

# **Growth of the Musselshell Watershed Coalition through Improving the Musselshell Watershed Plan**

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# Technical Proposal and Evaluation Criteria

## 1. Executive Summary

November 13, 2019

Petroleum County Conservation District  
Winnett, Petroleum County, Montana

As a participant in the Musselshell Watershed Coalition (MWC), the Petroleum County Conservation District submits this application to grow the MWC through *Improving the Musselshell Watershed Plan* (MWP). In 2015, the MWC completed its first Musselshell Watershed Plan. This was a stakeholder driven process that resulted in the identification and prioritization of on-the-ground and planning projects. The original Musselshell Watershed Plan has provided incredibly useful guidance for prioritizing work in the Musselshell Watershed. Since 2015, several circumstances have led to the need to update the existing plan. Twenty-five percent of these projects have been completed with another fifty percent of the projects either underway or ongoing. As projects are completed, the environmental conditions continue to change due to extreme flood and drought induced fires - and the Musselshell River continues to wreak havoc on those living and working along its banks. Repeated flooding has resulted in a grassroots movement to manage land and water resources for long-term resilience in the face of both drought and flood.

*Improving the Musselshell Watershed Plan* will build on past successes by synthesizing existing information, working with stakeholders to determine how the watershed can be improved, analyzing existing best management practices, and identifying new project management concepts that will address the current critical issues facing the Musselshell Watershed.

The project will commence July 1, 2020 and be completed by June 30, 2022.

This project is not located on a Federal facility.

## **2. Background Data**

### **The Musselshell River Watershed**

The Musselshell River Watershed contains approximately 9,500 square miles. The entire area is home to approximately 9,325 people. Draining from the Crazy, Castle and Little Belt Mountains, the main stem of the Musselshell River flows from the confluence of the North and South Forks near Martinsdale, Montana for nearly 340 miles to Fort Peck Reservoir. As it flows, it provides irrigation water for nearly 85,000 acres and 250 farms and ranches and 388 water rights holders, including six municipalities.

### **Water Use and History**

Ranchers were the first non-indigenous people to settle the Musselshell River Basin. In this semi-arid place, people recognized the significance of water immediately with the first water right filing in the Basin occurring in 1869 for stock use. Irrigation water rights were first filed in 1875. Agriculture and water use for stock and irrigation continues to be the dominant water use of Musselshell River water. From the beginning, the Musselshell drained to a trickle in the late summer and water shortages set the stage for future water development and disagreements.

With the formation of the Montana Irrigation Commission in 1919, irrigation districts were created in the basin, and the emphasis of the board was on water storage projects. By 1938, federal funding for state water projects was secured to store water to allow irrigation of land in the basin. Martinsdale Reservoir was completed in 1939 and stores water for the Upper Musselshell Project. The largest funded project was Deadman's Basin, which was completed in 1941. The Delphia-Melstone Canal was built between 1945 and 1949. It carries decreed Musselshell River water and contract water purchased from Deadman's Basin Water Users Association. Numerous off-channel small dams and reservoirs were also built in the 1930s and 1940s with federal funding. The USGS estimates the total consumptive water use for irrigation in the Musselshell basin to be 93,690 acre feet per year (USGS, 2004).

For over 50 years, the water users of these reservoirs fought, violently at times, over the timing of filling the reservoirs with river water. The Martinsdale project, located further upstream and completed first, felt the right to fill with water from the Musselshell first during the year. However, the Deadmans Basin water right was filed first, therefore, according to Montana water law, the lower reservoir has senior rights to Musselshell River water.

Finally, in 1995 the two water user association boards adopted a formal agreement to cooperatively manage river diversion rates and timing. Even with this agreement in place, it was the Musselshell River Distribution Project, implemented in 2002, that truly led to accurate water distribution on the Musselshell.

The Musselshell River Distribution Project (MRDP) involves the administration of decreed water on over 350 miles of the Musselshell River, from the confluence of the North Fork and the

South Forks to the USGS gage station at Mosby, and all waters considered by the Montana Water Court to be a part of the lower Musselshell River below the USGS gage station at Mosby, Montana.

All parties recognize the benefits of maintaining year-round flows, and all recognize the benefits of the MRDP that came with water rights enforcement. Since 2005, water has flowed uninterrupted to the confluence of the Missouri every year.

While the MRDP is viewed a success, the Musselshell remains classified by Montana Fish, Wildlife, and Parks as “chronically dewatered.” Water quality issues, in particular excessive salinity, have been exacerbated by low flows. The dewatering issue, recognized as significant by water users up and down the river, coupled with aging irrigation infrastructure precipitated the formation of the Musselshell Watershed Coalition (MWC). **The MWC works to bring together water users and conservation entities to tackle the issue of using water more efficiently to benefit water users, river health, and the whole river ecosystem.**

### **Current Water Issues**

Traditionally, the area’s water users plan for much less water than “normal” because of the much more frequent occurrence of drought. The Musselshell is a prime example of changing weather extremes, with spring melts and runoff taking place earlier in the year, unpredictable major weather events, and weather systems that change direction and intensity by the hour.

#### Quantity:

Extreme weather events are the new normal in the Musselshell Watershed. While drought and water shortages have historically characterized the Musselshell Basin, the two largest floods ever recorded at Roundup occurred in the last eight years; in the spring of 2011 and the late winter of 2014. Since 2011, flood events have come to define the Musselshell River as unpredictable and powerful.

In 2011, a combination of snowmelt and rain resulted in 150-year flooding along all reaches of the Musselshell. At its height, floodwaters reached two feet higher than the previous record flood in 1967. The 2011 flood caused a “reset” of the Musselshell River. There were 59 avulsions that resulted in the river channel being shortened by 37 miles. In places, the river migrated several hundreds of feet during the flood, causing massive erosion, and sediment deposition downstream. A total of 31 breaches occurred in the historic Milwaukee Railroad grade, which is no longer in use, but has served as a flood berm for nearly 100 years. In the subsequent floods and high water events, the river continues to make changes as it struggles to regain the length that it lost in 2011. These changes have caused extensive damage to agriculture along the river – cross-channel diversion structures have been flanked or heavily damaged, dozens of irrigation pump sites were damaged or lost altogether, and floodplain deposition was several feet thick covering agricultural fields.

A late winter rain event related flood in 2013 caused damage to residences, roads, and the Musselshell County fairgrounds. Ice jams and unusually warm temperatures in March 2014 resulted in the third 100+ year flood event in 3 years on the upper and middle Musselshell. Rain in August on the lower Musselshell saw the flow rate of the river near Mosby increase from 150 cfs to 20,090 cfs in two days. The event in 2013 and the two events in 2014 were much shorter-lived than the 2011 flood and resulted in fewer river changes. 2018 snowpack reached record levels, making everyone nervous. In contrast to 2011, the snowpack melted slowly and river levels only reached 10-year flood stage, however the river ran higher than normal from mid-April through mid-July, again causing significant changes to the river's path.

While the Musselshell Watershed experienced three 100-year or more flood events in 2011, 2013, and 2014, the area also sees extreme drought. 2012, for example, saw such dry conditions that wildfires ravaged the area, warranting a Presidential disaster declaration for Musselshell County. In 2017, the Lodgepole Complex Fires burned at the lower end of the watershed. These fires grew into the third largest wildfire in Montana history.

#### Quality:

Local partners identified salinity levels in river water as a high concern and priority for action. Salinity testing since 2013 has verified high levels of salinity in lower Musselshell River water, especially during spring run-off and toward the end of the summer as low flows and high temperatures exacerbate the issue.

#### Past Working Relationships with Reclamation:

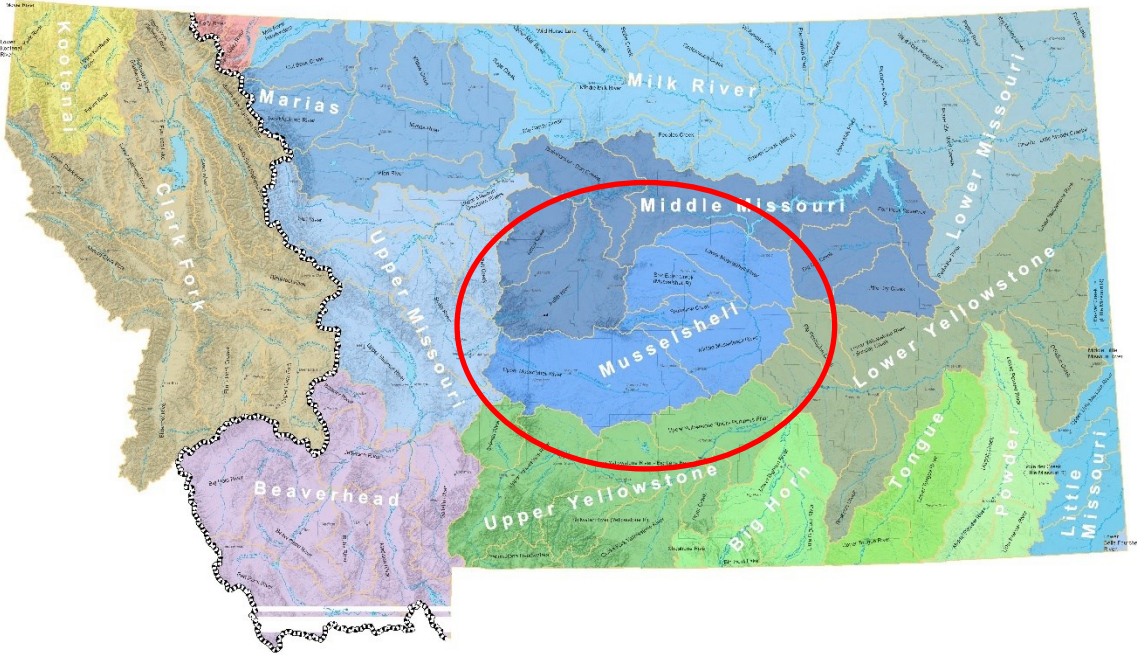
The Petroleum County Conservation District was awarded an FY2016 WaterSMART Cooperative Watershed Management Program Grant. This project is discussed further in the Approach section.



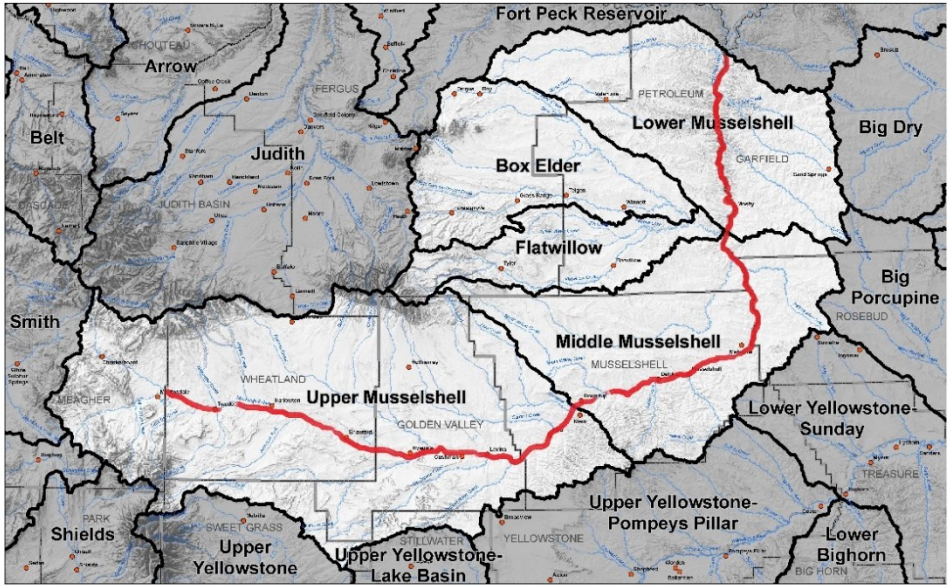
**Flooding at Roundup, MT in 2011. Photo by Kestrel Aerial.**

### 3. Project Location

This project considers the entire length of the Musselshell River in Central Montana. Counties included in the project location include Wheatland, Golden Valley, Musselshell, Rosebud, Petroleum, and Garfield. Communities included in the project location include Martinsdale, Two Dot, Harlowton, Ryegate, Lavina, Roundup, Musselshell, Melstone, and Mosby. The Musselshell Watershed HUC is: 100402.



Montana's Musselshell Watersheds



## 4. Technical Project Description

### Applicant Category

The Petroleum County Conservation District (PCCD) is the applicant for this grant. The PCCD is a **participant** in the Musselshell Watershed Coalition (MWC). The Petroleum County Conservation District works in conjunction with the Winnett Natural Resources and Conservation Service Field Office to provide conservation resource management tools to producers in Petroleum County, Montana. Currently, the PCCD and the MWC partner on several projects including a citizen-based water quality monitoring program through a Big Sky Watershed Corps member and a cooperative weed management area for the Musselshell River.

The **Musselshell Watershed Coalition (MWC) is an existing watershed group**. It has been operating since 2009 as a partnership of individuals and organizations with a shared vision of supporting Musselshell River water management through collaboration. The MWC is well-established with a diverse group of stakeholders and a culture of collaboration. The MWS is a voluntary partnership that brings together private associations, local districts, state agencies, and federal agencies. The Upper Musselshell Water Users Association, Deadman's Basin Water Users Association, Delphia Melstone Canal Water Users Association, and Mosby Musselshell Water Users Group represent members who practice irrigated agriculture and livestock grazing. Conservation Districts, which represent agriculture and conservation of lands within their jurisdiction, include the Upper Musselshell Conservation District, Lower Musselshell Conservation District, Petroleum County Conservation District, and Garfield County Conservation District. Counties, towns and individual landowners located along the river participate in discussions and projects. State and Federal agencies, including the Montana Department of Natural Resources and Conservation, Montana Department of Environmental Quality, Montana Fish, Wildlife, and Parks, and the Natural Resources and Conservation Service regularly participate as partners. The management of water is closely linked with an improving local economy and MWC is widely respected for its inclusive and pro-active leadership.



MWC Partners receive the Montana Watershed Stewardship Group Award in 2015 at the MT State Capitol.



In 2014, the MWC hired a part-time coordinator at approximately 12 hours per week. This position has expanded to 20 hours per week. The group averages 700 volunteer hours contributed per year. A Big Sky Watershed Corps member, which is an AmeriCorps program, has managed the volunteer water quality program since 2013. In early 2015, a board of directors was formed and a first Musselshell Watershed Plan was completed. Since 2015, MWC has worked to complete the projects identified in the Watershed Plan. As of November 2019; twenty-five percent of Musselshell Watershed Plan projects are complete and fifty percent of the projects are currently in progress. In addition to Watershed Plan projects, the MWC works on annual projects, including: a citizen-based salinity monitoring program; bringing together water-users, landowners, and agencies on a bi-monthly basis to discuss projects taking place in the watershed; coordinating the financial contribution of 18 different partner organizations toward funding the USGS gaging stations on the Musselshell River; developing and sharing Best Management Practices for landowner issues on the Musselshell River by the River Assessment Triage Team; providing a voice for the Musselshell on the Montana Salt Cedar Team; coordinating river restoration and irrigation development projects; and to spread more knowledge to others about the Musselshell Watershed. The MWC recently completed an assessment of 2018 flood impacts to the Musselshell River, an infrastructure condition assessment for the three main irrigation projects on the river, a new [Story Map website](#), and is working with the Montana Bureau of Mines and Geology on a salinity study to determine the sources of salinity in the lower river reach.

In 2015, the MWC received the Montana Wetland and Watershed Stewardship Group Award for, “the group’s persistence, dedication, and creativity put forth in its work within the Musselshell Watershed.” In 2017, the MWC hosted the Montana Watershed Coordination Council Annual Water Projects Tour. In 2019, facilitator Bill Milton was nominated by the MWC for the Montana Leopold Conservation Award. Mr. Milton received this award, representing work on his own ranch as well as collaborative efforts of the Musselshell Watershed Coalition to improve the Musselshell Watershed for the people who live here.

### **Eligibility of Applicant**

The Petroleum County Conservation District (PCCD) plays a key participant role in the Musselshell Watershed Coalition. The MWC relies on its governmental partner organizations to cooperatively accomplish projects, and in particular, to serve as fiscal agents necessary for bringing a project to completion. The PCCD currently handles the grant funds that employ the MWC coordinator as well as partner projects such as the Musselshell River Cooperative Weed Management Area.

### **Goals**

This application requests funds to *Improve the Musselshell Watershed Plan*. All work done as part of drafting the MWP and the final project concepts will align with the following MWC goals:

1. Water Quantity
  - a. Meet decreed and contract water rights obligations by sustaining sufficient water in the Musselshell through cooperative flow management and a well-maintained irrigation infrastructure system
2. Water Quality
  - a. Work with State agencies to meet State Water Standards using a voluntary local approach.
3. Support whole river management through whole river collaboration
  - a. Coordinate and communicate with MWC partners, agencies, and others along the Musselshell through regular meetings, newsletters, and other means of communication.
  - b. Enhance beneficial use of water, conserve the resource, and strive to improve river health.

In the next two years, the MWC will work toward these goals through the development of a watershed plan.

### **Approach**

Funds are requested for Task B – Watershed Restoration Planning. The requested funding is to improve the existing Musselshell Watershed Plan MWP through obtaining data on previous achievements to date and reviewing best management practices established at local, state, and federal levels, interviewing watershed group members and stakeholders, including holding stakeholder meetings for input on projects that would improve the watershed, working with stakeholders at the local, state, and federal level to determine how the watershed can be improved, and finally, through developing project concepts and creating a matrix for prioritizing these projects with input from stakeholders throughout the watershed. The original MWP has been highly successful in getting projects done, however it is losing its relevance as projects are completed and environmental conditions continue to change. Improving the existing MWP by creating a vision for the next 10 years will chart a path forward for resiliency and collaboration within the Musselshell Watershed.

**Project Tasks** for improving the existing Musselshell Watershed Plan are as follows:

1. Summarize Existing Data and Projects
2. Characterize the Watershed Characterization
3. Engage Stakeholders to Identify New Concerns/Project Needs
4. Develop Goals and Identify Solutions
5. Work with Stakeholder Groups to Develop Goals and Identify Solutions
6. Finalize and Release the Vision 2030 Musselshell Watershed Plan
  - a. Develop preliminary engineering designs of top projects

The PCCD previously received an FY2016 WaterSMART Cooperative Watershed Management Program grant. These funds were for, “expanding efforts to coordinate watershed-wide water resources planning in the Musselshell River Watershed.” The project scope included expanding

an existing watershed group by staffing a coordinator, hiring a facilitator, conducting outreach through bi-monthly meetings, bi-monthly newsletters, developing a brochure and website, and further developing the organization through developing bylaws and articles of incorporation. Additionally, funds helped to identify drought resilient projects within the watershed and create an outline for an EPA approved Watershed Restoration Plan for the Upper North Willow Creek Watershed.

Previous CWMP funding helped to establish the MWC as a key player in the Musselshell Watershed; a player with the ability to lead a watershed restoration planning effort. This request will build on all previous work by synthesizing existing reports, data, and efforts. Social, economic, and environmental conditions have changed considerably since the completion of the 2015 Musselshell Watershed Plan. The Musselshell River continues to change and on-the-ground conditions for irrigators and communities need to be considered in this new light. As the river continues to change, local residents and agencies at the local, state and federal level are adopting more adaptive strategies for living and working in a region with extreme weather events. The river continues to change, and local governments and landowners continually work toward recovery. This recovery work is becoming more and more holistic with investments being made in the longer-term resilient approaches. This watershed planning effort will summarize the work that has been done under the existing MWP, including the work done under prior CWMP funding, synthesize the environmental changes since the last plan, and work with stakeholders to identify and develop projects relevant to current environmental, economic, and social contexts.

### **Summarize Existing Data and Projects**

The Musselshell Watershed Plan (MWP) was completed in 2015. Since that time, 75% of the original projects identified in the MWP have been completed or are underway. The Musselshell River continues to change on a seasonal basis as it recovers from the massive flood of 2011. Approaches to project design are adapting to a continually changing river. All of these changes will be summarized. The progress and level of success of current projects will be considered as well as the effectiveness of any implemented Best Management Practices.

Anticipated Deliverables:

- Expand portfolio of completed projects; summarize outcomes of completed projects; update progress/status of proposed projects; review Best Management Practices.

Timeline: July – October 2020

### **Watershed Characterization**

The Watershed Plan will include a characterization of the basin based on existing data. Much of that data resides in local offices of the conservation district partners, NRCS field offices, and water association archives, so a locally-based project Coordinator will be essential to the data gathering process. Members of the River Assessment Triage Team (RAT Team) who have been

working for the past eight years with the MWC have agreed to share the information they collected and used to develop best management practices for the basin.

Three components to data collection:

1. Gather existing relevant information and categorize information in terms of critical issues as identified under Evaluation Criterion B. *Water Quantity Extremes, Floodplain Detachment and Flood Impacts, Aging Irrigation Infrastructure, Water Quality*
2. Summarize completed projects for each of the above-listed project types.
3. Identify and summarize ongoing data collection efforts in the basin, and create a list showing type and location of data collected. The list would include stream gages, water quality monitoring sites, photographic record sites, weed infestation location mapping, cottonwood regeneration sites, irrigation infrastructure sites and photos. This information will assist partners in project design in the future.

The watershed characterization will be used to help identify any factors that might assist or limit implementation of projects prioritized by the assessment process outlined below. Digital maps linked to a database will depict the location of potential projects. Data, ranking information, photographs, and other details associated with each project will reside in the linked database. Data collected through this process will be summarized and analyzed as it is collected and will be compiled into the Watershed Plan document.

Anticipated Deliverables:

- Compilation of previous studies, reports, and other data; map location and description of each potential project.

Timeline: July 2020 – July 2021

### **Engage Stakeholders to Identify New Concerns/Project Needs**

The MWC Coordinator will coordinate meeting logistics for up to six stakeholder meetings. The coordinator will also conduct interviews with local and regional stakeholders as well as attend the regular meetings of member groups throughout the basin in order to gather widespread input.

A series of stakeholder meetings will be held throughout the basin to build a list of desired projects and water management strategies. The contractors and the MWC Coordinator will work together to prepare short presentations on the work accomplished in the basin to date, update the master GIS database that already exists, print large maps to be posted during stakeholder meetings to assist participants in locating potential projects, develop a standard format to be used by stakeholders in identifying projects and strategies to be considered during the planning process, create a method to capture issues raised that may not yet have an identified solution.

Anticipated Deliverables:

- Conduct interviews; attend partner meetings; summary of interviews identifying how the watershed can be improved; brief presentation summarizing data; update master GIS project data; develop criteria for proposed projects; hold stakeholder meetings.

Timeline: August 2020 – March 2022

### **Work with Stakeholder Groups to Develop Goals and Identify Solutions**

Working closely with the stakeholders, the contractors and the MWC Coordinator will develop criteria to be used to prioritize proposed projects and strategies in the basin. The list of projects developed through stakeholder engagement will be reviewed by a contracting engineer to estimate costs and to identify any limiting factors that might impede implementation of infrastructure projects. Proposed projects and water management strategies will be reviewed for statutory compliance and possible environmental impacts by partner agencies. This information will lay the groundwork for the implementation program, as it will be essential for ranking the proposed projects and developing an implementation schedule.

A ranking team composed of diverse stakeholder representatives representing local and regional entities will work with the contractor to adopt project and strategy ranking criteria and then apply those criteria to the list developed during the stakeholder meetings.

Anticipated Deliverables:

- Database of projects, strategies, limiting factors, ranking information, photographs, etc.; project costs estimates; summary of issues that have no proposed solution, project ranking team created; prioritization process created; projects ranked and results summarized; prioritized list of projects and water management strategies.

Timeline: October 2021 – March 2022

### **Finalize and Release the Vision 2030 Musselshell Watershed Plan**

The contractor and MWC coordinator will work with stakeholders to develop an implementation schedule, with a target year/timeframe for each project expected to be pursued in the short-term (0-5 years) as well as long-term (5-20 years.) Funding opportunities will be evaluated and incorporated into the implementation schedule.

An engineering contractor will draft preliminary engineering designs for selected projects identified during this planning process. The implementation plan will be incorporated into the Watershed Plan document. The MWC coordinator will work with local stakeholders to provide review and comment on the final draft of the MWP. The partners agree that it is important that the final report prepared for this planning project be carefully crafted and useful in the future.

Anticipated Deliverables:

- Project implementation schedule; funding opportunities identified; preliminary engineering reports for two projects, basin-wide hard copy map showing location and type of each prioritized project and estimated year of completion; final Watershed Plan document.

Timeline: March – June 2022

## 5. Evaluation Criteria

### A: Watershed Group Diversity and Geographic Scope

#### A.1. Watershed Group Diversity

*“That MWC has put together this coalition of stakeholders that spans the length of one of Montana’s longest rivers is truly remarkable. It may be the only example that I know of in Montana in a watershed of this size where all of the parties involved in river management are at one table, working together, and getting things done.”* – Michael Downey, MT Department of Natural Resources and Conservation, Water Planning Bureau



Privately-held agricultural property dominates the Musselshell Watershed, therefore, the MWC key partners consist of water user associations, conservation districts, and the landowners that they represent. The MWC also works closely with county and city governments located along the Musselshell River, with state and federal agencies rounding out the group of stakeholders. MWC regularly works with state agencies to share information at the local level about state projects taking place in or affecting the Musselshell Watershed.

The following is a list of entities that regularly attend MWC meetings and/or engage in specific MWC projects on a regular basis:

Deadman’s Basin Water Users Association  
Upper Musselshell Water Users Association

Delphia-Melstone Water Users Association  
Mosby-Musselshell Water User Group

Upper Musselshell Conservation District	Montana State University Extension Office
Lower Musselshell Conservation District	MT Department of Natural Resources and Conservation
Petroleum County Conservation District	Conservation
Garfield County Conservation District	Montana Fish Wildlife and Parks
Natural Resources and Conservation Service	Montana Department of Environmental Quality
Weed Districts	US Geological Survey – Gaging Stations
Counties	US Bureau of Land Management
Cities	National Weather Service
Montana Watershed Coordination Council	

In addition, the MWC coordinates a stream gage contribution program among local partners along the Musselshell River. Eighteen local entities pay into this program to extend local support to the USGS stream gage program. These partners are:

Town of Harlowton	Golden Valley County	Petroleum County CD
Town of Ryegate	Musselshell County	Garfield County CD
Town of Lavina	Petroleum County	Upper Musselshell WUA
Town of Roundup	Garfield County	Deadmans Basin WUA
Town of Melstone	Upper Musselshell CD	Delphia-Melstone Canal
Wheatland County	Lower Musselshell CD	Mosby Musselshell WUG

While the partners involved in the MWC are diverse, ranging from private landowners to city governments to Montana State University to MT DEQ, the MWC is continually working to reach an even greater diversity of stakeholders. This expansion of stakeholders includes more individual landowners, more county commissioners and town council persons, the natural resource extraction industry, the US Forest Service, and recreational groups. There are no tribal entities with land in the watershed.

Improving the Musselshell Watershed Plan is a prime opportunity to engage additional stakeholders. The MWC Coordinator will work to contact and encourage participation in stakeholder meetings and submission of potential projects for development within the plan. Continued diverse stakeholder involvement and building the base of stakeholders will require outreach activities, in particular, face-to-face visits. The Musselshell River lies in a remote and rural part of central Montana. MWC's success is based on trust and understanding through acceptance of traditional agriculture cultural values such as hard work, honesty, and integrity. These relationships must be developed through face-to-face visits, phone calls, and hard copy correspondence. While more time-intensive and costly to develop, these traditional techniques in this area will establish a much stronger relationship and network than the new trends to communicate via social media and email. The work and investment to create and solidify relationships with stakeholders will pay dividends in the future as the groundwork for successful project implementation is laid early in the project development stage.

A series of stakeholder meetings will be held at multiple locations throughout the watershed so that at least one meeting will be close to stakeholders' properties or offices. In addition to stakeholder meetings held specifically for the development of the watershed plan, the MWC coordinator will travel to and attend regularly scheduled meetings of stakeholders, such as county commissioner meetings and water user association meetings. Also, the MWC will continue to hold bi-monthly public meetings where current projects are discussed and the opportunity for stakeholders to provide input for project development is always welcome.

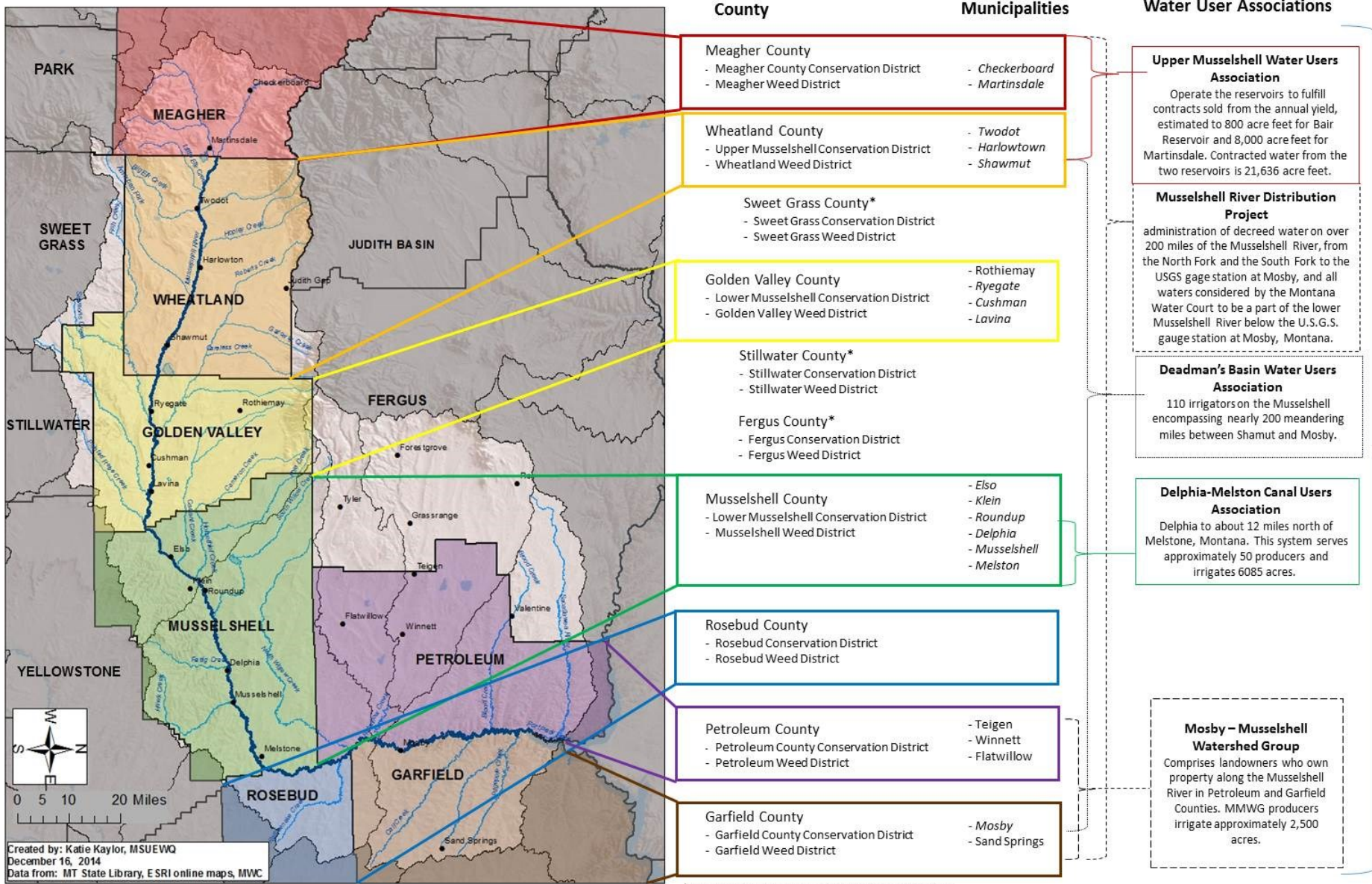
## **A.2. Geographic Scope**

The MWC's roots lie in the battles over water distribution along the chronically dewatered Musselshell River. While water disagreements will always exist, the large altercations have been addressed through the Musselshell River Distribution Project and water users along the Musselshell River are moving toward a river-length approach to efficiently managing water. This effort is guided by the MWC. With water quantity and quality of the MWC as the guiding goals of the MWC, the entire length of the river must be considered. Therefore, the geographic focus of the MWC is the Musselshell River itself. While the Musselshell Watershed is a large geographic area, the population is low and the communities are closely tied to each other, making watershed-wide efforts efficient. For example, during the devastating Lodgepole Complex Fires of 2017, which eventually burned over 270,000 acres in the lower Musselshell region, the water users of the upstream Deadman's Basin Water Users Association, also in severe drought, made a tough decision. The water manager along with the Chief Water Commissioner for the Musselshell Distribution Project, decided to let stored irrigation water from Deadman's Basin Reservoir flow downstream so it could aid in the firefighting efforts. It doesn't get any bigger than sacrificing water for your neighbor in times of drought.

This project will focus on the Musselshell River Corridor, as does the Musselshell River Cooperative Weed Management Area and other projects of the Musselshell Watershed Coalition. Focusing on the river itself will result in a range of projects that are both achievable and impactful. The MWC has adopted this approach to focus on the Musselshell River for 10 years and this approach has resulted in watershed-wide partnerships with conservation districts, county governments, and weed districts. These other partners focus on the remaining parts of the watershed.



# Musselshell Project Partners Diagram



Musselshell Watershed Coalition

Evaluation Criteria

## **B: Addressing Critical Watershed Needs**

### **B.1. Critical Watershed Needs or Issues**

Four large critical issues exist within the Musselshell Watershed:

1. Water quantity extremes experienced through extreme drought or flooding
2. Detachment from floodplain/flood damage
3. Aging irrigation infrastructure
4. Water Quality: High salinity

#### ***Water Quantity Extremes***

The Musselshell River flows commonly cease or become a trickle in late summer and early fall unless off-stream storage is supporting the system. Dewatering has been a persistent issue in the Musselshell River Basin. As early as 1949, a Water Resource Survey completed by the Montana State Engineers office classed the Musselshell River as an intermittent stream due to historically unreliable flows in the lower parts of the river. In 1991 the Montana State Legislature designated the Musselshell River as a chronically dewatered stream. In 2003, Montana Fish Wildlife and Parks identified 309 miles of the Musselshell River, extending from the Deadman's Basin Supply Canal to the mouth, as chronically dewatered. Since the start of the Musselshell River Distribution Project in 2002, water delivery has been measured and since 2005, the Musselshell River has flowed uninterrupted year-round to Fort Peck Lake.

2011 marked the end of a 30-year dry period, however and the period since 2011 has been characterized by unpredictable weather events resulting in massive flooding with shorter periods of "flash drought" being experienced in 2017 and to a lesser extent in 2012. These floods are further explained below.

#### ***Floodplain Detachment and Flood Impacts***

When the Milwaukee Railroad was constructed in the early 20th Century, the Musselshell River was dramatically altered to accommodate the railroad right-of-way. To minimize both the length of track and the need for bridges, the river was straightened and shortened. According to an article in the Billings Gazette (Graetz, 2003), "In building the route [through the Musselshell River Valley], workers moved the river's channel more than 100 times." The Musselshell River Assessment Report (Lower Musselshell Conservation District, 2004) describes 140 meanders as shortened or cut off from the river. Since the 1880s, the historic connectivity of the Musselshell River to its floodplain has been impacted by the river's response to this straightening.

The fact that the Musselshell River experienced four major floods since spring 2011 strongly influenced the desire for developing a Watershed Plan. The floods imparted a tremendous amount of change on the river that had seen little change in the 30 years prior. That change is largely due to the 2011 flood, which was notable in terms of its very long duration of high flows. At Mosby, for example, a 10-year flood discharge was exceeded for 19 days at Mosby and for 22

days at Roundup. Previous to that, the longest duration of a flood of that magnitude was in 1967, when the 10-year event was exceeded for 11 days. The long period of duration and repeated peaks in flood stage caused dramatic changes to the Musselshell River and imparted extensive damage to infrastructure and property in the river corridor.

Major changes caused by the 2011 flood include the following:

- The flood caused 59 avulsions, resulting in abandonment of almost 37 miles of channel;
- Avulsions created just over nine miles of new channel;
- The river was shortened by 8 percent between Fort Peck Reservoir and Martinsdale;
- The most severe shortening was in the lowermost 89 miles of river;
- In places, the river migrated several hundred feet during the flood, causing massive erosion and sediment delivery downstream;
- A total of 31 breaches through the abandoned railroad grade;
- Several diversion structures were flanked, buried, or abandoned;
- Dozens of irrigation pumps were abandoned;
- Floodplain deposition was several feet thick in some areas, commonly in agricultural fields;
- Vast carpets of cottonwood and willow seedlings were established by the flood.

Subsequent flooding around Roundup in Winter 2014 and on the lower river and Flatwillow Creek in August 2014, and prolonged high water in 2018 have further driven geomorphic change on the river, including bank erosion, channel movement, and floodplain inundation.

When the MWC formed in 2009, floodplain detachment was a little-known issue. Severe flooding in recent years has brought this issue to the limelight and individuals and entities, such as the town of Roundup, are eager to discuss solutions for building long-term solutions.

### ***Aging Irrigation Infrastructure***

No new major irrigation infrastructure projects have been initiated since the construction of the Delphia-Melstone Canal in the mid-1950s. The other major projects - Deadman's Basin and Upper Musselshell - were completed in the 1940s. Only minor modifications have been made to the infrastructure supporting those projects. Repairs have been addressed over the years to avert disastrous failures, however a history of deferred maintenance combined with age has left today's users in a quandary of how to continue with their systems – which deliver the water that is key to operations and therefore economic stability in the Basin.

Since the formation of the MWC, the poor condition of the irrigation infrastructure has only deteriorated as the systems have had to endure historic flooding in four of the last eight years. Work began immediately following the floods to repair damage and emergency needs have been addressed. However, the fragile state of the region's critical irrigation projects creeps closer and closer to a dangerous breaking point.

### ***Water Quality***

Salinity levels in groundwater as well as Musselshell River water have been a concern for decades. The wet spring and floods of 2011 heightened producers' awareness of and concern about salinity when several stockwater reservoirs became unusable for livestock because of high salinity content. Irrigators belonging to the Musselshell Watershed Coalition requested that the MWC begin a citizen-based salinity monitoring program to monitor these levels for irrigation purposes and for better understanding of the problem.

Local volunteers have monitored the river's salinity since 2013 (data are housed here: <http://waterquality.montana.edu/musselshell/salinity/>). Salinity has been mentioned as a concern in several reports (Stream Corridor Assessment, NRCS, 2002; Lower Musselshell River Monitoring Project, Warren Kellogg, 2013). Kellogg concluded, "Higher flows are typically affected by surface run-off with lower salt concentrations. Low flow conditions are usually influenced by groundwater with higher salt concentrations." This finding has been supported by both the MWC volunteer monitoring program as well as MT Department of Environmental Quality data loggers installed from 2015-2017. The source of this salinity remains undetermined. Groundwater contributions to the river are hypothesized to be a contributing factor as the river salinity is highest during times of lowest flows.

In 2015 the Montana Department of Environmental Quality (DEQ) launched a watershed planning project in the Musselshell. This assessment was completed in late 2018 and the results were made available to MWC and its partners in early 2019. This information is currently informing the development of Total Maximum Daily Load documents, which will be completed between 2020-2022.

The Musselshell River is currently impaired for:

<b>WATERBODY NAME / LOCATION</b>	<b>CAUSE NAME</b>
MUSSELSHELL RIVER, North & South Fork confluence to Deadmans Basin Diversion Canal	Iron
MUSSELSHELL RIVER, North & South Fork confluence to Deadmans Basin Diversion Canal	E. Coli
MUSSELSHELL RIVER, North & South Fork confluence to Deadmans Basin Diversion Canal	Habitat and Low Flow Alterations
MUSSELSHELL RIVER, Deadmans Basin Supply Canal to HUC boundary near Roundup	Iron, Lead
MUSSELSHELL RIVER, Deadmans Basin Supply Canal to HUC boundary near Roundup	E. Coli
MUSSELSHELL RIVER, Deadmans Basin Supply Canal to HUC boundary near Roundup	Sedimentation/Siltation
MUSSELSHELL RIVER, Deadmans Basin Supply Canal to HUC boundary near Roundup	Habitat and Low Flow Alterations
MUSSELSHELL RIVER, HUC boundary near Roundup to Flatwillow Creek	Iron
MUSSELSHELL RIVER, HUC boundary near Roundup to Flatwillow Creek	Habitat and Low flow alterations
MUSSELSHELL RIVER, Flatwillow Creek to Fort Peck Reservoir	Iron
MUSSELSHELL RIVER, Flatwillow Creek to Fort Peck Reservoir	E. Coli
MUSSELSHELL RIVER, Flatwillow Creek to Fort Peck Reservoir	Low flow alterations

## B.2. Developing Strategies to Address Critical Watershed Needs or Issues

### *Gathering Information*

The group will gather information through a combination of scientific techniques and subject matter expert interviews and input. These include scientific data review through literature reviews, a limited amount of mapping, and interviews and stakeholder engagement.

A contractor will gather scientific data to inform the Watershed Plan. Previous contractors for watershed planning efforts have been geomorphologists, biologists, and natural resources consultants. This consultant will compile and synthesize existing information, conduct any necessary mapping, and, with input from the stakeholders develop goals and benchmarks for the plan. A large amount of mapping has previously been completed for the Musselshell River and it is anticipated that any further mapping needed for the project will be minimal.

The core datasets that will be brought into an existing GIS database and used in the outreach process include the following:

**Framework Datasets** – Framework datasets are generally publicly available information from agencies and provide the core information used for mapping such as watershed boundaries, streams, roads, county boundaries, gage locations, elevation, etc. These datasets are valuable for identifying basic geographic features and ongoing sampling locations such as USGS gaging stations.

**River Assessment Triage Team (RATT)** – In response to the 2011 and 2018 floods, the RATT Team was formed to assess the impacts of the flooding and to provide a resource to those impacted by the flooding. As part of their assessment efforts, several datasets were created to help determine the extent of the impacts. These included pre and post-flooding channel centerlines, breached railroad grade locations, avulsions, dam/diversion locations, etc. These datasets provide an important snapshot of the river before and after the flood, as well as provide a basis for monitoring the long-term responses to the floods.

A series of map tiles covering the mainstem of the Musselshell River from Martinsdale to Fort Peck Reservoir will be created for the stakeholder meetings, as well as to provide a longer-term map resource for MWC and its partners.

The MWC Coordinator will work to gather information through in-person interviews with watershed group members, local, state, and federal government staff, landowners, and others. The Coordinator will travel to agency offices when necessary to review documents and access information as well as to speak to agency staff about best management practices and guidance on how the watershed can be improved. The Musselshell River Assessment Triage Team previously completed best management practices for the Musselshell River, the MT DEQ has best management practices for work in wetlands, and the water user associations have guidance on irrigation infrastructure best management practices. This watershed planning effort will synthesize all of this existing information as well as speak to landowners and water managers

about the effectiveness of these BMP's in order to identify the most current and relevant practices.

Gathering of information will result in a greater understanding of the critical watershed issues and will provide context for addressing the needs associated with **water quantity extremes, floodplain detachment and flood impacts, aging infrastructure, and water quality.**

### ***Opportunities to Resolve Conflicts***

Each of the identified critical issues has the potential to cause conflicts. One of the MWC's stated goals is, "Support whole river management through whole river collaboration." The MWC works on a continual basis to resolve conflicts and to find collaborative solutions. Through stakeholder meetings, in-person interviews, and meetings with watershed member groups, such as water user associations and county commissions, the MWC Coordinator and contractor will identify conflicts.

One step in the MWP planning process is to identify solutions. Solutions will address project challenges as well as conflict resolution for priority issues. MWC works through projects and issues as a group and will approach any conflicts identified in this same manner as previously proven to be successful.

### ***Prioritizing Issues***

One step in creating the Musselshell Watershed Plan is to prioritize the projects. In order to prioritize each project, the watershed planning effort will include developing criteria to use in ranking each project. These criteria will consider critical issues on the Musselshell River and incorporate those issues into the ranking criteria for projects. A ranking committee will be created that will meet in-person and discuss each project and assign a prioritization for each project based on the criteria that will have been previously determined.

### ***Building on Previous Efforts***

In the first watershed planning effort, the MWC coordinated a planning project to identify and evaluate project priorities throughout the Basin as a way to address needs expressed by landowners and water users along the Musselshell River. The planning process involved six landowner outreach meetings held in six locations along the 340-mile long river. Approximately 100 people attended these public meetings, a remarkable number for a planning project in an area with only 9,000 residents in the entire watershed. This planning effort addressed the needs of the entire river and included many tributaries.

The original Musselshell Watershed Plan identified and prioritized 19 individual rehabilitation projects and 14 study/planning efforts spanning the length of the river. Additionally, as part of the same effort, reconnaissance level engineering for the top three construction projects was completed. These projects address water shortages and infrastructure needs, flood damage and repair needs, habitat concerns, water quality concerns, and basin-wide planning concepts. This

Musselshell Watershed Plan contained an implementation schedule with short-term and long-term goals, as well as recommendations for funding sources. It provides guidance to the MWC as well as its many partners for priority projects within the Musselshell Watershed.

The watershed plan has been highly successful in project implementation, securing funding for projects, and in bringing stakeholders together. The first plan was intended to be a living document, with updates and improvements required over time.

The process for *Improving the Musselshell Watershed Plan* will mirror the successful efforts of the first plan to build upon the existing body of knowledge that has grown since 2015. The improved plan will develop projects based on information that informed the 2015 MWP as well as efforts since 2015, including all of the projects identified in the original plan, the 2018 River Assessment, invasive species work targeting aquatic invasive species and a new Cooperative Weed Management Area, and an irrigation infrastructure condition assessment. This information for the Musselshell River Corridor will help to identify and develop watershed management project concepts that address **water quantity extremes, floodplain detachment and flood impacts, aging infrastructure, and water quality.**

## **C: Implementation and Results**

### **C1. Understanding of and Ability to Meet Program Requirements**

Refer to the Approach section on pages 8-11 for more information on the implementation approach for improving the Musselshell Watershed Plan. A table summarizing this information follows:

<b>Implementation Plan: Vision 2030 Musselshell Watershed Plan</b>				
<b>Watershed Activity and Major Tasks</b>	<b>Milestones</b>	<b>Schedule</b>	<b>In-Kind Costs</b>	<b>Request</b>
Summarize Existing Data and Projects		July - Oct 2020		\$ 14,842
	Expand portfolio of completed projects			
	Summarize outcome of completed projects			
	Update progress/status of proposed projects			
	Review Best Management Practices			
Watershed Characterization		July 2020 - July 2021		\$ 4,231
	Describe watershed events since last effort			
Engage Stakeholders		Aug 2020 - March 2022	\$ 11,250	\$ 19,228
	Work with stakeholders to determine how the watershed can be improved			
	Interview group members and other stakeholders			
	Create brief presentation summarizing data			
	Update master GIS project			
	Develop criteria for proposed projects			
	Conduct stakeholder meetings			
Work with Stakeholders to Develop Goals and Identify Solutions		Oct 2021 - March 2022	\$ 2,500	\$ 12,126
	Place proposed project locations into GIS project			
	Summarize issues that have no proposed solution			
	Compile project forms into database			
	Organize a Project Ranking Team			
	Develop prioritization process			
	Rank projects and summarize results			
	Estimate project costs			
	Summarize project rankings by criteria			
Finalize and Release the Vision 2030 Musselshell Watershed Plan		March - June 2022		\$ 29,423
	Assess feasibility of completing top-ranked projects			
	Identify needs and limiting factors			
	Develop schedule for project completion			
	Compile results into overall implementation plan			
	Summarize results into planning project report			
	Create basin-wide maps with projects/timeline			
	Develop conceptual design/costs for two projects			
Total for Activity Implementation - Reclamation Request				\$ 79,850
Indirect Cost 10%				\$ 7,985
<b>Project Cost - Reclamation Request</b>				<b>\$ 87,835</b>
Project Cost - In-kind contributions			\$ 13,750	\$ 13,750
<b>Total Project Cost - Request and In-Kind Contributions</b>				<b>\$ 101,585</b>



## **C2. Building on Relevant Federal, State, or Regional Planning Efforts**

*“[MWC] is a model for how much you can achieve when you pull that off, when you get everyone together,”* - Karin Boyd, the owner of Applied Geomorphology in Bozeman

### ***Local Plan***

The existing Musselshell Watershed Plan is described as a “living document” and suggests regular updating. Through this project, *Improving the Musselshell Watershed Plan*, the goals of the existing plan will be met.

### ***Regional Plan***

The Musselshell River Basin was part of the Lower Missouri River Basin Advisory Council (LMR BAC) in the development of the Montana Water Supply Initiative for the Montana Department of Natural Resources and Conservation (DNRC). The LMR BAC consisted of 20 members that worked together to articulate water resource issues of concern starting in August of 2013. Six scoping meetings were held that fall, and issues raised were winnowed down to five core topics including Surface Water Availability and Quality, Groundwater Availability and Quality, Water Management, Future Needs, and Implementation Strategies. This project will take each of the core topics further and develop these within the Musselshell River context. Potential water management concepts will be considered with these core topics as relevant context for the larger region.

### ***Montana State Water Plan***

MWC activities relate directly to the Montana State Water Plan. The approach and strategy for improving the Musselshell Watershed Plan will ensure that elements are broad-ranging and include everything from specific on-the-ground projects focused on saving water to large watershed-wide management efforts, such as furthering the cooperative weed management area. The priority areas identified in the Montana State Water Plan are: water supply and demand, water information, ecological health and environment, and collaborative water planning and coordination. As outlined in the Developing Strategies section, watershed management project concepts will be analyzed and prioritized according to a set of criteria. These criteria closely align with the priority areas identified in the State Water Plan.

### ***Montana Nonpoint Source Management Plan***

Many projects prioritized by the MWC address specific strategies for agricultural contributions to NPS pollution.

1. *Improve communication on NPS pollution issues among Montana’s agricultural community.*

As the MWC works to improve the Musselshell Watershed Plan, communication among Montana’s agricultural community is critical to the successful completion of projects. Each of MWC’s projects requires the involvement of private landowners and/or water associations and/or conservation districts. Each of these entities represents the agricultural community. Also, as water quality benefits comprise a critical element to project priority, the project benefits discussions will improve communications on NPS pollution issues.

- a. *Face-to-face communication*

- b. *Mutual respect and support*
- 2. *Evaluate NPS pollution reduction efforts and activities*
  - a. *Inventory and monitor potential sources and types of NPS pollution.*

## **D: Department of the Interior Priorities**

### **Creating a conservation stewardship legacy second only to Teddy Roosevelt**

In *Improving the Musselshell Watershed Plan*, contractors and stakeholders will work to develop watershed management concepts through consideration of the best available science that helps residents and agencies to understand the local environment and to develop best management practices based on this science. The ultimate goal of the Musselshell Watershed Plan is to identify projects that will be most resilient and adaptive to changes in the environment of the Musselshell River Watershed.

### **Utilizing our Natural Resources**

The majority of land use within the Musselshell River Corridor is agricultural. Agricultural land is used mainly for grazing and for growing crops to feed livestock. The Musselshell Watershed Plan will identify projects that foster utilization of natural resources for agricultural benefits while also considering the effects to these natural resources.

### **Restoring Trust with Local Communities**

The significant service that the MWC delivers is an open line of communication among stakeholders in the Musselshell Watershed. The MWC hosts bi-monthly meetings that are a forum for respectful dialogue and information sharing among partners throughout the watershed. Through improving the existing watershed plan, a critical component will be expanding lines of communication at all levels; local, regional, state, and beyond with partners with an interest in the Musselshell Watershed.

### **Modernizing our Infrastructure**

Irrigation is by far the highest use of Musselshell River water and one of the biggest contributors to the local economy. Water user associations are core members of the MWC and will be submitting irrigation infrastructure project concepts for development in the Musselshell Watershed Plan. The plan will help to further these projects by prioritizing them and opening funding sources to assist in their completion.

## Project Budget

**Table 1 – Total Project Cost Table**

Source	Amount
Costs to be reimbursed with the requested Federal Funding	\$ 87,835.00
Costs to be paid by the applicant	\$ -
Value of third-party contributions	\$ 13,750.00
<b>Total Project Cost</b>	<b>\$ 101,585.00</b>

**Table 2 – Project Budget Proposal:**

This project requests funding from the Bureau of Reclamation for the Project Manager, which will be the MWC Coordinator, for Geomorphologist and Engineering Contractors, for travel related to engaging stakeholders and gathering information for the MWC Coordinator, for printing expenses, and for meeting expenses.

Budget Item Description	Computation		Quantity Type	Total Cost
	\$/Unit	Quantity		
Salaries and Wages				
Employee 1	20	750	hours	\$ 15,000.00
Fringe Benefits				
Part-Time Employees	5.56	750	hours	\$ 4,170.00
Travel				
Mileage	0.55	2872.73	miles	\$ 1,580.00
Equipment				
None				\$ -
Supplies and Materials				
Office - printing	0.25	4000	page	\$ 1,000.00
Contractual/Construction				
Contractor A - Geomorphologist	120	375	hours	\$ 45,000.00
Contractor B - Engineer	140	85	hours	\$ 11,900.00
Other				
Meeting Costs	200	6	meeting	\$ 1,200.00
In-Kind Stakeholder Time	25	550	hours	\$ 13,750.00
<b>Total Direct Costs</b>				<b>\$ 93,600.00</b>
Indirect Costs				
PCCD Admin of Grant Contract	10%	\$ 79,850.00		\$ 7,985.00
<b>Total Estimated Project Costs</b>				<b>\$ 101,585.00</b>

## Budget Narrative

### Salaries and Wages

Project Manager - Musselshell Watershed Coalition Coordinator

Task	Hours	Rate	Total Cost
Summarize Existing Data and Projects	200	20	\$ 4,000.00
Watershed Characterization	20	20	\$ 400.00
Engage Stakeholders	300	20	\$ 6,000.00
Work with Stakeholders to Develop Goals and Identify Solutions	100	20	\$ 2,000.00
Finalize and Release the Vision 2030 Musselshell Watershed Plan	130	20	\$ 2,600.00
<b>Total</b>	<b>750</b>		<b>\$ 15,000.00</b>

The MWC Coordinator will work with the contractors to perform tasks listed in the project approach and implementation sections. These tasks include local coordination and management of project components. The coordinator will work with the contractors to interview watershed group members and stakeholders to learn about projects that will improve the watershed. The coordinator will work with watershed stakeholders at local, state, and federal levels to determine how the watershed can be improved. The coordinator will work with the contractor to review best management practices already established by local, state, and federal agencies. The coordinator will also work with the contractor to develop watershed management project concepts, and work with a local steering committee to develop project criteria, a matrix for prioritizing projects and go through the process to prioritize projects. The coordinator will also work with stakeholders, the local steering committee, and the contractor to develop an implementation plan. Upon completion of the Musselshell Watershed Plan, the MWC coordinator will ensure that the plan is well distributed among stakeholders.

### Fringe Benefits

Task	Hours	Rate	Total Cost
Summarize Existing Data and Projects	200	5.56	\$ 1,112.00
Watershed Characterization	20	5.56	\$ 111.20
Engage Stakeholders	300	5.56	\$ 1,668.00
Work with Stakeholders to Develop Goals and Identify Solutions	100	5.56	\$ 556.00
Finalize and Release the Vision 2030 Musselshell Watershed Plan	130	5.56	\$ 722.80
<b>Total</b>	<b>750</b>		<b>\$ 4,170.00</b>

The Coordinator is employed by the Petroleum County Conservation District and receives leave and liability benefits according to the State of Montana rates for Conservation Districts. These rates are:

<u>Leave</u>	Sick	0.04611
	Annual	0.05778
<u>Company Paid Liabilities</u>		
	Social Security	0.062
	Medicare	0.0145
	Unemployment	0.0015
	Worker's Comp	0.0137
	PERS	0.0827

## Travel

### Mileage

Task	Miles	Rate	Total Cost
Summarize Existing Data and Projects	454.55	0.55	\$ 250.00
Watershed Characterization	0	0	\$ -
Engage Stakeholders	1600	0.55	\$ 880.00
Work with Stakeholders to Develop Goals and Identify Solutions	454.54	0.55	\$ 250.00
Finalize and Release the Vision 2030 Musselshell Watershed Plan	363.64	0.55	\$ 200.00
<b>Total</b>	<b>2872.7</b>		<b>\$ 1,580.00</b>

The Musselshell Watershed Coalition covers vast distances, with partner groups and individual stakeholders residing from the Meagher County seat in White Sulphur Springs to the Garfield County seat in Jordan, a distance of 243 miles. MWC meetings are currently held in Roundup, a distance of 45 miles from the Petroleum County Conservation District in Winnett, where the coordinator is employed. Up to six meetings will be held in different locations across the watershed and the coordinator will also travel throughout the watershed to conduct interviews and to meet with member groups, such as water user associations and county commissions. The Coordinator will also travel to Helena, Billings, and Lewistown, Montana, for meetings with state agencies and to access information in state and federal regional offices.

## Supplies and Materials

### Printing Costs

Task	Copies	Rate	Total Cost
Summarize Existing Data and Projects	0	0.25	\$ -
Watershed Characterization	0	0.25	\$ -
Engage Stakeholders	2400	0.25	\$ 600.00
Work with Stakeholders to Develop Goals and Identify Solutions	800	0.25	\$ 200.00
Finalize and Release the Vision 2030 Musselshell Watershed Plan	800	0.25	\$ 200.00
<b>Total</b>	<b>4000</b>		<b>\$ 1,000.00</b>

Paper and ink for 4,000 copies will be purchased in order to distribute pertinent information to stakeholders at meetings and throughout the watershed planning process.

## Contractual

### Contractor - Geomorphologist

Task	Hours	Rate	Total Cost
Summarize Existing Data and Projects	79	120	\$ 9,480.00
Watershed Characterization	31	120	\$ 3,720.00
Engage Stakeholders	74	120	\$ 8,880.00
Work with Stakeholders to Develop Goals and Identify Solutions	76	120	\$ 9,120.00
Finalize and Release the Vision 2030 Musselshell Watershed Plan	115	120	\$ 13,800.00
<b>Total</b>	<b>375</b>		<b>\$ 45,000.00</b>

A geomorphologist will be contracted with to perform the majority of the work to compile information, develop watershed management project concepts, and to prioritize these projects. The contractor will work closely with the MWC coordinator and stakeholders to develop the Musselshell Watershed Plan

Contractor - Engineer

<b>Task</b>	<b>Hours</b>	<b>Rate</b>	<b>Total Cost</b>
Summarize Existing Data and Projects	0	140	\$ -
Watershed Characterization	0	140	\$ -
Engage Stakeholders	0	140	\$ -
Work with Stakeholders to Develop Goals and Identify Solutions	0	140	\$ -
Finalize and Release the Vision 2030 Musselshell Watershed Plan	85	140	\$ 11,900.00
<b>Total</b>	<b>85</b>		<b>\$ 11,900.00</b>

An engineer will be contracted to develop project costs and preliminary designs for two selected projects. The engineer will work closely with the geomorphologist, MWC coordinator and stakeholders. The preliminary engineering designs will provide enough information for the two selected projects to get underway as quickly as possible.

**Other**

Meeting Costs

<b>Task</b>	<b>Meeting</b>	<b>Rate</b>	<b>Total Cost</b>
Summarize Existing Data and Projects	0	200	\$ -
Watershed Characterization	0	200	\$ -
Engage Stakeholders	6	200	\$ 1,200.00
Work with Stakeholders to Develop Goals and Identify Solutions	0	200	\$ -
Finalize and Release the Vision 2030 Musselshell Watershed Plan	0	200	\$ -
<b>Total</b>	<b>6</b>		<b>\$ 1,200.00</b>

There will be up to six meetings held across the Musselshell Watershed for stakeholders to attend to provide input on project concept identification and development. Associated meeting costs include printing and mailing of invitations and meeting room rental fees.

In-Kind Contributions - Stakeholder Time for Meetings and Interviews

<b>Task</b>	<b>Hours</b>	<b>Rate</b>	<b>Total Cost</b>
Summarize Existing Data and Projects	0	25	\$ -
Watershed Characterization	0	25	\$ -
Engage Stakeholders	450	25	\$ 11,250.00
Work with Stakeholders to Develop Goals and Identify Solutions	100	25	\$ 2,500.00
Finalize and Release the Vision 2030 Musselshell Watershed Plan	0	25	\$ -
<b>Total</b>	<b>550</b>		<b>\$ 13,750.00</b>

Stakeholders from across the watershed will contribute their time to identifying and developing project concepts. This time will include attending stakeholder meetings, being interviewed, providing individual feedback to the MWC Coordinator and consultant, participating in the prioritization process, and providing comment on the Watershed Plan document.

Total Direct Costs			\$ 93,600.00
10% De Minimus Indirect Costs of Request - \$79,850			\$ 7,985.00
<b>Total Estimated Project Costs</b>			<b>\$ 101,585.00</b>

	Total Direct Costs - Reclamation Request	\$ 79,850.00
	10% De Minimus Indirect Costs of Request	\$ 7,985.00
	<b>Total Reclamation Request</b>	<b>\$ 87,835.00</b>

**Letter of In-Kind Commitment**

Letter from the Musselshell Watershed Coalition stating commitment for in-kind contributions from its members.



## Musselshell Watershed Coalition

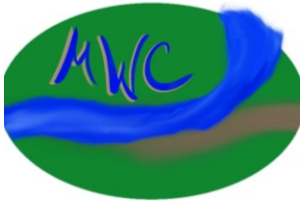
Board members: President Shirley Parrot, Vice-President Bill Bergin, Jr., Diane Ahlgren, Shane Moe, Lynn Rettig, Leon Hammond, Craig Dalgarno

Coordinator: Laura Nowlin

P.O. Box 118

Winnett, MT 59087

<http://musselshellwc.wix.com/musselshellwc>



November 12, 2019

Bureau of Reclamation  
Water Resources and Planning Division  
Attn: Ms. Avra Morgan  
Mail Code: 84-51000  
P.O. Box 25007  
Denver, CO 80225

Re: *Growth of the Musselshell Watershed Coalition through Improving the Musselshell Watershed Plan*

Dear Ms. Morgan;

The Musselshell Watershed Coalition (MWC) submits this letter as a commitment of in-kind time contributions to the Musselshell Watershed Planning effort on behalf of our members.

In 2015, the MWC completed it's first Musselshell Watershed Plan. This was a stakeholder driven process to which **MWC members contributed over \$22,500** worth of volunteer time. The original Musselshell Watershed Plan has proven to be highly successful in prioritizing work within the Musselshell Watershed and for bringing stakeholders together to complete projects. As with all plans, it is time to update the existing plan and our members are ready to contribute to developing the plan through in-kind time.

Time will be contributed by members representing themselves and by members representing entities, such as water user associations, towns, counties, and conservation districts. At least \$11,250 will be contributed during the information gathering portion of the project as stakeholders are interviewed and attend meetings. An additional \$2,500 will be donated to the project by members who are on the project ranking team and by those who will provide final review and comment of the document.

**Our members will contribute no less than \$13,750** of in-kind time to *Improving the Musselshell Watershed Plan*.

Sincerely,

Laura Nowlin, Coordinator  
Musselshell Watershed Coalition

## **Required Permits or Approvals**

This project does not require any permits or approvals in order to be implemented.

## **Letters of Support**

Letters of support testify to the diversity and geographic scope of the MWC. Letters of support from the following entities are attached to this application:

MT DNRC

MT Fish, Wildlife, and Parks

Upper Musselshell Water Users Assoc.

Deadman's Basin Water Users Assoc.

Delphia Melstone Canal Water Users Assoc.

Lower Musselshell Conservation District

City of Roundup

MT Department of Environmental Quality

Musselshell County

Bureau of Reclamation  
Water Resources and Planning Division  
Attn: Ms. Avra Morgan  
Mail Code: 84-51000  
P.O. Box 25007  
Denver, CO 80225

Re: Letter of Support for Further Developing the Musselshell Watershed Plan

Dear Ms. Morgan;

The Upper Musselshell Water Users Association provides this letter of support for the Petroleum County Conservation District application. The Upper Musselshell Water Users Association manages two reservoirs and a canal system for the delivery of stored water to its users. We have been involved with the Musselshell Watershed Coalition since its inception and support the further development of the Coalition and its project, *Growth of the Musselshell Watershed Coalition through Improving the Musselshell Watershed Plan*.

The MWC works effectively to address water quality and quantity issues by bringing together diverse stakeholders from across the Musselshell Watershed. The MWC focuses on watershed-wide collaboration strategies necessary to implementing projects that result in the improvement of water quality, the conservation of water, and the reduction of conflicts over water.

In 2015, the MWC completed its first Musselshell Watershed Plan. This was a stakeholder driven process that resulted in the identification and prioritization of 27 on-the-ground and planning projects. The original Musselshell Watershed Plan has provided incredibly useful guidance for prioritizing work in the Musselshell Watershed and for bringing stakeholders together to complete projects. As with all plans, it is time to update the existing plan and the Upper Musselshell Water Users Association looks forward to being a partner in this planning process.

Sincerely;

Craig Dalgarno, Projects Manager  
Upper Musselshell Water Users Association

A handwritten signature in black ink that reads "Craig Dalgarno". The signature is written in a cursive style with a long horizontal flourish extending to the right.

Bureau of Reclamation  
Water Resources and Planning Division  
Attn: Ms. Avra Morgan  
Mail Code: 84-51000  
P.O. Box 25007  
Denver, CO 80225

Re: Letter of Support for Further Developing the Musselshell Watershed Coalition

Dear Ms. Morgan;

I am Sandra Jones the Mayor of the City of Roundup. Roundup is the County seat for Musselshell County. We have been involved with the Musselshell Watershed Coalition since its inception and support the further development of the Coalition and its project, *Growth of the Musselshell Watershed Coalition through Improving the Musselshell Watershed Plan*.

The MWC works effectively to address water quality and quantity issues by bringing together diverse stakeholders from across the Musselshell Watershed. The MWC focuses on watershed-wide collaboration strategies necessary to implementing projects that result in the improvement of water quality, the conservation of water, and the reduction of conflicts over water.

In 2015, the MWC completed it's first Musselshell Watershed Plan. This was a stakeholder driven process that resulted in the identification and prioritization of 27 on-the-ground and planning projects. The original Musselshell Watershed Plan has provided incredibly useful guidance for prioritizing work in the Musselshell Watershed and for bringing stakeholders together to complete projects. As with all plans, it is time to update the existing plan and the City of Roundup looks forward to being a partner in this planning process.

Sincerely

Roundup Mayor

Sandra Jones

DEPARTMENT OF NATURAL RESOURCES  
AND CONSERVATION



STEVE BULLOCK  
GOVERNOR

DIRECTOR'S OFFICE (406) 444-2074  
TELEFAX NUMBER (406) 444-2684

STATE OF MONTANA

WATER RESOURCES DIVISION (406) 444-6601  
TELEFAX NUMBERS (406) 444-0533 / (406) 444-5918  
<http://www.dnrc.mt.gov>

1424 9TH AVENUE  
PO BOX 201601  
HELENA, MONTANA 59620-1601

Bureau of Reclamation  
Water Resources and Planning Division  
Attn: Ms. Avra Morgan  
Mail Code: 84-51000  
P.O. Box 25007  
Denver, CO 80225

November 6, 2019

Re: Letter of Support for Further Developing the Musselshell Watershed Coalition

Dear Ms. Morgan,

The Water Planning Section of Montana DNRC assists watershed groups in water management planning across Montana. Our interest extends from the state level to regional and local watershed basin planning efforts. Our involvement with the Musselshell Watershed Coalition (MWC) goes back to its inception, and we offer our unqualified support for the Coalition and its project, *Growth of the Musselshell Watershed Coalition through Updating the Musselshell Watershed Plan*.

The MWC works effectively to address water quality and quantity issues by bringing together diverse stakeholders from across the Musselshell Watershed. The MWC focuses on watershed-wide collaboration strategies necessary to implement projects that improve water quality, water conservation, and the reduction of conflicts over water use.

In 2015, the MWC completed the first *Musselshell Watershed Plan*. This was a stakeholder driven process that resulted in the identification and prioritization of 27 on-the-ground projects. This plan has provided a critical foundation for prioritizing work in the Musselshell Watershed and for bringing stakeholders together to complete projects. As with all plans, it is time to update the existing plan, and Montana DNRC looks forward to working with MWC as a partner in this planning process.

Sincerely,

A handwritten signature in blue ink that reads "Michael Downey".

Michael Downey  
Water Planning Section Supervisor  
DNRC, Water Resources Division

STATE WATER PROJECTS  
BUREAU  
(406) 444-6646

WATER MANAGEMENT  
BUREAU  
(406) 444-6637

WATER OPERATIONS  
BUREAU  
(406) 444-0860

WATER RIGHTS  
BUREAU  
(406) 444-6610



Bureau of Reclamation, Water Resources and Planning Division  
Attn: Ms. Avra Morgan  
Mail Code: 84-51000  
P.O. Box 25007  
Denver, CO 80225

November 8, 2019

Re: Letter of Support for Further Developing the Musselshell Watershed Coalition

Dear Ms. Morgan;

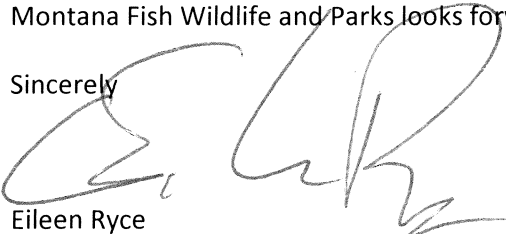
Montana Fish Wildlife and Parks has been involved with the Musselshell Watershed Coalition since its inception and support the further development of the Coalition and its project, *Growth of the Musselshell Watershed Coalition through Updating the Musselshell Watershed Plan*.

The MTFWP partnership with the MWC has resulted with removal of a flanked diversion dam, improving flood plain, assisting landowners with erosional issues, is leading to creation of a new Fishing Access Site near Roundup and many other projects. Projects going forward include removal of another flanked dam, restoration of an abandoned channel, potential diversion repair and fish passage project, and many other potential projects.

The MWC works effectively to address water quality and quantity issues by bringing together diverse stakeholders from across the Musselshell Watershed. The MWC focuses on watershed-wide collaboration strategies necessary to implementing projects that result in the improvement of water quality, the conservation of water, and the reduction of conflicts over water.

In 2015, the MWC completed it's first Musselshell Watershed Plan. This was a stakeholder driven process that resulted in the identification and prioritization of 27 on-the-ground and planning projects. The original Musselshell Watershed Plan has provided incredibly useful guidance for prioritizing work in the Musselshell Watershed and for bringing stakeholders together to complete projects. As with all plans, it is time to update the existing plan and Montana Fish Wildlife and Parks looks forward to being a partner in this planning process.

Sincerely



Eileen Ryce  
Montana Fish Wildlife and Parks  
Fisheries Division Chief

Bureau of Reclamation  
Water Resources and Planning Division  
Attn: Ms. Avra Morgan  
Mail Code: 84-51000  
P.O. Box 25007  
Denver, CO 80225

Re: Letter of Support for Further Developing the Musselshell Watershed Coalition

Dear Ms. Morgan;

The Lower Musselshell Conservation District (LMCD) in Roundup, MT is writing in support of the Musselshell Watershed Coalition. The LMCD was created to promote outreach and education for the wise use of our natural resources. We work with several partners to accomplish this goal. We have been involved with the Musselshell Watershed Coalition since its inception and support the further development of the Coalition and its project, *Growth of the Musselshell Watershed Coalition through Improving the Musselshell Watershed Plan*.

The MWC works effectively to address water quality and quantity issues by bringing together diverse stakeholders from across the Musselshell Watershed. The MWC focuses on watershed-wide collaboration strategies necessary to implementing projects that result in the improvement of water quality, the conservation of water, and the reduction of conflicts over water.

In 2015, the MWC completed it's first Musselshell Watershed Plan. This was a stakeholder driven process that resulted in the identification and prioritization of 27 on-the-ground and planning projects. The original Musselshell Watershed Plan has provided incredibly useful guidance for prioritizing work in the Musselshell Watershed and for bringing stakeholders together to complete projects. As with all plans, it is time to update the existing plan and the Lower Musselshell Conservation District looks forward to being a partner in this planning process.

Sincerely

A handwritten signature in black ink that reads "Wendy Jones". The signature is written in a cursive, flowing style.

Wendy Jones  
District Administrator  
Lower Musselshell Conservation District





November 4, 2019

Bureau of Reclamation  
Water Resources and Planning Division  
Attn: Ms. Avra Morgan  
Mail Code: 84-51000  
P.O. Box 25007  
Denver, CO 80225

Re: Letter of Support for Further Developing the Musselshell Watershed Coalition

Dear Ms. Morgan;

On behalf of the Montana Department of Environmental Quality (DEQ), I extend our support for the Musselshell Watershed Coalition's (MWC) application for a WaterSMART Grant. DEQ is charged with protecting, sustaining, and improving a clean and healthful environment. Our goal is to protect public health and to maintain Montana's high quality of life for current and future generations. DEQ is a member of the MWC, which is working collaboratively with landowners and government entities to improve water quality, water quantity, and holistic management of natural resources within the river corridor. We have been involved with the MWC since its inception and support the further development of the Coalition and its project, *Growth of the Musselshell Watershed Coalition through Updating the Musselshell Watershed Plan*.

The MWC works effectively to address water quality and quantity issues by bringing together diverse stakeholders from across the Musselshell Watershed. The MWC focuses on watershed-wide collaboration strategies necessary to implement projects that improve water quality, conserve water, and reduce conflicts over water.

In 2015, the MWC completed its first Musselshell Watershed Plan. This was a stakeholder driven process that resulted in the identification and prioritization of 27 on-the-ground and planning projects. The original Musselshell Watershed Plan has provided incredibly useful guidance for prioritizing work in the Musselshell Watershed and for bringing stakeholders together to complete projects. As with all plans, it is time to update the existing plan and DEQ looks forward to being a partner in this planning process.

Sincerely,

A handwritten signature in blue ink that reads "Jenny Chambers for".

Jenny Chambers  
Division Administrator  
Waste Management and Remediation Division

cc: Musselshell Watershed Coalition

Bureau of Reclamation  
Water Resources and Planning Division  
Attn: Ms. Avra Morgan  
Mail Code: 84-51000  
P.O. Box 25007  
Denver, CO 80225

Re: Letter of Support for Further Developing the Musselshell Watershed Coalition

Dear Ms. Morgan;

Musselshell County has been involved with the Musselshell Watershed Coalition since its inception and support the further development of the Coalition and its project, *Growth of the Musselshell Watershed Coalition through Updating the Musselshell Watershed Plan*.

The MWC works effectively to address water quality and quantity issues by bringing together diverse stakeholders from across the Musselshell Watershed. The MWC focuses on watershed-wide collaboration strategies necessary to implementing projects that result in the improvement of water quality, the conservation of water, and the reduction of conflicts over water.

In 2015, the MWC completed its first Musselshell Watershed Plan. This was a stakeholder driven process that resulted in the identification and prioritization of 27 on-the-ground and planning projects. The original Musselshell Watershed Plan has provided incredibly useful guidance for prioritizing work in the Musselshell Watershed and for bringing stakeholders together to complete projects. This work and these projects are integral to the infrastructure work that Musselshell County provides to the citizens in our community.

As with all plans, it is time to update the existing plan and Musselshell County looks forward to being a partner in this planning process.

Sincerely

Musselshell County Commission

*Avra Morgan - Chair*

Bureau of Reclamation  
Water Resources and Planning Division  
Attn: Ms. Avra Morgan  
Mail Code: 84-51000  
P.O. Box 25007  
Denver, CO 80225

Re: Letter of Support for Further Developing the Musselshell Watershed Coalition

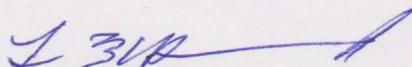
Dear Ms. Morgan;

The Deadmans Basin Water Users Assn (DBWUA) diverts, stores and delivers water to 110 contract holders on the Musselshell River from Barber to Mosby. We have been involved with the Musselshell Watershed Coalition since its inception and support the further development of the Coalition and its project, *Growth of the Musselshell Watershed Coalition through Improving the Musselshell Watershed Plan*.

The MWC works effectively to address water quality and quantity issues by bringing together diverse stakeholders from across the Musselshell Watershed. The MWC focuses on watershed-wide collaboration strategies necessary to implementing projects that result in the improvement of water quality, the conservation of water, and the reduction of conflicts over water.

In 2015, the MWC completed its first Musselshell Watershed Plan. This was a stakeholder driven process that resulted in the identification and prioritization of 27 on-the-ground and planning projects. The original Musselshell Watershed Plan has provided incredibly useful guidance for prioritizing work in the Musselshell Watershed and for bringing stakeholders together to complete projects. As with all plans, it is time to update the existing plan and the DBWUA looks forward to being a partner in this planning process.

Sincerely



Leon Hammond  
Water Project Manager  
DBWUA

Bureau of Reclamation  
Water Resources and Planning Division  
Attn: Ms. Avra Morgan  
Mail Code: 84-51000  
P.O. Box 25007  
Denver, CO 80225

Re: Letter of Support for *Growth of the Musselshell Watershed Coalition through Improving the Musselshell Watershed Plan*

Dear Ms. Morgan;

The Delphia Melstone Canal Users Association is an irrigation system irrigating over 6,000 acres, with three canals that start from two different diversion points off the Musselshell River. We have been involved with the Musselshell Watershed Coalition since its inception and support the further development of the Coalition and its project, *Growth of the Musselshell Watershed Coalition through Improving the Musselshell Watershed Plan*.

The MWC works effectively to address water quality and quantity issues by bringing together diverse stakeholders from across the Musselshell Watershed. The MWC focuses on watershed-wide collaboration strategies necessary to implementing projects that result in the improvement of water quality, the conservation of water, and the reduction of conflicts over water.

In 2015, the MWC completed its first Musselshell Watershed Plan. This was a stakeholder driven process that resulted in the identification and prioritization of 27 on-the-ground and planning projects. The original Musselshell Watershed Plan has provided incredibly useful guidance for prioritizing work in the Musselshell Watershed and for bringing stakeholders together to complete projects. As with all plans, it is time to update the existing plan and Delphia Melstone Canals Users Association looks forward to being a partner in this planning process.

Sincerely

Lynn Rettig – Manager

Delphia Melstone Canal Users Association

## **Official Resolution**

An official resolution from the Petroleum County Conservation District board of supervisors follows.

## RESOLUTION

Petroleum County Conservation District  
Board of Supervisors  
Winnett, MT 59087

### RESOLUTION AUTHORIZING APPLICATION FOR A COOPERATIVE WATERSHED MANAGEMENT GRANT FROM THE BUREAU OF RECLAMATION 2019 WATERSMART GRANT PROGRAM TO EXPAND THE MUSSELSHELL WATERSHED COALITION

WHEREAS, management, control and preservation of water resources is a matter of major concern for the sustainability of the ecology and economic development of Petroleum County and the greater Musselshell River Watershed; and

WHEREAS, the Musselshell Watershed Coalition is the local watershed group formed to work collaboratively with all interested groups on water resources issues in the Musselshell River Watershed; and

WHEREAS, the Petroleum County Conservation District wishes to facilitate the implementation of this project for the benefit of the watershed; and

WHEREAS, the Petroleum County Conservation District will serve as the grant sponsor and fiscal agent as a participant in the Musselshell Watershed Coalition; and

WHEREAS, the Musselshell Watershed Coalition has secured and will continue to secure cash contributions as well as in-kind contributions for this project; and

WHEREAS, the Petroleum County Conservation District will work with Reclamation to meet established deadlines for entering into a financial assistance agreement;

BE IT FURTHER RESOLVED, that the Petroleum County Conservation District has reviewed and approves the grant application prepared and that the Administrator and the Musselshell Watershed Coalition coordinator are hereby authorized and directed to file such application and execute a grant agreement with the WaterSMART: Cooperative Watershed Management Program Grants for FY 2019.

PASSED AND ADOPTED by the Board of Supervisors of the Petroleum County Conservation District, Montana, this 28th day of October, 2019.

  
\_\_\_\_\_  
Ralph Corbett, Vice- Chair

Petroleum County Conservation District Board of Supervisors

Attest:

  
\_\_\_\_\_

Carie Hess

Administrator of the Board