

## Montana DEQ - Water Quality Standards Attainment Record

**Reporting Cycle:** 2018      **Assessment Record:** MT40E002\_050.pdf      **Status:** Unassigned

### ASSESSMENT UNIT INFORMATION

**Reporting Cycle:** 2018  
**Assessment Unit:** MT40E002\_050  
**Waterbody Name:** Alder Gulch  
**Location Description:** ALDER GULCH, headwaters to mouth (Ruby Creek), T26N R25E S16

<b>Water Type:</b>	<b>Size (Miles/Acres)</b>	<b>Use Class:</b>
RIVER	4.04 MILES	C-3

**Hydrologic Unit Code:** 10040104  
**HUC Name:** Fort Peck Reservoir  
**Watershed:** Fort Peck Lake  
**Basin:** Lower Missouri  
**TMDL Planning Area:** Landusky  
**Ecoregion:** Middle Rockies  
**County:** Phillips County  
**Lat/Long AU Start (U/S):** 47.926172 / -108.582628  
**Lat/Long AU End (D/S):** 47.91233 / -108.510117

### MONITORING INFORMATION

**Date Assessment Started:** 12/01/2011  
**Assessed By:** Drygas, Jonathan

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**CITATIONS**

Citation	Location	Biological Data	Habitat Data	Chemistry Data
Chadwick Consultants (1997), Preliminary Biological Assessment of Streams in the Little Rocky Mountains, Montana, 1996, Draft	DEQ Metcalf Stacks	algae; fish; macroinvertebrates	riparian &/or instream surveys & physical features	
U.S. Department of the Interior, Bureau of Land Management ; Montana Department of Environmental Quality (2001), Final Supplemental Environmental Impact Statement for Reclamation of the Zortman and Landusky Mines Phillips County, Montana	DEQ Metcalf Stacks	fish; macroinvertebrates	Land use	common ions, pH, conductivity, miscellaneous; major nutrients; metals
Spectrum Engineering (2003), Water Monitoring Reports, Zortman / Landusky Mine	Assessment Record			common ions, pH, conductivity, miscellaneous; metals
Montana Department of Environmental Quality, Planning, Prevention and Assistance Division, Water Quality Planning Bureau (2006), STORET/Storease Data Archive [Electronic Resource]	DEQ Metcalf Multimedia Case	General; algae; chlorophyll; fecal coliforms; fish; macroinvertebrates; other bacteriological data	General; Land use; riparian &/or instream surveys & physical features	General; Rosgen type; benthic sediment data; common ions, pH, conductivity, miscellaneous; imagery data; major nutrients; metals; organics; quantitative physical data
Spectrum Engineering (2010), Water Monitoring Reports, Zortman / Landusky Mine	DEQ PC-EMB Hard Rock			common ions, pH, conductivity, miscellaneous; metals
Jepson, Wayne E. (2011), Personal Communication about the Zortman and Landusky Mine Status	Assessment Record		General	common ions, pH, conductivity, miscellaneous
Maehl, Bill (2011), Personal Communication About the Zortman and Landusky Mine Status after Hheavy Precipitation	Assessment Record		General; photo points	common ions, pH, conductivity, miscellaneous

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Citation	Location	Biological Data	Habitat Data	Chemistry Data
Maehl, Bill (2011), Water Status Memo. May 23rd, 2011	Assessment Record		General	
Montana Department of Environmental Quality (2012), Landusky Metals Total Maximum Daily Loads and Framework Water Quality Improvement Plan, M31-TMDL-01aF	DEQ Metcalf Stacks		riparian &/or instream surveys & physical features	common ions, pH, conductivity, miscellaneous; metals; quantitative physical data

**Comments:**

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**DATA MATRIX**  
**Biological Data**

**Comments:**

<b>Alder Gulch entire stream</b>			
<b>Data Type</b>	<b>Comments</b>	<b>Ref Num</b>	<b>Citation</b>
algae	Summer 1996: upstream reference site displayed higher algal density, diversity and pollution sensitive taxa. Siltation index (% motile diatom species) 0 at upper and lower site, 10 at middle site (below Carter Gulch. Blue-green algae dominant at all sites	880	Chadwick Consultants (1997), Preliminary Biological Assessment of Streams in the Little Rocky Mountains, Montana, 1996, Draft
fish	no fish were present	880	Chadwick Consultants (1997), Preliminary Biological Assessment of Streams in the Little Rocky Mountains, Montana, 1996, Draft
macroinvertebrates	Macroinvertebrates were sampled at an upstream references site, below metals impacted Carter Gulch, and at a lower station to measure cumulative effects. Total abundance was markedly diminished (>50%) at the two lower stations during summer sampling. Calculation of metrics indicates moderate impairment at the lower sites. The upstream reference site on Alder Gulch, unimpacted from mining, displayed a significantly greater number of taxa than the two downstream sites. Cater Gulch had low total abundance and number of taxa.	880	Chadwick Consultants (1997), Preliminary Biological Assessment of Streams in the Little Rocky Mountains, Montana, 1996, Draft

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**DATA MATRIX**

**Habitat Data**

**Comments:** Due to intense precipitation in May of 2011 a land slide occurred and the toe end of the Alder Gulch waste rock dump site. This caused over 150,000 cubic yards of material to be washed into Carter Gulch, a tributary to Alder Gulch. The slide took out the Carter Gulch water capture system allowing water to flow from the waste rock dump site down Carter Gulch and into Alder Gulch.

**Alder Gulch entire stream**

Data Type	Comments	Ref Num	Citation
General	The email from Wayne Jepson states that the Alder waste rock dump had a catastrophic failure. The Alder waste rock dump is located up Carter Gulch, a tributary to Alder Gulch. The land slide destroyed the water capture system used to collect and treat water from the dump. Information is limited at this time do too roads being washed out.	13483	Jepson, Wayne E. (2011), Personal Communication about the Zortman and Landusky Mine Status
Land use	In 1996, permanent capture systems began operating in the Alder Spur and waste rock dump in the Carter Spur. The water is pumped to the Zortman Mine water treatment plant and is released into Ruby Gulch. "Mining impacts are not present in surface and groundwater near the mouth of Alder Gulch." The Alder Spur has "occasional residual impacts due to runoff events."	3201	U.S. Department of the Interior, Bureau of Land Management ; Montana Department of Environmental Quality (2001), Final Supplemental Environmental Impact Statement for Reclamation of the Zortman and Landusky Mines Phillips County, Montana
riparian &/or instream surveys & physical features	The habitat quality scores decrease markedly from the upstream unimpacted reach, downstream through the mine affected area. Good bank stability, low amount of streambank alteration, and much lower amount of exposed banks at the internal reference site (upper site).The two lower sites displayed low bank stability, high amount of exposed banks, and a high amount of bank erosion. Carter Gulch, a tributary to Alder Gulch, had the lowest habitat score of all sites sampled in the Zortman Mine area. ltd score was less than half of the internal reference, the uppermost Alder Gulch site. At the Carter Gulch site, 100% of the banks had been altered, 5% of banks were stable, and 95% of the banks were lacking vegetation.	880	Chadwick Consultants (1997), Preliminary Biological Assessment of Streams in the Little Rocky Mountains, Montana, 1996, Draft

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<b>Carter Gulch entire length</b>			
<b>Data Type</b>	<b>Comments</b>	<b>Ref Num</b>	<b>Citation</b>
General	The Alder Gulch waste rock dump contains over 3.5 million tons of material on 17.9 acres. The top and part of the dump slid into Carter Gulch, destroying the waste water capture system. A map attached to the communication shows the extent of the affected area.	13494	Maehl, Bill (2011), Personal Communication About the Zortman and Landusky Mine Status after Heavy Precipitation
General	This memo was prepared as an update of the damage to the Landusky and Zortman mine complex caused by heavy precipitation. The memo states that the capture system on Carter Gulch and the entire top of the waste rock dump are gone. Rough estimates of the slide are 400 feet long by 200 feet wide by 60 feet deep with an estimate of 150,000+ cubic yards washing down Carter Gulch (tributary to Alder Gulch).	13484	Maehl, Bill (2011), Water Status Memo. May 23rd, 2011
photo points	Photo's show the aftermath of the slide.	13494	Maehl, Bill (2011), Personal Communication About the Zortman and Landusky Mine Status after Heavy Precipitation

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**DATA MATRIX**

**Chemistry Data**

**Comments:**      The data is older than 10 years. Conditions are also known to have changed in 2011 due to a land slide. Post slide data is needed. TMDL's have been written for Cadmium, Copper, Lead, Mercury, Selenium and Zinc. For more information refer to the Landusky TMDL document. It can be found at <http://deq.mt.gov/wqinfo/TMDL/finalReports.mcp>

<b>Alder Gulch entire stream</b>			
<b>Data Type</b>	<b>Comments</b>	<b>Ref Num</b>	<b>Citation</b>
common ions, pH, conductivity, miscellaneous	pH, alkalinity, sulfate and S.C. are stable in lower Alder Gulch.	3201	U.S. Department of the Interior, Bureau of Land Management ; Montana Department of Environmental Quality (2001), Final Supplemental Environmental Impact Statement for Reclamation of the Zortman and Landusky Mines Phillips County, Montana
common ions, pH, conductivity, miscellaneous	pH was below 4 in some sample areas	10255	Montana Department of Environmental Quality, Planning, Prevention and Assistance Division, Water Quality Planning Bureau (2006), STORET/Storease Data Archive [Electronic Resource]
common ions, pH, conductivity, miscellaneous	The data is older than 10 years. Conditions are also known to have changed in 2011 due to a land slide. Post slide data is needed.	13449	Spectrum Engineering (2010), Water Monitoring Reports, Zortman / Landusky Mine
common ions, pH, conductivity, miscellaneous	A pH of 7.4 was measured adjacent to the Zortman town site on 5/26/11	13483	Jepson, Wayne E. (2011), Personal Communication about the Zortman and Landusky Mine Status
common ions, pH, conductivity, miscellaneous	pH was 7.39 on 5/25/11	13494	Maehl, Bill (2011), Personal Communication About the Zortman and Landusky Mine Status after Hheavy Precipitation
major nutrients	Nitrate + Nitrite were frequently high at some locations	10255	Montana Department of Environmental Quality, Planning, Prevention and Assistance Division, Water Quality Planning Bureau (2006), STORET/Storease Data Archive [Electronic Resource]

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<b>Data Type</b>	<b>Comments</b>	<b>Ref Num</b>	<b>Citation</b>
metals	Affected areas at the head of the Carter Spur and Alder Spur are ARD impacted. 'Post 1995' data shows occasional elevated Iron levels and low, stable metals levels in Alder Gulch downgradient from the Carter Gulch and Alder Spur confluences.	3201	U.S. Department of the Interior, Bureau of Land Management ; Montana Department of Environmental Quality (2001), Final Supplemental Environmental Impact Statement for Reclamation of the Zortman and Landusky Mines Phillips County, Montana
metals	Majority of metals samples by Zortman mine company indicate WQB-7 exceedences. All sampled metals had one or more metals exceedences, some by large margins	10255	Montana Department of Environmental Quality, Planning, Prevention and Assistance Division, Water Quality Planning Bureau (2006), STORET/Storease Data Archive [Electronic Resource]
metals	The data is older than 10 years. Conditions are also known to have changed in 2011 due to a land slide. Post slide data is needed.	13449	Spectrum Engineering (2010), Water Monitoring Reports, Zortman / Landusky Mine
metals	TMDL's have been written for Cadmium, Copper, Lead, Mercury, Selenium and Zinc. For more information refer to the Landusky TMDL document. It can be found at <a href="http://deq.mt.gov/wqinfo/TMDL/finalReports.mcp">http://deq.mt.gov/wqinfo/TMDL/finalReports.mcp</a>	13387	Montana Department of Environmental Quality (2012), Landusky Metals Total Maximum Daily Loads and Framework Water Quality Improvement Plan, M31-TMDL-01aF
<b>Carter Gulch entire length</b>			
<b>Data Type</b>	<b>Comments</b>	<b>Ref Num</b>	<b>Citation</b>
major nutrients	Nutrient levels in Carter Gulch are low	10634	Spectrum Engineering (2003), Water Monitoring Reports, Zortman / Landusky Mine
metals	Copper levels exceed Acute standards in upper and lower Carter Gulch. Lead levels exceeded Chronic standards by 900% in upper Carter Gulch on 4/17/03. Iron exceeded Chronic standards in both upper and lower Carter Gulch in April 2003.	10634	Spectrum Engineering (2003), Water Monitoring Reports, Zortman / Landusky Mine

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**DQA SUMMARY**

**Aquatic Life & Fishes**

<b>Nutrients</b>	NOT ASSESSED
<b>Metals</b>	FAIL
<b>Sediment</b>	NOT ASSESSED
<b>Temperature</b>	NOT ASSESSED
<b>Other</b>	NOT ASSESSED

**Drinking Water**

<b>Metals</b>	FAIL
<b>Other</b>	NOT ASSESSED

**Recreation**

<b>Nutrients</b>	NOT ASSESSED
<b>E.coli</b>	NOT ASSESSED
<b>Other</b>	NOT ASSESSED

**Agriculture**

<b>Common</b>	NOT ASSESSED
<b>Other</b>	NOT ASSESSED

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### ASSESSMENT HISTORY

**Cycle 2006**

Not assessed this cycle

**Cycle 2008**

Not assessed this cycle

**Cycle 2010**

Not assessed this cycle

**Cycle 2012**

Not assessed this cycle

**Cycle 2014**

TMDL's have been written for Cadmium, Copper, Lead, Mercury, Selenium and Zinc. For more information refer to the Landusky TMDL document. It can be found at <http://deq.mt.gov/wqinfo/TMDL/finalReports.mcp>

**Cycle 2016**

Not assessed this cycle

**Cycle 2018**

Not assessed this cycle

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### Overall Condition of Segment

The data is older than 10 years. Conditions are also known to have changed in 2011 due to a land slide. Post slide data is needed to assess if conditions have changed. Due to the timing of the slide, lack of any post slide data and the TMDL document production, no changes were made to the current beneficial use assessments and TMDL's have been written for Cadmium, Copper, Lead, Mercury, Selenium and Zinc. For more information on the TMDL's refer to the Landusky TMDL document. It can be found at <http://deq.mt.gov/wqinfo/TMDL/finalReports.mcp>.

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USE SUPPORT DECISION

Use Class

Trophic Status:

Trophic Trend:

Uses	DQA	Method, Data, and Information Used	Assessment Type and Confidence	Use Support	Partial Flag	Use Support Threatened Certainty
Aquatic Life	Fail		BIOLOGICAL-GOOD, HABITAT-FAIR, PHYSICAL/CHEMICAL-FAIR	Not Fully Supporting	No	No
Drinking Water	Fail		PHYSICAL/CHEMICAL-LOW	Insufficient Information	No	No
Primary Contact Recreation				Not Assessed	No	No

Method Number and Description

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IMPAIRMENT INFORMATION

Uses	Cause (Confidence): Source(Confirmed)	Observed Effects
Aquatic Life	84 (): 56 (N), 82 (N) 127 (): 56 (N), 82 (N) 163 (): 56 (N), 82 (N) 267 (): 56 (N), 82 (N) 274 (): 56 (N), 82 (N) 372 (): 56 (N), 82 (N) 423 (): 56 (N), 82 (N) 441 (): 2 (N)	
Drinking Water		
Primary Contact Recreation		
Cause Number and Description	Source Number and Description	Observed Effect Number and Description
84-Alteration in stream-side or littoral vegetative covers	2-Acid Mine Drainage	
127-Cadmium	56-Impacts from Abandoned Mine Lands (Inactive)	
163-Copper	82-Mine Tailings	
267-Lead		
274-Mercury		
372-Selenium		
423-Zinc		
441-pH		

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**DELISTING / STATUS CHANGES**

<b>Cause</b>	<b>Reason for Change</b>	<b>Date of Change</b>
Cadmium	TMDL Approved or established by EPA (4A)	03/12/2012
Copper	TMDL Approved or established by EPA (4A)	03/12/2012
Lead	TMDL Approved or established by EPA (4A)	03/12/2012
Mercury	TMDL Approved or established by EPA (4A)	03/12/2012
Selenium	TMDL Approved or established by EPA (4A)	03/12/2012
Zinc	TMDL Approved or established by EPA (4A)	03/12/2012
pH	TMDL Approved or established by EPA (4A)	03/12/2012

**CATEGORY INFORMATION**

**Previous Cycle**

**Cycle**                    2016  
**Category**                4A - All TMDLs needed to rectify all identified threats or impairments have been completed and approved.  
  
**User Defined Category**    N/A

**Current Cycle**

**Cycle**                    2018  
**Category**                4A - All TMDLs needed to rectify all identified threats or impairments have been completed and approved.  
  
**User Defined Category**    N/A