate TMDL elements listed in Enclosure 2 adequately address the pollutants of concern, taking into consideration seasonal variation and a margin of safety. In approving these TMDLs, EPA affirms that the TMDLs have been established at levels necessary to attain and maintain the applicable water quality standards and have the necessary components of approvable TMDLs.

Thank you for submitting these TMDLs for our review and approval. If you have any questions, the most knowledgeable person on my staff is Jim Ruppel and may be reached at 303-312-6846.

Sincerely,

Carol L. Campbell
Assistant Regional Administrator
Office of Ecosystems Protection
and Remediation

Enclosures

cc: Claudia Massman, Attorney
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Enclosure 1
Middle Blackfoot – Nevada Creek

78 TMDLs Completed
87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Upper Washington Creek MT76F003-071	Sediment	**B Channel** Riffle substrate: <6mm (%) - ≤ 20 Riffle substrate: <2mm (%) - ≤ 10 McNeil Cores <6.35 mm (%) - ≤ 27 Pool Frequency (pools/mile) - ≥ 20 Residual Pool Depth (ft) - ≥ 0.6 Median W:D Ratio - 12-16 Median pool tailout surface fines < 6 mm (%) -Median pool tailout surface fines < 6 mm (%) - ≤ 17 McNeil Cores <2mm (%) - ≤ 12 McNeil Cores <.85 mm (%) - ≤ 6 Woody Vegetation Extent (%) - ≥ 88 Marcoinvertebrate Multi-Metric Index - ≥ 48 RIVPACS Observed/Expected - ≥ 0.8 Pool Extent (%) - ≥ 10 Woody Debris Aggregate Extent (%) - ≥ 3	**Current Load (t/yr) by Land Use Category:** Livestock Grazing -179 Placer Mining- 98 Timber harvest - 74 Hay Production - 6 Roads - 14 **Total Current - 371** **Reductions (t/yr & %) in current loading by Land Use Category:** Livestock Grazing -41 (22%) Placer Mining- 24 (24%) Timber harvest - 15 (20%) Hay Production - 2 (38%) Roads - 7 (50%) **Total Anthropogenic: 88 (24%)** **Naturally Occurring (t/yr): 283 (76%)** **Margin of Safety (MOS):** Implicit - High estimate of sheet flow contributing area. High estimate of load from most stable stream banks. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** As allowable loading (t/yr) by land use category + naturally occurring from other sources. Livestock Grazing -138 Placer Mining- 75 Timber harvest - 60 Hay Production - 4 Roads - 7	Section 9.1.6, Tables 9-6, 9-7 Appendix E Appendix J

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Middle Blackfoot – Nevada Creek

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87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Lower Washington Creek MT76F003-072	Sediment	**E Channel** Riffle substrate: <6mm (%) - ≤ 36 Riffle substrate: <2mm (%) - ≤ 20 McNeil Cores <6.35 mm (%) - ≤ 27 Pool Frequency (pools/mile) - ≥ 40 Residual Pool Depth (ft) - ≥ 1.5 Median W:D Ratio - 6-11 Median pool tailout surface fines < 6 mm (%) -Median pool tailout surface fines < 6 mm (%) - ≤ 82 Woody Vegetation Extent (%) - ≥ 74 Marcoinvertebrate Multi-Metric Index - ≥ 48 RIVPACS Observed/Expected - ≥ 0.8 Entrenchment Ratio - > 2.2 Pool Extent (%) - ≥ 29	**Current Load (t/y) by Source Category:** Livestock Grazing -307 Hay Production - 452 Roads - 12 **Total Current - 771** **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing -72 (39%) Hay Production - 105 (57%) Roads - 6 .03%) **Total Anthropogenic: 183 (24%)** **Naturally Occurring (t/y): 588 (76%)** **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from stable stream banks. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Upper Nevada Creek example, Appendix E.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 235 Hay Production -347 Roads - 6	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J
	Metals (Iron)	Maximum instream iron concentration of 1.0 mg/L	(X mg Fe/L) (Y cfs) (5.4) = TMDL (lbs/day) Where: X = Numeric aquatic life standard for Fe (1.0 mg/L) Y = Stream flow (cfs) 5.4 = Unit conversion factor **Low Flow Example:** (1.0 mg Fe/L) (0.024 cfs) (5.4) = 0.13 lbs/day **High Flow Example:** (1.0 mg Fe/L) (17.1 cfs) (5.4) = 92 lbs/day	**WLA:** 0 **LA:** 30 percent reduction from human caused sources of particulate and dissolved iron concentrations during high flow plus, 28 percent reduction from human caused sources of particulate and dissolved iron concentrations during low flow, plus Naturally occurring sources of particulate and dissolved iron concentrations.	Section 9.2.2, Appendix F

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Middle Blackfoot – Nevada Creek

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87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Upper Jefferson Creek MT76F003-021	Sediment	**B Channel** Riffle substrate: <6mm (%) - ≤ 20 Riffle substrate: <2mm (%) - ≤ 10 McNeil Cores <6.35 mm (%) - ≤ 27 Pool Frequency (pools/mile) - ≥ 20 Residual Pool Depth (ft) - ≥ 0.6 Median W:D Ratio - 12-16 Median pool tailout surface fines < 6 mm (%) -Median pool tailout surface fines < 6 mm (%) - ≤ 17 McNeil Cores <2mm (%) - ≤ 12 McNeil Cores <.85 mm (%) - ≤ 6 Woody Vegetation Extent (%) - ≥ 88 Marcoinvertebrate Multi-Metric Index - ≥ 48 RIVPACS Observed/Expected - ≥ 0.8 Pool Extent (%) - ≥ 10 Woody Debris Aggregate Extent (%) - ≥ 3	**Current Load (t/y) by Land Use Category:** Livestock Grazing -394 Placer Mining- 287 Timber harvest - 170 Roads - 21 **Total Current - 872** **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing -113 (38%) Placer Mining- 113 (38%) Timber harvest - 57 (19%) Roads - 12 (4%) **Total Anthropogenic: 296 (34%)** **Naturally Occurring (t/y): 576 (66%)** **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from stable stream banks. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	WLA: 0 LA: Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 280 Timber Harvest - 113 Placer Mining - 173 Roads - 9	Section 9.1.4, Tables 9-10, 9-11 Appendix E

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Middle Blackfoot – Nevada Creek

78 TMDLs Completed
87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Lower Jefferson Creek MT76F003-022	Sediment	**E Channel** Riffle substrate: <6mm (%) - ≤ 36 Riffle substrate: <2mm (%) - ≤ 20 Pool Frequency (pools/mile) - ≥ 40 Residual Pool Depth (ft) - ≥ 1.5 Median W:D Ratio - 6-11 Median pool tailout surface fines < 6 mm (%) - ≤ 82 Woody Vegetation Extent (%) - ≥ 74 Marcoinvertebrate Multi-Metric Index - ≥ 48 RIVPACS Observed/Expected - ≥ 0.8 Entrenchment Ratio - > 2.2 Pool Extent (%) - ≥ 29 Woody Debris Aggregate Extent (%) - ≥ 12	**Current Load (t/y) by Land Use Category:** Livestock Grazing -0.52 Hay Production - 0.65 Placer Mining- 0.13 Roads - 10 **Total Current - 11** **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing - 0.12 (4%) Hay Production - 0.15 (5%) Placer Mining- 0.03 (1%) Roads - 2.4 (89%) **Total Anthropogenic: 2.7** **Naturally Occurring (t/y): 8** **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from stable stream banks. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	WLA: 0 LA: Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 1 Hay Production - 1 Placer Mining - 0.1 Roads - 6	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J
	Metals (Iron, Aluminum)	Maximum instream iron concentration of 1.0 mg/L. Maximum instream aluminum concentration of 0.087 mg/L.	**Iron** (X mg Fe/L) (Y cfs) (5.4) = TMDL for Fe (lbs/day) Where: X = Numeric aquatic life standard for Fe (1.0 mg/L) Y = Stream flow (cfs) 5.4 = Unit conversion factor **Aluminum** (X mg Al/L) (Y cfs) (5.4) = TMDL for Al (lbs/day) Where: X = Numeric aquatic life standard for Fe (0.087 mg/L) Y = Stream flow (cfs) 5.4 = Unit conversion factor **MOS:** Implicit in the use of chronic aquatic life standards for Fe and Al.	**WLA:** 0 **LA:** A composite metals allocation equal to the sum of: 1. Naturally occurring sources of particulate bound and dissolved metals. 2. 34 percent reduction in controllable human caused sources of particulate bound and dissolved metals.	Section 9.2.3, Appendix F

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Middle Blackfoot – Nevada Creek

78 TMDLs Completed
87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
	Nutrients (TP, TN)	Maximum Seasonal TP concentrations: Growing Season - 0.01 mg/L. Maximum Seasonal TN concentrations: Growing Season - 0.33 mg/L. Mean Summer Benthic Chl-a - 100 mg/m2 Maximum Benthic Chl-a - 150 mg/m2	**TP** (X mg TP/L) (Y cfs) (5.4) = TMDL for TP (lbs/day) Where: X = Level IV ecoregional TP growing season target (0.01 mg/L) Y = Stream flow (cfs) 5.4 = Unit conversion factor **Single Sample Result: 0.11 lbs/day** **TN** (X mg TN/L) (Y cfs) (5.4) = TMDL for TN (lbs/day) Where: X = Level IV ecoregional TN growing season target of (0.33 mg/L) Y = Stream flow (cfs) 5.4 = Unit conversion factor **Single Sample Result: 1.08 lbs/day** **MOS:** Implicit in TP and TN targets representing nutrient concentration goals based on ecoregional level IV reference streams. Growing season targets protective against excessive growing season aquatic life growth.	WLA: 0 LA: **Composite allocation to the following sources:** • Dissolved loads of TP and TN from subsurface irrigation return flows. • Naturally occurring particulate and dissolved loads of TP and TN in both streams and groundwater. • TP and TN loading from agricultural sources, principally livestock grazing, irrigated hay production, irrigation return flows, and livestock feeding. • Particulate bound TP and TN from road erosion. • Particulate bound TP and TN from timber harvest. • Particulate bound TP and TN from placer mining.	Sections 9.3.1, 9.3.2, 9.3.3 and 9.3.5

Enclosure 1
Middle Blackfoot – Nevada Creek

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87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Gallagher Creek MT76F003-030	Sediment	**E Channel** Riffle substrate: <6mm (%) - ≤ 36 Riffle substrate: <2mm (%) - ≤ 20 Pool Frequency (pools/mile) - ≥ 40 Residual Pool Depth (ft) - ≥ 1.5 Median W:D Ratio - 6-11 Woody Vegetation Extent (%) - ≥ 74 Marcoinvertebrate Multi-Metric Index - ≥ 48 Pool Extent (%) - ≥ 29 Woody Debris Aggregate Extent (%) - ≥ 12	**Current Load (t/y) by Land Use Category:** Livestock Grazing -236 Hay Production - 99 Timber Harvest - 12 Roads - 16 **Total Current -364** **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing - 72 (66%) Hay Production - 26 (24%) Timber Harvest - 4 (0.2%) Roads - 7 (6%) **Total Anthropogenic: 109 (30%)** **Naturally Occurring (t/y): 255 (70%)** **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from stable stream banks. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Upper Nevada Creek example, Appendix E.	**WLA**: 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 163 Hay Production - 73 Timber Harvest - 8 Roads - 9	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J

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Middle Blackfoot – Nevada Creek

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87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
	Nutrients (TP, TN)	Maximum Seasonal TP concentrations: Growing Season - 0.01 mg/L. Maximum Seasonal TN concentrations: Growing Season - 0.33 mg/L. Mean Summer Benthic Chl-a - 100 mg/m2 Maximum Benthic Chl-a - 150 mg/m2	**Presented as loading equation for TP and TN** (X mg TPor TN/L) (Y cfs) (5.4) = TMDL for TP or TN (lbs/day) Where: X = Level IV ecoregional TP and TN growing season targets (0.01 mg TP/L and 0.33 mg TN/L) Y = Stream flow (cfs) 5.4 = Unit conversion factor **Single Sample TP Result: 0.02 lbs/day** **Single Sample TN Result:0.71 lbs/day** **Margin of Safety:** Implicit in TP and TN targets representing nutrient concentration goals based on ecoregional level IV reference streams. Growing season targets protective against excessive growing season aquatic life growth.	**WLA:** 0 **LA:** Composite allocation to the following sources: • Dissolved loads of TP and TN from subsurface irrigation return flows. • Naturally occurring particulate and dissolved loads of TP and TN in both streams and groundwater. • TP and TN loading from agricultural sources, principally livestock grazing, irrigated hay production, irrigation return flows, and livestock feeding. • Particulate bound TP and TN from road erosion. • Particulate bound TP and TN from timber harvest. • Particulate bound TP and TN from placer mining.	Sections 9.3.1, 9.3.2, 9.3.3 and 9.3.5 Tables 9-11, 9-16

Enclosure 1
Middle Blackfoot – Nevada Creek

78 TMDLs Completed
87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Buffalo Gulch MT76F003-130	Sediment	**B Channel** Riffle substrate: <6mm (%) - ≤ 20 Riffle substrate: <2mm (%) - ≤ 10 McNeil Cores <6.35 mm (%) - ≤ 27 Pool Frequency (pools/mile) - ≥ 20 Residual Pool Depth (ft) - ≥ 0.6 Median W:D Ratio - 12-16 Median pool tailout surface fines < 6 mm - ≤ 17 McNeil Cores <2mm (%) - ≤ 12 McNeil Cores <.85 mm (%) - ≤ 6 Woody Vegetation Extent (%) - ≥ 88 Marcoinvertebrate Multi-Metric Index - ≥ 48 RIVPACS Observed/Expected - ≥ 0.8 Pool Extent (%) - ≥ 10 Woody Debris Aggregate Extent (%) - ≥ 3	**Current Load (t/y) by Land Use Category:** Livestock Grazing - 246 Hay Production - 48 Timber Harvest - 215 Placer Mining - 16 Roads - 47 Total Current - 571 **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing - 75 (41%) Hay Production - 10 (6%) Timber Harvest - 68 (38%) Placer Mining - 3 (2%) Roads - 25 (14%) **Total Anthropogenic: 181 (32%)** **Naturally Occurring (t/y): 390 (68%)** **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from stable stream banks. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	WLA: 0 LA: Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 172 Hay Production - 38 Timber Harvest - 146 Placer Mining - 13 Roads - 22	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J

Enclosure 1
Middle Blackfoot – Nevada Creek

78 TMDLs Completed
87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Upper Nevada Creek MT76F003-011	Sediment	**B Channel** Riffle substrate: <6mm (%) - ≤ 20 Riffle substrate: <2mm (%) - ≤ 10 McNeil Cores <6.35 mm (%) - ≤ 27 Pool Frequency (pools/mile) - ≥ 20 Residual Pool Depth (ft) - ≥ 0.6 Median W:D Ratio - 12-16 Median pool tailout surface fines < 6 mm - ≤ 17 McNeil Cores <2mm (%) - ≤ 12 McNeil Cores <.85 mm (%) - ≤ 6 Woody Vegetation Extent (%) - ≥ 88 Marcoinvertebrate Multi-Metric Index - ≥ 48 RIVPACS Observed/Expected - ≥ 0.8 Pool Extent (%) - ≥ 10 Woody Debris Aggregate Extent (%) - ≥ 3 **C Channel** Riffle substrate: <6mm (%) - ≤ 22 Riffle substrate: <2mm (%) - ≤ 7 McNeil Cores <6.35 mm (%) - ≤ 27 Pool Frequency (pools/mile) - ≥ 46 Residual Pool Depth (ft) - ≥ 2 Median W:D Ratio - 12-20 Median pool tailout surface fines < 6 mm - ≤ 23 McNeil Cores <2mm (%) - ≤ 15 McNeil Cores <.85 mm (%) - ≤ 6 Woody Vegetation Extent (%) - ≥ 61	**Current Load (t/y) by Land Use Category:** Livestock Grazing - 1453 Hay Production - 1943 Timber Harvest - 33 Placer Mining - 33 Roads - 40 Total Current - 3501 **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing - 388 (43%) Hay Production - 491 (54%) Timber Harvest - 7 (1%) Placer Mining - 7 (1%) Roads -17 (2%) Total Anthropogenic: 909 **Naturally Occurring (t/y)**: 2592 **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from stable stream banks. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 1065 Hay Production - 1452 Timber Harvest - 26 Placer Mining - 26 Roads - 23	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J

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Middle Blackfoot – Nevada Creek

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87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
	Nutrients (TP, TN)	Maximum Seasonal TP concentrations: Growing Season - 0.01 mg/L. Maximum Seasonal TN concentrations: Growing Season - 0.33 mg/L. Mean Summer Benthic Chl-a - 100 mg/m2 Maximum Benthic Chl-a - 150 mg/m2	TP (X mg TP/L) (Y cfs) (5.4) = TMDL for TP (lbs/day) Where: X = Level IV ecoregional TP seasonal target (mg/L) Y = Stream flow (cfs) 5.4 = Unit conversion factor Respective TP TMDLs (lbs/day) at the 25th, 50th and 75th percentiles: 0.54, 0.81 and 1.67. TN (X mg TN/L) (Y cfs) (5.4) = TMDL for TN (lbs/day) Where: X = Level IV ecoregional TN seasonal target of (mg/L) Y = Stream flow (cfs) 5.4 = Unit conversion factor Respective TN TMDLs (lbs/day) at the 25th, 50th and 75th percentiles: 17.8, 28.5 and 53.0. **Margin of Safety:** Implicit in TP and TN targets representing nutrient concentration goals based on ecoregional level IV reference streams. Targets applied year round protective against excessive growing season aquatic life growth. Implicit MOS is use of mountain ecoregion targets to valley bottom setting. Implicit MOS is use of existing TKN data containing possible positive bias.	**WLA:** 0 **LA:** Composite allocation to the following sources: • Dissolved loads of TP and TN from subsurface irrigation return flows. • Naturally occurring particulate and dissolved loads of TP and TN in both streams and groundwater. • TP and TN loading from agricultural sources, principally livestock grazing, irrigated hay production, irrigation return flows, and livestock feeding. • Particulate bound TP and TN from road erosion. • Particulate bound TP and TN from timber harvest. • Particulate bound TP and TN from placer mining.	Sections 9.3.1 - 9.3.5 Tables 9-11, 9-16

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Middle Blackfoot – Nevada Creek

78 TMDLs Completed
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Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
	Metals (Iron, Copper, Lead)	Maximum instream iron concentration of 1.0 mg/L. Maximum instream copper concentration allowed by Circular DEQ-7 after adjustment for hardness. Maximum instream lead concentration allowed by Circular DEQ-7 after adjustment for hardness.	Presented as loading equation based on water body assimilative capacity, restoration target (corrected for hardness for Cu and Pb), and streamflow: TMDL= (X mg/L)(Y cfs)(5.4) Where X = applicable water quality numeric standard (target); Y =f low; 5.4 = conversion factor Fe TMDL (lbs/day) = (1.0 mg/L) (Stream discharge (cfs)) (Unit conversion factor of 5.4)	**WLA: 0** LA: Source Category Allocation Approach Load Allocations: 100% of the metals is allocated to: • Natural background sources of metals that are either particulate bound or dissolved. • Human caused sources of metals that are either particulate bound or dissolved. three source categories, each representing a separate load allocation. All metals loading reductions are to come from controllable sediment bound and dissolved sources to achieve the standard unless further study shows that this is not a reasonable expectation (adaptive management).	Section 9.2.4 Section 9.2.5

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Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
	Water Temperature	73 percent bankline woody vegetation Effective Shade comparable to reference conditions. AND Width/depth ratio for C channel type: 12-20.	• Main Document - Sum of the surrogate allocations to the known human-caused heating sources plus natural sources. • Appendix G. – TMDL = (Δ-32)*(Q)*(1359209) Where: Δ = allowed temperatures from according to state standard Q = average daily discharge in cubic feet per second (CFS) TMDL = daily TMDL in Calories (kilocalories) per day above water's melting point Conversion factor = 1359209 AND Instantaneous Thermal Load (ITL) = (Δ-32)*(Q)*(15.7) Where: Δ = allowed temperatures from Figure G-1 using daily temperature condition Q = instantaneous discharge in CFS ITL = Allowed thermal load per second in kilocalories per day above water's melting point Conversion factor = 15.7	WLA: 0 LA: • Main Document – Surrogate Allocations are based on 57% increases to effective shade and 27% decrease in channel W:D ration by contributing reach (Table 9-21). • Appendix O. Load Allocation = Allowable Human Sources + Naturally Occurring Thermal Loads Where: Naturally Occurring Thermal Loads = (Naturally Occurring Temperature (°F) from Modeling Scenarios -32)*(Discharge (CFS))*(1359209) Allowable Human Sources = (1°F)*(1359209)*(Discharge (CFS)) AND Load Allocation = Allowable Human Sources + Naturally Occurring Thermal Loads Where: Naturally Occurring Thermal Loads = (Naturally Occurring Temperature (°F) from Modeling Scenarios -32)*(Discharge (CFS))*(15.73158) Allowable Human Sources = (1°F)*(15.73158)*(Discharge (CFS))	Section 9.4.1 Appendix G

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Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Nevada Lake Reservoir MT76F007-020	Nutrients (TP, TN)	Nevada Lake Chlorophyll Based Trophic Status Index ≤ 50; Year Round TP target: 0.02 mg/L Chlorophyll-a Concentration: 7.2 ug/L Dissolved Oxygen Concentration: 5.0 mg/L	Respective TP TMDLs (lbs/day) applied downstream of Nevada Creek Reservoir at 25th, 50th and 75th percentiles: 2.3, 6.0 and 9.7. Respective TN TMDLs (lbs/day) applied downstream of Nevada Creek Reservoir at 25th, 50th and 75th percentiles: 35.6, 90.6 and 147.2. **Margin of Safety:** Implicit MOS in seasonal targets based upon ecoregional reference conditions; implicit MOS in application of mountain ecoregion values to valley settings; implicit MOS for possible positive bias in TKN results used for TN TMDLs; implicit MOS in applying adaptive management for future target and TMDL adjustments.	**WLA:** 0 **LA:** Composite allocation to the following sources: • Dissolved loads of TP and TN from subsurface irrigation return flows. • Naturally occurring particulate and dissolved loads of TP and TN in both streams and groundwater. • TP and TN loading from agricultural sources, principally livestock grazing, irrigated hay production, irrigation return flows, and livestock feeding. • Particulate bound TP and TN from road erosion. • Particulate bound TP and TN from timber harvest. • Particulate bound TP and TN from placer mining.	Section 9.3.1.2 Section 9.3.2.2 Tables 9-12 and 9-17
	Sediment	Nutrient TMDLs address sediment loading issues. No sediment TMDL proposed .			Section 7.3

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Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Braziel Creek MT76F007-040	Sediment	**B Channel** Riffle substrate: <6mm (%) - ≤ 20 Riffle substrate: <2mm (%) - ≤ 10 McNeil Cores <6.35 mm (%) - ≤ 27 Pool Frequency (pools/mile) - ≥ 20 Residual Pool Depth (ft) - ≥ 0.6 Median W:D Ratio - 12-16 Median pool tailout surface fines < 6 mm - ≤ 17 Woody Vegetation Extent (%) - ≥ 88 Marcoinvertebrate Multi-Metric Index - ≥ 48 RIVPACS Observed/Expected - ≥ 0.8 Pool Extent (%) - ≥ 10 Woody Debris Aggregate Extent (%) - ≥ 3	**Current Load (t/y) by Land Use Category:** Livestock Grazing -176 Timber harvest - 157 Roads - 39 **Total Current - 372** **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing -45 (52%) Timber harvest - 26 (31%) Roads - 15 (18%) **Total Anthropogenic: 86 (23%)** **Naturally Occurring (t/y): 286 (77%)** **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from stable stream banks. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 131 Timber Harvest - 131 Roads - 24	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J
	Nutrients (TP, TN)	Maximum Seasonal TP concentrations: Growing Season - 0.01 mg/L. Maximum Seasonal TN concentrations: Growing Season - 0.33 mg/L. Mean Summer Benthic Chl-a - 100 mg/m^2 Maximum Benthic Chl-a - 150 mg/m^2	**Presented as loading equation for TP and TN** (X mg TP or TN/L) (Y cfs) (5.4) = TMDL for TP or TN (lbs/day) Where: X = Level IV ecoregional TP and TN growing season targets (0.01 mg TP/L, 0.33 mg TN/L)) Y = Stream flow (cfs) 5.4 = Unit conversion factor Single Sample TP Result: 0.07 lbs/day Single Sample TN Result:0.41 lbs/day **Margin of Safety:** Implicit in TP and TN targets representing nutrient concentration goals based on ecoregional level IV reference streams; implicit in that growing season targets protective against excessive growing season aquatic life growth; implicit in use of TKN results with possible positive laboratory bias.	**WLA:** 0 **LA:** Composite allocation to the following sources: • Dissolved loads of TP and TN from subsurface irrigation return flows. • Naturally occurring particulate and dissolved loads of TP and TN in both streams and groundwater. • TP and TN loading from agricultural sources, principally livestock grazing, irrigated hay production, irrigation return flows, and livestock feeding. • Particulate bound TP and TN from road erosion. • Particulate bound TP and TN from timber harvest. • Particulate bound TP and TN from placer mining.	Section 9.3.1.3 Section 9.3.2.3 Section 9.3.5 Tables 9-13, 9-18

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Middle Blackfoot – Nevada Creek

78 TMDLs Completed
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Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Black Bear Creek MT76F007-060	Sediment	**E Channel** Riffle substrate: <6mm (%) - ≤ 36 Riffle substrate: <2mm (%) - ≤ 20 Pool Frequency (pools/mile) - ≥ 40 Residual Pool Depth (ft) - ≥ 1.5 Median W:D Ratio - 6-11 Woody Vegetation Extent (%) - ≥ 74 Marcoinvertebrate Multi-Metric Index - ≥ 48 RIVPACS O/E - 0.8 Pool Extent (%) - ≥ 29 Woody Debris Aggregate Extent (%) - ≥ 12	**Current Load (t/y) by Land Use Category:** Livestock Grazing -360 Timber harvest - 4 Roads - 67 **Total Current - 431** **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing - 88 (79%) Timber harvest - 1 (1%) Roads - 23 (21%) **Total Anthropogenic: 112 (26%)** **Naturally Occurring (t/y): 319 (74%)** **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from stable stream banks. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 228 Timber Harvest - 4 Roads - 44	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J

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Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
	Nutrients	Total Phosphorus - 0.01 mg/l Total Nitrogen - 0.33 mg/l Summer Mean Benthic Chlorophyll-a - 100 mg/m2 Maximum Benthic Chlorophyll-a - 150 mg/m2	**Presented as loading equation for TP and TN** (X mg TP or TN/L) (Y cfs) (5.4) = TMDL for TP or TN (lbs/day) Where: X = Level IV ecoregional TP and TN growing season targets (0.01 mg TP/L, 0.33 mg TN/L)) Y = Stream flow (cfs) 5.4 = Unit conversion factor Single Sample TP Result: 0.03 lbs/day Single Sample TN Result:0.89 lbs/day **Margin of Safety:** Implicit in TP and TN targets representing nutrient concentration goals based on ecoregional level IV reference streams; implicit in that growing season targets protective against excessive growing season aquatic life growth; implicit in use of TKN results with possible positive laboratory bias.	WLA: 0 LA: LA: Composite allocation to the following sources: • Dissolved loads of TP and TN from subsurface irrigation return flows. • Naturally occurring particulate and dissolved loads of TP and TN in both streams and groundwater. • TP and TN loading from agricultural sources, principally livestock grazing, irrigated hay production, irrigation return flows, and livestock feeding. • Particulate bound TP and TN from road erosion. • Particulate bound TP and TN from timber harvest. • Particulate bound TP and TN from placer mining.	Section 9.3.1.3 Section 9.3.2.3 Section 9.3.5 Tables 9-13, 9-18

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Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Murray Creek MT76F007-120	Sediment	**B Channel** Riffle substrate: <6mm (%) - ≤ 20 Riffle substrate: <2mm (%) - ≤ 10 Marcoinvertebrate Multi-Metric Index - ≥ 48 RIVPACS Observed/Expected - ≥ 0.8 **E Channels** Riffle substrate: <6mm (%) - ≤ 36 Riffle substrate: <2mm (%) - ≤ 20 Marcoinvertebrate Multi-Metric Index - ≥ 48 RIVPACS O/E - 0.8	**Current Load (t/y) by Land Use Category:** Livestock Grazing - 1788 Hay Production - 271 Timber harvest - 55 Road Crossings - 131 Road Extent - 3498 **Total Current - 5743** **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing - 470 (31%) Hay Production - 71 (5%) Timber harvest - 15 (1%) Road Crossings - 54 (4%) Road Extent - 918 (60%) **Total Anthropogenic: 1528** **Naturally Occurring (t/y): 4215** **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from stable stream banks. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 1318 hay Production - 199 Timber Harvest - 41 Road Crossings - 77 Road Extent - 2580	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J

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87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
	Nutrients (TP, TN)	Total Phosphorus - 0.01 mg/l Total Nitrogen - 0.33 mg/l Summer Mean Benthic Chlorophyll-a - 100 mg/m2 Maximum Benthic Chlorophyll-a - 150 mg/m2	**Presented as loading equation for TP and TN** (X mg TP or TN/L) (Y cfs) (5.4) = TMDL for TP or TN (lbs/day) Where: X = Level IV ecoregional TP and TN growing season targets (0.01 mg TP/L, 0.33 mg TN/L)) Y = Stream flow (cfs) 5.4 = Unit conversion factor Single Sample TP Result: 0.22 lbs/day Single Sample TN Result: 7.12 lbs/day **Margin of Safety:** Implicit in TP and TN targets representing nutrient concentration goals based on ecoregional level IV reference streams; implicit in that growing season targets protective against excessive growing season aquatic life growth; implicit in use of TKN results with possible positive laboratory bias.	**WLA:** 0 **LA:** Composite allocation to the following sources: • Dissolved loads of TP and TN from subsurface irrigation return flows. • Naturally occurring particulate and dissolved loads of TP and TN in both streams and groundwater. • TP and TN loading from agricultural sources, principally livestock grazing, irrigated hay production, irrigation return flows, and livestock feeding. • Particulate bound TP and TN from road erosion. • Particulate bound TP and TN from timber harvest. • Particulate bound TP and TN from placer mining.	Section 9.3.1.3 Section 9.3.2.3 Section 9.3.5 Tables 9-13, 9-18

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Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
	Water temperature	91 percent bankline woody vegetation to achieve effective shade comparable to reference condition.	• Main Document - Sum of the surrogate allocations to the known human-caused heating sources plus natural sources. • Appendix G. – TMDL = (Δ-32)*(Q)*(1359209) Where: Δ = allowed temperatures from according to state standard Q = average daily discharge in cubic feet per second (CFS) TMDL = daily TMDL in Calories (kilocalories) per day above water's melting point Conversion factor = 1359209 AND Instantaneous Thermal Load (ITL) = (Δ-32)*(Q)*(15.7) Where: Δ = allowed temperatures from Figure G-1 using daily temperature condition (0.5°F) Q = instantaneous discharge in CFS ITL = Allowed thermal load per second in kilocalories per day above water's melting point Conversion factor = 15.7	**WLA:** 0 **LA:** • Main Document – Surrogate Allocations are based on 61% increase to effective shade by contributing reach (Table 9-23). • Appendix G. Load Allocation = Allowable Human Sources + Naturally Occurring Thermal Loads Where: Naturally Occurring Thermal Loads = (Naturally Occurring Temperature (°F) from Modeling Scenarios -32)*(Discharge (CFS))*(1359209) Allowable Human Sources = (0.5°F)*(1359209)*(Discharge (CFS)) AND Load Allocation = Allowable Human Sources + Naturally Occurring Thermal Loads Where: Naturally Occurring Thermal Loads = (Naturally Occurring Temperature (°F) from Modeling Scenarios -32)*(Discharge (CFS))*(15.7) Allowable Human Sources = (0.5°F)*(15.7)*(Discharge (CFS))	Section 9.4.3 Appendix G
	Metals (As)	No As TMDL proposed.			Section 6.2 Section 6.3

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Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Upper Douglas Creek MT76F007-081	Sediment	**B Channel** Riffle substrate: <6mm (%) - ≤ 20 Riffle substrate: <2mm (%) - ≤ 10 Pool Frequency (pools/mile) - ≥ 20 Residual Pool Depth (ft) - ≥ 0.6 Median W:D Ratio - 12-16 Median pool tailout surface fines < 6 mm (%) -Median pool tailout surface fines < 6 mm (%) - ≤ 17 Woody Vegetation Extent (%) - ≥ 88 Pool Extent (%) - ≥ 10 Woody Debris Aggregate Extent (%) - ≥ 3 **E Channel** Riffle substrate: <6mm (%) - ≤ 36 Riffle substrate: <2mm (%) - ≤ 20 Pool Frequency (pools/mile) - ≥ 40 Residual Pool Depth (ft) - ≥ 1.5 Median W:D Ratio - 6-11 Woody Vegetation Extent (%) - ≥ 74 Marcoinvertebrate Multi-Metric Index - ≥ 48 RIVPACS O/E - 0.8 Pool Extent (%) - ≥ 29 Woody Debris Aggregate Extent (%) - ≥ 12	**Current Load (t/y) by Land Use Category:** Livestock Grazing - 679 Hay Production - 498 Road Crossings - 222 **Total Current - 1399** **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing - 181 (44%) Hay Production - 134 (32%) Road Crossings - 99 (24%) **Total Anthropogenic: 414** **Naturally Occurring (t/y): 985** **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from stable stream banks. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 498 Hay Production - 364 Road Crossings - 123	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J

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87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
	Nutrients	Total Phosphorus - 0.01 mg/l Total Nitrogen - 0.33 mg/l Summer Mean Benthic Chlorophyll-a - 100 mg/m2 Maximum Benthic Chlorophyll-a - 150 mg/m2	**Presented as loading equation for TP and TN** (X mg TP or TN/L) (Y cfs) (5.4) = TMDL for TP or TN (lbs/day) Where: X = Level IV ecoregional TP and TN growing season targets (0.01 mg TP/L, 0.3 mg TN/L)) Y = Stream flow (cfs) 5.4 = Unit conversion factor Single Sample TP Result: 0.49 lbs/day Single Sample TN Result: 160 lbs/day **Margin of Safety:** Implicit in TP and TN targets representing nutrient concentration goals based on ecoregional level IV reference streams; implicit in that growing season targets protective against excessive growing season aquatic life growth; implicit in use of TKN results with possible positive laboratory bias.	**WLA:** 0 LA: Composite allocation to the following sources: • Dissolved loads of TP and TN from subsurface irrigation return flows. • Naturally occurring particulate and dissolved loads of TP and TN in both streams and groundwater. • TP and TN loading from agricultural sources, principally livestock grazing, irrigated hay production, irrigation return flows, and livestock feeding. • Particulate bound TP and TN from road erosion. • Particulate bound TP and TN from timber harvest. • Particulate bound TP and TN from placer mining.	Section 9.3.1.3 Section 9.3.2.3 Section 9.3.5 Tables 9-13, 9-18

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78 TMDLs Completed
87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
	Water Temperature	Increase from 40 to 82 percent bankline woody vegetation to achieve effective shade comparable to reference condition.	• Main Document - Sum of the surrogate allocations to the known human-caused heating sources plus natural sources. • Appendix G. – TMDL = (Δ-32)*(Q)*(1359209) Where: Δ = allowed temperatures from according to state standard Q = average daily discharge in cubic feet per second (CFS) TMDL = daily TMDL in Calories (kilocalories) per day above water's melting point Conversion factor = 1359209 AND Instantaneous Thermal Load (ITL) = (Δ-32)*(Q)*(15.7) Where: Δ = allowed temperatures from Figure G-1 using daily temperature condition (0.5°F) Q = instantaneous discharge in CFS ITL = Allowed thermal load per second in kilocalories per day above water's melting point Conversion factor = 15.7	**WLA:** 0 **LA:** • Main Document – Surrogate Allocations are based on a 44% increase in effective shade by contributing reach and 20% reduction in reservoir pool area (Table 9-24). • Appendix G. Load Allocation = Allowable Human Sources + Naturally Occurring Thermal Loads Where: Naturally Occurring Thermal Loads = (Naturally Occurring Temperature (°F) from Modeling Scenarios -32)*(Discharge (CFS))*(1359209) Allowable Human Sources = (0.5°F)*(1359209)*(Discharge (CFS)) AND Load Allocation = Allowable Human Sources + Naturally Occurring Thermal Loads Where: Naturally Occurring Thermal Loads = (Naturally Occurring Temperature (°F) from Modeling Scenarios -32)*(Discharge (CFS))*(15.73158) Allowable Human Sources = (0.5°F)*(15.73158)*(Discharge (CFS))	Section 9.4.3 Appendix G
	Metals (As)	No As TMDL proposed.			Section 6.2 Section 6.3

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Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Cottonwood Creek MT76F003-090	Sediment	**E Channel** Riffle substrate: <6mm (%) - ≤ 36 Riffle substrate: <2mm (%) - ≤ 20 Pool Frequency (pools/mile) - ≥ 40 Residual Pool Depth (ft) - ≥ 1.5 Median W:D Ratio - 6-11 Median pool tailout surface fines < 6 mm - ≤ 82 Woody Vegetation Extent (%) - ≥ 74 Pool Extent (%) - ≥ 29 Woody Debris Aggregate Extent (%) - ≥ 12	**Current Load (t/y) by Land Use Category:** Livestock Grazing - 2179 Hay Production - 2118 Road Crossings - 75 **Total Current - 4372** **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing - 569 (49%) Hay Production - 554 (48%) Road Crossings - 43 (4%) **Total Anthropogenic: 1166** **Naturally Occurring (t/y): 3206** **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from stable stream banks. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 1610 Hay Production - 1564 Road Crossings - 32	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J

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78 TMDLs Completed
87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
	Water Temperature	Increase from 33 to 91 percent bankline woody vegetation to achieve effective shade comparable to reference condition.	Surrogate allocation to the known human-caused heating source plus natural sources. • Appendix G. – TMDL = (Δ-32)*(Q)*(1359209) Where: Δ = allowed temperatures from according to state standard Q = average daily discharge in cubic feet per second (CFS) TMDL = daily TMDL in Calories (kilocalories) per day above water's melting point Conversion factor = 1359209 AND Instantaneous Thermal Load (ITL) = (Δ-32)*(Q)*(15.7) Where: Δ = allowed temperatures from Figure G-1 using daily temperature condition (0.5°F) Q = instantaneous discharge in CFS ITL = Allowed thermal load per second in kilocalories per day above water's melting point Conversion factor = 15.7	**WLA:** 0 **LA:** • Main Document – Surrogate Allocations are based on a 61% increase to effective shade by contributing reach (Table 9-23). • Appendix G. Load Allocation = Allowable Human Sources + Naturally Occurring Thermal Loads Where: Naturally Occurring Thermal Loads = (Naturally Occurring Temperature (°F) from Modeling Scenarios -32)*(Discharge (CFS))*(1359209) Allowable Human Sources = (0.5°F)*(1359209)*(Discharge (CFS)) AND Load Allocation = Allowable Human Sources + Naturally Occurring Thermal Loads Where: Naturally Occurring Thermal Loads = (Naturally Occurring Temperature (°F) from Modeling Scenarios -32)*(Discharge (CFS))*(15.73158) Allowable Human Sources = (0.5°F)*(15.73158)*(Discharge (CFS))	Section 9.4.3 Appendix G
	Salinity	No salinity TMDL is proposed.			Section 2.4

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Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Lower Douglas Creek MT76F003-082	Sediment	**C Channel** Riffle substrate: <6mm (%) - ≤ 22 Riffle substrate: <2mm (%) - ≤ 7 Pool Frequency (pools/mile) - ≥ 46 Residual Pool Depth (ft) - ≥ 2 Median W:D Ratio - 12-20 Median pool tailout surface fines < 6 mm - ≤ 23 Woody Vegetation Extent (%) - ≥ 61 MMI ≥ 48 RIVPACS O/E ≥ 0.8 Entrenchment Ratio - > 2.2 Pool Extent (%) - ≥ 35 Woody Debris Aggregate Extent (%) - ≥ 8	**Current Load (t/y) by Land Use Category:** Livestock Grazing - 3750 Hay Production - 1040 Road Crossings - 222 **Total Current - 5012** Reductions (t/y & %) in current loading by Land Use Category: Livestock Grazing - 765 (68%) Hay Production - 272 (24%) Road Crossings - 92 (8%) **Total Anthropogenic:** 1129 **Naturally Occurring (t/y):** 3883 **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from stable stream banks. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 2985 Hay Production - 768 Road Crossings - 130	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J
	Nutrients	Total Phosphorus - 0.01 mg/l Total Nitrogen - 0.33 mg/l Summer Mean Benthic Chlorophyll-a - 100 mg/m2 Maximum Benthic Chlorophyll-a - 150 mg/m2	**Presented as loading equation for TP and TN** (X mg TP or TN/L) (Y cfs) (5.4) = TMDL for TP or TN (lbs/day) Where: X = Level IV ecoregional TP and TN growing season targets (0.01 mg TP/L, 0.33 mg TN/L)) Y = Stream flow (cfs) 5.4 = Unit conversion factor Single Sample TP Result: 0.04 lbs/day Single Sample TN Result: 6.3 lbs/day **Margin of Safety:** Implicit in TP and TN targets representing nutrient concentration goals based on ecoregional level IV reference streams; implicit in that growing season targets protective against excessive growing season aquatic life growth; implicit in use of TKN results with possible positive laboratory bias.	**WLA:** 0 **LA:** Composite allocation to the following sources: • Dissolved loads of TP and TN from subsurface irrigation return flows. • Naturally occurring particulate and dissolved loads of TP and TN in both streams and groundwater. • TP and TN loading from agricultural sources, principally livestock grazing, irrigated hay production, irrigation return flows, and livestock feeding. • Particulate bound TP and TN from road erosion. • Particulate bound TP and TN from timber harvest. • Particulate bound TP and TN from placer mining.	Section 9.3.1.3 Section 9.3.2.3 Section 9.3.5 Tables 9-13, 9-18

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Middle Blackfoot – Nevada Creek

78 TMDLs Completed
87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
	Water Temperature	Increase from 23 to 89 percent bankline woody vegetation to achieve effective shade comparable to reference condition; Width:Depth Ratio - 12-20 for C channels along Doug5 and Doug7; Flow Augmentation of ≥ 15 during July 15th to August 15th.	Surrogate allocation to the known human-caused heating source plus natural sources. • Appendix G. – TMDL = (Δ-32)*(Q)*(1359209) Where: Δ = allowed temperatures from according to state standard Q = average daily discharge in cubic feet per second (CFS) TMDL = daily TMDL in Calories (kilocalories) per day above water's melting point Conversion factor = 1359209 AND Instantaneous Thermal Load (ITL) = (Δ-32)*(Q)*(15.7) Where: Δ = allowed temperatures from Figure G-1 using daily temperature condition (0.5°F) Q = instantaneous discharge in CFS ITL = Allowed thermal load per second in kilocalories per day above water's melting point Conversion factor = 15.7	**WLA:** 0 **LA:** • Main Document – Surrogate Allocations are based on a 69% increase to effective shade and 54% decrease in channel W:D ratio by contributing reach (Table 9-25). • Appendix G. Load Allocation = Allowable Human Sources + Naturally Occurring Thermal Loads Where: Naturally Occurring Thermal Loads = (Naturally Occurring Temperature (°F) from Modeling Scenarios -32)*(Discharge (CFS))*(1359209) Allowable Human Sources = (0.5°F)*(1359209)*(Discharge (CFS)) AND Load Allocation = Allowable Human Sources + Naturally Occurring Thermal Loads Where: Naturally Occurring Thermal Loads = (Naturally Occurring Temperature (°F) from Modeling Scenarios -32)*(Discharge (CFS))*(15.7) Allowable Human Sources = (0.5°F)*(15.7)*(Discharge (CFS))	Section 9.4.3 Appendix G
	Metals (As)	No As TMDL proposed.			Section 6.2 Section 6.3
	Salinity	No salinity TMDL is proposed.			Section 2.4

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Middle Blackfoot – Nevada Creek

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Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Nevada Spring Creek MT76F003-100	Sediment	**E Channel** Pool Frequency (pools/mile) - ≥ 46 Riffle Substrate < 6 mm - ≤ 36 Median W:D Ratio - 6 - 11 Woody Vegetation Extent (%) - ≥ 74	**Current Load (t/y) by Land Use Category:** Livestock Grazing - 22 Hay Production -2 Road Crossings - 11 **Total Current - 36** **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing - 5 (51%) Hay Production - 1 (6%) Road Crossings - 5 (47%) **Total Anthropogenic: 10** **Naturally Occurring (t/y):** 25 **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from stable stream banks. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 17 Hay Production - 2 Road Crossings - 6	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J

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Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
McElwain Creek MT76F003-050	Sediment	**E Channel** Riffle substrate: <6mm (%) - ≤ 36 Riffle substrate: <2mm (%) - ≤ 20 Pool Frequency (pools/mile) - ≥ 40 Residual Pool Depth (ft) - ≥ 1.5 Median W:D Ratio - 6-11 Median pool tailout surface fines < 6 mm - ≤ 82 Woody Vegetation Extent (%) - ≥ 74 Entrenchment Ratio: ≥ 2.2 Pool Extent (%) - ≥ 29 Woody Debris Aggregate Extent (%) - ≥ 12	**Current Load (t/y) by Land Use Category:** Livestock Grazing - 306 Hay Production -260 Road Crossings - 50 **Total Current - 616** **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing - 92 (48%) Hay Production - 77 (40%) Road Crossings - 22 (12%) **Total Anthropogenic:** 191 **Naturally Occurring (t/y):** 425 **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from stable stream banks. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 214 Hay Production - 183 Road Crossings - 28	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J
	Nutrients	Total Phosphorus - 0.01 mg/l Total Nitrogen - 0.33 mg/l Summer Mean Benthic Chlorophyll-a - 100 mg/m2 Maximum Benthic Chlorophyll-a - 150 mg/m2	**Presented as loading equation for TP and TN** (X mg TP or TN/L) (Y cfs) (5.4) = TMDL for TP or TN (lbs/day) Where: X = Level IV ecoregional TP and TN growing season targets (0.01 mg TP/L, 0.33 mg TN/L)) Y = Stream flow (cfs) 5.4 = Unit conversion factor Single Sample TP Result: 0.04 lbs/day Single Sample TN Result: 63 lbs/day **Margin of Safety:** Implicit in TP and TN targets representing nutrient concentration goals based on ecoregional level IV reference streams; implicit in that growing season targets protective against excessive growing season aquatic life growth; implicit in use of TKN results with possible positive laboratory bias.	**WLA:** 0 **LA:** Composite allocation to the following sources: • Dissolved loads of TP and TN from subsurface irrigation return flows. • Naturally occurring particulate and dissolved loads of TP and TN in both streams and groundwater. • TP and TN loading from agricultural sources, principally livestock grazing, irrigated hay production, irrigation return flows, and livestock feeding. • Particulate bound TP and TN from road erosion. • Particulate bound TP and TN from timber harvest. • Particulate bound TP and TN from placer mining.	Section 9.3.1.3 Section 9.3.2.3 Section 9.3.5 Tables 9-13, 9-18

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87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Lower Nevada Creek MT76F003-012	Sediment	**C Channel** Riffle substrate: <6mm (%) - ≤ 22 Riffle substrate: <2mm (%) - ≤ 7 Pool Frequency (pools/mile) - ≥ 46 (Nev8) Pool Frequency (pools/mile) - ≥ 26 (Nev7, 13, 14) Residual Pool Depth (ft) - ≥ 2 Median W:D Ratio - 12-20 Median pool tailout surface fines < 6 mm - ≤ 23 Woody Vegetation Extent (%) - ≥ 61 Entrenchment Ratio - > 2.2 Pool Extent (%) - ≥ 35 Woody Debris Aggregate Extent (%) - ≥ 7 **E Channel** Riffle substrate: <6mm (%) - ≤ 36 Riffle substrate: <2mm (%) - ≤ 20 Pool Frequency (pools/mile) - ≥ 40 Residual Pool Depth (ft) - ≥ 1.5 Median W:D Ratio - 6-11 Median pool tailout surface fines < 6 mm - ≤ 82 Woody Vegetation Extent (%) - ≥ 74 Pool Extent (%) - ≥ 29 Woody Debris Aggregate Extent (%) - ≥ 12	**Current Load (t/y) by Land Use Category:** Livestock Grazing - 2415 Hay Production -252 Road Crossings - 36 **Total Current - 2703** Reductions (t/y & %) in current loading by Land Use Category: Livestock Grazing - 543 (42%) Hay Production - 56 (39%) Road Crossings - 22 (30%) **Total Anthropogenic:** 621 **Naturally Occurring (t/y):** 2082 **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from stable stream banks. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 1873 Hay Production - 196 Road Crossings - 14	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J

Enclosure 1
Middle Blackfoot – Nevada Creek

78 TMDLs Completed
87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
	Nutrients	Total Phosphorus 0.02 mg/l Total Nitrogen 0.3 mg/l Summer Mean Benthic Chlorophyll-a 100 mg/m2 Maximum Benthic Chlorophyll-a 150 mg/m2	Presented as loading equation for TP and TN (X mg TP or TN/L) (Y cfs) (5.4) = TMDL for TP or TN (lbs/day) Where: X = Level IV ecoregional TP and TN growing season targets (0.02 mg TP/L, 0.3 mg TN/L)) Y = Stream flow (cfs) 5.4 = Unit conversion factor **Range of TP TMDLs (Reductions) for:** 0-25th percentile flow - 0.65 – 2.37 lbs/day (85%-86%) 25th-75th percentile flow - 2.37 – 4.42 lbs/day (76% – 90%) 75th-100th percentile flow - 4.42 – 53.90 (84% – 98%) **Range of TN TMDLs (Reductions) for:** 0-25th percentile flow - 9.7 – 35.6 lbs/day (9%-29%) 25th-75th percentile flow - 35.6 – 66.3 lbs/day (0% – 57%) 75th-100th percentile flow - 66.3 – 808.5 (47% – 92%) **Margin of Safety:** Implicit in TP and TN targets representing nutrient concentration goals based on ecoregional level IV reference streams. Targets applied during runoff and growing seasons that affect downstream season aquatic life growth. Implicit MOS is use of mountain ecoregion targets to valley bottom setting. Implicit MOS is use of existing TKN data containing possible positive bias.	**WLA:** 0 **LA:** Composite allocation to the following sources: • Dissolved loads of TP and TN from subsurface irrigation return flows. • Naturally occurring particulate and dissolved loads of TP and TN in both streams and groundwater. • TP and TN loading from agricultural sources, principally livestock grazing, irrigated hay production, irrigation return flows, and livestock feeding. • Particulate bound TP and TN from road erosion. • Particulate bound TP and TN from timber harvest. • Particulate bound TP and TN from placer mining.	Sections 9.3.1.3, 9.3.2.3 and 9.3.5 Tables 9-13, 9-18

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Middle Blackfoot – Nevada Creek

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Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
	Water Temperature	Increase from 28 to 80 percent bankline woody vegetation to achieve effective shade comparable to reference condition; Width:Depth Ratio - 12-20 for C channels along Nev7, 8, 14; Width:Depth Ratio - 6-11 for E channels along Nev9; Flow Augmentation of ≥ 15 during July 15th to August 15th.	Sum of the surrogate allocations to the known human-caused heating sources plus natural sources. Appendix G. – TMDL = (Δ-32)*(Q)*(1359209) Where: Δ = allowed temperatures from according to state standard Q = average daily discharge in cubic feet per second (CFS) TMDL = daily TMDL in Calories (kilocalories) per day above water's melting point Conversion factor = 1359209 AND Instantaneous Thermal Load (ITL) = (Δ-32)*(Q)*(15.7) Where: Δ = allowed temperatures from Figure G-1 using daily temperature condition Q = instantaneous discharge in CFS ITL = Allowed thermal load per second in kilocalories per day above water's melting point Conversion factor = 15.7	WLA: 0 LA: Surrogate Allocations are based on a 55% increase to effective shade, 45% decrease in channel W:D ratio of C channel types, and a 21% decrease in channel W:D ratios for E channel types by contributing reach (Table 9-22). • Appendix G. Load Allocation = Allowable Human Sources + Naturally Occurring Thermal Loads Where: Naturally Occurring Thermal Loads = (Naturally Occurring Temperature (°F) from Modeling Scenarios -32)*(Discharge (CFS))*(1359209) Allowable Human Sources = (0.5°F)*(1359209)*(Discharge (CFS)) AND Load Allocation = Allowable Human Sources + Naturally Occurring Thermal Loads Where: Naturally Occurring Thermal Loads = (Naturally Occurring Temperature (°F) from Modeling Scenarios -32)*(Discharge (CFS))*(15.7) Allowable Human Sources = (0.5°F)*(15.7)*(Discharge (CFS))	Section 9.4.2 Appendix G

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Middle Blackfoot – Nevada Creek

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Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Yourname Creek MT76F004-080	Sediment	**E Channel** Riffle substrate: <6mm (%) - ≤ 36 Riffle substrate: <2mm (%) - ≤ 34 MMI - ≥ 48 RIVPACS O/E - 0.8	**Current Load (t/y) by Land Use Category:** Livestock Grazing - 515 Hay Production -5 Silviculture - 3 Placer Mining - 3 Road Crossings - 101 **Total Current - 627** **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing - 130 (72%) Hay Production - 1 (0.7%) Silviculture - 1 (0.4%) Placer Mining - 1 (0.4%) Road Crossings - 48 (27%) **Total Anthropogenic:** 181 **Naturally Occurring (t/y):** 446 **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from stable stream banks. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 385 Hay Production - 4 Silviculture - 2 Placer Mining - 2 Road Crossings - 53	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J

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Middle Blackfoot – Nevada Creek

78 TMDLs Completed
87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
	Nutrients	Total Phosphorus - 0.01 mg/l Total Nitrogen - 0.33 mg/l Summer Mean Benthic Chlorophyll-a - 100 mg/m2 Maximum Benthic Chlorophyll-a - 150 mg/m2	**Presented as loading equation for TP and TN** (X mg TP or TN/L) (Y cfs) (5.4) = TMDL for TP or TN (lbs/day) Where: X = Level IV ecoregional TP and TN growing season targets (0.01 mg TP/L, 0.33 mg TN/L)) Y = Stream flow (cfs) 5.4 = Unit conversion factor Single Sample TP Result: 022 lbs/day Single Sample TN Result: 7.1 lbs/day **Margin of Safety:** Implicit in TP and TN targets representing nutrient concentration goals based on ecoregional level IV reference streams; implicit in that growing season targets protective against excessive growing season aquatic life growth; implicit in use of TKN results with possible positive laboratory bias.	**WLA:** 0 **LA:** Composite allocation to the following sources: • Dissolved loads of TP and TN from subsurface irrigation return flows. • Naturally occurring particulate and dissolved loads of TP and TN in both streams and groundwater. • TP and TN loading from agricultural sources, principally livestock grazing, irrigated hay production, irrigation return flows, and livestock feeding. • Particulate bound TP and TN from road erosion. • Particulate bound TP and TN from timber harvest.	Section 9.3.1.4 Section 9.3.2.4 Section 9.3.5
Wales Creek MT76F004-050	Sediment	**E Channel** Riffle substrate: <6mm (%) - ≤ 36 Riffle substrate: <2mm (%) - ≤ 34 MMI - ≥ 48 RIVPACS O/E - 0.8	**Current Load (t/y) by Land Use Category:** Livestock Grazing - 190 Hay Production -107 Road Crossings - 11 **Total Current - 308** **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing - 52 (60%) Hay Production - 29 (33%) Road Crossings - 6 (7%) **Total Anthropogenic:** 87 **Naturally Occurring (t/y):** 221 **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from stable stream banks. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 138 Hay Production - 78 Road Crossings - 5	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J

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Middle Blackfoot – Nevada Creek

78 TMDLs Completed
87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
	Nutrients	Total Phosphorus - 0.01 mg/l Total Nitrogen - 0.33 mg/l Summer Mean Benthic Chlorophyll-a - 100 mg/m2 Maximum Benthic Chlorophyll-a - 150 mg/m2	**Presented as loading equation for TP and TN** (X mg TP or TN/L) (Y cfs) (5.4) = TMDL for TP or TN (lbs/day) Where: X = Level IV ecoregional TP and TN growing season targets (0.01 mg TP/L, 0.33 mg TN/L)) Y = Stream flow (cfs) 5.4 = Unit conversion factor Single Sample TP Result: 0.08 lbs/day Single Sample TN Result: 0.16 lbs/day **Margin of Safety:** Implicit in TP and TN targets representing nutrient concentration goals based on ecoregional level IV reference streams; implicit in that growing season targets protective against excessive growing season aquatic life growth; implicit in use of TKN results with possible positive laboratory bias.	**WLA:** 0 **LA:** Composite allocation to the following sources: • Dissolved loads of TP and TN from subsurface irrigation return flows. • Naturally occurring particulate and dissolved loads of TP and TN in both streams and groundwater. • TP and TN loading from agricultural sources, principally livestock grazing, irrigated hay production, irrigation return flows, and livestock feeding. • Particulate bound TP and TN from road erosion. • Particulate bound TP and TN from timber harvest.	Section 9.3.1.4 Section 9.3.2.4 Section 9.3.5
Frazier Creek MT76F004-010	Sediment	**E Channel** Riffle substrate: <6mm (%) - ≤ 36 Riffle substrate: <2mm (%) - ≤ 34 Poll frequency - ≥ 40 Residual Pool Depth - ≥ 1.5 Width; Depth Ratio - 6-11 Median pool tail surface fines < 6 mm - ≤ 48 Woody Vegetation Extent (%) - ≥ 69 MMI - ≥ 48 RIVPACS O/E - 0.8 Pool Extent (%) - ≥ 19 Woody Debris Aggregate Extent (%) - ≥ 12	**Current Load (t/y) by Land Use Category:** Livestock Grazing - 20 Road Crossings - 19 **Total Current - 39** **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing - 7 (41%) Road Crossings - 10 (59%) **Total Anthropogenic:** 17 **Naturally Occurring (t/y):** 22 **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from stable stream banks. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 13 Road Crossings - 9	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J

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Middle Blackfoot – Nevada Creek

78 TMDLs Completed
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Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
	Nutrients	Total Phosphorus - 0.01 mg/l Total Nitrogen - 0.33 mg/l Summer Mean Benthic Chlorophyll-a - 100 mg/m2 Maximum Benthic Chlorophyll-a - 150 mg/m2	**Presented as loading equation for TP and TN** (X mg TP or TN/L) (Y cfs) (5.4) = TMDL for TP or TN (lbs/day) Where: X = Level IV ecoregional TP and TN growing season targets (0.01 mg TP/L, 0.33 mg TN/L)) Y = Stream flow (cfs) 5.4 = Unit conversion factor Single Sample TP Result: 0.08 lbs/day Single Sample TN Result: 2.7 lbs/day **Margin of Safety:** Implicit in TP and TN targets representing nutrient concentration goals based on ecoregional level IV reference streams; implicit in that growing season targets protective against excessive growing season aquatic life growth; implicit in use of TKN results with possible positive laboratory bias.	**WLA:** 0 **LA:** Composite allocation to the following sources: • Dissolved loads of TP and TN from subsurface irrigation return flows. • Naturally occurring particulate and dissolved loads of TP and TN in both streams and groundwater. • TP and TN loading from agricultural sources, principally livestock grazing, irrigated hay production, irrigation return flows, and livestock feeding. • Particulate bound TP and TN from road erosion. • Particulate bound TP and TN from timber harvest.	Section 9.3.1.4 Section 9.3.2.4 Section 9.3.5

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Middle Blackfoot – Nevada Creek

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87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Ward Creek MT76F004-060	Sediment	**C Channel** Riffle substrate: <6mm (%) - ≤ 15 Riffle substrate: <2mm (%) - ≤ 11 Pool Frequency (pools/mile) - ≥ 55 Residual Pool Depth (ft) - ≥ 2 Median W:D Ratio - 12-19 Median pool tailout surface fines < 6 mm - ≤ 20 Woody Vegetation Extent (%) - ≥ 84 Pool Extent (%) - ≥ 35 Woody Debris Aggregate Extent (%) - ≥ 8 **E Channel** Riffle substrate: <6mm (%) - ≤ 36 Riffle substrate: <2mm (%) - ≤ 34 Poll frequency - ≥ 40 Residual Pool Depth - ≥ 1.5 Width; Depth Ratio - 6-11 Median pool tail surface fines < 6 mm - ≤ 48 Woody Vegetation Extent (%) - ≥ 69 Pool Extent (%) - ≥ 19 Woody Debris Aggregate Extent (%) - ≥ 12	**Current Load (t/y) by Land Use Category:** Livestock Grazing - 90 Silviculture - 34 Road Crossings - 32 **Total Current - 156** **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing - 22 (46%) Silviculture - 8 (16%) Road Crossings - 18 (38%) **Total Anthropogenic:** 48 **Naturally Occurring (t/y):** 108 **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from stable stream banks. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 68 Silviculture - 26 Road Crossings - 14	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J

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87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Kleinschmidt Creek MT76F004-110	Sediment	**E Channel** Riffle substrate: <6mm (%) - ≤ 36 Riffle substrate: <2mm (%) - ≤ 34 Poll frequency - ≥ 40 Width; Depth Ratio - 6-11 Woody Vegetation Extent (%) - ≥ 69 MMI - ≥ 48 RIVPACS O/E - 0.8 Pool Extent (%) - ≥ 19 Woody Debris Aggregate Extent (%) - ≥ 12	**Current Load (t/y) by Land Use Category:** Livestock Grazing - 3 Hay Production - 2 Road Crossings - 22 **Total Current - 27** **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing - 1 (5%) Road Crossings - 11 (94%) **Total Anthropogenic:** 12 **Naturally Occurring (t/y):** 15 **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from stable stream banks. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 2 Hay Production - 2 Road Crossings - 11	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J

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Middle Blackfoot – Nevada Creek

78 TMDLs Completed
87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
	Water Temperature	Increase from 29 to 69 percent bankline woody vegetation to achieve effective shade comparable to reference condition;	Surrogate allocation to the known human-caused heating source plus natural sources. • Appendix G. – TMDL = (Δ-32)*(Q)*(1359209) Where: Δ = allowed temperatures from according to state standard Q = average daily discharge in cubic feet per second (CFS) TMDL = daily TMDL in Calories (kilocalories) per day above water's melting point Conversion factor = 1359209 AND Instantaneous Thermal Load (ITL) = (Δ-32)*(Q)*(15.7) Where: Δ = allowed temperatures from Figure G-1 using daily temperature condition (1°F) Q = instantaneous discharge in CFS ITL = Allowed thermal load per second in kilocalories per day above water's melting point Conversion factor = 15.7	**WLA:** 0 **LA:** • Main Document – Surrogate Allocations are based on a 42% increases to effective shade by contributing reach (Table 9-26). • Appendix G. Load Allocation = Allowable Human Sources + Naturally Occurring Thermal Loads Where: Naturally Occurring Thermal Loads = (Naturally Occurring Temperature (°F) from Modeling Scenarios -32)*(Discharge (CFS))*(1359209) Allowable Human Sources = (1°F)*(1359209)*(Discharge (CFS)) AND Load Allocation = Allowable Human Sources + Naturally Occurring Thermal Loads Where: Naturally Occurring Thermal Loads = (Naturally Occurring Temperature (°F) from Modeling Scenarios -32)*(Discharge (CFS))*(15.7) Allowable Human Sources = (1°F)*(15.7)*(Discharge (CFS))	Section 9.4.6 Appendix G
	Metals (As, Cu)	No As TMDL proposed. No Cu TMDL proposed.			Section 6.2 Section 6.3

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87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Rock Creek MT76F004-090	Sediment	**E Channel** Riffle substrate: <6mm (%) - ≤ 36 Riffle substrate: <2mm (%) - ≤ 34 Poll frequency - ≥ 40 Residual Pool Depth (ft) - ≥ 1.5 Width; Depth Ratio - 6-11 Median pool tailout surface fines < 6 mm (%) - ≤ 48 Woody Vegetation Extent (%) - ≥ 69 MMI - ≥ 48 RIVPACS O/E - 0.8 Entrenchment Ratio - ≥ 2.2 Pool Extent (%) - ≥ 19 Woody Debris Aggregate Extent (%) - ≥ 12	**Current Load (t/y) by Land Use Category:** Livestock Grazing - 1706 Silviculture - 748 Road Crossings - 54 **Total Current - 2508** **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing - 503 (67%) Silviculture - 219 (29%) Road Crossings - 32 (4%) **Total Anthropogenic:** 754 **Naturally Occurring (t/y):** 1754 **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from stable stream banks. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 1203 Hay Production - 529 Road Crossings - 22	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J

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Middle Blackfoot – Nevada Creek

78 TMDLs Completed
87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Warren Creek MT76F004-070	Sediment	**E Channel** Riffle substrate: <6mm (%) - ≤ 36 Riffle substrate: <2mm (%) - ≤ 34 Poll frequency - ≥ 40 Residual Pool Depth (ft) - ≥ 1.5 Width; Depth Ratio - 6-11 Median pool tailout surface fines < 6 mm (%) - ≤ 48 Woody Vegetation Extent (%) - ≥ 69 Pool Extent (%) - ≥ 19 Woody Debris Aggregate Extent (%) - ≥ 12	**Current Load (t/y) by Land Use Category:** Livestock Grazing - 101 Hay production - 9 Road Crossings - 288 **Total Current - 397** **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing - 17 (13%) Hay Production - 1 (1%) Road Crossings - 110 (86%) **Total Anthropogenic:** 128 **Naturally Occurring (t/y):** 269 **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from stable stream banks. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 77 Hay Production - 7 Road Crossings - 167	Section 9.1.4, Tables 9-10, 9-11 Appendix E

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Middle Blackfoot – Nevada Creek

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Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Monture Creek MT76F004-100	Sediment	**C Channel** Riffle substrate: <6mm (%) - ≤ 15 Riffle substrate: <2mm (%) - ≤ 11 McNeil Cores < 6.35 mm (%) ≤ 27 Pool Frequency (pools/mile) - ≥ 33 Residual Pool Depth (ft) - ≥ 2 Median W:D Ratio - 12-29 Median pool tailout surface fines < 6 mm - ≤ 20 McNeil Cores <2mm (%) - ≤ 15 McNeil Cores <.85 mm (%) - ≤ 6 Woody Vegetation Extent (%) - ≥ 84 MMI - ≥ 48 RIVPACS O/E - ≥ 0.8 Pool Extent (%) - ≥ 35 Woody Debris Aggregate Extent (%) - ≥ 8	**Current Load (t/y) by Land Use Category:** Livestock Grazing - 250 Silviculture - 998 Road Crossings - 312 **Total Current - 1560** **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing - 36 (11%) Silviculture - 146 (43%) Road Crossings - 160 (47%) **Total Anthropogenic:** 342 **Naturally Occurring (t/y):** 1218 **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from stable stream banks. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 213 Silviculture - 853 Road Crossings - 152	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J

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87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Blackfoot River (Nevada Creek to Monture Creek) MT76F001-031	Sediment	**C Channel** Riffle substrate: <6mm (%) - ≤ 10 Riffle substrate: <2mm (%) - ≤ 7 McNeil Cores < 6.35 mm (%) ≤ 27 Median pool tailout surface fines < 6 mm - ≤ 25	**Current Load (t/y) by Land Use Category:** Livestock Grazing - 5087 Hay Production - 3953 Silviculture - 2274 Road Crossings - 107 **Total Current** - 11421 **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing - 1127 (44%) Hay Production - 876 (34%) Silviculture - 504 (20%) Road Crossings - 54 (2%) **Total Anthropogenic (t/y):** 2560 **Naturally Occurring (t/y):** 8861 **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from vertical eroding bank extent. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 3960 Hay Production - 3078 Silviculture - 1771 Road Crossings - 53	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J

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Middle Blackfoot – Nevada Creek

78 TMDLs Completed
87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
	Nutrients	Total Phosphorus 0.02 mg/l Total Nitrogen 0.3 mg/l Summer Mean Benthic Chlorophyll-a 100 mg/m2 Maximum Benthic Chlorophyll-a 150 mg/m2	Presented as loading equation for TP and TN (X mg TP or TN/L) (Y cfs) (5.4) = TMDL for TP or TN (lbs/day) Where: X = Level IV ecoregional TP and TN growing season targets (0.02 mg TP/L, 0.3 mg TN/L)) Y = Stream flow (cfs) 5.4 = Unit conversion factor The respective TP TMDLs (Reductions) for Blackfoot River upstream of Nevada Creek: 25th percentile flow - 15.20 lbs/day (26%) 50th percentile flow - 17.57 lbs/day (0% - 35%) 75th percentile flow - 31.4 lbs/day (0% - 80%) Range of TP TMDLs (Reductions) for Blackfoot River at Bonner: 25th percentile flow - 19.4 – 59 lbs/day (26%) 50th percentile flow - 59 – 171 lbs/day (26%) 75th percentile flow - 171 – 1940 lbs/day (0% – 88%) The respective TN TMDLs (Reductions) for Blackfoot River upstream of Nevada Creek: 25th percentile flow - 288 lbs/day (1%) 50th percentile flow - 264 lbs/day (1%) 75th percentile flow - 467 lbs/day (1%) Range of TN TMDLs (Reductions) for Blackfoot River at Bonner: 25th percentile flow - 883 lbs/day (1%-11%) 50th percentile flow - 1187 lbs/day (1%-11%) 75th percentile flow - 2555 lbs/day (1%-11%) **Margin of Safety:** Implicit in TP and TN targets representing nutrient concentration goals based on ecoregional level IV reference streams; implicit in that growing season targets protective against excessive growing season aquatic life growth; implicit in use of TKN results with possible positive laboratory bias.	**WLA:** 0 **LA:** Composite allocation to the following sources: • Dissolved loads of TP and TN from subsurface irrigation return flows. • Naturally occurring particulate and dissolved loads of TP and TN in both streams and groundwater. • TP and TN loading from agricultural sources, principally livestock grazing, irrigated hay production, irrigation return flows, and livestock feeding. • Particulate bound TP and TN from road erosion. • Particulate bound TP and TN from timber harvest.	Section 9.3.1.4 Section 9.3.2.4. Tables 9-14, 9-15, 9-19 and 9-20
	Temperature	No Thermal Modification TMDL needed, not exceeding the narrative temperature standard.			Section 8.2.2.2

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87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Cottonwood Creek MT76F004-040	Sediment	C Channel Riffle substrate: <6mm (%) - ≤ 15 Riffle substrate: <2mm (%) - ≤ 11 McNeil Cores < 6.35 mm (%) ≤ 27 Pool Frequency (pools/mile) - ≥ 55 Residual Pool Depth (ft) - ≥ 2 Median W:D Ratio - 12-29 Median pool tailout surface fines < 6 mm - ≤ 20 McNeil Cores <2mm (%) - ≤ 15 McNeil Cores <.85 mm (%) - ≤ 6 Woody Vegetation Extent (%) - ≥ 84 Pool Extent (%) - ≥ 35 Woody Debris Aggregate Extent (%) - ≥ 8	**Current Load (t/y) by Land Use Category:** Livestock Grazing - 405 Hay Production - 162 Silviculture - 1054 Road Crossings - 388 **Total Current - 2009** **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing - 93 (16%) Hay Production - 37 (6%) Silviculture - 241 (41%) Road Crossings - 213 (37%) **Total Anthropogenic (t/y): 583** **Naturally Occurring (t/y): 1426** **Margin of Safety:** Implicit - High estimate of hillslope contributing area. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 313 Hay Production - 125 Silviculture - 813 Road Crossings - 175	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J

Enclosure 1
Middle Blackfoot – Nevada Creek

78 TMDLs Completed
87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Richmond Creek MT76F005-020	Sediment	B Channel Riffle substrate < 6 mm (%) - ≤ 20 Riffle substrate < 2 mm (%) - ≤ 10 MMI - ≥ 63 RIVPACS O/E - ≥ 0.8	**Current Load (t/y) by Land Use Category:** Silviculture - 5 Road Crossings - 18 **Total Current - 23** **Reductions (t/y & %) in current loading by Land Use Category:** Silviculture - 1 (6%) Road Crossings - 12 (94%) **Total Anthropogenic (t/y): 12** **Naturally Occurring (t/y): 11** **Margin of Safety:** Implicit - High estimate of hillslope contributing area. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 4 Road Crossings - 7	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J
West Fork Clearwater River MT76F005-040	Sediment	B Channel Riffle substrate < 6 mm (%) - ≤ 20 Riffle substrate < 2 mm (%) - ≤ 10 MMI - ≥ 63 RIVPACS O/E - ≥ 0.8	**Current Load (t/y) by Land Use Category:** Silviculture - 557 Road Crossings - 136 **Total Current - 693** **Reductions (t/y & %) in current loading by Land Use Category:** Silviculture - 90 (52%) Road Crossings - 85 (48%) **Total Anthropogenic (t/y): 175** **Naturally Occurring (t/y): 518** **Margin of Safety**: Implicit - High estimate of hillslope contributing area. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Silviculture - 467 Road Crossings - 51	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J

Enclosure 1
Middle Blackfoot – Nevada Creek

78 TMDLs Completed
87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Deer Creek MT76F005-030	Nutrients	Total Phosphorus - 0.01 mg/l Total Nitrogen - 0.33 mg/l Summer Mean Benthic Chlorophyll-a - 100 mg/m2 Maximum Benthic Chlorophyll-a - 150 mg/m2	**Presented as loading equation for TP and TN** (X mg TP or TN/L) (Y cfs) (5.4) = TMDL for TP or TN (lbs/day) Where: X = Level IV ecoregional TP and TN growing season targets (0.01 mg TP/L, 0.33 mg TN/L)) Y = Stream flow (cfs) 5.4 = Unit conversion factor Single Sample TP Result: 0.01 lbs/day Single Sample TN Result: 0.72 lbs/day **Margin of Safety:** Implicit in TP and TN targets representing nutrient concentration goals based on ecoregional level IV reference streams; implicit in that growing season targets protective against excessive growing season aquatic life growth; implicit in use of TKN results with possible positive laboratory bias.	**WLA:** 0 **LA:** Composite allocation to the following sources: • Dissolved loads of TP and TN from subsurface irrigation return flows. • Naturally occurring particulate and dissolved loads of TP and TN in both streams and groundwater. • TP and TN loading from agricultural sources, principally livestock grazing, irrigated hay production, irrigation return flows, and livestock feeding. • Particulate bound TP and TN from road erosion. • Particulate bound TP and TN from timber harvest.	Section 9.3.1.4 Section 9.3.2.4 Section 9.3.5
	Sediment	B Channel Riffle substrate < 6 mm (%) - ≤ 20 Riffle substrate < 2 mm (%) - ≤ 10 MMI - ≥ 63 RIVPACS O/E - ≥ 0.8	**Current Load (t/y) by Land Use Category:** Silviculture - 961 Roads - 438 **Total Current - 1399** **Reductions (t/y & %) in current loading by Land Use Category:** Silviculture - 148 (55%) Roads - 123 (45%) **Total Anthropogenic (t/y): 271** **Naturally Occurring (t/y):** 1128 **Margin of Safety**: Implicit - High estimate of hillslope contributing area. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Silviculture - 813 Road Crossings - 315	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J

Enclosure 1
Middle Blackfoot – Nevada Creek

78 TMDLs Completed
87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Blanchard Creek MT76F005-060	Sediment	B Channel Riffle substrate < 6 mm (%) - ≤ 20 Riffle substrate < 2 mm (%) - ≤ 10 MMI - ≥ 63 RIVPACS O/E - ≥ 0.8	**Current Load (t/y) by Land Use Category:** Livestock Grazing - 77 Silviculture - 35 Roads - 223 **Total Current - 335** **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing - 21 (14%) Silviculture - 7 (5%) Roads - 119 (81%) **Total Anthropogenic (t/y): 147** **Naturally Occurring (t/y): 188** **Margin of Safety**: Implicit - High estimate of hillslope contributing area. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 56 Silviculture - 29 Road Crossings - 104	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J

Enclosure 1
Middle Blackfoot – Nevada Creek

78 TMDLs Completed
87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
Blackfoot River (Monture Creek to Belmont Creek) MT76F001-032	Sediment	**C Channel** Riffle substrate: <6mm (%) - ≤ 10 Riffle substrate: <2mm (%) - ≤ 7 Median pool tailout surface fines < 6 mm - ≤ 25	**Current Load (t/y) by Land Use Category:** Livestock Grazing - 2907 Hay Production - 400 Rural Residential - 800 Roads - 784 **Total Current - 4891** **Reductions (t/y & %) in current loading by Land Use Category:** Livestock Grazing - 477 (50%) Hay Production - 64 (7%) Rural Residential - 127 (13%) Roads - 280 (30%) **Total Anthropogenic (t/y):** 948 **Naturally Occurring (t/y):** 3943 **Margin of Safety:** Implicit - High estimate of hillslope contributing area. High estimate of load from vertical eroding bank extent. **Daily Loads:** Apportioned according to SWAT-generated daily fraction of annual total. Mid-winter, peak runoff and mid-summer examples Appendix E, Table E-2.	**WLA:** 0 **LA:** Allowable loading (t/y) by land use category + naturally occurring from other sources. Livestock Grazing - 2430 Hay Production - 337 Rural Residential - 673 Road Crossings - 503	Section 9.1.4, Tables 9-10, 9-11 Appendix E Appendix J

Enclosure 1
Middle Blackfoot – Nevada Creek

78 TMDLs Completed
87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA LA	Supporting Documentation
	Nutrients	Total Phosphorus 0.02 mg/l Total Nitrogen 0.3 mg/l Summer Mean Benthic Chlorophyll-a 100 mg/m2 Maximum Benthic Chlorophyll-a 150 mg/m2	Presented as loading equation for TP and TN (X mg TP or TN/L) (Y cfs) (5.4) = TMDL for TP or TN (lbs/day) Where: X = Level IV ecoregional TP and TN growing season targets (0.02 mg TP/L, 0.3 mg TN/L)) Y = Stream flow (cfs) 5.4 = Unit conversion factor **The respective TP TMDLs (Reductions) for Blackfoot River upstream of Nevada Creek:** 25th percentile flow - 15.20 lbs/day (26%) 50th percentile flow - 17.57 lbs/day (0% - 35%) 75th percentile flow - 31.4 lbs/day (0% - 80%) **Range of TP TMDLs (Reductions) for Blackfoot River at Bonner:** 25th percentile flow - 19.4 – 59 lbs/day (26%) 50th percentile flow - 59 – 171 lbs/day (26%) 75th percentile flow - 171 – 1940 lbs/day (0% – 88%) **The respective TN TMDLs (Reductions) for Blackfoot River upstream of Nevada Creek:** 25th percentile flow - 288 lbs/day (1%) 50th percentile flow - 264 lbs/day (1%) 75th percentile flow - 467 lbs/day (1%) **Range of TN TMDLs (Reductions) for Blackfoot River at Bonner:** 25th percentile flow - 883 lbs/day (1%-11%) 50th percentile flow - 1187 lbs/day (1%-11%) 75th percentile flow - 2555 lbs/day (1%-11%) Margin of Safety: Implicit in TP and TN targets representing nutrient concentration goals based on ecoregional level IV reference streams; implicit in that growing season targets protective against excessive growing season aquatic life growth; implicit in use of TKN results with possible positive laboratory bias.	**WLA:** 0 **LA:** Composite allocation to the following sources: • Dissolved loads of TP and TN from subsurface irrigation return flows. • Naturally occurring particulate and dissolved loads of TP and TN in both streams and groundwater. • TP and TN loading from agricultural sources, principally livestock grazing, irrigated hay production, irrigation return flows, and livestock feeding. • Particulate bound TP and TN from road erosion. • Particulate bound TP and TN from timber harvest.	Section 9.3.1.4 Section 9.3.2.4. Tables 9-14, 9-15, 9-19 and 9-20

Enclosure 1
Middle Blackfoot – Nevada Creek

78 TMDLs Completed
87 waterbody / pollutant combinations addressed by the TMDLs

Water Body Name and Tracking #	TMDL Pollutant Type	Water Quality Goal/Endpoint	TMDL	WLA	LA	Supporting Documentation
	Water Temperature	No Thermal Modification TMDL needed, not exceeding the narrative temperature standard.				Section 8.2.2.3

ENCLOSURE 2

EPA REGION VIII TMDL REVIEW

TMDL Document Info:

Document Name:	**Middle Blackfoot-Nevada Creek TMDLs and Water Quality Improvement Plan**
Submitted by:	**Montana Department of Environmental Quality**
Date Received:	**August 29, 2008**
Review Date:	**September 19, 2008**
Reviewer:	**Ron Steg**
Rough Draft / Public Notice / Final Draft?	**Final**
Notes:	**This review addresses TMDLs presented in the subject document for sediment, nutrients, temperature, and metals.**

Reviewers Final Recommendation(s) to EPA Administrator (used for final draft review only):

- ☒ Approve
- ☐ Partial Approval
- ☐ Disapprove
- ☐ Insufficient Information

Approval Notes to Administrator: Based on the review presented below, I recommend approval of the TMDLs submitted in this document.

This document provides a standard format for EPA Region 8 to provide comments to state TMDL programs on TMDL documents submitted to EPA for either formal or informal review. All TMDL documents are evaluated against the minimum submission requirements and TMDL elements identified in the following 8 sections:

1. Problem Description
   - 1.1. .TMDL Document Submittal Letter
   - 1.2. Identification of the Waterbody, Impairments, and Study Boundaries
   - 1.3. Water Quality Standards
2. Water Quality Target
3. Pollutant Source Analysis
4. TMDL Technical Analysis
   - 4.1. Data Set Description
   - 4.2. Waste Load Allocations (WLA)
   - 4.3. Load Allocations (LA)
   - 4.4. Margin of Safety (MOS)
   - 4.5. Seasonality and variations in assimilative capacity
5. Public Participation
6. Monitoring Strategy
7. Restoration Strategy
8. Daily Loading Expression

Under Section 303(d) of the Clean Water Act, waterbodies that are not attaining one or more water quality standard (WQS) are considered "impaired." When the cause of the impairment is determined to be a pollutant, a TMDL analysis is required to assess the appropriate maximum allowable pollutant loading rate. A TMDL document consists of a technical analysis conducted to: (1) assess the maximum pollutant loading rate that a waterbody is able to assimilate while maintaining water quality standards; and (2) allocate that assimilative capacity among the known sources of that pollutant. A well written TMDL document will describe a path forward that may be used by those who implement the TMDL recommendations to attain and maintain WQS.

Each of the following sections describe the rationale that EPA Region 8 staff uses when reviewing TMDL documents. Also included in each section is a list of EPA's minimum submission requirements relative to that section, a brief summary of the EPA reviewer's findings, and the reviewer's comments and/or suggestions. Use of the verb "must" in the minimum submission requirements denotes information that is required to be submitted because it relates to elements of the TMDL required by the CWA and by regulation. Use of the term "should" below denotes information that is generally necessary for EPA to determine if a submitted TMDL is approvable.

This review template is intended to ensure compliance with the Clean Water Act and that the reviewed documents are technically sound and the conclusions are technically defensible.

1.0 Problem Description

A TMDL document needs to provide a clear explanation of the problem it is intended to address. Included in that description should be a definitive portrayal of the physical boundaries to which the TMDL applies, as well as a clear description of the impairments that the TMDL intends to address and the associated pollutant(s) causing those impairments. While the existence of one or more impairment and stressor may be known, it is important that a comprehensive evaluation of the water quality be conducted prior to development of the TMDL to ensure that all water quality problems and associated stressors are identified. Typically, this step is conducted prior to the 303(d) listing of a waterbody through the monitoring and assessment program. The designated uses and water quality criteria for the waterbody should be examined against available data to provide an evaluation of the water quality relative to all applicable water quality standards. If, as part of this exercise, additional WQS problems are discovered and additional stressor pollutants are identified, consideration should be given to concurrently evaluating TMDLs for those additional pollutants. If it is determined that insufficient data is available to make such an evaluation, this should be noted in the TMDL document.

1.1 TMDL Document Submittal Letter

When a TMDL document is submitted to EPA requesting formal comments or a final review and approval, the submittal package should include a letter identifying the document being submitted and the purpose of the submission.

Minimum Submission Requirements:

☒ A TMDL submittal letter should be included with each TMDL document submitted to EPA requesting a formal review.

☒ The submittal letter should specify whether the TMDL document is being submitted for initial review and comments, public review and comments, or final review and approval.

☒ Each TMDL document submitted to EPA for final review and approval should be accompanied by a submittal letter that explicitly states that the submittal is a final TMDL submitted under Section 303(d) of the Clean Water

Act for EPA review and approval. This clearly establishes the State's/Tribe's intent to submit, and EPA's duty to review, the TMDL under the statute. The submittal letter should contain such identifying information as the name and location of the waterbody and the pollutant(s) of concern, which matches similar identifying information in the TMDL document for which a review is being requested.

Recommendation:
☒ Approve ☐ Partial Approval ☐ Disapprove ☐ Insufficient Information

Summary and Comments: An adequate cover letter transmitting the final Middle Blackfoot-Nevada Creek TMDLs has been provided. Note that DEQ originally submitted this document on March 3, 2008. The March 3 document has been withdrawn and replaced by the subject August 2008 document.

1.2 Identification of the Waterbody, Impairments, and Study Boundaries

The TMDL document should provide an unambiguous description of the waterbody to which the TMDL is intended to apply and the impairments the TMDL is intended to address. The document should also clearly delineate the physical boundaries of the waterbody and the geographical extent of the watershed area studied. Any additional information needed to tie the TMDL document back to a current 303(d) listing should also be included.

Minimum Submission Requirements:

☒ The TMDL document should clearly identify the pollutant and waterbody segment(s) for which the TMDL is being established. If the TMDL document is submitted to fulfill a TMDL development requirement for a waterbody on the state's current EPA approved 303(d) list, the TMDL document submittal should clearly identify the waterbody and associated impairment(s) as they appear on the State's/Tribe's current EPA approved 303(d) list, including a full waterbody description, assessment unit/waterbody ID, and the priority ranking of the waterbody. This information is necessary to ensure that the administrative record and the national TMDL tracking database properly link the TMDL document to the 303(d) listed waterbody and impairment(s).

☒ One or more maps should be included in the TMDL document showing the general location of the waterbody and, to the maximum extent practical, any other features necessary and/or relevant to the understanding of the TMDL analysis, including but not limited to: watershed boundaries, locations of major pollutant sources, major tributaries included in the analysis, location of sampling points, location of discharge gauges, land use patterns, and the location of nearby waterbodies used to provide surrogate information or reference conditions. Clear and concise descriptions of all key features and their relationship to the waterbody and water quality data should be provided for all key and/or relevant features not represented on the map

☐ If information is available, the waterbody segment to which the TMDL applies should be identified/geo-referenced using the National Hydrography Dataset (NHD). If the boundaries of the TMDL do not correspond to the Waterbody ID(s) (WBID), Entity_ID information or reach code (RCH_Code) information should be provided. If NHD data is not available for the waterbody, an alternative geographical referencing system that unambiguously identifies the physical boundaries to which the TMDL applies may be substituted.

Recommendation:
☒ Approve ☐ Partial Approval ☐ Disapprove ☐ Insufficient Information

Summary and Comments: The waterbody/pollutant combinations addressed in the Middle Blackfoot-Nevada Creek TMDL document are summarized in Table 1 (appended to the end of this document) and are clearly described in the subject document. The number of TMDLs developed and the pollutants for which they were developed are summarized below:

Middle Blackfoot – Nevada Creek TMDL Count

Number of TMDLs:	78
Number of Waterbody/Pollutant Combinations addressed by TMDLs:	87
Number of Sediment TMDLs:	31
Number of Metals TMDLs:	6
Number of Temperature TMDLs:	7
Number of TN TMDLs:	17
Number of TP TMDLs:	17

The waterbodies addressed by the sediment, nutrient, temperature, and metals TMDLS are listed in Tables 2, 3, 4, and 5, respectively (these tables are appended to the end of this document). The waterbody segments are not referenced to the NHD within the subject document. However, MTDEQ's internal databases do link between their waterbody ID and NHD.

1.3 Water Quality Standards

TMDL documents should provide a complete description of the water quality standards for the waterbodies addressed, including a listing of the designated uses and an indication of whether the uses are being met, not being met, or not assessed. If a designated use was not assessed as part of the TMDL analysis (or not otherwise recently assessed), the documents should provide a reason for the lack of assessment (e.g., sufficient data was not available at this time to assess whether or not this designated use was being met).

Water quality criteria (WQC) are established as a component of water quality standard at levels considered necessary to protect the designated uses assigned to that waterbody. WQC identify quantifiable targets and/or qualitative water quality goals which, if attained and maintained, are intended to ensure that the designated uses for the waterbody are protected. TMDLs result in maintaining and attaining water quality standards by determining the appropriate maximum pollutant loading rate to meet water quality criteria, either directly, or through a surrogate measurable target. The TMDL document should include a description of all applicable water quality criteria for the impaired designated uses and address whether or not the criteria are being attained, not attained, or not evaluated as part of the analysis. If the criteria were not evaluated as part of the analysis, a reason should be cited (e.g. insufficient data were available to determine if this water quality criterion is being attained).

Minimum Submission Requirements:

Minimum Submission Requirements	Sediment	Temperature	Nutrients	Metals
The TMDL must include a description of the applicable State/Tribal water quality standard, including the designated use(s) of the waterbody, the applicable numeric or narrative water quality criterion, and the anti-degradation policy. (40 C.F.R. §130.7(c)(1)).	√	√	√	√
The purpose of a TMDL analysis is to determine the assimilative capacity of the waterbody that corresponds to the existing water quality standards for that waterbody, and to allocate that assimilative capacity between the significant sources. Therefore, all TMDL documents must be written to meet the existing water quality standards for that waterbody (CWA §303(d)(1)(C)). *Note: In some circumstances, the load reductions determined to be necessary by the TMDL analysis may prove to be infeasible and may possibly indicate that the existing water quality standards and/or assessment methodologies may be erroneous. However, the TMDL must still be determined based on existing water quality standards. Adjustments to water quality standards and/or assessment methodologies may be evaluated separately, after the completion of the TMDL.*	√	√	√	√
The TMDL document should describe the relationship between the pollutant of concern and the water quality standard the pollutant load is intended to meet. This information is necessary for EPA to evaluate whether or not attainment of the prescribed pollutant loadings will result in attainment of the water quality standard in question.	√	√	√	√
If a standard includes multiple criteria for the pollutant of concern, the document should demonstrate that the TMDL value will result in attainment of all related criteria for the pollutant. For example, both acute and chronic values (if present in the WQS) should be addressed in the document, including consideration of magnitude, frequency and duration requirements.	NA	NA	NA	√

Recommendation:

Recommendation	Sediment	Temperature	Nutrients	Metals
Approve	√	√	√	√
Partial Approval				
Disapprove				
Insufficient Information				

Summary and Comments: The Middle Blackfoot-Nevada Creek TMDL document includes a description of all applicable water quality standards associated with sediment, temperature, nutrients, and metals and addresses whether or not the criteria are being attained, not attained, or not evaluated.

2.0 Water Quality Targets

TMDL analyses establish numeric targets that are used to determine whether water quality standards are being achieved. Quantified water quality targets or endpoints should be provided to evaluate each listed pollutant/water body combination addressed by the TMDL, and should represent achievement of applicable water quality standards and support of associated beneficial uses. For pollutants with numeric water quality standards, the numeric criteria are generally used as the water quality target. For pollutants with narrative standards, the narrative standard should be translated into a measurable value. At a minimum, one target is required for each pollutant/water body combination. It is generally desirable, however, to include several targets that represent achievement of the standard and support of beneficial uses (e.g., for a sediment impairment issue it may be appropriate to include a variety of targets representing water column sediment such as TSS, embeddeness, stream morphology, up-slope conditions and a measure of biota).

Minimum Submission Requirements:

Minimum Submission Requirements	Sediment	Temperature	Nutrients	Metals
The TMDL should identify a numeric water quality target(s) for each waterbody pollutant combination. The TMDL target is a quantitative value used to measure whether or not the applicable water quality standard is attained. *Generally, the pollutant of concern and the numeric water quality target are, respectively, the chemical causing the impairment and the numeric criteria for that chemical (e.g., chromium) contained in the water quality standard. Occasionally, the pollutant of concern is different from the parameter that is the subject of the numeric water quality target (e.g., when the pollutant of concern is phosphorus and the numeric water quality target is expressed as a numerical dissolved oxygen criterion). In such cases, the TMDL should explain the linkage between the pollutant(s) of concern, and express the quantitative relationship between the TMDL target and pollutant of concern. In all cases, TMDL targets must represent the attainment of current water quality standards.*	√	√	√	√
When a numeric TMDL target is established to ensure the attainment of a narrative water quality criterion, the numeric target, the methodology used to determine the numeric target, and the link between the pollutant of concern and the narrative water quality criterion should all be described in the TMDL document. Any additional information supporting the numeric target and linkage should also be included in the document.	√	√	√	√

Recommendation:

Recommendation	Sediment	Temperature	Nutrients	Metals
Approve	√	√	√	√
Partial Approval				
Disapprove				
Insufficient Information				

Summary and Comments:

Sediment

Sediment targets are presented in Section 5.1 of the Middle Blackfoot-Nevada Creek TMDL document. A suite of targets and supplemental indicators have been established to represent Montana's narrative sediment standards. The targets have been stratified into three categories based on the linkage between the target parameter and beneficial use support: Tier 1, Tier 2, and Supplemental. In general terms, the Tier 1 targets must be met and the Tier 2 and Supplemental targets are used to provide supporting information in a weight of evidence approach. This approach provides a complicated, but, systematic/consistent means for the application of best professional judgment.

Nutrients

Nutrient targets are presented in Section 7.1. Montana's nutrient standards are currently narrative, but MDEQ is in the process of developing and formally adopting numeric nutrient criteria with an anticipated adoption date in late 2009 or early 2010. Given the timing of this TMDL document (i.e., while MDEQ is in the middle of adopting numeric nutrient criteria), the nutrient targets are considered interim values that may need to be revised in the future and compliance with the targets is currently considered voluntary. An adaptive management strategy to facilitate revision of the nutrient targets, TMDLs, and allocations is presented in Section 9.3.5.

Temperature

Temperature targets are presented in Section 8.1. A suite of surrogates indicators of temperature increases have been selected and applied on a case-by-case basis depending upon the source of thermal loading that need to be addressed. These include: woody vegetation extent, channel width to depth ratio, stream flow, and thermal loading. These surrogates are linked to the allowable increase in temperature above naturally occurring levels as specified in the applicable water quality standards.

Metals

Targets for the metals for which TMDLs have been developed (i.e., iron, aluminum, lead, copper) are presented in Table 2-6. Although this table includes acute and chronic aquatic life and human health criteria, the more protective chronic aquatic life criteria have been applied as the TMDL targets. The targets have been applied as a maximum value based on a single sample. This is a very conservative (i.e., protective) approach that goes above and beyond Montana's current standards and, theoretically, will ensure that the human health values and acute values are not exceeded.

3.0 Pollutant Source Analysis

A TMDL analysis is conducted when a pollutant load is known or suspected to be exceeding the loading capacity of the waterbody. Logically then, a TMDL analysis should consider all sources of the pollutant of concern in some manner. The detail provided in the source assessment step drives the rigor of the pollutant load allocation. In other words, it is only possible to specifically allocate quantifiable loads or load reductions to each significant source (or source category) when the relative load contribution from each source has been estimated. Therefore, the pollutant load from each significant source (or source category) should be identified and quantified to the maximum practical extent. This may be accomplished using site-specific monitoring data, modeling, or application of other assessment

techniques. If insufficient time or resources are available to accomplish this step, a phased/adaptive management approach can be employed so long as the approach is clearly defined in the document.

Minimum Submission Requirements:

Minimum Submission Requirements	Sediment	Temperature	Nutrients	Metals
The TMDL should include an identification of all potentially significant point and nonpoint sources of the pollutant of concern, including the geographical location of the source(s) and the quantity of the loading, e.g., lbs/per day. This information is necessary for EPA to evaluate the WLA, LA and MOS components of the TMDL.	√	√	√	
The level of detail provided in the source assessment should be commensurate with the nature of the watershed and the nature of the pollutant being studied. Where it is possible to separate natural background from nonpoint sources, the TMDL should include a description of both the natural background loads and the nonpoint source loads.	√	√	√	√
Natural background loads should not be assumed to be the difference between the sum of known and quantified anthropogenic sources and the existing *in situ* loads (e.g. measured in stream) unless it can be demonstrated that all significant anthropogenic sources of the pollutant of concern have been identified, characterized, and properly quantified.	√	√	√	√
The sampling data relied upon to discover, characterize, and quantify the pollutant sources should be included in the document (e.g. a data appendix) along with a description of how the data were analyzed to characterize and quantify the pollutant sources. A discussion of the known deficiencies and/or gaps in the data set and their potential implications should also be included.	√	√	√	√

Recommendation:

Recommendation	Sediment	Temperature	Nutrients	Metals
Approve	√	√	√	√
Partial Approval				
Disapprove				
Insufficient Information				

Summary and Comments:

Sediment

Potentially significant sediment sources considered in the Middle Blackfoot-Nevada Creek TPA include hill slope erosion, roads, stream bank erosion, and culvert failure. Hill slope erosion was quantified using SWAT in combination with a post processing methodology through which sediment delivery was assumed to occur only within 350 feet of the stream channel in areas with greater than a 3 percent slope. The BEHI method was employed to estimate loads from bank erosion. The Washington Forest Practices Board Watershed Assessment Methodology was applied to estimate loading from roads. Loading from culvert failure was estimated assuming a one percent annual failure rate with load estimates based on measurements from a sub-sample of the culverts within the TPA.

Nutrients

Source assessment data for the Middle Blackfoot-Nevada Creek TPA are limited. As a result, a preliminary source assessment was conducted based on a review of available aerial photography and readily available GIS data. The uncertainties associated with this approach are likely high but have been acknowledged and an adaptive management strategy is presented in Section 9.3.5 to address these uncertainties.

Temperature

Temperature source assessment is presented in Section 8.1.3. The following sources were considered: 1) alteration of flow by diversion or reservoir storage, 2) stream channel shade reduction caused by removal of woody riparian vegetation, 3) solar heating of impounded water surfaces, and, 4) alterations of stream geometry that increase the channel surface area exposed to air and sunlight.

Metals

Based on Section 6.3 (Metals Source Assessment) it appears that only a cursory source assessment has been conducted and it is presented only in narrative form without the inclusion of a map showing the geographic location of potential sources. The data relied upon in the source assessment have been cited (i.e., Hydrometrics, 2006) and are presented in Appendix F. Additional monitoring is proposed in Section 10.4.2.3 to provide a more comprehensive understanding of metals sources.

It was noted in the review of this document that conclusions presented in Section 6.3 appear to conflict with those presented in Section 9.2.1 (Approach to Metals Allocations). Section 6.3 states that "*A number of abandoned mines are present in the upper reach of Nevada Creek and several tributary drainages including...These mines could potentially function of sources of arsenic and other metals to area surface waters.*" Section 9.2.1 states that "*There are no known historic or current mining properties in upper Nevada Creek or its tributaries that involve or have involved physical or chemical ore processing that could be discrete sources for individual metals causing impairment.*" Based on discussion with Dean Yashan (personal communication on September 12, 2008), the conclusion reached in 9.2.1 is not in conflict with that presented in Section 6.3. Rather, the conclusion in Section 9.2.1 (i.e., that mining is not a significant source) was based on site reconnaissance conducted by, and the best professional judgment of, the project team.

In summary, in spite of the short comings of the metals source assessment, it is considered approvable given the fact that a gross allocation approach is used (see comments below under Load Allocation) which does not necessitate an in-depth understanding of specific sources, and the fact that additional

monitoring is proposed. Prior to implementation of these metals TMDLs, EPA strongly recommends additional monitoring and a more thorough source assessment to develop a better understanding of the potentially significant sources of metals and to verify the conclusion presented in Section 9.2.1.

4.0 TMDL Technical Analysis

TMDL determinations should be supported by a robust data set and an appropriate level of technical analysis. This applies to **all** of the components of a TMDL document. It is vitally important that the technical basis for **all** conclusions be articulated in a manner that is easily understandable and readily apparent to the reader.

A TMDL analysis determines the maximum pollutant loading rate that may be allowed to a waterbody without violating water quality standards. The TMDL analysis should demonstrate an understanding of the relationship between the rate of pollutant loading into the waterbody and the resultant water quality impacts. This stressor → response relationship between the pollutant and impairment and between the selected targets, sources, TMDLs, and load allocations needs to be clearly articulated and supported by an appropriate level of technical analysis. Every effort should be made to be as detailed as possible, and to base all conclusions on the best available scientific principles.

The pollutant loading allocation is at the heart of the TMDL analysis. TMDLs apportion responsibility for taking actions by allocating the available assimilative capacity among the various point, nonpoint, and natural pollutant sources. Allocations may be expressed in a variety of ways, such as by individual discharger, by tributary watershed, by source or land use category, by land parcel, or other appropriate scale or division of responsibility.

The pollutant loading allocation that will result in achievement of the water quality target is expressed in the form of the standard TMDL equation:

$$TMDL = \sum LAs + \sum WLAs + MOS$$

Where:

TMDL = Total Pollutant Loading Capacity of the waterbody

LAs = Pollutant Load Allocations

WLAs = Pollutant Wasteload Allocations

MOS = The portion of the Load Capacity allocated to the Margin of safety.

Minimum Submission Requirements:

Minimum Submission Requirements	Sediment	Temperature	Nutrients	Metals
A TMDL must identify the loading capacity of a waterbody for the applicable pollutant, taking into consideration temporal variations in that capacity. EPA regulations define loading capacity as the greatest amount of a pollutant that a water can receive without violating water quality standards (40 C.F.R. §130.2(f)).	√	√	√	
The total loading capacity of the waterbody should be clearly demonstrated to equate back to the pollutant load allocations through a balanced TMDL equation. In instances where numerous LA, WLA and seasonal TMDL capacities make expression in the form of an equation cumbersome, a table may be substituted as long as it is clear that the total TMDL capacity equates to the sum of the allocations.	√	√	√	√
The TMDL document should describe the methodology and technical analysis used to establish and quantify the cause-and-effect relationship between the numeric target and the identified pollutant sources. In many instances, this method will be a water quality model.	√	√	√	√
It is necessary for EPA staff to be aware of any assumptions used in the technical analysis to understand and evaluate the methodology used to derive the TMDL value and associated loading allocations. Therefore, the TMDL document should contain a description of any important assumptions (including the basis for those assumptions) made in developing the TMDL, including but not limited to: (1) the spatial extent of the watershed in which the impaired waterbody is located and the spatial extent of the TMDL technical analysis; (2) the distribution of land use in the watershed (e.g., urban, forested, agriculture); (3) a presentation of relevant information affecting the characterization of the pollutant of concern and its allocation to sources such as population characteristics, wildlife resources, industrial activities etc...; (4) present and future growth trends, if taken into consideration in determining the TMDL and preparing the TMDL document (e.g., the TMDL could include the design capacity of an existing or planned wastewater treatment facility); (5) an explanation and analytical basis for expressing the TMDL through surrogate measures, if applicable. Surrogate measures are parameters such as percent fines and turbidity for sediment impairments; chlorophyll *a* and phosphorus loadings for excess algae; length of riparian buffer; or number of acres of best management practices.	√	√	√	√
The TMDL document should contain documentation supporting the TMDL analysis, including an inventory of the data set used, a description of the methodology used to analyze the data, a discussion of strengths and weaknesses in the analytical process, and the results from any water quality modeling used. This information is necessary for EPA to review the loading capacity determination, and the associated load, wasteload, and margin of safety allocations.	√	√	√	√
TMDLs must take critical conditions (e.g., steam flow, loading, and water quality parameters, seasonality, etc...) into account as part of the analysis of loading capacity (40 C.F.R. §130.7(c)(1)). TMDLs should define applicable critical conditions and describe the approach used to determine both point and nonpoint source loadings under such critical conditions. In particular, the document should discuss the approach used to compute and allocate nonpoint source loadings, e.g., meteorological conditions and land use distribution.	√	√	√	√
Where both nonpoint sources and NPDES permitted point sources are included in the TMDL loading allocation, and attainment of the TMDL target depends on reductions in				

the nonpoint source loads, the TMDL document must include a demonstration that nonpoint source loading reductions needed to implement the load allocations are actually practicable [40 CFR 130.2(i) and 122.44(d)].				

Recommendation:

Recommendation	Sediment	Temperature	Nutrients	Metals
Approve	√	√	√	√
Partial Approval				
Disapprove				
Insufficient Information				

Summary and Comments:

Sediment

An adequate technical analysis has been completed. Summary information is presented in the main body of the document and supporting analyses/data are presented in appendices. It should be noted, however, that organization of this document is poor and the document is difficult to read/follow. Also, the technical analysis that has been performed may be more complicated than necessary. For example, sufficient analysis was completed (Sections 9.1.1 though 9.1.5) to calculate the TMDL and allocations when source specific loads and controllable loads were calculated for hill slope erosion, stream bank erosion, road crossings, and culvert failure. However, the analysis was complicated when additional work was then completed to allocate to a complete different set of source categories (i.e., grazing, hay production, silviculture, placer mining, etc.).

Nutrients

An adequate technical analysis has been performed. Given the lack of available data, uncertainties associated with the analysis are likely high but have been acknowledged and an adaptive management strategy is presented in Section 9.3.5 to address these uncertainties.

Temperature

An adequate technical analysis has been performed. The SNTEMP model was applied to evaluate a variety of scenarios in consideration of the sources that exist, the naturally occurring condition, and the applicable water quality standards. Further, uncertainties are acknowledged and an adaptive management strategy is provided in Section 8.1.6 to address them.

Metals

The metals technical analysis is based on limited data and a cursory level of analysis. However, a phased approach has been used where additional data collection and analysis are recommended in Section 10.4.2.3. EPA strongly recommends implementation of the additional data collection prior to implementation and/or as the first step in implementing the metals TMDLs.

4.1 Data Set Description

TMDL documents should include a thorough description and summary of all available water quality data that are relevant to the water quality assessment and TMDL analysis. An inventory of the data used for the TMDL analysis should be provided to document, for the record, the data used in decision making. This also provides the reader with the opportunity to independently review the data. The TMDL analysis should make use of all readily available data for the waterbody under analysis unless the TMDL writer determines that the data are not relevant or appropriate. For relevant data that were known but rejected, an explanation of why the data were not utilized should be provided (e.g., samples exceeded holding times, data collected prior to a specific date were not considered timely, etc...).

Minimum Submission Requirements:

Minimum Submission Requirements	Sediment	Temperature	Nutrients	Metals
TMDL documents should include a thorough description and summary of all available water quality data that are relevant to the water quality assessment and TMDL analysis such that the water quality impairments are clearly defined and linked to the impaired beneficial uses and appropriate water quality criteria.	√	√	√	√
The TMDL document submitted should be accompanied by the data set utilized during the TMDL analysis. If possible, it is preferred that the data set be provided in an electronic format and referenced in the document. If electronic submission of the data is not possible, the data set may be included as an appendix to the document.	√	√	√	√

Recommendation:

Recommendation	Sediment	Temperature	Nutrients	Metals
Approve	√	√	√	√
Partial Approval				
Disapprove				
Insufficient Information				

Summary and Comments: The data and technical analyses for all four pollutants addressed are summarized in the main body of the document and presented in the appendices.

4.2 Waste Load Allocations (WLA):

Waste Load Allocations represent point source pollutant loads to the waterbody. Point source loads are typically better understood and more easily monitored and quantified than nonpoint source loads. Whenever practical, each point source should be given a separate waste load allocation. All NPDES permitted dischargers that discharge the pollutant under analysis directly to the waterbody should be identified and given separate waste load allocations. The finalized WLAs are required to be incorporated into future NPDES permit renewals.

Minimum Submission Requirements:

Minimum Submission Requirements	Sediment	Temperature	Nutrients	Metals
EPA regulations require that a TMDL include WLAs for all significant and/or NPDES permitted point sources of the pollutant. TMDLs must identify the portion of the loading capacity allocated to individual existing and/or future point source(s) (40 C.F.R. §130.2(h), 40 C.F.R. §130.2(i)). In some cases, WLAs may cover more than one discharger, e.g., if the source is contained within a general permit. If no allocations are to be made to point sources, then the TMDL should include a value of zero for the WLA.	NA	NA	NA	NA
All NPDES permitted dischargers given WLA as part of the TMDL should be identified in the TMDL, including the specific NPDES permit numbers, their geographical locations, and their associated waste load allocations.	NA	NA	NA	NA

Recommendation:

Recommendation	Sediment	Temperature	Nutrients	Metals
Approve				
Partial Approval				
Disapprove				
Insufficient Information				
No Action	√	√	√	√

Summary and Comments: There are no permanent point sources in the Middle Blackfoot – Nevada Creek TPA.

4.3 Load Allocations (LA):

Load allocations include the nonpoint source, natural, and background loads. These types of loads are typically more difficult to quantify than point source loads, and may include a significant degree of uncertainty. Often it is necessary to group these loads into larger categories and estimate the loading rates based on limited monitoring data and/or modeling results. The background load represents a composite of all upstream pollutant loads into the waterbody. In addition to the upstream nonpoint and upstream natural load, the background load often includes upstream point source loads that are not given specific waste load allocations in this particular TMDL analysis. In instances where nonpoint source loading rates are particularly difficult to quantify, a performance-based allocation approach, in which a detailed monitoring plan and adaptive management strategy are employed for the application of BMPs, may be appropriate.

Minimum Submission Requirements:

Minimum Submission Requirements	Sediment	Temperature	Nutrients	Metals
EPA regulations require that TMDL expressions include LAs which identify the portion of the loading capacity attributed to nonpoint sources and to natural background. Load allocations may range from reasonably accurate estimates to gross allotments (40 C.F.R. §130.2(g)). Load allocations may be included for both existing and future nonpoint source loads. Where possible, load allocations should be described separately for natural background and nonpoint sources.	√	√	√	√
Load allocations assigned to natural background loads should not be assumed to be the difference between the sum of known and quantified anthropogenic sources and the existing *in situ* loads (e.g., measured in stream) unless it can be demonstrated that all significant anthropogenic sources of the pollutant of concern have been identified and given proper load or waste load allocations.	√	√	√	√

Recommendation:

Recommendation	Sediment	Temperature	Nutrients	Metals
Approve	√	√	√	√
Partial Approval				
Disapprove				
Insufficient Information				
No Action				

Summary and Comments:

Sediment

DEQ has chosen to allocate to land uses and appears to have done so appropriately. The minimum submission requirements have been met. However, while this may be more practical from an implementation perspective, it has complicated the technical analysis and likely resulted in more work than necessary.

Nutrients

The temperature TMDLs have been allocated to the significant sources of thermal loading and/or surrogates ~~that affect~~ thermal loading.

Temperature

The temperature TMDLs have been allocated to the significant sources of thermal loading and/or surrogates that affect thermal loading.

Metals

Given the limited data and cursory level of source assessment, a gross allocation approach has been applied for the metals TMDLs. Further study will be necessary to direct implementation of this TMDL.

4.4 Margin of Safety (MOS):

Natural systems are inherently complex. Any mathematical relationship used to quantify the stressor → response relationship between pollutant loading rates and the resultant water quality impacts, no matter how rigorous, will include some level of uncertainty and error. To compensate for this uncertainty and ensure water quality standards will be attained, a margin of safety is required as a component of each TMDL. The MOS may take the form of a explicit load allocation (e.g., 10 lbs/day), or may be implicitly built into the TMDL analysis through the use of conservative assumptions and values for the various factors that determine the TMDL pollutant load → water quality effect relationship. Whether explicit or implicit, the MOS should be supported by an appropriate level of discussion that addresses the level of uncertainty in the various components of the TMDL technical analysis, the assumptions used in that analysis, and the relative effect of those assumptions on the final TMDL. The discussion should demonstrate that the MOS used is sufficient to ensure that the water quality standards would be attained if the TMDL pollutant loading rates are met. In cases where there is substantial uncertainty regarding the linkage between the proposed allocations and achievement of water quality standards, it may be necessary to employ a phased or adaptive management approach (e.g., establish a monitoring plan to determine if the proposed allocations are, in fact, leading to the desired water quality improvements).

Minimum Submission Requirements:

Minimum Submission Requirements	Sediment	Temperature	Nutrients	Metals
TMDLs must include a margin of safety (MOS) to account for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)). EPA's 1991 TMDL Guidance explains that the MOS may be implicit (i.e., incorporated into the TMDL through conservative assumptions in the analysis) or explicit (i.e., expressed in the TMDL as loadings set aside for the MOS).	√	√	√	√
If the MOS is implicit, the conservative assumptions in the analysis that account for the MOS should be identified and described. The document should discuss why the assumptions are considered conservative and the effect of the assumption on the final TMDL value determined.	√		√	√
If the MOS is explicit, the loading set aside for the MOS should be identified. The document should discuss how the explicit MOS chosen is related to the uncertainty and/or potential error in the linkage analysis between the WQS, the TMDL target, and the TMDL loading rate.				
If, rather than an explicit or implicit MOS, the TMDL relies upon a phased approach to deal with large and/or unquantifiable uncertainties in the linkage analysis, the document should include a description of the planned phases for the TMDL as well as a monitoring plan and adaptive management strategy.		√		

Recommendation:

Recommendation	Sediment	Temperature	Nutrients	Metals
Approve	√	√	√	√
Partial Approval				
Disapprove				
Insufficient Information				
No Action				

Summary and Comments:

Sediment

The document provides an implicit margin of safety through conservative assumptions and the use of an adaptive management strategy.

Nutrients

An adaptive management strategy has been presented in Section 9.3.5 to address uncertainties and to facilitate revision of all aspects of the nutrient TMDLs, if necessary/appropriate.

Temperature

A margin of safety has been provided by focusing the analysis on, and establishing allocations based on the warmest period of the year. Additionally, an adaptive management strategy is provided to address uncertainties.

Metals

A margin of safety has been provided through conservatively using the chronic aquatic life criteria for targets (i.e., more protective than specifically required by Montana's standards) and an adaptive management strategy to address uncertainties and provide a feedback loop for taking corrective action in the future.

4.5 Seasonality and variations in assimilative capacity:

The TMDL relationship is a factor of both the loading rate of the pollutant to the waterbody and the amount of pollutant the waterbody can assimilate and still attain water quality standards. Water quality standards often vary based on seasonal considerations. Therefore, it is appropriate that the TMDL analysis consider seasonal variations, such as critical flow periods (high flow, low flow), when establishing TMDLs, targets, and allocations.

Minimum Submission Requirements:

Minimum Submission Requirements	Sediment	Temperature	Nutrients	Metals
The statute and regulations require that a TMDL be established with consideration of seasonal variations. The TMDL must describe the method chosen for including seasonal variability as a factor. (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)).	√	√	√	√

Recommendation:

Recommendation	Sediment	Temperature	Nutrients	Metals
Approve	√	√	√	√
Partial Approval				
Disapprove				
Insufficient Information				
No Action				

Summary and Comments:

Sediment

The annual approach is appropriate for the situation, and, the daily approach that is presented in Section 9.1.8 addresses natural variations that occur throughout the year.

Nutrients

The TMDLs presented in this document are flow-based. In other words, they vary based on flow. Also, to be conservative given the limited data, lower summer (i.e., growing season) nutrient targets are applied for the entire year.

Temperature

Seasonality was addressed conservatively by focusing the analysis on, and establishing allocations based on the warmest period of the year

Metals

Seasonality was addressed by providing flow-based TMDLs.

5.0 Public Participation

EPA regulations require that the establishment of TMDLs be conducted in a process open to the public, and that the public be afforded an opportunity to participate. To meaningfully participate in the TMDL process it is necessary that stakeholders, including members of the general public, be able to understand the problem and the proposed solution. TMDL documents should include language that explains the issues to the general public in understandable terms, as well as provides additional detailed technical information for the scientific community. Notifications or solicitations for comments regarding the TMDL should be made available to the general public, widely circulated, and clearly identify the product as a TMDL and the fact that it will be submitted to EPA for review. When the final TMDL is submitted to EPA for approval, a copy of the comments received by the state and the state responses to those comments should be included with the document.

Minimum Submission Requirements:

☒ The TMDL must include a description of the public participation process used during the development of the TMDL (40 C.F.R. §130.7(c)(1)(ii)).

☒ TMDLs submitted to EPA for review and approval should include a summary of significant comments and the State's/Tribe's responses to those comments.

Recommendation:

☒ Approve ☐ Partial Approval ☐ Disapprove ☐ Insufficient Information

Summary and Comments: The public participation process for all pollutants considered in the subject document is summarized in Section 10.0 and comments and responses associated with the Draft TMDL document are included in Appendix P.

6.0 Monitoring Strategy

TMDLs may have significant uncertainty associated with the selection of appropriate numeric targets and estimates of source loadings and assimilative capacity. In these cases, a phased TMDL approach may be necessary. For Phased TMDLs, it is EPA's expectation that a monitoring plan will be included as a component of the TMDL document to articulate the means by which the TMDL will be evaluated in the field, and to provide for future supplemental data that will address any uncertainties that may exist when the document is prepared.

Minimum Submission Requirements:

Minimum Submission Requirements	Sediment	Temperature	Nutrients	Metals
When a TMDL involves both NPDES permitted point source(s) and nonpoint source(s) allocations, and attainment of the TMDL target depends on reductions in the nonpoint source loads, the TMDL document should include a monitoring plan that describes the additional data to be collected to determine if the load reductions provided for in the TMDL are occurring.				
Under certain circumstances, a phased TMDL approach may be utilized when limited existing data are relied upon to develop a TMDL, and the State believes that the use of additional data or data based on better analytical techniques would likely increase the accuracy of the TMDL load calculation and merit development of a second phase	√	√	√	√

TMDL. EPA recommends that a phased TMDL document or its implementation plan include a monitoring plan and a scheduled timeframe for revision of the TMDL. These elements would not be an intrinsic part of the TMDL and would not be approved by EPA, but may be necessary to support a rationale for approving the TMDL. http://www.epa.gov/owow/tmdl/tmdl_clarification_letter.pdf				

Recommendation:

Recommendation	Sediment	Temperature	Nutrients	Metals
Approve	√	√	√	√
Partial Approval				
Disapprove				
Insufficient Information				
No Action				

Summary and Comments:

Sediment

A monitoring strategy is presented in Section 10.0. Much of the proposed monitoring is intended to validate the basic assumption that implementation of the load allocations will result in attainment of water quality standards.

Nutrients

Development and implementation of a detailed monitoring strategy is proposed in Section 9.3.5 to:

- Better characterize current water quality and discharge conditions in the tributaries, Nevada Creek, Nevada Creek Reservoir, and the Blackfoot River;
- Develop a better understanding of the connection between groundwater and surface waters, especially downstream of Nevada Creek Reservoir;
- Develop a water balance for the entire Nevada Creek watershed so that actual flow conditions are known and possible flow management options can be considered for all tributaries;
- Compile sufficient data such that a watershed loading and stream/lake response model can be set-up and calibrated; and better define nutrient source loadings.

Temperature

An adaptive management strategy is provided in Section 9.5 and linked to the overall monitoring strategy provided in Section 10.0.

Metals

An adaptive management strategy is discussed in Section 9.2.5 and linked to the overall monitoring strategy provided in Section 10.0.

7.0 Restoration Strategy

The overall purpose of the TMDL analysis is to determine what actions are necessary to ensure that the pollutant load in a waterbody does not result in water quality impairment. Adding additional detail regarding the proposed approach for the restoration of water quality is not currently a regulatory requirement, but is considered a value added component of a TMDL document. During the TMDL analytical process, information is often gained that may serve to point restoration efforts in the right direction and help ensure that resources are spent in the most efficient manner possible. For example, watershed models used to analyze the linkage between the pollutant loading rates and resultant water quality impacts might also be used to conduct "what if" scenarios to help direct BMP installations to locations that provide the greatest pollutant reductions. Once a TMDL has been written and approved, it is often the responsibility of other water quality programs to see that it is implemented. The level of quality and detail provided in the restoration strategy will greatly influence the future success in achieving the needed pollutant load reductions.

Minimum Submission Requirements:

☒ EPA is not required to and does not approve TMDL implementation plans. However, in cases where a WLA is dependent upon the achievement of a LA, "reasonable assurance" is required to demonstrate the necessary LA called for in the document is practicable). A discussion of the BMPs (or other load reduction measures) that are to be relied upon to achieve the LA(s), and programs and funding sources that will be relied upon to implement the load reductions called for in the document, may be included in the implementation/restoration section of the TMDL document to support a demonstration of "reasonable assurance".

Recommendation:

☐ Approve ☐ Partial Approval ☐ Disapprove ☐ Insufficient Information ☒ No-action

Summary and Comments: Although not required, a detailed restoration strategy is provided in Section 10.0.

8.0 Daily Loading Expression

The goal of a TMDL analysis is to determine what actions are necessary to attain and maintain WQS. The appropriate averaging period that corresponds to this goal will vary depending on the pollutant and the nature of the waterbody under analysis. When selecting an appropriate averaging period for a TMDL analysis, primary concern should be given to the nature of the pollutant in question and the achievement of the underlying WQS. However, recent federal appeals court decisions have pointed out that the title TMDL implies a "daily" loading rate. While the most appropriate averaging period to be used for developing a TMDL analysis may vary according to the pollutant, a daily loading rate can provide a more practical indication of whether or not the overall needed load reductions are being achieved. When limited monitoring resources are available, a daily loading target that takes into account the natural variability of the system can serve as a useful indicator for whether or not the overall load reductions are likely to be met. Therefore, a daily expression of the required pollutant loading rate is a required element in all TMDLs, in addition to any other load averaging periods that may have been used to conduct the TMDL analysis. The level of effort spent to develop the daily load indicator should be based on the overall utility it can provide as an indicator for the total load reductions needed.

Minimum Submission Requirements:

Minimum Submission Requirements	Sediment	Temperature	Nutrients	Metals
The document should include an expression of the TMDL in terms of a daily load. However, the TMDL may also be expressed in temporal terms other than daily (e.g., an annual or monthly load). If the document expresses the TMDL in additional "non-daily" terms the document should explain why it is appropriate or advantageous to express the TMDL in the additional unit of measurement chosen.	√	√	√	√

Recommendation:

Recommendation	Sediment	Temperature	Nutrients	Metals
Approve	√	√	√	√
Partial Approval				
Disapprove				
Insufficient Information				
No Action				

Summary and Comments:

Sediment

Beneficial uses in the Middle Blackfoot-Nevada Creek TPA are thought to be affected by long-term sediment loading resulting in fine sediment deposition. Loading is driven entirely by nonpoint sources. The majority of the annual sediment load is delivered during spring runoff and/or episodic intense precipitation/runoff events. The TMDLs have been expressed in annual terms in the main body of the TMDL document to facilitate long-term load reductions. However, daily loads were estimated and presented in Section 9.1.8.

Nutrients

The flow-based TMDLs are expressed in pounds per day

Temperature

Although surrogate measures have been used in the temperature TMDLs to facilitate implementation of the TMDL, daily temperature TMDLs expressed in kilocalories/day are presented in Appendix G.

Metals

Flow based TMDLs are presented for the TMDLs and they are expressed in daily terms.

Table 1. Stream Segments in the Middle Blackfoot – Nevada Creek TMDL Planning Area That Appear On Montana's 2006 303(D) List of Impaired Waters, their Associated Levels of Beneficial Use-Support and Causes of Impairment.

Water Body Name and Location Description	Water Body ID	Aquatic Life	Cold Water Fishery	Drinking Water	Primary Contact Recreation	Agriculture	Industry	Cycle First Listed (Pollutants Only)	Cause of Impairment	DEQ Action
Washington Creek (upper)	MT76F003_071	X	X	X	P	F	F	NA	Physical substrate habitat alterations	No Action – Pollution
								NA	Low flow alterations	No Action – Pollution
								Not Listed	Sediment	TMDL
Washington Creek (lower) from Cow Gulch to the mouth (Nevada Creek)	MT76F003_072	P	P	X	P	F	F	NA	Low Flow Alteration	No Action – Pollution
								1988	Sedimentation/Siltation	TMDL
								Not Listed	Iron	TMDL
Jefferson Creek (upper) from headwaters to one mile above Madison Gulch	MT76F003_021	P	P	F	F	F	F	NA	Alteration in stream-side or littoral vegetative covers	No Action - Pollution
								1990	Sedimentation/Siltation	TMDL
Jefferson Creek (lower) Headwaters to 1 mile above Madison Gulch	MT76F003_022	P	P	F	P	F	F	NA	Alteration in stream-side or littoral vegetative covers	No Action - Pollution
								2006	Aluminum	TMDL
								2006	Iron	TMDL
								2006	TP	TMDL
								Not Listed	TN	TMDL
								1988	Sedimentation/Siltation	TMDL
								1988	Solids (Suspended/Bedload)	Addressed by sediment TMDL
								NA	Low flow Alterations	No Action - Pollution
Gallagher Creek from the BLM property line to the mouth (Nevada Creek)	MT76F003_030	P	P	F	P	F	F	NA	Alteration in stream-side or littoral vegetative covers	No Action - Pollution
								NA	Low flow Alterations	No Action - Pollution
								2006	TP	TMDL

Water Body Name and Location Description	Water Body ID	Aquatic Life	Cold Water Fishery	Drinking Water	Primary Contact Recreation	Agriculture	Industry	Cycle First Listed (Pollutants Only)	Cause of Impairment	DEQ Action
								2006	Sedimentation/Siltation	TMDL
								2006	TKN	TMDL
Buffalo Gulch from headwaters to mouth (Nevada Creek)	MT76F003_130	P	P	X	X	X	X	NA	Physical substrate habitat alterations	No Action - Pollution
								2002	Sedimentation/Siltation	TMDL
Nevada Creek (upper) from headwaters to Nevada Lake	MT76F003_011	P	P	N	P	F	F	NA	Alteration in stream-side or littoral vegetative covers	No Action - Pollution
								2000	Cadmium	No Action (not impaired)
								2000	Lead	TMDL
								Not Listed	Iron	TMDL
								Not Listed	Copper	TMDL
								2000	Mercury	No Action
								NA	Physical substrate habitat alterations	No Action - Pollution
								1996	Solids (Suspended/Bedload)	TMDL
								1996	TKN	TMDL
								Not Listed	TP	TMDL
								Not Listed	Temperature	TMDL
Nevada Lake	MT76F007_020	P	P	F	P	F	F	1996	Oxygen, Dissolved	Addressed by TP and TN TMDLs
								1996	TP	TMDL
								1996	Sedimentation/Siltation	No action
								1996	TKN	TMDL
Braziel Creek 2.8 miles upstream from mouth (Nevada Cr) T12N R10W Sec 22	MT76F003_040	P	P	F	F	F	F	NA	Alteration in stream-side or littoral vegetative covers	No Action - Pollution
								1988	Sedimentation/Siltation	TMDL
								2006	TP	TMDL
								Not Listed	TN	TMDL
Black Bear Creek 2.8 miles upstream from	MT76F003_060	N	N	F	N	F	F	NA	Alteration in stream-side or littoral vegetative covers	No Action - Pollution

Water Body Name and Location Description	Water Body ID	Aquatic Life	Cold Water Fishery	Drinking Water	Primary Contact Recreation	Agriculture	Industry	Cycle First Listed (Pollutants Only)	Cause of Impairment	DEQ Action
mouth (Sturgeon Creek) T12N R10W Sec 22								1988	Sedimentation/Siltation	TMDL
								1998	Solids (Suspended/Bedload)	Addressed by Sediment TMDL
								2006	TP	TMDL
								2006	TKN	TMDL
Murray Creek from headwaters to mouth (Douglas Creek)	MT76F003_120	P	P	N	N	F	F	NA	Alteration in stream-side or littoral vegetative covers	No Action - Pollution
								2006	Arsenic	No Action
								NA	Chl-a	Addressed by TN and TP TMDLs
								NA	Low flow Alterations	No Action - Pollution
								2006	$NO_3 + NO_2$ as N	TMDL (TN)
								2006	TP	TMDL
								1994	Sedimentation/Siltation	TMDL
								1994	Temperature, water	TMDL
								2006	TKN	TMDL (TN)
Douglas Creek (upper) from headwaters to Murray Creek	MT76F003_081	P	P	N	N	F	F	NA	Alteration in stream-side or littoral vegetative covers	No Action - Pollution
								2006	Arsenic	No Action
								NA	Chl-a	Addressed by TN and TP TMDLs
								NA	Low flow Alterations	No Action - Pollution
								1990	$NO_3 + NO_2$ as N	TMDL (TN)
								1990	TP	TMDL
								1990	Sedimentation/Siltation	TMDL
								1990	Temperature, water	TMDL
								1990	TKN	TMDL (TN)
Cottonwood Creek from South Fork	MT76F003_090	X	X	X	N	F	F	NA	Low flow alterations	No Action - Pollution

Water Body Name and Location Description	Water Body ID	Aquatic Life	Cold Water Fishery	Drinking Water	Primary Contact Recreation	Agriculture	Industry	Cycle First Listed (Pollutants Only)	Cause of Impairment	DEQ Action
Cottonwood Creek to mouth (Douglas Creek)								Not Listed	Sediment	TMDL
								Not Listed	Temperature	TMDL
Douglas Creek (lower) from Murray Creek to mouth (Nevada Creek)	MT76F003_082	N	N	N	N	F	F	NA	Alteration in stream-side or littoral vegetative covers	No Action - Pollution
								2006	Arsenic	No Action
								NA	Low flow Alterations	No Action - Pollution
								1990	TP	TMDL
								1990	Sedimentation/Siltation	TMDL
								1990	Temperature, water	TMDL
								1990	TKN	TMDL (TN)
Nevada Spring Creek from headwaters to mouth (Nevada Creek)	MT76F003_100	N	N	X	P	F	F	NA	Alteration in stream-side or littoral vegetative covers	No Action - Pollution
								1992	Sedimentation/Siltation	TMDL
McElwain Creek 2 miles upstream from mouth (Nevada Creek) T13N R12W Sec 27-28	MT76F003_050	P	P	F	P	F	F	NA	Alteration in stream-side or littoral vegetative covers	No Action - Pollution
								NA	Low flow Alterations	No Action - Pollution
								2006	$NO_3 + NO_2$ as N	TMDL (TN)
								2006	TP	TMDL
								1988	Sedimentation/Siltation	TMDL
Nevada Creek (lower) from Nevada Lake to mouth (Blackfoot River)	MT76F003_012	N	N	F	P	F	F	NA	Low flow Alteration	No Action - Pollution
								1996	TP	TMDL
								NA	Physical substrate habitat alterations	No Action - Pollution
								1996	Sedimentation/Siltation	TMDL
								1996	TKN	TMDL (TN)
								Not Listed	Water Temperature	TMDL
Yourname Creek from headwaters to the	MT76F004_080	P	P	F	P	F	F	NA	Low Flow Alteration	No Action - Pollution

Water Body Name and Location Description	Water Body ID	Aquatic Life	Cold Water Fishery	Drinking Water	Primary Contact Recreation	Agriculture	Industry	Cycle First Listed (Pollutants Only)	Cause of Impairment	DEQ Action
mouth (Blackfoot River)								NA	Alteration in stream-side or littoral vegetative covers	No Action - Pollution
								2006	Sedimentation/Siltation	TMDL
								2006	TP	TMDL
								Not Listed	TN	TMDL
Wales Creek from reservoir outlet to the mouth (Blackfoot River)	MT76F004_050	P	P	F	P	F	F	NA	Low flow Alteration	No Action - Pollution
								NA	Alteration in stream-side or littoral vegetative covers	No Action - Pollution
								2006	Nitrate/Nitrite ($NO_3 + NO_2 - N$)	TMDL (TN)
								2006	TP	TMDL
								1992	Sedimentation	TMDL
								NA	Chlorophyll-a (Chl-a)	Addressed by TN and TP TMDLs
Frazier Creek from headwaters to mouth (Blackfoot River)	MT76F004_010	N	N	F	P	F	F	NA	Alteration in stream-side or littoral vegetative covers	No Action - Pollution
								NA	Low flow Alterations	No Action - Pollution
								2006	Sedimentation/siltation	TMDL
								2006	TKN	TMDL (TN)
								2006	TP	TMDL
Ward Creek from the headwaters to Browns Lake	MT76F004_060	P	P	F	F	F	F	NA	Physical substrate habitat alterations	No Action - Pollution
								2002	Sedimentation/Siltation	TMDL
Kleinschmidt Creek from mouth 1.5 miles upstream	MT76F004_110	P	P	N	F	F	F	NA	Alteration in stream-side or littoral vegetative covers	No Action - Pollution
								2000	Thermal Modifications	TMDL
								2006	Sedimentation/Siltation	TMDL
								2000	Arsenic	No Action
								2000	Copper	No Action

Water Body Name and Location Description	Water Body ID	Aquatic Life	Cold Water Fishery	Drinking Water	Primary Contact Recreation	Agriculture	Industry	Cycle First Listed (Pollutants Only)	Cause of Impairment	DEQ Action
Rock Creek from headwaters to the mouth (North Fork Blackfoot River)	MT76F004_090	P	P	X	F	F	F	NA	Alteration in stream-side or littoral vegetative covers	No Action - Pollution
								NA	Low flow Alterations	No Action - Pollution
								1992	Sedimentation/Siltation	TMDL
Warren Creek From headwaters to mouth (Blackfoot River)	MT76F004-070							NA	Fish Passage Barrier	No Action – Pollution
								NA	Low Flow Alterations	No Action - Pollution
								Not Listed	Sediment	TMDL
North Fork Blackfoot River from headwaters to mouth (Blackfoot River)	MT76F004_030	F	F	F	F	F	F	NA	None (Fully-Supporting)	No Action
Warren Creek from headwaters to the mouth (Blackfoot River)	MT76F004_070	P	P	F	P	F	F	NA	Fish Passage Barrier	No Action - Pollution
								NA	Low flow Alterations	No Action - Pollution
Monture Creek from headwaters to the mouth (Blackfoot River)	MT76F004_100	P	P	F	F	F	F	NA	Alteration in stream-side or littoral vegetative covers	No Action - Pollution
								Not Listed	Sediment	TMDL
Blackfoot River (Nevada Creek to Monture Creek)	MT76F001_31	P	P	F	F	F	F	1996	Total Nitrogen (TN)	TMDL
								1996	Total Phosphorus (TP)	TMDL
								2000	Thermal Modifications	No Action – Not Exceeding Standards
								Not Listed	Sediment	TMDL
Cottonwood Creek 10 miles upstream from the mouth (Blackfoot River)	MT76F004_040	F	F	F	F	F	F	NA	None (Fully-Supporting)	No Action
								Not Listed	Sediment	TMDL

Water Body Name and Location Description	Water Body ID	Aquatic Life	Cold Water Fishery	Drinking Water	Primary Contact Recreation	Agriculture	Industry	Cycle First Listed (Pollutants Only)	Cause of Impairment	DEQ Action
Chamberlain Creek from East Fork to mouth (Blackfoot River)	MT76F004_020	F	F	F	F	F	F	NA	None (Fully-Supporting)	No Action
Richmond Creek from headwaters to mouth (Lake Alva)	MT76F005_020	P	P	F	F	F	F	1992	Sedimentation/Siltation	TMDL
West Fork Clearwater River from headwaters to mouth (Clearwater River)	MT76F005_040	F	F	F	P	F	F	NA	Chl-*a*	Addressed by TN and TP TMDLs
								Not Listed	TN	TMDL
								Not Listed	TP	TMDL
								Not Listed	Sediment	TMDL
Deer Creek from headwaters to mouth (Seeley Lake)	MT76F005_030	F	P	F	F	F	F	1992	Sedimentation/Siltation	TMDL
Seeley Lake	MT76F007_010	F	F	F	F	F	F	NA	None (Fully-Supporting)	No Action
Buck Creek from headwaters to the mouth (Placid Creek)	MT76F005_050	X	X	X	X	X	X	NA	Not Assessed	No Action
Salmon Lake	MT76F007_030	F	F	F	F	F	F	NA	None (Fully-Supporting)	No Action
Blanchard Creek from the North Fork to the mouth (Clearwater River)	MT76F005_060	P	P	F	N	F	F	NA	Alteration in stream-side or littoral vegetative covers	No Action - Pollution
								NA	Low Flow Alteration	No Action - Pollution
								1990	Sedimentation/Siltation	TMDL
Blackfoot River (Monture Creek to Clearwater River)	MT76F001_32	P	P	F	F	F	F	1996	TN	TMDL
								1996	TP	TMDL
								2000	Thermal Modifications	No Action – Not Exceeding Standards

Water Body Name and Location Description	Water Body ID	Aquatic Life	Cold Water Fishery	Drinking Water	Primary Contact Recreation	Agriculture	Industry	Cycle First Listed (Pollutants Only)	Cause of Impairment	DEQ Action
								Not Listed	Sediment	TMDL

Legend:
F= Full Support; **P**= Partial Support; **N**= Not Supported; **T**= Threatened; **X**= Not Assessed (Insufficient Credible Data)

Table 2. Waterbody segments addressed by sediment TMDLs.

Water Body	Segment ID	Water Body	Segment ID
Washington Creek (upper)	MT76F003_071	Yourname Creek	MT76F004_080
Washington Creek (lower)	MT76F003_072	Wales Creek	MT76F004_050
Upper Jefferson Creek	MT76F003_021	Frazier Creek	MT76F004_010
Lower Jefferson Creek	MT76F003_022	Ward Creek	MT76F004_060
Gallagher Creek	MT76F003_030	Kleinschmidt Creek	MT76F004_110
Buffalo Gulch	MT76F003_130	Rock Creek	MT76F004_090
Upper Nevada Creek	MT76F003_011	Warren Creek	MT76F004_070
Braziel Creek	MT76F003_040	Monture Creek	MT76F004_100
Black Bear Creek	MT76F003_060	Blackfoot River	MT76F001_31
Murray Creek	MT76F003_120	Cottonwood Creek	MT76F004_040
Upper Douglas Creek	MT76F003_081	Richmond Creek	MT76F005_020
Cottonwood Creek	MT76F003_090	West Fork Clearwater	MT76F005_040
Lower Douglas Creek	MT76F003_082	Deer Creek	MT76F005_030
Nevada Spring Creek	MT76F003_100	Blanchard Creek	MT76F005_060
McElwain Creek	MT76F003_050	Blackfoot River	MT76F001_32
Lower Nevada Creek	MT76F003_012		

Table 3. Waterbody segments addressed by nutrient TMDLs.

Water Body Name	Water Body ID
Lower Jefferson Creek	MT76F003_022
Gallagher Creek	MT76F003_030
Upper Nevada Creek	MT76F003_011
Nevada Lake	MT76F007_020
Braziel Creek	MT76F003_040
Black Bear Creek	MT76F003_060
Murray Creek	MT76F003_120
Upper Douglas Creek	MT76F003_081
Lower Douglas Creek	MT76F003_082
McElwain Creek	MT76F003_050
Lower Nevada Creek	MT76F003_012
Yourname Creek	MT76F004_080
Wales Creek	MT76F004_050
Frazier Creek	MT76F004_010
Blackfoot River	MT76F001_31
West Fork Clearwater	MT76F005_040
Blackfoot River	MT76F001_32

Table 4. Waterbody segments addressed by temperature TMDLs.

Water Body Name	Water Body ID
Upper Nevada Creek	MT76F003_011
Murray Creek	MT76F003_120
Upper Douglas Creek	MT76F003_081
Cottonwood Creek	MT76F003_090
Lower Douglas Creek	MT76F003_082
Lower Nevada Creek	MT76F003_012
Kleinschmidt Creek	MT76F004_110

Table 5. Waterbody segments addressed by temperature TMDLs.

Water Body Name	Water Body ID	Fe	Al	Pb	Cu
Washington Creek (lower)	MT76F003_072	X			
Lower Jefferson Creek	MT76F003_022	X	X		
Upper Nevada Creek	MT76F003_011	X		X	X