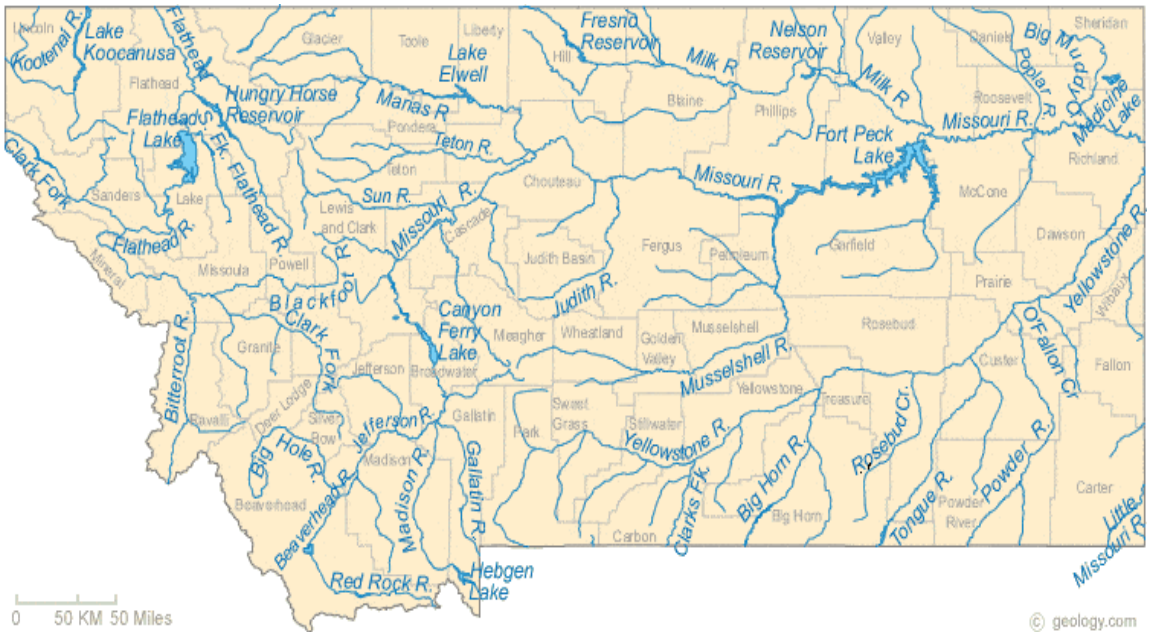
Creating and Implementing an Improved Process for Stream Permit Management and Data Collection in Montana



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D.2.2.2.3 Executive Summary

Four Corners Community Foundation - Bozeman, Gallatin, Montana - October 14, 2023

The 310 Law is the primary tool for water-resource protection in Montana. Its mandated permitting system is an integral, but often overlooked, component of water conservation and stream restoration efforts across the State. In practice, Montana's 58 Conservation Districts (CDs) regulate water diversions and water supply using the 310 Law. The permitting system, however, is antiquated and inefficient and does not effectively capture, or make readily available to water managers, the valuable data contained in permit applications, nor are the cumulative impacts of permitted projects on river systems as a whole accounted for. To address these problems, Four Corners Foundation (4CF) collaborated with the Gallatin CD to create Gilly, a non-profit software solution to streamline the application and administrative process, capture the data contained in permits, and easily share that data. This proposal will expand Gilly to support water management, data acquisition, and data accessibility across the state of Montana. Using Gilly, CD supervisors will have the data and mapping tools they need to inform water management and enforcement and issue permits that improve the resiliency of our water system. Watershed groups and conservation non-profits state-wide will have access to Gilly to inform and accelerate both short-term and long-term restoration and conservation efforts. **The outcome of this project will be increased water supply reliability, reductions in flood risk, increased drought mitigation, and an overall improvement in watershed health across Montana.** The proposed project is already in development. 4CF will ensure the completion of this phase of software development expansion within two years of the start of project funding, estimated to be September 30, 2026.The project is not located on a federal facility.

D.2.2.2.4 Technical Project Description

In Montana, CDs are charged with water enforcement authority as it applies to the Natural Streambed and Land Conservation Act, commonly known as the 310 Law. All construction on or near a perennial stream or river in Montana requires the filing and approval of a 310 Joint Permit application from one of 58 local CDs across the State. The ability of CDs to access quality assured, quality controlled hydrologic data is critical to inform water management and enforcement decisions.

4CF has been a registered 501(c)3 since 2003 and, as such, qualifies as a Category B applicant. As a Category B applicant, 4CF is partnering with the Gallatin CD, an approved Category A applicant, to complete this project. 4CF will work in partnership with the Gallatin CD, whose administrative staff and supervisors have offered invaluable guidance over the past three years. The Gallatin CD will participate in the expansion of Gilly by continuing to provide input to new product features and feedback regarding the performance and day-to-day usefulness of the system overall. Working directly with end users, like Gallatin CD, allows 4CF to collect feedback directly and quickly incorporate it into the Gilly platform. The Gallatin CD is an ideal partner for this project due to the agency's willingness to share expertise from decades of experience in oversight and enforcement of the Natural Streambed and Land Preservation Act, hands-on

management of the 310 Joint Application and Administration Process, and its ongoing interest in identifying and improving the critical functions of all CDs to better regulate water management and enforce 310 Law.

Detailed Project Description:

The Natural Streambed and Land Preservation Act is intended to "protect and preserve streams, rivers, and lands adjacent to them in as natural or existing a condition as possible, to minimize sedimentation and to recognize beneficial uses." An unfunded state mandate, 310 Law is administered by 58 CDs throughout Montana. Managing the required application, inspection, and approval process under the 310 law is an integral, but often overlooked, component of nearly all water conservation and stream restoration efforts in the state.

In many respects, the fate of Montana's rivers is in the hands of the CDs, yet the antiquated system that they work under is extremely uninformed and inefficient. Gilly addresses problems and inefficiencies associated with the 310 process. Using Gilly, decision makers will be able to query and easily access the data contained in 310 Joint Permit applications. Access to this data will streamline the application process for administrators and provide supervisors and inspectors with the data they need to make well-informed decisions regarding water management and enforcement.

Data collection within Gilly is based on a robust information acquisition platform. In Montana, the 310 Application is one component of the larger Joint Application Permit. The Joint Application Permit includes applications for:

1) 310 Permits (Local Conservation Districts)
2) Section 404 and Section 10 Permits (US Army Corps of Engineers)
3) 318 Authorization and 401 Certification (Montana Department of Environmental Quality)
4) SPA 124 Permits (Montana Department of Fish, Wildlife and Parks)
5) Floodplain Permits (City and County Floodplain Administrators)
6) Navigable Rivers Land Use Licensing / Leasing / Easements (Montana Department of Natural Resources and Conservation)

Prior to Gilly, the important data contained in completed permit applications was largely inaccessible to any but the most determined researchers. Applications were usually completed by hand and often illegible. Site drawings were submitted on anything from grocery bags to bar napkins. This kind of data could not be digitized, filtered, sorted, or easily accessed. Using Gilly, CDs and restoration managers will have access to application information, both current and historic. Platform improvements funded through this proposal will add advanced query tools for individual data fields (managers could search by fields such as "irrigation" or "improve fish habitat"), and will make it possible to filter and export data to spreadsheets (administrators could easily compile reports for state agencies, planners could sort by project types such as "diversions" or "headgates").

Through outreach and product integration, administrators, supervisors, and inspectors in CDs other than Gallatin and Lewis and Clark will be able to log into Gilly and have complete access to the data they need to inform their planning, management, and enforcement decisions. Their constituents will be able to fill out their application forms online. With platform additions, they will also be able to file complaint forms from the point of disturbance. All users are able to enhance project information by adding photographs, site maps, work plans, and drone imagery to individual applications and inspection forms. With enhanced features proposed here, they will be able to add similar documentation to complaint forms and inspection forms.

In addition to expanding Gilly into all interested CDs and instituting effective education and support strategies in those districts, a suite of upgrades and features will be added to the Gilly platform. These additions to the Gilly platform were identified through regular conversations and interactions with end users and are the result of significant trust and communication between 4CF and our partners. With these additions, Gilly will take the next step in its evolution to becoming a cornerstone of water management in CDs across Montana.

Planned Software Program Expansions and Enhancements:

Current Work

Access for Non-CDs: Non-profits, restoration firms, engineering firms

Map Improvements: automatically orient map to users watershed, add satellite view

Add Ability to Duplicate Permits

Enhancements for CDs: error messaging, help text, status enhancements

Enhancements for CDs: Inspection Form Enhancements

2024: Software Expansion and Enhancements

Mobile Device improvements

Map View for non-CDs

Map Accessible to General Public

Enhancements for CDs: Complaint Form

Enhancements for CDs: Additional Base Layers to Map

User-generated Layers to Map

Enhancements for CDs: Export Data to Spreadsheets

Private Sector Enhancements: templates, user management

2025: Software Expansion and Enhancements

Private Sector Enhancements: user management, permit management

Access to all Permits for Agencies: e.g. DNRC

Enhancements for CDs: Internal Comment Integration

Dashboard Analysis Tools

Enhancements for CDs: Query Tools for Permit Data

Advanced query tools for all layer data

2026: Software Expansion and Enhancements

Saving dashboards, queries, and maps
Creating public-facing dashboards and map
Help integration
Upload coordinates to map
Supporting other types of forms: 404 permits
Tabular view of data

Goals:

The overall goal of this project is to increase the functionality of Gilly by incorporating user-driven additions to the software and adding helpful features that will continue to improve its functionality and contribute to its widespread adoption across the state of Montana. Specifically, requested BOR grant funds will be used to create durable tools for water management that meet the following goals:

1. Build upon the existing Gilly platform by developing additional data acquisition and data management tools to aid water managers in 310 Law enforcement and planning for the continued resilience of Montana's rivers.
2. Develop mapping capabilities that capture data contained in the 310 Joint Application Form to inform and allow for easy access to data and illustrate the cumulative impacts of construction projects on Montana's Rivers
3. Expand Gilly into all interested Montana Conservation Districts through outreach and education by 4CF staff and partners by
4. Institute effective education and support strategies in Districts where Gilly is adopted.
5. Give access to Gilly's data collection, data analysis, and mapping features to watershed groups and conservation non-profits state-wide.

The required 50% match will be met through incoming philanthropic funding.

D.2.2.2.5 Project Location

Gilly's project area encompasses the entire state of Montana. Montana is 147,040 square miles and includes the headwaters of the Missouri River, headwater tributaries to the Columbia River system, and waters that flow into Canada and the Hudson Bay. Over 58,200 miles of perennial streams run through Montana. These streams are vital for drinking water, agriculture, the State's endangered species, commercial and industrial users, recreation, and the tourism industry. Montana's water is also critical to innumerable downstream users and Indigenous communities across the state. 4CF will include the three tribal conservation districts–Fort Belknap, Flathead, and Blackfeet–as end users of this work.

D.2.2.6 Data Management Practices

The Gilly database system is stored on **AWS** (Amazon Web Services). The geospatial component uses **WFS** (Web Feature Service), which is compatible with **GIS** (Geographic

Information System) platforms. The data can also be shared in **WMS** (Web Map Service Interface Standard) and **WMTS** (Web Map Tile Service) formats if needed. The system will also be capable of supporting **ESRI** (Environmental Research Institute). The flexibility built into the map tool means it is capable of importing map data in a wide range of formats.

See Attachment 1: Gilly – Data Management Practices / Definitions

D.2.2.8 Project Budget

FUNDING SOURCES	AMOUNT
Non-Federal Entities	
Four Corners Foundation	$400,000
	$
	$
Non-Federal Subtotal	$400,000
REQUESTED RECLAMATION FUNDING	$400,000

D.2.2.12 Conflict of Interest Disclosure Statement

Per 2CFR §1402.112, no actual or potential conflict of interest exists at the time of submission.

D.2.2.12.1 Applicability

In accordance with the 2 CFR§200.318, Four Corners Community Foundation and their employees will take appropriate steps to avoid conflicts of interest in their responsibilities under or with respect to Federal financial assistance agreements in the procurement of supplies, equipment, construction, and services by recipients and by sub recipients, the conflict-of-interest provisions.

D.2.2.15 Letters of Support: See Attached

D.2.2.16 Letter of Partnership (Category B Applicants):

See Attachment 2: Gallatin Conservation District Category A Partnership Letter

E.1. Evaluation Criteria

E.1.1. Evaluation Criterion A—Water Management Challenge(s) (30 points)

1. Describe the water management challenge(s).

Water availability and rivers are often discussed in the context of a “watershed”. A watershed is the name for an area of land within which all rainfall, snowmelt, rivers, and

streams drain to one specific point – typically a specific waterbody. Closely related to a watershed is the term “river basin.” A river basin is an area of land comprising many different watersheds that contribute to a single river. For example, the Missouri River Basin is the cumulative area of all the watersheds of smaller waterways that flow into the Missouri River. The term “headwaters” means the source of a river basin. Because virtually all water in a system lies downstream of the headwaters, the effects of mismanagement in headwaters regions can negatively impact the water quantity, water quality, and water temperature of an entire river system. Stewarding the water in a headwaters region is a large responsibility and no small task.

Montana serves as a headwaters region for extensive waters in the United States. Working in a headwaters area has outsized impacts because all of the water that we protect benefits downstream uses. East of the Continental Divide, the Jefferson, Madison, and Gallatin rivers come together to form the Missouri. The Missouri joins the Mississippi, traveling over 3700 miles before reaching the Gulf of Mexico. West of the Continental Divide, the Clark Fork originates in Deer Lodge County, flowing into Idaho and through Lake Pend Orielle to join the Columbia on its journey to the Pacific Ocean, a journey of over 1200 miles.

A river system, as a whole, is only as resilient as its headwater streams; therefore, the way we manage Montana’s water has significant implications for downstream neighbors who depend on us. Watersheds are incredibly important to their human and wildlife populations. Together, the Missouri / Mississippi and the Columbia support more than 400 species of wildlife. Approximately 40% of America’s waterfowl migrate along the Mississippi and its tributaries. The Columbia River alone supports 61 different species of fish. The monetary value of these ecosystems and the value of their natural infrastructure are simply too large to be quantified. Twenty million people in 50 cities depend on the Mississippi River for their drinking water and 8 million in the Columbia basin depend on its rivers for drinking water. Ninety percent of our country’s farm exports come from the Mississippi’s vast watershed and the Columbia supports a multi-billion dollar agricultural industry.

Resource Management Challenges

Changes in water quality, water quantity, climate, and population are putting increasing pressure on the watersheds that support rivers like the Columbia, Missouri, and Mississippi. All of these stressors impact water supply and dependability into the future. 4CF seeks to address these challenges by providing technological tools that help individuals, groups, and agencies work together to build durable, locally inspired solutions to water-related problems.

One of North America’s premier cold water fisheries, the Gallatin originates in Yellowstone National Park and flows for 120 miles before joining the Jefferson and the Madison to form the headwaters of the mighty Missouri. Like all rivers, it is the beating heart of its watershed, supporting hundreds of species of animals, a booming tourist industry, and nearly 100,000 acres of irrigated farmland. Yet, portions of the lower

Gallatin are regularly dewatered and the Montana Department of Environmental Quality (DEQ) is preparing to list a major segment of the river as “impaired” due to nitrogen-based algae blooms. Additionally, each year over 100 construction projects affecting the banks and bed of the river are permitted. This amounts to approximately one project per linear mile after the Gallatin River leaves Yellowstone National Park, and construction is booming. These projects are approved on a case-by-case basis with no means to consider their cumulative effect on water quantity, water quality, or fish and wildlife habitat.

Rivers across this headwaters state share a similar story. Each year, hundreds of permits are issued, taxing the administrative system and potentially allowing for construction without thorough review. For instance, on the Gallatin, some stretches see 10 permits per mile in a heavy year. In many cases, the permitted projects are necessary in order to maintain the rivers and their banks in a manner that supports the lives and livelihoods of people and municipalities who depend on them. In other cases, permits are issued for fish and wildlife restoration and conservation projects. But for other projects, no permit has ever been approved. Unless a citizen files a formal complaint, these projects are never reviewed or reported.

Permit management is an integral, but often overlooked, component of most water management, conservation, preservation, and restoration efforts, but Montana’s current permitting system is inefficient and does not capture, or make readily available, the valuable data contained in permit applications, nor are the cumulative effects of permitted projects taken into account.

2. Describe the concerns or outcomes if this water management challenge is not addressed?

The 310 Joint Application and its accompanying permitting process are the foundation for oversight and enforcement of the Natural Streambed and Land Preservation Act and 310 Law. And, while permitting alone is not the solution to our water challenges, acquiring and having easy access to the data needed to give decision makers a clear overview of water-related impacts is key to successful water management, water conservation, and restoration efforts. Examples of beneficial use as they apply to 310 Law include water delivery related to irrigation, stock water, instream flow, recreational use, hydropower, fish and wildlife preservation, aquifer storage and recovery, and mitigation.

There are 1 million acres of flood irrigated farmland in Montana, much of which is located on or near the State’s streams and rivers. Due to this proximity, many 310 Joint Applications come from farmers and ranchers. Replacement and maintenance of irrigation structures are common 310 projects, and permitted diversions, headgates, and ditches move water from one place to another in order to irrigate crops. In Gallatin County alone, there are around 20 headgates feeding approximately 2,000 miles of irrigation ditches. Many landowners who own stream or riverside property experience bank erosion issues. Bank erosion is often a problem for landowners, resulting in costly land loss. It also has implications for water quality. One common solution to this problem is

incorporating rock, known as rip-rap, to promote bank stability. In some situations, rip-rap is necessary to protect high-value infrastructure, such as bridges and railroads, but many producers now recognize the value of riparian areas for their operations. Access to the data and mapping functions in Gilly make it possible to plan where diversions, headgates, and rip rap are absolutely necessary and where less invasive riparian stabilization approaches are possible. During flood events, preserved riparian buffers can slow runoff and absorb excess water. This reduces peak flows and can lessen downstream flooding. Flooded areas then release the absorbed water over time, minimizing drought impacts and preserving instream flows.

If water managers, inspectors, and permit holders continue to evaluate impacts on rivers and streams using only the limited tools and data available in the current system, the following concerns and outcomes are likely:

Water Quantity

- Dewatered sections of rivers and perennial streams will increase, particularly in late season and drought years. Dewatering will lead to a decrease in effective beneficial use as the reliability of rivers and streams for water delivery for agriculture and downstream municipality users.
- Flood and drought impacts will increase as development escalates, uncoordinated streambank armoring (rip rap) use escalates, rivers and streams are canalized, and wetland functions are negated.

Water Quality

Sediment is a leading cause of waterbody impairment in Montana. Reducing and minimizing excess sediment is an integral part of protecting our streams and rivers from degradation. Reducing or eliminating human impacts is a key tenant of 310 Law.

If water managers, inspectors, and permit holders continue to evaluate impacts on rivers and streams using only the limited tools and data available in the current system, the following concerns and outcomes are likely:

- The amount of sediment in Montana rivers and streams will increase as increased development and changing climate factors put pressure on watersheds across the state.
- Increased sediment in stream beds will disrupt the natural food chain by destroying the habitat where the smallest stream organisms live. In this way, sediment pollution will cause declines in fish populations.
- Nutrients transported by sediment will result in eutrophication, the process in which excess blue-green algae blooms and can affect wildlife and water quality.
- Increases in sedimentation raise the cost of treating drinking water and can result in odor and taste problems.

From the perspective of health and human safety, municipalities can also benefit from the use of Gilly. For instance, Gilly could be used to plan the maximum safe load of armoring that a given stretch of river can carry by accessing historic permit data, mapping existing rip rap, and estimating the effect of a flood event on a given stretch of river through the accompanying visualizations. Access to the data and mapping functions in Gilly makes this kind of planning possible. By highlighting not just the current project's area of need but, through accessible data, other potential areas of need downstream, Gilly allows system-wide planning for water delivery by offering the option to be proactive on projects rather than reactive. In both drought and flood conditions, what we build and how we build on our riverbanks is incredibly important, not only from a fish and wildlife perspective but in terms of the safety of people and structures nearby.

3. Explain how your project will address the water management issues identified in your response to the preceding bullets and provide support for your response.

Gilly is an effective tool for CD Supervisors to use in the application and enforcement of the 310 Law. Additions and expansions to the Gilly platform will provide Inspectors and Supervisors with easy access to current and historic data and the mapping tools they need to investigate the likely effects of a given project and act accordingly. Using the Gilly platform will maintain data integrity across multiple users, enable data access and data sharing, and create the forms necessary for submission to the Board of Supervisors and to the Montana Department of Natural Resources and Conservation (DNRC).

Improvements to and expansion of the Gilly Platform will improve data access and make it easier for supervisors to evaluate and enforce the following considerations:

1. Effect of the project on both upstream or downstream users
2. Potential for the project to increase erosion and sedimentation
3. Evaluation of the effect on streamflow, turbidity and water quality
4. Whether the proposed project will create harmful flooding or erosion problems upstream or downstream
5. Evaluation of the effects of stream channel alterations to minimize adverse impacts and maintain the integrity and function of the natural channel for beneficial use
6. Does the project preserve, establish, or enhance native vegetation on the banks and floodplain
7. Evaluation of the effects of the project on fish and aquatic habitat
8. Alternate project methods that could better accomplish the purpose of the proposed project

Improvements to and expansion of the Gilly Platform will improve historic data access to and make it easier for Inspectors to evaluate and enforce design standards meant to improve water delivery and water quality based on the effectiveness and impact of similar projects. These design standards include but are not limited to:

1. Design and construction using methods that minimize adverse upstream and downstream impacts and future disturbances to the stream

2. Channel alterations designed to retain original stream length or otherwise to provide hydrologic stability
3. For streambank stabilization projects, designs which encourage the use of methods that preserve or enhance natural stream habitat, function, and resiliency
4. Live vegetation remains viable and functional after completion of the project

The ease that Gilly brings to data accessibility is relevant at the project planning stage, the application stage, the inspection stage, and the approval stage.

A Gilly use case example:

A CD supervisor has just received a 310 Joint Permit Application for a bank armoring (riprap) project and would like to see how many similar projects have been approved on that stretch of river. She needs this data in order to determine if the stretch is becoming drought prone (through blocked riverine access to wetlands) or creating extreme flood situations (through lack of permeable banks, lack of access to flood plains) due to excess armoring.

Data acquisition to aid in that determination would currently look like this:

1. Locate and obtain all of the historic permits that the cd has on file for the past ten to twenty years
2. Go through the permits individually (1000-2000 permits), review each permit, and remove all permits related to armoring projects
3. Identify each armoring project on a map of the river (make sure it's a current map that charts river movement to the present day)

Using Gilly you would:

1. Log into the Gilly software platform
2. Choose the river you are working on
3. Filter the permits in that river section according to type (in this case armoring)
4. View and share on a current map with other Supervisors and Inspectors

E.1.2. Evaluation Criterion B—Project Benefits (30 points)

1. Describe how the need for the project was identified. Was the proposed project identified using a collaborative process with input from multiple and diverse Stakeholders?

The problem of data sharing and transparency is widespread in the natural resource management world and a lack of capital resources perpetuates the problem. After identifying data sharing, transparency, and informed decision making as key goals to improve water management, 4CF began to look for a solution. To do this, we began several months of industry interviews with a diverse set of stakeholders. We defined User Characteristics and arrived at the following overarching User Needs Statement:

"As a user, I need a way to access and understand data in order to make informed decisions."

See Attachment 3: Gilly, User Characteristics

Based on needs identified in the interview process, we assembled a detailed request for proposals, contracted with a software developer, and began writing code for our first platform, H2O Tools. Two years into building the H2O Tools platform, we realized that, by trying to address everyone's needs, the platform we were creating was becoming inefficient and unwieldy. We needed to refine it, and we did. We evaluated every platform function to identify the true minimum viable product (MVP). The process required systematic evaluation and planning in the following areas: User Characteristics, User Priorities, Data Evaluation, UX / IX, Competitor Evaluation, and Gap Analysis.

At the end of the evaluation process, we had identified three key user needs:

1. Access to conservation and restoration related data
2. The ability to map the data
3. The ability to share the data

Users felt that fulfilling these needs would enable a system-based, rather than project-by-project, approach to river conservation and restoration. All three needs were related to the 310 Joint Application.

To test our findings, we spoke with local watershed groups, our local conservation district, engineers, non-profits, and professionals involved in water conservation and river restoration. They were in agreement on the following points:

- The 310 Joint Application is inefficient and frustrating for managers and users alike. We need a better system.
- The 310 Joint Application is filled with data that could inform management and enforcement. We need access to that data.
- Mapping 310 Joint Application data would be very useful not only for planning purposes but for enforcement of 310 Law.
- A functioning 310 platform could capture and share invaluable institutional knowledge.

After extensive interviews and collaboration with a wide variety of stakeholders (and with an informed realization of both the pitfalls and advantages of technology), we rebranded our redesigned platform and launched Gilly. In ancient Gaelic, Gilly is the term for a guide in the wilderness or on a river. Our Gilly is a software platform used to guide river management, conservation and preservation.

2. Describe how the tool, method, or information will be applied and when.
The basic Gilly platform is ready for use in all interested CDs. Of the 58 CDs in Montana, the Gilly platform is currently in use in just two - the Gallatin CD (as of March 2021) and the Lewis and Clark CD (as of April 2023). Expanding to the Lewis and Clark CD was a

test to determine resources needs for expansion of the program to additional CDs. Budget estimates in this proposal reflect the costs and considerations for statewide expansion. Expansion includes giving access to Gilly's data collection, data analysis, and mapping features to watershed groups and conservation non-profits state-wide. Additional software expansion that will give users beyond the CDs access to the platform will be completed in two stages: basic access available in May of 2024, and mapping function enhancements completed in August of 2024.

Under the timeline planned for this proposal, software expansion and geographic expansion will happen simultaneously. In 2022, Montana CDs handled 1048 permit applications. 8 CDs accounted for 50% of those permits and 21 CDs accounted for 80% of the permits. These CDs are located in riverine areas that are, in many cases, experiencing rapid population growth and accompanying pressure on their water resources. Geographic expansion will focus on these areas.

From the limited data available, it appears that permit numbers increase yearly. Though Gilly is useful in its current MVP form, funding requested in this proposal will expand access to the Gilly platform, fulfill identified user needs that promote better management of our limited water resources, inform restoration and conservation in order to guarantee an adequate water supply, and maintain an acceptable level of water quality into the future. Specifically, BOR funding will be used to:

- Build upon the existing Gilly platform by developing additional data acquisition, data management, and data mapping tools to inform water supply and water quality management
- Expand capabilities that capture and illustrate data contained in the 310 Joint Application Form to inform and plan for the cumulative effects of construction projects on Montana's Rivers
- Give access to Gilly's data collection, data analysis, and mapping features to additional CDs as well as watershed groups and conservation non-profits state-wide to aid in conservation and restoration efforts.

3. Describe, in detail, the extent of benefits that can be expected to occur upon implementation of the project, and provide support for your responses.

Geographic Expansion:

Our geographic expansion goal for this proposal is to implement the full Gilly platform in 8 additional CDs or CDs representing 50% of the permits issued in Montana. Our goal for the automated 310 Joint Application permit is implementation in every CD issuing 10 or more permits per year. With geographic expansion, the benefits currently accrued by just two CDs will extend to additional users. Gilly staff will provide education and support to make the transition to the new system as smooth as possible.

Listed below are General Benefits for Gilly's CD users. A comprehensive list of benefits for primary users is attached.

See Attachment 4: Gilly User Benefits

Applicants:
- Ease of Use

Agricultural Producers
- Shortened project timeframes
- Long-term resource planning

CD Administrators and Supervisors
- Streamlined Administrative Process

CD Inspectors and Supervisors:
- Streamlined Inspection and Review Process
- Maps and data are readily available to inform review process

CD Supervisors:
- Mapped data is readily available to inform violation enforcement and complaints
- Mapping feature allows for long term proactive planning of riverine systems to account for overall watershed health, water delivery, water quality, flood impacts, and drought impact.

How will the project improve *water management decisions*?

The 310 Law is the front line of water resource management and protection in Montana, and Gilly supports water management and enforcement decisions through improved data acquisition and data accessibility related to that law. The 310 permitting process ensures that the local Conservation District and local FWP fisheries biologists consult on each project that manipulates the bed and banks of any stream across the state. While the permitting process scrutinizes individual projects, the current archaic record-keeping system precludes consideration of cumulative impacts of multiple projects across a watershed nor does it provide planning tools to ensure the resiliency of our water delivery system over time.

Gilly will not only catalog and map decades of permit data, it will enable CDs, local restoration and conservation professionals, and the public to visualize, analyze, and plan for the cumulative impacts of multiple projects across watersheds. Gilly's database and mapping capabilities will create an institutional memory of watershed impacts where individual memories fade and staff turnover is frequent. In the end, Gilly will have established a foundational framework for better watershed management across Montana.

Describe if the results of your project will be *applicable elsewhere*. What additional work would need to be done to make the project results transferable to others?

Outside of 310 Law-centered work proposed here, the Gilly platform could be expanded to serve additional agencies (outside of the CDs and DNRC) within Montana (FWP, DEQ, and municipal and county governments). 4CF is also considering the viability of a standardized 404 application that could be used by the Army Corps of Engineers. The

system is designed to be replicable to additional geographic locations and a wide range of state and federal agencies.

To what extent will the project address the water management challenges described in E.1.1.?

Permitting is a necessary means of maintaining control over the way our rivers and the lands abutting them are managed. Gilly provides a fully-functioning permit system that makes a more comprehensive strategy for preserving our river systems possible. Without systems-scale planning and access to the data that is necessary to make informed planning decisions, our rivers cannot be sustained at a level that will support the myriad of living things that depend on them. Capturing and sharing the data contained in permits is an incredibly important aspect of ensuring the resiliency of our rivers going forward.

The data captured in Gilly will inform 310 Law decisions and enforcement and provide integral planning information for water delivery, water conservation, and water restoration professionals, while streamlining the administrative process for CDs. Software enhancements will improve permit related data acquisition, data delivery, and data analysis and create new data sets that act as decision support tools, informing watershed-based decisions that recognize rivers and streams as complex systems.

E.1.3. Evaluation Criterion C—Project Implementation (20 points)

1. Describe your project implementation plan:

4CF has established a solid foundation for successful implementation of Gilly's technical and geographic expansion by developing many of the processes necessary for that expansion prior to application for BOR grant funding. New strategies may be instituted as needed, but much of our methodology going forward will be based on programs and protocols that we have previously tested and found to be effective. In addition, we will draw on our experience in the following areas to implement this project:

- We have years of experience working with software development teams to ensure that our product is delivered on time, to spec, and within budget.
- We solicit bids to ensure that the ongoing costs of software expansion are reasonable.
- Our outreach and engagement efforts are based on decades of water conservation experience and community connections in Montana.
- We have actively engaged and will continue to involve a wide variety of users regarding needed improvements and expansion.
- We have instituted a successful statewide outreach program to CDs that is ready to be expanded to other institutions and agencies.
- We regularly present at a variety of conferences
- 4CF's Communications Program supports media access for Gilly related material and articles.

2. Describe the work plan for implementing the proposed scope of work. Such plans may include, but are not limited to:

Implementation: Software Expansion

To date, Gilly's software has been developed by Build. Build is based in Bozeman, Montana. We have had a close working relationship with Build for three years and have been satisfied with their performance over the course of many contract periods (6). Build was chosen from several competitive bids at the outset of the Gilly project based not only on competitive pricing but on their experience, proximity, and staff diversity. Build also conveyed a genuine concern for the preservation of water and an interest in working with a non-profit organization.

Prior to submission of this proposal, we solicited bids to ensure that the ongoing costs of using Build for upcoming software expansions are reasonable and competitive. The experience they have with our product and their ability to hit the ground running on this project are also important (and potentially cost saving) considerations. We will thoughtfully consider all bids going forward.

See Attachment 5: Software Development, Contract Bids

The attached table illustrates deliverables by month during the project period. Exact product deliverables by month may change based on grant start dates but estimated monthly costs over a 24 month period will not.

See Attachment 6: Implementation – Software Expansion

Implementation: Education and Outreach Expansion

Over the course of the last four years, 4CF has worked to establish a good working relationship with CDs across Montana. This strong foundation will be the basis of our education and outreach efforts going forward. 4CF presented Gilly at the MACD convention in November of 2022 and will be returning in November of 2023 to host training sessions and offer one-on-one assistance to all interested individuals. In July, MACD listed Gilly on the resources page of its website. In January of 2023 we were invited to present Gilly at the annual convention of the National Association of Conservation Districts (NACD). In February of 2023 we presented the Gilly platform at the Montana convention for the American Water Resources Association (AWRA).

Activity	Year One	Year Two
E-Newsletter	10-12 annually	10-12 annually
Webinars & Trainings offered	10-12	10-12

Presentations and Posters/Booths	1-3	1-3
Website Information - FAQ, application, importance	ongoing	ongoing
Individual Technical Assistance	As needed	As needed
Rack cards and printed information	500 pieces	500 pieces

See Attachment 7: Implementation – Education and Outreach Expansion

3. Who will be involved in the project as project partners and stakeholders?

Gallatin Conservation District: The Gallatin CD will continue to participate in the expansion of Gilly by acting formally as the Category A partner for the project. Active engagement between the Gilly Team and the Gallatin CD will be ongoing throughout the grant period.

Montana Conservation Districts (CDS): CDs are Gilly's primary stakeholders and the focus of much of our education and outreach work. CDs administer 310 permitting and enforce 310 Law . The Gilly team is personally in contact with 17 CDs, to date.
See Attachment 8: Map of Montana CDs
Montana Association of Conservation Districts

Gallatin Watershed Council: GWC has been an active stakeholder since Gilly's inception. Going forward, GWC will help our team design the new access portal for conservation and restoration groups. Active engagement between the Gilly Team and GWC will be ongoing throughout the grant period.
See Attachment 9: GWC Letter of Support
Montana Watershed Coordination Council (MWCC)
See Attachment 10: MWCC Letter of Support

Trout Unlimited: TU offers invaluable insight into the data needs of conservation and restoration non-profits. TU staff's knowledge of Montana water law and 310 Law, combined with deep experience in habitat conservation and stream restoration inform Gilly's long-term goals as well as its day-to-day user experience. Active engagement between the Gilly Team and TU will be ongoing throughout the grant period.
See Attachment 11: TU Letter of Support

WGM Group: WGM is a Montana based engineering firm. WGM has worked with the Gilly team to identify user needs specific to engineered restoration and conservation work.. Engagement between the Gilly Team and WGM Group is on an as needed basis.
See Attachment 12: WGM Letter of Support

4. Identify staff with appropriate credentials and experience and describe their qualifications.

Because the Gilly team has been in place for some time, we anticipate no changes in their positions over the course of the grant period. All team members have experience and/or education relevant to completion of the tasks required in the proposed project.

Sharon Brodie (4CF president) is Gilly's Project Manager and is responsible for the overall direction of the project. She helps to coordinate Gilly's outreach and education program and monitors the overall progress of the software development team. She works extensively with project partners and stakeholders. Prior to her current position, Ms. Brodie served as the director of development for Western Sustainability Exchange (WSE). Prior to WSE, she was the Northern Rockies development and finance manager for Sonoran Institute. Sharon is co-founder and serves on the Board of Directors of the Gallatin Water Trust. She has served on the Gallatin Area Planning Grants Advisory Board, the Greater Gallatin Watershed Council, and as Board Chair for the Gallatin-Park Chapter of Montana Conservation Voters.

Ephie Risho is Gilly's Software Development Director. Ephie brings an extensive background in software development to the Gilly team. As a UI/UX designer for large and small companies and a wide range of use cases, he has an eye for the end user and the long term needs of the software. His many years of experience as an entrepreneur drive him to get projects moving on a tight budget, with tight deadlines, and in a way that solves real user needs. Ephie ensures that the Gilly software is built to spec and on budget with the biggest possible impact, user friendly, and effective in solving real user needs. Mr. Risho has generously reduced his hourly rate to work on this project, which he believes will have a positive and lasting impact on the health of Montana's rivers and streams.

Karen Filipovich is Gilly's Outreach Coordinator I. She oversees the Outreach Program and will be responsible for implementing Gilly in new Conservation Districts. Karen brings a wealth of experience to the Gilly team from a career focused on providing outreach, analytical, and facilitation services to communities struggling to solve natural resource and public health challenges. Her background is in biology, political science, and public policy. Previously, Karen was the Director of Montana Watercourse at Montana State University. She also worked on climate change and energy related research at the Kennedy School of Government at Harvard University.

Tess Parker is Gilly's Outreach Coordinator II. Tess develops educational materials, publishes the Streamline newsletter, and leads Gilly training sessions. These training sessions are an integral part of Gilly's communication and outreach success with CDs. Tess graduated from the University of Montana with a B.A. in Organizational Communication and has experience as a Big Sky Watershed Corps member, a program director for the Gallatin Watershed Council, and leading a trail crew.

E.1.4. Evaluation Criterion D—Dissemination of Results (10 Points)

How will the project results be communicated internally and to interested stakeholders and water resources managers in the area.

The nature of this project requires a high level of ongoing communication between a diverse group of stakeholders statewide and throughout its duration. Internal communication consists of bi-weekly software development meetings, bi-monthly sprint reports, weekly communication meetings, and weekly team meetings.

External communication is executed on a continuous basis throughout the grant period **(**please refer to **Section E.3.1.2: Implementation: Education and Outreach Expansion)** with CDs, conservation and restoration managers, engineering firms, and state associations and state agencies.

As the project progresses we will use our extensive contacts with water managers throughout the West to share information regarding applicability, best practices, and lessons learned through Gilly via:

- Website: Gilly.org is active and contains a wealth of information (including users manuals and training videos) regarding the platform
- Press Releases: 4CF's Communications Program will institute a regular schedule of press releases in local and Western papers
  See Attachment 13: Collaboration Article – Bozeman Daily Chronicle
- Webinars: Beginning in year two, 4CF will schedule regular webinars designed to increase awareness with agencies and water managers outside of Montana
- Publications: Publications and manuals will be considered on an as needed basis

E.1.5. Evaluation Criterion E—Presidential and Department of the Interior Priorities

Climate change is having an outsized impact on water resources across the nation. The increasing frequency of droughts and floods mean that better systems for water management and permitting are urgently needed to protect rivers and streams and ensure their continued delivery of the ecosystem services that humans and biodiversity depend on. Given the combined threats of increased temperatures and decreased precipitation in downstream regions, easy access to reliable data for protecting and supporting decisions that improve water delivery and water quality in headwaters regions, like Montana, is of utmost importance.

Building resilience in a system is often dependent on moving from reactive to proactive management. For example, in water management, construction permitting is directly tied to outcomes for water quantity and quality. Without a clear permitting process that provides transparency and data search capabilities, projects that negatively impact water resources are likely to be approved and the total impact of projects at the local and states levels are largely unknown. With an easily navigable process in place, water managers can more adeptly plan to reduce the cumulative impacts of projects by looking holistically across both geography and time.

Administrative burden has long been a hurdle in natural resource management at all levels. Agencies use unique systems, websites are difficult to navigate, and data are difficult to share across systems and agencies. By offering a one-stop solution to streamlining the permitting process, Gilly strengthens water protections by identifying potential impacts in a shared map platform. Furthermore, Gilly can help to hold offenders accountable through its ability to search for disturbances and submit a complaint form, thus democratizing the permitting and accountability of water resources.

Lastly, climate change will increase the likelihood of disaster events, such as droughts and floods. Given the strong link between Montana's economy–agricultural, recreational, development–and water resources, it is imperative that communities who benefit from and are dependent on water are able to access permits quickly and efficiently. Floods like the 100-year flood on the Yellowstone River in 2022 demonstrate the likelihood that human communities will need these services in the future. Gilly can be a partner in providing this important service to communities in need.

Disadvantaged or Underserved Communities:

The Climate and Economic Justice Screening Tool identifies 39 of Montana's 56 counties (69.64%) as disadvantaged. For many of these communities, their reliance on a stable and reliable source of water is directly tied to their livelihoods. Many counties across the state are dependent on agriculture and recreation for economic prosperity. Based on emigration from rural areas–many of which are highlighted as disadvantaged or underserved–to more populated areas in the state and country, we know that these populations are already struggling and are dependent on continued access to abundant, clean water in the future. Gilly will expand its reach to many of these areas through its outreach efforts as part of the work proposed herein. Specifically, we will visit CDs located in Flathead County, Beaverhead County, and Sanders County to provide information about Gilly and how it can help them access needed information.

Tribal Benefits:

Incorporating Tribal lands and people into water-resources decision making is of utmost importance. As identified in recent studies, measures of biodiversity and other ecosystem services suggest that Tribes have much to offer by way of thoughtful, sustainable use of resources. According to U.S. Census Bureau figures, 6.9% of Montana's residents are Native people. Tribal nations govern seven reservations that comprise 9% of Montana's land base.

4CF recognizes the importance of Tribes across the state and wants to support their use of Gilly, as well as gather their input as to how to make Gilly both more useful and more inclusive in its data collection. To that end, 4CF will work directly with the three Tribal CDs across the state–Fort Belknap Indian Community CD, Confederated Salish and Kootenai Tribes CD, and Blackfeet CD–as a starting point for both outreach about the Gilly tool and input from communities on how to make Gilly useful across many water resource situations.

WGMGROUP
Community Values. Inspired Futures.

October 10, 2023

Stephanie Micek
Department of the Interior
Bureau of Reclamation – Water Resources & Planning Office
1849 C Street NW
Washington, DC 20240-0001

Re: WaterSmart - Applied Science Grants R23AS00446

Dear Ms. Micek:

I am writing to express my support for the Bureau of Reclamation WaterSmart Applied Science Grant proposal "Creating and Implementing an Improved Process for Stream Permit Management and Data Collection in Montana."

Having more tools to track and manage permitting in Montana would be useful for water management across the state. Permitting is an integral, but often overlooked, component of water conservation and stream restoration efforts. By capturing and making information readily available to water managers, it improves the capacity of Conservation Districts to oversee permitting and manage water projects.

Expanding the capabilities and bringing these to Conservation Districts and applicants across Montana helps make it easier to administer and comply with permitting requirements. This data in turn, combined with additional mapping and analysis, makes it easier to implement water management activities.

As a firm that conducts many restoration projects, we appreciate tools that allow for more streamlined permitting and better management of water resources.

Sincerely,
WGM Group, Inc.

Jeff Dunn
Water Resource Specialist
WGM Group

GALLATIN WATERSHED COUNCIL

October 9, 2023

Stephanie Micek
WaterSmart - Applied Science Grants R23AS00446
Department of the Interior
Bureau of Reclamation
Water Resources & Planning Office
1849 C Street NW
Washington DC 20240-0001

Dear Grant Review Committee,

The Gallatin Watershed Council (GWC) welcomes the opportunity to provide our support for the Bureau of Reclamation WaterSmart Applied Science Grant proposal, "Creating and Implementing an Improved Process for Stream Permit Management and Data Collection in Montana."

The Gallatin Watershed Council guides collaborative water stewardship in the Gallatin Valley for a healthy and productive landscape. As a watershed group with significant interest in promoting effective water management, having more tools to track and manage permitting in Montana would be useful for water management across the state. Permitting is an integral, but often overlooked, component of water conservation and stream restoration efforts. By capturing and making information readily available to water managers, it improves the capacity to oversee permitting and manage water projects.

Expanding the capabilities of Conservation Districts and applicants to better connect across Montana helps make it easier to administer and comply with permitting requirements. As a watershed group working to identify and track restoration projects and cumulative impacts, improving tools to track and analyze projects will help all partners coordinate efforts and further our common goals for awareness, restoration, and protection of our most important resources. We encourage your broad support of this proposal.

Respectfully,

Holly Hill
Executive Director
Gallatin Watershed Council

MONTANA WATERSHED COORDINATION COUNCIL
Uniting and Supporting Watershed Communities

October 13, 2023

Stephanie Micek
WaterSmart - Applied Science Grants R23AS00446
Department of the Interior
Bureau of Reclamation
Water Resources & Planning Office
1849 C Street NW
Washington DC 20240-0001

Dear Ms. Micek:

I am writing to express the support of the Montana Watershed Coordination Council for the Four Corners Community Foundation's Bureau of Reclamation WaterSmart Applied Science Grant proposal "Creating and Implementing an Improved Process for Stream Permit Management and Data Collection in Montana."

As a 501c3 watershed group with a vision of a Montana where watersheds and communities are healthy, productive, and thriving, having more tools to track and manage permitting in Montana would be useful for water management across the state. Permitting is an integral, but often overlooked, component of water conservation and stream restoration efforts. By capturing and making information readily available to water managers, it improves the capacity to oversee permitting and manage water projects for organizations of any size or scale.

Expanding the capabilities and bringing these to Conservation Districts and applicants across Montana helps make it easier to administer and comply with permitting requirements. As a watershed group working to cultivate community-driven approaches to managing complex water issues, improving tools to track and analyze projects will help all partners coordinate efforts and identify areas that require further conservation work.

Sincerely,

Amy Seaman
Executive Director, Montana Watershed Coordination Council