Exhibit A

Attainment Record for
Upper East Fork Armells Creek

Montana DEQ - Water Quality Standards Attainment Record

Reporting Cycle: 2016 **Assessment Record:** MT42K002_170.pdf **Status:** Completed

ASSESSMENT UNIT INFORMATION

Reporting Cycle:	2016
Assessment Unit:	MT42K002_170
Waterbody Name:	East Fork Armells Creek
Location Description:	EAST FORK ARMELLS CREEK, headwaters to Colstrip

Water Type:	Size (Miles/Acres)	Use Class:
RIVER	24.67 MILES	C-3

Hydrologic Unit Code:	10100001
HUC Name:	Lower Yellowstone-Sunday
Watershed:	Lower Yellowstone
Basin:	Yellowstone
TMDL Planning Area:	Middle Yellowstone Tributaries
Ecoregion:	Northwestern Great Plains
County:	BIG HORN CO, ROSEBUD CO
Lat/Long AU Start (U/S):	45.813191 / -106.881882
Lat/Long AU End (D/S):	45.886051 / -106.622164

MONITORING INFORMATION

Date Assessment Started:	09/27/2016
Assessed By:	Kron, Darrin

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CITATIONS

Citation	Location	Biological Data	Habitat Data	Chemistry Data
(1997), Pre 1997 Field Assessments	Assessment Record	algae; chlorophyll; fecal coliforms; fish; macroinvertebrates	Land use; photo points; riparian &/or instream surveys & physical features	Rosgen type; benthic sediment data; bioaccumulation; common ions, pH, conductivity, miscellaneous; major nutrients; metals; quantitative physical data
Erbes, Dan (1998), Montana Dept. of Environmental Quality Letter to Office of Surface Mining and Reclaimation	Assessment Record			common ions, pH, conductivity, miscellaneous; quantitative physical data
Montana Department of Fish, Wildlife, and Parks (1999), Montana Rivers Information System (MRIS)	Assessment Record	algae; fish; macroinvertebrates; wildlife	Land use; riparian &/or instream surveys & physical features	common ions, pH, conductivity, miscellaneous; quantitative physical data
(2005), DEQ Field Assessment Form	Assessment Record	algae; chlorophyll; fecal coliforms; fish; macroinvertebrates	Land use; photo points; riparian &/or instream surveys & physical features	Rosgen type; benthic sediment data; bioaccumulation; common ions, pH, conductivity, miscellaneous; major nutrients; metals; organics; quantitative physical data
Montana Department of Environmental Quality, Planning, Prevention and Assistance Division, Water Quality Planning Bureau (2006), STORET/Storease	DEQ Metcalf Multimedia Case	General; algae; chlorophyll; fecal coliforms; fish;	General; Land use; riparian &/or instream surveys & physical	General; Rosgen type; benthic sediment data; common ions, pH,

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Citation	Location	Biological Data	Habitat Data	Chemistry Data
Data Archive [Electronic Resource]		macroinvertebrates; other bacteriological data	features	conductivity, miscellaneous; imagery data; major nutrients; metals; organics; quantitative physical data
Montana Department of Fish, Wildlife, and Parks (2006), Montana Rivers Information System (MRIS): Montana Fisheries Information System (MFISH) - http://maps2.nris.mt.gov/scripts/esrimap.dll?name=MFISH&Cmd=INST	Assessment Record	fish; wildlife	Land use; riparian &/or instream surveys & physical features	benthic sediment data; common ions, pH, conductivity, miscellaneous; quantitative physical data
(2015), Montana DEQ IEMB Permit Data	Assessment Record			quantitative physical data
Schade, Pete (2016), DEQ IEMB Memo: East Fork Armells impairment status	Assessment Record		riparian &/or instream surveys & physical features	
Montana Bureau of Mines and Geology (nnnn), GWIC Data from http://mbmggwic.mtech.edu/	Assessment Record	algae	Land use; riparian &/or instream surveys & physical features	benthic sediment data; common ions, pH, conductivity, miscellaneous; major nutrients; metals; quantitative physical data

Comments:

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DATA MATRIX
Biological Data

Comments: The 1992 and 2005 assessments indicated much of this segment is ephemeral except the lower reach. Water begins to gather and flow at or near the Hwy 39 bridge, approximately 1/2 mile above the town of Colstrip. Biological data not useful for current assessment methods.

Headwaters to Colstrip

Data Type	Comments	Ref Num	Citation
fish	No useful data.	11349	Montana Department of Fish, Wildlife, and Parks (1999), Montana Rivers Information System (MRIS)
fish	One dry site in this segment visited in 2003. No other information available.	11355	Montana Department of Fish, Wildlife, and Parks (2006), Montana Rivers Information System (MRIS): Montana Fisheries Information System (MFISH) - http://maps2.nris.mt.gov/scripts/esrimap.dll?name=MFISH&Cmd=INST

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DATA MATRIX

Habitat Data

Comments: Stream is likely ephemeral except in the lower reaches where flow begins above hwy 39. Mining activity (open cut coal) surrounds the stream for much of the reach. The upper 1/4 of the segment is pasture land. Bank vegetation consists mostly of grasses and shrubs, trees are mostly missing. There are a number of dikes and road crossings in the channel. Many road crossings do not have culverts. Grazing occurs throughout the segment, even in riparian areas with upland opencut mines. One pond created by a road crossing is located in the lower reach and there is continuous flow at a site about 300 yds above hwy 39 crossing. The effect upon flow from the open cut mine is unknown.

Headwaters to Colstrip

Data Type	Comments	Ref Num	Citation
Land use	The dominant land uses are grazing and mining. Mine activities take place in the lower 3/4's of the stream. The upper 1/4 of the stream is ranch land. Grazing takes place throughout the drainage where land has been reclaimed or is not under construction.	4652	(2005), DEQ Field Assessment Form
photo points	32 photos.	4652	(2005), DEQ Field Assessment Form
riparian &/or instream surveys & physical features	(DR8 Citation: 1992 Stream Reach Assessment Form) Stream ephemeral in middle reaches of the segment. Some erosion evident from bank trampling, 10-20% of segment shows erosion. Substrate not measured (no water). Bank vegetation consists of grass with some shrubs and small trees. Little structure in the stream bed to slow water and sediment movement. Some channelization through the town of Colstrip. No flowing or ponded water. Upper reach has dry land farming, with equipment getting as close to banks as possible. Flow began in Colstrip (<1 cfs).	10472	(1997), Pre 1997 Field Assessments
riparian &/or instream surveys & physical features	Ephemeral stream until the lowest reach above hwy 39. According to locals, stream did not run from top to bottom this year despite the heavy rains. Some ponded water stands behind a dike in the lower section, which looks to be perennial. There is much land disturbance in the area, but the creek channel itself is undisturbed for the most part. The effects	4652	(2005), DEQ Field Assessment Form

Data Type	Comments	Ref Num	Citation
	upon flow from the opencut mine is unknown. Stream Reach Assessment: Stream is ephemeral from headwaters to near Colstrip (highway 39). Unable to access the upper 2-3 miles of stream (access denied). Could see trees, shrubs, pasture land. A moderate amount of road construction is taking place in the drainage, and the main road crosses the creek in several places. There are numerous dikes in the reach, and there are no culverts at the road crossings or dikes. Riparian Assessment: Laterally stable, and in balance with water and sediment supplied by the watershed. Type and amount of riparian vegetation sub-optimal (lacks trees). Dikes and roads interrupt stream channel.		
riparian &/or instream surveys & physical features	The memo contains a review of the prior assesment record language and identifies portions of the language that were in need of updates. A map was included and is attached to this record showing that the mining does not intersect the channel of EF Armells Creek. It recommends that the WQ Assessment be updated to help assist the IEMB program in their permitting process.	15479	Schade, Pete (2016), DEQ IEMB Memo: East Fork Armells impairment status

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DATA MATRIX

Chemistry Data

Comments: Water chemistry data is mostly limited to the area just above and below hwy 39 road crossing. Discharge data indicates the lowest reach is either intermittent or perennial. Not enough data for a chemistry assessment of this segment according 2016 assessment methods.

Headwaters to Colstrip

Data Type	Comments	Ref Num	Citation
common ions, pH, conductivity, miscellaneous	1980, 1985: Pond approx. 2 mi. above hwy 39 sampled twice in 1980: Calcium=547 and 132 mg/L; Sodium=160 and 66.7 mg/L; Chloride=15.6 and 15.2 mg/L; Magnesium=345 and 185 mg/L; Bicarbonate=547 and 370 mg/L; Carbonate=<1.0 mg/L; Sulfate=1600 and 921 mg/L; Alkalinity=448 and 303 mg/L; Total Hardness as CaCO3=1841 and 1094 mg/L.1985, approx. 5 mi. above town: Calcium=210 mg/L; Sodium=300 mg/L; Chloride=20 mg/L; Magnesium=410 mg/L; Sulfate=2300 mg/L; Alkalinity=457 mg/L; Total Hardness as CaCO3. pH=7.68; Calcium=303 mg/L; Sodium=756 mg/L; Chloride=76.8 mg/L; Magnesium=542 mg/L; Bicarbonate=480 mg/L; Carbonate=<2.0 mg/L; Sulfate=3920 mg/L; Alkalinity=480 mg/L; Total Hardness as CaCO3=2990 mg/L; SAR=6.0.	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	1973: Water hole approx. 2 mi. above town: Calcium=106 mg/L; Sodium=0 mg/L; Chloride=7 mg/L; Magnesium=35 mg/L; Bicarbonate=497 mg/L; Carbonate=<1.0 mg/L; Sulfate=295 mg/L; Alkalinity=408 mg/L; Total Hardness as CaCO3=409 mg/L. Approx. 5 mi. above town: Calcium=40 mg/L; Sodium=230 mg/L; Chloride=12 mg/L; Magnesium=403 mg/L; Bicarbonate=584 mg/L; Carbonate=<1.0 mg/L; Sulfate=1722 mg/L; Alkalinity=479 mg/L; Total Hardness as CaCO3=1759 mg/L; SAR=2.39.	10121	Montana Bureau of Mines and Geology (nnnn), GWIC Data from http://mbmggwic.mtech.edu/
major nutrients	1973: Water hole approx. 2 mi. above town: Nitrate as N= 0	10121	Montana Bureau of Mines and Geology (nnnn),

Data Type	Comments	Ref Num	Citation
	mg/L. Approx. 5 mi. above town: Nitrate as N= 0.97 mg/L.		GWIC Data from http://mbmggwic.mtech.edu/
quantitative physical data	This memo describes analysis of groundwater in the area. No data analysis could be found to support the information that is quoted in the memo.	11628	Erbes, Dan (1998), Montana Dept. of Environmental Quality Letter to Office of Surface Mining and Reclaimation
quantitative physical data	1980, 1985: Pond approx. 2 mi. above hwy 39 sampled twice in 1980: Calculated TDS = 2866 and 1725 mg/L. 1985, approx. 5 mi. above town: Flow= 0.22 cfs; Temp= 13.5 °C.	10255	Montana Department of Environmental Quality, Planning, Prevention and Assistance Division, Water Quality Planning Bureau (2006), STORET/Storease Data Archive [Electronic Resource]
quantitative physical data	Permit data from 2014-2015 indicates year round flow at site SW-55 wier a couple hundred yds above hwy 39 crossing, even though it is low volume at certain times of the year.	15481	(2015), Montana DEQ IEMB Permit Data
quantitative physical data	1973: Water hole approx. 2 mi. above town: TDS= 962 mg/L. Approx. 5 mi. above town: Calculated dissolved solid= 2732.62 mg/L.	10121	Montana Bureau of Mines and Geology (nnnn), GWIC Data from http://mbmggwic.mtech.edu/

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DQA SUMMARY

Aquatic Life & Fishes

Nutrients	FAIL
Metals	FAIL
Sediment	NOT ASSESSED
Temperature	NOT ASSESSED
Other	NOT ASSESSED

Drinking Water

Metals	NOT ASSESSED
Other	NOT ASSESSED

Recreation

Nutrients	NOT ASSESSED
E.coli	NOT ASSESSED
Other	NOT ASSESSED

Agriculture

Common	NOT ASSESSED
Other	NOT ASSESSED

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ASSESSMENT HISTORY

Cycle 2006

1996 - Listed as partially supporting aquatic life, swimmable, and warm water fishery. The causes were nutrients and suspended solids. The sources were agriculture and range land. Listed for assessment in 2004 due to insufficient credible data.

Cycle 2008

Not assessed this cycle

Cycle 2010

Not assessed this cycle

Cycle 2012

Not assessed this cycle

Cycle 2014

Removed 2B category during 2014 cycle.

Cycle 2016

DEQ received public comment and a subsequent memo from the DEQ coal and opencut mining bureau about errors in the assessment record language. The assessment record was edited to address erroneous source assessment language in data matrix and overall condition summary pages. Lower reach of the segment is determined to be intermittent and therefore DQA for chemistry was attempted but insufficient data exists and DQA fails. After the 2016 public comment period, DEQ updated the list of probable sources, added instream flow measurement data, attempted to assess water quality in intermittent area, and updated language about the flow regime of this segment. Overall, no impairment listings were changed but erroneous language about potential sources was updated.

Overall Condition of Segment

This segment appears to be ephemeral except where it becomes intermittent near highway 39. Water begins to surface in the channel near highway 39. The stream did not flow continually from the top to bottom in spring 2005, despite the heavy rains. Some water chemistry data is available from the intermittent area but not enough to complete nutrient, salinity or toxics assessment for the lowest, intermittent reach. The suspected ephemeral reach of this segment should only be assessed for habitat according to current DEQ assessment methods.

There are several dikes and road crossings in the reach with no ponded water, and the upland area is currently being mined for coal. At least 2 open pits are located near the channel and some stormwater outfalls are present from these areas but only flow during intense storm conditions. Adjacent upland areas that are downslope from haul roads appear to have low vegetation regrowth. Aerial photos show the mine encroaching upon, but not entering the stream channel. The DEQ coal and opencut mining bureau confirmed that the stream channel has not been actively mined and is outside the mining area permit boundaries in a memo written in September, 2016. Grazing is occurring throughout the reach. The riparian vegetation is mostly grasses and shrubs. Trees are generally missing. Riparian habitat has been influenced in this segment. Riparian habitat remains impaired.

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USE SUPPORT DECISION

Use Class C-3

Trophic Status: **Trophic Trend:**

Uses	DQA	Method, Data, and Information Used	Assessment Type and Confidence	Use Support	Partial Flag	Use Support Certainty	Threatened
Aquatic Life	Fail	110, 240, 310, 375, 860	HABITAT-GOOD, PHYSICAL/CHEMICAL-LOW	Not Fully Supporting	No	High	No
Primary Contact Recreation				Not Assessed	No		No

Method Number and Description
110-Information from local residents 240-Non-fixed station physical/chemical (conventional + toxicants) 310-Ecological/habitat surveys 375-Visual observation, may not quantify some parameters; single season; by prof. 860-Other Agencies/Organizations provided monitoring data

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IMPAIRMENT INFORMATION

Uses	Cause (Confidence): Source(Confirmed)	Observed Effects
Aquatic Life	84 (Low): 156 (N)	
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	156-Agriculture	

DELISTING / STATUS CHANGES

Cause	Reason for Change	Date of Change

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CATEGORY INFORMATION

Previous Cycle

Cycle	2014
Category	4C - Identified threats or impairments result from pollution categories such as dewatering or habitat modification and, thus, the calculation of a Total Maximum Daily Load (TMDL) is not required
User Defined Category	N/A

Current Cycle

Cycle	2016
Category	4C - Identified threats or impairments result from pollution categories such as dewatering or habitat modification and, thus, the calculation of a Total Maximum Daily Load (TMDL) is not required
User Defined Category	N/A