2004 FINAL
UPPER CLARK FORK RIVER BASIN
RESTORATION WORK PLAN

PREPARED BY:

STATE OF MONTANA
NATURAL RESOURCE DAMAGE PROGRAM
1301 EAST LOCKEY
P. O. BOX 201425
HELENA, MT 59620-1425

DECEMBER 2004

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I hereby approve of the project funding recommendations as stated in this document:

_____ _____

Governor Judy Martz **Date**

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Acronyms

ADLC	Anaconda-Deer Lodge City County Government
Advisory Council	Upper Clark Fork River Basin Remediation and Restoration Education Advisory Council
ARCO	Atlantic Richfield Company
BPMC	Bridger Plant Materials Center
B-SB	Butte-Silver Bow City County Government
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Clark Fork River
CFWEP	Clark Fork Watershed Education Program
DEQ	Montana Department of Environmental Quality
DLVCD	Deer Lodge Valley Conservation District
DNRC	Montana Department of Natural Resources and Conservation
DOI	U.S. Department of Interior
EPA	U.S. Environmental Protection Agency
FWP	Montana Fish, Wildlife and Parks
MHCD	Mile High Conservation District
MOA	Memorandum of Agreement
MT Tech	Technical Outreach of Montana Tech
NRCS	Natural Resource Conservation Service
NRDP	Natural Resource Damage Program
RPPC	UCFRB Restoration Plan Procedures and Criteria
ROD	Record of Decision
SBC	Silver Bow Creek
TMDL	Total Maximum Daily Load
TRC	Trustee Restoration Council
Tribes	Confederated Salish and Kootenai Tribes
UCFRB	Upper Clark Fork River Basin
USFS	U.S. Forest Service
WRC	Watershed Restoration Coalition of the Upper Clark Fork

1.0 EXECUTIVE SUMMARY

1.1 Background

The State of Montana obtained approximately $130 million for restoration of injured natural resources in the Upper Clark Fork River Basin (UCFRB) through a partial settlement of its natural resource damage lawsuit against the Atlantic Richfield Company (ARCO) in 1999. In February 2000, the State released the *UCFRB Restoration Plan Procedures and Criteria* (*RPPC*) that provided the framework for expending these Restoration funds. The document was based on input from the UCFRB Remediation and Restoration Education Advisory Council (Advisory Council)[1] and public comment. Rather than embarking on a prescriptive process, the State elected to establish a grant process whereby various entities could apply for Restoration funds based on procedures and criteria set forth in the *RPPC*. The criteria are aimed at funding the best mix of projects that will restore or replace the natural resources that were injured, and/or services provided by those resources that were lost, due to releases of hazardous substances from ARCO and its predecessor's mining and mineral processing operations in the UCFRB. Using experience gained from the first two grant cycles, the State revised the *RPPC* in March 2002.

The Montana Natural Resource Damage Program (NRDP) administers the UCFRB Restoration Grant process. UCFRB Restoration Grant eligibility requirements include:

Applicant Eligibility: Governmental entities, private entities and individuals are eligible to apply for UCFRB Restoration Grants.

Project Type Eligibility: Three types of projects are eligible for funding:

- Restoration projects that will restore, rehabilitate, replace, or acquire the equivalent of injured natural resources and/or the services lost as a result of releases of hazardous substances by ARCO or its predecessors that were the subject of the Montana v. ARCO lawsuit.

- Planning projects that involve developing future grant proposals.

- Monitoring and research projects that pertain to restoration of natural resources in the UCFRB.

Project Location Eligibility: Only projects that are located in the UCFRB are eligible for funding. Activities associated with research projects do not have to occur within the UCFRB, provided the proposed research project pertains to injured natural resources in the UCFRB.

[1] The Advisory Council consists of 11citizen volunteers representing the public and various interest groups and 6 government representatives. A list of Advisory Council members is provided in Appendix E.

The State has awarded approximately $24.3 million for 35 projects since December 2000. Information on these projects can be found on the Department of Justice website at www.doj.state.mt.us under "Montana Lands" or upon request from the NRDP (406-444-0205).

1.2 Work Plan Overview

This *2004 Draft UCFRB Restoration Work Plan* (*Draft*) describes the NRDP's draft evaluation of the 2004 Restoration Grant applications and draft funding recommendations. The *RPPC* sets forth the process the NRDP followed in evaluating applications and recommending funding. As set forth in the *RPPC*, the NRDP is to submit a *Pre-Draft* to the Advisory Council, the U.S. Environmental Protection Agency (EPA), the U.S. Department of Interior (DOI), the Confederated Salish and Kootenai Tribes (Tribes), and any other interested parties. After considering the views of these entities, the NRDP makes appropriate revisions to the *Pre-Draft* before submitting it to the Trustee Restoration Council.[2] Based on its review of the *Pre-Draft*, the Trustee Restoration Council directs the NRDP on preparing a *2004 Draft UCFRB Restoration Work Plan (Draft)*.

This *Draft* is subject to a formal public comment period of 30 days, which ends October 15, 2004. Based on public comment on the *Draft* and input from various entities throughout the funding selection process, the Trustee Restoration Council will make funding recommendations to the Governor. A final funding decision by the Governor is expected in December 2004.

The following summarizes the various phases of the application submittal and evaluation process and describes the sections of this *Pre-Draft* that are reflective of these phases.

- In January 2004, the NRDP distributed the 2004 grant application materials and conducted educational workshops on the application process.

- In March 2004, the NRDP received six grant applications for a total funding request of $4,897,235. Subsequently, one applicant reduced their funding requests, thereby reducing the total funding request to $4,739,252.

- In April 2004, the NRDP issued its minimum qualification determinations for the six applications. All six projects were judged as meeting all the minimum qualification criteria, as covered in Section 2.0.

- The NRDP evaluated the six projects according to criteria specified in the *RPPC*. Section 3.0 contains a project summary, a map, and a criteria summary table for each project. The criteria summary tables are based on the detailed criteria narratives provided in Appendix A. These evaluations were based on application review

[2] The Trustee Restoration Council consists of the Governor's Chief of Staff, the Attorney General, the Chairman of the Advisory Council, and the Director's of the State's three natural resource agencies.

guidelines contained in Appendix E that were derived from the criteria set forth in the *RPPC*. Appendix C provides the Budget Summary Tables for each project.

- The NRDP received input from the Confederated Salish and Kootenai Tribes (Tribes) and Department of Interior on this year's projects that is provided in Appendix D.

- The NRDP compared the six projects on a criterion-specific basis as provided in Appendix B. The NRDP then ranked the projects in order of preference for funding consideration based on these criteria comparisons. Section 4.0 presents these rankings and the NRDP's funding recommendations and any conditions placed on these recommendations.

- The NRDP presented the July 2004 *Pre-Draft Work Plan* to the UCFRB Advisory Council at its July 14, 2004 meeting. At its August 11, 2004 meeting, the Advisory Council voted to recommend six projects for funding in the amounts recommended by the NRDP, as indicated below. Appendix D contains a summary of Advisory Council decisions, minutes from the Advisory Council's April 2004 Applicant Symposium and follow-up correspondence to the Symposium, and minutes for the Council's July 14, 2004 and August 11, 2004 meeting on this year's projects.

- At its September 2, 2004 meeting, the Trustee Restoration Council considered the recommendations of the NRDP and the Advisory Council. The NRDP incorporated the Trustee Restoration Council's draft funding recommendations into the *2004 Draft UCFRB Restoration Work Plan*.

- The NRDP solicited public comment on the *Draft Work Plan* from September 10, 2004 through October 15, 2004. A total of 37 individuals including representatives of 10 entities either submitted written comments or provided oral comments at a public hearing held in Butte on September 16, 2004.

- At its November 10, 2004 meeting, the Advisory Council considered public comments on the *Draft Work Plan* and affirmed their earlier funding recommendations. A summary of Advisory Council input in contained in Appendix D.

- On December 14, 2004, the Trustee Restoration Council considered public comments on the *Draft Work Plan* and the NRDP's draft response to these comments. The Council affirmed the draft funding recommendations as their final recommendation. The following are the six projects and amounts recommended for funding. Section 4 provides more detail on these funding recommendations and any funding conditions associated with them.

1. Bridger Plant Materials Center – $253,926
2. Butte Waterline – $1,192,802
3. Anaconda Waterline – $1,223,374
4. High Service Tank Replacement – $1,197,971
5. Clark Fork Watershed Education Project – $673,801
6. Browns Gulch Watershed Project, Phase 1 – $143,404

Public input received before and during the public comment period on specific grant projects and draft funding recommendations is summarized in the Project Criteria Narratives (Appendix A) of the *Final Work Plan*. *The State of Montana's Responses to Public Comments on the Draft 2004 UCFRB Restoration Work Plan* (December 2004) provides copies of the comment letters and public hearing comments received during the public comment period and the State's responses to these comments. This document is available upon request from the NRDP or from the Department of Justice webpage at **www.doj.state.mt.us** under "Montana Lands."

2.0 MINIMUM QUALIFICATION DETERMINATIONS

The NRDP initially evaluated the six applications according to the following minimum qualification criteria specified in the *RPPC*:

- The application is completed fully and accurately and contains all necessary information.

- The proposed project would restore, rehabilitate, replace or acquire the equivalent of the injured natural resources that were the subject of Montana v. ARCO.

- The proposed project would be located in the UCFRB. (This requirement does not apply to research projects, provided that the proposed research pertains to restoration of natural resources located in the UCFRB).

- The applicant has the ability, financial means, and other qualifications necessary to undertake the proposed project.

- That consideration or implementation of the proposed project would not interfere, potentially interfere, overlap, or partially overlap with the State's remaining claims in the Montana v. ARCO natural resource damage lawsuit, or with the State's proposed restoration determination plans for the three sites still involved in that litigation. Those sites are Butte Area One, Smelter Hill Area Uplands and the Upper Clark Fork River. In addition, projects that are proposed for implementation at the Upper Clark Fork River or Butte Priority Soils Operable Units will not be considered prior to the issuance of EPA's Record of Decision for the sites.

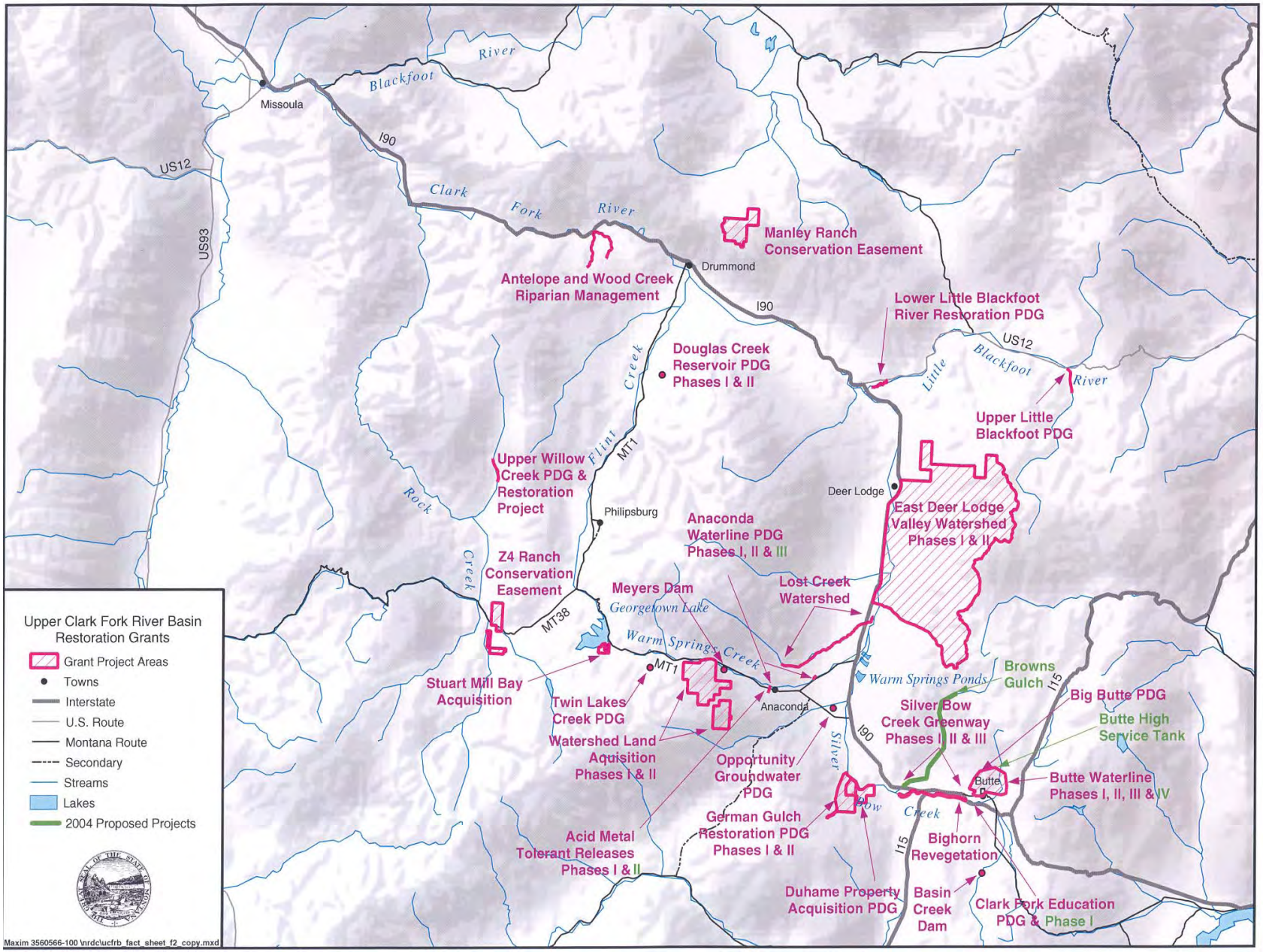
The six projects met minimum qualifications and were fully evaluated for Stage 1 and 2 criteria according to the *RPPC* procedures.

3.0 PROJECT SUMMARIES, MAPS, and CRITERIA SUMMARY TABLES

Table 1 summarizes the six projects submitted. The total request for Restoration funds for these projects is $4,739,252. Figure 1 shows the location of these proposed projects in relationship to those projects already funded. Project summaries, maps and criteria summary tables follow for each project. The criteria summary tables contain a summary of the detailed criteria narratives evaluations contained in Appendix A.

Table 1
2004 Restoration Projects

APPLICANT	PROJECT	BUDGET	Total Amount Requested in Restoration Funds
Deer Lodge Valley Conservation District	Acid/Heavy Metal Tolerant Releases (4 years) – "BPMC project"	NRDP - $253,926 Other - $71,000 Total - $324,926	$253,926
Butte-Silver Bow Local Government	Drinking Water Infrastructure Replacement, Year 4 – "Butte Waterline project"	NRDP - $1,197,971 Other - $557,919 Total - $1,755,890	$1,197,971
Anaconda-Deer Lodge City County	West Fourth Street Water Main Improvements – "Anaconda Waterline project"	NRDP - $1,223,374 Other - $309,217 Total - $1,532,591	$1,223,374
Butte-Silver Bow Local Government	High Service Tank Replacement – "High Service project"	NRDP - $1,192,802 Other - $343,010 Total - $1,535,812	$1,192,802
Montana Tech Technical Outreach	Clark Fork River Watershed Education Program (3 years) – "CFWEP project"	NRDP - $673,801 Other - $166,664 Total - $840,465	$673,801
Watershed Restoration Coalition and Deer Lodge Valley Conservation District	Browns Gulch Watershed Project – Phase 1 (2 years) – "Browns Gulch project"	NRDP - $197,378 Other - $96,510 Total - $293,888	$197,378
TOTAL		**$6,283,572**	**$4,739,252**


Missoula
Blackfoot River
I90
US12
US93
Clark Fork River
Drummond
Manley Ranch Conservation Easement
Antelope and Wood Creek Riparian Management
Douglas Creek Reservoir PDG Phases I & II
Lower Little Blackfoot River Restoration PDG
Little Blackfoot River
Upper Little Blackfoot PDG
Flint Creek
MT1
Upper Willow Creek PDG & Restoration Project
Rock Creek
Philipsburg
Deer Lodge
East Deer Lodge Valley Watershed Phases I & II
Anaconda Waterline PDG Phases I, II & III
Z4 Ranch Conservation Easement
Meyers Dam
Georgetown Lake
MT38
Warm Springs Creek
Lost Creek Watershed
Warm Springs Ponds
Browns Gulch
I15
Big Butte PDG
Silver Bow Creek Greenway Phases I, II & III
Butte High Service Tank
Stuart Mill Bay Acquisition
Twin Lakes Creek PDG
Anaconda
Watershed Land Aquisition Phases I & II
Opportunity Groundwater PDG
Silver Bow Creek
Butte
Butte Waterline Phases I, II, III & IV
German Gulch Restoration PDG Phases I & II
Acid Metal Tolerant Releases Phases I & II
Bighorn Revegetation
Duhame Property Acquisition PDG
Basin Creek Dam
Clark Fork Education PDG & Phase I
Upper Clark Fork River Basin Restoration Grants
Grant Project Areas
Towns
Interstate
U.S. Route
Montana Route
Secondary
Streams
Lakes
2004 Proposed Projects
Maxim 3560566-100 \nrdc\ucfrb_fact_sheet_f2_copy.mxd

Deer Lodge Valley Conservation District
Bridger Plant Materials Center
Developing Acid/Heavy Metal-Tolerant Releases

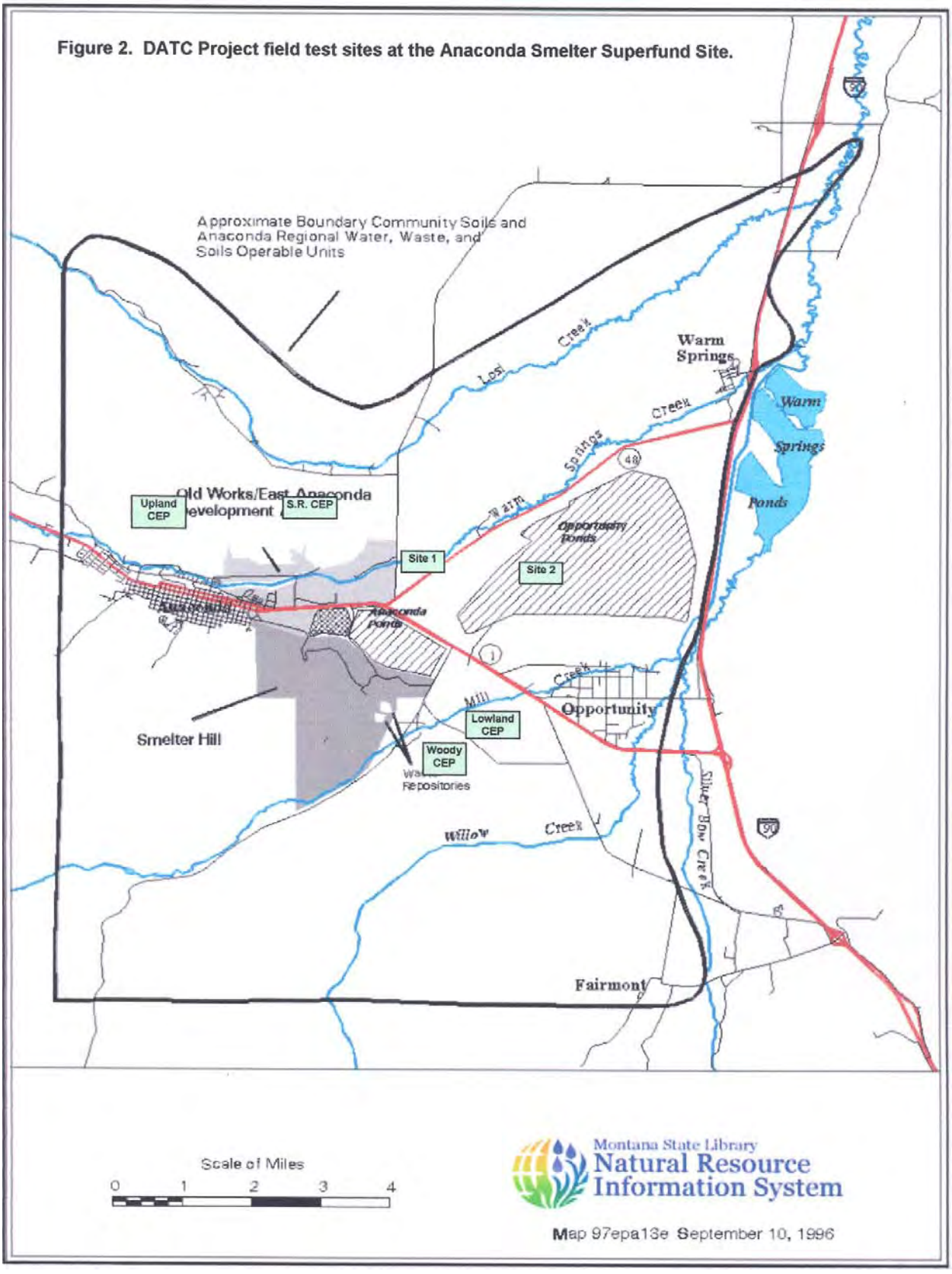
Project Summary

This project is a joint effort between the Deer Lodge Valley Conservation District and the Natural Resources Conservation Service (NRCS) Bridger Plant Materials Center (BPMC). It involves continuing the research and development of a seed supply of native plant species that are best adapted to the climatic and acidic/heavy metal soil conditions of the UCFRB, particularly the Anaconda uplands area. Funding the research and development component of the Foundation seed will greatly increase the likelihood that commercial seed growers will mass produce these seeds, which can then be used for revegetation efforts in UCFRB as well as other contaminated and degraded areas throughout western Montana and the Northern Rockies area. Total project costs are $324,926 for four years, with $253,926 requested in Restoration funds and $71,000 to be provided in kind matching funds.

This project was started nine years ago and has been partly funded by the NRDP over the last four years.[3] Past efforts focused on collecting seed from 27 plants in the Anaconda area and then testing these plants in field trials. Plants demonstrating superior survival, establishment, and growth have been selected for further testing over the next four years. The BPMC has already made selections and released Foundation seeds for a grass, shrub and forb. By the end of the four years of funding under this grant, the BPMC could potentially release an additional 12 species of plants for seed and plant production that are appropriate for reclamation in the UCFRB. Seed and plant production resulting from this project could greatly enhance restoration options in the Anaconda Uplands injured areas and other areas, such as Silver Bow Creek and the Clark Fork River.

[3] Restoration funds over the last four years (2001-2004) totaled $141,400.

Figure 2. DATC Project field test sites at the Anaconda Smelter Superfund Site.



Summary of RPPC Criteria Evaluation for Developing Acid/Heavy Metal-Tolerant Releases Applicant: Deer Lodge Valley Conservation District (DLVCD) and Bridger Plant Materials Center (BPMC)	
CRITERIA	The overall goal of this project is to develop a seed supply of native plant species that are best adapted to the climatic and acidic/heavy metal soil conditions of the UCFRB, particularly the Anaconda uplands areas. The total project cost is $324,926 over four years, with $253,926 requested in Restoration funds. NRDP recommends this project for the requested $253,926 over four years with only the normal funding conditions.
1. Technical Feasibility	Reasonably Feasible: The BPMC project will employ well-known and accepted technologies for seed collection and propagation and the BPMC has demonstrated it has the expertise to accomplish the project. The project is centered on the principle that use of local seed is superior to use of non-local seed. The long-term success of the project will depend on the demand by commercial nurseries and seed producers for the seed materials this project will develop and release; the NRDP believes that demand will exist.
2. Costs:Benefits	High Net Benefits: The benefits of this project will be the availability of locally adapted seed for revegetation of the UCFRB, particularly the Anaconda uplands areas, and the production of guidelines on the optimal plant species and seed mixes for these revegetation efforts. The project facilitates restoration of native wildlife habitat, acceleration of nutrient cycling, stabilization of soils and enhancements of soil properties, and establishment of self-perpetuating plant communities in the UCFRB.
3. Cost-Effectiveness	Likely Cost Effective: BMPC provided a limited analysis of alternatives that demonstrated the inadequacy of the no-action alternative. The positive results of BPMC's research to date, plus other revegetation studies in impacted areas, indicates that using locally adapted, metal tolerant seed for revegetation of impacted lands in the UCFRB is superior to using the presently available non-local seed. This project will have a critical role in expanding the palate of options available for reestablishment of vegetation in degraded areas.
4. Adverse Environmental Impacts	No Adverse Impacts: Beneficial impacts to the environment are likely to be derived from use of the seed product developed and released by the project.
5. Human Health and Safety	No Significant Adverse Impacts: The applicant has properly planned to meet OSHA training requirements for work in contaminated areas.
6. Results of Response Actions	Positive Coordination: This project positively coordinates with and augments remedial actions by providing key plant materials and information that will be essential for both effective remedy and restoration in the UCFRB.

Summary of RPPC Criteria Evaluation for Developing Acid/Heavy Metal-Tolerant Releases Applicant: Deer Lodge Valley Conservation District (DLVCD) and Bridger Plant Materials Center (BPMC)	
7. Natural Recovery Potential	Reduces Recovery Period: The plants grown from the superior seed materials to be produced by this project can be used to directly restore injured wildlife habitat and thus reduce the recovery timeframe.
8. Applicable Policies and Laws	Consistent/Sufficient Information Provided
9. Resources of Special Interest	Beneficial Impact: The project provides a seed product that can be used to improve the wildlife habitat in injured areas and thus benefit sensitive fish and wildlife species. The DOI supports the project. The Tribes have no concerns regarding impacts to tribal cultural or religious sites.
10. Project Location	Within Basin and Proximate: The project's field-testing and seed collection activities occur at various locations within the UCFRB. The seed production activities will occur at the BMPC facility located 45 miles south of Billings.
11. Actual Restoration of Injured Resources	Contributes to Restoration: The project can contribute to restoration by replacing lost upland habitat with native species adapted to the climatic and soil conditions in the UCFRB.
12. Service Loss/Restored & Service Restoration	Same: With the use of the BMPC foundation seed by commercial growers, this project could contribute to restoring some of the same services that were lost in uplands and riparian areas due to habitat loss.
13. Public Support	4 Support Comments: Two support letters from the MSU Reclamation Research Unit and the University of Wyoming Certification Service and two comments in support at the public hearing.
14. Matching Funds	22% Match: Three entities will provide $71,000 total as in-kind matches.
15. Public Access	Not Applicable
16. Ecosystem Considerations	Positive: Any improvement in the revegetation success would benefit the natural resources throughout the UCFRB by reducing erosion, increasing wildlife habitat, and improving water quality.
17. Coordination & Integration	Coordinates/Integrates: BPMC directly coordinates with other entities involved in revegetation in the UCFRB. The seed product from this project could be used in a multitude of needed revegetation projects on impacted lands in the UCFRB and throughout the Northern Rockies region.
18. Normal Government Functions	Outside of Normal Government Function: No governmental entities are responsible or funded for the development of the site-specific plants materials to be produced by this project.
MONITORING AND RESEARCH CRITERIA	
21. Overall Scientific Program	Coordinates: BPMC will continue its coordination with EPA, DEQ, MSU, NRCS, ARCO and local conservation districts.
22. Assistance with Restoration Planning	Major Benefits: This project will be of major benefit to future restoration efforts in the UCFRB in terms of producing needed information on optimum revegetation methodologies and optimum seed source materials.

Butte-Silver Bow Local Government
Drinking Water Infrastructure Replacement – Year Four

Project Summary

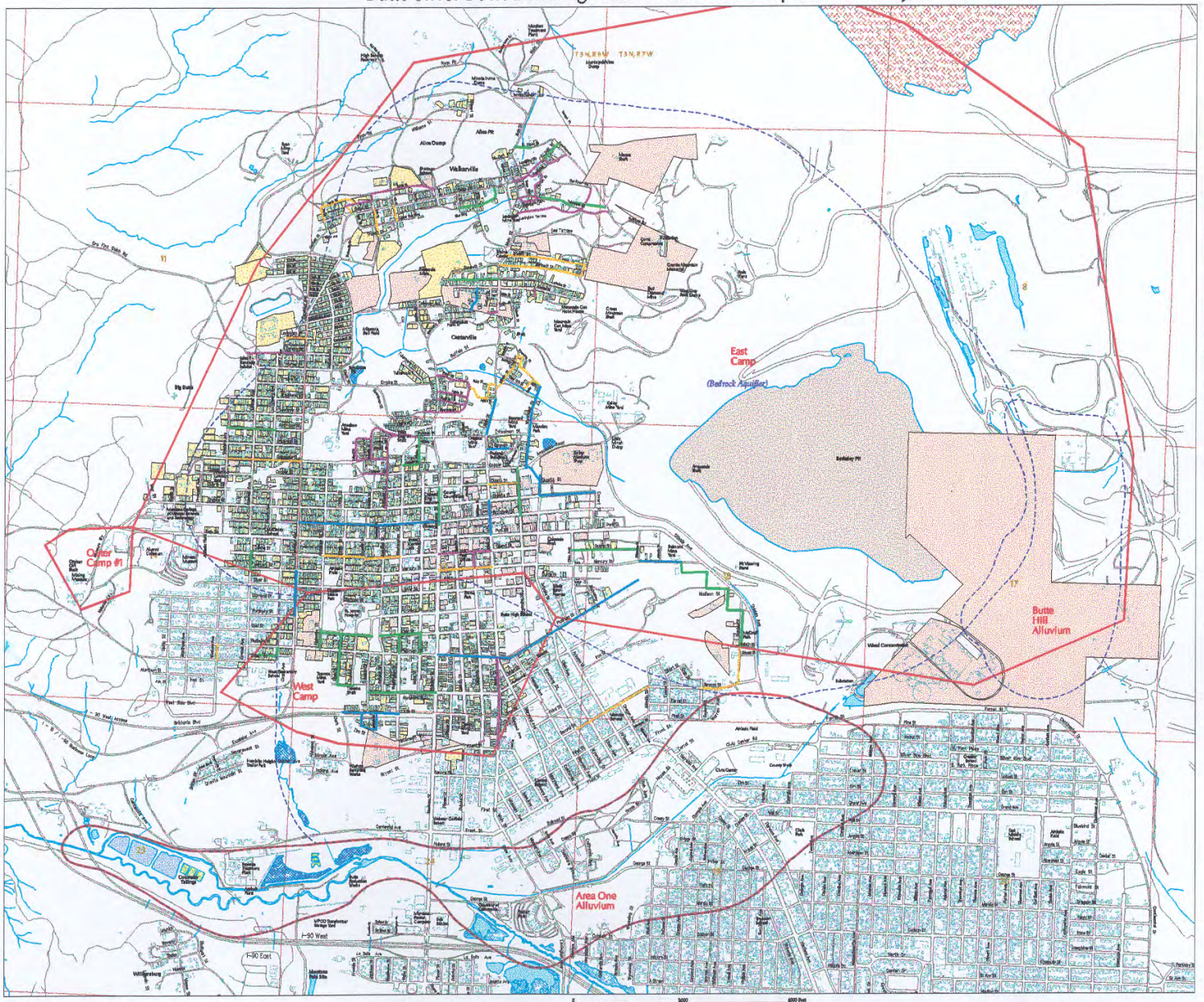
Butte-Silver Bow City-County (B-SB) proposes to replace approximately 17,000 feet of inadequate water distribution lines in the City of Butte for a total cost of $1,755,890, including $1,197,971 requested in Restoration funds. This is the fourth year in which B-SB has requested funding for water line replacement, with $3,523,542 approved in the past three years for replacement of 51,000 feet of waterlines. The amount requested is $9,066 more than last year's approved funding request.

Butte's bedrock aquifer is contaminated throughout a seven square mile area of the City and these distribution lines overlay that aquifer. This aquifer is so severely injured that natural recovery will not occur for thousands of years, as concluded by the State's 1995 Restoration Determination Plan and by EPA's 1994 Record of Decision. Restoration of the bedrock aquifer is infeasible, thus the aquifer's drinking water and its storage capacity and transport services have been lost for thousands of years. By fixing leaking and corroded water lines, this project will enhance the water supply from an uncontaminated source. Thus, it constitutes replacement of lost services to thousands of property owners and other members of the public in Butte that could utilize the aquifer if it was not injured.

In its application, B-SB also provides its 20-year plan for 2000 to 2020 that projects the county's long-range plans for Restoration fund requests. The plan indicates the County's intent to continue water main replacement for a total of 15 years and seek an estimated $17.5 million total in Restoration funds for this effort, with B-SB providing a total match over 15 years of about $8.1 million.[4] This evaluation does not address that long-term plan. If B-SB seeks further funding of projects contemplated by the plan, it will need to do so through a separate application(s).

[4] Approximately $3.52 million has already been approved for water main replacement; therefore, the total remaining for future B-SB requests, including this year's request of $1.2 million is estimated to be $13.98 million.

Butte-Silver Bow: Drinking Water Infrastructure Replacement Project -- Year 4



2004 NRD Grant Application

Appendix A

Legend

- Proposed Water Main Replacements for 2005
- Approved Water Main Replacements for 2004
- Completed Water Main Replacements for 2003
- Completed Water Main Replacements for 2002
- Boundary of Alluvium or Underground Mineworkings
- Boundaries From Original Analysis
- Street or Road
- Hydrologic Feature
- Building or Structure
- Section Line
- Parcel-Residence
- Parcel-Commercial Business
- Pond or Containment
- Berkeley Pit

Source for Residential and Commercial Lots: Montana Department of Revenue CAMA Data for the Butte Silver Bow Appraiser's Office. Last updated 9/15/2002.

Source for Planimetrics: 1989 - 1991 Horizon, Inc Aerial Photography

Source for Area One Alluvium:
1)Natural Resource Damage Assesment for Butte Area. RCC Hagler & Bailey, Inc
2)Phase II Remedial Investigation by CH2M Hill, for State of Montana.

Source for Underground Mine Workings (Areas known as East Camp, West Camp and Outer Camp): John Metesh, for Natural Resource Damage Assesment- Based on outermost extent of mineshafts.

Source for Butte Hill Alluvium: John Metesh.

N

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G I S

Summary of RPPC Criteria Evaluation for Butte Waterline Applicant: Butte-Silver Bow City County Government (B-SB)	
CRITERIA	The overall goal of this project is to replace 17,000 feet of inadequate water distribution lines in Butte. This is the fourth year in which Butte-Silver Bow has requested funding for waterline replacement. The total project cost is $1,755,890, with $1,197,971 requested in Restoration funds. The NRDP recommends funding year four of the Butte Waterline project for the requested $1,197,971 with only the normal funding conditions.
1. Technical Feasibility	Reasonably Feasible: The project will replace 17,000 feet of leaking waterlines that vary in diameter from 6 to 12 inches using standard engineering and construction practices. B-SB has successfully conducted similar work over the last decade in Butte.
2. Costs:Benefits	Net Benefits: This project replaces services lost due to injured groundwater resources. Benefits include improved fire protection; reduced treatment, repair, and property damage costs that result from reduced leakage; a reduced potential for the distribution system becoming contaminated through leaky and failing pipes; and water conservation.
3. Cost-Effectiveness	Likely Cost Effective: The selected alternative of replacing pipe and the proposed level of pipe replacement is cost effective due to the savings gained from replacing the pipes, B-SB's successful past work replacing waterlines, and the use of recent bids to estimated costs.
4. Adverse Environmental Impacts	No Significant Adverse Impacts: B-SB has adequately recognized and planned for potentially short-term adverse impacts that are typically associated with construction activities.
5. Human Health and Safety	No Significant Adverse Impacts: B-SB has planned for effective mitigation measures to alleviate short-term impacts to the human environment associated with construction activities. The project can have beneficial impacts to human health and safety by improving fire protection, reducing road hazards caused by leaking water and ice, and increasing the availability of water otherwise lost to leakage.
6. Results of Response Actions	Consistent: The project will not interfere or duplicate the results of any known EPA Superfund actions.
7. Natural Recovery Potential	No Effect on Recovery Period: This replacement project will not affect the groundwater recovery period.

Summary of RPPC Criteria Evaluation for Butte Waterline Applicant: Butte-Silver Bow City County Government (B-SB)	
8. Applicable Policies and Laws	Consistent/Sufficient Information Provided: The applicant identified and adequately planned for necessary permits.
9. Resources of Special Interest	No Impact: The project will not impact resources of special interest to the Tribes or DOI. The DOI supports the project.
10. Project Location	Within Basin and Proximate: The project overlies the injured Butte Hill groundwater resource.
11. Actual Restoration of Injured Resources	No Restoration: The project replaces services of injured groundwater resources that cannot be restored and thus constitutes compensatory restoration.
12. Service Loss/Restored & Service Restoration	Same: This proposal replaces lost services to thousands of property owners and other members of the public in Butte that could use the bedrock aquifer if it was not injured.
13. Public Support	5 Support Comments: Two letters of support from B-SB Council of Commissioners and Butte Chamber of Commerce and 3 comments in support at public hearing.
14. Matching Funds	32% Match: B-SB will contribute $513,417 for construction costs and $44,503 for in-kind labor, for a total match of $557,919.
15. Public Access	Not Applicable
16. Ecosystem Considerations	Positive: By conserving water and reducing power needs for pumping and treating water
17. Coordination & Integration	None
18. Normal Government Functions	Augments Normal Government Functions: Pervasive groundwater contamination underlying Butte has caused B-SB to seek outside funding for upgrading the water system.

Anaconda-Deer Lodge County
West Fourth Street Water Distribution Upgrade

Project Summary

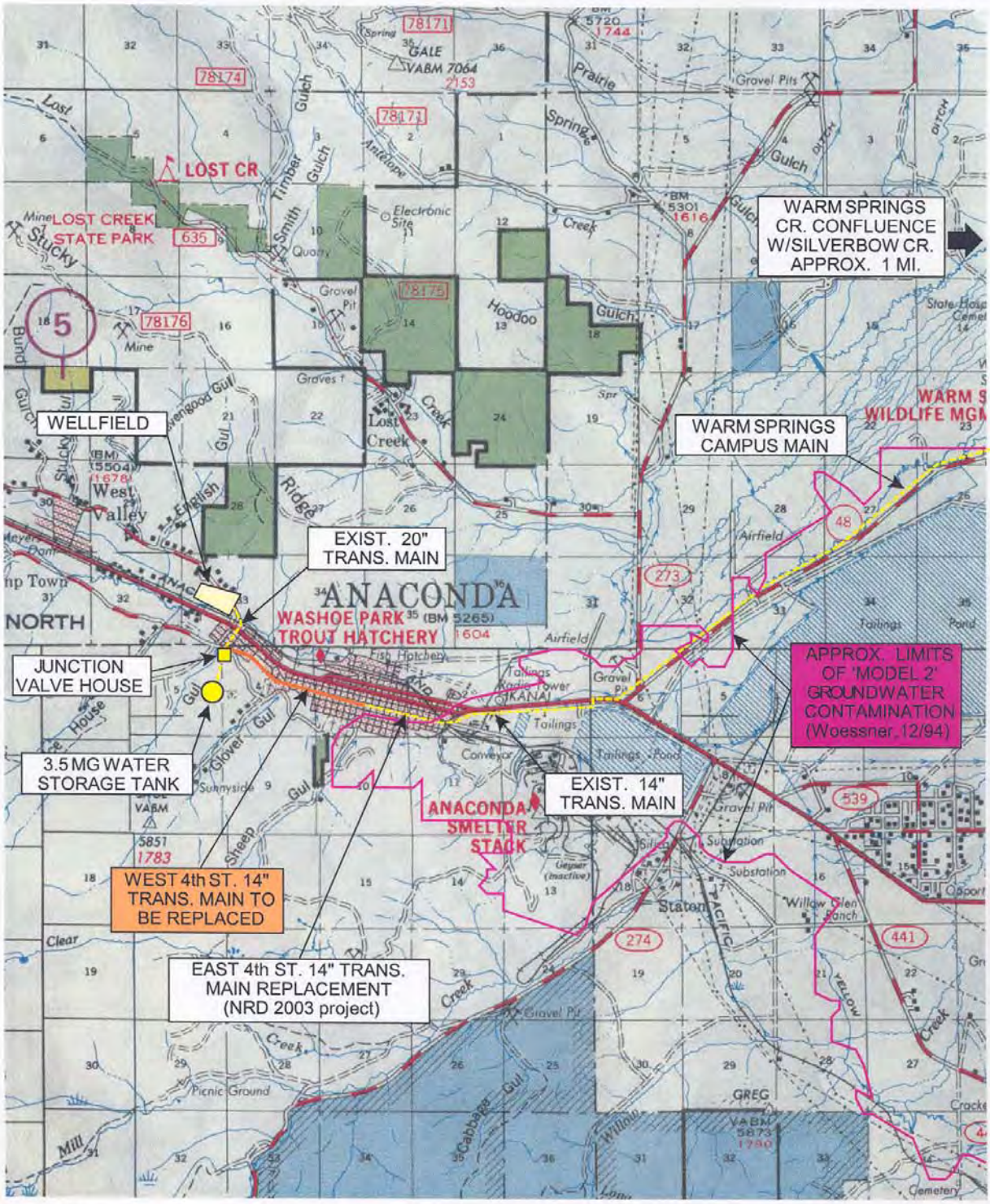
Anaconda-Deer Lodge City County (ADLC) is replacing a leaking, 104-year-old, 14-inch waterline along West Fourth Street. Approximately 1.6 million gallons of water per day leak through the City of Anaconda's water distribution system. Repairing these leaks is an alternative that will provide the City of Anaconda with additional water resources instead of developing a new source of water. The total project costs are $1,532,591, with $309,217 in matching funds and $1,223,374 requested in Restoration funds.

The City of Anaconda is located adjacent or partially within the 40 square miles of groundwater contamination associated with the Anaconda Regional Water, Waste, and Soils Operable Unit. Groundwater resources are somewhat limited because the upper portion of the alluvial groundwater aquifer east of Anaconda is contaminated with metals associated with past mining activities at levels above water quality standards. The 1995 State of Montana Anaconda Groundwater Injury Assessment Report supports this claim of groundwater contamination east of Anaconda. Also, the 1998 Anaconda Regional Water, Waste, and Soils Operable Unit Record of Decision indicate some 30 square miles of contaminated bedrock groundwater to the north and south of the City.

The West Fourth Street waterline project is considered a replacement project. This request is the third year of what ADLC has indicated will be a multi-year funding request to replace the waterline system. The Governor approved the 2002 Main Street and Bowman Field waterline replacement and installation projects for $749,942 and the 2003 East Fourth Street waterline replacement project for $995,000. The Draft Preliminary Engineering Report Municipal Water System[5] completed for ADLC indicates that, beyond the 43,175 feet of waterline already replaced, approximately 65,000 feet of waterline should be replaced over the next nine years at a cost of approximately $14 million to recover a significant portion of the water lost and effectively bolster the available capacity of the water system. ADLC indicates that, assuming a 25% local match, the anticipated future Restoration Fund request for waterline improvements through 2011 is about $11 million.

The 2002 and 2003 NRDP funded waterline replacements projects in Anaconda have reduced ADLC waterline losses. In 2002, ADLC estimated water loss from leaking waterlines to be 1.75 million gallons per day. Currently, the system is losing 1.6 million gallons of water per day, which could be further reduced by 100,000 gallons per day if this current project is implemented.

[5] Draft Preliminary Engineering Report Municipal Water System, prepared for ADLC, prepared by HKM Engineering, Butte, May 2004.



NORTH

ADLC West4thSt. WaterMain Improvements

FIGURE 1 – PROJECT LOCATION

Summary of RPPC Criteria Evaluation for Anaconda Waterline Applicant: Anaconda Deer Lodge County (ADLC)	
CRITERIA	The overall goal of this project is to replace 7,925 feet of leaking 104-year waterlines along West Fourth Street and save 100,000 gallons of water per day. The total project cost is $1,532,591, with $1,223,374 requested in Restoration funds. The NRDP recommends this project be funded for the requested $1,223,374 with only the normal funding conditions.
1. Technical Feasibility	Reasonably Feasible: The project will replace 7,925 feet of waterlines, most of which are 14" in diameter, using standard engineering practices, conforming to Montana Public Works Standards and DEQ requirements. ADLC proposes the same level of effort and approached used to complete past waterline projects. ADLC has completed over 43,175 feet of waterline replacement projects since 1994.
2. Costs:Benefits	Net Benefit: ADLC estimates replacement of the West Fourth Street waterline will save approximately 100,000 days of water loss per day. The project offers substantial benefits to the Anaconda public by reducing water treatment, property damage and repair costs associated with leaks, reducing the need to seek additional water supplies, offering greater fire protection, and conserving water. The project constitutes compensatory restoration for extensive injuries to the aquifers surrounding Anaconda.
3. Cost-Effectiveness	Cost Effective: The costs are considered reasonable as they are based on bids from the 2002 and 2003 waterline projects, preliminary draft design plans for the West Fourth Street waterline project, and ADLC's consulting engineer's knowledge and experience. The alternatives analyses demonstrated the selected approach was cost-effective.
4. Adverse Environmental Impacts	No Significant Adverse Impacts: Replacing Anaconda's West Fourth Street waterline presents no significant adverse impacts to the environment. Water conservation is an environmental benefit that will likely result.
5. Human Health and Safety	No Significant Adverse Impacts: Potentially adverse impacts during construction activities include dust, noise, temporary loss of water service, restricted access to commercial facilities, worker safety, and disruption of traffic flow. The ADLC has proposed mitigation measures to alleviate these adverse impacts.
6. Results of Response Actions	Consistent: The project will not interfere or duplicate the results of any known EPA Superfund actions.

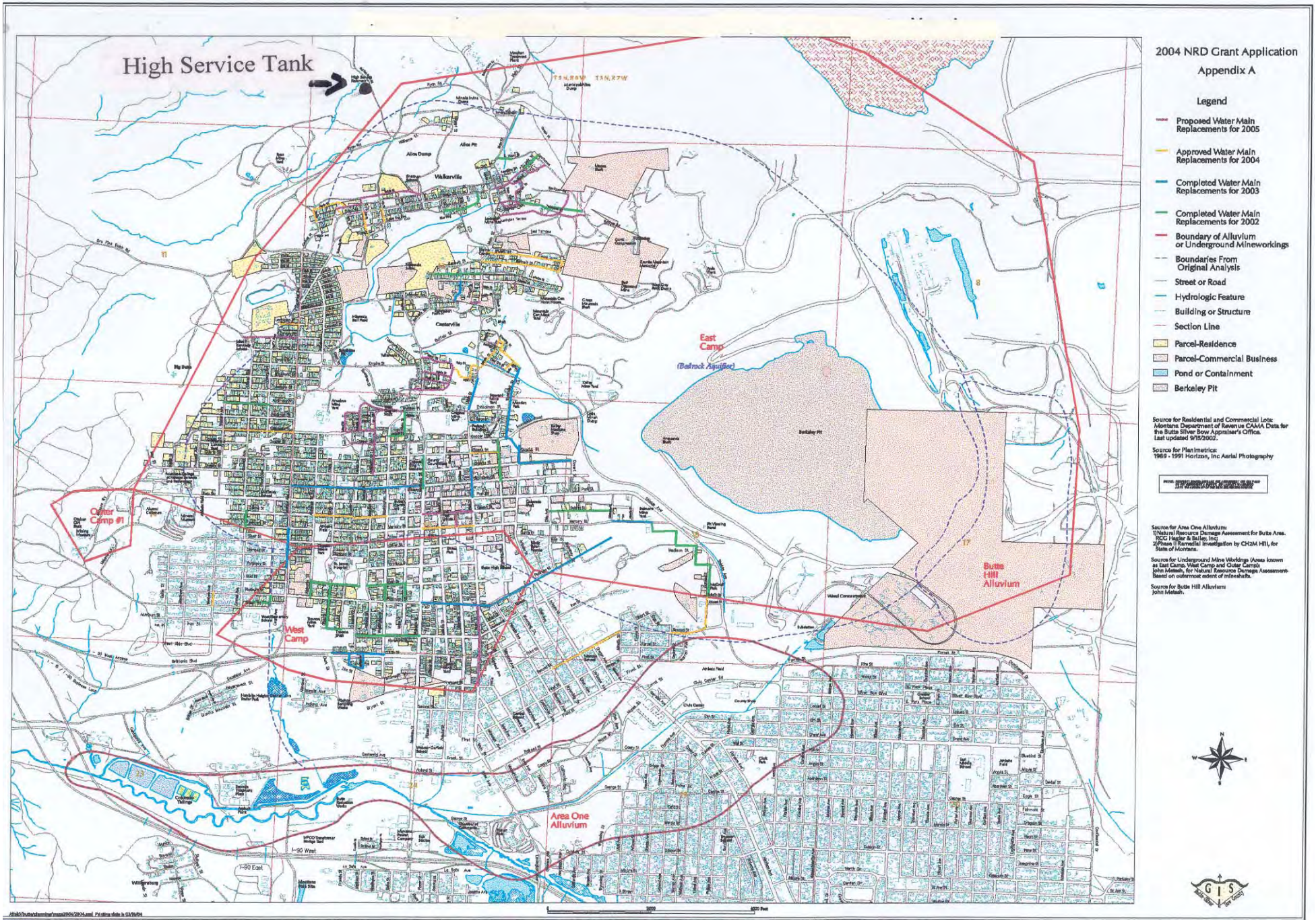
Summary of RPPC Criteria Evaluation for Anaconda Waterline Applicant: Anaconda Deer Lodge County (ADLC)	
7. Natural Recovery Potential	No Effect on the Recovery Period: This replacement project will not affect the groundwater recovery period.
8. Applicable Policies and Laws	Consistent/Sufficient Information Provided: ADLC indicates they will submit the required drawings to DEQ for review, coordinate with DEQ if contaminants are encountered, and follow Montana Public Works Specifications.
9. Resources of Special Interest	No Impact: It is not anticipated this project will have adverse impacts on resources related to the Tribes or DOI. The DOI supports this project.
10. Project Location	Within Basin and Proximate: The project will occur in Anaconda within and adjacent to injured groundwater resource areas.
11. Actual Restoration of Injured Resources	No Restoration: This project constitutes replacement of lost services because it replaces drinking water lost in the area as a result of contamination where cleanup is infeasible.
12. Service Loss/Restored & Service Restoration	Same/Similar: This project replaces services lost; injured groundwater resources somewhat limit ADLC's potential sources for water development, thus making conservation of existing sources of an effective means of enhancing its water resources.
13. Public Support	6 Support Comments: Four letters of support from the ADLC Council of Commissioners, Anaconda Chamber of Commerce, Anaconda Local Development Corporation, and Anaconda Public Schools and 2 comments of support at public hearing.
14. Matching Funds	20% Match: ADLC proposes matching funds of $250,000 in cash and $59,247 of in-kind services for a total match of $309,247.
15. Public Access	Not Applicable
16. Ecosystem Considerations	Positive Impacts: An estimated 100,000 gallons of water per day will be conserved, reducing water treatment and energy requirements for pumping and treating. Overall, only 6% of the water losses are being addressed with this request.
17. Coordination & Integration	Integrates: This waterline project connects to the waterline project funded in 2003 and connects the well field with the city, a critical waterline section.
18. Normal Government Functions	Augments Normal Government Functions: This project augments normal government function because communities typically rely on a combination of grant funds and user fees to fund such projects and because of the extensive injuries to Anaconda area groundwater resources.

Butte-Silver Bow Local Government
High Service Tank Replacement

Project Summary

Butte-Silver Bow City County (B-SB) proposes to replace the 2.5-million-gallon High Service water tank for a cost of $1,535,812 with $1,192,802 requested in Restoration funds. The original tank, which was constructed in 1956, is located on the northwest end of Butte and serves the north side of the community in a 400-acre area. The purpose of the tank is to maintain pressure in the distribution system and provide treated water storage for both domestic and fire flow demands. It receives water from the Moulton reservoir and the West Side Pumping Station. The High Service Tank is in poor condition with large cracks in the walls and in the columns that support the roof.

Butte's bedrock aquifer is so severely injured that natural recovery will not occur for thousands of years, as concluded by the State's 1995 Restoration Determination Plan and by EPA's 1994 Record of Decision. Restoration of the bedrock aquifer is infeasible, thus the aquifer's drinking water storage capacity and transport services have been lost for thousands of years. By replacing a water supply tank that is in poor condition, this project will enhance an uncontaminated drinking water supply for Butte water users. It therefore constitutes replacement of lost services to some of the thousands of property owners and to other members to other members of the public in Butte that could use the aquifer if it was not injured.


High Service Tank
Outer Camp #1
West Camp
East Camp
(Bedrock Aquifer)
Butte Hill Alluvium
Area One Alluvium
Walkerville
Centerville
Berkeley Pit
I-90 East
I-90 West
2004 NRD Grant Application
Appendix A
Legend
Proposed Water Main Replacements for 2005
Approved Water Main Replacements for 2004
Completed Water Main Replacements for 2003
Completed Water Main Replacements for 2002
Boundary of Alluvium or Underground Mineworkings
Boundaries From Original Analysis
Street or Road
Hydrologic Feature
Building or Structure
Section Line
Parcel-Residence
Parcel-Commercial Business
Pond or Containment
Berkeley Pit
Source for Residential and Commercial Lots: Montana Department of Revenue CAMA Data for the Butte Silver Bow Appraiser's Office. Last updated 9/15/2002.
Source for Planimetrics: 1989 - 1991 Horizon, Inc Aerial Photography
Source for Area One Alluvium: 1)Natural Resource Damage Assesment for Butte Area. RCG Hagler & Bailey, Inc; 2)Phase II Remedial Investigation by CH2M Hill, for State of Montana.
Source for Underground Mine Workings (Areas known as East Camp, West Camp and Outer Camp): John Metesh, for Natural Resource Damage Assesment. Based on outermost extent of mineshafts.
Source for Butte Hill Alluvium: John Metesh.
N
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E
S
G I S

Summary of RPPC Criteria Evaluation for High Service Tank Replacement Applicant: Butte-Silver Bow City-County Government (B-SB)	
CRITERIA	The overall goal of this project is to replace the 2.5 million gallon High Service water tank. The present tank is in poor condition with large cracks in the walls and in the columns that support the roof. The total project cost is $1,535,812, with $1,192,802 requested in Restoration funds. The NRDP recommends this project be funded for the requested $1,192,802 with only the normal funding conditions.
1. Technical Feasibility	Reasonably Feasible: The objectives and tasks discussed in the application are technically feasible and the selected approach is likely to achieve the stated objectives.
2. Costs:Benefits	Net Benefits: This project will help replace services lost due to injured groundwater resources. Structural failure of the High Service tank would eliminate fire protection and domestic water service to a significant portion of the north side of Butte and cause pressure loss in the distribution system. A new water storage tank will allow for a safe reliable source of water to the system users, providing substantial benefits to a large public.
3. Cost-Effectiveness	Likely Cost Effective: The NRDP believes that replacing the High Service tank with another 2.5 million gallon tank is likely cost effective given the age of the tank; however, it would have been helpful in evaluating this project if a water system master plan had been completed. Butte-Silver Bow (B-SB) has applied for funding from DNRC for developing a master plan and agreed to not seek additional Restoration funds should a larger tank be needed in the future.
4. Adverse Environmental Impacts	No Significant Adverse Impacts: B-SB has adequately recognized and planned for potentially short-term adverse impacts that are typically associated with construction activities.
5. Human Health and Safety	No Significant Adverse Impacts: The proposed tank replacement will enhance human health and safety by providing clean water for domestic demands, by providing storage for fire protection, and by removing the threat to the public health and welfare that the existing tank poses because of its poor condition.
6. Results of Response Actions	Consistent: The project will not interfere or duplicate the results of any known EPA Superfund actions.
7. Natural Recovery Potential	No Effect on Recovery Period: This replacement project will not affect the groundwater recovery period.
8. Applicable Policies and Laws	Consistent/Sufficient Information Provided: The applicant identified and adequately planned for necessary permits.

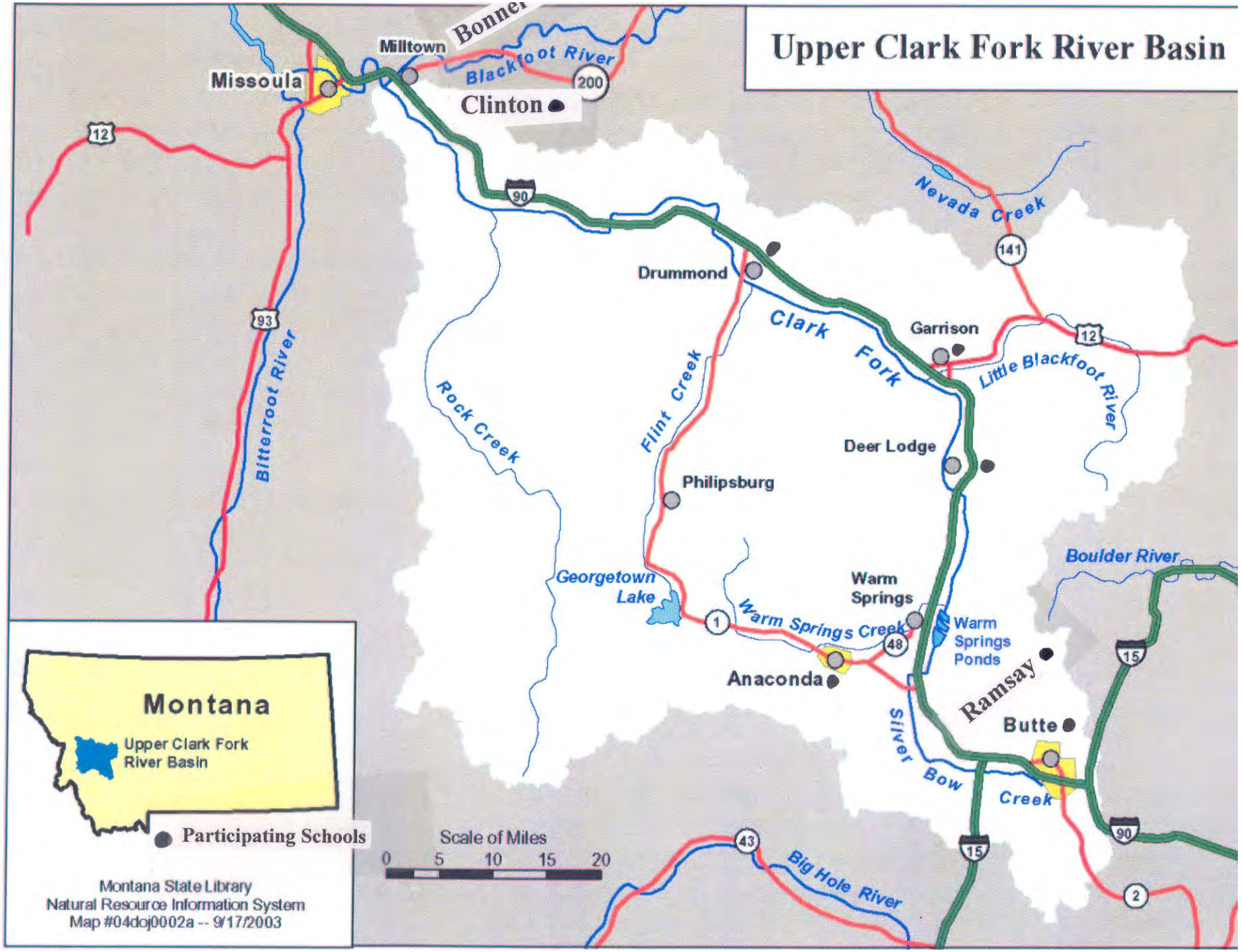
Summary of RPPC Criteria Evaluation for High Service Tank Replacement Applicant: Butte-Silver Bow City-County Government (B-SB)	
9. Resources of Special Interest	No Impact: The project will not impact resources of special interest to the Tribes or DOI. The DOI supports the project.
10. Project Location	Within UCFRB and Proximate: The High Service Tank is located in Walkerville, north of the City of Butte at the edge of the Bedrock Groundwater injured area.
11. Actual Restoration of Injured Resources	No Restoration: The project replaces services of injured groundwater resources that cannot be restored and constitutes compensatory restoration.
12. Service Loss/Restored & Service Restoration	Same: The proposal replaces lost services to property owners and other members of the public in Butte who could utilize the aquifer if it was not injured.
13. Public Support	5 Support Comments: Two letters of support from B-SB Council of Commissioners and Butte Chamber of Commerce and three comments in support at the public hearing.
14. Matching Funds	22% Match: B-SB will contribute $298,200 for construction costs and $44,810 for in-kind labor, for a total match of $342,010.
15. Public Access	Not Applicable
16. Ecosystem Considerations	Positive: The project removes the threat of tank failure, which could have severe negative consequences locally and also to the larger ecosystem.
17. Coordination & Integration	None
18. Normal Government Functions	Augments Normal Government Functions: Pervasive groundwater contamination underlying Butte has caused B-SB to seek outside funding for upgrading the water system.

Montana Tech
Clark Fork Watershed Education Program

Project Summary

The Department of Technical Outreach at Montana Tech (MT Tech), in partnership with three other entities, requests $673,801 to implement a Clark Fork Watershed Education Program for primary and secondary level school children and teachers in the UCFRB extending from Butte to Bonner over a three-year period. The program expands on a pilot watershed education effort funded in 2003 for $25,000 offered to four 6th grade classrooms and high school students in Butte. The program will provide three tracks of watershed education: Track 1 for 6th – 8th grade students, Track 2 for high school students and Track 3 for teachers. Each phase of the program includes student and teacher training in the classroom and field. These students will use Silver Bow Creek and the Clark Fork River as large-scale outdoor laboratories to apply age-appropriate math and science principles to examine and compare the water quality and biota in uninjured, injured and restored reaches. The long-term goal of this project is to create a sustainable field science program, focused on baseline, injured and restored reaches in the UCFRB, which is widely available to school age children.

The budget originally submitted for this proposal was for $832,984 in Restoration funds to be spent over three years. After discussions between the NRDP and MT Tech, MT Tech submitted a revised and reduced budget for $673,801 in Restoration funds and $840,465 for total project costs. This evaluation is based on the revised budget.


Upper Clark Fork River Basin
Missoula
Milltown
Bonner
Blackfoot River
200
Clinton
12
90
93
Bitterroot River
Nevada Creek
141
Drummond
Clark Fork
Garrison
12
Little Blackfoot River
Rock Creek
Flint Creek
Deer Lodge
Philipsburg
Boulder River
Georgetown Lake
Warm Springs
Warm Springs Creek
1
48
Warm Springs Ponds
Anaconda
Ramsay
15
Butte
Silver Bow Creek
90
43
Big Hole River
15
2
Montana
Upper Clark Fork River Basin
Participating Schools
Scale of Miles
0 5 10 15 20
Montana State Library
Natural Resource Information System
Map #04doj0002a -- 9/17/2003

Summary of RPPC Criteria Evaluation for the Clark Fork Watershed Education Program Applicant: Technical Outreach at Montana Tech (MT Tech), in partnership with 3 other entities	
CRITERIA	The overall goal of this project is to implement a Clark Fork Watershed Education Program (CFWEP) for primary and secondary level school children and teachers in UCFRB schools from Butte to Bonner. Each phase of the program includes student and teacher training in the classroom and the field. The total project costs over three years is $840,465, with $673,801 requested in Restoration funds. The NRDP recommends this project be funded for the requested $673,801 subject to the following extra conditions: 1) that pursuant to the Trustee's Multi-year Funding Policy for Category 1 projects, an evaluation system be established to annually review milestones achieved by the program and measure success and reevaluate funding for the subsequent years, including the option of discontinuing funding; 2) that all activities undertaken would pertain to the natural resources or services that were subject of Montana v. ARCO or the partial settlement of that lawsuit; 3) that stipends will only be provided to teachers who complete training and fully participate in the program; and 4) that honoraria for technical experts be awarded only to those that meet an agreed-upon list of criteria and are subject to approval by the NRDP.
1. Technical Feasibility	Reasonably Feasible for Short Term; Uncertain Feasibility for Long-term: The CFWEP's management approach and skills make it likely to succeed in terms of its ability to effectively educate a large number of UCFRB school children about general watershed concepts and restoration in the UCFRB. Uncertainty exists about the ability to fund such an ambitious program in the long-term without continued substantial support by NRDP.
2. Costs:Benefits	Net Benefits: The CFWEP offers net benefits. The project lays the foundation for creating a sustainable field science program that uses the entire Upper Clark Fork Basin as a "living classroom" which is widely available to school age children. Over three years, the program will serve an estimated 1,600 elementary students, 780 high school students, and 90 teachers from Butte to Bonner. Costs translate to about $272 per student or teacher over a 3-year period.
3. Cost-Effectiveness	Likely Cost Effective: The revised budget of $673,801, which resulted from the cuts and some additional match by MT Tech from the originally submitted budget, is considered as likely to be cost-effective based on the program's centralized program approach and other favorable aspects of the project's approach.
4. Adverse Environmental Impacts	No Significant Adverse Impacts: The applicant has made a commitment to minimize impacts to vegetation that could occur with repeated group visits to sampling sites.
5. Human Health and Safety	No Adverse Impacts: Procedures will be implemented to prevent exposure to unacceptable levels of contamination and proper liability insurance will be required of all school districts.
6. Results of Response Actions	Positive Coordination: The timing of this project fits well with the schedule for Silver Bow Creek and the Clark Fork River restoration and remediation efforts.
7. Natural Recovery Potential	No Effect on Recovery Period
8. Applicable Policies and Laws	Consistent: The lesson plans developed for this program will conform to Montana Standards for science, writing and social studies. The workshops will qualify as continuing education credits for teachers.
9. Resources of Special Interest	No Impact: This project will not directly impact resources of special interest to the Tribes or DOI. While DOI indicates its general support of public education efforts, they reserve judgment pending further clarification regarding the project's monitoring activities and the connection to restoration benefits.

Summary of RPPC Criteria Evaluation for the Clark Fork Watershed Education Program Applicant: Technical Outreach at Montana Tech (MT Tech), in partnership with 3 other entities	
10. Project Location	Within the Basin and Proximate: All activities associated with this project will occur within the UCFRB and pertain to natural resources and services that were subject of Montana v. ARCO.
11. Actual Restoration of Injured Resources	May Contribute to Restoration: This project will indirectly benefit restoration of injured resources by promoting stewardship of those resources through education.
12. Service Loss/Restored & Service Restoration	Similar: The partial settlement in Montana v. ARCO resolved claims for the services that unimpaired resources provide the public simply by virtue of their existence. This grant focuses on the restoration of lost services through public education about the injured or lost natural resources and by enhancing stewardship of restored resources.
13. Public Support	3 Project Partners; 38 Support Comments: This project had nine letters of public support from the following entities: University of Montana's Center of Riverine Science and Stream Renaturalization, the Montana Watercourse, the George Grant Chapter of Trout Unlimited, Montana Mind Expansion, Montana Tech Regional Science Fair, Butte School District No. 1, Anaconda School District, and Drummond Schools. During the public comment period, an additional 29 comments were submitted in support of the project—12 letters of support and 17 public hearing comments.
14. Matching Funds	19% Match: $92,803 will be provided in cash match and $73,681 will be provided as in-kind match for a total match of $166,664.
15. Public Access	Not Relevant
16. Ecosystem Considerations	Positive: This project will further the knowledge of school children about ecosystems concepts and stewardship of natural resources.
17. Coordination & Integration	Coordinates/Integrates: This project will integrate educational materials that focus on resource conditions in the UCFRB. The monitoring aspect of the project will coordinate with the State's comprehensive monitoring effort currently underway on Silver Bow Creek and to occur on the Clark Fork River. The goals of this project are consistent with the educational goals of the UCFRB Remediation and Restoration Education and Advisory Council and the Silver Bow Creek Greenway project.
18. Normal Government Functions	Augments Normal Government Functions: Teaching science is a normal part of public schools; however, this program will enhance existing curricula and provide a depth of science education and access that is beyond the ability of most public schools. The specific curriculum and proposed field activities with this focus would not be undertaken basin-wide without this funding.
MONITORING AND RESEARCH CRITERIA	
21. Overall Scientific Program	Coordinates: The program will coordinate its monitoring and database efforts with the State's monitoring and database efforts in the UCFRB.
22. Assistance with Restoration Planning	Minor Benefit: This program may provide a minor benefits in terms of providing long-term screening level data through the students' documentation of the restoration and recovery of injured resources that can augment the State's monitoring efforts.

Watershed Restoration Coalition of the Upper Clark Fork
Browns Gulch Watershed Project, Phase I

Project Summary

The Watershed Restoration Coalition of the Upper Clark Fork (WRC), in association with the Mile High Conservation District (MHCD), proposes a Project Development Grant to assess the physical, chemical, and biological conditions of the Browns Gulch watershed and determine how best to improve surface water quality, aquatic resources, terrestrial resources, and recreation opportunities in Browns Gulch. The total project costs are $293,888, with $197,378 requested in Restoration funds and $96,510 to be provided in matching funds.

The Browns Gulch watershed is a tributary of Silver Bow Creek, originating near the continental divide north of Butte. The watershed is about 55,000 acres consisting of approximately one-half private lands dominated by agricultural properties and rural homes and one-half national forestlands. The watershed has eight fish-bearing streams and the main stem of Browns Gulch provides recreation opportunities and supports a wide variety of wildlife. The current conditions of the natural resources within the watershed range from excellent to very poor, depending on the natural resource and its location.

This Phase I project, which would occur over two years, will produce an implementation guideline plan for improving natural resources in the watershed by focusing on seven resource areas: stream flows, invasive plant species, wildlife management, fishery management, forest health, riparian zone/water quality, and conservation easements. The WRC will use results of the Phase I assessment process to seek future funding from the Restoration Fund and other sources to implement recommended natural resource improvements.

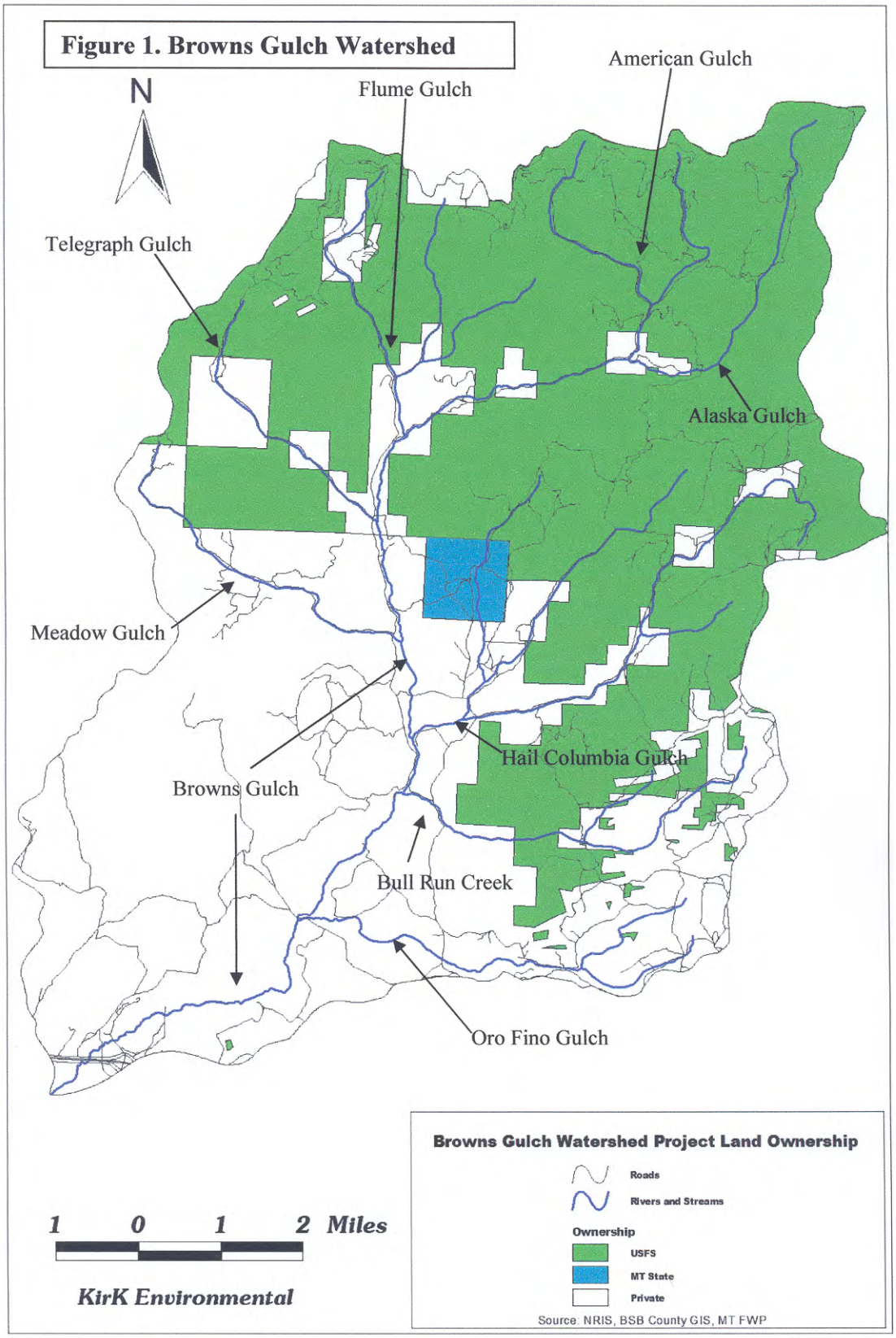


Figure 1. Browns Gulch Watershed
N
American Gulch
Flume Gulch
Telegraph Gulch
Alaska Gulch
Meadow Gulch
Hail Columbia Gulch
Browns Gulch
Bull Run Creek
Oro Fino Gulch
1 0 1 2 Miles
KirK Environmental
Browns Gulch Watershed Project Land Ownership
Roads
Rivers and Streams
Ownership
USFS
MT State
Private
Source: NRIS, BSB County GIS, MT FWP

Summary of RPPC Criteria Evaluation for Browns Gulch Watershed Project, Phase I Applicant: Watershed Restoration Coalition of the Upper Clark Fork River (WRC), In association with the Mile High Conservation District (MHCD)	
CRITERIA	The overall goal of this project is to identify current physical, chemical, and biological conditions of seven resource areas, establish baseline conditions, and prioritize habitat, water quality, and stream flow restoration needs in the Browns Gulch watershed. This assessment work would occur over two years and result in an implementation guideline plan for improving water, fish and wildlife resources. The total project cost is $293,888, with $197,378 requested in Restoration funds. The NRDP recommends partial funding for $143,404 over two years with only the normal funding conditions.
1. Technical Feasibility – Task Specific	Task 1: Stream Flow/ Water Balance Assessments – Reasonably Feasible: The tasks that involve assessing stream flow, irrigation efficiency, and groundwater and the production of a water budget are needed and likely to achieve their objectives. Task 1: Water Storage and Routing Analyses – Not Feasible: The NRDP questions the usefulness of the proposed water storage and routing studies budgeted for $35,800. Based on three studies already completed, developing water storage sites is cost-prohibitive. Also, a high level of uncertainty exists concerning the evaluation of these analyses due the lack of information provided in the application. Tasks 2-7: Reasonably Feasible: These tasks involve assessing water quality, riparian health, fishery populations and habitat, and wildlife populations, mapping weeds, and conducting outreach on forest health and conservation easements. The work and methods proposed by the applicant to complete these watershed assessment and outreach tasks are reasonably feasible.
2. Costs:Benefits	Net Benefit with proposed NRDP reductions: The NRDP judges net benefits would be derived from reduced funding of $143,404 for assessing stream flow, water quality, riparian habitat, and aquatic habitat, developing a water budget, surveying elk and fish populations, inventorying weeds in riparian areas, and developing an implementation guideline plan for restoration in Browns Gulch. This information will be useful for improvements to the natural resources of the watershed. Subsequent funding and implementation of these improvements could result in improved water quality, stream flow, and fisheries in both Browns Gulch and Silver Bow Creek, and in improved wildlife resources and recreational opportunities in Browns Gulch. The NRDP deemed the cost:benefit relationship to be unfavorable for the water storage and routing analysis and the outreach efforts on forest health and conservation easements for reasons explained under the technical feasibility or cost effectiveness criteria.

Summary of RPPC Criteria Evaluation for Browns Gulch Watershed Project, Phase I Applicant: Watershed Restoration Coalition of the Upper Clark Fork River (WRC), In association with the Mile High Conservation District (MHCD)	
3. Cost-Effectiveness – Task Specific	Cost Effective with NRDP revisions: The total recommended funding for this project is $143,404, with $53,974 in funding reductions. The application outlines cost-effective methods for completing the proposed assessments that the NRDP recommends for funding (i.e. assessments of stream flow, water balance, weeds, riparian health, water quality, aquatic resources, and elk resources). Of these assessments, the NRDP recommends a more cost-effective alternative for the elk management task that is $1,300 less than the proposed $4,900. The NRDP believes the proposed water storage and water routing analyses for $35,800 are not cost-effective due to unfavorable results for water storage indicated in previous analyses and due to the lack of information in the application on, and the existence of better alternatives to, the proposed water routing. The NRDP believes that the desired outreach of forest health can be accomplished via available other funding sources and that the proposed outreach on conservation easements is premature and involves producing educational materials that are not needed. Thus these outreach efforts are not judged cost-effective and not recommended for funding.
4. Adverse Environmental Impacts	No Significant Adverse Impacts: Assessing the current watershed condition of the Browns Gulch watershed presents no significant adverse environmental impacts.
5. Human Health and Safety	No Significant Adverse Impacts: Assessing the current watershed condition of the Browns Gulch watershed presents no significant adverse impacts to human health and safety.
6. Results of Response Actions	Consistent: Restoration guidelines resulting from this assessment will be able to coordinate with proposed remedial work at the confluence of Silver Bow Creek and Browns Gulch. This project's assessment activities may augment the Silver Bow Creek response actions with the implementation of water quality, quantity, and riparian habitat improvements in upstream reaches to be planned via this project.
7. Natural Recovery Potential	No Effect on the Recovery Period: While this assessment project will not affect any natural resource recovery periods, future improvements planned via this project could improve the recovery time of the downgradient injured aquatic resources of Silver Bow Creek.
8. Applicable Policies and Laws	Consistent/Sufficient Information Provided
9. Resources of Special Interest	No Impact: It is not anticipated this project will have adverse impacts on resources related to the Tribes or DOI. DOI recommended funding the stream flow/water balance/water storage, fishery, and riparian health and water quality tasks but not the elk management, weed mapping, forest health or conservation easement tasks.
10. Project Location	Within Basin and Proximate: Browns Gulch is within the UCFRB and a major tributary to the injured Silver Bow Creek, located north of Ramsey.
11. Actual Restoration of Injured Resources	May Contribute to Restoration: This assessment project will not restore injured resources. The implementation of recommended restoration projects that will result from this project could help restore the injured aquatic resources of Silver Bow Creek.

Summary of RPPC Criteria Evaluation for Browns Gulch Watershed Project, Phase I Applicant: Watershed Restoration Coalition of the Upper Clark Fork River (WRC), In association with the Mile High Conservation District (MHCD)	
12. Service Loss/Restored & Service Restoration	Same/Similar: This project generally assesses natural resources and services that are substantially similar to those covered under Montana v. ARCO.
13. Public Support	8 Support Comments: Three letters of support from resource agencies working in the watershed and four letters from landowners and one public hearing comment in support.
14. Matching Funds	37% Match: With the NRDP's revised budget, the proposed match would be $20,000 as a cash match ($7000 of which is still pending) and $64,510 as in-kind service matches. As originally proposed, the percentage match would be 32%, with $20,000 ($7000 pending) as a cash match and $76,510 ($16,000 pending) as in-kind services.
15. Public Access	To Be Assessed: The elk management task could lead to increased public access to private land.
16. Ecosystem Considerations	Positive Impacts: This assessment is planned at a watershed scale and addresses multiple natural resources. The restoration guideline document will identify and prioritize improvements to multiple natural resources in the Browns Gulch watershed, some of which could also improve aquatic resources in Silver Bow Creek.
17. Coordination & Integration	Coordinates/Integrates: The applicant offered the opportunity for land managers and resource agencies to participate in planning this assessment project and has recruited many of them to assist with conducting it. The proposed assessment will coordinate with other assessment work.
18. Normal Government Functions – Task Specific	Outside Normal Government Function: Task 1 (Stream Flow), Task 2 (Weed Mapping), Task 6 (Riparian Assessment), and Task 7 (Conservation Easements): While various governmental entities may manage some of these resources, the tasks proposed are outside their normal function. Augments Normal Government Functions: Task 3 (Forest Health), Task 4 (Elk Management), and Task 5 (Fishery Assessment): These tasks would augment the efforts of governmental entities that manage forests, wildlife and fish. Funding would be for activities that supplement, not supplant, existing program efforts and funding.
MONITORING AND RESEARCH CRITERIA	
21. Overall Scientific Program	Coordinates: The assessment activities proposed in this application coordinate well with other UCFRB scientific work. The inventory and monitoring tasks recommended for funding will provide needed baseline data to resource managers about the current condition of the natural resources within Browns Gulch and the connection between the aquatic resources of Browns Gulch and Silver Bow Creek.
22. Assistance with Restoration Planning	Major Benefit: The watershed information to be collected will assist in planning improvements to natural resource conditions in Browns Gulch and also to the aquatic resources of Silver Bow Creek.

4.0 PROJECT RANKING and FUNDING RECOMMENDATIONS

This section provides the Trustee Restoration Council's (TRC) final funding recommendations and specific funding conditions. The TRC recommends five projects for full funding as requested and one project for partial funding. The TRC's final funding recommendations are the same as those recommended by the NRDP and by the UCFRB Advisory Council.

This section also provides NRDP's overall ranking of the projects and the NRDP's basis for these rankings. The project ranking is based on the detailed criteria narratives contained in Appendix A and the project criteria comparisons contained in Appendix B. The *RPPC* does not rank criteria in terms of importance, noting that "each criterion as applied to individual projects will vary in its importance depending on the nature of the project and unique issues it raises." A project does not need to meet all of Stage 1 and Stage 2 criteria in order to be considered worth funding. A project may rank poorly compared to others for a particular criterion, but that criterion may be inapplicable or relatively unimportant for that type of project. Or, the merits of a project based on some number of criteria may significantly outweigh its deficiencies noted for a particular criterion or multiple criteria. The adequacy and quality of an application affects the NRDP's judgment of how well a project meets certain *RPPC* criteria and, consequently, affects the project's overall ranking as well.

Based on the NRDP's assessment of how the projects compared for the Stage 1 and 2 *RPPC* criteria, which focus on the project's anticipated benefits to the restoration or replacement of injured resources and or/lost services, the NRDP ranks the six projects in the following order of preference. In determining its draft funding recommendations, the TRC did not rank the projects.

Table 2. Project Ranking

Rank	Project
1	Bridger Plant Materials Center
2	Butte Waterline
3	Anaconda Waterline
4	High Service Tank
5	Clark Fork Watershed Education Program
6	Browns Gulch Watershed Project

The following discussion also identifies project-specific funding conditions. Two funding conditions apply to all projects. First, as required by the *RPPC*, funding should be contingent on the NRDP's approval of the final design for various components of the projects. Second, the proportionate share of matching funds recognized by the NRDP in the project-specific criteria narrative will apply to project implementation and adequate documentation of both in-kind and cash matches will be required.

1) Bridger Plant Materials Center

The TRC recommends the Bridger Plant Materials Center (BPMC) be funded at the requested amount of $253,926 over four years, with no additional funding conditions.

The BPMC project is a research and development project that can significantly contribute to the restoration of injured natural resources and services by providing the foundation seeds that can be used for numerous revegetation efforts in the UCFRB, particularly those in upland areas. The product of this project can be used to directly restore injured wildlife habitat by providing superior seed for trees, shrubs, forbs, and grasses. By doing so, it also helps restore the same services that these injured resources once provided. This project can also benefit natural resources and services in other areas of Northern Rockies that have degraded vegetation. Discontinuing this project now during its last phase of research and development would jeopardize the value of previous funding efforts over the past nine years and significantly increase the timeframe and expense of needed revegetation efforts in the UCFRB. Given the critical need for this seed product to successfully and cost-effectively revegetate injured areas in the UCFRB, the NRDP judges this project to be one of high net benefits. The project is cost effective, positively coordinates with remedial actions, has in-kind matching funds of 22%, and has four support comments.

The NRDP ranked the BPMC project highest of all the six projects because this project can contribute the greatest to the restoration of injured areas in the UCFRB at the lowest costs. The BPMC project does better than the other projects for the multiple criteria that give preference to actual restoration of injured resources. Although it does not directly restore injured areas, it produces a seed project that is critically needed for successful revegetation of injured areas in the UCFRB.

2) Butte Drinking Water Infrastructure Replacement – Year 4

The TRC recommends the Butte Waterline project be funded at the requested amount of $1,197,971, with no additional funding recommendations.

Restoration of Butte's bedrock aquifer that is contaminated throughout a six-mile area of the city is infeasible. By fixing leaking and corroded water lines, this proposal will enhance the water supply from an uncontaminated source. It will reduce treatment, repair and property damage costs associated with leaks, improve fire protection, conserve water, and reduce the potential for the distribution system becoming contaminated through leaky and failing pipes. The project is considered of net benefit because it compensates a large public for some of the lost use of groundwater that Butte has suffered due to the inability to use groundwater in much of the city. The project is cost-effective and highly feasible due to the successful water main replacement that has been ongoing in Butte since 1992. It has matching funds of 32%, the highest cash match of all six projects, and five support comments.

3) Anaconda Waterline

The TRC recommends the Anaconda Waterline project be funded at the requested amount of $1,223,374, with no additional funding conditions.

The Anaconda Waterline is considered to have net benefits to the City of Anaconda and its residents. By fixing leaking and corroded water lines, this proposal will enhance the water supply from an uncontaminated source. The West Fourth Street project is expected to reduce water loss from the entire system by approximately 6% (100,000 gallons/day). Fixing the leaks will reduce water treatment, property damage and repair costs associated with leaks, reduce the need to seek additional water supplies, offer greater fire protection, and offer the opportunity to conserve more water during drought conditions. The Anaconda Waterline project is cost-effective and reasonably feasible, since ADLC has successfully performed similar work in the past. The project has matching funds of 20% and six support comments.

The Butte Waterline and Anaconda Waterline projects are very comparable for many of the *RPPC* criteria since they involve the same activities and constitute replacement of lost services. Both counties have successfully completed waterline projects for a number of years, with B-SB's having performed more replacement and invested proportionately more into system improvements than Anaconda. ADLC provided a more detailed analysis of alternatives that better demonstrated the cost-effectiveness of its project than the analysis provided by B-SB. The NRDP ranked the Butte Waterline project higher than the Anaconda Waterline project because of B-SB's greater local contribution than ADLC based on matching funds (32% B-SB vs. 20% ADLC) and B-SB's higher user fees and proportion of metered users.

4) High Service Tank Replacement

The TRC recommends the High Service Tank Replacement project for funding at the requested amount of $1,192,802, with no additional funding conditions.

This project will replace an antiquated and failing water tank, which will allow for fire protection and a safe reliable source of water to the system users, providing substantial benefits to a large public. Failure of the High Service Tank would eliminate fire protection and domestic water service to a significant portion of the north side of Butte. Without the tank, it would be difficult to maintain pressure in the distribution system. Contamination could be drawn into the distribution system as a result of low or negative system pressures and lack of fire protection could result in property damage or loss of life. The project offers net benefits, is reasonably feasible and likely to be cost-effective. It has matching funds of 22% and five support comments.

Restoration of the bedrock aquifer beneath the City of Butte is infeasible, thus the City's drinking water storage capacity and transport services associated with this aquifer have been lost for thousands of years. This proposal enhances an uncontaminated drinking water supply for Butte water users. The State's 1995 Restoration Determination Plan considered upgrading existing reservoirs as a viable restoration alternative for the bedrock injuries in

Butte. This proposal, which is of similar nature, represents an important step in compensating the public for some of the lost use of groundwater resources of the Butte bedrock aquifer.

The lower costs of the High Service tank project than the waterline projects and the greater consequences to public health and the environment from a tank failure than from leaking lines are reasons why the High Service project might rank higher than the two waterline projects. The NRDP ranked it below the waterline projects, however, because the applications for waterline projects had more comprehensive alternatives analyses than the High Service application and because the size of the replacement High Service tank would have been better justified had B-SB completed a water system master plan. B-SB has indicated that if a water master plan indicates a need to expand the tank's capacity, the county would not seek additional Restoration funds to do so.

The two waterline and High Service projects do not do well for the criteria that focus on injured resource benefits, but the NRDP does not consider the projects to be deficient based on these lower rankings for these particular criteria because these projects provide services linked to injured resources that cannot be restored. By increasing the efficiency of storage or delivery of water from uncontaminated sources, these projects offer effective compensatory restoration for the extensive injuries to the bedrock aquifer underlying Butte Hill and the shallow alluvial aquifer in areas surrounding Anaconda that were covered under Montana v. ARCO. Although all three water projects involve activities that are normal government function, the NRDP does not believe that this should be a reason to reject them for funding considerations as explained under the normal government function criterion.

5) Clark Fork Watershed Education Program

The TRC recommends funding of the Clark Fork Watershed Education Program at the requested amount of $673,801,[6] subject to four additional funding conditions.

This project seeks to create a sustainable field science program for primary and secondary school level children and teachers in the Upper Clark Fork Basin over a three-year period. The direct benefit of the project will be to provide approximately 1600 elementary students, 780 high school students and 90 teachers the opportunity to understand restoration and remediation efforts in the UCFRB through stream science education and to connect program participants to science professionals. The indirect benefit of this project is that educating school children about the restoration of injured resources can increase the likelihood that the UCFRB's future residents will be engaged in restoration and be responsible stewards for the watershed. Compared to the millions of dollars to be spent to restore injured resources in the UCFRB, this project's cost of about $272 per teacher or student over a three year period represents a small but important investment in the future caretakers of the restored watershed's landscape.

[6] MT Tech's original Restoration Fund request was $832,984. After discussions between the NRDP and MT Tech, MT Tech submitted a revised and reduced Restoration Fund request of $673,801.

The project is considered cost-effective based on the project's centralized approach and other favorable aspects of the project approach. This project has 38 support comments, including letters from seven local schools, and matching funds of 19%.

This CFWEP is innovative and ground breaking relative to the types of restoration projects funded to date and an uncertainty exists about the ability to fund such an ambitious program in the long-term. The TRC thus approved a funding condition that, pursuant to the Trustee's Multi-Year Funding Policy for Category 1 projects, an evaluation system be established to annually review milestones achieved by the program and measure success and reevaluate funding for the subsequent years, including the option of discontinuing funding. Funding after Year 1 could be based on measurable milestones reached and deliverables produced during that year. The other approved funding conditions are: that all activities undertaken would pertain to the natural resources or services that were subject of Montana v. ARCO or the partial settlement of that lawsuit; that stipends be provided only to teachers who complete training and fully participate in the program; and that honoraria for technical experts be awarded only to those that meet an agreed-upon list of criteria and are subject to approval by the NRDP.

The NRDP ranked the CFWEP project below the waterline and tank projects because the three water projects have less uncertainty regarding their feasibility, a greater certainty of benefits, a more direct connection to injured areas and the damages that were the subject of the Montana v. ARCO lawsuit, and greater matching funds than the CFWEP project.

6) Browns Gulch Watershed Assessment

The TRC recommends the Browns Gulch project for $143,404 of the requested $197,378, subject to no additional funding conditions.

With the budget reductions, the Browns Gulch project is considered as one of net benefit. The project will provide needed and useful data on stream flow, water quality, riparian habitat, and fish and wildlife resources. The data to be collected will be usable by resource managers seeking to improve the natural resources of the Browns Gulch watershed, independent of future funding considerations. For example, information gathered on irrigation efficiency will provide irrigators and fishery specialists with important information concerning water use and water availability within this watershed. Similarly, worthwhile information will result from the elk, fishery, water quality, stream and riparian assessments.

The project will also produce a plan to improve natural resources in Browns Gulch. Potential benefits that could result from the funding and implementation of an effective watershed restoration plan to be developed by this assessment project include improved water quality and quantity and fisheries in Browns Gulch and Silver Bow Creek, and improved fish and wildlife habitat and associated recreational opportunities in Browns Gulch.

The water storage and routing analyses and the outreach efforts on forest health and conservation easements are not recommended for funding for reasons explained in the detailed criteria narrative contained in Appendix A. These analyses and efforts were not

considered cost-effective, and consequently, worth the expenditure of Restorations funds. The total budget cut recommended is $53,974. With these cuts, the Browns Gulch project is considered as reasonably feasible and likely to be cost-effective. It has matching funds of 37% and eight support comments.

Both the CFWEP and Browns Gulch projects are judged to be of net benefit. The NRDP ranked the Browns Gulch project below the CFWEP project primarily because the Browns Gulch project, as proposed, had greater uncertainties regarding the likelihood of success and its cost-effectiveness and greater inadequacies in its application than the CFWEP project.

Funding Cap Considerations

In November 2003, the TRC set the funding cap for the 2004 Restoration Grant Cycle at $6.5 million.

Table 3 provides a summary of the TRC's final funding recommendations. The total funding recommendation of $4,685,278 is about $1.8 million below the funding cap.

Table 3. Summary of TRC Funding Recommendations

Project	Requested Restoration Funds	Recommended Restoration Funds
Bridger Plant Materials Center	$ 253,926	$ 253,926
Butte Waterline	$1,197,971	$1,197,971
Anaconda Waterline	$1,223,374	$1,223,374
High Service Tank	$1,192,802	$1,192,802
Clark Fork Watershed Education Program	$ 673,801	$ 673,801
Browns Gulch Watershed Assessment	$ 197,378	$ 143,404
TOTAL	**$4,739,252**	**$4,685,278**

APPENDIX A

PROJECT CRITERIA NARRATIVES

Deer Lodge Valley Conservation District
Bridger Plant Materials Center
Developing Acid/Heavy Metal-Tolerant Releases

Project Summary

This project is a joint effort between the Deer Lodge Valley Conservation District and the Natural Resources Conservation Service (NRCS) Bridger Plant Materials Center (BPMC). It involves continuing the research and development of a seed supply of native plant species that are best adapted to the climatic and acidic/heavy metal soil conditions of the UCFRB, particularly the Anaconda uplands area. Funding the research and development component of the Foundation seed will greatly increase the likelihood that commercial seed growers will mass produce these seeds, which can then be used for revegetation efforts in UCFRB as well as other contaminated and degraded areas throughout western Montana and the Northern Rockies area. Total project costs are $324,926 for four years, with $253,926 requested in Restoration funds and $71,000 to be provided in kind matching funds.

This project was started nine years ago and has been partly funded by the NRDP over the last four years.[7] Past efforts focused on collecting seed from 27 plants in the Anaconda area and then testing these plants in field trials. Plants demonstrating superior survival, establishment, and growth have been selected for further testing over the next four years. The BPMC has already made selections and released Foundation seeds for a grass, shrub and forb. By the end of the four years of funding under this grant, the BPMC could potentially release an additional 12 species of plants for seed and plant production that are appropriate for reclamation in the UCFRB. Seed and plant production resulting from this project could greatly enhance restoration options in the Anaconda Uplands injured areas and other areas, such as Silver Bow Creek and the Clark Fork River.

Stage 1 Criteria

1. Technical Feasibility – Reasonably Feasible

   The applicant presents three goals: 1) continued field testing of releases and potential releases at the Anaconda Smelter Superfund site to verify adaptation and inter-species compatibility; 2) continued selection and release of acid/heavy metal-tolerant plants adapted to mine and smelter-impacted sites in western Montana; and 3) development and dissemination information regarding new plant materials and establishment techniques related to the reclamation of acid/heavy-metal impacted sites.

   The project's goals are to: 1) establish and maintain seed production fields of superior accessions to make seed available for field testing and eventual production of Foundation quality seed for distribution to commercial seed growers; 2) test species compatibility and plant community stability in field evaluation trials; 3) evaluate

[7] Restoration funds over the last four years (2001-2004) totaled $141,400.

stand density and species composition in two Anaconda evaluation plots; 4) continue seed collections of Anaconda plants; 5) maintain the seed production fields established at the BPMC for 10 grass, 5 forb, and 5 shrub species, which involves weed control, fertilization, irrigation, and seed harvest; 6) clean all collected or raised seed; 7) release superior plant seed to Montana State University (MSU) and the University of Wyoming; and 8) analyze data, produce reports and conduct public outreach efforts.

The applicant has demonstrated that the technologies proposed, such as seed collection and propagation, are well known and accepted technologies and reasonably likely to achieve their stated objectives. The application includes a thorough scope of work demonstrating the applicant's knowledge and expertise applied to this project and similar projects. The project is centered on the principle that utilization of local seed adapted to local climatic conditions and acid and metal-contaminated soil is superior to use of non-local seed. Commercially-grown seed from locally-adapted plants has higher viability and greater chance of survival than wildland and non-locally collected seed. Applying these principles to reclamation of coal mine lands in eastern Montana and Wyoming has proven successful. Research results of this project to date, though limited, have also indicated that indigenous plant material is superior to commercially available plant material.[8] NRCS Plant Material Centers are the primary vehicle for conservation plant releases nationwide and the activities to be conducted are the specialty of the BPMC and other Centers. These efforts are feasible and the BPMC has demonstrated it has the needed expertise to accomplish this effort. Over the last nine years BPMC has demonstrated that it can effectively coordinate and work with project managers from EPA, DEQ, NRDP and ARCO to investigate plant seed needs and challenges in the injured upland areas.

In the long-term, the success of this project depends on whether there will be enough of a proven market for the plant material produced by this project that commercial nurseries and seed producers would be willing to invest their land and efforts making these plant materials commercially available. BPMC has committed to maintaining the Foundation seed as long as NRCS program funding allows, there is a commercial demand, or commercial seed orchards and fields are established; outside funding would not be needed for the release and maintenance of acid tolerant releases after this last phase of research and development is completed.[9] Based on the NRDP's knowledge of the anticipated remediation and restoration needs and desired plant specifications in the UCFRB, the NRDP believes the long-term demand for the materials will exist. Four commercial growers have begun growing the three species already released to commercial growers. It is estimated that tens of millions of dollars will be spent for remedial and restoration efforts in the Anaconda Upland areas alone over the next 15 years.

[8] BPMC, DATC Project Bi-annual Report, October 2003-March 2004, prepared by Leslie Marty. March 2004.

[9] Per information provided in the application and in supplemental correspondence from Mark Majerus of the BPMC to Greg Mullen of the NRDP dated 5/20/04 and 7/6/04.

2. Relationship of Expected Costs to Expected Benefits – High Net Benefits

The total cost for the project is $324,926 to be spent over four years. Of this, $253,926 is requested in Restoration funds, or about $63,500 per year, and $71,000 will be provided as in-kind matching funds. The majority (92%) of the Restoration funds would cover the salaries and benefits for a project technician ($162,926) and BPMC consultant assistance from BPMC ($72,000) over four years.

The products of this research and development project include: 1) additional releases of acid/metal tolerant grass, forb, shrub species which can be used in the UCFRB; 2) data on the optimum plant species for upland sites; and 3) data on optimal species composition seed mixes for viable plant communities. Presently, there is a lack of locally adapted seed available for revegetation in the UCFRB. Forb and shrub seed is as yet nonexistent and only a few grasses are presently available from non-local sources such as eastern Montana. The grass and forb seeds that become available from this project can be used as Foundation seed for use by seed growers to provide a seed source for revegetating the UCFRB over the next 15 or more years. Nurseries can directly use shrub seeds that are collected from the BPMC orchards to produce plants or obtain seeds and/or cuttings to establish their own seed orchards. The project facilitates restoration of native wildlife habitat, acceleration of nutrient cycling, stabilization of soils and enhancements of soil properties, and establishment of self-perpetuating plant communities in the UCFRB such as the Anaconda upland injured area, Silver Bow Creek, and Clark Fork River. It can also benefit other impacted lands in the Northern Rockies. The NRDP believes the long-term benefits of soil and water conservation, water quality, and wildlife habitat restoration to be gained from this proposal significantly outweigh its costs.

3. Cost-Effectiveness – Likely Cost Effective

The applicant's alternatives analysis is limited to justifying why the no-action alternative is inadequate. A no-action alternative would result in the use of inferior seed sources that are not adapted to acidic/heavy metal soil conditions; this could increase revegetation expenses due to potential plant failure and jeopardize the success of upland revegetation efforts. In addition, the no action alternative could result in the loss of the ongoing research and development accomplished to date. The NRDP believes the only other likely alternative is collecting seed as needed from the site, which would be far more expensive and time-consuming than the selected approach and thus disadvantageous to remediation and restoration of injured resources. Additional support for the selected approach was provided in a letter of support by the MSU RRU, which has been working extensively for 10 years on revegetation designs for EPA in the UCFRB. The RRU asserts that the difference between seeding adapted, metal tolerant stock compared to commercially available and non-specific seed stock potentially will be the difference between dense vegetation and sparse eroded landscapes following restoration. The RRU characterizes this project as one of the cornerstones of successful restoration actions

carried out in the UCFRB in the decades to come, noting its critical role in expanding the palate of options available for reestablishment of vegetation in degraded areas. Due to these reasons, and due to positive results already obtained over the past decade from this project, the NRDP believes that the continuation of this project is likely to be cost effective in the long-term.

4. Environmental Impacts – No Adverse Impacts

   The project activities do not present any potential adverse impacts to the environment. By providing Foundation seeds of native species, the project provides beneficial impacts to air, water, soil, vegetation, fish and wildlife habitats and species.

5. Human Health and Safety Impacts – No Significant Adverse Impacts

   The project activities do not present any potential adverse human health and safety impacts. The applicant has properly planned for meeting the required OSHA training specific to work in contaminated areas.

6. Results of Superfund Response Actions – Positive Coordination

   This project positively coordinates with and augments remedial actions. BPMC has coordinated with remedial actions to date. Most notably, coordination has occurred with the establishment of the 2003 Stucky Ridge evaluation plot, in which ARCO contractors amended contaminated soils at the plot before BPMC seeded a two-acre site to evaluate grass and shrub species success in amended soils. The upland soils in non-steep sites will be amended for pH control, thus the Stucky Ridge test site will be useful in determining which species and combination of species will grow the best in these areas.

   This proposal will provide key plant materials and information that will be essential for both effective remedy and restoration activities in upland and riparian areas in the UCFRB. By 2007 and 2008, approximately 8 grasses, 4 shrubs and 5 forbs could be commercially available from locally adapted seed sources. Remedial and restoration actions are expected to be very active about this time and will continue in the UCFRB for at least another decade.

7. Recovery Period and Potential for Natural Recovery – Reduces Recovery Period

   Plants propagated from the superior local seed sources identified by this project can be used to directly restore injured wildlife habitat. Plants propagated from these seeds will be adapted to both to the climatic and acidic/heavy metal soil conditions of the UCFRB. Assuming that these plants and seeds are used in future remedial or restoration actions, then this project would reduce the time in which upland and riparian wildlife habitat would recover to baseline, especially if reseeding/replanting is not necessary because of the use of these UCFRB-specific seeds.

8. Applicable Policies, Rules and Laws – Consistent/Sufficient Information Provided

   The applicant has provided sufficient information to show that all applicable policies, rules and laws were considered and no permits, deeds, or easements are needed.

9. Resources of Special Interest to the Tribes and DOI – Beneficial Impact

   The project provides a product that can improve the wildlife habitat in injured areas and thus can benefit sensitive fish and wildlife species. The Tribes have no concerns with this project regarding potential impacts to tribal cultural or religious sites. The DOI supports funding of the project, with a suggested modification to expressly earmark a significant portion of the seed releases for use within the UCFRB Superfund areas. The NRDP does not have the regulatory authority to allow for such an earmarking. As discussed under criteria #1, however, the NRDP believes that the commercial growers will produce the needed seeds given the predicted demand for them to revegetate mining-impacted areas in the UCFRB and elsewhere.

Stage 2 Criteria

10. Project Location – Within Basin and Proximate

    The project's field-testing and seed collection activities will occur at various locations within the UCFRB. Seed production activities will occur at the BPMC, 45 miles south of Billings. The seed and information developed is specifically focused on revegetation of the Mount Haggin, Smelter Hill and Stucky Ridge injured areas.[10]

11. Actual Restoration of Injured Resources – Contributes to Restoration

    If the Foundation seeds are grown by commercial growers, it is likely that these species would be used in future restoration actions in the UCFRB. This project would contribute to the restoration of injured wildlife habitat by replacing lost vegetation with native species adapted to both climatic conditions at the site and to acid and metals in the site soils. Also, if these restoration actions complement remedial actions in designated injured areas that also use these plants and seeds, then this project would contribute to restoration by increasing the density and or diversity of vegetation attained through remedial actions on injured lands.

12. Relationship Between Service Loss and Service Restoration – Same

    The services lost in the UCFRB due to habitat loss include hunting and other recreational activities. Utilizing site-adapted seed and woody plant stock from local

[10] The designated injured areas in the Anaconda Uplands total 18 square miles. These areas are approximately seven miles in the Mount Haggin Wildlife Management area, another seven miles known as the Smelter Hill Area which is the area surrounding the Anaconda Smelter, and four miles in the Stucky Ridge area.

seed sources is important in re-establishing the plant communities upon which these services depend. Assuming use of the BPMC Foundation seed by commercial growers to fulfill future restoration needs, this project will contribute to restoring some of the same services that were lost.

13. Public Support – 4 support comments

The NRDP received a total of four comments in support of funding for the BPMC project, including two letters of support from MSU's RRU and the University of Wyoming Seed Certification Service.

14. Matching Funds – 22%

Restoration Fund Request:	$253,926
BPMC in-kind match:	$ 49,000
SWCDMI in-kind match:	$ 16,000
DLVCD in-kind match:	$ 6,000
Total Project Costs:	**$324,926**

Total project costs are $324,926, with $253,926 (88%) requested in Restoration funds and $71,000 (22%) to be provided in in-kind matching funds. The BPMC will contribute $57,000, mostly for supplies and materials and use of equipment and laboratory facilities owned by the BPMC. The Soil and Water Conservation Districts of Montana, Inc. (SWCDMI) will contribute $8,000 to in-kind rental of the lands, office space, and equipment owned by the SWCDMI. The Deer Lodge Valley Conservation District (DLVCD) will donate $6,000 as in-kind funds for administration services.

In past years, other funding sources besides the NRDP have contributed the majority of project funding. In the past four years, EPA's Mine Waste Technology Program (MWTP) funded 70% ($326,793) and the NRDP funded 30% ($141,400) of the project costs. As verified in a 5/21/04 letter to the NRDP, the MWTP has a general policy of funding revegetation research for the amount of time needed to assess the technology, which is typically three years, because the focus of the MWTP is technology assessment rather than on the next stage of technology commercialization or full-scale application. The MWTP is thus only committed to funding $12,000 to complete one more year of vegetation monitoring at the Stucky Ridge site.

15. Public Access – Not Applicable

Public access is not a component of this project.

16. Ecosystem Considerations – Positive

The goal of the project is to develop native adapted plant materials for future revegetation needs in the UCFRB, particularly in the Anaconda upland areas. The

release of site adapted grasses, forbs, and shrubs from this project would offer a wider variety of native plants that could lead to a more diverse and potentially stable plant communities. Any improvement in the revegetation success would benefit the natural resources throughout the UCFRB by reducing erosion, increasing wildlife habitat, and improving water quality.

17. Coordination and Integration – Coordinates/Integrates

This project coordinates with other restoration projects because its seed product could potentially be used in a multitude of needed revegetation projects on impacted mine lands throughout the UCFRB and throughout the states in the Northern Rockies. BPMC coordinates its efforts with the EPA Mine Waste Technology Program and the MSU Reclamation Research Unit and other entities involved in revegetation efforts statewide.

18. Normal Government Functions – Outside of Normal Government Functions

The development of the site-specific plant materials proposed by this project does not entail those for which a governmental agency would normally be responsible or that would receive funding in the normal course of events. Grant monies from governmental and private entities have funded this project in the past.

Land Acquisition Criteria – Not Applicable

Monitoring and Research Criteria – Portions of the project involve research.

21. Overall Scientific Program – Coordinates

The BPMC has coordinated efforts to date on this project with other entities and researchers performing revegetation activities in the UCFRB, including EPA, DEQ, MSU, NRCS, ARCO, and local conservation districts. This coordination will continue as planned by the applicant. In addition, this project would continue to be under the scrutiny and advisement of the MSU Reclamation Research Unit, the EPA Mine Waste Technology Program, the DEQ and ARCO and its reclamation subcontractors, as well as NRDP.

22. Assistance with Restoration Planning – Major Benefits

This project will provide critical information for successful revegetation of the UCFRB on optimal seed blends, composition, and application rates. In addition, plants released to commercial seed/plant producers via this project would potentially become available for seeding and planting in the UCFRB. Thus, this project will be of major benefit to future restoration efforts in terms of producing needed information on optimum revegetation methodologies and optimum seed source materials.

Butte-Silver Bow Local Government
Drinking Water Infrastructure Replacement – Year Four

Project Summary

Butte-Silver Bow City-County (B-SB) proposes to replace approximately 17,000 feet of inadequate water distribution lines in the City of Butte for a total cost of $1,755,890, including $1,197,971 requested in Restoration funds. This is the fourth year in which B-SB has requested funding for water line replacement, with $3,523,542 approved in the past three years for replacement of 51,000 feet of waterlines. The amount requested is $9,066 more than last year's approved funding request.

Butte's bedrock aquifer is contaminated throughout a seven square mile area of the City and these distribution lines overlay that aquifer. This aquifer is so severely injured that natural recovery will not occur for thousands of years, as concluded by the State's 1995 Restoration Determination Plan and by EPA's 1994 Record of Decision. Restoration of the bedrock aquifer is infeasible, thus the aquifer's drinking water and its storage capacity and transport services have been lost for thousands of years. By fixing leaking and corroded water lines, this project will enhance the water supply from an uncontaminated source. Thus, it constitutes replacement of lost services to thousands of property owners and other members of the public in Butte that could utilize the aquifer if it was not injured.

In its application, B-SB also provides its 20-year plan for 2000 to 2020 that projects the county's long-range plans for Restoration fund requests. The plan indicates the County's intent to continue water main replacement for a total of 15 years and seek an estimated $17.5 million total in Restoration funds for this effort, with B-SB providing a total match over 15 years of about $8.1 million.[11] This evaluation does not address that long-term plan. If B-SB seeks further funding of projects contemplated by the plan, it will need to do so through a separate application(s).

Stage 1 Criteria

1. Technical Feasibility – Reasonably Feasible

   This project involves the replacement of old (early 1900's), leaking, and, in many cases, undersized water distribution mains within the City of Butte. The lines vary in size from 6 to 12 inches. Major project tasks include: 1) selecting a consulting engineer to oversee the project for the upcoming construction season; 2) confirming which water mains to replace; 3) producing designs for water main replacements; 4) preparing and releasing bid packages for selection of a general contractor for the project; 5) implementing water main construction and performing oversight; 6)

[11] Approximately $3.52 million has already been approved for water main replacement; therefore, the total remaining for future B-SB requests, including this year's request of $1.2 million is estimated to be $13.98 million.

preparing record drawings for work completed during the construction season; and 7) updating B-SB records and database.

The NRDP has a reasonable degree of confidence that technologies proposed for water distribution main replacement can be achieved. The B-SB Department of Public Works, Water Utility Division, has extensive experience with the replacement of water mains in the community. Deteriorated conditions of the water distribution system led B-SB to create procedures for water main replacement when B-SB acquired the water system in 1992. Since 1992, B-SB has replaced about 255,000 feet of water mains total, or an average of 21,250 feet annually. B-SB successfully implemented the 2001 and 2002 waterline replacement projects funded by the NRDP and is currently implementing the 2003 project. The County has gained valuable insight as to the appropriate volume of replacement that can be accommodated by the water system and by the citizens of the community.

The primary logistical problems to deal with are: 1) the provision of temporary water to affected homes during the construction phase; and 2) traffic congestion and confusion due to street closures. The affected homes must be provided with an alternate source of water during the approximate two-week construction period. This temporary water comes from active water mains in adjacent blocks. Due to the difficulty in providing temporary water service in a large area at once, the County has proposed to replace water mains in small areas throughout Butte. The applicant has provided a map that depicts 23 areas in the City scheduled for replacement. The County will replace an average of 750 feet of water main pipe in each area. The areas selected are based upon locations with the highest current water leakage rates. Field conditions, such as an unexpected increase in chronic leaks elsewhere, could cause a modification to this schedule. The other logistical concern is that the water main renewal process will disrupt traffic patterns in the community since water mains underlie the city streets. Construction activities will require street closures during the approximate two-week construction period. Taking into account any inconvenience and annoyance to residents, 17,000 feet of water main replacement in the Butte Hill area has been determined by the applicant as a reasonable quantity of lines for replacement per year.

Overall Technical Feasibility

Standard construction procedures for water main replacement are being planned for this work and the project team has successfully conducted similar efforts. Water main replacement has been ongoing in Butte since 1992 on a large scale with minimal problems. This project is technically feasible based on the information provided.

2. Relationship of Expected Costs to Expected Benefits – Net Benefits

Costs proposed for implementing this year's water line replacement total $1,755,890 with $1,197,971 (68%) requested in Restoration funds. B-SB's share for all costs is $557,919 (32%). Restoration funds would cover 70% of the engineering and

construction costs, which total $141,522 and $1,569,865, respectively. B-SB is paying all the county salaries and wages on the project, which are estimated to be $44,503 (3%). To estimate costs for 2004, B-SB added a 10% contingency to the average costs in the last five years of water line replacement of $84 per foot, resulting in an estimate of about $92 per foot for construction. Based on this last five years of expenses, engineering costs are estimated at $8.00/foot. The estimated total cost per foot is $100 for water main replacement.

This project is the fourth year of an intended 15-year effort, started in 2002, of replacing water lines system-wide to address the long-term maintenance problems of the system. This 15-year effort, combined with improvements made between 1992 and 2001, would replace a total of 255,000 feet of waterline, which represents about 40% of the entire water distribution system and about half of the sections in most need of replacement. Although this effort lags behind the accepted rule-of-thumb for a waterline replacement of 1% each year, the project would achieve substantial progress toward getting the community's infrastructure needs met.

The NRDP agrees with the applicant that this project represents an important step in replacing services lost due to injured groundwater resources. The State's 1995 Restoration Determination Plan[12] affirmed upgrading Butte's antiquated water system as a viable replacement alternative for the injured bedrock aquifer. The benefits to the Butte residents who lost the use of groundwater include the following:

- Reduced rate of leakage which will reduce pumping and treatment costs;
- Reduction in the potential for the distribution system becoming contaminated through leaking and failing pipes;
- Improved fire protection;
- Cost savings due to the reduction in the number of leaks per year that have to be repaired;
- Reduction in the potential for property damage and reduction in associated insurance claims from leaky pipes;
- Assurance of B-SB's continued provision of a reliable source of potable water to its residents meeting current federal and state regulations; and
- The opportunity to conserve more water during drought conditions as a result of reduced leakage.

Because this proposal will cost-effectively benefit and compensate the public for some of the lost use of groundwater that Butte has suffered due to inability to use

[12] *Restoration Determination Plan Upper Clark Fork River Basin*, NRDP, October, 1995.

groundwater in much of the City, the NRDP believes the benefits gained from this replacement proposal outweigh its costs.

3. Cost Effectiveness – Likely Cost Effective

B-SB considers the proposed project the most economical way to replace lost services from injured groundwater resources. B-SB indicates the no action alternative would eliminate one of the few viable means to replace the lost services that groundwater provides. Another alternative considered by the applicant was to vary the level of effort to replace the distribution system. For example, the proposed project could replace the distribution lines at a higher or lower level of effort per year. B-SB states that the proposed level of replacement of 17,000 feet of line per year is optimum based on B-SB's experience over the last 12 years. B-SB appropriately uses safety, public health, and leakage criteria to plan the sequence of leak repairs, with the areas of greatest impact addressed first. The proposed replacement schedule and cost estimates are reasonable based on previous waterline replacement costs in Butte. B-SB budgeted this project based on actual costs of similar projects in the past five years. Based on the low bid for the approved 2003 project of about $1.52 million for 17,000 feet of pipe construction, the estimate in this proposal is also considered reasonable since the application's construction cost allocation is $1.57 million. However, due to the fact that replacement pipes are an oil-based product, future pipe costs are expected to increase. B-SB has informed NRDP that if monies fall short for replacing 17,000 feet of pipe then B-SB, then B-SB would reduce the amount of waterline to be replaced to stay within the approved budget or increase the county's contribution so that the full 17,000 feet of pipe could be replaced.[13] NRDP approval would be required of any reduction to the scope of the project.

If groundwater of acceptable quality were available from wells, the cost of operating and maintaining the water system would be significantly less. Under current state and federal regulations, most ground water supplies require little or no treatment other than disinfection with chlorine or ultraviolet light. Groundwater systems typically do not have to be manned on a full-time basis. This alternative is not available due to the extensive groundwater contamination underlying Butte.

Another alternative, which would save water, would be placing meters on the 7,500 unmetered connections presently existing in Butte. B-SB has expressed a strong desire to place meters throughout the City. Presently all new connections require water meters, however, due to the severity of the present water problems facing the B-SB water system, such as leaking pipes, metering is not a high priority at this time. B-SB points to the existing high debt of B-SB water users as a reason to wait for requiring extensive metering. Insufficient information is available to compare per unit cost of water saved from metering vs. repairing leaks. The NRDP believes that B-SB should continue to expand the use of meters in the near future in order to save

[13] E-mail from Jean Pentecost of B-SB to Gregory Mullen of NRDP on 6/14/04.

water.[14] Water restrictions have been in place during the last four summers to limit lawn watering, primarily due to continuing low stream flow volumes in the Big Hole River.

Leakage from distribution lines has been predicted to be about 14% of the water pumped into the distribution system, at an estimated treatment cost of $55,000 per year. Another annual cost that would be eventually saved by replacing water lines would be the cost of repairing water main leaks. These leaks, in excess of 250 per year, cost B-SB about $1000 per leak to fix, or some $250,000 per year. At some point in time, without the proposed water main replacement, the distribution system would become totally unmanageable and unusable due to the excessive leakage and age of piping.

Due to these savings and the successful project performance of similar pipeline replacement work with NRDP funds over the last two years, the NRDP believes that the selected alternative of replacing pipe and the level of pipe replacement proposed by B-SB of 17,000 feet is cost effective.

4. Environmental Impacts – No Significant Adverse Impacts

Replacing Butte's water mains presents no significant adverse impacts to the environment. The project will have potentially adverse impacts to aesthetics from the short-term excavation within the city streets for the installation of the mains. This impact will be mitigated, to the extent possible, by limiting public access to the disturbed areas. Actual construction activity will last about two weeks for each renewal segment. The project will have a potentially beneficial impact on conservation of water, by reducing the estimated total water loss of 14% from leaking pipes.

5. Human Health and Safety Impacts – No Significant Adverse Impacts

Potentially adverse impacts to the human environment during construction activities include worker accidents, dust, noise, temporary loss of water service, restricted access to commercial facilities and disruption of traffic flow. The applicant has planned effective mitigation measures to alleviate these adverse impacts to the greatest extent possible, such as limiting construction to daytime hours. Although this section does not directly address the workers' safety, the section on applicable laws indicates that B-SB will follow safety guidelines of the Montana Public Works and Standard Specifications. Also, the 2002 bid package for last year's approved project indicates that worker safety measures will be required.

In addition to bringing clean water to residences, replacing water mains will also benefit the community by reducing impacts on human health and safety that are

[14] B-SB has 5,203 accounts that are metered and 7,158 accounts that are flat rate. Metered accounts represent about 42% of the total connections. Source: e-mail from Jean Pentecost of B-SB to Gregory Mullen of NRDP on 6/14/04.

caused by water leaks. These include road hazards from leaking water and ice, health hazards due to possible contamination of the water system via leaks, and safety hazards caused by inadequate pressure and flow for fire fighting purposes.

6. Results of Superfund Response Actions – Consistent

   The 1994 Record of Decision[15] for the Butte Mine Flooding Operable Unit declared that the bedrock aquifer and parts of the alluvial aquifer on the Butte Hill could never be used for drinking water. B-SB has adequately planned to replace water lines in areas where impacts from mine flooding decisions are applicable. This is consistent with remedy in that contaminated groundwater cannot be accessed for residential use.

7. Recovery Period and Potential for Natural Recovery – No Effect on Recovery Period

   This replacement project will not affect the bedrock aquifer's recovery period, which will not occur for thousands to tens of thousands of years.

8. Applicable Policies, Rules and Laws – Consistent/Sufficient Information Provided

   The applicant has provided sufficient information on the applicable requirements needed to complete this project. The following three standard procedures will be implemented:

   - B-SB will submit all design drawings for water main segment replacements to DEQ for review and approval prior to performing the work.

   - B-SB will coordinate all replacement activities with the U.S. EPA to ensure any excavated materials that contain heavy metals in excess of remedial action levels are disposed at the mine waste repository and clean back fill materials are used.

   - B-SB will follow Montana Public Works Specifications in the implementation of the project, including those for ditch width, pipe bury depths, safety measures, and related specifications.

9. Resources of Special Interest to the Tribes and DOI – No Impact

   It is not anticipated that this project will have adverse impacts on resources related to the Tribes or DOI. The Tribes have indicated this. The DOI supports funding this project.

[15] *Record of Decision, Butte Mine Flooding Operable Unit*, U.S. Environmental Protection Agency, September 1994.

Stage 2 Criteria

10. Project Location – Within Basin and Proximate

    The project will be conducted above the injured Butte Hill bedrock aquifer area.

11. Actual Restoration of Injured Resources – No Restoration

    This is a replacement project; actual restoration of the bedrock aquifer is infeasible. The State recognized this infeasibility in its 1995 Restoration Determination Plan that selected a replacement alternative for this groundwater injury.

12. Relationship Between Service Loss and Service Restoration – Same

    Restoration of the bedrock aquifer is infeasible, thus the aquifer's drinking water and its storage capacity and transport services have been lost for thousands of years. This proposal constitutes replacement of lost services to thousands of property owners and other members of the public in Butte that could utilize the aquifer if it was not injured. By fixing leaking and corroded water lines, this proposal will enhance the water supply from an unaffected source. Thus, there is a direct connection between lost services and services this project will replace.

13. Public Support – 5 support comments

    The NRDP received 5 comments in support of the Butte waterline project, including letters of support from the B-SB Council of Commissioners and from the Butte Chamber of Commerce.

14. Matching Funds and Cost Sharing – 32%

Restoration Fund Request:	$1,197,971
B-SB cash match:	$ 513,417
B-SB in-kind match:	$ 44,503
Total Project Costs:	**$1,755,890**

    B-SB has matching funds of $557,919 or 32% of the total project costs for this year's proposal. The matching funds consist of $513,417 for construction costs and $44,503 for in-kind labor. B-SB indicates its intent to continue this match for the project's 15-year length, for a total match of $8 million. Independent of this match specific to the 17,000 ft. of waterline to be replaced in this project, B-SB will also invest $500,000 towards water main replacement in other areas of Butte outside of the bedrock injured areas.

    A possibility exists that higher pipeline prices anticipated in 2005 may result in significantly higher cost per foot than the costs used to budget this project. If that occurs, B-SB would still be expected to contribute the proposed 32% of project costs.

Although not considered a cost share for this specific project request, B-SB has noted the $40 million dollars already invested by Butte municipal drinking water system ratepayers over the past ten years. These monies were used for constructing a treatment plant for the Big Hole water supply ($20 million), water line replacement from 1992 to 2000 ($10 million) and for other surface water improvements ($10 million).

15. Public Access – Not applicable

    Public access is not a component of this project, nor is it relevant to the project.

16. Ecosystem Considerations – Positive

    The project will conserve water and reduce power requirements for pumping and treating water.

17. Coordination and Integration – None

    This project is not coordinated or integrated with other ongoing or planned actions in the UCFRB besides the remedial actions addressed under Criterion #6.

18. Normal Government Functions – Within but Augments Normal Government Functions

    Upgrading drinking water lines is a normal responsibility of local governments that is typically accomplished via funding from grants and ratepayers. The costs B-SB faces to upgrade their system are greater than typical community costs due, in part, to pervasive groundwater contamination underlying Butte. In the absence of that injury, Butte may have been able to construct a simpler and less expensive nearby groundwater system than the existing system that relies on more distant uncontaminated surface water sources, as further documented in the State's 1995 NRD assessment report.[16] B-SB ratepayer's costs are significantly higher than other similar communities. For example, the Butte water rates are twice the rates of Great Falls, Kalispell and Anaconda, and 20% more than Helena's rates.[17] Another consideration of this criterion is that B-SB is contributing 32% of this project that seeks to address the water main leak problems over a 15-year period to bring annual maintenance costs within reason for this size of a utility system. After that, B-SB would be funding routine maintenance costs.

[16] *Revised Report and Rebuttal: Assessment of Damages to Groundwater and Literature Review of Water Use Values in the Upper Clark Fork River Drainage*, Duffield, October, 1995. Note: this report estimates lost use values for Butte's bedrock and alluvial aquifers.

[17] Water Rate Survey, City of Great Falls, April 2003. B-SB water rates average $36.04 for metered users and $48.78 for unmetered users.

Anaconda-Deer Lodge County
West Fourth Street Water Distribution Upgrade

Project Summary

Anaconda-Deer Lodge City County (ADLC) is replacing a leaking, 104-year-old, 14-inch waterline along West Fourth Street. Approximately 1.6 million gallons of water per day leak through the City of Anaconda's water distribution system. Repairing these leaks is an alternative that will provide the City of Anaconda with additional water resources instead of developing a new source of water. The total project costs are $1,532,591, with $309,217 in matching funds and $1,223,374 requested in Restoration funds.

The City of Anaconda is located adjacent or partially within the 40 square miles of groundwater contamination associated with the Anaconda Regional Water, Waste, and Soils Operable Unit. Groundwater resources are somewhat limited because the upper portion of the alluvial groundwater aquifer east of Anaconda is contaminated with metals associated with past mining activities at levels above water quality standards. The 1995 State of Montana Anaconda Groundwater Injury Assessment Report supports this claim of groundwater contamination east of Anaconda. Also, the 1998 Anaconda Regional Water, Waste, and Soils Operable Unit Record of Decision indicates some 30 square miles of contaminated bedrock groundwater to the north and south of the City.

The West Fourth Street waterline project is considered a replacement project. This request is the third year of what ADLC has indicated will be a multi-year funding request to replace the waterline system. The Governor approved the 2002 Main Street and Bowman Field waterline replacement and installation projects for $749,942 and the 2003 East Fourth Street waterline replacement project for $995,000. The Draft Preliminary Engineering Report Municipal Water System[18] completed for ADLC indicates that, beyond the 43,175 feet of waterline already replaced, approximately 65,000 feet of waterline should be replaced over the next nine years at a cost of approximately $14 million to recover a significant portion of the water lost and effectively bolster the available capacity of the water system. ADLC indicates that, assuming a 25% local match, the anticipated future Restoration Fund request for waterline improvements through 2011 is about $11 million.

The 2002 and 2003 NRDP funded waterline replacements projects in Anaconda have reduced ADLC waterline losses. In 2002, ADLC estimated water loss from leaking waterlines to be 1.75 million gallons per day. Currently, the system is losing 1.6 million gallons of water per day, which could be further reduced by 100,000 gallons per day if this current project is implemented.

[18] Draft Preliminary Engineering Report Municipal Water System, prepared for ADLC, prepared by HKM Engineering, Butte, May 2004.

Stage 1 Criteria

1. Technical Feasibility – Reasonably Feasible

   This project involves the replacement of approximately 7,925 feet of 14-inch waterline and 680 feet of smaller waterlines within the City of Anaconda. The West Fourth Street waterline replacement project will be completed after the East Fourth Street waterline replacement project, which is scheduled to be completed in 2004. Major project tasks include competitively selecting an engineering firm, producing designs and specifications, preparing and competitively releasing a construction bid package, and implementing waterline construction and oversight.

   The current West Fourth Street waterline is Kalimane pipe that is 104-years old and connects the well field and storage tank to the central portion of the water distribution system, servicing 119 water users directly off this line. ADLC proposes to manage and be responsible for the design, project bidding and contracting, construction oversight, and waterline maintenance. The Restoration funds will be used for installation of the new waterline, connection to existing water service, and construction oversight.

   ADLC has successfully completed 43,175 feet of waterline replacement since 1994, including waterlines along Commercial and Park Avenue, Main Street, East Fourth Street, installed a waterline to the Warms Springs Campus, constructed a new well field and water storage tank, and contracted for engineering services for the design and planning of these projects. The same level of effort and approach is proposed by ADLC for the West Fourth Street project. ADLC has invested $8.1 million in its water system since 1992.

   The NRDP has a reasonable degree of confidence that the technologies proposed to complete this project can be achieved. Standard design and construction techniques that conform to the Montana Public Works Standards Specifications for Construction and the Department of Environmental Quality (DEQ) specifications will be used for the West Fourth Street waterline replacement project.

2. Relationship of Expected Costs to Expected Benefits – Net Benefit

   Total cost for the proposed project is projected to be $1,532,591. ADLC proposes to provide $309,217 (20%) in matching funds, including $59,217 of in-kind services. The proposed Restoration grant is for $1,223,374 to cover the West Fourth Street waterline replacement, or 80% of the total project costs.

   The leaking waterlines in Anaconda lose approximately 1.6 million gallons of water per day. An assessment by Peccia and Associates in 2000 completed for ADLC calculated this loss by subtracting the volume of water pumped from the City wells by the volume of water treated at the wastewater plant (water in minus water out). This assessment was completed during winter months to eliminate uses such as yard

watering that would normally not be treated at the wastewater treatment plant. The difference represents the estimated amount of water loss through leaking pipes. The assessment concluded that the best alternative to develop a water supply would be to conserve the water already being treated and piped out through the water distribution system. The West Fourth Street project is expected to reduce water loss from the entire system by approximately 6% or 100,000 gallons/day.

Conservation of the leaking water from the West Fourth Street waterline will be a direct benefit to the City of Anaconda by reducing the need to seek additional water supplies and lowering water distribution costs since water pumped from the wells will not be lost through leaking pipes. HKM (2004) estimates a financial loss of $65,000 per year associated with the high percentage (75%) water system loss. In addition, other benefits include:

- Increased water pressure for fire protection and users;
- Cost savings associated with reduction in repairs;
- Reduction in potential for property damage and reduction in associated insurance claims for leaky pipes; and
- Opportunity to conserve more water during drought conditions as a result of reduced leakage.

Restoration funds are needed to help defer costs of replacing waterlines and to conserve water. The project offers substantial benefits to the Anaconda public. It constitutes cost effective compensatory restoration for extensive injuries to the shallow and bedrock aquifers surrounding the City of Anaconda. Thus, NRDP believes the benefits gained from this replacement proposal exceed its costs.

3. Cost-Effectiveness – Cost Effective

The West Fourth Street waterline replacement project involves replacing 8,000 feet of waterline for $1,532,591. The costs for this project were estimated using bids from the 2002 and 2003 waterline projects, preliminary draft design plans for the West Fourth Street waterline project, and ADLC's consulting engineer's knowledge and experience. ADLC's consulting engineer made some necessary adjustments to account for individual bid item pricing. The NRDP believes the use of this approach to estimate costs is appropriate.

The application compares three construction methods for completing this project. ADLC evaluated using trenchless technology and installing a new waterline in a different corridor. As presented in the application, neither of the alternative methods of installation was as cost effective as standard waterline installation within the existing waterline corridor.

ADLC has water development limitations because of the groundwater contamination associated with the Anaconda Water, Waste, and Soils Operable Unit and the restrictions on installation of new well fields in some areas inside and outside the contamination. The groundwater contamination east of Anaconda in the upper portion of the aquifer has limited, to some degree, the number of sources for Anaconda's additional water resources. Conservation of the existing water supply is an efficient and effective alternative to increase the supply of water to the current and future users. Development of additional water resources and reserves would utilize the existing water distribution system, resulting in continued losses of treated water. ADLC does hold the water rights to Hearst Lake/Fifer Gulch (7.63 cubic feet per second), although ADLC indicates a new pipeline and treatment system would be required to integrate this water into the current system, at a cost of approximately $1.7 million. Additional wells at the current well field may not be possible due to an agreement between ADLC and the West Valley Water Users. This agreement was negotiated to protect the water rights of the West Valley Water Users.

Metering water use is another mechanism to conserve water. ADLC has recently contracted with an engineering firm to assess their water system. The 2004 Draft Preliminary Engineering Report Municipal Water System concludes that along with waterline replacement, water metering is the best way to reduce water loss from the current water system. The report indicates that 7% of the connections within Anaconda are metered. A new ordinance has been passed reinstating that metering be required for all new connections. The current loss of water through leaks appears greater than the estimated possible water savings from installation of meters.[19] ADLC estimates the cost of installing water meters on all connections is greater than $1.2 million. While proceeding with more intensive efforts to increase use of water meters, replacing waterlines is likely a more cost-effective method to conserve water in the short-term.

In conclusion, the alternative of replacing the leaking West Fourth Street waterline is a cost effective alternative compared to other water development alternatives and waterline replacement methods, and the estimated costs are reasonable since actual contractor bids were used to estimate the potential costs for this project. Also, the materials proposed should provide the City of Anaconda with a quality waterline serving West Fourth Street users for many years.

4. Environmental Impacts – No Significant Adverse Impacts

Replacing Anaconda's West Fourth Street waterline presents no significant adverse impacts to the environment. The project will have potentially adverse impacts to aesthetics from the short-term excavation during the installation of the new waterline.

[19] In a letter dated May 18, 2003, Dave Shultz, of B-SB, indicated that metering is estimated to save 1/3 of the difference between winter base usage and summer peak usage; this reduction is also generally applicable to metering in Anaconda. This difference may not equal the current loss of 1.75 million gallons per day from the ADLC waterlines.

The West Fourth Street project will use erosion control to protect stormwater runoff. The ADLC states that, if required, the contractors will obtain a construction site stormwater management permit from DEQ. The project will potentially benefit water conservation by reducing leaks.

5. Human Health and Safety Impacts – No Significant Adverse Impacts

   Potentially adverse impacts to the human environment during construction activities include dust, noise, temporary loss of water service, restricted access to commercial facilities, worker safety, and disruption of traffic flow. The ADLC has proposed mitigation measures to alleviate these adverse impacts to the greatest extent possible. Temporary waterlines and construction site safety measures are proposed for the West Fourth Street waterline replacement. Bringing clean water to residences and businesses by replacement of water mains will also benefit the community by reducing impacts on human health and safety due to enhanced reliability of the water service and distribution, and by increasing availability of water otherwise lost to leakage. In addition to bringing clean water to the City of Anaconda, the services will also improve fire protection pressure and flows. ADLC indicates that standard OSHA and Montana Public Work Standards for work place safety practices will be followed during the completion of this project to insure worker and public health and safety.

6. Results of Superfund Response Actions – Consistent

   This project is consistent with remedy in that contaminated groundwater is not being accessed for use. The project will not conflict or coordinate with any known EPA Superfund actions.

7. Recovery Period and Potential for Natural Recovery – No Effect on the Recovery Period

   This replacement project will not affect the groundwater recovery period, which will not occur for thousands to tens of thousands of years.

8. Applicable Policies, Rules and Laws – Consistent

   The ADLC has provided sufficient information on the applicable requirements needed to complete these projects. The following standard procedures will be implemented:

   - ADLC will submit all design drawings for water main replacement to DEQ for review and approval prior to performing the work.

   - ADLC will coordinate with DEQ to ensure that contamination from other potential sources will be investigated prior to construction.

- ADLC will follow Montana Public Works Specifications in the implementation of the projects, including those for ditch width, pipe burial depths, safety measures, and related specifications.

9. Resources of Special Interest to the Tribes and DOI – No Impact

   It is not anticipated this project will have adverse impacts on resources related to the Tribes or DOI. The Tribes have indicated this in their comment letter. The DOI has indicated its support for funding this proposal.

Stage 2 Criteria

10. Project Location – Within Basin and Proximate

    The West Fourth Street waterline replacement project is located within the City of Anaconda, within the UCFRB and within and adjacent to the injured groundwater resource boundary.

11. Actual Restoration of Injured Resources – No Restoration

    This is a replacement project; actual restoration of the injured portion of the Anaconda Area groundwater resource is infeasible as recognized in the State's 1995 Restoration Determination Plan. The West Fourth Street waterline project constitutes replacement of lost services because it replaces drinking water lost in the area as a result of contamination.

12. Relationship between Service Loss and Service Restoration – Same/Similar

    Remediation and restoration of the injured groundwater in the upper portion of the aquifer associated with the Anaconda Regional Water, Waste, and Soils Operable Unit is infeasible as recognized in the State's 1995 Restoration Determination Plan. Use of much of the bedrock aquifer north and south of Anaconda is also not feasible due to contamination. Thus, ADLC has lost potential sources of water for future development and needs. Optimization and conservation of existing water resources from the current leaking water supply system (approximately 1.6 million gallons per day) is an effective means of enhancing its water resources. Thus, there is a direct connection between the potential services lost and the services the West Fourth Street waterline project will replace.

13. Public Support – 6 support comments

    The NRDP received a total of 6 comments in support of the funding the Anaconda waterline project, including letters from the ADLC Council of Commissioners, the Anaconda Area Chamber of Commerce, the Anaconda Local Development Corporation, and the Anaconda Public Schools.

14. Matching Funds and Cost Sharing – 20%

Restoration Fund Request:	$1,223,374
ADLC Cash Match:	$ 250,000
ADLC In-kind Match:	$ 59,247
Total Project Costs:	**$1,532,217**

ADLC has proposed to provide matching funds of $309,217, or 20% for the West Fourth Street waterline installation project. These matching funds from ADLC are for administration, project oversight, fiscal management, and construction coordination services. ADLC is providing $250,000 in cash as well as $59,217 in staff in-kind services.

15. Public Access – Not Applicable

Public access is not a component of this project, nor is it relevant to the project.

16. Ecosystem Considerations – Positive Impacts

The ADLC states that the grant project will provide a net benefit to the local ecosystem by conservation of water resources and reduced power requirements for pumping and treating water. These statements are correct; however, the overall effect of the requested grant funds is limited since the replacement of the West Fourth Street waterline will conserve approximately 6% of the 1.6 million gallons of water loss per day in Anaconda.

17. Coordination and Integration – Integrates

The West Fourth Street waterline replacement project is integrated with other ADLC plans. The West Fourth Street waterline project will be completed following completion of the East Fourth Street waterline replacement project being completed the summer of 2004. This will complete the critical waterline section along Fourth Street, connecting the well field and storage tank with the City of Anaconda.

18. Normal Government Functions – Within but Augments Normal Government Functions

Waterline installations and repairs are part of local government responsibilities as they are the owners of the water distribution systems. The NRDP considers this project as one that augments, not replaces, normal government function because communities typically rely on grant funds to assist in funding such work and also because the replacement of severely leaking waterlines is an effective way to compensate the community for extensive injuries Anaconda area groundwater resources that were covered under Montana v. ARCO.

ADLC proposes to provide matching funds of $309,217, or 20% for this project. ADLC has offered several reasons as to why they are currently unable to contribute greater funding to this project at this time.[20] They include a remaining debt of $2.7 million that remains on the 1994 water bond used to fund system improvements, a 96% water rate increase over the last decade, declining economic conditions in the community, and a current high mill levy (748 mils). ADLC has not applied to the state's Treasure State Endowment Fund and Renewable Resource Grant and Loan programs because ADLC does not currently meet these program's target rates for eligibility due to low cumulative water and sewer rates and because these programs effectively require water metering for competitive consideration and a match via additional local debt. Nor is the county eligible for Community Development Block Grants. ADLC's current water rates of $22.68 per month are higher than several cities with populations greater than 5,000 (Billings, Great Falls, and Kalispell).

The Draft Preliminary Engineering Report Municipal Water System (HKM 2004) recommends a specific water rate increase schedule and increasing the number of water meters as a viable step to conserving water. ADLC's diligence and documented efforts to implement these recommendations should be considered with future funding requests for water system improvements.

Land Acquisition Criteria – Not Applicable

Monitoring and Research Criteria – Not Applicable

[20] More detailed information on the county's funding situation is provided on pages 8, 10, 52, and 53 of the application and in a 5/13/04 memorandum and 5/21/04 e-mail from Alden Beard of BETA consulting to Doug Martin of the NRDP.

Butte-Silver Bow Local Government
High Service Tank Replacement

Project Summary

Butte-Silver Bow City County (B-SB) proposes to replace the 2.5-million-gallon High Service water tank for a cost of $1,535,812 with $1,192,802 requested in Restoration funds. The original tank, which was constructed in 1956, is located on the northwest end of Butte and serves the north side of the community in a 400-acre area. The purpose of the tank is to maintain pressure in the distribution system and provide treated water storage for both domestic and fire flow demands. It receives water from the Moulton reservoir and the West Side Pumping Station. The High Service Tank is in poor condition with large cracks in the walls and in the columns that support the roof.

Butte's bedrock aquifer is so severely injured that natural recovery will not occur for thousands of years, as concluded by the State's 1995 Restoration Determination Plan and by EPA's 1994 Record of Decision. Restoration of the bedrock aquifer is infeasible, thus the aquifer's drinking water storage capacity and transport services have been lost for thousands of years. By replacing a water supply tank that is in poor condition, this project will enhance an uncontaminated drinking water supply for Butte water users. It therefore constitutes replacement of lost services to some of the thousands of property owners and to other members to other members of the public in Butte that could use the aquifer if it was not injured.

Stage 1 Criteria

1. Technical Feasibility – Reasonably Feasible

   This project involves the removal of the existing 2.5-million-gallon High Service Tank and replacing it with a new 2.5-million-gallon pre-stressed concrete tank. Major project tasks are to: 1) select a consulting engineering firm to design the project; 2) design the installation of a new tank; 3) select the general contractor or contractors through a competitive public bidding process; 4) oversee the contractor during construction; and 5) startup and thoroughly test the newly installed components.

   In 2000, B-SB contracted with Bridger Engineering, Inc. for the inspection and recommendations for the High Service Tank. The findings of the inspection are attached to the application. The main problems the inspection revealed were that:

   - The roof of the tank was in poor condition and weak with exposed reinforcing in some places. The interior of the walls and beams of the roof had numerous cracks.

   - The exterior walls have large vertical cracks that extend through the entire thickness of the wall and extend into the roof slab. The interior of the tank's walls also had numerous cracks.

- The 43 steel columns were encased in concrete in 1964 to protect the steel. The concrete encasement is now severely corroded. The floor of the tank is covered with an accumulation of silt and sandy remains from the corroded columns.

- The inspection concluded that the tank is probably leaking and would not meet American Water Works Association (AWWA) standards regarding leakage for water storage tanks. However, a leakage test was not performed because removal of backfill from around the tank in order to look for leaks could cause the tank to fail, as the backfill material is providing structural support to the tank.

The conclusions of the 2000 inspection was to replace the tank because attempts to repair the existing tank and bring the tank into compliance would result in high costs with a tank most likely not meeting AWWA standards and having a short life expectancy.

The project proposes the following major components and estimated costs for replacing the tank:[21]

- *Engineering design, construction drawings and technical specification preparation for bid documents ($94,500).*

- *Floor and Footing Concrete and Reinforcement ($152,000).* The floor will be a 6-inch thick reinforced concrete slab using 4000 psi concrete. Rebar will be placed on four-foot centers. The footings contain complex reinforcement using #5 rebar are 5 foot in width and 18 inches in depth. The 342 cubic yards of concrete required for the floor and footings will most likely be done in one cement pour.

- *Wall and Concrete Reinforcement ($548,700).* The wall will be a 10-inch pre-stressed concrete wall. The reinforcing steel is a combination of rebar and high tensile steel. The wall will need 533 cubic yards of concrete completed in eight cement pours, each about 50 feet of the walls circumference.

- *Roof and Columns Concrete and Reinforcement ($405,475).* The roof is proposed to be a nine-inch flat slab and the columns are heavily reinforced concrete. The concrete, which totals 450 cubic yards in the roof and 141 cubic yards in the columns, is expected to be poured in two pours.

[21] Pioneer Technical Services prepared these cost estimates in February 2004. Table with costs are found in Appendix B of the Application. Task descriptions are outlined in a memo from Jean Pentecost to Gregory Mullen dated May 18, 2004.

Overall Technical Feasibility

The NRDP has a reasonable degree of confidence that the technologies proposed for water tank replacement can be achieved. B-SB Department of Public Works, Water Utility Division, has extensive experience with the construction of water system infrastructure. B-SB has built two water tanks in Butte, a five million gallon steel tank in 1990, and a nine million gallon pre-stressed[22] concrete tank in 1993. Due to economic value of a pre-stressed concrete tank, B-SB has chosen this type of tank for replacing the existing tank. There are pre-stressed concrete tanks in several Montana communities and many utilized by water utilities nation-wide.

2. Relationship of Expected Costs to Expected Benefits – Net Benefits

Costs proposed for replacing the High Service tank total $1,535,812, with $1,192,802 (78%) requested in Restoration funds. B-SB's share for all costs is $343,010 (22%). Restoration funds would cover 80% of the engineering and construction costs, or $81,860 and $1,110,942, respectively. B-SB is funding the remaining 20% of the engineering and construction costs, or $20,465 and $277,735, respectively. B-SB is also funding all county salaries and wages, which are estimated at $44,809. All construction cost estimates include an added 10% contingency cost and a 7.5% mark-up for engineering and design. The tank supplier will perform the design.

The State's 1995 Restoration Determination Plan considered upgrading existing reservoirs as a viable restoration alternative for the bedrock injuries in Butte. This proposal, which is of similar nature, represents an important step in compensate the public for some of the lost use of groundwater resources of the Butte bedrock aquifer.

Failure of the High Service Tank would eliminate fire protection and domestic water service to a significant portion of the north side of Butte. Without the tank, it would be difficult to maintain pressure in the distribution system. Contamination could be drawn into the distribution system as a result of low or negative system pressures and lack of fire protection could result in property damage or loss of life. A new water storage tank will allow for fire protection and a safe reliable source of water to the system users, providing substantial benefits to a large public. Thus, the NRDP judges this project to be one of net benefits.

3. Cost Effectiveness – Likely Cost Effective

B-SB considers that the proposed project is the most economical way to replace lost services from injured groundwater resources. B-SB indicates the no action alternative would eliminate one of the few viable means to replace the lost services that groundwater provides. Another alternative proposed was to repair only portions of the

[22] A pre-stressed tank is constructed with a casing of reinforcement steel placed around the concrete and then the steel casing is tensioned by equipment that stretches the steel, which compresses and strengthens the concrete.

tank. B-SB notes that the existing tank would be difficult and too expensive to repair; however, no cost estimates for repairing the tank or an explanation as to the difficulties expected with tank repair were provided.

The application did not provide a detailed alternatives analysis. However, B-SB's response[23] to NRDP's questions did provide some additional discussion regarding the selection of the pre-stressed concrete tank, which was based on B-SB's experience. Butte has a welded steel tank that requires painting up to a cost of $200,000 every 10 years. The pre-stressed tank would have a useful life of up to 100 years and would initially cost more than a steel tank. However, B-SB failed to give detailed cost estimates to substantiate these statements.

NRDP's consulting engineer believes that the type of tank being proposed is cost effective when compared to alternative tanks, such as cast-in place, welded steel, or bolted steel tanks.[24] He also states that replacement of the tank with a pre-stressed tank is also more cost effective than repairing the existing tank. A pre-stressed concrete tank has a much longer useful life when compared to a steel tank (25 to 50 years for steel vs. 50 to 100 years for pre-stressed concrete tanks). Also, a pre-stressed concrete tank does not require periodic painting as a steel tank requires.

B-SB's response letter also answered questions about why the tank is proposed to be replaced by a similar 2.5 million gallon sized tank. The additional tank sizing information provided the maximum fire flow and maximum day flow needed for the 400-acre water zone presently served by the tank. The information provided is sufficient to justify a tank size of 2.5 million gallons based on the current demand and the current configuration of the water system, however, since the tank is located at the top of the Butte Water system and provides supplemental flow to other pressure zones, a more detailed analysis could reveal that a larger tank may be more beneficial or cost effective.

NRDP's consultant engineer opines that a water system master plan should be completed in order to make a complete and accurate assessment of a significant water system improvement such as the High Service water tank replacement. The master plan should look at the entire water system (distribution, transmission, storage, supply and treatment). A water system master plan typically includes a computer model of the entire water system and typically looks at a 20-year planning period. The computer model is used to optimize and size improvements in the water system. Without a computer model the relationship between various aspects of the water system as well as the overall effect of proposed improvements can be difficult to predict. This is especially true in the case of a water system like Butte's where the distribution system is comprised of multiple pressure zones.

[23] Memo from Jean Pentecost to Gregory Mullen dated May 18, 2004.

[24] Proposal review memo from Gary Swanson of Robert Peccia and Associates to Gregory Mullen of the NRDP, dated May 26, 2004.

As a whole, the proposed costs are reasonable; however, there are a few items, which are either missing itemized costs or expected to increase in costs. Rebar has doubled in costs and concrete testing is not included in the cost sheets. However, these costs should not cause the estimated total tank cost to be significantly underestimated.

Overall Cost Effectiveness

The NRDP believes that replacing the High Service tank with another 2.5 million gallon tank is likely cost effective; however, it would have been helpful in evaluating this project if a water system master plan had been completed. It is possible that a larger or smaller tank would be superior for Butte's water system as a whole. B-SB has applied for $100,000 in funding from DNRC to conduct the water master plan and the 2005 Legislature will decide on this funding. The NRDP suggests that B-SB not apply for grants for any other water projects of this type within the city until such a water master plan is completed. B-SB has indicated that if a water master plan indicates a need to expand the capacity of the High Service Tank, the county would not seek additional Restorations funds to do so.[25]

4. Environmental Impacts – No Significant Adverse Impacts

This project does not present significant adverse impacts on the environment. There will be some short-term impacts associated with construction activities that can be mitigated by following good construction practices and permit requirements, which B-SB indicates it will do. The time frame for construction is estimated at eight months. The old tank will be demolished after completion of the new tank.

5. Human Health and Safety Impacts – No Significant Adverse Impacts

This project does not present significant adverse impacts to the human environment. B-SB will seek to mitigate short-term safety issues typically associated with construction projects by following standard worker-safety procedures. The proposed tank replacement will enhance human health and safety by providing clean water for domestic demands, by providing storage for fire protection, and by removing the threat to the public health and welfare that the existing tank poses because of its poor condition. The tank is designed to withstand seismic events.

6. Results of Superfund Response Actions – Consistent

This project will not duplicate or interfere with results of a completed, planned, or anticipated Superfund response action.

[25] Based on memorandum dated 7/6/04 from Jean Pentecost of B-SB to Greg Mullen of the NRDP.

7. Recovery Period and Potential for Natural Recovery – No Effect

   This project will not affect the bedrock aquifer's recovery period, which will not occur for thousands to tens of thousands of years.

8. Applicable Policies, Rules and Laws – Consistent/Sufficient Information Provided

   B-SB has provided adequate information on the applicable requirements needed to complete this project. B-SB will follow the applicable DEQ approval process and the Montana Standard Specification and Montana Public Works Specification in implementation of the project.

9. Resources of Special Interest to the Tribes and DOI – No Impact

   It is not anticipated that this project will have adverse impacts on resources related to the Department of Interior (DOI), or the Tribes. The Tribes have indicated this in their comments. The DOI supports funding of this project.

Stage 2 Criteria

10. Project Location – Within Basin and Proximate

    The High Service Tank is located in Walkerville, north of the City of Butte at the edge of the bedrock groundwater injured area.

11. Actual Restoration of Injured Resources – No Restoration

    This is a replacement project; actual restoration of the bedrock aquifer in Butte is infeasible. The State recognized this infeasibility in its 1995 Restoration Determination Plan that selected a replacement alternative for this groundwater injury. This Plan considered expanding existing reservoirs as a viable restoration alternative for the bedrock injuries in Butte.

12. Relationship Between Service Loss and Service Restoration – Same

    Restoration of the bedrock aquifer is infeasible, thus the aquifer's drinking water and its storage capacity and transport services have been lost for thousands of years. This proposal constitutes replacement of lost services to thousands of property owners and other members of the public in Butte who could utilize the aquifer if it was not injured. By replacing the High Service reservoir tank, this proposal will enhance the water supply from an unaffected source. Thus, there is a direct connection between lost services and services this project will replace.

13. Public Support – 5 support comments

The NRDP received five comments in support of the High Service project, including letters of support from the B-SB Council of Commissioners and from the Butte Chamber of Commerce.

14. Matching Funds and Cost Sharing – $343,010 (22%)

Restoration Fund Request:	$1,192,802
B-SB cash match:	$ 298,200
B-SB in-kind match:	$ 44,810
Total Project Costs:	**$1,535,813**

B-SB has matching funds of $343,010, or 22% of the total project costs, for this proposal. The matching funds consist of $298,200 for construction costs and $44,810 for in-kind labor. Although not considered as a cost share on this tank project, B-SB has noted the $40 million dollars already invested by Butte municipal drinking water system ratepayers over the past 10 years. These monies were used for constructing a treatment plant for the Big Hole water supply ($20 million), water line replacement from 1992 to 2000 ($10 million) and for other surface water improvements ($10 million).

15. Public Access – Not Applicable

Public access is not allowed at the water tank area to protect the water supply. This will not change as a result of the proposed project.

16. Ecosystem Considerations – Positive

Replacing the existing tank that is in poor condition removes the threat of tank failure, which could have severe negative consequences locally and also to the larger ecosystem given that Butte's water system relies on surface water supplies.

17. Coordination and Integration – None

This project is not coordinated or integrated with other ongoing or planned actions in the UCFRB.

18. Normal Government Functions – Within but Augments Government Functions

Replacing antiquated water tanks is a normal responsibility of local governments that is typically accomplished via funding from grants and ratepayers. But the costs B-SB faces to upgrade their system are greater than typical community costs due, in part, to pervasive groundwater contamination underlying Butte. In the absence of that injury, Butte may have been able to construct a simpler and less expensive nearby groundwater system than the existing system that relies on more distant uncontaminated surface water

sources, as further documented in the State's 1995 NRD assessment report.[26] B-SB ratepayer's costs are significantly higher than other similar communities. For example, the Butte water rates are twice the rates in Great Falls, Kalispell and Anaconda, and 20% more than Helena's rates.[27]

[26] *Revised Report and Rebuttal: Assessment of Damages to Groundwater and Literature Review of Water Use Values in the Upper Clark Fork River Drainage,* Duffield, October, 1995. Note: this report estimates lost use values for Butte's bedrock and alluvial aquifers.

[27] Water Rate Survey, City of Great Falls, April 2003. B-SB rates are an average of $36.04 for metered users and $48.78 for unmetered users.

Montana Tech
Clark Fork Watershed Education Program

Project Summary

The Department of Technical Outreach at Montana Tech (MT Tech), in partnership with three other entities, requests $673,801 to implement a Clark Fork Watershed Education Program for primary and secondary level school children and teachers in the UCFRB extending from Butte to Bonner over a three-year period. The program expands on a pilot watershed education effort funded in 2003 for $25,000 offered to four 6th grade classrooms and high school students in Butte. The program will provide three tracks of watershed education: Track 1 for 6th – 8th grade students, Track 2 for high school students and Track 3 for teachers. Each phase of the program includes student and teacher training in the classroom and field. These students will use Silver Bow Creek and the Clark Fork River as large-scale outdoor laboratories to apply age-appropriate math and science principles to examine and compare the water quality and biota in uninjured, injured and restored reaches. The long-term goal of this project is to create a sustainable field science program, focused on baseline, injured and restored reaches in the UCFRB, which is widely available to school age children.

The budget originally submitted for this proposal was for $832,984 in Restoration funds to be spent over three years. After discussions between the NRDP and MT Tech, MT Tech submitted a revised and reduced budget for $673,801 in Restoration funds and $840,465 for total project costs. This evaluation is based on the revised budget.

Stage 1 Criteria

1. Technical Feasibility – Reasonably Feasible for Short-term; Uncertain Feasibility for Long-term.

   This evaluation involves determining to what degree the project employs well known and accepted technologies and the likelihood it will achieve its goals. The goals of the Clark Fork Watershed Education Program (CFWEP) are to:

   - To create a sustainable, hands-on field science program that is widely available to children in the Upper Clark Fork River watershed;
   - To put 6-12th grade students in direct contact with science professionals;
   - To ensure that residents of the UCFRB understand its damage as well as it restoration history;
   - To create a community of science-educated citizens who are engaged in the process of the UCFRB watershed restoration;
   - To educate the next generation of responsible stewards for the watershed; and
   - To act in a timely manner.

The applicant, comprised of MT Tech and its project partners, proposes to accomplish these goals through the phased development of three tracks of watershed education for students and teachers:

1) Track 1 involves 6th, 7th, or 8th grade students, with the grade level to be determined by the individual school districts. This track includes a classroom visit introducing students to basic water and stream science. These lessons will include hands-on activities related to water cycle, stream processes and sediment transport, groundwater flow, and water quality. The students will then be taken on a field trip to selected locations in the Upper Clark Fork drainage. During the field trip, students will measure stream flow, groundwater gradient, transpiration rate, water quality, macroinvertebrate density and diversity and habitat health at baseline, injured, and restored reaches in the UCFRB. There will also be follow up classroom activities.

2) Track 2 will be comprised of high school students recruited through classroom visits to participate in seminars and field trips. There will be at least one seminar every month, which will be facilitated by CFWEP personnel. Students will participate by researching and presenting information and choosing directions for further study. They will be required to undertake independent research projects and will be matched with scientist mentors. Students will participate in five field trips annually and learn to test water quality, flow rates, biotic density and diversity as well as other experiments that may relate to their individual research projects pertaining to baseline, injured and restored reaches in the UCFRB.

3) Track 3 is intended to provide teachers with annual training workshops and put teachers in direct contact with science professionals who are working in the Upper Clark Fork Watershed. Teachers participating in Track 1 will be given stipends to attend 2 one-day workshops each year. The first workshop would be tailored to address lesson plans on the water cycle, stream process, sediment transport, groundwater flow and water quality. The second workshop would be field based. Teachers would learn how to observe and measure factors listed above. Also included in this track is a weeklong watershed education camp at MT Tech where selected high school teachers and students learn the principals and techniques of environmental monitoring through hands-on experience.

MT Tech will develop and implement these tracks using the following phased approach, which the NRDP considers to be feasible.

Phase I – Planning and Development: Create ties with individual teachers and school administrators; develop appropriate project goals, objectives and infrastructure; create and compile lesson plans; and conduct fundraising.

Phase II – Implementation of Track 1 in Butte and Ramsay and Track 2 in Butte, Anaconda and Deer Lodge and Track 3 throughout the watershed in 2005 and 2006. This phase will consist of providing teachers with classroom materials, visiting the classrooms, and offering training workshops for area science teachers.

Phase III – Expansion: In 2006, Track 1 will expand to Anaconda and Track 2 will expand to Drummond. In 2007, Track 1 will expand to Garrison, Deer Lodge, Drummond, Clinton and Bonner.

The project employs well-known and accepted methods to educate teachers and students in a Clark Fork watershed education program. The project's potential to meet its goals is enhanced by the applicant's intent to build on and adapt existing watershed science curricula. Substantial groundwork for this program was accomplished through a pilot project implemented during the 2003/2004 school year. This pilot project focused on select schools within the Butte School District and served 120 high school and sixth grade students. The applicant is applying lessons learned from the pilot project to this project. Some of the lessons learned and incorporated into this proposal include: increasing teacher preparation through teacher training workshops and providing stipends to teachers for attending the workshops; increasing student preparation by supplying teachers with lesson plans prior to field visit; limiting field trip participant numbers to 30 per trip; enhancing the watershed history component; having students keep a journal of thoughts and observations; and conducting assessment surveys to monitor the academic success of the program. Area teachers who participated in the pilot considered it a success and were eager to participate in future years. Based on this favorable response of teachers to the pilot project and the NRDP's favorable observations of the pilot program as well, the NRDP believes that this program is worth expanding to a wider audience of school age children throughout the UCFRB.

The diversity and expertise of the project team and project's opportune timing in relation to restoration work in the UCFRB also enhance the likelihood of its success. Project planning and peer-review will be conducted through all the project phases by an Educational Advisory Board consisting of 10 area educators and administrators and a Technical Advisory Board consisting of 16 science professionals who are very knowledgeable about UCFRB restoration issues. With the cleanup activity along Silver Bow Creek well underway, and the pending start of activity at the Clark Fork River and Milltown within the next few years, students can observe science in the making as they participate in activities in the outdoor laboratory.

The long-term goal of this project is to create a sustainable field science program that is widely available to school age children in the UCFRB. Highlighted above are aspects of the program's management approach and skills that NRDP believes make it likely to succeed in terms of its ability to effectively educate a large number of UCFRB school children about general watershed concepts and restoration in the UCFRB. Uncertainty exists, however, about the ability the fund such an ambitious program in the long-term, particularly without continued substantial funding support from NRDP in the long-term. The applicant envisions a program that expands beyond the scope of this initial 3-year start-up effort and continues as long as watershed restoration continues. The applicant intends to seek future funding from many other entities, but to also continue to seek NRDP funding at a lower, but unspecified, funding level than this initial project request.[28] Input from others involved in seeking

[28] This evaluation does not address or evaluate future funding requests. These would be evaluated in a future application, if submitted.

funding for statewide educational programs that are more reduced in scope and budget than the proposed CFWEP is that funding for educational programs is extremely tight. Smaller, similar programs have been started in many Upper Clark Fork watershed communities, but none have demonstrated sustainability to date. The applicant notes that that the National Science Foundation grants typically have a rejection rate as high as 80%, with two grant cycles attempts typically needed to receive funding for a new project.

Factors that the applicant indicates will help sustain the CFWEP in the long-term include[29]: 1) the applicant intends to hire a full time grant writer starting in June 2004 who will devote all of their time to generate funds for the sustainability of the program increases the chances of success; 2) the focus on teacher training will increase teacher capacity and reduce the needed classroom preparation; 3) the project director will work with the school administrators to help institutionalize the curriculum; 4) community involvement will be broadened by expanding the technical and educational advisory boards to include community members for every school district; 5) there is a wide range of groups that support and participate in the program; and 6) after three years, the school districts will be asked to cover the costs for transportation, substitute teaching, and expendable items for in-class lessons and field trips. While the NRDP agrees that these factors will help the program's long-term sustainability, the NRDP cannot reliably predict whether the applicant will be successful in its long-term fundraising efforts, partly due to the lack of comparable efforts from which to judge.

In summary, the NRDP is confident about the potential success of this program except for the noted uncertainty about funding to sustain it in the long-term. Since the program is innovative and groundbreaking relative to the types of restoration projects funded to date, the NRDP recommends a funding condition that an evaluation system be established to review milestones achieved by the program and measure success and reevaluate funding for the subsequent years, including the option of discontinuing funding. Funding after Year 1 could be based on measurable milestones reached and deliverables produced during that year. The applicant offers some potential measures of success beyond the numbers of participating students and teachers, such as increased student understanding of watershed concepts and adoption of lesson plans by school district, that could be better quantified and include deliverable products. This system could be established in consultation with the applicant and be in place at the time the contract is executed. A committee comprised of the NRDP project officer, an Advisory Council member, and a consulting educator and perhaps others would review the achievements of the program and make recommendations on subsequent funding after each year.

This method of funding is established by the Trustee's Multi-year funding policy (Attachment 1), which states that projects can be approved with the expectation that they will be funded to their completion or for a certain number of years. A project in this category would not be formally reconsidered for approval in subsequent years; however, the Trustee would annually evaluate the project's funding needs and approve each subsequent year's budget for the project. As part of this evaluation, the Trustee could decide to discontinue

[29] This information is provided in the application and in supplemental information provided in MT Tech's 5/26/04 response to NRDP and Advisory Council questions.

funding. In this case, it would be due to inadequate progress made during the course of the year. It is envisioned that the committee established to review the project yearly would make recommendations to the Trustee to either continue or discontinue funding based on achievements of the program. Attachment 2 contains a draft evaluation plan that representatives of the applicant, the NRDP, and the Advisory Council developed after the *Draft Work Plan* was issued for public comment.

2. Relationship of Expected Costs to Expected Benefits – Net benefits as revised by NRDP

Total project costs are estimated at $840,465 with a request of $673,801 in Restoration funds over three years, or about $224,600 per year, and matching funds of $166,664. The approximate breakdown of the Restoration fund costs for three years is as follows:

Salaries:	$322,625
Fringe:	$ 95,136
Contracted Services:	$ 68,764
Supplies:	$ 14,310
Communications:	$ 22,500
Travel:	$ 19,466
Equipment:	$ 1,000
Misc.:	$ 17,700
Indirects:	$112,300

The majority of Restoration funds, or 70%, will be for program staffing, which includes two full-time positions (a project director and science coordinator) and numerous part-time positions, none that exceed one-quarter time. As explained under criterion #3, the NRDP believes that all costs are reasonable and necessary to accomplish this project's ambitious goals.

With respect to benefits, this project lays the foundation for creating a sustainable field science program that uses the entire Upper Clark Fork watershed as a "living classroom," which is widely available to all school aged children. The direct benefits of this project include providing a group of students an understanding of restoration and remediation efforts in the UCFRB through stream science education and connecting 6^{th}-12^{th} grade students to science professionals. Related quantifiable benefits tied to student and teacher participation in CFWEP from 2005 through 2007 are:

- Via Track 1, the participation of about 1,600 students in 15 elementary schools in about 55 field trips, with associated classroom preparatory and follow-up lessons;
- Via Track 2, the participation of about 780 students in four high schools[30] in about 65 field trips and associated classroom seminars and independent research projects; and
- Via Track 3, the participation 90 teachers, some participating in three weeklong science camps for high school teachers and the majority participating in six one-day workshops for elementary school teachers.

[30] The number of participating high school students is estimated to be 10% of the total enrollment.

The indirect benefit of this project is that educating school children about the restoration of injured resources can increase the likelihood that the UCFRB's future residents will be engaged in restoration and be responsible stewards for the watershed. The NRDP agrees with the applicant that, "The greatest lesson we can pass on to future generations is taking responsibility for our actions. Our children need to know why they must work to create a healthy watershed, and what they must do to maintain it into the future."

As noted under criterion #17, the goals of CFWEP related to the knowledge and stewardship of future UCFRB residents match well with the educational goals of the UCFRB Remediation and Restoration Advisory Council and the consensus-derived vision statement developed for the restoration of Silver Bow Creek watershed. These goals all share an underlying, holistic approach to watershed restoration that integrates the scientific, cultural, social, and economic values associated with a healthy watershed.

While uncertainty exists regarding the sustainability of such an ambitious program in the long-term, significant benefits will result from the program's implementation in its first 3 years. Those benefits include the production of useful lesson plans and workshop training materials on watershed concepts and restoration of injured resources in the UCFRB and the education of teachers and students who participate of the program in its first three years. Teachers participating in the program in its first three years will likely carry on the lessons learned to other teachers and future students. In addition, providing a well-funded, well-implemented program at the outset will make achievement of a sustainable, hands-on field science program over the long-term more likely to be attained.

While the project costs may seem high, the costs become easier to understand when compared to the number of students (2,380) and teachers (90) involved. This translates to about $272 per teacher or student over a three-year period. Given the amount of information and experience to be gained by those participating, the NRDP believes the project offers net benefits (with the noted exception of paying honorariums). Compared to the millions of dollars to be spent to restore injured resources and to remediate in the UCFRB, it represents a small but important investment in the future caretakers of the restored watershed's landscape.

3. Cost-Effectiveness – Likely Cost Effective

The applicant did not detail alternative approaches, stating that there are no directly comparable alternatives. They noted that community-specific projects without adequate funding sources are not apt to succeed and that existing tight school budgets make it unlikely that a program similar to CFWEP would be implemented without supplemental funding. The NRDP agrees that having the centralized program envisioned in CFWEP available to schools throughout watershed offers cost savings to community-specific projects through the sharing of resources, equipment, and project personnel and that the projects goals could not be accomplished within the existing school system budgets.

The favorable aspects of the project approach noted under criterion #1 that increase the likelihood of its success are also favorable from a cost-effectiveness standpoint. Those

aspects include use of existing watershed curricula; the demonstrated success of the 2003/2004 pilot project that laid the groundwork for this request; the emphasis on teacher training and incentives for teachers to attend the training; the opportune timing of the project, the great diversity and expertise of the team members and advisory boards; and the planned peer review by educational and technical experts.

The NRDP conducted a detailed review of the budget in term of possible cuts that could be made and still meet the desired project goals, particularly in terms of the number of schools, students and teachers the program would serve. As a result of this analysis and the NRDP's consultation with the project applicant on budget reductions, the original budget was reduced from $832,984 to $673,801. The major reductions occurred in the proposed salary of the project director and science education coordinator (with corresponding reductions fringe benefits and indirects costs), the elimination of laboratory analyses[31], and cutting the number of field kits per school. An additional match from Montana Tech will cover the equipment charges for the first year as well as half of the salary for the grant writer for three years. The NRDP did consider combining the project director and science education coordinator positions, however, this would have severely reduced the number of field trips and amount of classroom time.[32]

The applicant proposes a total budget of $17,600 to compensate technical advisors for their donating their time to plan and lead daylong field trips at $200/school visit. The NRDP questioned the need for these honoraria, believing that professionals can be found who would be willing to take part in classroom and field activities as a part of their regular course of work or on a volunteer basis. The NRDP also questioned providing $200 in honorarium to technical advisors who might only provide limited services. To address these concerns, the applicant provided a set of criteria provided in Attachment 3 that advisors would need to meet to eligible for a $200 honorarium. The NRDP suggests a funding condition that honoraria for technical experts be awarded only to those that meet an agreed-upon list of criteria and are subject to approval by the NRDP.

Teachers would receive a stipend of $100 each ($9,000 total) to attend a two-day teacher-training workshop and $500 each ($7,500 total) to attend the weeklong summer workshop. Based on their experience with the pilot project, the applicant proposed these stipends to give teachers added incentive to take on new learning and make changes in their class plans. Based on input from other environmental educators to the NRDP, these stipends are needed. The NRDP suggests a funding condition that the stipends will only be provided to teachers who complete training and fully participate in the program.

An alternative not evaluated by the applicant would have been to develop a smaller scale project. Reducing the scale would likely involve reducing the number of schools, students, and teachers participating in the program and lengthen the timeframe for educating primary

[31] Results of field test kits and field equipment were considered sufficient for collecting monitoring data of screening level-quality.

[32] Supplemental information provided by MT Tech in 5/26/04 and 6/21/04 correspondence to Kathy Coleman of the NRDP.

and secondary students in the UCFRB about the restoration activities now occurring or soon to occur nearby. However, it is more appropriate to maximize the number of participants, particularly those living in the upper portions of the UCFRB where the greatest injury occurred, and increase the number of future residents informed about and engaged in the restoration process. With the remediation and restoration actions completed along ¼ of the Silver Bow Creek corridor and the pending start of Clark Fork River and Milltown Reservoir remediation and restoration actions within the next few years, the time to develop a field-oriented science curriculum for UCFRB school children is now. The recommended evaluation of the program on annual basis as described under criterion #1 affords an opportunity to evaluate whether the scope and costs of the project could be reduced in subsequent years, without jeopardizing the number of students and teachers served in an optimum timeframe.

4. Environmental Impacts – No Significant Adverse Impacts

   The applicant recognizes that repeated visits to a single spot by groups of up to thirty students may negatively impact vegetation at sample sites. The applicant has made a commitment to minimize these impacts, and sampling locations will be selected with this in mind.

5. Human Health and Safety Impacts – No Adverse Impacts

   The applicant will be required to assure that program participants will not be exposed to unacceptable levels of contamination. This project does not involve any activities that would adversely impact safety other than transportation to and from the field trips. Transportation will be the responsibility of the school districts. The applicant notes the Butte School District No. 1 has liability coverage for field trips and parents are required to sign permission slips before children are allowed to participate. School district liability coverage will be required for each school district that participates in CFWEP. In addition, the applicant includes funding for supplemental student insurance in the budget.

6. Results of Superfund Response Actions – Positive Coordination

   This project will not interfere or duplicate the results of completed, planned, or anticipated Superfund response actions. As noted previously, the timing of this project fits well with the schedule for Silver Bow Creek and Clark Fork River restoration and remediation efforts. Increasing the knowledge about remediation efforts can help protect these remediated areas from future detrimental human activities.

7. Recovery Period and Potential for Natural Recovery – No Effect on Recovery Period

   The project will not change the timeframe for recovery.

8. Applicable Policies, Rules and Laws – Consistent

The lesson plans developed for this program will conform to Montana standards for science, writing and social studies. The applicant indicates the teaching material and methods will meet and exceed state and national science standards. The workshops will qualify as continuing education credits for teachers.

The applicant notes that once sampling sites are selected, it may be necessary to obtain landowner permission.

9. Resources of Special Interest to the Tribes and DOI – No Impact

This project will not directly impact resources of special interest to the Tribes or DOI. By instilling a philosophy of stewardship of natural resources in school children, it can indirectly benefit these resources. The Tribes have noted that the project does not present any concerns regarding negative impacts to tribal culture or religious sites. In its comments, the DOI notes that education of the public is essential to the long-term success of restoration efforts but reserves judgment on project funding pending further clarification regarding the project's monitoring activities and connection to restoration benefits.

Stage 2 Criteria

10. Project Location – Within the Basin and Proximate

All activities associated with this project will occur within the UCFRB and pertain to natural resources that were subject of Montana v. ARCO, with the program targeted for Butte, Anaconda, Ramsay, Deer Lodge, Garrison, Drummond, Clinton and Bonner area school children. The applicant will also make the program materials available to Montana schools outside of the UCFRB.

11. Actual Restoration of Injured Resources – May Contribute to Restoration

This project is not intended to accomplish restoration of an injured natural resource. It will indirectly benefit restoration of injured resources by promoting stewardship of those resources through education. The monitoring conducted by the students may assist the State by providing screening level data through the students' documentation of the restoration and recovery of injured resources.

12. Relationship between Service Loss and Service Restoration – Similar

This project will restore or replace lost or impaired services of Montana citizens. As part of the Montana v. ARCO settlement, in addition to resolving the lost service claims such as for recreation and groundwater use, the settlement also resolved claims for the service that unimpaired resources provide the public simply by virtue of their existence, also referred to as claims for non-use values. This grant would follow a line of restoration grants occurring in several states that focus on the restoration of lost services through interpretive and public

education about the injured or lost natural resources.[33] Thus a condition of funding should be that all activities undertaken under the CFWEP would pertain to the natural resources or services that were the subject of Montana v. ARCO or the partial settlement of that lawsuit. Also, by enhancing stewardship of restored resources, the project will also enhance the services provided by those resources.

13. Public Support – 3 project partners; 38 support comments

Three project partners are involved in this application. They include: The Center for Riverine Science and Stream Renaturalization; World Museum of Mining (WMM); Montana Mind Expansion (MoMEx). This project will have the cooperation of the Watershed Education Network – WEN; MT Watercourse (Montana State University); and schools in the Upper Clark Fork Watershed.

The NRDP received a total of 38 comments in support of the CFWEP, including 21 letters of support. Letters have been received from the following entities: University of Montana's Center of Riverine Science and Stream Renaturalization, the Montana Watercourse, the George Grant Chapter of Trout Unlimited, the Montana Mind Expansion, the Montana Tech Regional Science Fair, Butte School District No. 1, Anaconda School District, Drummond Schools, Powell County High School, Kennedy School (Butte), Ramsay School, Rattlesnake Productions and Butte High Science Department.

14. Matching Funds and Cost Sharing –19% Match (8% In-kind)

Restoration Request:	$673,801
EPA (pending cash match):	$ 15,000[34]
Americorp (cash):	$ 45,632
Butte School Dist. (cash):	$ 8,850
MT Tech (cash):	$ 23,501
MT Tech (In-kind):	$ 73,681
Total Project Costs:	**$840,465**

Matching funds include $166,664 or 19% of the total project costs.[35] Of this match, $92,983 comes from a cash match from the sources listed above and $73,681 comes from un-recovered indirect costs from MT Tech. This figure is calculated as the difference between the 20% of the total direct costs of $112,300 to be applied to this grant and paid by the Restoration Fund compared to the full indirect federally-approved and audited rate of 44% of total salaries and benefits that MT Tech could have applied to the project, which would have amounted to $185,981. This approach is consistent with other grants MT Tech has sought

[33] See for example, the State of Alaska's Youth Area Watch program, and the final restoration plan for the Tenyo Maru spill in Washington.

[34] The applicant was unsuccessful in receiving EPA education funds in 2004 but intends to reapply in 2005.

[35] These matching funds are those indicated in the 5/26/04 response to NRDP questions and 6/21/04 correspondence rather than those identified in the application.

from other state agencies that have restricted the indirect costs to the 20% rate and recognized the difference between the 44% and the 20% as an in-kind match.

15. Public Access – Not Relevant

Public access is not relevant to this project.

16. Ecosystem Considerations – Positive

This project will further the knowledge of school children and teachers about ecosystem concepts and stewardship of natural resources.

17. Coordination and Integration – Coordinates/Integrates

This project will integrate educational materials that focus on the resource conditions of the UCFRB, including the NRDP's multi-media CD's (Restoring Silver Bow Creek and the UCFRB multi-media project) and the UCFRB educational trunk developed by Watershed Education Network. A set of detailed lesson plans will be included in the trunk with information on how to reach the CFWEP team to arrange for field trips for out of town students.

The monitoring aspect of the project will coordinate with the State's comprehensive monitoring effort currently underway on Silver Bow Creek and to occur on the Clark Fork River.

The goals of the program are consistent with the educational goals of the UCFRB Remediation and Restoration Advisory Council, which are to promote public understanding of the need for site remediation and restoration and impart knowledge that encourages active public participation in remediation and restoration. The goals also fit well with goals of the Silver Bow Creek Greenway project and the following portion of the consensus-derived vision statement developed for the Silver Bow Creek watershed, which connected a healthy ecosystem with a quality education and informed citizenry:

> The Silver Bow Creek watershed's healthy ecosystem provides for quality education and balanced recreation, contributing to a diverse and sustainable economy, improved aesthetics and community well being. Stable and healthy local communities of informed citizens actively protect and preserve the watershed's resources.

18. Normal Government Functions – Within but Augments Normal Government Functions

The NRDP considers this project as one that augments but does not replace normal government function. Teaching science is a normal part of public schools. However, this program will enhance existing curricula and provide a depth of science education and access that is beyond the ability of most public school teachers and is focused specifically on the baseline, injured, and restored reaches in the UCFRB. This specific curriculum would not be

undertaken basin-wide without this funding. In addition to the enhanced curriculum afforded by this project, it will also provide students the opportunity to experience "hands on" learning with the opportunity to participate in field activities. Another added benefit that would not be accomplished without the use of outside funds is the ability to put school children in direct contact with science professionals who are doing research within the Upper Clark Fork Watershed.

Project funding will not be used for funding teacher's salaries expect for a $70 reimbursements to pay substitutes for high school teachers who accompany students on daylong trips ($1,540 total). The substitute fee ensures the high school teachers will not have to pay substitutes themselves. The stipends teachers will receive to attend workshops do not replace teacher's salaries and the NRDP has recommended that the stipends only be provided to teachers who complete training and fully participate in the program (see criterion #3).

Land Acquisition Criteria – Not Applicable

Monitoring and Research Criteria – Under this criterion, grant applications would typically include the expected end result of the monitoring and research component. However, while CFWEP is an education program, it would conduct monitoring for educational purposes only.

21. Overall Scientific Program – Coordinates

The applicant commits to coordinating the monitoring portion of the project with the ongoing monitoring of Silver Bow Creek and the Clark Fork River and coordinating the database development with the Montana's Natural Resource Information System (NRIS) database managers as well as with the United States Geological Survey.

22. Assistance with Restoration Planning – Minor Benefit

The program will not provide quality assurance/quality control (QA/QC) level laboratory analyses. However, the program would provide screening level data through the students' documentation of the restoration and recovery of injured resources. This project may therefore provide a minor benefit in terms of providing long-term screening level monitoring information on the status and condition of natural resources and recovery of those resources by monitoring various water quality, biologic and physical stream parameters as remediation and restoration are taking place (although the data collected would not be QA/QC data). This could possibly augment the State's restoration monitoring efforts.

ATTACHMENT 1

Funding Policy for Multi-Year Projects[36]

1) The Trustee shall have the flexibility to approve full or partial funding of multi-year projects. Projects would fall into one or two categories:

Category 1 – Multi-year projects that would be approved with the expectation that they will be funded to their completion or, at least, for a certain number of years. A project in this category would not be formally reconsidered for approval in subsequent years; however, the Trustee would annually evaluate the project's funding needs and approve each subsequent year's budget for the project. As part of this evaluation, the Trustee could decide to discontinue funding.

Category 2 – Multi-year projects that would be approved for the first year's funding with the expectation that they will be resubmitted for approval in a subsequent year. A project in this category would be generally one whose future scope or priority over other projects is uncertain. (It's possible that some projects under this category might need more than one year's funding to demonstrate effectiveness.)

2) When approving a multi-year project, the Trustee should use only the projected expenditures in the first year of the project to determine whether the spending limitation for that year will be exceeded. The Trustee should use the projected expenditures in any subsequent year to determine whether the spending limitation for that subsequent year will be exceeded.

3) The Trustee shall limit the amount of multi-year projects that the State commits to pay in the future by assuring that total spending limit in any future year will not exceed the funding limit set for that year. Subject of public review, the Trustee may set future year spending limits on an annual basis.

[36] This policy was approved by the Trustee Restoration Council on November 14, 2000

ATTACHMENT 2

Draft Evaluation Plan for the Clark Fork Watershed Education Program (CFWEP)

I. An evaluation committee made up of six individuals as identified by the NRDP staff will comprise the evaluation committee. At least one member will be a professional educator such as a teacher, a principal who is not involved with the CFWEP project or a representative from the Office of Public Instruction. A member of the Upper Clark Fork River Basin Remediation and Restoration Education Advisory Council (Advisory Council) and Trustee Restoration Council will also serve on the committee. The committee will meet quarterly with program staff to review the progress of the program, as measured by the accomplishment of the following milestones. It should be noted the milestones are subject to change, as the evaluation committee deems necessary. Members of the evaluation committee and the Advisory Council's Communication Subcommittee will be provided the opportunity to comment on draft lesson plans and other materials produced through the CFWEP.

II. The program will assure neutrality by guaranteeing that all materials produced or disseminated are fact based and do not advocate or promote any particular political or social viewpoint.

III. Program Administration Evaluation Milestones

- The program will be fully staffed within 3 months of funding.
- The program will be providing direct services to participating schools and students within 4 months of funding notification.
- The program will assure sustainability by submitting a minimum of 6 non-NRDP grant proposals or securing a minimum of $22,000 of non-NRDP funds annually.

IV. Track One (services to 6, 7 or 8th grade students) Evaluation Milestones

These milestones are limited to the schools in the basin to which the program will provide direct services. The target schools are; the seven elementary schools in Butte, Butte Central Junior High, East Middle School, Ramsay School, Dwyer Intermediate, Fred Moodry Middle School in Anaconda, EF Duvall Middle School, Deer Lodge Elementary, Avon Elementary, Elliston Elementary, Garrison Elementary, Gold Creek Elementary, Drummond School, Hall School, Philipsburg School, Bonner Schools, and Clinton School.

- A minimum of 10 area scientists will serve the program's target schools as classroom presenters, student mentors, or field trip leaders by the end of year one.
- A minimum of 15 area scientists will serve the program's target schools as classroom presenters, student mentors, or field trip leaders by the end of year two. (Please note, these 15 scientists may include some of the ten scientists who served the program in year one.)
- A minimum of 20 area scientists will serve the program's target schools as classroom presenters, student mentors, or field trip leaders by the end of year two. (Please note,

these 20 scientists may include some of the scientists who served the program in prior years.)

- 10 teachers from target schools will report teaching watershed science lessons (Please note, these lessons refer to one-hour subject lesson plans, some of which may be part of a larger unit.) in their classroom after year one.
- 20 teachers from target schools will report teaching watershed science lessons in their classroom after year two.
- 30 teachers from target schools will report teaching watershed science lessons in their classroom after year three.
- One target school will agree to use watershed science teaching for 6, 7 or 8th grade students after year one.
- Three target schools will agree to use watershed science teaching for 6, 7 or 8th grade students after year two.
- 70% of target schools in the basin will agree to use watershed science teaching for 6, 7 or 8th grade students after year three.

V. Track Two (services to high school students) Evaluation Milestones

These milestones are limited to the schools in the basin that the program will provide direct services. The target schools are; Butte Central High School, Butte High School, Anaconda High School, Powell County High School, Granite County High School, and Drummond High School.

- At least 10 area scientists will be paired with students as mentors by the end of year one. (Please note, an individual scientist may pair with more than one student, this milestone is intended to measure the programs effectiveness at integrating scientists with the schools, not necessarily the number of students served).
- At least 20 area scientists will be paired with students as mentors by the end of year two. (Please note, these 20 scientists may be some of the same people who served the program in year one.)
- At least 30 area scientists will be paired with students as mentors by the end of year three. (Please note, these 20 scientists may be some of the same people who served the program in prior years.)
- The number of related science fair projects presented at the regional and/or state science fair by area students will increase by 5% after year one.*
- The number of related science fair projects presented at the regional and/or state science fair by area students will increase by 20% after year two.
- The number of related science fair projects presented at the regional and/or state science fair by area students will increase by 30% after year three.

*(Baseline data for these milestones is available from the State Science Fair Director's Association, and they will be measured from data collected via the association.)

- Four teachers will report teaching watershed science lessons in their classroom after year one.
- Eight teachers will report teaching watershed science lessons in their classroom after year two.

- Every high school in the basin will have at least one teacher will report teaching watershed science lessons in their classroom after year three.
- One target school will agree to use watershed science teaching for 9-12th grade students after year one.
- Three target schools will agree to use watershed science teaching for 9-12th grade students after year two.
- All target schools in the basin will agree to use watershed science teaching for 9-12th grade students after year three.

VI. Track Three (services to teachers) Evaluation Milestones

- At least 30 teachers will participate in the summer training institutes annually.
- The activities and related accomplishments of the program will be shared state-wide with educators via presentations made at the Montana Educators Association annual meeting, the annual meeting of the Montana Small Schools Alliance, and any other appropriate educational conferences.
- All the lesson plans and activities developed (the curriculum) will be published and ready for distribution basin-wide by the end of year three.

ATTACHMENT 3

CFWEP Honoraria Criteria Statement

To design and implement field programs that are tailored to each participating school we will seek science and engineering experts working in specific scientific fields and in reaches of the watershed near the schools. Honoraria will be awarded to science and/or engineering experts who participate in the Clark Fork Watershed Education Program if they meet the following criteria:

1) Experts must provide documentation of services rendered to the program. They will be paid $25 per hour. The $200 per field trip honorarium written into the CFWEP budget is based on an 8 hour work day.

2) Experts must contribute written plans for sampling, research, and lessons for a specific site along the Upper Clark Fork. For example, the Deer Lodge school district may focus field work on arsenic loading to the Clark Fork from Arrowstone Park, while Ramsay students may measure copper loads from slickens at Miles Crossing. The input required from such experts will decrease as lesson and research plans are acquired by the program.

3) Experts are expected to plan and execute one scientific component of a field trip. For example, he or she might plan and present a water chemistry component of a field trip in which riparian flora and macroinvertebrates are also surveyed.

4) An honorarium will be given only to those who will not otherwise be compensated for the time they spend working for CFWEP. Scientists for whom education outreach is a part of their job will not receive an honorarium, and efforts will be made to recruit such people before an honorarium is offered.

Watershed Restoration Coalition of the Upper Clark Fork
Browns Gulch Watershed Project, Phase I

Project Summary

The Watershed Restoration Coalition of the Upper Clark Fork (WRC), in association with the Mile High Conservation District (MHCD), proposes a Project Development Grant to assess the physical, chemical, and biological conditions of the Browns Gulch watershed and determine how best to improve surface water quality, aquatic resources, terrestrial resources, and recreation opportunities in Browns Gulch. The total project costs are $293,888, with $197,378 requested in Restoration funds and $96,510 to be provided in matching funds.

The Browns Gulch watershed is a tributary of Silver Bow Creek, originating near the continental divide north of Butte. The watershed is about 55,000 acres consisting of approximately one-half private lands dominated by agricultural properties and rural homes and one-half national forestlands. The watershed has eight fish-bearing streams and the main stem of Browns Gulch provides recreation opportunities and supports a wide variety of wildlife. The current conditions of the natural resources within the watershed range from excellent to very poor, depending on the natural resource and its location.

This Phase I project, which would occur over two years, will produce an implementation guideline plan for improving natural resources in the watershed by focusing on seven resource areas: stream flows, invasive plant species, wildlife management, fishery management, forest health, riparian zone/water quality, and conservation easements. The WRC will use results of the Phase I assessment process to seek future funding from the Restoration Fund and other sources to implement recommended natural resource improvements.

Stage 1 Criteria

1. Technical Feasibility – Task Specific

   This evaluation considers whether the project employs well-known and accepted technologies and whether it is likely to accomplish its goals. The project's overall goal is to identify current physical, chemical, and biological conditions, establish baseline conditions, and prioritize habitat, water quality, and stream flow restoration needs in the Browns Gulch watershed. The applicant has grouped project tasks that would be conducted to accomplish this goal by the seven resource areas: stream flows, invasive plant species, wildlife management, fishery management, forest health (outreach tasks only), riparian zone/water quality, and conservation easements (outreach tasks only). A final task would be to compile all of the data and reports generated into one watershed assessment report and plan.

The applicant recognizes general uncertainties in retaining adequate funding to complete the needed assessment and also in the landowners and agencies continuing to participate in the future. The NRDP agrees with the applicant that these uncertainties are common to watershed projects and adjustments can be made to overcome these uncertainties. Proposed tasks constitute monitoring, research, or outreach activities, none of which involve technological uncertainties. Some uncertainties exist, however, as to whether the selected tasks will accomplish the indicated goals as discussed below on a task-specific basis.

Also provided below is the specific Restoration fund request indicated by the applicant for the seven resource areas. These amounts shown below do not include $52,688 for project administration, supplies and materials, travel, equipment, and report production that are associated with completing all these tasks.

Task 1 Stream Flow/Water Balance/Storage Analysis (Restoration Fund request $73,400) – Some components are reasonably feasible

This task will characterize stream flow in Browns Gulch and its tributaries; evaluate irrigation uses and efficiencies; assess alternatives associated with water storage and routing; and produce a water budget for the watershed. The current conditions of the watershed do not meet all the irrigation water use demands and fishery needs. In addition, the water rights in this watershed are over-allocated.

Of the proposed Task 1 activities, the NRDP believes the tasks totaling $37,600 that involve assessing stream flow, irrigation efficiency, and groundwater and determining a water budget are needed and likely to achieve their objectives. The NRDP questions, however, the need for, and consequently the likelihood of success of, the proposed water storage and routing studies. Insufficient information was provided by the applicant on both proposed storage and routing analyses. The applicant requests $35,800 to review existing water storage data and water rights, and to conduct an engineering assessment of three areas for water storage potential. Three other studies have been completed within the Browns Gulch watershed that analyzed water storage potential,[37] including one study that evaluated the same general locations as proposed for study with this project. These studies were not referenced or discussed in the application. The NRDP's review of these documents indicates that while water storage potential exists in the drainage, the high costs of the structures make construction of water impoundments infeasible. The 1990 report prepared for DNRC by Aquoneering indicates the creation of a water impoundment would result in a high hazard dam classification, which would raise liability issues and increase costs for creation of such impoundments. One study (ESA, 1990) estimates annual costs of storage ranges from $35 to $55 per acre-foot, depending on this size of the reservoir.

[37] *Reconnaissance Investigations of Damsites, Upper Clark Fork River Basin.* Aquoneering, June 1990. Prepared for DNRC; ESA Consultants, June 1990. *Evaluation of Browns Gulch and German Gulch Storage Areas.* US Department of Agriculture Soil Conservation Service and Forest Service. 1994. *Cooperative River Basin Study, Upper Clark Fork River Storage Sites.*

The USDA (1994) study estimated the costs of impoundments at two locations in the Browns Gulch as ranging from about $40 to $44 per acre-foot discounted at 4.6% over a 70-year period. The studies lead to a conclusion that these storage reservoirs would be cost-prohibitive based on beneficial storage. The USDA (1994) report also shows that the irrigation benefits for raising hay from a sprinkler system in mid-July is $37.50 per acre-foot, while flood irrigation is $18.75 per acre-foot. While these analyses are confined to judging feasibility based on the cost: benefit relationship to irrigators, the additional benefits to fisheries is not likely to change this negative cost: benefit relationship. The cost to lease the stored water varies amongst watersheds and is dependent on the value of the resources produced with that specific watershed's water. For example, if the water produces a highly valued resource such as a critical spawning stream, the water is worth more than water that produces a resource of lesser value. A recent review of what private users were paying the DNRC for stored water uses indicated a maximum of about $14 per acre foot.[38] Based on available information, the NRDP does not believe conducting the proposed water storage research would accomplish its intended goal of obtaining beneficial information about effective ways to augment stream flows to support fisheries and sustain agricultural uses in Browns Gulch. If the baseline investigations to be conducted as part of this grant indicate that Browns Gulch has high fishery values and there is a need for restoration, then further evaluation of water storage potential in light of those results can be subject of future grant request. This request would need to be better detailed and justified than the existing request.

The applicant indicates in the application and in its response to NRDP questions[39] that water routing will also be evaluated within this task. A high level of uncertainty exists concerning the evaluation of water routing due the lack of information provided in the application. The applicant did not include this task in its detailed budget, so we have assumed it is covered in the budget for the water storage study. Nor does the application identify what water routing would be considered. From the applicant's response to NRDP questions and follow-up conservations, the NRDP understands this tasks involves evaluating the cost:benefit relationship of routing clean water from the headwaters of Yankee Doodle Creek to Browns Gulch to augment stream flow in Browns Gulch and preclude the Yankee Doodle Creek water from entering the contaminated Berkley Pit and thereby having to be treated. While cost savings can be achieved by routing clean water around the Berkley Pit so it does not have be the treated, there are other feasible, less expensive, and more beneficial options for routing Yankee Doodle Creek water within its own watershed rather than an adjacent watershed. These alternate options would also be of less complexity in terms of water rights uses than the option proposed for study. The NRDP does not believe this task would accomplish its intended goals of obtaining useful information on how to augment stream flows to support fisheries and sustain agricultural uses in Browns Gulch.

[38] Doug Martin communications with Pat Saffel, Regional Fisheries Manager, FWP.

[39] 5/19/04 letter from Scott Payne of KirK Environmental to Doug Martin of the NRDP.

In summary, of the proposed Task 1 activities, the NRDP does not believe the proposed water storage and routing analyses will accomplish their objectives and thus does not recommend funding these efforts that were budgeted for $35,800.

Task 2 Invasive Plant Species (Restoration Fund request - $20,000) – Reasonably Feasible:

The application states that invasive plant species are taking over the watershed and loss of native species is a potential contributor to increased stress on wildlife, streambank stability, and competition between grazing and wildlife. The applicant proposes to use Restoration funds for the Butte-Silver Bow (B-SB) Weed District to map invasive species along the riparian areas and one upland area. The application does not indicate the number of acres to be inventoried; however, discussions with B-SB indicate that the time (800 hours) and budget ($20,000) will be enough to map approximately 900 feet on both sides of all streams within the Browns Gulch watershed. A weed management plan will be developed using the collected information. The WRC indicated in the application that they will not be asking the State for additional money from the Restoration Fund to pay for the implementation of the plan, although Fund money might be requested for weed control on future Restoration Fund projects that would involve soil disturbance.

The uncertainties associated with the success of this task involve the ability to secure future funding for implementation of the weed management plan and whether needed weed mapping and control will occur in other areas of the watershed. The NRDP believes that the weed mapping data in the riparian zone is an important component to establishing a healthy riparian corridor and that conducting the mapping will increase the chances of obtaining supplemental weed management funds.

Task 3 Forest Health (Restoration Fund request $2,400) – Reasonably Feasible:

The applicant proposes to compile data on forest health, such as insect infestation, conifer encroachment on grasslands, and hazardous fuel reduction. The applicant will partner with the Montana Department of Natural Resources and Conservation (DNRC) and the MSU Extension Service on this task. Restoration funds would to be spent on coordination and on setting up meetings with landowners and organizing a workshop on forestry health. While it is unclear in the application as to what entity would be conducting proposed outreach, supplemental information provided by the applicant indicates the requested monies would go to the MCHD to augment DNRC's forestry management efforts. There are no uncertainties associated with technical feasibility of the proposed outreach tasks.

Task 4 Elk Management (Restoration Fund request $4,900) – Reasonably Feasible:

The applicant proposes to have FWP lead the analyses of existing elk population data, conduct addition elk population surveys, and make recommendations to current elk management and land use practices. The information could lead to enhanced

rangeland conditions for elk and cattle. FWP indicates the current elk population is lower than historic levels while landowners have noted increasing problems of wildlife depredation in lower Browns Gulch.

While the proposed tasks are feasible, input to the NRDP from the current and past area FWP wildlife biologists for the project area indicates some uncertainty about collecting data that would be useful for addressing landowner/elk issues. Population surveys are conducted using aerial flights and the number of elk counted can vary from greatly from flight to flight. FWP conducts annual surveys while elk are in their wintering areas or more visible during spring green up. These annual surveys allow FWP to estimate elk population numbers based on years of surveys during the same period of time each year. The survey information collected during these surveys is variable and utilization of past year's surveys along with the present year's annual survey are used to estimate the elk population. FWP's annual surveys provide the best approximation of the elk population. Additional elk surveys completed at times when landowners are reporting the highest impacts could be useful to determine an approximate number of elk that are utilizing private ground and could provide insight into elk population distribution within Browns Gulch. This information will allow resource managers the ability to propose changes to the current elk management strategies or propose land use changes, which may increase recreational uses and hunting opportunities. While the data collected during these additional survey flights may not be adequate to address the elk/landowner issues, the survey data will provide worthwhile information to resource agencies on wildlife populations and management.

The uncertainties associated with the budget for this task, which was proposed without direct input from FWP, are addressed with a revised scope and budget discussed under the cost-effectiveness criterion (#3). With these changes, the NRDP considers this task to be reasonably feasible.

Task 5 Fishery Enhancement (Restoration Fund request $6,940) – Reasonably Feasible:

The applicant proposes to have FWP lead fisheries assessment work that involves population surveys, genetic testing, and habitat surveys. The work will focus on identifying ways to enhance westslope cutthroat trout opportunities and include a fish barrier assessment aimed at considering options to preserve previously identified westslope cutthroat trout populations. This effort would be coordinated with a similar effort conducted by the U.S. Forest Service (USFS), who has committed $10,000 to its assessment.

There are uncertainties about the budget for this effort, which was estimated without direct input from the area FWP fishery biologist. These uncertainties are addressed under criterion #3.

Task 6 Riparian Health and Water Quality (Restoration Fund request $29,630): – Reasonably Feasible:

The applicant proposes to collect water quality data on streams, complete biological monitoring of macroinvertebrates within the streams, and complete a riparian assessment. This monitoring will provide the applicant data to identify degraded riparian habitat and underlying causes of that degradation. The applicant proposes to establish water quality monitoring stations at four stations and collect quarterly samples to assess water quality. Eleven stations will be sampled and analyzed for benthic macroinvertebrates. The largest aspect of this task will be the riparian evaluation of 30 miles of streams. The lower 15 miles of Browns Gulch and an additional 15 miles of tributary streams will have their associated riparian corridors assessed using the MDEQ Stream Reach Assessment, Hansen's Riparian Health Assessment, NRCS's Proper Functioning Condition assessment methods.

The applicant indicates that this task is only possible as proposed if the NRCS, DNRC, and FWP help support the effort with proposed matching funds. These agencies have indicated a willingness to provide many of these services as in-kind services. $14,000 of the $18,000 in matching funds has been confirmed.

Task 7 Conservation Easement Outreach (Restoration Fund request $7,440) – Reasonably Feasible:

The applicant proposes using Restoration funds to prepare education materials and conduct two workshops on conservation easements for watershed residents and to facilitate meeting between interested landowners and entities that acquire easements. Interested landowners will receive information on the types and options that various conservation easements offer.

This type of outreach has been successful on the Blackfoot River where the Blackfoot Challenge, in cooperation with multiple entities that acquire easements, has assisted many landowners in considering the advisability of conveying conservation easements. There are no uncertainties regarding its feasibility or the likelihood this outreach will meet the indicated goal of helping landowners make informed decisions about easements.

2. Relationship of Expected Costs to Expected Benefits – Net Benefit with Proposed NRDP Reductions

Total cost for the proposed project is projected to be $293,888, with $197,378 (67%) in Restoration funds and $96,510 (32%) proposed in matching funds. Based on uncertainties associated with the technical feasibility and cost effectiveness of some tasks, the NRDP recommends Restoration funding of $143,404, or a budget reduction of $53,974.

The recommended $143,404 in Restoration funds, combined with $86,510 in matching funds, would be used to assess stream flows, water quality, riparian habitat, aquatic habitat; to develop a water budget; to survey elk and fish populations; to map weeds in riparian areas; and to produce an implementation guideline plan for improving natural resources and maintaining the current social and economic fabric of the Browns Gulch watershed. It is assumed that implementation of the guidelines will follow the completion of this watershed assessment project.

The current conditions in the watershed range from excellent to very poor, depending on the natural resource and the location within the watershed. This assessment project focuses on quantifying the condition and planning restoration or outreach in seven resource areas. Some information is available on the Browns Gulch watershed; however, additional information is necessary for restoration planning and implementation. The direct benefits of the project are the data to be collected that will be usable by resource managers seeking to improve the natural resources of the Browns Gulch watershed, independent of future funding considerations. For instance, information gathered on irrigation efficiency will provide irrigators and fishery specialists with important information concerning water use and water availability within this watershed. Similarly worthwhile information will result from the elk, fishery, water quality, stream and riparian assessments.

The project will develop a plan to improve natural resources in Browns Gulch. Potential benefits that could result from the funding and implementation of an effective watershed restoration plan include improved water quality and quantity in Browns Gulch and Silver Bow Creek. Also, if the Browns Gulch fish populations within the lower reaches of the watershed are restored, a connection to the Silver Bow Creek fishery may be re-established. Stream restoration could also increase westslope cutthroat trout numbers within the UCFRB. Increases in wildlife habitat may also be an indirect benefit, depending on future use of the weed inventory information, the riparian assessment, and elk population data. Improved recreational opportunities can indirectly result from improved fishery and wildlife resources.

The NRDP has not recommended funding the water storage and routing analysis or the outreach efforts on forest health and conservation easements for reasons explained under the technical feasibility or cost effectiveness criteria. The NRDP does not believe the water storage or routing analyses will produce useful information given already existing information; therefore, the costs of the these analyses are judged to exceed the benefits. The NRDP does not believe the outreach efforts are needed and, consequently, worth the expenditure of Restorations funds.

3. Cost-Effectiveness – Task Specific

The NRDP believes the use of the watershed evaluation approach proposed in this application is an appropriate method to develop an implementation guideline plan for restoration actions within a watershed. The application presents three alternatives to the preferred alternative: 1) no action; 2) multiple, smaller funding grants; and 3)

selected action with only partial funding. The no action alternative was not selected since it would not benefit the natural resources of the watershed or the services that this watershed offers. The applicant did not select the alternative of applying for a number of smaller grants due the limited dollar amounts available from NRDP and the fact that some tasks require more than the limited grant amounts. The alternative would also be more time consuming and costly than a full watershed assessment request. The partial funding alternative was not selected because it would take away from the character of the watershed evaluation approach, i.e., the entire watershed would not be able to be evaluated. The NRDP believes there is a more cost-effective alternative to the selected project that would involve reduced funding but still achieve the goal of a complete watershed assessment. Following is an evaluation of cost-effectiveness on a more detailed, task-specific basis.

Task 1 Stream Flow: The applicant's approach and cost estimate for the stream flow assessment, water balance, irrigation efficiency and groundwater assessment appear to be cost effective. The costs are reasonable and the proposed tasks comprehensively cover the various assessments needed to evaluate the potential for instream flow augmentation. The groundwater assessment proposes to utilize existing wells, which will decrease costs. The other approaches, such as the irrigation efficiency evaluation, have been used successfully in other watersheds.

Under criterion #1, the NRDP offers reasons why the water storage and routing components of the project are unlikely to achieve their objectives. The NRDP does not consider these activities cost-effective for the same reasons. Based on studies already completed, developing water storage sites is considered cost-prohibitive. Other feasible, less expense, less complex, and more beneficial alternatives exist if there is a need and desire to route Yankee Doodle Creek. The NRDP does not recommend these analyses for funding.

Task 2 Invasive Plant Species: The weed mapping costs are based on previous mapping conducted by B-SB on the Big Hole and Beaverhead Rivers and seem reasonable. Cost efficiencies will also be achieved through the planned coordination of this task with the stream corridor assessment (task 6).

Task 3 Forest Health: The applicant proposes that DNRC along with the MSU Extension Service lead this task costing $7,900, with $2,400 of Restoration funds to be used for the MCHD to conduct landowner outreach tasks. This task's focus is to compile existing data and prepare a hazardous fuels reduction plan to be included in the Browns Gulch Watershed Baseline Report and Plan, which will be used for planning and seeking funds. NRDP staff communications with DNRC determined that DNRC is applying for funds to conduct this type of work.[40] In addition, the DNRC has funding available for residents of B-SB to have their property assessed for hazardous fuels. Thus, the NRDP questions whether the additional outreach effort is necessary and consequently cost-effective and does not recommend it for funding.

[40] Based on a 6/22/04 conversation between Doug Martin of NRDP and Chris Town of DNRC.

Task 4 Elk Management: The total costs to the Restoration Fund for this task is $4,900, with a pending in-kind match of $5,000 from FWP. This budget was derived without direct input from FWP, and NRDP discussions with FWP determined that the $5,000 match from FWP is not available. The NRDP has concerns about the cost effectiveness of this task because of the potential for collection of unusable data as reflected under criterion #1. While the additional surveys may not provide the answers as to why there appears to be higher impacts, wildlife managers could still use the survey information to help improve elk management and land use strategies. The NRDP recommends reduced funding of $3,600, which would provide flight time for three additional flights per year for two years. FWP has committed to assessing this additional data and working with landowners on elk management issues as an in-kind, but unestimated match.[41]

Task 5 Fishery Enhancement: FWP is the lead agency for this task but was not directly involved in project budgeting. Subsequent follow-up from the FWP biologist indicates that FWP can commit to the in-kind matching funds of $1,375 for fish population studies and that the proposed budget of $6,940 is adequate for contract field technicians to conduct the proposed aquatic habitat survey and for the proposed contract laboratory fish genetic analysis.[42]

Task 6 Riparian Health and Water Quality: The assessment approach for riparian health and the associated budget appear appropriate. The data that will be collected during this task will also be useable by other agencies, no matter the outcome of this watershed evaluation.

Task 7 Conservation Easement Outreach: The $7,440 budget outreach tasks would be for 124 hours of project coordinator time to prepare an educational package (60 hours), conduct two workshops, and meet one-on-one with landowners. The coordinator would rely on the donated assistance of experts from entities that acquire conservation easements. The cost effectiveness of conservation outreach tasks depends largely on the number of landowners that show an interest in conservation easements. The applicant indicates that they would like to meet with five to ten landowners to discuss conservation easements.

The NRDP does not believe it is cost-effective to produce an educational package specific to Brown's Gulch ($3,600) when available outreach materials would suffice. Those materials include the general brochures produced by various entities that acquire easements, the brochure produced by the Blackfoot Challenge that covers a variety of easement options, and the NRDP's issue paper and panel proceedings concerning easements. It would seem more appropriate to use Restoration funds to help develop easements on lands known to offer significant fish, wildlife and recreational values rather than on general easement outreach activities that are of

[41] Based on phone conversations between Doug Martin of NRDP and Ray Vinkey of FWP.

[42] Based on 6/25/04 phone conservation between Ron Spoon of FWP and Carol Fox of the NRDP.

uncertain outcome. The NRDP would be in a better to position to judge the merits of potential easements in Brown's Gulch and, consequently of funding outreach to accomplish easements, after watershed assessment are completed. For these reasons, the NRDP thus does not recommend funding the requested $7,440 for this effort.

Summary

In conclusion, the alternatives selected complete a comprehensive watershed assessment appear to be a cost effective with the NRDP's recommended reductions to the stream flow tasks by $35,800 (i.e., deleting the water storage and routing studies), to the elk management tasks by $1,300 and the NRDP's the recommended elimination of the forest health outreach tasks ($2,400) and the conservation outreach tasks ($7,440). Associated with these cuts is additional reduction of $7,034 in task-specific support expenses (travel, administration, supplies and materials, task setup) that were budgeted separately by the applicant. These recommended budget cuts totaling $53,974 result in a revised Restoration funding total of $143,404.

4. Environmental Impacts – No Significant Adverse Impacts

   Assessing the current watershed condition of the Browns Gulch watershed presents no significant adverse impacts to the environment. Implementation of improvements via this assessment can benefit environmental resources.

5. Human Health and Safety Impacts – No Significant Adverse Impacts

   Assessing the current watershed condition of the Browns Gulch watershed presents no significant adverse impacts to human health and safety.

6. Results of Superfund Response Actions – Consistent

   DEQ's 2004 Silver Bow Creek remedial design documents indicate about 1,000 feet of the lower Browns Gulch between its confluence and the railroad bed will be reconstructed to coordinate with the tailings cleanup and channel reconstruction of Silver Bow Creek, which is scheduled to occur in 2005. The sinuosity in this stream channel will be increased and other aquatic enhancements may also be considered. This project's assessment activities will not interfere or duplicate this response action. While the assessment activities do not directly coordinate with the response action, they will not interfere or duplicate them. This project's assessment activities may augment the Silver Bow Creek response actions with the implementation of water quality, quantity, and riparian habitat improvements in upstream reaches to be planned via this project.

7. Recovery Period and Potential for Natural Recovery – No Effect

   This assessment project will not directly affect the recovery period of any natural resources. It may lead to the implementation of project(s) that would improve water

quality and quantity and fisheries habitat in Browns Gulch, which could improve the recovery time of the downgradient injured aquatic resources of Silver Bow Creek.

8. Applicable Policies, Rules and Laws – Consistent

   The applicant has provided sufficient information on the applicable requirements needed to complete these projects.

9. Resources of Special Interest to the Tribes and DOI – No Impact

   The Tribes provided comments indicating there will not be any adverse impacts to Tribal resources from this project since no soil disturbance activities will occur. The DOI supports funding the stream flow/water balance/water storage, fishery, and riparian health and water quality tasks, but not the forest health ($2400), elk management ($4900), the weed mapping ($20,000), and conservation easement ($7,440) tasks.

Stage 2 Criteria

10. Project Location – Within Basin and Proximate

    All project activities will occur in the Browns Gulch watershed, which is located north of the community of Rocker, within Butte-Silver Bow County and within the UCFRB. Browns Gulch is a major tributary stream to Silver Bow Creek.

11. Actual Restoration of Injured Resources – May Contribute to Restoration

    This assessment project will not restore injured resources covered under Montana v. ARCO. The implementation of the recommendations that will result from this project could help restore the injured aquatic resources of Silver Bow Creek if they involve improving instream flows, fisheries habitat, and water quality.

12. Relationship between Service Loss and Service Restoration – Same/Similar

    This project generally assesses natural resources and services that are substantially similar to those covered under Montana v. ARCO, such as water quality, wildlife habitat and populations, fish habitat and populations, and recreational services. The stream flow assessment would evaluate irrigation uses, which were not services covered under Montana v. ARCO, but need to be considered in order to determine the best alternatives to augment instream flows to benefit fisheries in Browns Gulch and Silver Bow Creek.

13. Public Support – 8 support comments

The NRDP received 8 comments of support for funding the Browns Gulch Watershed Project, including letters from the NRCS, WRC, USFS, and four landowners within Browns Gulch.

14. Matching Funds and Cost Sharing

A. Matching funds for project as proposed by applicant: – 32%

Restoration Fund Request:	$197,378
Proposed Cash Match:	$ 20,000
Proposed In-kind Match:	$ 76,510
Total Project Costs:	**$293,888**

The application indicates proposed matching funds of $96,510, with a further breakdown of the proposed matches as follows:

Funding Source	**Amount**	**Cash or In-Kind**	**Status**
WRC & Mile High CD	$ 1,700	In-kind	Committed
WRC & Mile High CD	$10,000	Cash	Committed
KirK Environmental	$ 6,060	In-kind[43]	Committed
NRCS	$22,000	In-kind	Committed
NRCS EQIP	*$10,000*	*Cash*	*$3000 Committed/ $7000 Pending*
USFS	$11,500	In-kind	Committed
FWP	$ 500	Cash	Committed
FWP	$10,750	In-kind	$1750 Committed/ $9000 Pending[44]
DNRC	$ 8,000	In-kind	Committed
MSU Ext. Service	$ 5,000	In-kind	Pending[45]
Butte-Silver Bow	$ 7,700	In-kind	Committed
Private Landowners	$ 3,000	In-kind	Committed
Total Match	**$96,510**		

As of July 2004, $21,500 of the proposed match is still pending. Assuming the applicant is successful in obtaining the pending funds, the matching funds are 32% of the total project costs. Committed matching funds are 25% of total project costs. This matching funds analysis will be updated when the NRDP proceeds to final

[43] $5,000 of KirK Environmental's $6,060 in-kind match is a cash grant from the DNRC LEP grant.

[44] FWP committed funding for $1,375 in Task 5, fish population studies, and $375 for task 1, streamflow monitoring.

[45] While the application indicates $2,500 from the MSU Extension office is pending, a supplemental response indicates all $5000 is pending.

funding recommendations. $40,300 of the proposed match is for efforts by various entities to be conducted prior to March 2005, the predicted award date for any approved Restoration funds. The applicant will need to provide adequate documentation of what these "pre-award" efforts involved and their connection to the activities proposed for Restoration funding.

B. Matching funds for revised project as proposed by NRDP – 37%

Restoration Fund Request:	$143,404
Proposed Cash Match:	$ 20,000
Proposed In-kind Match:	$ 64,510
Total Project Costs:	**$227,914**

The NRDP calculated this revised match by deleting the proposed match associated with the forest outreach ($5,500) and conservation easement outreach ($1,500) and the proposed $5000 in-kind match by FWP on the elk management task (see discussion under criterion #3, task 4).

15. Public Access – To be assessed

The elk management tasks could lead to increased public access to private lands.

16. Ecosystem Considerations – Positive

The assessment work is planned at a watershed scale and addresses multiple natural resources. The restoration guideline document resulting from this assessment work will identify and prioritize improvements to multiple natural resources in the Browns Gulch watershed. The assessment work may indicate there are cost-effective and feasible alternatives to increasing flows in Browns Gulch such that water from Browns Gulch reaches Silver Bow Creek. These increased flows potentially could improve water quality in Silver Bow Creek, provide connectivity of the Browns Gulch fishery with Silver Bow Creek, and improve the riparian corridor along Browns Gulch to Silver Bow Creek.

17. Coordination and Integration – Coordinates/Integrates

The applicant offered the opportunity for land managers and resource agencies with responsibilities in Browns Gulch and area landowners to participate in planning this assessment project and has recruited many of them to assist with conducting it. The project coordinates with the USFS planned fishery studies in the headwater reaches that are within the forest boundary. While the Silver Bow Creek watershed planning effort is not final, information gathered to date indicates the need for the water quality, water quantity, fisheries, and riparian habitat assessment proposed in this project.

18. Normal Government Functions – Task Specific

Task 1 (Stream Flow) and Task 6 (Riparian Health and Water Quality) – Outside Normal Government Functions:

While stream flow and riparian assessment work is conducted by various governmental entities that manage natural resources, no governmental entity has responsibility for or is funded to conduct the specific assessment activities to be conducted in Browns Gulch. Browns Gulch is not listed on DEQ's 303 list so DEQ will not evaluate this stream anytime in the near future. While the study of water storage potential would include USFS lands, the USFS is neither responsible for nor funded to conduct this assessment.

Task 2 Weed mapping – Outside Normal Government Function:

While local weed districts typically conduct mapping efforts on county lands. They generally only map private lands if grant monies are awarded.

Task 3 Forest Health Outreach – Augments Normal Government Functions:

The $2,400 requested in Restoration funds would be used for the project coordinator to conduct landowner outreach and organize a workshop on forestry health. While DNRC and other entities such as the Headwater RC&D do conduct such outreach activities, this money would be used to fund conservation district staff to assist the DNRC staff.

Task 4 Elk Management – Augments Normal Government Functions:

FWP is responsible for management of the wildlife populations within the Browns Gulch watershed. These responsibilities include discussions with landowners concerning wildlife damage, managing the wildlife populations, conducting game animal surveys, and analysis of the data. As proposed, monies would have gone to FWP to assist with wildlife management for activities the agency is normally funded to conduct. However, the NRDP only recommends funding for conducting population surveys via aerial flights outside of FWP's the normal survey periods. Thus, these additional surveys are considered as augmenting government function.

Task 5 Fishery Assessment – Augments Normal Government Functions:

The FWP fisheries biologist will conduct the proposed population estimates using FWP monies. NRDP monies of $2,500 will cover the costs of genetic sampling and $4,400 fishery technician support. The costs will augment but not replace FWP funding.

Task 7 Conservation Easement Outreach – Outside Normal Government Function:

While governmental organizations complete and fund conservation easements, no governmental entity is specifically responsible or funded to conduct the proposed outreach activities to landowners.

Land Acquisition Criteria – Not Applicable

Monitoring and Research Criteria

21. Overall Scientific Program – Coordinates

The assessment activities proposed in this application coordinate well with other UCFRB scientific work. Browns Gulch is potentially an important tributary to Silver Bow Creek; however, limited information has been collected in this watershed in the past. Of the tasks proposed, only elk populations have been monitored within Browns Gulch to the degree that a baseline could be estimated. The inventory and monitoring tasks recommended for funding by the NRDP will provide needed baseline data to resource managers about the current condition of the natural resources within Browns Gulch and the connection between the aquatic resources of Browns Gulch and Silver Bow Creek.

22. Assistance with Restoration Planning – Major Benefit

The watershed information proposed to be collected in this application will provide needed information about natural resource conditions in Browns Gulch. The information gathered during this watershed assessment will be useful to the on-going Silver Bow Watershed planning effort, as well as restoration planning for the Browns Gulch watershed itself.

APPENDIX B

PROJECT CRITERIA COMPARISONS

This section compares the projects pursuant to each criterion, summarizing the similarities and differences between projects that were determined through a comparison of the Project Criteria Narratives contained in Appendix A. None of the six projects proposed have land acquisition components; therefore, the land acquisition criteria were not evaluated.

Stage 1 Criteria Required by Legal Considerations

#1 Technical Feasibility

This criterion evaluates the degree to which a project employs well-known and accepted technologies and the likelihood that a project will achieve its objectives. It considers both the technology and management aspects of the project in judging whether each of the proposed project elements have a reasonable chance of successful completion in an acceptable period of time. The State will not fund projects considered technologically infeasible or insufficiently planned.

All six projects employ well-known and accepted technologies. The Butte Waterline, Anaconda Waterline, High Service projects are considered to be reasonably feasible and likely to achieve the stated objectives. Of them, the waterline projects have the highest certainty of technical and administrative feasibility given that both counties have successfully completed waterline replacements for a number of years; B-SB has replaced 255,000 feet of waterline since 1992 and ADLC has replaced 43,175 feet of waterline since 1994. B-SB has successfully installed a pre-stressed concrete tank similar to that proposed for the High Service tank. While the application for the High-Service project originally lacked an adequate level of detail on the project implementation, B-SB provided the information needed in supplemental correspondence to demonstrate that the project approach was reasonably feasible.

The Bridger Plant Material Center (BPMC) project will employ well-known and accepted technologies for seed collection and propagation and the BPMC has demonstrated it has the needed expertise to accomplish the project. The long-term success of the project will depend on the demand by commercial nurseries and seed producers for the seed materials this project will develop and release. Based on the NRDP's prediction of remediation and restoration needs in the UCFRB, a long-term demand will exist for these seed materials.

The management approach and skills of the Clark Fork Watershed Education Program (CFWEP) make it likely to succeed in terms of its ability to effectively educate a large number of UCFRB school children about watershed concepts in general and restoration in the UCFRB in specific. Aspects of the project's approach that increase its likely success include that the project will build on existing curriculum and lessons learned from the 2002 pilot project, that the project is well-timed in relation to the on-going and planned restoration activities in the UCFRB, and that the project team has a diversity and depth of experience in education, science, and UCFRB restoration issues. Uncertainty exists, however, about the ability to fund such the ambitious program in the long-term. Given this uncertainty and that the project is innovative and groundbreaking relative to other types of restoration projects funded to date, the NRDP recommends that the project be subject of annual evaluation pursuant to the Trustee's multi-year funding policy that could involve funding changes for the second and third year of the project.

There are no uncertainties associated with the technologies to be used for the monitoring, research and outreach activities proposed for the Browns Gulch project. Some uncertainties exist, however, as to whether some of the selected tasks will accomplish the indicated goals. The stream flow, fishery, riparian health, water quality, and weed assessment tasks and the forest health and conservation easement outreach tasks are likely to achieve their goals and are therefore reasonably feasible. The elk management tasks, as revised by the NRDP, are considered reasonably feasible. The water storage and routing tasks are not likely to obtain useful information about cost effective ways to augment stream flows based on already existing information and are therefore not considered feasible.

#2 Relationship of Expected Costs to Benefits

This criterion evaluates the degree to which project costs are commensurate with project benefits. While it is possible to quantify most costs, quantifying benefits is more difficult. Thus, application of this criterion is not a straight cost/benefit analysis. Because this criterion involves a weighting of all public benefits expected to be derived from a project against all costs associated with the project, it is essentially a summation of results of all other criteria.

The BPMC project offers high net benefits, with the long-term benefits of soil and water conservation and wildlife habitat restoration to be gained from the proposal judged to significantly outweigh its costs. The products of the proposed seed research and development activities include data on optimum seed mixes and plants and releases of superior seed materials which can be used to revegetate injured areas in the UCFRB, such as the Anaconda Uplands injured area, Silver Bow Creek, and the Clark Fork River, over the next 15 years or more.

The High Service, Butte Waterline and Anaconda Waterline projects will have net benefits to the Butte and Anaconda communities and water system users. The High Service tank is a critical reservoir to Butte's water distribution system. The waterline projects will improve fire protection, conserve water, and reduce treatment, repair and property damage costs. Replacement of the High Service tank, which is in poor condition, will provide adequate fire protection and a safe reliable source of water, and will help sustain pressure zones, thereby providing substantial benefits to a large public. The High Service and Butte Waterline projects will cost-effectively benefit and compensate the public for some of the lost use that Butte has suffered due to the inability to use groundwater in much of the city. The Anaconda Waterline project constitutes cost effective compensatory restoration for extensive injuries to the shallow and bedrock aquifers surrounding Anaconda.

The NRDP believes the CFWEP, as revised by the NRDP, will also derive net public benefits. The project lays the foundation for creating a sustainable field science program that uses the entire UCFRB as a "living classroom" which is widely available to school age children. Directly, the project will provide UCFRB school children and teachers with a stream science education that focuses on the injury to and restoration of injured resources in the UCFRB and connect students with science professionals. Indirectly, the education of school children about the restoration of injured resources can increase the likelihood that the UCFRB's residents will be engaged in restoration and responsible stewards for the watershed. Over three years, the

program will serve an estimated 1600 elementary students, 780 high school students, and 90 teachers. With the NRDP's revised budget of $656,201, this translates to about $267 per teacher or student over a three-year period. Compared to the millions of dollars to be spent to restore injured resources and to remediate in the UCFRB, it represents a small but important investment in the future caretakers of the restored watershed's landscape.

With the NRDP's proposed budget reductions, the Browns Gulch project is considered as one of net benefit. The project will provide needed and useful data on stream flow, water quality, riparian habitat, and fish and wildlife resources. Potential benefits that could result from the funding and implementation of an effective watershed restoration plan to be developed by this assessment project include improved water quality and quantity and fisheries in Browns Gulch and Silver Bow Creek, and improved fish and wildlife habitat and associated recreational opportunities in Browns Gulch.

#3 Cost-Effectiveness

This criterion examines whether a particular project accomplishes its goals in the least costly way possible, with preference given to projects with demonstrated cost-effectiveness. Applicants were to address this criterion through the analysis of alternatives and justification of the selected alternative.

The Anaconda Waterline and Butte Waterline projects are considered cost-effective, economical ways for the counties to address their future water supply needs given the significant documented leakage from their water distribution systems. ADLC provided a more detailed analysis of alternatives that better demonstrated the cost-effectiveness of its proposed approach than B-SB provided. Estimated costs for both projects are considered reasonable since they are based on recent competitive bidding for similar work.

BPMC provided a limited analysis of alternatives that adequately justified why a no-action alternative would be inadequate for meeting the anticipated revegetation needs in the UCFRB. The positive results of the project to date and additional support for the selected approach provided by the MSU Reclamation Research Unit favor continuing the project and indicate the project is likely to be cost-effective in the long-term.

Replacing the High Service tank with another 2.5 million gallon tank appears to be cost-effective; however, it would have been helpful in evaluating this project if a water system master plan had been completed and had B-SB provided a full analysis of alternatives and more details on costs. Supplemental information provided by the NRDP's consulting engineer indicates that replacement of the tank with the pre-stressed concrete tank is likely to be cost effective when compared to alternative tanks or repairing the existing tank.

MT Tech cooperatively worked with the NRDP to identify cuts to its original budget of $832,984 for the CFWEP that could be made without jeopardizing project goals, particularly the number of schools, students, and teachers to be served. The revised budget of $673,901, which resulted from the cuts and some additional match by MT Tech, is considered likely to be cost-effective with the NRDP's suggested additional cut of $17,600 in honorariums. The applicant adequately

justified its project approach compared to the no-action alternative or a less centralized approach than that proposed. The NRDP's suggested annual evaluation of program accomplishments allows an opportunity to evaluate whether the scope and costs of the project could be reduced in subsequent years without jeopardizing the number of students and teachers served in an optimum timeframe.

For the Browns Gulch project, some tasks were considered cost-effective (the stream flow, water balance, weed, fishery, riparian health, water quality assessments), while others were of questionable cost-effectiveness (outreach for forest health and conservation easements) or not considered cost-effective (water storage and routing studies). Thus the NRDP offers a more cost-effective alternative to the selected project that involves reduced funding but would still achieve the goal of a completing a comprehensive watershed assessment that is needed to effectively plan natural resource improvements.

#4 Environmental Impacts

This criterion evaluates whether and to what degree the proposal will have an adverse impact on environmental resources. None of the projects will cause significant adverse impacts to the environment. The High Service, Butte Waterline and Anaconda Waterline projects have potential short-term adverse impacts associated with construction that can be mitigated. The counties have appropriately planned for necessary mitigation.

The waterline projects will benefit water conservation by reducing water leaks in the distribution systems. Beneficial impacts to the environment are also likely to be derived from use of the seed product developed and released by the BPMC project, from implementation of the improvements recommended by the proposed assessment activities in Browns Gulch, and from the increased public knowledge about and stewardship of natural resources resulting from the CFWEP project.

#5 Human Health and Safety Impacts

This criterion evaluates whether and to what degree the proposal will have an adverse impact on human health and safety. None of the projects will have any significant adverse human health and safety impacts. The High Service, Butte Waterline and Anaconda Waterline projects have potential impacts related to construction or field activities, but none are deemed significant and mitigative efforts are appropriately planned. The waterline projects can have beneficial impacts to human health and safety by improving fire protection, reducing road hazards caused by leaking water and ice, and increasing the availability of water otherwise lost to leakage. The High Service Project can also enhance human health and safety by providing clean water for domestic demand and storage for fire protection and by removing the threat to the public health and welfare that the existing tank poses.

Concerns exist regarding the exposure of students to contaminated media during the CFWEP field trips. The applicant will be required to assure that program participants will not be exposed to unacceptable levels of contamination. Also, proper liability insurance for transportation of students and teachers in the program will be required of all school districts.

#6 Results of Superfund Response Actions

This criterion examines the relationship between projects and completed, planned, or anticipated Superfund response actions. The State will tend to favor projects that build on response actions rather than those that undo an effective response action.

The BPMC project positively coordinates with and augments remedial actions. The proposal will provide key plant materials and information that will be essential for both effective remedy and restoration activities in upland and riparian areas in the UCFRB.

The CFWEP project will positively coordinate with response actions in terms of the coordinated timing of educational field trips while actions are underway. Increasing the knowledge about remediation efforts can also assist in protecting remediated areas from future detrimental human activities. The Browns Gulch project may also augment response actions along Silver Bow Creek with the implementation of water quality, quantity and riparian habitat improvements in upstream reaches that may result from the assessment and restoration planning activities of this project.

The High Service, Butte Waterline and Anaconda Waterline projects are considered consistent with Superfund response actions. They will not interfere with or duplicate the results of these actions.

#7 Recovery Period and Potential for Natural Recovery

This criterion evaluates whether and to what degree a project affects the time frame for natural recovery of the injured resources to their baseline conditions. Reduction of the recovery period benefits a project's overall ranking. This criterion also evaluates the potential for natural recovery of injured resources. If a resource is expected to recover on its own in a short period of time, a restoration action may not be justified.

The BPMC project is expected to reduce the recovery period by providing superior foundation seed for shrubs, forbs, and grasses that can be used to directly restore injured wildlife habitat. The other five projects are not expected to affect the timeframe for recovery of injured resources.

#8 Applicable Policies, Rules, and Laws

This criterion evaluates to what degree the proposal is consistent with all applicable policies of state, federal, local and tribal government and in compliance with applicable laws and rules. Consistency with applicable policies, rules, and laws benefits a project's overall ranking.

The NRDP concludes that all six projects can be implemented in compliance with applicable laws and rules. All applications identified the needed permits and plans for obtaining them. All of the applicants have conducted the needed coordination with local entities or appropriately planned for this coordination.

#9 Resources of Special Interest to the Tribes and Department of Interior

Pursuant to a Memorandum of Agreement (MOA), the State is to address natural resources of special interest to the Confederated Salish and Kootenai Tribes (Tribes) and the Department of Interior (DOI) in its restoration planning process. Projects that may cause potential negative impacts to resources of special interest require special consideration according to provisions of the MOA.

The NRDP solicited information from both the Tribes and the DOI regarding these resources or sites that are relevant to proposals. The DOI and Tribes have provided specific comments on all six projects (see Appendix D).

The DOI supports the BPMC project with the recommendation that a large portion of the seeds developed by this project be earmarked for the UCFRB. The Tribes have no concerns with this project regarding potential impacts to tribal cultural or religious sites.

Both agencies indicated the High Service, Anaconda Waterline and Butte Waterline projects would have no negative impacts on resources of special interest to the Tribes or DOI. The DOI supports these projects.

The CFWEP project will not impact resources of special interest to the Tribes. The DOI indicates its general support of public education efforts but reserves judgment on funding this project pending further clarification on how the activities will benefit the restoration process.

The Tribes do not anticipate impacts to cultural sites from the Browns Gulch project since no soil disturbance will occur. The DOI commends the project for addressing multiple issues but only supports partial funding of the project. The agency recommends funding the stream flow, fishery, riparian health, and water quality tasks but not the weed mapping, elk management, forest health, or the conservation easement outreach tasks.

Stage 2 Criteria Reflecting Montana Policies

#10 Project Location

This criterion evaluates the proximity of the proposal to the injured resources it restores or replaces. The *RPPC* expresses a preference for restoration projects that occur at or near the site of injury.

All six projects are considered within the UCFRB and proximate to injured resources. The Butte Waterline and High Service projects overlie the injured Butte Hill groundwater resource. The Anaconda Waterline project is adjacent to the injured Anaconda-area groundwater resource. The CFWEP is targeted for school children in Butte, Anaconda, Ramsey, Deer Lodge, Garrison, Drummond, Clinton, and Bonner. All activities associated with this project will occur in the UCFRB and pertain to natural resources that were the subject of Montana v. ARCO. The Browns Gulch project is located north of Silver Bow Creek near Ramsey. The BPMC project's

field-testing and seed collection will occur at various locations within the UCFRB. The seed production activities will occur at the BPMC facility 45 miles south of Billings.

#11 Actual Restoration of Injured Resources

This criterion evaluates whether and to what extent a project actually restores an injured resource. A preference exists for those projects that constitute actual restoration (i.e., they operate directly on the injured resources). For those projects that do not constitute actual restoration, a preference can be given to those that may or will indirectly contribute to restoration of injured natural resources over those that do not so contribute.

The BPMC Materials project would contribute to restoration assuming its seed products are used for restoration of areas within the UCFRB that are lacking in healthy vegetation as a result of metals contamination. The products developed may contribute to restoration by increasing the density and diversity of vegetation and increasing wildlife habitat by replacing lost vegetation with native species.

The Browns Gulch project and the CFWEP project will not contribute to restoration of the injured resources since these are assessment and educational projects, respectively. The implementation of the natural resource improvement projects recommended as a result of the Browns Gulch assessment activities could help restore injured aquatic resources of Silver Bow Creek. The CFWEP can indirectly benefit restoration of injured resources by promoting stewardship of those resources.

The High Service, Butte Waterline, and Anaconda Waterline projects are considered replacement projects and will not restore or contribute to the restoration of injured resources; however, these projects replace services of injured groundwater resources that cannot be restored and constitute compensatory restoration.

#12 Relationship between Service Lost and Service Restoration

This criterion examines the connection between the services that a project seeks to address and the services that were lost or impaired. Projects that focus on providing the same or similar services as those lost or impaired will be favored over projects that focus on providing dissimilar services.

All of the proposed projects have a focus of providing services that are the same or similar to those services that were lost. The Butte Waterline, Anaconda Waterline, and High Service Tank projects will provide replacement drinking water services that are closely linked to the injured groundwater resources of the Butte and Anaconda areas. All three projects will enhance the water supply from an unaffected source.

With the use of the BMPC foundation seed by commercial growers, this project could contribute to restoring some of the same services that were lost in uplands and riparian areas due to habitat loss. The Browns Gulch project will assess natural resources and services that are substantially

similar to those covered under Montana v. ARCO, such as water quality, wildlife habitat and populations, fish habitat and populations, and recreational services.

The CFWEP project would provide services considered similar to those covered under the compensable damage portion of the Montana v. ARCO lawsuit. This grant focuses on the restoration of lost services through public education about the injured or lost natural resources. Also, by enhancing stewardship of restored resources, the project will enhance the services provided by those resources.

#13 Public Support

This criterion assesses the level of public support based on information provided to the State between application submittal in March 2004 and the close of the public comment period on the *Draft Work Plan* in October 2004. The December 2004 State of Montana's Responses to Public Comment on the *Draft 2004 UCFRB Restoration Work Plan* includes copies of the public comments received before, during, and after the public comment period and the State's response to the comments submitted during the public comment period.

The CFWEP project received the highest demonstrated public support with 38 comments in support, including letters of public support from the following entities: University of Montana's Center of Riverine Science and Stream Renaturalization, the Montana Watercourse, the George Grant Chapter of Trout Unlimited, Montana Mind Expansion, Montana Tech Regional Science Fair, Butte School District No. 1, Anaconda School District, Drummond Schools, Ramsay School, Powell County High School, Butte High Science Department, Kennedy School (Butte), and Rattlesnake Productions..

The Brown's Gulch project received eight support comments, including letters of support from the NRCS, WRC, USFS, and four landowners.

Anaconda Waterline project received six support comments, including letters from the ADLC Council of Commissioners, Anaconda Area Chamber of Commerce, Anaconda Local Development Corporation and the Anaconda Public Schools.

The Butte Waterline and the High Service projects each received 5 support comments, including letters from the B-SB Council of Commissioners and the Butte Chamber of Commerce. The BPMC project received 4 support comments, including letters from the MSU Reclamation Research Unit and the University of Wyoming Seed Certification Service.

#14 Matching Funds

This criterion evaluates the extent to which a project entails cost sharing.

In terms of the percentage match, the Browns Gulch project, as revised by the NRDP, would have the highest percent of matching funds at 37% totaling $84,510, with a cash match of $20,000 and an in-kind match of $64,510. The Butte Waterline project has the next highest

percentage of matching funds of 32% totaling $557,920, with a cash match of $513,417 and in-kind match of $44,503.

Both the BPMC and High Service projects have 22% in matching funds. The High Service Tank's match is $343,010, with a cash match of $298,200 and an in-kind match of $44,810. The BPMC project has a total match of $71,000, all of which is in-kind.

The Anaconda Waterline has a 20% match totaling $309,247, comprised of a $250,000 cash match and a $59,217 in-kind match. The CFWEP has a 19% match totaling $166,664, comprised of a cash match of $92,983 and a $73,681 in-kind match.

The following lists the cash match to be provided for each project. B-SB will contribute the greatest match in terms of cash match:

Butte Waterline – $513,417
High Service – $343,010
Anaconda Waterline – $309,246
CFWEP – $92,983
Browns Gulch – $20,000
BMPC – no cash match.

#15 Public Access

This criterion evaluates whether a project will affect public access and the positive or negative aspects of any increased or decreased public access associated with the project. Public access is not required for every project, nor is it relevant to all projects.

The Browns Gulch elk management tasks could lead to increased public access to private lands. Public access is not a component of the other five projects.

#16 Ecosystem Considerations

This criterion examines the relationship between the project and the overall resource conditions of the UCFRB. The State will favor projects that fit within a broad ecosystem concept in that they improve a natural resource problem(s) when viewed on a large scale, are sequenced properly from a watershed management approach, and are likely to address multiple resource problems.

All six projects positively fit within a broad ecosystem context. Through the development of native adapted plant materials, the BPMC project can increase the likelihood of revegetation in mining impacted areas, thereby benefiting multiple natural resources throughout the UCFRB by reducing erosion, increasing wildlife habitat, and improving water quality. The assessment work of the Browns Gulch project is planned at a watershed scale and addresses multiple natural resources in Browns Gulch. The CFWEP project will further knowledge of school children and teachers about ecosystems concepts and stewardship of natural resources. By replacing an existing water tank that is in poor condition, the High Service project removes the threat of

failure of the existing tank, which could have severe consequences locally and to the larger ecosystem. The Anaconda Waterline and Butte Waterline projects will conserve water and reduce power requirements of pumping and treating water.

#17 Coordination and Integration

This criterion examines whether, how, and to what extent a restoration project is coordinated and integrated with other on-going or planned actions in the UCFRB besides the coordination with Superfund remedial actions addressed under Criterion #6. Restoration projects that can be efficiently coordinated with other actions may achieve cost savings.

The Browns Gulch project involves the coordination and participation of multiple entities that have responsibilities for managing natural resources. It directly coordinates with USFS fishery studies planned in the watershed headwaters. The CFWEP project will integrate educational materials that focus on the resource conditions of the UCFRB, including, the NRDP's educational CD's and educational trunk. Monitoring conducted under CFWEP will also be coordinated with the State's restoration and remediation monitoring efforts in the UCFRB. CFWEP's goals are also consistent with the educational goals of the UCFRB Remediation and Restoration Advisory Council, the consensus vision statement derived for the Silver Bow Creek watershed, and the Silver Bow Creek Greenway.

The BPMC project coordinates with other restoration projects because its seed product could potentially be used in a multitude of needed revegetation projects on impacted lands in the UCFRB and throughout the Northern Rockies Region. The BMPC directly coordinates with other entities involved in revegetation efforts in the UCFRB.

The Anaconda Waterline project is integrated with other county projects. The High Service and Butte Waterline projects do not coordinate/integrate with other actions.

#18 Normal Government Functions

As set forth in the *RPPC*, the State, through its restoration program, will not fund activities for which a governmental entity would normally be responsible or that would receive funding in the normal course of events. Restoration funds may be used to augment funds normally available to government agencies to perform a particular project if such cost sharing would result in implementation of a restoration project that would not otherwise occur through normal agency function.

The development of site-specific plant materials proposed by the BPMC project does not entail activities that a governmental entity is obligated by law to conduct or would normally conduct.

The majority of the Browns Gulch assessment activities also involve efforts that are outside of normal government function. The proposed stream flow, riparian health/water quality, weed mapping, and conservation easement outreach efforts are efforts that a governmental entity is not obligated by law to conduct or would normally conduct. The forest health outreach, elk management and fishery assessment activities would augment the efforts of the governmental

agencies that manage forests, wildlife, and fish. Funds would not be used to provide salaries to existing governmental staff or for the operations of existing governmental programs, and the proposed activities under these tasks are unlikely to be conducted without supplemental grant funds.

The Butte Waterline, Anaconda Waterline, and High Service projects augment normal government function. These water system improvements are part of the local government responsibilities since these counties own the systems. Community water system improvement projects such as these are typically funded through a combination of user fees, loans, and grants. Due to pervasive groundwater contamination underlying the Butte area, its water system facilities upgrade costs are greater than the typical costs of communities that can use nearby groundwater sources. The large area of groundwater contamination has limited ADLC's access to clean groundwater resources. By increasing the efficiency of storage or delivery of water from uncontaminated sources, these projects offer effective compensation for extensive injuries to the bedrock aquifer underlying Butte Hill and the shallow alluvial aquifer in areas surrounding Anaconda that were covered under Montana v. ARCO. Comparatively, B-SB offers a greater proportionate local contribution than ADLC does based on B-SB's higher user fees, matching funds, and metering.[46]

The CFWEP project also augments normal government function. While teaching science is a normal part of public schools, CFWEP provides a depth of science education and access that is beyond the ability of most public school teachers and is focused specifically on the baseline, injured, and restored reaches in the UCFRB. This specific curriculum and the proposed field activities would not be undertaken basin-wide without this funding.

Stage 2 Land Acquisition Criteria: Since none of the projects involve acquiring public lands or interest in public lands, these criteria were not evaluated.

Stage 2 Monitoring and Research Criteria

These criteria apply to any research activity and to projects for which monitoring is a significant focus of the project. The Browns Gulch project and portions of the BPMC project involve research. Monitoring is also a significant focus of the Browns Gulch project. Monitoring is a component of the CFWEP project.

#19 Overall Scientific Program

The criterion considers the extent to which the proposed monitoring and research efforts coordinate or integrate with other scientific work in the UCFRB. Greater benefits can be achieved when monitoring and research projects can use and assist other projects.

[46]B-SB will contribute 32% and 22% in matching funds to the waterline and tank projects, respectively. ADLC will contribute 20% in matching funds. B-SB's current water rate is $48.78 per month for unmetered users and an average of $36.04 for metered users; ADLC's flat-rate is $22.68. 42% of B-SB's connections are meters whereas only 7% of ADLC's are metered.

All three projects will adequately coordinate with other scientific work in the UCFRB. The BPMC project involves continued coordination with other entities and researchers performing revegetation activities in the UCFRB. The Browns Gulch project will provide needed baseline data to resource managers about the current condition of natural resources in Browns Gulch and the connection between the aquatic resources of Browns Gulch and Silver Bow Creek. The CFWEP project will coordinate its monitoring activities with the State's monitoring efforts on Silver Bow Creek and the Clark Fork River and its database activities with state database managers.

#20 Assistance with Restoration Planning

Under this criterion, the State will consider whether the knowledge that might be gained from a monitoring or research project will directly assist with future restoration efforts.

The BPMC project will be of major benefit to future restoration efforts in terms of producing needed information on optimum revegetation methodologies and optimum seed source materials. The information gathered for the Browns Gulch watershed assessment will be of major benefit for restoration planning in Browns Gulch and also beneficial to restoration planning efforts for Silver Bow Creek. The CFWEP project may provide long-term screening level monitoring information that could possibly augment the State's restoration monitoring efforts.

APPENDIX C

PROJECT BUDGET SUMMARY TABLES

This Appendix may be requested from the

Natural Resource Damage Program
P.O. Box 201425
Helena, MT 59620
406-444-0205
nrdp@mt.gov

APPENDIX D

INPUT FROM THE: ADVISORY COUNCIL, DEPARTMENT OF INTERIOR, AND CONFEDERATED SALISH AND KOOTENAI TRIBES

This Appendix may be requested from the

Natural Resource Damage Program
P.O. Box 201425
Helena, MT 59620
406-444-0205
nrdp@mt.gov

APPENDIX E

APPLICATION REVIEW GUIDELINES

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P.O. Box 201425
Helena, MT 59620
406-444-0205
nrdp@mt.gov