2023 319 Application Form - General and Focus Watershed

General Information

Project Name: Thompson #2 Mine Reclamation Low-Tech Process Based Restoration Project

Sponsor Name: Gallatin Watershed Council

Registered with the Secretary of State? Y

Registered with SAM? Y

UEI #: Gallatin Watershed Council

Does your organization have liability insurance? Y

Primary Contact: Holly Hill	Signatory: Holly Hill
Title: Executive Director	Title: Executive Director
Address: P.O. Box 751	Address: P.O. Box 751
City: Bozeman State: MT Zip Code: 59771	City: Bozeman State: MT Zip Code: 59771
Phone Number: 406-560-4425	Phone Number: 406-560-4425
Email Address: holly@gallatinwatershedcouncil.org	Email Address: holly@gallatinwatershedcouncil.org
Signature: Holly Hill	Signature: Holly Hill

Technical and Administrative Qualifications

Technical and administrative support for this project will be provided by the Gallatin Watershed Council (GWC) and Sundog Ecological. GWC Executive Director, Holly Hill has over 15 years of experience in nonprofit administration and will provide grant administration and project coordination. GWC Restoration Director, Lilly Deford, received her Masters degree in water resource engineering and will provide technical support and partner collaboration. GWC Education and Outreach Coordinator, Heather Priest, received her Masters in Natural Resource Management with a specification in Watershed Management and recently completed a 3 day training workshop coordinated by the BLM and Utah State University titled, “Low Tech Process Based Restoration of Riverscapes.” Heather will manage volunteer contributions to the project. Briana Schultz with Sundog Ecological is a wetland, stream and riparian restoration scientist and has worked on many projects across the Gallatin Watershed. Briana will conduct a post-project wetland delineation.

Budget Summary: *Fields outlined in **black** on this page will auto-populate from other sections of the application form. Fields outlined in **red** on this page will not auto-populate. You must manually input the information for fields outlined in **red**.*

	319 Funding Request	Non-Federal Match	Other Funding	Total Cost
Education and Outreach Project	$ 5,000	$ 1,300	$ 0	$ 6,300
Administration	$ 4,350	$ 0	$ 0	$ 4,350
Project 1 Name	Thompson #2 Mine Reclamation Low-Tech Process Based Restoration Project			
Project Planning	$ 7,100	$ 0	$ 0	$ 7,100
Landowner Agreements	$ 1,050	$ 0	$ 0	$ 1,050
Project Implementation	$ 14,600	$ 35,900	$ 0	$ 50,500
Project Effectiveness Monitoring	$ 11,350	$ 500	$ 0	$ 11,850
Total	$ 34,100	$ 36,400	$ 0	$ 70,500
Project 2 Name				
Project Planning				$ 0
Landowner Agreements				$ 0
Project Implementation Project				$ 0
Effectiveness Monitoring				$ 0
Total	$ 0	$ 0	$ 0	$ 0
Project 3 Name				
Project Planning				$ 0
Landowner Agreements				$ 0
Project Implementation Project				$ 0
Effectiveness Monitoring				$ 0
Total	$ 0	$ 0	$ 0	$ 0
Project 4 Name				
Project Planning				$ 0
Landowner Agreements				$ 0
Project Implementation Project				$ 0
Effectiveness Monitoring				$ 0
Total	$ 0	$ 0	$ 0	$ 0
Grand Total	$ 43,450	$ 37,700	$ 0	$ 81,150

Education and Outreach

Developing good projects often requires a considerable amount of time and effort up front to build relationships and trust with individual landowners and stakeholder groups. It also requires adequate training for project sponsor staff (e.g., technical training, project management, public procurement, technical writing, etc).To promote the development of future projects, DEQ is encouraging project sponsors to use up to $5,000 in 319 funding for education and outreach to develop and capitalize on critical relationships and to improve organizational capacity. DEQ also encourages applicants to incorporate on-the-ground projects into education and outreach efforts through on-site demonstrations and project tours. 319 funding may not be used to pay for food and beverages, or for honorariums and gifts.

Activity (method of delivery)	Feature project in GWC's newsletter, press releases, and social media posts
Target Audience	General public, GWC contact list, GWC social media followers
Goals	- Elevate awareness of the causes and sources of impairments in Rocky Creek and the East Gallatin River - Communicate the importance of floodplain and wetland ecosystem services - Generate momentum and support for replicating LTBPR across the Lower Gallatin
Effectiveness Evaluation	Number of times the project is used in combined media outreach. Public engagement with content (i.e.number of clicks, page views on virtual content)

Activity (method of delivery)	Site tours and field trips
Target Audience	Landowners and partners interested in LTPBR, MSU students and science depts, Gen public
Goals	- Elevate awareness of the causes and sources of impairments in Rocky Creek and the East Gallatin River - Increase local watershed knowledge and understanding on the benefits of LTPBR - Inspire students to incorporate good water resource stewardship into their professional careers - Generate momentum for landowner stewardship and future projects
Effectiveness Evaluation	Number of site tours and field trips, number of attendees

Activity (method of delivery)	
Target Audience	
Goals	
Effectiveness Evaluation	

319 Funding Request	Non-Federal Match	Other Funding*	Total
$ 5,000	$ 1,300		$ 6,300

Match Source	MSU Professors and Guest Speakers Time - In Kind Match	Secured ☑
Match Source		Secured ☐
Match Source		Secured ☐

***Use this space to record any funding that will be used to support creation of the task deliverables, but will not be reported as match. The purpose of this information is to give application reviewers a clearer understanding of the total amount of funding required to complete a task.*

Project Administration

Project administration includes book keeping, invoicing, interim/annual/final report preparation, office supplies, rent, communications, etc. 319 funding applied to this task must not exceed 10% of the total amount of 319 funding requested, or $12,000, **whichever is lower**. Like all other tasks, payment is by reimbursement for actual expenses incurred.

319 Funding Request	Non-Federal Match	Other Funding*	Total Cost
$ 4,350	$ 0		$ 4,350

Match Source _____ Secured ☐

Match Source _____ Secured ☐

***Use this space to record any funding that will be used to support creation of the task deliverables, but will not be reported as match. The purpose of this information is to give application reviewers a clearer understanding of the total amount of funding required to complete a task.*

Project 1

Project Form

A separate Project Form ***(including providing separate attachments)*** must be submitted for each project included in your application. Use the following examples to help determine when to lump and when to split projects. For additional assistance, contact Mark Ockey at mockey@mt.gov or 406-444-5351.

Splitting Examples (fill out multiple Project Forms)

- Stream restoration work occurring on two separate streams, on parcels owned by two separate individuals
- Two projects with significantly different sets of project partners
- Two projects that address substantially different pollution sources (e.g., one project moves a corral off of a streambank, and another removes mine tailings, with both projects being on the same property)

Lumping Examples

- Contiguous stream restoration work spanning multiple land parcels
- 3 projects that address similar sources of pollution on a single land parcel (e.g., moving a corral off a stream, implementing a grazing management plan, and relocating a manure storage facility out of the floodplain, all on the same ranch)

Project 1 Name Thompson #2 Mine Reclamation Low-Tech Process Based Restoration Project

Project 1 - Problem Description

Select the watershed restoration plan (WRP) that your project will help implement.

Lower Gallatin - Greater Gallatin Watershed Council

NA | Letter of support from author entity attached? *(If no, explain why below.)*

GWC is the author of the Lower Gallatin Watershed Restoration Plan and this application has the full support of our staff and Board of Directors.

Waterbody name from the 2020 List of Impaired Waters	Rocky Creek (MT41H003_080), confluence of Jackson and Timberline Creeks t
Probable causes of impairment to be addressed	Sediment/Siltation, Alteration in stream-side/littoral vegetative covers, Other anthropogenic substrate alterations, & Physical substrate habitat alterations
Waterbody name from the 2020 List of Impaired Waters	East Gallatin River, confluence of Rocky and Bear Creeks to MT HWY No. 411
Probable causes of impairment to be addressed	Total Nitrogen, Total Phosphorus

Name of healthy waterbody to be protected	
Description of identified threat to non-impairment status	
Name of healthy waterbody to be protected	
Description of identified threat to non-impairment status	

Detailed Problem Description

Provide a detailed description of the nonpoint source pollution problem you are attempting to address. Be sure to include the following:

- Identify the primary types of pollution
- Identify the primary sources of the pollution
- Identify the root causes of the pollution
- Describe any previous work done to address the problem (who, what, where, when)
- Describe the impacts of the problem (who, what, where)

Location: The Thompson #2 Mine Reclamation Low-Tech Process Based Restoration (LTPBR) Project is located on three unnamed perennial spring creeks that flow into Rocky Creek, a tributary to the East Gallatin River. The project is close to the eastern border of the watershed in the Bangtail foothills, where historic coal waste material was piled in a small drainage. The site is located 8.5 miles heading east from Bozeman, just north off of the Trail Creek exit. The property is owned by a private landowner, Cliff Rockhill.

Types and Source of Pollution: Rocky Creek is considered impaired and is not fully supporting its beneficial use for aquatic life. Rocky Creek is impaired for sediment, physical and other anthropogenic substrate alterations and alterations to riparian vegetation. Rocky Creek flows into the upper reach of the East Gallatin River, which is impaired for Total Nitrogen and Total Phosphorus.

Root Cause of Pollution and Impacts of the Problem: On Mr. Rockhill's property, the spring creek at Site #1 flows through mine tailings which contribute pollutants and sediment loading to Rocky Creek. All three reaches included in this proposal are severely downcut and are largely lacking in riparian vegetation from decades of hay production and livestock pressure. With little to no access to their respective floodplains, snow melt runs quickly off site, out of the foothills, and into Rocky Creek. A lack of available groundwater and a system that is reduced to a trickle by early summer has resulted in decadent riparian vegetation and limited regrowth. Riparian vegetation is dominated by aggressive graminoid monocultures, aging willows, and sagebrush.

After joining with Rocky Creek, the stream channel parallels I-90 and passes under numerous bridges. Sections have been straightened and confined to accommodate transportation infrastructure. Rocky Creek is severely lacking in riparian vegetation for approximately 30% of its length. The combined result is that during high flood events, floodwater is restricted and accelerated downstream, with limited natural capacity to slow-the-flow. Storm water, loaded with gravel fines, transaction sand, hydrocarbons, and nutrients from fertilizer and livestock have easy access to Rocky Creek. Cumulative impacts have resulted in a down cut channel showing evidence of unstable rates of bank erosion and channel migration, and degraded water quality.

Previous Work: The proposed project aims to expand on ongoing restoration efforts led by the DEQ Abandoned Mine Lands (AML) program. DEQ is removing mine waste from the drainage to a new, upland repository site, and reconstructing the stream channel on native bed material. Construction is anticipated to take place in the spring of 2023. The Gallatin Watershed Council (GWC) has a current Big Sky Watershed Corps member that received a grant from the Montana Watershed Coordination Council to complete wetland delineations in three locations at the project site that would benefit from the addition of PBR structures. Briana Schultz with Sundog Ecological has been contracted to conduct these delineations, which are expected to be completed in early November 2022.

Project 1 - Solution Description

Provide a detailed description of the solution you are proposing to implement to address the nonpoint source pollution problem described in the previous section. Be sure to include the following:

- Describe the range of options available for solving the problem, including a no-action alternative
- Describe the practices you intend to design and/or implement to solve the problem (what, where, when, how much or how many)
- Explain why the chosen alternative is the best alternative
- Describe any pre-project planning that has already taken place (e.g., design work, permitting consultation, Endangered Species Act consultation, wetland delineations, landowner agreements, community outreach)
- Describe the anticipated maintenance needs (what, where, who, how long)

Design Description: GWC proposes to construct a series of approximately 30 beaver dam analogues (BDAs) and/or post-assisted log structures (PALs) that mimic beaver activity at three separate sites on Mr. Rockhill's property. These low tech, process based (LTPBR) structures would be implemented in phases during the summer/fall of 2024 and summer/fall of 2025. The exact location of structures will be determined after initial wetland delineations are completed by Sundog Ecological this fall, but general placement is indicated in the attached conceptual design. The structures will be designed utilizing typical structure schematics developed by Utah State University and included in their Low-Tech Process-Based Restoration of Riverscapes: Design Manual. Project partner, Trout Unlimited, will assist with structure design and planning in addition to donating the use of required equipment such as a hydraulic post pounder. Materials for building structures such as logs, branches and brush will be sourced on-site and recovered from fuels reduction efforts that Mr. Rockhill will be pursuing simultaneously. GWC will coordinate between project partners, ensure the project is inline with grant deliverables, manage all volunteer activities and conduct education and outreach tasks. GWC and the Sacajawea Audubon Society partnered in 2021 to develop the IAWP Busy Beavers program, a committed and trained team of volunteers that will participate in construction and monitoring activities throughout the project, including PBR structure construction, revegetation and photo point monitoring.

Design Considerations: These design features have been chosen to work with the landowner's goals, suit the available site, and maximize ecological benefits to Rocky Creek and the East Gallatin River system. Mr. Rockhill is a wildlife and hunting enthusiast, and is committed to promoting high quality wildlife habitat. Unlike traditional restoration projects, LTPBR utilizes techniques that are simple, cost-efficient, low risk and can be hand-crafted by volunteers, allowing the community to participate in the process of stream restoration. LTPBR also utilizes an adaptive management system that allows for "learning by doing" and provides the opportunity to assess and make adjustments over time. As our community grows and the pressures on our watershed increase, the accessibility of LTPBR projects enables us to address many more miles of degraded streams and establish natural processes that are self-sustaining into the future.

Ecological Objectives: The proposed LTPBR structures will help mitigate channel incision, reconnect the perennial streams to their natural floodplain, and raise the groundwater table. Creating wetter conditions will increase wetland and riparian areas at the site, benefiting water quality and wildlife habitat. As water passes through several small pools, mining waste, sediment, and excess nutrients in the perennial spring creeks will be attenuated before entering Rocky Creek and eventually the East Gallatin River. These streams flow through the foothills of the Bangtail Mountains, and are the first to receive snowmelt in the spring. Adding low-tech structures to these headwaters streams will increase natural water storage and will play a much needed part in improving drought and flood resilience in our watershed. By slowing-the-flow we can help relieve some of the erosive forces in Rocky Creek. Not only does the project directly reduce TN, TP, and sediment nonpoint source loading, it also plays a role in stabilizing the system downstream.

Maintenance: Efforts to maintain and improve LTPBR structures will be ongoing. For the first three years, during the life of the grant, volunteers will assist with maintenance needs. Mr. Rockhill is committed to seeing long-term benefits, such as habitat enhancement, occur as a result of this project and is committed to maintaining project investments.

Range of Options and No-Action Alternative:

- Option A: Installation of LTPBR Structures: This project proposal would result in the installation of approximately 30 LTPBR structures in unnamed spring creeks that feed into the sediment impaired Rocky Creek. Due to the extensive erosion and sediment impairment, the proposed project would benefit the tributary and reduce sediment loads. Over time the project should help improve the riparian habitat, enhance water quality and serve as a model for replication across the Lower Gallatin Watershed.
- Option B: No-Action Alternative: Under this alternative no changes to the site would occur and a degraded stream channel and riparian area would remain in its current condition.

Project 1 - Goals and Effectiveness Evaluation

List the specific, measurable nonpoint source goals for your project.

Improve overall stream function: Increased acreage of wetland and riparian areas to help prevent sediment and nutrient pollution from entering Rocky Creek and the East Gallatin River.

Mitigate downcut channels and stream incision: As water backs up behind the LTPBR structures it will raise the groundwater table and promote re-growth of riparian vegetation. Deeply rooting riparian vegetation will stabilize the banks. Additionally, sediment will build up behind each structure and slowly raise the stream bed and promote floodplain access.

Water retention: LTPBR structures will create a series of pools and expanded wetland conditions, slowing the base flow of the perennial streams, decreasing flooding pressure in Rocky Creek, and holding water into the dry season.

Explain how you will determine whether the you have met the goals described above. Identify any data you intend to collect, calculations you'll make, or methods you intend to use.

Photo point monitoring: Record visual changes in hydrology and vegetation to indicate qualitative impacts to wetland habitat, natural storage of water, and water quality.

Pre- and post-construction wetland delineation: Record changes to wetland area, and infer changes to natural storage of water, and water quality. Delineation will be conducted by Sundog Ecological. (Pre-construction delineation is not included in this proposal request.)

Pre- and post-construction in stream habitat measurements including channel bed morphology (including pool/riffle ratios), residual pool depth (maximum depth and tail crest depth), as well as pool habitat quality (pool type, size, total number of pools).

Installation of a staff gauges behind BDAs to measure sediment retention - pre construction and post construction monitoring

Project 1 - Location

Upstream End	Latitude	45.651949	Longitude	-110.889784
Downstream End	Latitude	45.649872	Longitude	-110.888156
Centerpoint	Latitude	45.650783	Longitude	-110.889092
Upstream End	Latitude		Longitude	
Downstream End	Latitude		Longitude	
Centerpoint	Latitude		Longitude	
Upstream End	Latitude		Longitude	
Downstream End	Latitude		Longitude	
Centerpoint	Latitude		Longitude	

List the 12-digit Hydrologic Unit Code(s) (HUCs) in which the project area is located: 100200080902

☑ **Detailed Project site map(s)** Attach a map or set of maps showing the location and size of proposed activity. The map scale must be between 1:1,000 and 1:12,500. The map(s) must have an aerial photo background (e.g., USDA NAIP photography, Google Earth imagery, etc.). The map(s) must show the latitude, longitude, site name, and landowner for the activity site. The map(s) should also identify waterbodies affected by the pollution that the activity is designed to address.

Other Attachments - *(These documents are not required, but may be submitted to provide more specific details about a project or to demonstrate adequate planning and preparation; please, however, be respectful of the amount of time it will take an application reviewer to find relevant information within a document and use excerpts where appropriate; do not attach WRPs, TMDLs or other large-scale planning documents)*

- ☑ Letters of support
- ☑ Project Site Map
- ☑ Conceptual Design
- ☑ Project Site Photos
- ☐

Project 1 - Partners

Identify each of the project partners and describe their contribution to the project. Include landowners, land managers, project designers, funders, and your own organization. Indicate whether each partner, other than your organization, has provided a letter of support. (*Note: each landowner must provide a letter of support.*)

Landowner	Contributions to Project	Letter of Support Attached?
Cliff Rockhill	Land for installation of the project, onsite materials for LTPBR structures, heavy machinery	☑
		☐
		☐
		☐

Project Partner	Contributions to Project	Letter of Support Attached?
Gallatin Watershed Council	Project sponsor, partner coordination, community outreach, design and permitting, provide volunteers, develop and administer 319 grant	☐
Briana Schutlz/Sundog Ecological	Conduct site assessment, pre-project implementation wetland delineation	☐
Sacajawea Audubon Society	Provide volunteer labor with shared Busy Beaver volunteer team with the Gallatin Watershed Council	☑
Department of Environmental Quality Abandoned Mine Lands	Piling woody debris for LTPBR structures, general project support and guidance	☑
Trout Unlimited	LTPBR structure design and planning, general project support and guidance	☑

Project 1 - Budget

Use the space below to outline your project budget.

Project Planning This includes costs for surveying, engineering, permitting, procurement, construction oversight, and overall coordination of the proposed project. This does not include things like reporting, book keeping, communications, office space, or utilities, which are all covered in the Project Administration budget.

319 Funding Request	Non-Federal Match	Other Funding*	Total Cost
$ 7,100			$ 7,100

Match Source		Secured ☐
Match Source		Secured ☐
Match Source		Secured ☐
Match Source		Secured ☐

**Use this space to record any funding that will be used to support creation of the task deliverables, but will not be reported as match. The purpose of this information is to give application reviewers a clearer understanding of the total amount of funding required to complete a task.*

Landowner Agreements This includes costs for developing and managing landowner agreements. The landowner agreement(s) must verify that Contractor and DEQ staff may access the project site, at reasonable times and with prior notification, for the purposes of project planning, implementation, and post-implementation monitoring. The agreement(s) must ensure appropriate operation and maintenance of all structures, vegetation, and management measures for the life of the project. If grazing will be allowed within the project area, the agreement(s) must include a sustainable management plan for livestock grazing, designed to protect and enhance riparian function.

319 Funding Request	Non-Federal Match	Other Funding*	Total Cost
$ 1,050			$ 1,050

Match Source		Secured ☐
Match Source		Secured ☐
Match Source		Secured ☐
Match Source		Secured ☐

**Use this space to record any funding that will be used to support creation of the task deliverables, but will not be reported as match. The purpose of this information is to give application reviewers a clearer understanding of the total amount of funding required to complete a task.*

Project Implementation This includes costs for all materials, labor, equipment, and as-built surveys associated with implementing the plans developed under the Project Planning task. If you are requesting funding for design only, leave this task blank.

319 Funding Request	Non-Federal Match	Other Funding*	Total Cost
$ 14,600	$ 35,900		$ 50,500

Match Source	Trout Unlimited - In Kind Use of Equipment	Secured	✔
Match Source	Busy Beavers Volunteer Time - In Kind Match - 900 hours	Secured	✔
Match Source	Landowner - In Kind Materials and Equipment	Secured	✔
Match Source		Secured	

**Use this space to record any funding that will be used to support creation of the task deliverables, but will not be reported as match. The purpose of this information is to give application reviewers a clearer understanding of the total amount of funding required to complete a task.*

Project Effectiveness Monitoring This includes costs for developing and implementing a reasonable method or set of methods for evaluating and reporting on the effectiveness of the project in achieving NPS pollution goals. It includes preparation and implementation of a monitoring plan, and preparation of a monitoring report. If the project goals include reducing sediment, nitrogen and/or phosphorus, this task will also include calculation of annual load reduction estimates. Photo-point monitoring is also a standard requirement for this task. If you are requesting funding for design only, you may either leave this task blank or request funding for plan development and pre-project monitoring.

319 Funding Request	Non-Federal Match	Other Funding*	Total Cost
$ 11,350	$ 500		$ 11,850

Match Source	Busy Beavers Volunteer Time - In Kind Match - 18 hours	Secured	✔
Match Source		Secured	
Match Source		Secured	
Match Source		Secured	

**Use this space to record any funding that will be used to support creation of the task deliverables, but will not be reported as match. The purpose of this information is to give application reviewers a clearer understanding of the total amount of funding required to complete a task.*

Project 1 - Project Timeline

Task Description	3Q 2023	4Q 2023	1Q 2024	2Q 2024	3Q 2024	4Q 2024	1Q 2025	2Q 2025	3Q 2025	4Q 2025	1Q 2026	2Q 2026
Permitting	✔	✔	✔									
Construction (Phases)				✔	✔	✔		✔	✔	✔		
Pre construction monitoring	✔			✔	✔	✔						
Post construction monitoring						✔		✔	✔	✔		✔
Education and outreach	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔

Project 1 - Bigger Picture Benefits

Environmental Justice

Explain how your project incorporates disadvantaged community populations and priorities, Tribal and community leader engagement, or socioeconomic barriers in the context of equal protection and access to a healthy environment.

As the Lower Gallatin Watershed grows, so does the pressure to effectively treat waste water and figure out how we will have enough water. The City of Bozeman Water Reclamation Facility is anticipating major and expensive upgrades in an effort to meet water quality standards for the East Gallatin River, a burden that the citizen taxpayers must face. This project has the potential to take some financial pressure off the community by treating headwater streams before they enter the East Gallatin. Efforts to increase natural storage also improves our community's water security in times of drought, and decreases flood risks and costly infrastructure damage. Disadvantaged communities do not have the funds to implement these types of projects themselves, and organizations such as GWC have more access to the financial resources to steward the landscape. It is our obligation, being situated at the headwaters of the Missouri River, to keep our tributaries and rivers clean before they flow through the communities of our downstream neighbors, who possess a broad range of socioeconomic statuses.

Climate Change/Resilience

How will your project improve climate change resilience for communities, native plants, wildlife, or ecosystems?

Southwestern Montana is projected to face warmer temperatures each year for longer periods of time, with larger gaps between precipitation events. With these changes in climate come concerns about drought, wildfire, and changes in landscapes and ecosystems. Moreover, warmer climates have put a strain on native fish populations due to prolonged periods of warmer water temperature.

BDAs and PALs will slow the base flow of the perennial streams, creating a series of pools with expanded wetland conditions. These low tech structures will check the flow of spring runoff, naturally slowing and storing water into the dryer parts of the season, helping to maintain enough cool water for aquatic life downstream. Wetter riparian corridors will act as natural fire breaks and protect dry landscapes from burning. Wetlands also contribute to slowing climate change by sequestering carbon.

Impacts to Downstream Human, Plant and Animal Communities

What sort of an impact will your project have on downstream human, plant or animal communities?

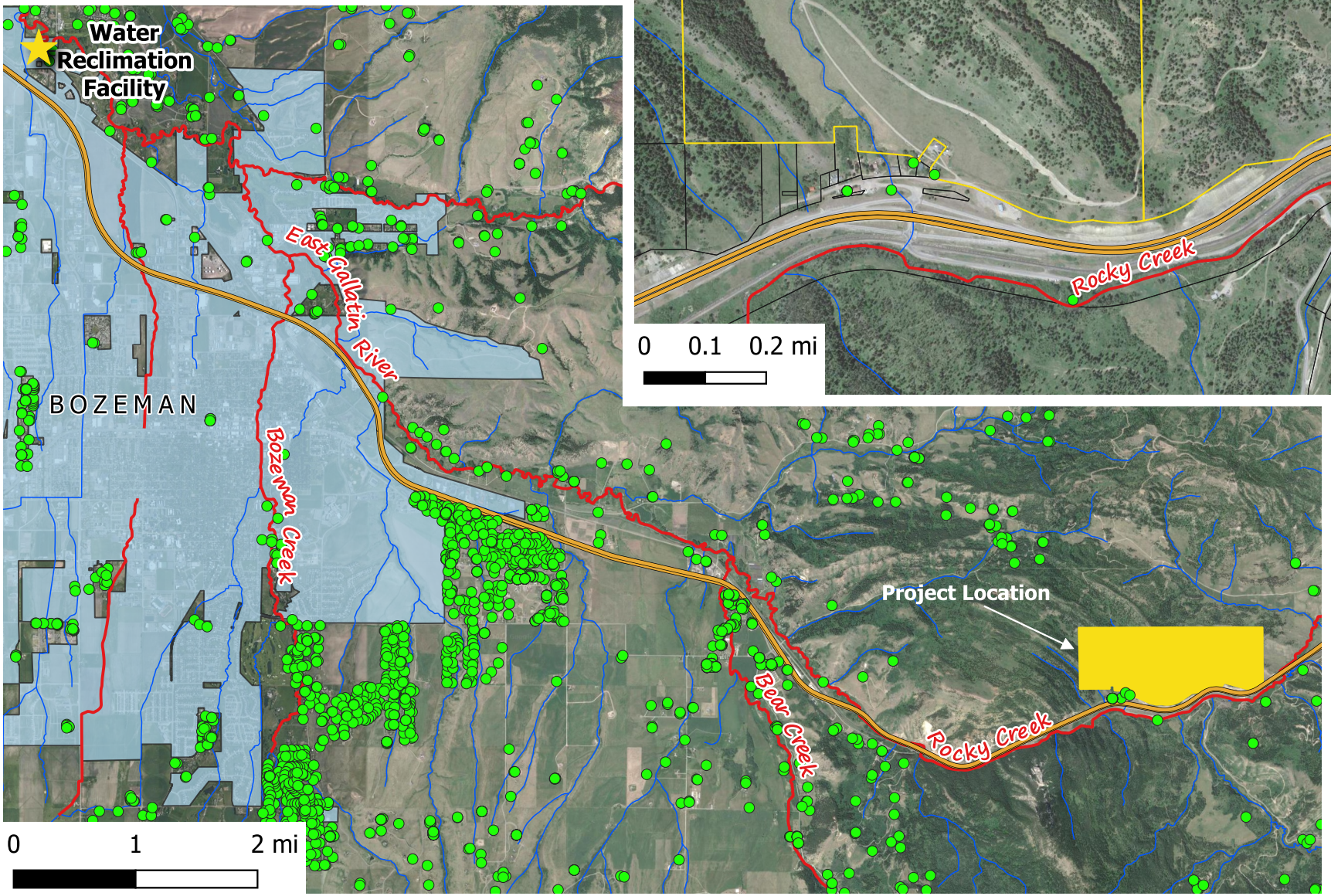
The connection of the perennial streams to their floodplains will reintroduce wetland vegetation that once existed on this landscape, which is now covered with sagebrush, orchard grass, and other water intolerant species.

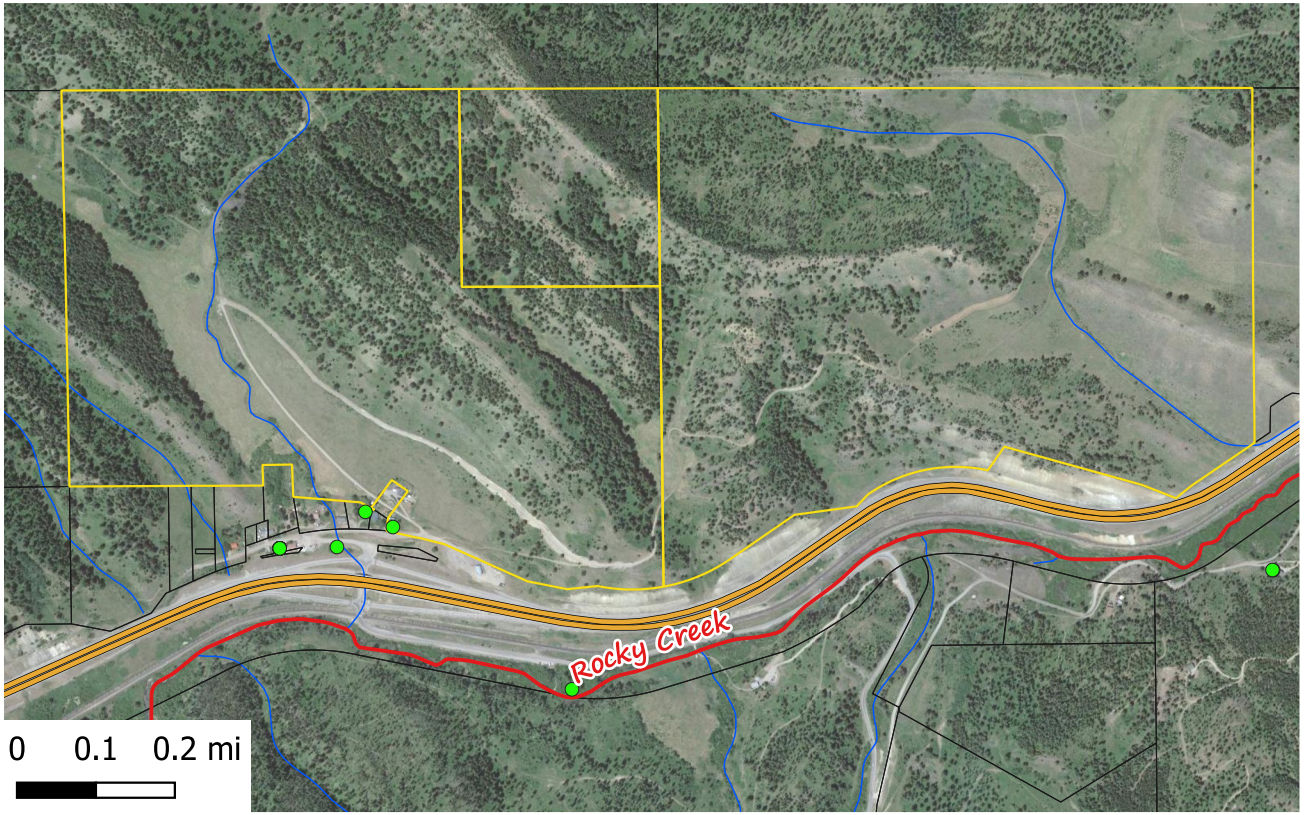
Introducing complexity to the streams via woody debris will create favorable habitat and will increase biodiversity for insects, amphibians, and small fish. The creation of pools will provide cool riparian habitat that will invite species such as waterfowl, deer, elk, and bear.

Map

Project Overview Map

Thompson Mine
Low-Tech Process Based
Channel Restoration





Map Legend

- Proposed Project
- Streams
- Impaired Streams
- Septic System
- Bozeman City Limits
- Interstate 90

Project Center Point:
45.652572, -110.876966

Letters of Support

Gallatin Watershed Council

Thompson #2 Mine Reclamation Low-Tech Process Based Restoration Project

2023 DEQ 319 Application

Attachments

Letters of Support

Cliff Rockhill - Landowner
DEQ Abandoned Mine Lands Program - Project partner
Sacajawea Audubon Society - Project partner
Trout Unlimited - Project partner
Montana State University - Project partner

October 7, 2022

Watershed Protection Section
Department of Environmental Quality
Attn: Mark Ockey

1520 E. Sixth Avenue
Helena, MT 59620

Re: Letter of Support for Thompson #2 Mine Reclamation Low-Tech Process Based Restoration Project

Dear Mr. Ockey,

As the landowner of the project site, I strongly support the Gallatin Watershed Council's 319 grant application. I've worked together with GWC and the DEQ Abandoned Mine Land Program over the last year to implement a restoration project on my property which will prevent coal waste from entering Rocky Creek and the East Gallatin River. Funding for this expanded effort would include the addition of a series of beaver dam analogues and/or post-assisted log structures to mimic beaver activity in the reach just downstream of DEQ's reclamation treatments. These enhancements would not only improve water quality, but it would also create quality habitat for fish and wildlife.

This project furthers my goal as a responsible landowner for restoration of the landscape I have stewardship over. I encourage your broad support of this proposal.

Respectfully,

Cliff Rockhill

Cliff Rockhill

Landowner

Montana Department
Of Environmental Quality

October 3, 2022

Watershed Protection Section
Montana Department of Environmental Quality
Attn: Mark Ockey
1520 E. Sixth Avenue
Helena, MT 59620

Dear Grant Review Committee,

As the Project Manager for the Thompson# 2 Mine Reclamation in eastern Gallatin Co. MT, I fully support the Gallatin Watershed Council's (GWC) participation in this project and grant application. The MTDEQ Abandoned Mine Lands Program (AML) has reached out to GWC for advice and assistance in the restoration of this perennial spring creek drainage. This partnership will ensure the successful reclamation of this site.

This un-named spring creek reports to Rocky Creek which is considered an impaired water by the MTDEQ. This site contributes sediment in the form of coal waste to Rocky Creek which eventually joins with Bear Creek to form the East Gallatin River. This is considered a "Contribution to Nonpoint Source Pollution from Mining" due to direct additions of waste rock, spoil piles, or placer piles (riparian and wetland habitat loss due to sediment).

The available flood plain area has been greatly reduced by the placement of the coal waste in the stream bottom and subsequent erosion of coal waste piles. The project will remove the waste from the stream channel area, re-establishing a functioning floodplain allowing for better groundwater storage and eliminating the contribution of coal waste sediment to the system.

GWC proposes to construct a series of beaver dam analogues and/or post-assisted structures that mimic beaver activity in the reach just downstream of DEQ's reclamation treatments. These low-tech structures will help mitigate channel incision, reconnect the perennial stream to its natural floodplain, and raise the groundwater table. Creating wetter conditions will increase wetland and riparian area at the site, benefiting water quality and wildlife habitat. As water passes through several small pools, mining waste, sediment, and excess nutrients in the perennial spring creek will be attenuated before entering Rocky Creek and eventually the East Gallatin River.

Thank You,

Bob Flesher CPG I *Sr. Environmental Project Manager* Waste Management and Remediation Div. -AML Program
Montana Department of Environmental Quality

MONTANA
Abandoned Mine Lands

Sacajawea Audubon Society

PO Box 1711 • Bozeman, Montana 59771-1711
Sacajaweaaudubon.org

Mr. Mark Ockey
Watershed Protection Section
Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

October 6, 2022

Dear Mr. Ockey,

On behalf of Sacajawea Audubon Society, I am delighted to submit this letter of support for Gallatin Watershed Council (GWC) grant request to secure funding for **Thompson #2 Mine Reclamation Low-Tech Process Based Restoration Project.**

Sacajawea Audubon Society (SAS) is partnering with GWC as we create the exciting new Indreland Audubon Wetland Preserve (IAWP). On the Indreland Audubon Wetland Preserve we are showcasing the importance of beaver as a keystone species as one of our 10 goals for the project. The **Thompson #2 Mine Reclamation Low-Tech Process Based Restoration Project includes beaver mimicry.**

The IAWP is being set aside by Sacajawea Audubon Society (SAS) to conserve and enhance a wetland community in an urban setting. The site will serve as an environmental study area offering education about wetland ecology accessible to all ages. SAS aims to document the effect of human influence on wetland communities and inspire the conservation, restoration, and enhancement of wetlands.

The **Thompson #2 Mine Reclamation Low-Tech Process Based Restoration Project** helps us accomplish the IAWP vision and goals. Design elements considered for this project have the potential to not only improve water quality but also enhance fish and other wildlife habitat. The fishery will benefit from natural storage features that increase late season flows. Riparian and wetland habitat will provide critical habitat for birds and other diverse wildlife species that depend on these vital local habitats.

This project provides an opportunity for our IAWP Busy Beavers, the IAWP outreach community group, to participate and learn about hydrology, ecology, history and the need for clean and cool water flows into the East Gallatin River. We look forward to assisting with pre-project monitoring such as bird counts and other wetland assessments.

SAS has been rapidly growing after taking on a leadership position in wetland protection and awareness in the Gallatin River watershed. We are approaching 1000 members and area an affiliate with the National Audubon Society. Our community-based programming promotes the conservation of our natural environment through enjoyment, education and action. We have been serving the Northern Greater Yellowstone Ecosystem of Montana since 1967.

Approval of this grant proposal will enhance the capacity, efficiency and quality of local natural resources that are under threat with the current growth of Bozeman/Gallatin Valley. We ask that you give positive consideration the **Thompson #2 Mine Reclamation Low-Tech Process Based Restoration Project**. Funding this project would help improve this area's very important but limited wetlands. It further supports the efforts of SAS to protect wetlands in Bozeman and the Gallatin Valley.

Submitted on behalf of the Sacajawea Audubon Society Board of Directors.

Sincerely,

Christopher J. Nixon

Chris Nixon
President, Sacajawea Audubon Society
406-544-4901 - pres@sacajaweaaudubon.org

Connor Parrish, Project Manager, Gallatin Home River Initiative

Mr. Mark Oakey
Watershed Protection Section
Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

Dear Mr. Ockey,

I am contacting you to provide Trout Unlimited's support for the Gallatin Watershed Council's (GWC) application to Department of Environmental Quality's (DEQ) 319 non-point source grant opportunity. The Gallatin watershed faces numerous water quality impairments that jeopardize the health of its fish, wildlife, and growing community. GWC's Thompson #2 Mine Reclamation Low-Tech Process Based Restoration Project provides cost effective solutions to improve water quality and restore natural process that enhance fish and wildlife habitat. The proposed project aims to expand on ongoing restoration efforts led by the DEQ. DEQ is removing mine waste from the drainage to a new, upland repository site, and reconstructing the stream channel on native bed material. GWC proposes to construct a series of beaver dam analogues and/or post-assisted structures that mimic beaver activity in the reach just downstream of DEQ's reclamation treatments. These low-tech structures will help mitigate channel incision, reconnect the perennial stream to its natural floodplain, and raise the groundwater table. Creating wetter conditions will increase wetland and riparian area at the site, benefiting water quality and wildlife habitat. As water passes through several small pools, mining waste, sediment, and excess nutrients in the perennial spring creek will be attenuated before entering Rocky Creek and eventually the East Gallatin River. Adding natural water storage also plays a much-needed part in improving drought and flood resilience in our watershed.

Trout Unlimited is intimately involved in ongoing conservation efforts in the Gallatin watershed and I believe the Gallatin Watershed Council has the professional capabilities and local contacts that position them well for the project they are proposing. Trout Unlimited is dedicated to protecting and restoring the Gallatin's coldwater fishery and thus very supportive of the Gallatin Watershed Council's grant proposal.

Connor Parrish
Project Manager, Gallatin Home River Initiative

MONTANA
STATE UNIVERSITY
College of
LETTERS & SCIENCE

Department of
Earth Sciences

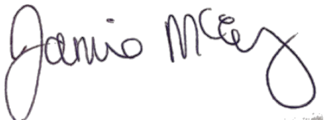
October 4, 2022

Dear Review Committee Members,

It is my pleasure to write a letter of support from Gallatin Watershed Council's (GWC) proposed project at the Thompson #2 Mine site. As you may know, Low-Tech Process Based Restoration (LTPBR) strategies or "beaver dam analogues" are a conservation technique that is increasingly popular among stream restoration practitioners. As noted in the proposal, the goals of this project are to mitigate channel incision, reconnect the stream to its floodplain, raise the groundwater table, create wetlands and riparian areas, and attenuate mining waste, sediment, and excess nutrients.

As a researcher at Montana State University, I am very interested in LTPBR. My colleagues in ecology, engineering, and social science, and I are very interested in would be very enthusiastic for the opportunity to further study the outcomes of LTPBR projects. If this proposal is funded, GWC has offered that the site could provide an opportunity for MSU faculty and students to do site visits, volunteer, and monitor, among other possibilities. This is a very exciting opportunity. I hope you will consider funding this proposal.

Sincerely,



Dr. Jamie McEvoy
Associate Professor of Earth Sciences
Montana State University

Email: jamie.mcevoy@montana.edu
Phone: 406-994-4069

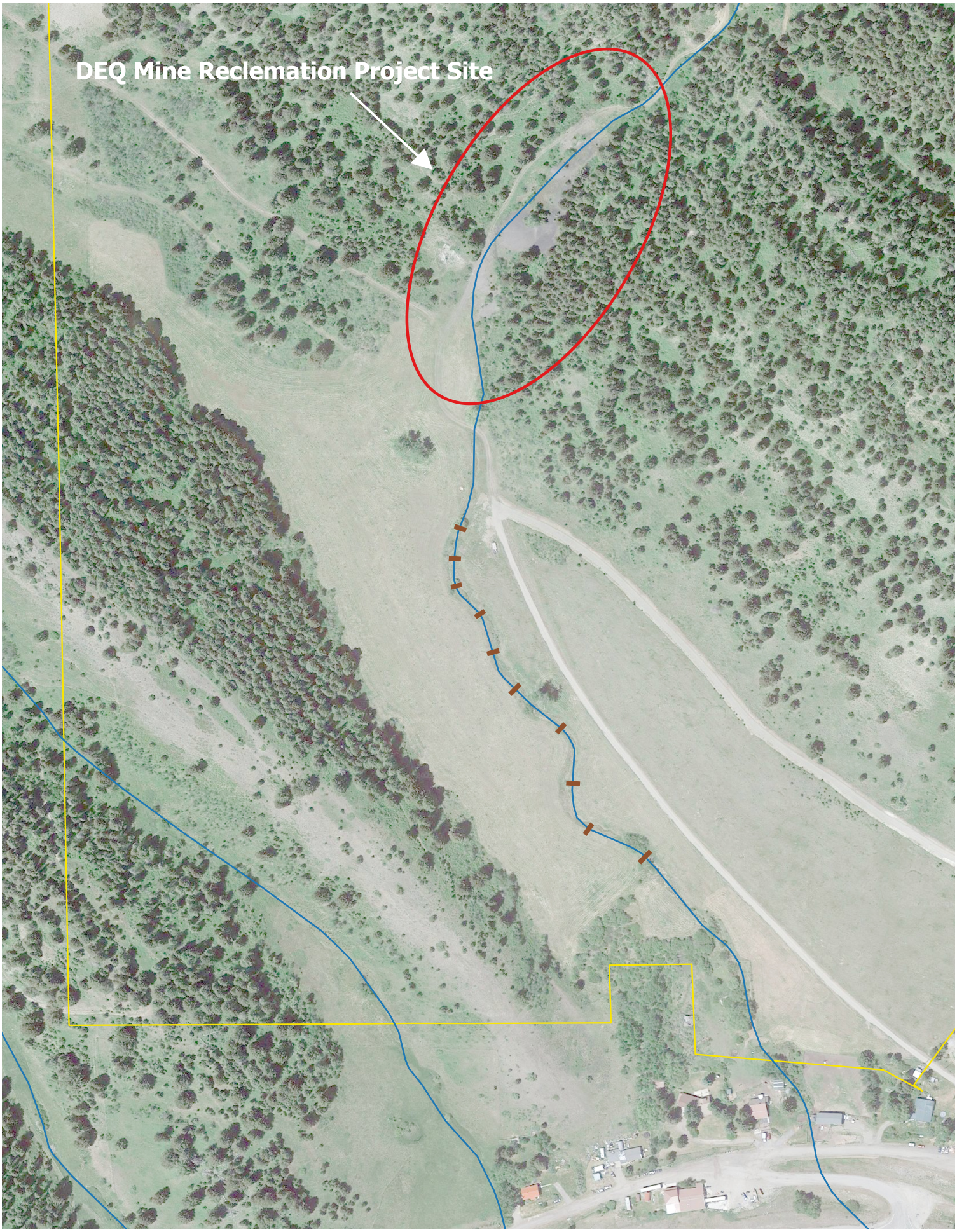
226 Traphagen Hall
P.O. Box 173480
Bozeman, MT 59717-3480
www.montana.edu/wwes

Tel 406-994-3331
Fax 406-994-6923
Email earth@montana.edu

Supplemental Attachment 1

Conceptual Design

Conceptual Design



Site #1

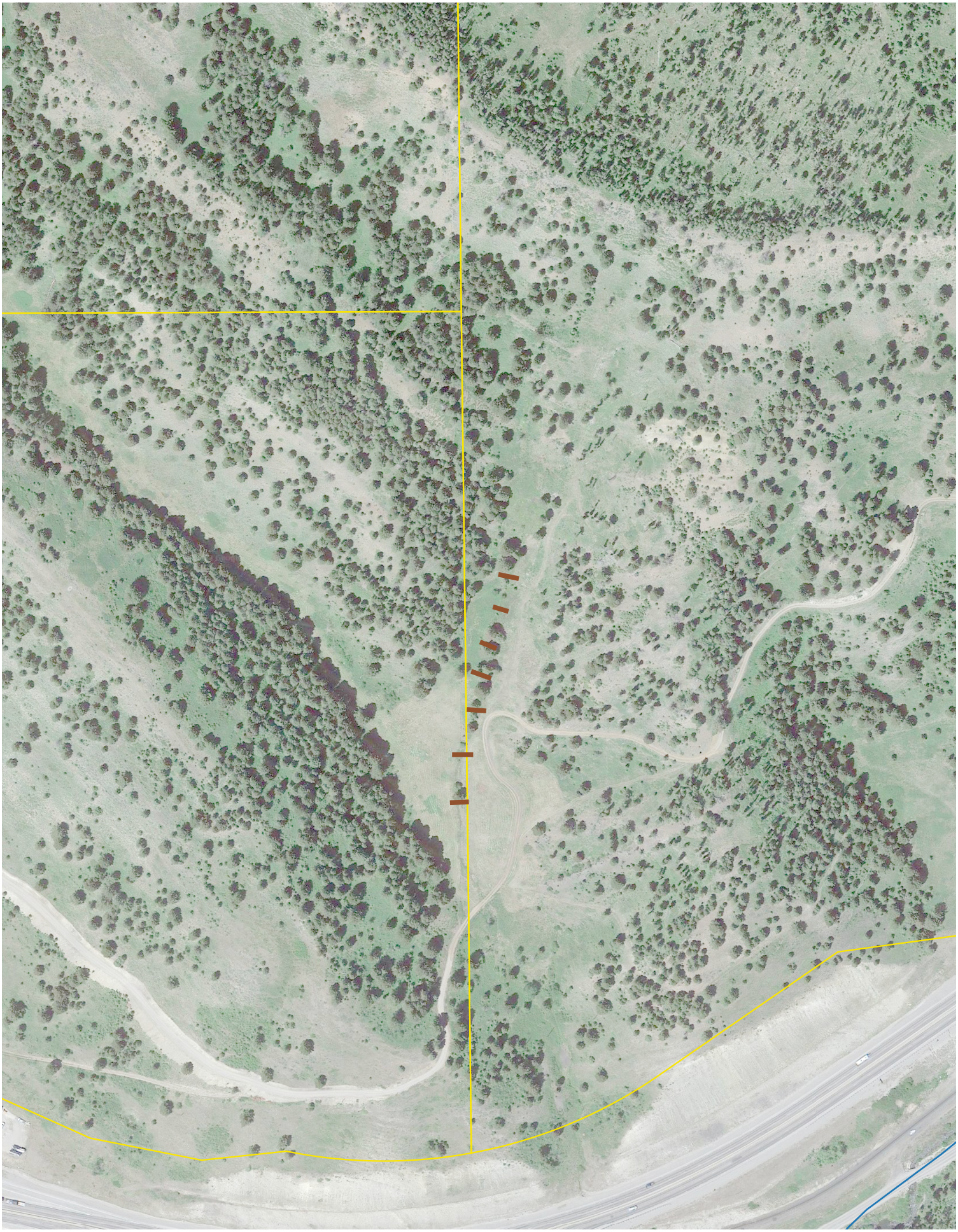
0 100 200 ft

Thompson Mine Low Tech Process Based Channel Restoration

Map Legend

Low Tech Structures

Rockhill Property



Site #2

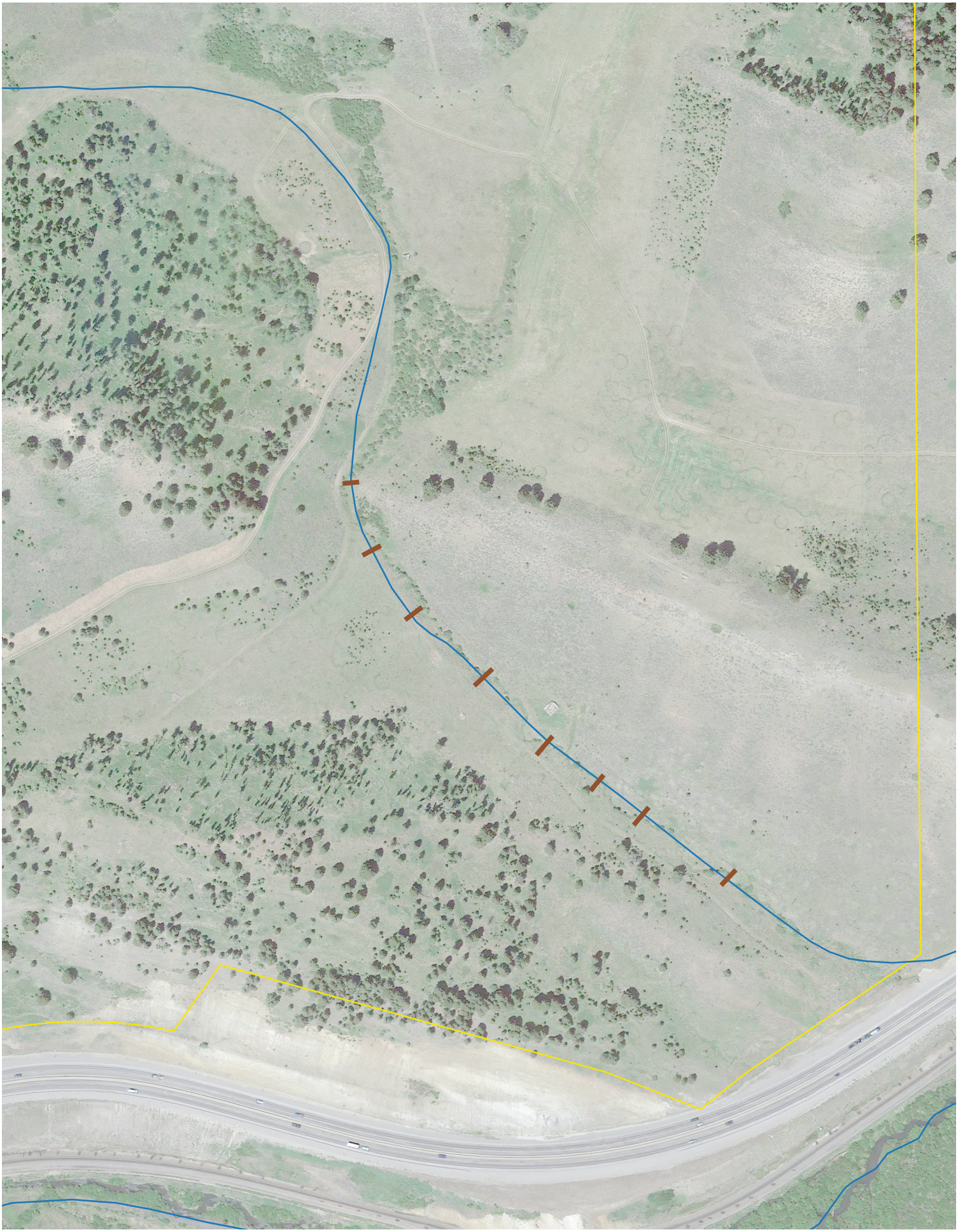
0 100 200 ft

Thompson Mine
Low Tech Process Based Channel Restoration

Map Legend

Low Tech Structures

Rockhill Property



Site #3

0 100 200 ft

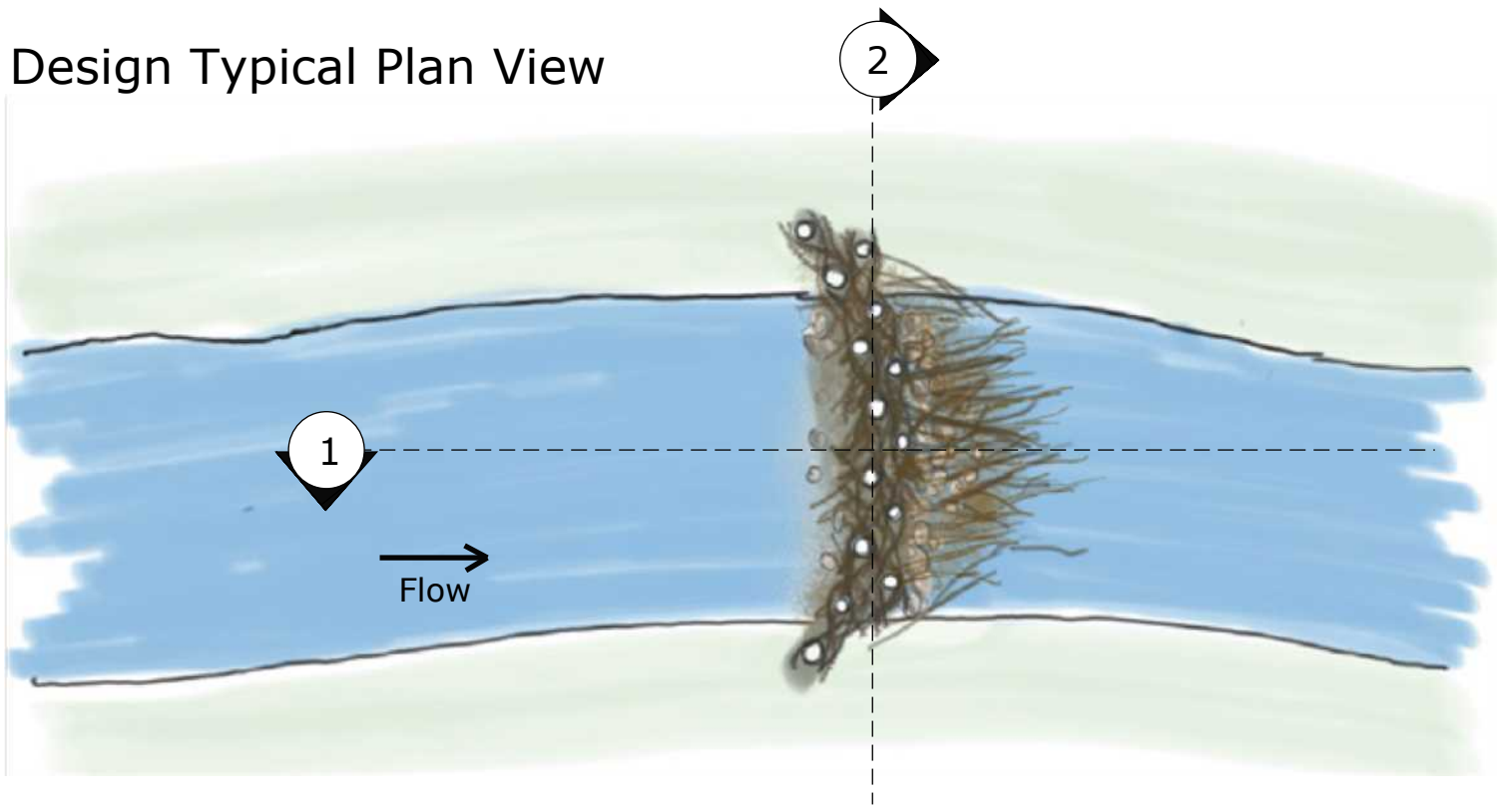
Thompson Mine
Low Tech Process Based Channel Restoration

Map Legend

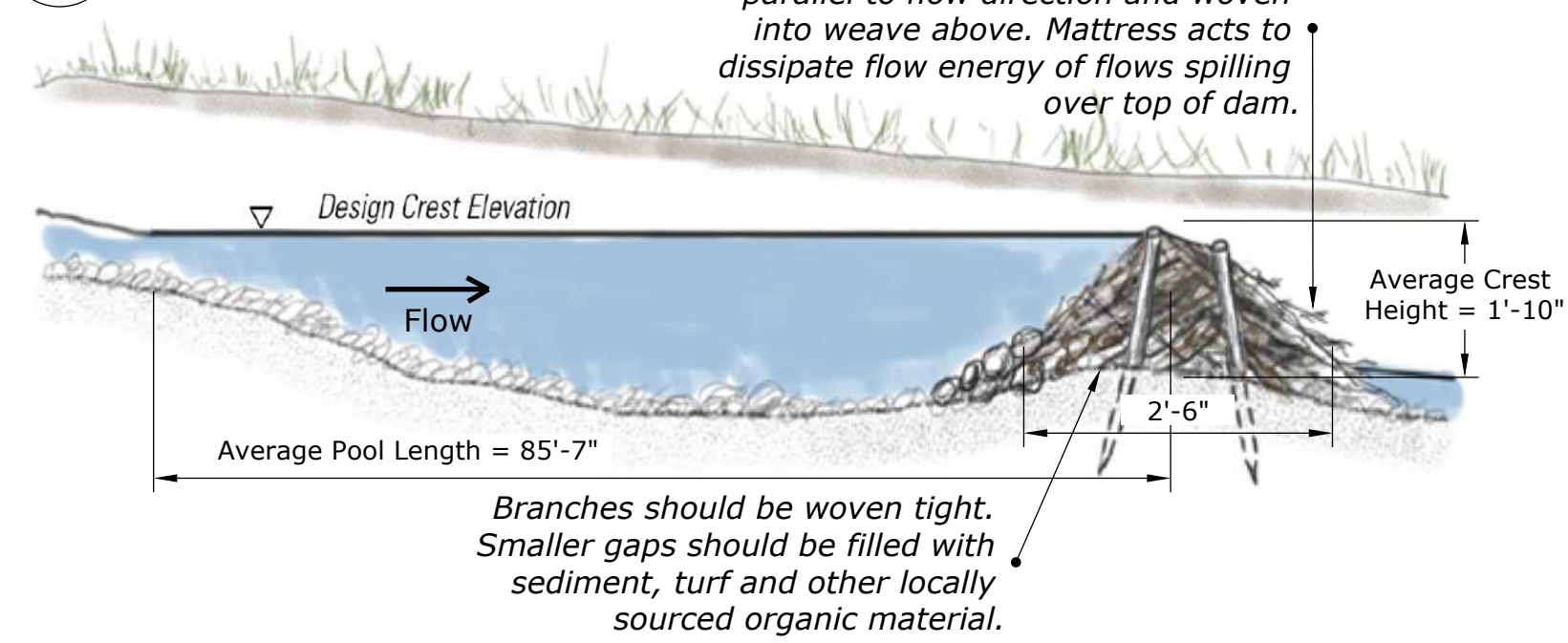
Low Tech Structures

Rockhill Property

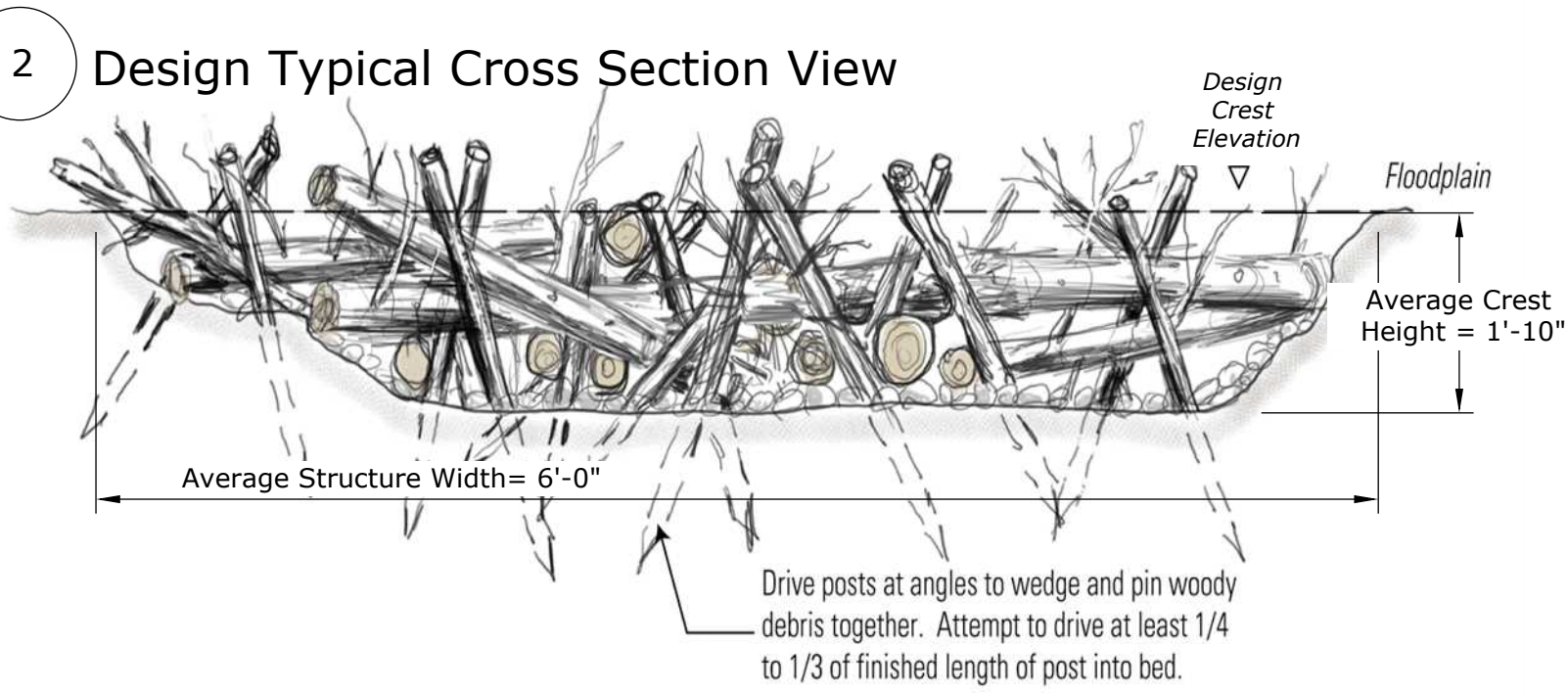
Design Typical Plan View



1 Design Typical Profile View



2 Design Typical Cross Section View



Design Typicals	Thompson Mine Low Tech Processed Based Channel Restoration
Date: 7/11/2022	
Scale: None	

Supplemental Attachment 2

Project Site Photos

Project Site Photos

Thompson Mine
Low Tech Process Based Channel Restoration
Site #1 Photos

Site overview standing on the access road, looking west across the meadow at site #1.

Typical channel cross section.

Site #2 Photos

Site overview looking north from the site access road, upstream to the origins of the small perennial stream at site #2.

Typical channel cross section.

Site #3 Photos

Site overview looking downstream, standing at the top of the meadow at site #3.

Typical channel cross section.

DEQ Mine Reclamation Site

Looking upstream, showing channel routed through mine tailings. Mine tailings slope down from the right. Photos taken in the spring.

Looking downstream., showing channel routed through mine tailings. Photos taken in the spring.