Colorado
Department
of Public Health
and Environment

Nonpoint Source Program Application
Watershed Based Plan Project Proposal and PIP

Project Title	Evans Gulch Watershed Plan

1.0 - Project Proposal Summary

Sponsor		
Organization Name	Trout Unlimited, Inc. (TU)	
E-mail address	erussell@tu.org	
Mailing Address	523 Arbor Drive	
City, State and Zip	Lafayette, CO 80026	
Telephone Number	720-938-5438	
Tax ID Number: 38-1612715		DUNS Number: 051698132

Project Coordinator or Primary Contact	
Name	Elizabeth Russell
Title	Project Manager
E-mail Address	erussell@tu.org
Mailing Address	523 Arbor Drive
City, State and Zip	Lafayette, CO 80026
Telephone Number	720-938-5438

Type of Entity (check on)	
	Governmental Agency
x	Non-for-profit entity, including watershed groups
	Quasi-governmental Entity
	Commercial Organization

Project Start Date	May 2014	Project End Date	December 2015

Project Funding
CO NPS Funds Requested $ 30,000 Match (cash/in-kind) 20,000 = Total Project Cost $50,000
Federal Funds - Federal Cooperator Contribution (please do not include in the total) $3,000

Project Location	
WQCC Regulation River Basin	Arkansas River Basin
Sub-Watershed(s)	Evans Gulch
HUC(s) - 8 or 12 digit USGS Hydrologic Unit Codes	East Fork of the Arkansas River - 110200010206
Impaired Segment(s) Waterbody ID(s)	COARUA07

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NPS Pollution Source categories to be addressed (Check all that apply)			
	Agriculture		Silviculture
	Habitat Modification (drainage/filling wetlands, stream bank destabilization)		Hydrologic Modification (changes to water flow as in reservoir, diversions, etc.)
	Urban runoff/Stormwater		Groundwater Loading
x	Mining		Natural Sources
	Construction		Other:

NPS Pollutants to be addressed (Check all that apply)			
	Excess Nitrogen		Pesticides
	Excess Phosphorus		Selenium
	Sedimentation		Temperature
	Pathogens/Bacteria	x	pH
x	Metals		Habitat impact
	Low dissolved oxygen		Other:

Estimate Load Reduction, if checked for excess nitrogen, excess phosphorus and/or sedimentation	
# pounds of nitrogen reduced by project	Reference:
# pounds of phosphorus reduced by project	Reference:
# tons of sediment load reduced by project	Reference:
# pounds of metals reduced by project To Be Determined X	Reference:
# pounds of selenium reduced by project	Reference:

Project Description:

The Evans Gulch Restoration Project will be a joint partnership between Trout Unlimited, Bureau of Land Management, Colorado Nonpoint Source Program, Colorado Division of Reclamation, Mining and Safety, Parkville Water District, Freeport-McMoRan Copper and Gold, Colorado Mountain College, Collegiate Peaks Anglers Chapter of Trout Unlimited, local landowners and other local partners. Historic mining operations within the Evans Gulch area have created the degraded landscape that visibly exists in the watershed today. Mine wastes and tailings piles are scattered throughout the riparian area with numerous piles coming in contact with Evans Gulch. During spring runoff and summer precipitation events these mine wastes directly interact with Evans Gulch stream flows causing a spike in metals loading and a low pH, which is why Evans Gulch is included on the State's 303(d) list for exceedance of zinc. This listing, combined with the fact that the watershed serves as the primary municipal water supply for approximately 5,000 residents of Lake County and Leadville, makes Evans Gulch restoration a

priority. For this project, TU will create a Watershed Plan to help guide all future cleanup efforts in the watershed.

By signing and submitting the attached application, the authorized official agrees that the information provided in this application is, to the best of the applicant's knowledge and based on reasonable inquiry, true, accurate and complete.

Print Name and Title of Authorized Official: Elizabeth Russell, Mine Restoration Project Manager

Signature of Authorized Official: E Russell Date: Feb 20, 2014

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2.0 - Statement of Need

2.1 – Water Quality Priorities and Problems

Evans Gulch first appeared on Colorado's 303(d) list of impaired waterways in 1998 for dissolved zinc. This listing refers to the mainstem of Evans Gulch from the source area to the confluence with the Arkansas River. The TMDL was completed in 2009 with the goal of attainment of aquatic life classification, which is Aquatic Life Cold 1 (Table 1).

Waterbody ID	Beneficial Uses	WQ Impairment	TMDL Status
COARUA07	Aquatic Life Cold 1, Recreation E, Water Supply, Agriculture;	Zinc	Completed

Table 1: WBID description for Evans Gulch showing TMDL Criteria

The source of zinc can be attributed to runoff from the many mine waste piles located near the waterway. Non-attainment of dissolved zinc corresponds with the spring runoff in May, as well as the convection storm season in July and August (CDPHE, 2009). Based on the 1995 water quality data used to create the TMDL, a 21% (May), 8% (July), and 3% (August) load reduction is necessary to achieve chronic zinc TVS (Table 2). These data show that zinc values are not far from attaining standards and a restoration project in the watershed could efficiently remove Evans Gulch from the 303(d) list.

Month	Avg. Hardness	Zn - D (TVS)	Zn - D, (85th%)	% Reduction
Jan	100	124	27	0%
Feb	115	140	23	0%
Mar	130	156	18	0%
Apr	120	145	18	0%
May	59	79	***100***	21%
Jun	76	98	66	0%
Jul	82	105	***114***	8%
Aug	87	110	***114***	3%
Sep	90	114	15	0%
Oct	94	118	16	0%
Nov	98	122	16	0%
Dec	100	124	15	0%
Annual	93	117	113	0%

Source: TMDL for Evans Gulch - Segment 7 (CDHPE, 2009)

Table 2: Hardness based zinc concentrations in Evans Gulch showing chronic exceedances in bold

In addition to loading from mine waste pile runoff, zinc can coat streambeds in the form of leachable, total-recoverable concentrations that are typically several orders of magnitude greater than in concurrent stream water (Cleasby et al., 2002). During spring runoff and precipitation events, higher flow rates could mobilize zinc concentrations from streambed sediments resulting in a synergistic effect between the two loaders. Studies have shown that leachable-metal concentrations in streambed sediments of a mine inflow are 11 times greater for zinc than in streambed sediment samples collected in an unaffected area upstream (Cleasby et al., 2002). This could cause a significant source of waterborne-metal contamination that could be harmful to aquatic biota and cause a reduction of in-stream habitat in areas adjacent to mine waste piles along Evans Gulch.

Including TMDL measurements, water quality samples have been periodically recorded in Evans Gulch starting in June of 1991 through June of 2004. A higher concentration of samples was taken in 1994-95 and 2000-2003. Various organizations have participated in sampling since 1991 including Colorado Parks and Wildlife (CPW, formerly CDOW), Environmental Protection Agency (EPA), CDM Smith, Colorado State University (CSU), American Smelting and Refining Company (ASARCO), Colorado Mountain College (CMC), and Parkville Water District (PWD). The samples have been analyzed for the typical abandoned mine metals group and have included surface water (14-16 sites), ground water (2 sites), mine water (2 sites), spring (2 sites), and surface/ground/spring water (2 sites) locations. Even though several water quality sampling locations exist in the watershed, there has been no sequential monitoring for a duration of more than two years between sites. Additionally, only one of the surface water sites has had samples recorded at times other than high and low flow. This set of samples was taken in 2003 during the months of April, June, July, August, September and November. Flow and hardness values were not recorded for several of these samples, especially during the 2000-01 timeframe. This project will expand upon the existing dataset and target data gaps in parameters, as well as past sampling locations.

The Evans Gulch project is consistent with water quality priorities specified in the 2012 Colorado Nonpoint Source Program (NPS) Management Plan because it addresses water quality impacts stemming from legacy hardrock mining. Following the completion of the Watershed Plan, TU and its partners intend to proceed with implementation of restoration plans to both improve water quality that has been degraded from nonpoint source mining-related problems and to protect the waterway from future nonpoint source pollution.

TU will create a Watershed Plan identifying major sources of metals pollution within the watershed, which will be based largely upon existing documents previously created by EPA, CDPHE, and PWD. The Watershed Plan will satisfy the nine EPA required components, and will also incorporate water quality data gathered during monitoring efforts planned for 2014 and 2015. The Watershed Plan will then act as the driver for all future engineering/design and subsequent project implementation. The Colorado Division of Reclamation, Mining and Safety (DRMS), Environmental Data Unit (EDU) of the Water Quality Control Division (WQCD), and PWD will assist in the selection of potential source areas to be included in soil/water quality analysis portion of this project. Following source identification, we will pinpoint the highest contributors of metals by monitoring water quality during spring runoff (high flow), low flow, and during a summer precipitation event. Using the results of the monitoring effort, we will develop restoration plans that will address and expand upon the 53 mine sites and waste piles that were identified in CDPHE's Source Water Assessment Report. Consistent with all of TU's restoration work, this project will include education and public outreach to inform interested individuals and groups about our efforts, as well as the larger issue of legacy mining impacts.

2.2 – Watershed and Waterbody Description

Evans Gulch is a five mile long segment of the Upper Arkansas River basin in the historic mountainous "mineral belt" located near Leadville, Colorado. Evans Gulch is a large glacial valley that extends down the west slope of Mount Evans from elevations above 13,200 feet (ft) above mean sea level (MSL) to the Arkansas Valley at approximately 9,900 ft above MSL. It is bordered on the north by Prospect Mountain and on the south by Iron Hill, Breece Hill, and Ball Mountain. Evans Gulch contains two tributary drainages in the upper watershed; Lincoln Gulch and South Evans Gulch. Average annual precipitation is 18 inches with the wettest months being July and August and the driest months being December and January. The largely undeveloped land is a mix of federal and private ownership, though most of the private sections are mining claims. The drainage serves as a municipal water supply for approximately 5,000 residents of Lake County and Leadville by way of Parkville Water District (PWD), which also holds the only discharge permit in the watershed. Through its treatment system and water sources, PWD can provide a peak daily demand of 3.5 million gallons per day (MGD) and an average daily demand of 1.36 MGD (Parkville, 2013). Evans Gulch is one of the primary surface water sources for PWD, and any contamination could prove detrimental to the ability to meet demand if disablement occurs for an extended period of time.

The bedrock formations beneath the surface of Evans Gulch and nearby areas are a series of sedimentary strata that range in age from Cambrian to Pennsylvanian and consist of quartzite, limestone, dolomite and shale (HDR, 2002). These Paleozoic sedimentary formations were intruded during the late Cretaceous or early Tertiary periods in several episodes by sills and dikes (HDR, 2002). These porphyry intrusions created the major portion of the mineralized zones and ore deposits, which is why the area was heavily mined beginning in the late 1800s (Bureau of Reclamation, 1997). The result of this historic mining was the discharge and deposition of mine waste that has since degraded water quality in Evans Gulch. Ore deposits were mined and wastes were deposited on the surface, usually located near water and scattered throughout the watershed (Figure 1). These waste materials became subject to weathering which releases remaining contaminant metals into surface and ground water (HDR, 2002). These conditions led the EPA to include part of Evans Gulch within Operable Unit (OU) 6 of the California Gulch Superfund listing. Planned remedial action under CERCLA authority, either by the Agency directly or through enforcement against facility owners would render the site ineligible for NPS funding due to restriction on funding legally required activities. Following investigation, the Agency has no future remediation plans for the watershed, so restoration through voluntary programs may proceed. In addition to there being no EPA involvement, there are currently no other NPS projects within the watershed.

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Figure 1. Mine waste piles located directly adjacent to stream channel and County Road 38 near South Evans Gulch.

The five mile reach of Evans Gulch begins in the western basin of Mount Evans, picks up notable flows from South Evans Gulch, Lincoln Gulch, Johnson Gulch and Little Evans Gulch before crossing HWY 91 and joining with the East Fork of the Arkansas River on the north side of HWY 24. During this stretch, Evans Gulch passes through Mountain Lake, Diamond Lake and several PWD reservoirs along County Road 3 or Mosquito Pass Road. According to the U.S. Geological Survey (USGS) HUC 12 geodatabase, Evans Gulch is within the East Fork of the Arkansas River Watershed containing a HUC 12 digit code of 110200010202.

Evans Gulch is typical of a high alpine stream channel with varying gradients, riparian vegetation consisting largely of willows and a low water temperature. Downstream of Diamond Lake and along County Road 3, Evans Gulch maintains a consistent grade of 2-4% and passes through several wetland type areas. The streambed is primarily composed of cobble bedforms and possesses a riffle-type channel. In areas unaffected by mine wastes, the stream channel is stable due to the ample amounts of riparian vegetation. However, the areas of Evans Gulch that pass through or near mine waste piles have degraded bank conditions due to the presence of unconsolidated soils, which could ultimately raise zinc levels during runoff periods due to adsorption to suspended sediment . According to Rosgen's Geomorphic Classification, Evans Gulch would primarily be a B classification with moderate relief, colluvial deposition, moderate entrenchment and width-to-depth ratio. Rapids are the predominate feature of the stream, though there are also infrequent scour pools. Limited flow data show that the stream typically flows at 2-3 cubic feet per second (cfs) in the upper reaches of the watershed to over 65.5 cfs during July peak flow near the confluence of the Arkansas River. South Evans Gulch has shown historic peak flow values of around 26 cfs during spring runoff, while Lincoln Gulch has an ephemeral flow regime. As noted in the Total Maximum Daily Load Assessment (TMDL), there have been no recent studies of aquatic life in Evans Gulch, but previous sampling showed brook trout and a macroinvertebrate community in the waterway (CDPHE, 2009).

Evans Gulch is chemically impaired because of zinc concentrations that exceed chronic table value standards (TVS). Additionally, pH values in Evans Gulch are not in attainment of chronic and acute standards (CDPHE, 2009). The elevated concentrations are likely a result of interactions between surface water (stream flows or runoff) and mine waste piles. There are approximately 53 existing/abandoned mine sites with a moderate susceptibility rating and a moderately high physical setting vulnerability rating, which are directly related to the number of contaminant sources (Parkville, 2013). Previous studies state that no recent aquatic life data hve been collected for Evans Gulch, but field observations indicate that the watershed contains good fish and macroinvertebrate numbers (CDPHE, 2009). Because zinc is highly toxic to trout, it is likely that any fish populations within Evans Gulch are impaired by water quality conditions. Additionally, elevated zinc concentrations can also result in substantial mortality of sensitive taxa and affect the life stages of benthic invertebrates (Besser et al., 1999).

The entire Evans and South Evans upper watershed is composed of mining waste rock piles adjacent to roadways and stream corridors (Figure 2). These waste rock piles are usually near shaft or adit openings and comprised of various rock types and acidified soils. Weathering of these piles usually leads to pyrite oxidation and subsequent metals leaching. The close proximity of some of these mine waste piles to Evans Gulch is likely the reason for the elevated zinc concentrations during periods of high flow and precipitation events. The proposed Watershed Plan will investigate several potential source contributors on the south side of County Road 3, as well as identification of other loading piles.

Figure 2: Evans Gulch off of County Road 3 looking east at a potential source contributing mine waste pile.

2.3- Map of Watershed Location *(Appendix A)*

3.0 - Project Description

3.1 - Environmental and Programmatic Goals

Environmental Goal:

- Provide guidance for future implementation to improve water quality in Evans Gulch and its tributaries.

Programmatic Goals:

- Develop a Watershed Plan for the Evans Gulch watershed than can be used to plan corrective actions to aid in the restoration of aquatic and terrestrial ecosystems that have been impacted by pollutants (zinc).
- Identify data gaps and conduct further watershed monitoring.
- Provide a means to identify problematic areas and appropriate BMPs to reduce metals loading into Evans Gulch and its tributaries using the EPA's Nine Elements Guidance.
- Further TU's mission to conserve, protect and restore North America's trout and salmon fisheries and their watersheds.
- Gain landowner support for improving watershed health.
- Adhere to proper reporting and administrative guidelines for this grant.

3.2 - Objectives, Tasks and Products (*Note: Costs are calculated in the 2014 Budget Table)*

Objective 1: Manage project

Task #1: Manage grant, oversee project, submit required semi-annual and final reports.
Product: Project reports to CDPHE for review and approval; assessment and monitoring reports. Completion of all required tasks.
Task #2: Identify watershed stakeholders and develop communication network. Gain landowner approval and support of project activities through outreach. This will be done through meetings and by making phone calls, sending letters and emails to landowners that are in desired project areas along Evans Gulch.
Product: A list of stakeholders to be included in a communication network. Signed letters or emails from selected landowners within communication network stating their support and approval of the project.

Objective 2: Develop a Watershed Plan for Evans Gulch that conforms to the EPA's "Nine Components of a Watershed-based Plan".

Task #3: Data Analysis.
Conduct a literature review by compiling, reviewing and analyzing existing reports and data. TU will identify any data gaps that currently exist for Evans Gulch with regards to the EPA "Nine Components Checklist." Any components identified to be missing will be included in subsequent watershed monitoring.
Product: A literature review and data gap identification.
Task #4: Define the watershed boundary and update existing watershed maps to include current information on areas of concern, land use, water quality, ownership status and aerial imagery.
Product: Maps of Evans Gulch Watershed showing monitoring locations, ownership status, areas identified in restoration plans.
Task #5: Identify potential causes and sources of watershed impairment, including heavy metals (Zinc) and sedimentation loading. This will include relevant data and documentation of sources.
Product: A review of previous studies and field reconnaissance to determine sites to be used in Objective 3.

Objective 3: Watershed Monitoring

Task #6: TU and project partners will complete a SAPP and develop and implement a monitoring plan. TU will assist WQCD and Colorado Mountain College (CMC) with all monitoring, which will take place during spring runoff, summer storm events and low flow, starting in 2014. This detailed monitoring effort will focus on measuring water quality parameters, macroinvertebrate and flow data at potential source contributing sites identified in Objective 2.

Product: SAPP and monitoring results to complete any necessary components of the Watershed Plan. (Qualitatively and quantitatively document source loading areas to be targeted in restoration plans. Data will also be used to determine whether loading reductions are being achieved and progress is being made towards attaining water quality standards).

Objective 4: Identify restoration plans for the watershed that recommend best management practices to address key issues of concern in the watershed, and to prioritize sites for reclamation based on technical feasibility, financial, environmental and community concerns.

Task 7#: Identify restoration management plans where appropriate for the Evans Gulch watershed utilizing information acquired through the literature review, watershed monitoring and community input from informational meetings. The plans will preliminarily prioritize and identify sites within the watershed that are contributing metals loading.

Product: Restoration management plans and site maps identified in the Watershed Plan.

Task #8: Identify BMPs.

Identify and prioritize BMPs to achieve restoration plans. These would include any activities, maintenance procedures and other management practices that would prevent or reduce pollution of waters in the project area.

Product: A list of applicable BMPs will be compiled based upon literature review and consequent monitoring efforts. Also, any BMPs in direct reference to the Clean Water Act (CWA), 404 Permit, or EPA Storm water permits will be identified in the Watershed Plan (LM - need to clarify what this means? If referring to permits, they are addressed in Section 3.3 below. Construction stormwater permits are State-issued, not EPA. Also, need to clarify if a 404 general permit already exists and if a 401 Water Quality Certification will be needed – again, state does that, after a consultation with the Army Corps. If referring to BMPs, I don't understand the sentence).

Objective 5: Develop Public Relationship and Involvement

Task #9: Establish an information/education component that will enhance public understanding of project and encourage early and continued public participation in selecting design and implementing NPS management measures.

Products:

1. Hold 2 community meetings to present information and gather feedback.
2. Completed Evans Gulch Watershed Plan.
3. All Watershed Plan project information will be available to the public via the TU website, newsletters, blogs and annual reports.
4. Regular project updates through the TU website and blog posts on Colorado TU website.
5. The final Watershed Plan will be placed on the TU national and Colorado TU websites.
6. During the final stage project planning, a tour of the Watershed will be conducted for community members and stakeholders to show what water quality and environmental concerns exist in the Watershed.

Task #10: Contribute project monitoring data to the Colorado Data Sharing Network (CDSN).
Product: Yearly updates to the CDSN after verification of data accuracy.

3.3 - Environmental Permits

No Environmental Permits will be required for monitoring activities and development of a Watershed Plan.

3.4 - Lead Project Sponsor Qualifications

TU has extensive experience managing grants and overseeing restoration projects throughout the county. Over the past three years, TU's Colorado Abandoned Mine Restoration Project has utilized grants from the BLM, U.S. Forest Service, Colorado State Forest Service, Colorado's NPS program, the Colorado Water Conservation Board, DRMS, and Freeport-McMoRan Copper and Gold totaling more than $1.5 million to complete restoration projects across the state. The continued support of these agencies and partners speaks to TU's strong track record for completing its project-specific objectives to benefit coldwater resources and documenting the results of its projects in reports to these agencies. As for the Colorado Nonpoint Source Program specifically, TU has successfully managed the award-winning Kerber Creek Restoration Project.

3.5 – Watershed Plan Maintenance

TU will be responsible for updating the Watershed Plan to include new monitoring results and implementation project reports every two years. If TU is unable to fulfill its responsibilities due to inadequate staffing, we will make every effort to encourage one of our project partners to fulfill the obligation.

4.0 - Coordination Plan

4.1 - Lead Project Sponsor and Cooperating Organizations (*Complete in Appendix)*

4.2 - Local Support

TU has the local support of CMC, PWD and LCOSI. CMC will assist in the water quality monitoring associated with summer precipitation events. The Collegiate Peaks Anglers (CPA) Chapter of TU has a history of working on river restoration projects in the Arkansas River basin and will also be contributing towards the project. We will work with individual landowners to obtain access to monitoring sites and acquire their consent to do future reclamation work at project sites.

This project brings a new and substantial partner to the NPS project work. In 2013, TU began a vital partnership with Freeport-McMoRan Copper and Gold. The mining corporation operates the Climax molybdenum mine outside of Leadville and is committed to improving water quality and fish habitat impacted by historic hardrock mining in the Upper Arkansas River watershed. Freeport has pledged $100,000 of cash match to the Evans Gulch Watershed Plan and future restoration projects because of the corporation's investment in the local community of Leadville.

The project also has the strong support of the BLM's Cannon City office. The federal agency owns many small strips of land within Evans Gulch and the relevant staff is invested in helping move this project forward. TU also has the support from the local DRMS office in Leadville, which has committed $30,000 of cash match towards both the Watershed Plan and any implementation projects. DRMS also has a staff person working in its Leadville office who will be assisting TU's efforts throughout the length of the project.

4.3 - Coordination with Other Projects and Organizations

Evans Gulch has no other on-going restoration projects planned for the foreseeable future. PWD will be notified of any construction or monitoring performed in the watershed that may have an impact on the Big Evans Treatment Plant. They will conversely notify TU of any activities that may disturb monitoring or construction sites. Because part of Evans Gulch is located within a Superfund site, we will coordinate with the EPA on all project work.

The watershed monitoring described in Objective 3 will be a collaborative effort with the EDU of the WQCD, CMC and TU. This part of the project will be organized by TU, but implemented and managed using WQCD protocols and monitoring methodology, unless otherwise specified. There are currently several gauging stations along Evans Gulch managed by PWD, and a snow water equivalent (SWE) station managed by CMC for the EPA.

4.4 - Similar Watershed Activities

With regards to a Watershed Plan, similar watershed activities have taken place throughout the Evans Gulch area since the early 1990's. In 2004, CDPHE created a Source Water Assessment Report for the Parkville Water District, which was followed by a Source Water Protection Plan – Surface and Groundwater Plan published by PWD in 2013. CDPHE also released a TMDL in 2009 for Lake/Chaffee Counties that included Evans Gulch.

Due to the Superfund designation of the California Gulch site and surrounding Operable Units in Lake County, Colorado, the EPA has produced numerous remedial investigations, sampling events and feasibility studies dating back to 1993. There are currently eight documents that have been created by/for the EPA that investigate conditions present at the Evans Gulch site (OU 6). These documents can be found on the EPA FTP site (ftp://ftp.epa.gov/r8/calgulch/OU6/RODFeasilibiltyStudiesRIFS/). An exhaustive amount of information exists within these documents ranging from a Record of Decision (ROD), feasibility studies, mine waste pile screening and remediation alternatives, tailings disposal reports and five year reviews. The information provided from these reports, combined with the project planning put forth in this document, already achieves six of the nine components specified in the EPA Watershed-based Plan Checklist. With a large portion the component checklist already existing or completed, TU plans to strengthen and repackage existing data through the monitoring activities to produce a full-scale Watershed Plan.

5.0 – Project Evaluation and Data Management

5.1 - SAPP Development

As project sponsor, TU will not conduct any project monitoring with NPS funds during the contract period without SAPP approval by a NPS manager. A majority of the sampling procedures will be completed and analyzed by the EDU of the WQCD; therefore WQCD staff will develop the SAPP for Evans Gulch with the exception of appendices for photo point and auto-sampling procedures developed by TU. The standard suite of metals associated with AML will be analyzed including aluminum, arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, uranium, and zinc. Additional parameters of alkalinity, hardness, ammonia, kjeldahl, nitrate, nitrite, and total phosphate will also be analyzed in the total recoverable and dissolved forms. Field parameters will include dissolved oxygen, pH, conductivity, temperature and flow. Examples of specific methods to be included in the SAPP are shown below.

- Water quality data will be collected according to Appendix 1: CDPHE SOP for WQ Monitoring Activities_10_2008_Revision 06.
- WQ equipment calibration and testing procedures will either follow Appendix 2: Water Quality Control Division (WQCD) QAPP 2007 RSG_Final_3_11 or protocols instituted by Colorado Mountain College Testing Laboratory.
- Macroinvertebrate data will be collected using Appendix 4"Benthic Macroinvertebrate Sampling Protocols" May 2010, WQCD
- Discharge data will be collected using Appendix 4: EPA - Discharge Calculation (LM - is this a protocol for data collection or for calculation? or both?).
- "Planning Procedures for Safety in the Field" undated, WQCD
- "Quality Assurance Project Plan for Surface Water Monitoring and Assessment" February 2011, WQCD

5.2 – Monitoring Strategy

The overall watershed monitoring strategy will be multi-phased. The first part will be to diagnose problem areas within the watershed that are contributing to the degraded water quality conditions. Specific sites along Evans Gulch from the source to the confluence of the Arkansas River will be selected based upon field reconnaissance with WQCD, DRMS, CMC, TU and PWD officials prior to 2014 spring runoff. An estimated six to ten monitoring stations will be located to best identify source contribution. These stations would then be monitored starting with the 2014 spring runoff, a summer precipitation event, and fall low flow. Water quality data during summer sampling events will be monitored by CMC and TU using up to six auto-samplers with the capability of each taking 24 samples. One of the sites will correspond with a PWD gauging station so that flow can be extrapolated for a specific storm event since flow data are not recorded by the auto-samplers. Both total-recoverable and dissolved fractions will be collected and analyzed using the laboratory at CMC. To keep consistency between spring/fall events and summer storm sampling, all parameters listed in Section 5.1 will be analyzed during all events. A standard operating procedure (SOP) for the auto-samplers will be developed and added to the SAPP as an appendix. The auto-samplers have the ability to record continuous pH and specific conductance, and additional field parameters of dissolved oxygen and temperature can be recorded on-site upon collection of each sample. The total-recoverable portion of the samples will be essential in quantifying short-term increases in metal loading due to runoff. An identical sampling regime would follow the same timeframe for 2015, with high and low flow measurements continuing for the duration of the project. The results will provide a robust set of parameters and expand upon the existing dataset to allow for the completion of the Watershed Plan.

5.3 – Data Management

In conjunction with the WQCD, TU will assist in the collection of samples throughout the duration of the project. As the project sponsor, TU will be responsible for data management, analysis, and reporting. All methods for data collection and photo points will follow those listed in the aforementioned SAPP developed by the WQCD. Alternative methods described below will be used since CDPHE will be a project partner for monitoring of water quality, discharge, and macroinvertebrates.

In addition to management of project data, TU plans to contribute all water quality data to the CDSN. Microsoft Excel data tables will be designed according to CDSN format and will adhere to the ambient water quality monitoring system (AWQMS), which is compatible with the EPA National Data Warehouse Water Quality Exchange (WQX). All data entry will be peer-reviewed to ensure there are no data entry errors when compared to laboratory results Any spatial data with unique attributes to Evans Gulch will be stored in a project-specific geo-database by Trout Unlimited. Data will be updated as they are collected and results from the data analysis will be used to evaluate progress, determine if changes in monitoring or restoration plan need to be considered and assess the overall final project success.

5.4 – Models

No models will be used for this project.

6.0 - Budget

6.1 - Budget Table (*Appendix E)*

7.0 - Public Involvement

7.1 - Process for Public Involvement

TU maintains a high quality and heavily used national and state websites where this project will be highlighted. Our staff will also make an effort to keep Lake County Open Space Initiative, project partners, and interested stakeholders informed of project milestones and pertinent issues. We will present updates on the project at two meetings each year and suggestions and comments from the local public will be taken into consideration throughout the project. As with our other projects, educational tours of the Evans Gulch project will be conducted on an individual basis with community members such as local school groups, volunteers, watershed groups and history-based organizations. Additionally, CPA has a number of active members in the Leadville area will assist us in organizing volunteer workdays for both monitoring and implementation work.

Appendix Contents

A) Project Map
B) Lead Project Sponsor and Cooperating Organizations – *Add blocks as needed*
C) Evaluation Table
D) References
E) Budget Table

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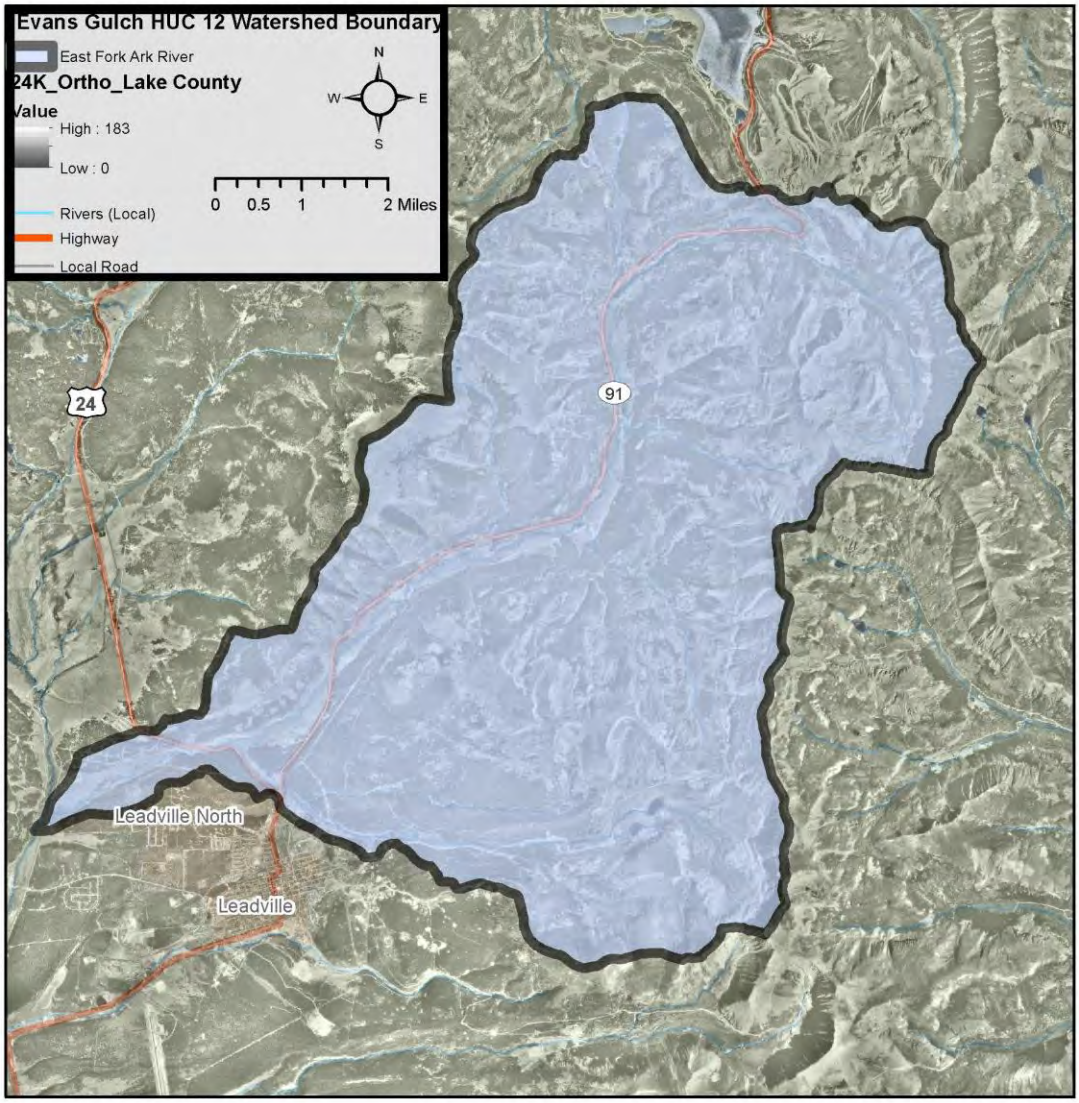
Appendix A: Project Map



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Appendix B: Lead Project Sponsor and Cooperating Organizations

Sponsor			
Organization Name	Trout Unlimited, Inc. (TU)		
E-mail address	erussell@tu.org		
Mailing Address	523 Arbor Drive		
City, State and Zip	Lafayette, CO 80026		
Telephone Number	720-938-5438		
Tax ID Number: 38-1612715	DUNS Number: 051698132		
Cooperators			
Agency Name	Colorado Division of Reclamation Mining and Safety		
Agency Address	P.O. Box 1619, Leadville, CO 80461		
Role/contribution	Technical assistance, project match funds		
Contact Person	Craig Bissonnette	Telephone	970-445-8635
E-mail address	craig.bissonnette@state.co.us		
Cooperators			
Agency Name	Freeport-McMoRan Copper and Gold, Inc.		
Agency Address	333 North Central Ave., Phoenix, AZ 85004		
Role/contribution	Project match funding		
Contact Person	Bill Cobb	Telephone	602-366-7826
E-mail address	William_cobb@fmi.com		
Cooperators			
Agency Name	Colorado Mountain College		
Agency Address	901 South Hwy. 24, Leadville, CO 80461		
Role/contribution	Technical assistance, monitoring, project in-kind match		
Contact Person	Kato Dee	Telephone	719-486-4222
E-mail address	kdee@coloradomtn.edu		
Cooperators			
Agency Name	Parkville Water District		
Agency Address	2015 Poplar Street, Leadville, CO		
Role/contribution	Technical Assistance		
Contact Person	Greg Teter	Telephone	719-486-1449
E-mail address	gteter@parkvillewater.org		
Cooperators			
Agency Name	Collegiate Peaks Anglers Chapter of Trout Unlimited		
Agency Address	128 East 1st Street, Suite 203, Salida, CO 81201		
Role/contribution	Project Funding		
Contact Person	Dan Clegg (Past President)	Telephone	719-942-3648
E-mail address	Clegg_22@msn.com		

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Cooperators			
Agency Name	Water Quality Control Division		
Agency Address	4300 Cherry Creek Drive South, Denver, CO 80246		
Role/contribution	Monitoring Plan Implementation		
Contact Person	Skip Feeney	Telephone	303-691-4928
E-mail address	stanley.feeney@state.co.us		

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Appendix C: Section 5.2 Evaluation Table

Environmental (E) Goal:

- Provide guidance for future implementation to improve water quality in Evans Gulch and its tributaries.

Programmatic (P) Goals:

- Develop a Watershed Plan for the Evans Gulch watershed than can be used to plan corrective actions to aid in the restoration of aquatic and terrestrial ecosystems that have been impacted by pollutants.
- Identify data gaps and conduct further watershed monitoring.
- Provide a means to identify problematic areas and appropriate BMP's to reduce metals loading into Evans Gulch and its tributaries using the EPA's Nine Elements Guidance.
- Gain landowner support for improving watershed health.
- Further TU's mission to conserve, protect, and restore North America's trout and salmon fisheries and their watersheds.
- Adhere to proper reporting and administrative guidelines for this grant.

	Responsible Party	Outputs or Outcomes	Evaluation Methods	Measure of Success
Objective 1: Manage Project				
Task 1: Manage grant, oversee project, submit required semi-annual and final reports.	TU	Project reports to CDPHE for review and approval; assessment and monitoring reports, and completion of all required tasks.	Writing, reviewing, and submitting required reports; Monitoring all partners' involvement and ensuring that all work is completed as prioritized in Watershed Management Plan.	Timely submission and approval of required reports.
Task 2: Identify watershed stakeholders and develop communication network. This list of stakeholders will be comprised of landowners along the stream corridor, floodplain, and within sampling locations. Gain landowner approval and support of project activities through outreach. This will be done by making phone calls, sending letters, and emails to landowners that are in desired project areas along Evans Gulch.	TU, PWD, BLM	A list of stakeholders to be included in a communication network. Signed letters or emails from selected landowners stating their support and approval of the project.	Compiling a list of sites and landowners that have property in the Watershed Plan boundary. Yes or no responses from landowners within the watershed.	Establishment of a communication network between TU and stakeholders. Support from landowners in areas where monitoring and restoration is needed.
Objective 2: **Develop a Watershed Plan for Evans Gulch that conforms to the EPA's "Nine Components of a Watershed Plan"**				
Task 3: Conduct a literature review by compiling, reviewing, and analyzing existing data. TU will identify any data gaps that currently exist for Evans Gulch with regards to the EPA "Nine Components Checklist." Any components identified to be	TU, WQCD, BLM	A literature review and data gap identification of previous watershed studies.	Writing a site literature review that contributes information to a Watershed Plan.	Successful identification of data gaps, source pile contributors, and location of monitoring locations.

missing will be included in subsequent watershed monitoring.				
Task 4: Define the watershed boundary and update existing watershed maps to include current information on areas of concern, land use, water quality, ownership status, and aerial imagery.	TU, BLM, PWD	A GIS database and maps of Evans Gulch watershed.	Update existing data and develop new maps that correspond to desired monitoring sites.	Completed inventory of parameters to be included in Watershed Plan.
Task 5: Identify potential causes and sources of watershed impairment, including heavy metals (zinc) and sedimentation loading. This will include relevant data and documentation of sources.	TU, DRMS, WQCD	A review of previous studies and field reconnaissance to determine sites to be used in Objective 3.	Identified sites will be further evaluated during Watershed monitoring to document source contributions.	Identified sites will result in metal concentration values that can be used for load reduction calculations.
Objective 3: Watershed Monitoring				
Task 6: TU and project partners will develop and implement a monitoring plan. TU will assist Water Quality Control Division (WQCD) and Colorado Mountain College (CMC) with all monitoring, which will take place during spring runoff, summer storm events, and low flow starting in 2014. This detailed monitoring effort will focus on measuring water quality parameters, macroinvertebrate, and flow data at potential source contributing sites identified in Objective 2.	TU, CMC, WQCD, PWD	Use monitoring results to complete any necessary components of the Watershed Plan. Qualitatively and quantitatively document source loading areas to be targeted in restoration plans. Data will also be used to determine whether loading reductions are being achieved and progress is being made towards attaining water quality standards.	Continue sampling efforts of water quality parameters before, during, and after construction.	Valuable data to assess current/future water quality and form a baseline for evaluation of future improvement. Existing data gaps filled.
Objective 4: Identify restoration plans for the watershed that recommend best management practices to address key issues of concern in the Watershed, and to prioritize sites for reclamation based on technical feasibility, financial, environmental, and community concerns.				
Task 7: Identify restoration management plans where appropriate for the Evans Gulch watershed utilizing information acquired through the literature review, watershed monitoring, and community input. The plans will preliminarily prioritize and identify sites within the watershed that are contributing metals loading.	TU, DRMS, PWD, WQCD	Restoration management plans and site maps identified in the Watershed Plan.	Review of final restoration plans by all project partners to ensure that most appropriate sites are being addressed.	Creation of restoration plans that can be eventually used towards future implementation.
Task 8: Identify BMPs. Identify and prioritize activities, maintenance procedures, and other management practices that would prevent or reduce pollution of waters in the project area.	TU, BLM, DRMS	A list of applicable BMPs will be compiled based upon literature review and consequent monitoring efforts. Also, any BMPs in direct reference to the Clean Water Act (CWA),	Use literature review and monitoring data to select best fit BMP for each site.	Selection of best fit BMP that best suits desired goals and outcomes of future restoration management plans.

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		404 Permit, or EPA Storm water permits will be identified in the Watershed Plan.		
Objective 5: Develop Public Relationship and Involvement				
Task 9: Establish an information/education component that will enhance public understanding of project and encourage early and continued public participation in selecting, designing, and implementing NPS management measures.	TU	1. All Watershed Plan project information will be available to the public via the TU website, newsletters, blogs, and annual reports. 2. Regular project updates through the TU website and blog posts on CTU website. 3. The final Watershed Plan will be placed on the TU national and CTU websites. 4. During the final stage of project planning, a tour of the Watershed will be conducted for community members and stakeholders to show what water quality and environmental concerns exist in the watershed.	Using TU websites to create a project database for Watershed Plan updates and final report. Regular project updates will coincide with project milestones to keep public informed. Watershed tour will act as an opportunity for public to comment on issues present within watershed.	Produce a Watershed Plan public database that incorporates updates when project milestones are achieved. This will allow TU to publicize project and educate public increased capacity to address new watershed issues. A successful Watershed tour will have included participating landowners that provided feedback regarding future plans.
Task 10: Contribute any project monitoring data to the CDSN.	TU,WQCD	Yearly updates to the CDSN after verification of data accuracy.	Successful updates to CDSN database with monitoring data.	Increased contribution to the CDSN to fill data gaps. Increased WQ database for other organizations to use.

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Appendix D: References

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