Water Supply Reserve Account – Grant and Loan Program
Water Activity Summary Sheet
March 16-17, 2016
Agenda Item 14(f)

Applicant & Fiscal Agent:	Upper Arkansas Water Conservancy District
Water Activity Name:	Upper Arkansas Multi-Use Projects Phase I – Lake Ranch Multi-Use Pilot Project (LRMUPP) Feasibility Study
Water Activity Purpose:	Multipurpose
County:	Chaffee
Drainage Basin:	Arkansas
Water Source:	Arkansas River
Amount Requested/Source of Funds:	$31,196 Arkansas Basin Account $162,944 Statewide Account $194,140 Total Grant Request
Matching Funds:	Basin Account Match ($31,196.50) = 16% of total grant request (meets 5% min); Applicant/3rd Party Match ($35,569) = 18.3% of total grant request ($229,709.50) Basin Account & Applicant Match ($66,765) = 34.4% of total grant request (meets 25% min) (refer to *Funding Summary/Matching Funds* section)

Staff Recommendation:

Staff recommends approval of up to $31,196 from the Arkansas Basin Account, and $162,944 from the Statewide Account to help fund the project titled: Upper Arkansas Multi-Use Projects Phase I – Lake Ranch Multi-Use Pilot Project (LRMUPP) Feasibility Study.

Water Activity Summary: WSRA funds, if approved, will be expended to fund the project titled: Upper Arkansas Multi-Use Projects Phase I – Lake Ranch Multi-Use Pilot Project (LRMUPP) Feasibility Study. This project is one of two multi-use projects that the Upper Arkansas Conservancy District is moving forward. These projects aim to integrate multiple water use components to address the "gap" through a multi-purpose approach. the District owns the Lake Ranch property, associated water rights, and has lease agreements for lease fallowing and other project components with the current lessee.

Components of the LRMUPP include: alluvial aquifer storage and return flow mapping; lease fallowing in the forms of interruptible water supply or rotational crop fallowing; low-head low-impact hydropower supply; water supply yield enhancement and delivery improvements; educational demonstrations on alternatives to permanent dry-up, use of small scale hydropower and demonstration plots for irrigation technology and crop science R&D; environmental benefits through wetlands and protection of open space; recreational benefits through the enhancement of the Voluntary Flow Management Program; and, potential collaborations with CPW, CSU Extension, USGS, NRCS, Colorado Water Resources and Power Development Authority (CWRPDA), etc ..

For the purposes of this grant application, the District would like to investigate the feasibility of each component of the LRMUPP. A feasibility study will allow the District to study each complex component of this pilot project and ensure the success of its implementation. Elements of the feasibility study can be transferable to the larger TCPMUP and aid in future projects to come. The LRMUPP will give the District the insight and knowledge needed for implementation of multi-use projects, while gaining vast benefits at the Lake Ranch throughout the process. The LRMUPP's successful implementation will provide a demonstration of how to maximize utilization of State waters and address the "gap" with a multi-purpose approach.

OBJECTIVES:

- To study the feasibility of multi-use projects;
- To improve understanding of how multiple water use components can be integrated into a single project;
- To investigate the use of alluvial aquifer storage;
- To investigate the potential for low-head, low-impact, hydro-power systems;
- To analyze the potential for enhancements of delivery systems;
- To analyze water rights yields and return flows;
- To analyze the use of ATMS and the Lease Fallowing Tool;
- To successfully integrate environmental and recreational needs;
- To develop educational demonstrations on irrigation R&D, ATMs, & hydropower;
- To produce studies and demonstrations that can lead as an example and be transferable to the TCPMUP and future multi-use projects across the State; and,
- To establish the necessary requirements to move the LRMUPP into Phase 2- Implementation.

Discussion: The LRMUPP will help implement projects and processes identified in the Arkansas Basin Implementation Plan. This pilot project will lead as a demonstration for the implementation of the larger TCPMUP that is featured in the Ark BIP. This pilot project will assist in the implementation of future multi-use projects that will have the ability to address the "gap" through a collaborative approach. Specifically, the LRMUPP will address the "gap" through new storage, lease fallowing and delivery system improvements.

MEETING THE NEEDS OF THE COLORADO WATER PLAN:

Critical Action Plan Implementation Goals Met:

1. Supply & Demand (A)- This project will address the supply & demand gap through increased storage, lease fallowing and integrated water management;
2. Conservation (B) - This project has the ability to address conservation by providing a demonstration on new storage technologies to store and manage this conserved water and will provide a demonstration garden on irrigation efficiencies and plant species;
3. Agriculture (D)- This project will demonstrate agricultural viability through Alternative Transfer Methods and protection from permanent "buy & dry";
4. Storage (E)- This project will provide multi-purpose & multi-partner storage options and will demonstrate the use and benefits of alluvial aquifer storage;
5. Watershed Health, Environment, and Recreation (F)- Enhances environmental values through the creation of wetlands and protection of open space. Recreational benefits include the potential enhancement of the Voluntary Flow Management Program;

6. Funding (G) - This project uses a variety of funding mechanisms in the form of matching grants from the Colorado Water Resources and Power Development Small Hydropower Grant Match and UAWCD cash matching. This project is designed to promote sustainability through generating revenue and promoting collaboration through multiple partnerships. Potential revenue can be developed through the hydropower and storage components and future partnerships include CPW, SECWCD, Local Land Trusts, GARNA, CSU Extension, and, more.; and,
7. Education, Outreach, and Innovation (H)- This project will include education and outreach in the form of a demonstration garden to promote innovation in irrigation and plant species; provide a demonstration of the use of small hydropower systems; provide a demonstration on the use of lease fallowing; and provide an example of how to implement multi-purpose/use projects.

Issues/Additional Needs: No issues or additional needs have been identified.

Threshold and Evaluation Criteria:
The application meets all four Threshold Criteria.

Tier 1-3 Evaluation Criteria:
This activity has undergone has review and evaluation and staff has determined that it satisfies the Evaluation Criteria. Please refer to WSRA Application for applicant's detailed response.

Funding Summary/Matching Funds:

Funding Source	Cash	In-kind	Total
UAWCD	$30,569	$0	$30,569
PEPO match	n/a	$5,000	$5,000
Subtotal Matching Funds	$30,569	$5,000	$35,569
WSRA Arkansas Basin Account	$31,196	n/a	$31,196
WSRA Statewide Account	$162,944	n/a	$162,944
Total Project Costs	**$194,140**	**$5,000**	**$229,709**

CWCB Project Manager: Brent Newman

All products, data and information developed as a result of this grant must be provided to the CWCB in hard copy and electronic format as part of the project documentation. This information will in turn be made widely available to Basin Roundtables and the general public and will help promote the development of a common technical platform. In accordance with the revised WSRA Criteria and Guidelines, staff would like to highlight additional reporting and final deliverable requirements. The specific requirements are provided below.

Reporting: The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of the executed contract. The progress report shall describe the completion or partial completion of the tasks identified in the scope of work including a description of any major issues that have occurred and any corrective action taken to address these issues.

Final Deliverable: At completion of the project, the applicant shall provide the CWCB a final report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings and engineering reports/designs.

Engineering: All engineering work (as defined in the Engineers Practice Act (§12-25-102(10) C.R.S.)) performed under this grant shall be performed by or under the responsible charge of professional engineer licensed by the State of Colorado to practice Engineering.

Arkansas Basin Roundtable

January 29, 2016

Via Electronic Mail: craig.godbout@state.co.us

Mr. Craig Godbout
Colorado Water Conservation Board
1313 Sherman Street, Room 721
Denver, CO 80203

Re: Water Supply Reserve Account Grant/Loan Application: Upper Arkansas Multi-Use Projects Phase I – Lake Ranch Multi-Use Pilot Project Feasibility Study

Dear Craig:

At its January 13, 2016 meeting, the Arkansas Roundtable approved the Upper Arkansas Multi-Use Projects Phase I – Lake Ranch Multi-Use Pilot Project Feasibility Study for $31,196.50 in Basin Funds, $162,944.00 in Statewide Funds, with $30,569.00 cash matching funds and $5,000 In-Kind from the applicant, the Upper Arkansas Water Conservancy District. There were no dissenting opinions expressed in the consensus decision.

This project is intended to provide a model for multi-purpose projects in the Arkansas Basin. The initiative of the Pilot Feasibility Study seeks to integrate principles of Alternative Transfer Methods, Conservation & Efficiency, Aquifer Storage and Recovery along with an hydro-electric component. The success and experience gained from this pilot will position the Upper Arkansas District to effectively complete a significant Multi-Use Project in the future that may provide as much as 25-30,000 AF of water storage. It furthers the goals and objectives of the Arkansas Basin Implementation Plan and multiple objectives of the Colorado Water Plan, including Objective A. Supply-Demand Gaps, Objective D. Agriculture: "*Maintain Agricultural Viability*" and "*Support Agricultural Conservation and Efficiency*" and Objective E. Storage: "*Promote Additional Storage and Infrastructure*" (Section 10.3). Should you have any questions or concerns, please feel free to contact me either by telephone, 719-742-6164, or by email, sandy@white-jankowski.com.

With warm regards

Michael D. (Sandy) White
Chair

Copy via email:
Applicant
ABRT Executive Committee

COLORADO
DEPARTMENT OF NATURAL RESOURCES

COLORADO WATER CONSERVATION BOARD

WATER SUPPLY RESERVE ACCOUNT APPLICATION FORM

Today's Date:2/1/2016

Upper Arkansas Multi-Use Projects Phase I- Lake Ranch Multi-Use Pilot Project (LRMUPP) Feasibility Study

Name of Water Activity/Project

Upper Arkansas Water Conservancy District

Name of Applicant

Arkansas Basin Roundtable

Amount from Statewide Account: $162,944.00

Amount from Basin Account(s): $31,196.50

Total WSRA Funds Requested: $194,140.50

Approving Basin Roundtable(s)
(If multiple basins specify amounts in parentheses.)

FEIN:

Application Content

Required Exhibits

A. Statement of Work, Budget, and Schedule
B. Project Map
C. As Needed (i.e. letters of support, photos, maps, etc.)

Appendices – Reference Material

1. Program Information
2. Insurance Requirements
3. WSRA Standard Contract Information (Required for Projects Over $100,000)
4. W-9 Form (Required for All Projects Prior to Contracting)

Instructions

To receive funding from the Water Supply Reserve Account (WSRA), a proposed water activity must be approved by the local Basin Roundtable **AND** the Colorado Water Conservation Board (CWCB). The process for Basin Roundtable consideration and approval is outlined in materials in Appendix 1.

Once approved by the local Basin Roundtable, the applicant should submit this application **with a detailed statement of work including budget and schedule as Exhibit A** to CWCB staff by the application deadline.

WSRA applications are due with the roundtable letter of support 60 calendar days prior to the bi-monthly Board meeting at which it will be considered. Board meetings are held in January, March, May, July, September, and November. Meeting details, including scheduled dates, agendas, etc. are posted on the CWCB website at: http://cwcb.state.co.us Applications to the WSRA Basin Account are considered at every board meeting, while applications to the WSRA Statewide Account are only considered at the March and September board meetings.

When completing this application, the applicant should refer to the WSRA Criteria and Guidelines available at: http://cwcb.state.co.us/LoansGrants/water-supply-reserve-account-grants/Documents/WSRACriteriaGuidelines.pdf. In addition, the applicant should also refer to the Supplemental Scoring Matrix applied to Evaluation Criteria Tiers 1-3 for Statewide Account requests .

The application, statement of work, budget, and schedule **must be submitted in electronic format** (Microsoft Word or text-enabled PDF are preferred) and can be emailed or mailed on a disk to:

Craig Godbout - WSRA Application
Colorado Water Conservation Board
1313 Sherman St., Room 721
Denver, CO 80203
Craig.godbout@state.co.us

If you have questions or need additional assistance, please contact Craig Godbout at: 303-866-3441 x3210 or craig.godbout@state.co.us.

Water Supply Reserve Account – Application Form
Revised October 2013

Part I. - Description of the Applicant (Project Sponsor or Owner);

1.	Applicant Name(s):	Upper Arkansas Water Conservancy District		
	Mailing address:	339 East HWY 50 P.O. BOX 1090 Salida, CO. 81201		
	FEIN #:			
	Primary Contact:	Ralph "Terry" Scanga Jr.	Position/Title:	General Manager
	Email:	manager@uawcd.com		
	Phone Numbers:	Cell:	Office:	719-539-5425
	Alternate Contact:	Chelsey Nutter	Position/Title:	Project Coordinator
	Email:	projects@uawcd.com		
	Phone Numbers:	Cell: 719-221-8213	Office:	719-539-5425

2. Eligible entities for WSRA funds include the following. What type of entity is the Applicant?

[ ] Public (Government) – municipalities, enterprises, counties, and State of Colorado agencies. Federal agencies are encouraged to work with local entities and the local entity should be the grant recipient. Federal agencies are eligible, but only if they can make a compelling case for why a local partner cannot be the grant recipient.

[x] Public (Districts) – authorities, Title 32/special districts, (conservancy, conservation, and irrigation districts), and water activity enterprises.

[ ] Private Incorporated – mutual ditch companies, homeowners associations, corporations.

[ ] Private individuals, partnerships, and sole proprietors are eligible for funding from the Basin Accounts but not for funding from the Statewide Account.

[ ] Non-governmental organizations – broadly defined as any organization that is not part of the government.

3. Provide a brief description of your organization

The Upper Arkansas Water Conservancy District (UAWCD) was formed in 1979 pursuant to C.R.S. 37-45-102 and case number 79CV30. The district is a quasi-municipality created to conserve water resources and to provide the greatest beneficial use of water in the Upper Arkansas River Basin by construction as defined in C.R.S. 37-45-103(10): dams, reservoirs, canals, conduits, pipelines, tunnels, and all works, facilities, improvements, and property necessary or convenient for supplying water for domestic, irrigation, power, milling, manufacturing, mining, metallurgical, and all other beneficial uses. About 7,000 District customers use water for irrigation (38% of use); municipal storage (25%); and domestic and commercial augmentation (18%). Its service area covers over 2 million high mountain acres in Chaffee, Fremont, Custer and parts of Saguache and El Paso Counties.

A brief history of the applicant

In 1979, the Upper Arkansas Water Conservancy District (UAWCD) was created. In 1982, it assumed control of three high mountain reservoirs in Chaffee County. Since assuming control of the reservoirs, UAWCD has provided storage for two growing municipalities on the South Arkansas River: Salida and Poncha Springs.

From 1980-2000, UAWCD pioneered conjunctive ground water and surface water management, filing the first-ever blanket water augmentation plan for all of Chaffee and part of Fremont County. It acquired storage at two reservoirs tributary to the Arkansas River. It acquired water rights to meet increased demand for augmentation due to promulgation in 1996 of *Amended Rules and Regulations Governing the Diversion and Use of Tributary Ground Water in the Arkansas River Basin*. The Arkansas River Basin is fully-appropriated.

By the early-2000s, population escalated. Double-digit population growth increased municipal demands, intensifying the need for reservoir storage. By utilizing Pueblo Reservoir and Twin Lakes water in conjunction with its tributary storage, UAWCD increased water use efficiency and met municipal demand. To meet growing municipal and augmentation demand, UAWCD expanded the geographic extent of its blanket augmentation plans into eastern Fremont and Custer Counties. As part of its approval, the State Engineer mandated that UAWCD install remote continuous recording instrumentation at most of its reservoirs and certain stream locations.

In the late-2000s, UAWCD built 22 high mountain telemetry water data collection platforms To do so, it leveraged federal Bureau of Reclamation funds of ~$285,000 and state funds of ~$285,000. The project was twice selected as a nationwide success story. More than 500,000 down-basin residents are affected by available supplies of Upper Arkansas River water. Data is managed with Colorado Division of Water Resources software so records for administration/augmentation agree. See http://www.dwr.state.co.us/SurfaceWater/ and http://www.uawcd.com/water_resources.php

In the early 2010s, UAWCD implemented its ~$400,000 US Geological Survey (USGS) water balance study to quantify both surface water and ground water and characterize the interaction between them in the Upper Arkansas River Basin. UAWCD leveraged federal USGS funds of ~$135,000 and state funds of ~$180,000. Study results will enhance the basin-wide decision-making framework for water users including municipalities, irrigators, and recreationists.

4. If the Contracting Entity is different then the Applicant (Project Sponsor or Owner) please describe the Contracting Entity here.

   N/A

5. Successful applicants will have to execute a contract with the CWCB prior to beginning work on the portion of the project funded by the WSRA grant. In order to expedite the contracting process the CWCB has established a standard contract with provisions the applicant must adhere to. A link to this standard contract is included in Appendix 3. Please review this contract and check the appropriate box.

   [x] The Applicant will be able to contract with the CWCB using the Standard Contract

   [ ] The Applicant has reviewed the standard contract and has some questions/issues/concerns. Please be aware that any deviation from the standard contract could result in a significant delay between grant approval and the funds being available.

6. The Tax Payer Bill of Rights (TABOR) may limit the amount of grant money an entity can receive. Please describe any relevant TABOR issues that may affect the applicant.

   Funding will not trigger any TABOR limitations

Part II. - Description of the Water Activity/Project

1. What is the primary purpose of this grant application? (Please check only one)

	Nonconsumptive (Environmental or Recreational)
	Agricultural
	Municipal/Industrial
	Needs Assessment
	Education
X	Other Explain: Multi-Use Feasibility Study

2. If you feel this project addresses multiple purposes please explain.

This grant application is for funding to study the feasibility of multi-use projects that will address agricultural, municipal, recreational, environmental and educational needs.

3. Is this project primarily a study or implementation of a water activity/project? (Please check only one)

X	Study		Implementation

4. To catalog measurable results achieved with WSRA funds can you provide any of the following numbers?

	New Storage Created (acre-feet)
	New Annual Water Supplies Developed, Consumptive or Nonconsumptive (acre-feet)
	Existing Storage Preserved or Enhanced (acre-feet)
	Length of Stream Restored or Protected (linear feet)
	Length of Pipe/Canal Built or Improved (linear feet)
	Efficiency Savings (acre-feet/year OR dollars/year – **circle one**)
	Area of Restored or Preserved Habitat (acres)
	Other -- Explain:

4. To help us map WSRA projects please include a map (Exhibit B) and provide the general coordinates below:

Latitude: 38°33.208 N Longitude: 106°3.669 W

5. Please provide an overview/summary of the proposed water activity (no more than one page). Include a description of the overall water activity and specifically what the WSRA funding will be used for. A full **Statement of Work** with a detailed budget and schedule is required as **Exhibit A** of this application.

The Upper Arkansas Water Conservancy District (the District) is dedicated to the development of innovative water solutions that will address our future water needs. This commitment is demonstrated through the many years dedicated to the development of multi-use projects in the Upper Basin. These projects aim to integrate multiple water use components to address the "gap" through a multi-purpose approach. Currently, the District is moving forward with two multi-use projects; the Lake Ranch Multi-Use Pilot Project (LRMUPP) and the Trout Creek Park Multi-Use Project (TCPMUP), which is featured in the Arkansas Basin Implementation Plan (ArkBIP). These projects are similar in scope and share a common emphasis on the need for Upper Basin storage. The projects have the ability to address both consumptive and non-consumptive needs, while providing a high level of benefit throughout the Arkansas Basin.

The LRMUPP and the TCPMUP have the ability to address storage, agriculture, municipal, recreational and environmental needs. These projects share many of the same components, but differ in scale and available resources. The larger of the two, the TCPMUP is a large scale multi-use project developed to address multiple needs through the collaboration of private, government and public entities. Elements of the TCPMUP include: potential development of 20,000 acre-feet of storage in existing storage facilities and alluvial aquifer storage; lease fallowing options on over 1,800 acres of land decreed for irrigation; recreational opportunities in the form of fishing/ boating access; environmental benefits through protection of open space, wildlife/river corridors and creation of wetlands; and, development of a low-impact hydropower system.

As we continue to move forward with the TCPMUP we recognize the complexity of a project of this scale. The District realized the need for a smaller scale demonstration project, which led to the development of the LRMUPP. Unlike the TCPMUP, the District already owns the Lake Ranch property, associated water rights and has lease agreements for lease fallowing and other project components with the present lessee. Components of the LRMUPP include: alluvial aquifer storage and return flow mapping; lease fallowing in the forms of interruptible water supply or rotational crop fallowing; low-head low-impact hydropower supply; water supply yield enhancement and delivery improvements; educational demonstrations on alternatives to permanent dry-up, use of small scale hydropower and demonstration plots for irrigation technology and crop science R&D; environmental benefits through wetlands and protection of open space; recreational benefits through the enhancement of the Voluntary Flow Management Program; and, potential collaborations with CPW, CSU Extension, USGS, NRCS, Colorado Water Resources and Power Development Authority (CWRPDA), etc..

Multiple purpose water projects are necessary for providing additional needed water supplies in the Twenty First Century. Increasing supplies are essential for all uses of water—municipal, industrial, irrigation (agriculture), recreation and the environment. Storage and management of storage is the element common to all and is necessary to achieve success. For the purposes of this grant application, we would like to investigate the feasibility of each component of the LRMUPP. A feasibility study will allow the District to study each complex component of this pilot project and ensure the success of its implementation. Elements of the feasibility study can be transferable to the larger TCPMUP and aid in future projects to come. The LRMUPP will give the District the insight and knowledge needed for implementation of multi-use projects, while gaining vast benefits at the Lake Ranch throughout the process. The LRMUPP's successful implementation will provide a demonstration of how to maximize utilization of State waters and address the "gap" with a multi-purpose approach.

Part III. – Threshold and Evaluation Criteria

1. Describe how the water activity meets these **Threshold Criteria.** (Detailed in Part 3 of the Water Supply Reserve Account Criteria and Guidelines.)

   a) The water activity is consistent with Section 37-75-102 Colorado Revised Statutes.[1]

   This grant application is for a feasibility study and will not harm any water rights.

   b) The water activity underwent an evaluation and approval process and was approved by the Basin Roundtable (BRT) and the application includes a description of the results of the BRTs evaluation and approval of the activity. At a minimum, the description must include the level of agreement reached by the roundtable, including any minority opinion(s) if there was not general agreement for the activity. The description must also include reasons why general agreement was not reached (if it was not), including who opposed the activity and why they opposed it. Note- If this information is included in the letter from the roundtable chair simply reference that letter.

   Under Separate Cover- Arkansas Basin Roundtable Letter of Approval

[1] 37-75-102. Water rights - protections. (1) It is the policy of the General Assembly that the current system of allocating water within Colorado shall not be superseded, abrogated, or otherwise impaired by this article. Nothing in this article shall be interpreted to repeal or in any manner amend the existing water rights adjudication system. The General Assembly affirms the state constitution's recognition of water rights as a private usufructuary property right, and this article is not intended to restrict the ability of the holder of a water right to use or to dispose of that water right in any manner permitted under Colorado law. (2) The General Assembly affirms the protections for contractual and property rights recognized by the contract and takings protections under the state constitution and related statutes. This article shall not be implemented in any way that would diminish, impair, or cause injury to any property or contractual right created by intergovernmental agreements, contracts, stipulations among parties to water cases, terms and conditions in water decrees, or any other similar document related to the allocation or use of water. This article shall not be construed to supersede, abrogate, or cause injury to vested water rights or decreed conditional water rights. The General Assembly affirms that this article does not impair, limit, or otherwise affect the rights of persons or entities to enter into agreements, contracts, or memoranda of understanding with other persons or entities relating to the appropriation, movement, or use of water under other provisions of law.

c) The water activity meets the provisions of Section 37-75-104(2), Colorado Revised Statutes.[2] The Basin Roundtable Chairs shall include in their approval letters for particular WSRA grant applications a description of how the water activity will assist in meeting the water supply needs identified in the basin roundtable's consumptive and/or non-consumptive needs assessments.

Under Separate Cover- Arkansas Basin Roundtable Letter of Approval

d) Matching Requirement: For requests from the **Statewide Fund**, the applicants will be required to demonstrate a **25 percent** (or greater) match of the total grant request from the other sources, including by not limited to Basin Funds. A minimum match of 5% of the total grant amount shall be from Basin funds. A minimum match of 5% of the total grant amount must come from the applicant or 3rd party sources. Sources of matching funds include but are not limited to Basin Funds, in-kind services, funding from other sources, and/or direct cash match. Past expenditures directly related to the project may be considered as matching funds if the expenditures occurred within 9 months of the date the contract or purchase order between the applicant and the State of Colorado is executed. Please describe the source(s) of matching funds. (NOTE: These matching funds should also be reflected in your Detailed Budget in **Exhibit A** of this application)

Project costs to State and Basin funds may be significantly reduced…
The UAWCD is in the process of leveraging WSRA grant funds with additional grant options. It is anticipated that a 46% match will be made available through direct contributions, cost shares and Basin funds. However, the cost shares will not be made available until July 2016. These cost shares include: funding from the Severance Tax Grant in the amount of $45,290.00 and a match from UAWCD in the amount of $4,529.00 to help fund phase 2 of the Alluvial Aquifer Storage component; and funding through the Colorado Water Resources and Power Development Authority in the amount of $15,000.00 for half the cost of the Hydroelectric component. If the hydroelectric matching amount is not funded through the CWRPDA, the District will cover the full amount of the hydroelectric component at $30,569.00. The district will also receive $5,000 of In-Kind work through the PEPO/ARBWF committees, which will provide outreach and education on both multi-use projects (See Anticipated Funding Budget).

[2] 37-75-104 (2)(c). Using data and information from the Statewide Water Supply Initiative and other appropriate sources and in cooperation with the on-going Statewide Water Supply Initiative, develop a basin-wide consumptive and nonconsumptive water supply needs assessment, conduct an analysis of available unappropriated waters within the basin, and propose projects or methods, both structural and nonstructural, for meeting those needs and utilizing those unappropriated waters where appropriate. Basin Roundtables shall actively seek the input and advice of affected local governments, water providers, and other interested stakeholders and persons in establishing its needs assessment, and shall propose projects or methods for meeting those needs. Recommendations from this assessment shall be forwarded to the Interbasin Compact Committee and other basin roundtables for analysis and consideration after the General Assembly has approved the Interbasin Compact Charter.

2. For Applications that include a request for funds from the **Statewide Account**, describe how the water activity/project meets all applicable **Evaluation Criteria.** (Detailed in Part 3 of the Water Supply Reserve Account Criteria and Guidelines and repeated below.) Projects will be assessed on how well they meet the Evaluation Criteria. **Please attach additional pages as necessary.**

Evaluation Criteria – the following criteria will be utilized to further evaluate the merits of the water activity proposed for funding from the Statewide Account. In evaluation of proposed water activities, preference will be given to projects that meet one or more criteria from each of the three "tiers" or categories. Each "tier" is grouped in level of importance. For instance, projects that meet Tier 1 criteria will outweigh projects that only meet Tier 3 criteria. The applicant should also refer to the Supplemental Scoring Matrix applied to Evaluation Criteria Tiers 1-3 for Statewide Account requests. WSRA grant requests for projects that may qualify for loans through the CWCB loan program will receive preference in the Statewide Evaluation Criteria if the grant request is part of a CWCB loan/WSRA grant package. For these CWCB loan/WSRA grant packages, the applicant must have a CWCB loan/WSRA grant ratio of 1:1 or higher. Preference will be given to those with a higher loan/grant ratio.

Tier 1: Promoting Collaboration/Cooperation and Meeting Water Management Goals and Identified Water Needs

a. The water activity addresses multiple needs or issues, including consumptive and/or non-consumptive needs, or the needs and issues of multiple interests or multiple basins. This can be demonstrated by obtaining letters of support from other basin roundtables (in addition to an approval letter from the sponsoring basin).

   The LRMUPP's main objective is to determine the feasibility of how to successfully implement multi-use and multi-purpose projects. The LRMUPP is designed to address both consumptive and non-consumptive needs and integrate these needs into a single project. This project can lead as an example of how to face water challenges in the future through a multi-purpose approach. This study will specifically address storage, agriculture, municipal, energy, education, recreational and environmental needs.

b. The number and types of entities represented in the application and the degree to which the activity will promote cooperation and collaboration among traditional consumptive water interests and/or non-consumptive interests, and if applicable, the degree to which the water activity is effective in addressing intrabasin or interbasin needs or issues.

   The LRMUPP will address the needs of multiple water users and will bring collaboration and cooperation between private, government and public entities. Specifically this project aims to collaborate with: the current agricultural lessee through lease fallowing options; CPW or SECWCD for integration and enhancement of the Voluntary Flow Management Program; CSU Extension for educational attributes of crop R&D and irrigation methods; USGS for the study of the underlying aquifer and potential for underground storage; CWRPDA for the use of a low-head low-impact hydro-power system; Greater Arkansas River Nature Association (GARNA) for implementation of wetlands; and, public education through development of a pilot project that can showcase the benefits of multi-use projects.

c. The water activity helps implement projects and processes identified as helping meet Colorado's future water needs, and/or addresses the gap areas between available water supply and future need as identified in SWSI or a roundtable's basin-wide water needs assessment.

The LRMUPP will help implement projects and processes identified in the Arkansas Basin Implementation Plan. This pilot project will lead as a demonstration for the implementation of the larger TCPMUP that is featured in the ArkBIP. This pilot project will assist in the implementation of future multi-use projects that will have the ability to address the "gap" through a collaborative approach. Specifically, the LRMUPP will address the "gap" through new storage, lease fallowing and delivery system improvements.

Tier 2: Facilitating Water Activity Implementation

d. Funding from this Account will reduce the uncertainty that the water activity will be implemented. For this criterion the applicant should discuss how receiving funding from the Account will make a significant difference in the implementation of the water activity (i.e., how will receiving funding enable the water activity to move forward or the inability obtaining funding elsewhere).

Funding for the LRMUPP feasibility study will aid in the implementation of the LRMUPP, as well as, the larger TCPMUP. Initial feasibility studies are complex and funding will ensure the successful study of all elements of this project. A feasibility study is needed to understand all of the working components involved in these multi-use projects. Without funding, these projects will be unable to move forward and/or without the extent to which they are intended.

e. The amount of matching funds provided by the applicant via direct contributions, demonstrable in-kind contributions, and/or other sources demonstrates a significant & appropriate commitment to the project.

The District is dedicated to securing all possible funding from multiple sources for this study. We are applying for grants through CWRPDA and the Severance Tax Fund to ensure enough funding to properly study all elements of this project. A 46% match will be provided through District contributions, cost share partners & basin funds. The District will also be responsible for the total cost share matching amounts from the CWRPDA if they are unable to contribute.

Tier 3: The Water Activity Addresses Other Issues of Statewide Value and Maximizes Benefits

f. The water activity helps sustain agriculture & open space, or meets environmental or recreational needs.

This project helps sustain agriculture through the continued irrigation of agricultural lands and through the use of Alternative Transfer Methods instead of permanent buy-and-dry. This project also supports environmental needs through the creation of wetlands on re-charge ponds and protection of open space. The LRMUPP will support recreational needs through the enhancement of storage options for the Voluntary Flow Management Program.

g. The water activity assists in the administration of compact-entitled waters or addresses problems related to compact entitled waters and compact compliance and the degree to which the activity promotes maximum utilization of state waters.

h. The water activity assists in the recovery of threatened and endangered wildlife species or Colorado State species of concern.

i. The water activity provides a high level of benefit to Colorado in relationship to the amount of funds requested.

This project can lead as an example of how to address future water needs with a collaborative approach. There is a high level of benefit from this project through the studies that will be conducted and can be transferable across the state. This project will act as a demonstration of how to integrate the needs of agricultural, municipal, recreational and environmental interests, while addressing the "gap" and providing new inventive ways to face our future water challenges. This project will also demonstrate how to implement multi-use projects more efficiently.

j. The water activity is complimentary to or assists in the implementation of other CWCB programs.

Continued: Explanation of how the water activity/project meets all applicable **Evaluation Criteria**.

Please attach additional pages as necessary.

Part IV. – Required Supporting Material

1. **Water Rights, Availability, and Sustainability** – This information is needed to assess the viability of the water project or activity. Please provide a description of the water supply source to be utilized, or the water body to be affected by, the water activity. This should include a description of applicable water rights, and water rights issues, and the name/location of water bodies affected by the water activity.

   This is a feasibility study and will not affect any sources of water. The study will include analysis on the Cameron Ditch in Chaffee County Colorado and the underlying alluvial aquifer.

2. Please provide a brief narrative of any related studies or permitting issues.

   Reservoir and Stream Gauge Telemetry Project
   In the late-2000s, UAWCD built 22 high mountain telemetry water data collection platforms, to do so, it leveraged federal Bureau of Reclamation funds of ~$285,000 and state funds of ~$285,000. The project was twice selected as a nationwide success story. More than 500,000 down-basin residents are affected by available supplies of Upper Arkansas River water. Data is managed with Colorado Division of Water Resources software so records for administration/augmentation agree. These telemetry water data stations will be critical for the administration of proposed components associated with both the LRMUPP and the TCPMUP.

   Underground Water Storage in the Buena Vista-Salida Basin
   In the early 2010s, UAWCD implemented its ~$400,000 US Geological Survey (USGS) water balance study to quantify both surface water and ground water and characterize the interaction between them in the Upper Arkansas River Basin. The final draft of the study titled *Groundwater and Surface-Water Interaction and Potential for Underground Water Storage in the Buena Vista-Salida Basin, Chaffee County, Colorado, 2011* was distributed in 2014. The report showed high potential for underground storage at both the TCPMUP and LRMUPP locations.

   Lease Fallowing Tool
   In 2012, the lease fallowing tool development sponsored by the UAWCD with participation and cost shares from of Southeastern Colorado Water Conservancy District, Board of Water Works Pueblo, Lower Arkansas Water Conservancy District, and Colorado Springs Utilities, and was begun with the awarding of grants from the ATM grant funds and WSRA State and Arkansas Basin funds. The four phased project total cost was $355,715.00. Beta versions of the tool are being used on pilot lease-fallowing projects in the Lower Arkansas Valley. The tool development was completed in mid-2015 and presentations of the tool to the public will take place in early 2016 and extend throughout the State during 2016. The development of the lease fallowing (Administration/Accounting) tool was an important precursor to the continuum of multi-use water projects in the Arkansas Basin. This tool is anticipated to be implemented in both the LRMUPP and the TRCMUP.

CoAgMet Stations
The Colorado Agricultural Meteorological Network (CoAgMet) is a network of automatic weather stations that provide internet access to weather and crop water use data. CoAgMet provides weather data in different formats, including daily or monthly summaries, hourly data, and graphs. Crop water use information from CoAgMet can be used in irrigation scheduling. The UAWCD sponsors 5 CoAgMet stations within the district boundaries. These stations will be extremely beneficial in the development of lease fallowing options and educational demonstrations for irrigation research and development at both project locations.

3. Statement of Work, Detailed Budget, and Project Schedule

The statement of work will form the basis for the contract between the Applicant and the State of Colorado. In short, the Applicant is agreeing to undertake the work for the compensation outlined in the statement of work and budget, and in return, the State of Colorado is receiving the deliverables/products specified. **Please note that costs incurred prior to execution of a contract or purchase order are not subject to reimbursement**. All WSRA funds are disbursed on a reimbursement basis after review invoices and appropriate backup material.

Please provide a detailed statement of work using the template in Exhibit A. Additional sections or modifications may be included as necessary. Please define all acronyms and include page numbers.

REPORTING AND FINAL DELIVERABLE

Reporting: The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of the executed contract. The progress report shall describe the completion or partial completion of the tasks identified in the statement of work including a description of any major issues that have occurred and any corrective action taken to address these issues.

Final Deliverable: At completion of the project, the applicant shall provide the CWCB a final report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings and engineering reports/designs.

PAYMENT

Payment will be made based on actual expenditures and invoicing by the applicant. Invoices from any other entity (i.e. subcontractors) cannot be processed by the State. The request for payment must include a description of the work accomplished by major task, and estimate of the percent completion for individual tasks and the entire water activity in relation to the percentage of budget spent, identification of any major issues and proposed or implemented corrective actions. The last 10 percent of the entire water activity budget will be withheld until final project/water activity documentation is completed. All products, data and information developed as a result of this grant must be provided to the CWCB in hard copy and electronic format as part of the project documentation. This information will in turn be made widely available to Basin Roundtables and the general public and help promote the development of a common technical platform.

The above statements are true to the best of my knowledge:

Signature of Applicant:

Print Applicant's Name: Ralph "Terry" Scanga

Project Title: Upper Ark Multi-Use Projects Phase 1: Lake Ranch Multi-Use Pilot Project Feasibility Study

Date: 2/1/2016

Return an electronic version (hardcopy may also be submitted) of this application to:

Craig Godbout – WSRA Application
Colorado Water Conservation Board
1313 Sherman St., Room 721
Denver, CO 80203
303-866-3441, ext. 3210 (office)
303-547-8061 (cell)
craig.godbout@state.co.us

Exhibit A

Statement of Work
Date: 2/1/16

WATER ACTIVITY NAME – Upper Arkansas Multi-Use Projects Phase 1: Lake Ranch Multi-Use Pilot Project (LRMUPP) Feasibility Study

GRANT RECIPIENT – Upper Arkansas Water Conservancy District

FUNDING SOURCE – WSRA- State and Basin Funding

INTRODUCTION AND BACKGROUND

Multiple purpose water projects are necessary for providing additional needed water supplies in the Twenty First Century. Increasing supplies are essential for all uses of water—municipal, industrial, irrigation (agriculture), recreation and the environment. Storage and management of storage is the element common to all and is necessary to achieve success. Currently, the District is moving forward with two multi-use projects; the Lake Ranch Multi-Use Pilot Project (LRMUPP) and the Trout Creek Park Multi-Use Project (TCPMUP), which is featured in the Arkansas Basin Implementation Plan (ArkBIP). These projects are similar in scope and share a common emphasis on the need for Upper Basin storage. The projects have the ability to address both consumptive and non-consumptive needs, while providing a high level of benefit throughout the Arkansas Basin.

For the purposes of this grant application, we would like to investigate the feasibility of each component of the LRMUPP. A feasibility study will allow the District to study each complex component of this pilot project and ensure the success of its implementation. Elements of the feasibility study can be transferable to the larger TCPMUP and aid in future projects to come. The LRMUPP will give the District the insight and knowledge needed for implementation of multi-use projects, while gaining vast benefits at the Lake Ranch throughout the process. The LRMUPP's successful implementation will provide a demonstration of how to maximize utilization of State waters and address the "gap" with a multi-purpose approach.

MEETING THE NEEDS OF THE COLORADO WATER PLAN

Critical Action Plan Implementation Goals Met:

1. **Supply & Demand (A)**- This project will address the supply & demand gap through increased storage, lease fallowing and integrated water management;
2. **Conservation (B)** - This project has the ability to address conservation by providing a demonstration on new storage technologies to store and manage this conserved water and will provide a demonstration garden on irrigation efficiencies and plant species;
3. **Agriculture (D)**- This project will demonstrate agricultural viability through Alternative Transfer Methods and protection from permanent "buy & dry";
4. **Storage (E)**- This project will provide multi-purpose & multi-partner storage options and will demonstrate the use and benefits of alluvial aquifer storage;

5. **Watershed Health, Environment, and Recreation (F)** - Enhances environmental values through the creation of wetlands and protection of open space. Recreational benefits include the potential enhancement of the Voluntary Flow Management Program;
6. **Funding (G)** – This project uses a variety of funding mechanisms in the form of matching grants from the Colorado Water Resources and Power Development Small Hydropower Grant Match and UAWCD cash matching. This project is designed to promote sustainability through generating revenue and promoting collaboration through multiple partnerships. Potential revenue can be developed through the hydropower and storage components and future partnerships include CPW, SECWCD, Local Land Trusts, GARNA, CSU Extension, and, more.; and,
7. **Education, Outreach, and Innovation (H)** – This project will include education and outreach in the form of a demonstration garden to promote innovation in irrigation and plant species; provide a demonstration of the use of small hydropower systems; provide a demonstration on the use of lease fallowing; and provide an example of how to implement multi-purpose/use projects.

OBJECTIVES

- To study the feasibility of multi-use projects;
- To improve our understanding of how multiple water use components can be integrated into a single project;
- To investigate the use of alluvial aquifer storage;
- To investigate the potential for low-head, low-impact, hydro-power systems;
- To analyze the potential for enhancements of delivery systems;
- To analyze water rights yields and return flows;
- To analyze the use of ATMS and the Lease Fallowing Tool;
- To successfully integrate environmental and recreational needs;
- To develop educational demonstrations on irrigation R&D, ATMs, & hydropower;
- To produce studies and demonstrations that can lead as an example and be transferable to the TCPMUP and future multi-use projects across the State; and,
- To establish the necessary requirements to move the LRMUPP into Phase 2- Implementation.

TASKS

TASK A – Water Rights Analysis
Phase 1- Feasibility Analysis Water Rights Yield & Development Costs

Description of Task
Includes review of the ranch water rights decrees, deeds and agreements, historic diversion analysis, inspection of diversion points and field delivery, review of historic irrigation practices water use and delivery, delineation and mapping of irrigated acreage, survey of soils, cropping records, crop ET analysis, analysis of aquifer characteristics with estimates on transmissivity and travel times for groundwater return flows, complete preliminary sizing of recharge pits for return flow requirements, analyze utilization of the lease fallowing tool and calculate historic consumptive use and depletions crop consumption and return flow requirements; identify cost components and estimates needed to perfect a water right change and alternative transfer options such as lease fallowing and interruptible supply.

Method/Procedure

- Water rights review- obtain and summarize water rights decrees, deeds, and agreements;
- Diversion analysis- complete historic diversion analysis for Cameron Ditch diversions;
- Field Inspection- inspect ditch headgate diversion and review of other diversion points;
- Historic Reviews- interview past tenants, owners, and water commissioners on historic use;
- Irrigated Acreage- field inspection and delineate historic irrigated acreage;
- Soils Survey- summarize soils survey data including soil types and holding water capacity;
- Cropping records- review and summarize FSA files for historic cropping information;
- Crop ET- using state CU programs, Salida CoAgMET station data, or other excepted data;
- Aquifer Characteristics -summarize well permit database to establish well depths and levels;
- Recharge Pit- complete preliminary sizing of pits to provide delayed return flow requirements;
- Historic Consumptive Use/Depletion - utilize the Lease Fallowing Tool; and,
- Development Costs- identify and estimate cost components for items needed to perfect a water rights change.

Deliverable

Photo mapping and project mapping of property, maps that summarize ground contours, flow paths and travel times to the Arkansas River. List of estimates of constructions costs and consumptive use yield loss due to evaporation from recharge pits. A feasibility report summarizing all work associated with HCU, valuation and development costs. The report will address the use of diversions as a potential use for augmentation.

TASK A-2 – Water Rights Analysis
Phase 2- Water Rights Detailed Studies

Description of Task

Ditch transit loss, ET study based on local climate data such as from the UAWCD sponsored CoAgMet Stations in the UA valley, ground water impact to crop growth, analysis of potential dry-up alternatives such as crop rotation, identification of potential injury to other water rights.

Method/Procedure

- Ditch Transit Loss Study- install flow measuring devices and determine losses and gains of the ditch system;
- ET- perform detailed ET study based on available local climate data;
- Ground Water- develop several shallow root zone piezometers to monitor groundwater levels;
- Dry Up- analyze irrigated areas to determine partial dry up alternatives or rotation schedule plan; and,
- Potential Injury- identify potential injury to other water users and investigate methods to prevent injury.

Deliverable

Engineering report in support of water right application for lease fallowing to add other uses to existing water right. Water right accounting, and complete feasibility report of all elements of phase 2.

TASK B- Water Supply Yield Enhancement

Description of Task
Develop a summary of South Arkansas and Main Stem Calls; historic estimate of flow rate and volume available for delivery to the ranch; review of land ownership between ranch and Arkansas River.

Method/Procedure

- Historic Calls- Develop summary of analysis for the South Arkansas River and Main Stem;
- Historic Flow Rate- Develop historic estimate of flow rate available for delivery to the Lake Ranch; and,
- Review Land Ownership from property to river- Identify alternative easement routs for physical delivery of water to river.

Deliverable
Create a GIS mapping of assessor's parcel list and identify alternate easement routes for physical delivery of water to the Arkansas River. Summarize a memo report.

TASK C- Hydraulic Analysis and Delivery Improvement

Description of Task
Reconnaissance of existing ditch conditions from headgate to end of ditch; analyze ditch capacity and transit loss; investigate ditch alignment; perform hydraulic analyses for piping to property boundaries; identify potential easement issues, environmental issues or permitting requirements.

Method/Procedure

- Develop Reconnaissance Level Existing Conditions Survey of Ditch -dams, turnouts, divider boxes, measuring devices, soils, surroundings and topography;
- Ditch Capacity and Transit Loss Study-make spot measurements of actual flow at full water right capacity to determine actual capacity vs. water right capacity;
- Ditch alignment with respect to property boundaries- identify potential easement issues, environmental issues, or permitting requirements;
- Hydraulic Analysis for Ditch Piping or Lining- perform hydraulic analysis for flow enlargement alternatives; and,
- Improvement Alternatives of Several Scenarios- existing operations, improved delivery, year-round deliveries, and enlargement scenarios.

Deliverable
Digital mapping of plan view and ditch profile with improvements, summarized in a memo report. A gain/loss study summary report. Summarize ditch improvement alternatives and project cost estimates. Feasibility report of all work associated with ditch improvement alternatives.

TASK D- Alluvial Aquifer Storage
Phase 1- Feasibility Analysis Water Rights Yield, Valuation, and Development

Description of Task
Summarize soil survey data and water holding capacity; complete sizing of recharge pits; estimate construction costs; research USGS studies including the UAWCD sponsored Water Balance Study; summarize well permit data; estimate transmissivity; develop water inflow versus delayed returns; investigate groundwater levels along Arkansas River; estimate groundwater elevation increases;

Method/Procedure

- Soil Survey- summarize soils survey data including soil types and holding water capacity
- Recharge Pit- complete preliminary sizing of pits to provide delayed return flow requirements;
- USGS- research USGS studies and incorporate into report
- Aquifer Characteristics- complete estimates on transmissivity and travel time from historic irrigation practices; and,
- Groundwater and Springs- investigate groundwater/spring levels & elevations.

Deliverable
Summarize all work associated with Alluvial Aquifer development in a feasibility report and include cost estimates of construction.

TASK D-2 – Alluvial Aquifer Storage
Phase 2- Geotechnical Engineering

Description of Task
Develop monitoring holes to define soil characteristics and water level monitoring, monitor monthly for one year; model groundwater travel paths and locations; detailed property topographical survey.

Method/Procedure

- Monitoring Holes- develop monitoring holes to define soil characteristics and levels;
- Monitoring- monitor water levels monthly for one year;
- Groundwater Modeling- refine travel paths and locations; and,
- Produce a detailed property topographical survey.

Deliverable
Summarize all work associated with geotechnical engineering in a feasibility report.

TASK E-Hydroelectric Plant

Description of Task
Field survey elevation potential, piping and electrical infrastructure; estimate water supply and flow as well as historic diversions with various flow scenarios; investigate utility interconnection requires; power purchase options such as net metering and power purchase agreements with local electric provider; research FERC, CDPHE, and local permitting requirements; preliminary hydraulic design and equipment selection; develop cost estimates for the various alternatives; perform economic analysis of each alternative for ROI.
Method/Procedure

- Site Investigation- field survey elevation potential, assess piping and electrical infrastructure;
- Water Supply Estimates- develop available flow hydrographs;

- Investigate utility interconnection requirements & power purchase options;
- Research federal, state, and local permitting requirements
- Preliminary Hydrologic Design- design and select equipment for all alternatives;
- Develop cost estimates for all alternatives; and,
- Preform economic analysis for all alternatives.

Deliverable
Summarize in a feasibility report hydroelectric project alternatives and financial analysis for each.

TASK F- Educational Demonstrations

Description of Task
Demonstration project for ATM; utilization of pivot irrigation corners for plant and irrigation research and development; hydroelectric project demonstration; partner with CSU Extension, NRCS, and Conservation District.

Method/Procedure
- Solicit potential partners for development of educational demonstrations;
- Investigate potential for utilization of pivot irrigation corners;
- Develop alternatives for potential uses of irrigation corners;
- Collect all data needed for plant and irrigation R&D;
- Design demonstration plant and irrigation R&D; and,
- Develop demonstrations for ATM and Hydropower.

Deliverable
Report on feasibility of demonstration projects on Ranch property for Education

TASK G- Environment/ Recreation

Description of Task
Develop project concept and determine water requirements for wetland development and costs by using recharge pits; research regional wetlands banks and market value for credits; meet with USACE to review wetlands permitting; investigate the potential quantity and timing of water available for delivery to enhance flow regimes in the Arkansas River below the ranch utilizing underground storage under a lease fallowing arrangement.

Method/Procedure
- Created Wetlands- develop concepts, costs and water requirements and hold permitting meetings;
- Voluntary Flow Management Program- investigate quantity and timing of available water and meet with potential partners for enhancement of the VFMP.

Deliverable
Prepare a feasibility report to include project development and associated cost estimates.

LRMUPP Initial WSRA Grant Request Budget

Total Personnel Cost by Task					Initial Funding Request by Task				
Tasks	Description	Engineering	Project Management	Total	WSRA State Funds	WSRA Basin Funds	In-Kind-PEPO	UAWCD Match	Total
A	Water Rights Yield, Valuation, and Development	$12,540.00	$1,254.00	$13,794.00	$13,794.00				$13,794.00
A-2	Water Rights Detailed Studies	$29,615.00	$2,961.50	$32,576.50	$32,576.50				$32,576.50
B	Water Supply yeild Enhancement	$8,895.00	$889.50	$9,784.50	$9,784.50				$9,784.50
C	Hydrolic Analysis & Delivery Improvements	$28,680.00	$2,868.00	$31,548.00	$31,548.00				$31,548.00
D	Alluvial Aquifer Storage	$13,815.00	$1,381.50	$15,196.50		$15,196.50			$15,196.50
D-2	Geotechnical Engineering	$45,290.00	$4,529.00	$49,819.00	$39,819.00	$10,000.00			$49,819.00
E	Hydroelectic	$27,790.00	$2,779.00	$30,569.00				$30,569.00	$30,569.00
F	Education/ Outreach /Demonstrations	$5,000.00	$6,000.00	$11,000.00		$6,000.00	$5,000.00		$11,000.00
G	Environment/Rec	$14,020.00	$1,402.00	$15,422.00	$15,422.00				$15,422.00
H	Contingency	$20,000.00		$20,000.00	$20,000.00				$20,000.00
	Totals	**$205,645.00**	**$24,064.50**	**$229,709.50**	**$162,944.00**	**$31,196.50**	**$5,000.00**	**$30,569.00**	**$229,709.50**
	Percent Totals	**90%**	**10%**	**100%**	**71%**	**14%**	**2%**	**13%**	**100%**

UAWCD LAKE RANCH FEASIBILITY STUDIES TIMELINE

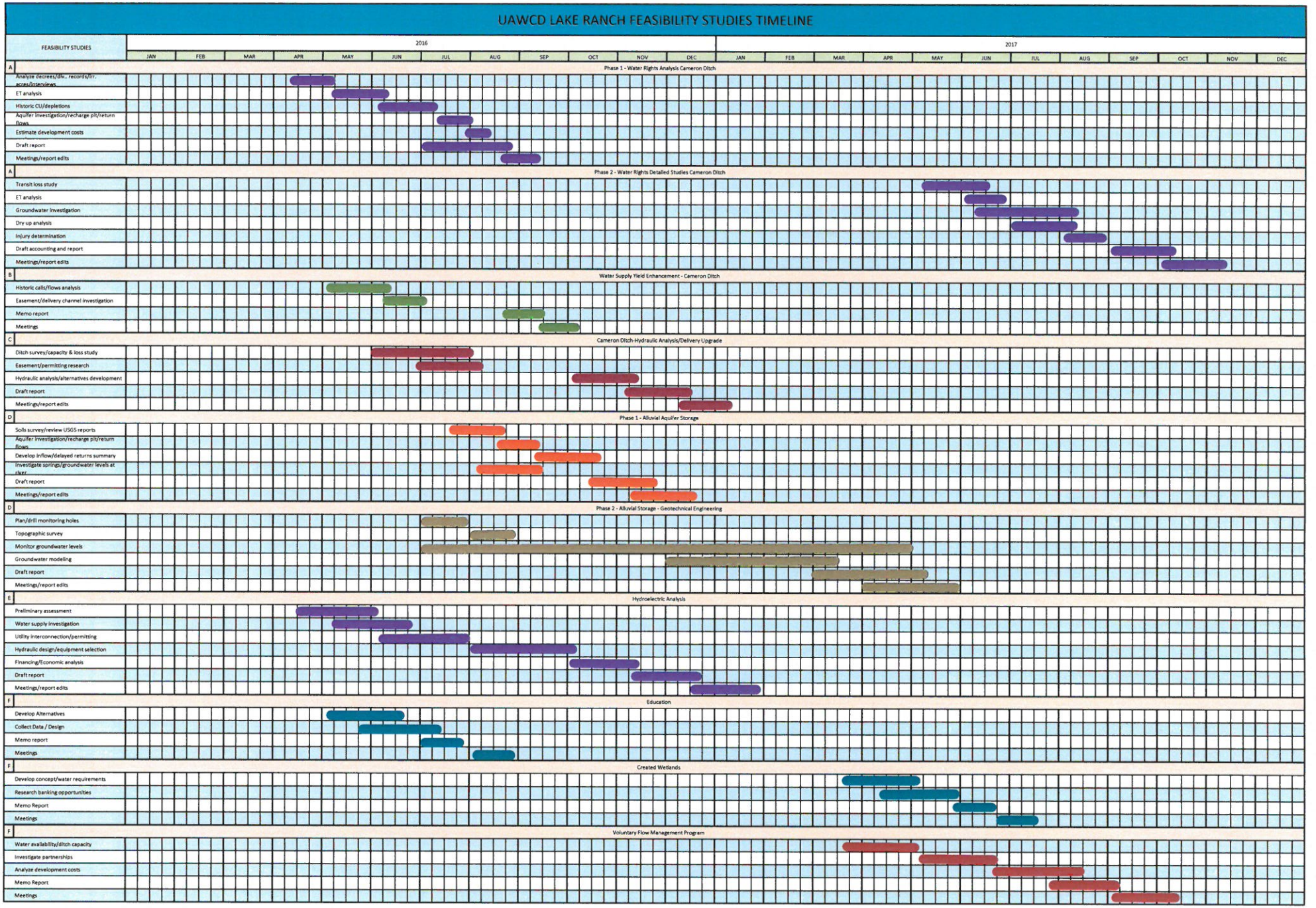


TABLE 1
Detailed Engineering Costs

Feasibility Studies				Expenses		Others Subs Costs		CRE costs					
		Description of Tasks	Total Cost	$	Item	$	Item	Hrs	$130 /hr	Hrs	$95 /hr	Hrs	$65 /hr
A	**Water Rights Analysis Cameron Ditch**												
	Phase 1 - Feasibility analysis Water Rights Yield and Development costs												
	1	Water rights review - Obtain and summarize water right decrees, deeds, and existing agreements. Summarize known ownership by others in the ditch	$ 580					2	$ 260	2	$ 190	2	$ 130
	2	Diversion analysis - complete historic diversion analysis for Cameron Ditch diversions including prorata headgate entitlements.	$ 830					1	$ 130	6	$ 570	2	$ 130
	3	Field Inspection - Inspect ditch headgate diversion and reconnaissance level review of other diversion points, methods of water splitting and delivery infrastructure	$ 900					4	$ 520	4	$ 380		$ -
	4	Historic interviews - Interview past tenants, owners, and water commissioners on historic irrigation practices, water use, and deliveries	$ 510					1	$ 130	4	$ 380		$ -
	5	Irrigated acreage - Field inspect property and delivery system. Compile historic aerial photo and delineate historic irrigated acreage of property through time. Create photo mapping and project mapping	$ 675					3	$ 390	3	$ 285		$ -
	6	Soils Survey - Summarize soils survey data including soil types and holding water capacity for root zone of crops grown	$ 450					1	$ 130	2	$ 190	2	$ 130
	7	Cropping records - Review and summarize FSA files for historic cropping information	$ 385					1	$ 65	2	$ 190	2	$ 130
	8	Crop Et - Using state CU programs, Salida CoAgMet station data, or other accepted engineering numbers from recent cases estimate the crop consumptive use requirements	$ 510						$ -	4	$ 380	2	$ 130
	9	Aquifer Characteristics - Summarize well permit database to establish wells in the area, depths, water levels, and aquifer materials. Prepare estimates on transmissivity and travel times for groundwater return flows from historic irrigation practices. Prepare maps summarizing ground contours, flow paths, travel times to the Arkansas River[1]	$ 2,120					4	$ 520	10	$ 950	10	$ 650

Feasibility Studies				Expenses		Others Subs Costs		CRE costs					
		Description of Tasks	Total Cost	$	Item	$	Item	Hrs	$130 /hr	Hrs	$95 /hr	Hrs	$65 /hr
	10	Recharge Pit - Utilizing soils and aquifer data complete preliminary sizing of recharge pits to provide delayed return flow requirements. Include estimated construction costs and loss of consumptive use yield due to evaporation[2]	$ 675					3	$ 390	3	$ 285		$ -
	11	Historic Consumptive use/Depletions - Analyze historic time period options. Utilizing Lease fallow tool to calculate depletions to the Arkansas River and South Arkansas River. The depletions will identify diversions, delivery losses, crop water consumed, and return flow requirements.	$ 1,030					1	$ 130	4	$ 380	8	$ 520
	12	Development Costs - Identify and estimate cost components for items needed to perfect a water rights change. Include typical engineering fees, legal costs, return flow analysis. Include alternative transfer options including lease fallow and interruptible supply. Include recharge pit alternative for delayed return flows	$ 615					4	$ 520	1	$ 95		$ -
	13	Feasibility Report - Deliverable will be a report summarizing all work associated with the historic use analyses, valuation, and development costs. The report will address the use of the diversions from the Cameron Ditch as a potential augmentation source.	$ 1,410					4	$ 520	8	$ 760	2	$ 130
	14	Meetings with UAWCD staff to obtain project information, update results, and provide summary report to Board of Directors.	$ 1,350					6	$ 780	6	$ 570		$ -
	15	Misc expenses copies, research documents, photos	$ 500	$ 500	mileage,misc				$ -		$ -		$ -
		Subtotal $12,540											
	Phase 2 - Water Rights Detailed Studies												
	1	Ditch Transit Loss study - Install flow measuring devices and determine losses /gains. Field inspect diversion splitters, spot measurement flows in ditch.	$ 3,190					1	$ 130	24	$ 2,280	12	$ 780
	2	ET - Perform detailed ET study based on available local climate data	$ 2,505					8	$ 1,040	12	$ 1,140	5	$ 325

Feasibility Studies				Expenses		Others Subs Costs		CRE costs					
		Description of Tasks	Total Cost	$	Item	$	Item	Hrs	$130 /hr	Hrs	$95 /hr	Hrs	$65 /hr
	3	Ground water - Develop several shallow root zone piezometers to monitor groundwater levels and potential impact to crop water demands. Permitting, contractor coord.	$ 7,020	$ 6,000	6 piez				$ -	8	$ 760	4	$ 260
	4	Dry up - analyze topographical contours of irrigated areas, determine partial dry up alternatives or rotation schedule plan. Monument plan areas	$ 4,540			$ 2,500	surveyo	4	$ 520	16	$ 1,520		$ -
	5	Identify potential injury to other water users and investigate methods to prevent injury	$ 780					6	$ 780		$ -		$ -
	6	Prepare Engineering report in support of water rights application using feasibility analysis report updated for above items	$ 6,750					24	$ 3,120	30	$ 2,850	12	$ 780
	7	Water Rights accounting	$ 1,820					4	$ 520		$ -	20	$ 1,300
	8	Feasibility Report - Phase 2: update initial report	$ 1,160					4	$ 520	4	$ 380	4	$ 260
	9	Meetings with UAWCD staff to obtain project information, update results, and provide summary report to Board of Directors.	$ 1,350					6	$ 780	6	$ 570		$ -
	10	Misc expenses copies, research documents, photos	$ 500	$ 500	mileage, wells,				$ -		$ -		$ -
		Subtotal $29,615											
B	**Water Supply Yield Enhancement - Increase water deliveries through the Cameron Ditch**												
	1	Historic Calls - Develop Summary of analysis South Arkansas River and Main Stem	$ 2,010					2	$ 260	2	$ 190	24	$ 1,560
	2	Develop historic estimate of flow rate and volume of water that would have been available for delivery to the Lake property	$ 4,020					4	$ 520	30	$ 2,850	10	$ 650
	3	Review land ownership between UAWCD property and Arkansas River. Create GIS mapping county assessors parcel. Identify alternative easement routes for physical delivery of water to the river.	$ 1,135					2	$ 260	1	$ 95	12	$ 780
	4	Summarize in Memo report	$ 1,030					4	$ 520	4	$ 380	2	$ 130
	5	Meetings with UAWCD staff to obtain project information, update results, and provide summary report to Board of Directors.	$ 450					2	$ 260	2	$ 190		$ -
	6	Misc expenses copies, research documents, photos	$ 250						$ -		$ -		$ -
		Subtotal $8,895											
C	**Cameron Ditch - Hydraulic Analysis and Delivery Improvements**												

Feasibility Studies				Expenses		Others Subs Costs		CRE costs					
		Description of Tasks	Total Cost	$	Item	$	Item	Hrs	$130 /hr	Hrs	$95 /hr	Hrs	$65 /hr
	1	Develop reconnaissance-level existing conditions survey of ditch from the headgate to the end of the ditch, including diversion dam, turnouts, divider boxes, measuring devices. Existing conditions to include the typical ditch dimensions, ditch materials/soils, surrounding topography, and improvements. The final product to be digital mapping showing plan view and profile of the ditch, with improvements, summarized in memo report.	$ 4,880					8	$ 1,040	24	$ 2,280	24	$ 1,560
	2	Ditch capacity and transit loss study: Install flow measuring devices as needed and make spot measurements of actual flows in the ditch at the headgate, flume and at two downstream locations. Field inspect diversion splitters. Measurements should be taken at the full water right capacity for purposes of establishing actual capacity versus water right capacity. Gain/loss study to be summarized.	$ 7,740	$ 2,500	weir plates			12	$ 1,560	36	$ 3,420	4	$ 260
	3	Investigate ditch alignment with respect to property boundaries (assessor's data and original ditch plat). Identify potential easement issues, environmental issues, or permitting requirements.	$ 4,880					8	$ 1,040	24	$ 2,280	24	$ 1,560
	4	Perform hydraulic analyses for ditch piping or lining alternatives, based on historic ditch flows. Perform hydraulic analyses for flow enlargement alternatives.	$ 3,310					4	$ 520	28	$ 2,660	2	$ 130
	5	Develop improvement alternatives and water supply yield for several scenarios: existing operations, historic flows with improved delivery, year-round deliveries, and possible enlargement alternatives. Summarize ditch improvement alternatives including estimates of project costs.	$ 3,840					12	$ 1,560	24	$ 2,280		$ -
	6	Feasibility Report - Deliverable will be a report summarizing all work associated with the ditch improvement alternatives.	$ 2,630					8	$ 1,040	14	$ 1,330	4	$ 260
	7	Meetings with UAWCD staff to obtain project information, update results, and provide summary report to Board of Directors.	$ 900					4	$ 520	4	$ 380		$ -
	8	Misc expenses copies, research documents, photos	$ 500	$ 500	mileage, wells,				$ -		$ -		$ -
		Subtotal $28,680											

Feasibility Studies				Expenses		Others Subs Costs		CRE costs					
		Description of Tasks	Total Cost	$	Item	$	Item	Hrs	$130 /hr	Hrs	$95 /hr	Hrs	$65 /hr
D		**Alluvial Aquifer Storage**											
		Phase 1 - Feasibility analysis Water Right Yield, Valuation, and Development costs											
	1	Soils Survey - Summarize soils survey data including soil types and holding water capacity	$ 900					2	$ 260	4	$ 380	4	$ 260
	2	Recharge Pit - Utilizing soils and aquifer data complete preliminary sizing of recharge pits to provide delayed return flow requirements. Include estimated construction costs and loss of consumptive use yield due to evaporation[2]	$ 675					3	$ 390	3	$ 285		$ -
	3	Research USGS studies and incorporate into report	$ 1,300					4	$ 520		$ -	12	$ 780
	4	Aquifer Characteristics - Summarize well permit database to establish wells in the area, depths, water levels, and aquifer materials. Prepare estimates on transmissivity and travel times for groundwater return flows from historic irrigation practices. Prepare maps summarizing ground contours, flow paths, travel times to the Arkansas River[1]	$ 2,120					4	$ 520	10	$ 950	10	$ 650
	5	Develop summary of water inflow versus delayed returns	$ 1,400					2	$ 260	12	$ 1,140		$ -
	6	Investigate groundwater levels and springs along river. Estimate groundwater elevation increases	$ 2,940					4	$ 520	20	$ 1,900	8	$ 520
	7	Feasibility Report - Deliverable will be a report summarizing all work associated with the Alluvial Aquifer development.	$ 2,630					8	$ 1,040	14	$ 1,330	4	$ 260
	8	Meetings with UAWCD staff to obtain project information, update results, and provide summary report to Board of Directors.	$ 1,350					6	$ 780	6	$ 570		$ -
	9	Misc expenses copies, research documents, photos	$ 500						$ -		$ -		$ -
		Subtotal $13,815											
		Phase 2 - Geotechnical Engineering											
	1	Geotechnical engineering monitoring holes to define soils characteristcs and development of monitoring holes for water level monitoring	$ 20,000	$ 20,000	4 wells				$ -		$ -		$ -
	2	water level monitoring monthly through one year	$ 4,800						$ -		$ -		$ -
	3	Groundwater modeling to refine travel paths and locations	$ 10,500					24	$ 3,120	64	$ 6,080	20	$ 1,300
	4	Detailed property topographical survey	$ 2,500	$ 2,500					$ -		$ -		$ -

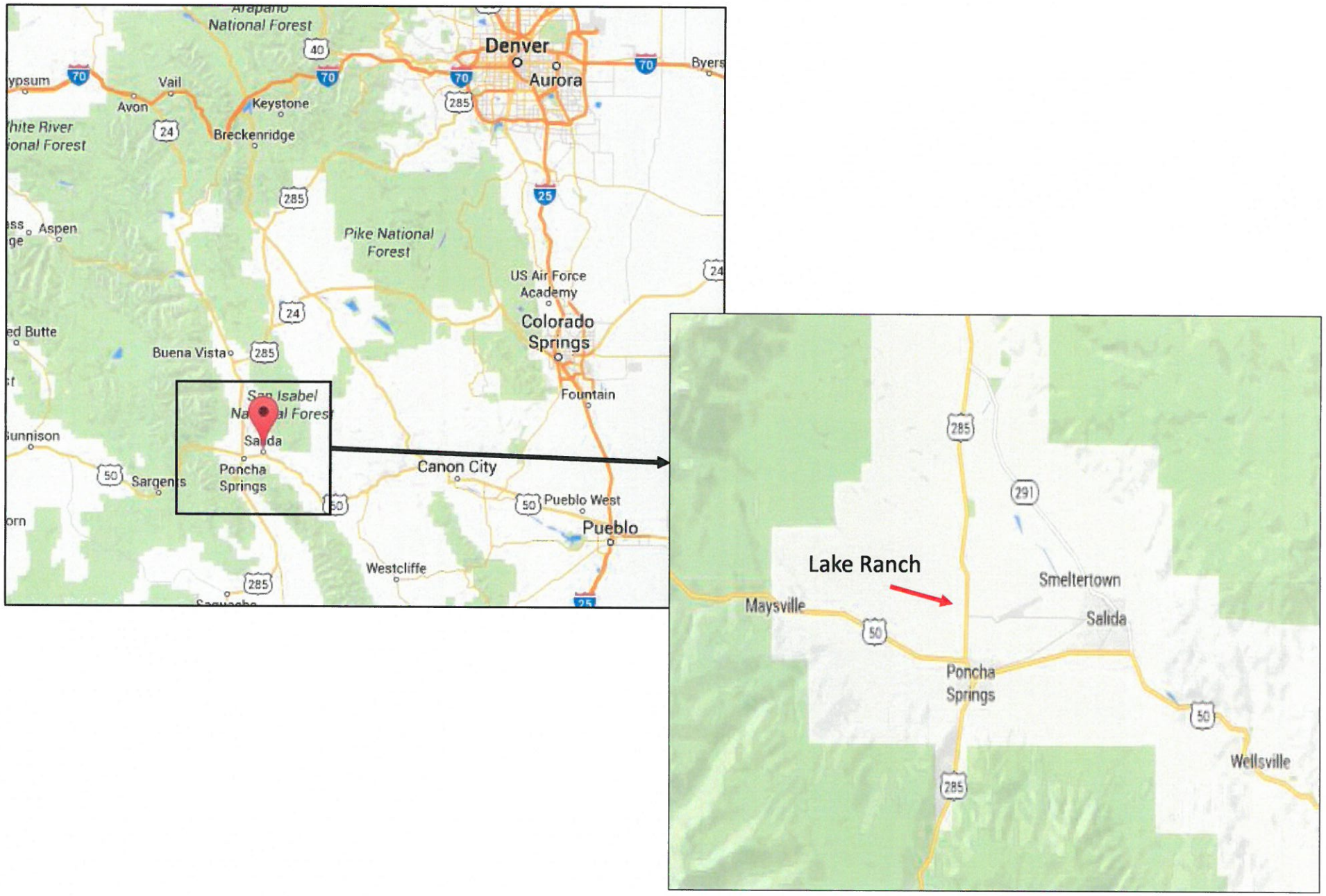
Feasibility Studies				Expenses		Others Subs Costs		CRE costs					
		Description of Tasks	Total Cost	$	Item	$	Item	Hrs	$130 /hr	Hrs	$95 /hr	Hrs	$65 /hr
	5	Feasibility Report - Deliverable will be a report summarizing all work associated with the geotechnical engineering.	$ 4,880					8	$ 1,040	24	$ 2,280	24	$ 1,560
	6	Meetings with UAWCD staff to obtain project information, update results, and provide summary report to Board of Directors.	$ 1,610					8	$ 1,040	6	$ 570		$ -
	7	Misc expenses copies, research documents, photos	$ 1,000						$ -		$ -		$ -
		Subtotal $45,290											
E	**Hydroelectric Plant**												
	1	Site Investigation: field survey elevation potential, assess piping and electrical infrastructure	$ 1,540					4	$ 520	8	$ 760	4	$ 260
	2	Water Supply Estimates: develop available flow hydrographs for several alternatives including historic diversions, year-round operation, and enhanced flow scenarios.	$ 4,860					12	$ 1,560	32	$ 3,040	4	$ 260
	3	Investigate utility interconnection requirements and power purchase options: meet with Sangre de Christo Electric to identify interconnection requirements and costs; assess purchase options: power purchase agreement or net-metering.	$ 2,040					4	$ 520	16	$ 1,520		$ -
	4	Research federal (FERC, etc.), state (CDPHE, etc.), and local permitting requirements, develop timeline and process for permit acquisition	$ 2,550					4	$ 520	20	$ 1,900	2	$ 130
	5	Preliminary hydraulic design and equipment selection: select several potential water supply flow regimes; perform hydraulic analyses and select turbine/generator equipment for each alternative.	$ 4,150					6	$ 780	30	$ 2,850	8	$ 520
	6	Develop cost estimates for each alternative, including design, equipment, construction, interconnection costs, and other development costs, i.e., permitting, easements, etc.	$ 1,480					4	$ 520	6	$ 570	6	$ 390
	7	Perform economic analysis for each hydroelectric alternative: estimate power production and revenues; investigate project financing mechanisms; develop ROI analysis spreadsheet	$ 2,040					4	$ 520	16	$ 1,520		$ -
	8	Feasibility Report - Deliverable will be a report summarizing hydroelectric project alternatives, including financial analysis for each.	$ 6,830					12	$ 1,560	50	$ 4,750	8	$ 520

Feasibility Studies				Expenses		Others Subs Costs		CRE costs					
		Description of Tasks	Total Cost	$	Item	$	Item	Hrs	$130 /hr	Hrs	$95 /hr	Hrs	$65 /hr
	9	Meetings with UAWCD staff to obtain project information, update results, and provide summary report to Board of Directors.	$ 1,800					8	$ 1,040	8	$ 760		$ -
	10	Misc expenses copies, research documents, photos	$ 500	$ 500					$ -		$ -		$ -
		Subtotal $27,790											
	Education												
		Alternatives to permanent dryup, e.g., lease fallowing, demonstration project	$ 1,000						$ -		$ -		$ -
		Corner utilization demonstration	$ 1,000						$ -		$ -		$ -
		Hydroelectric project demonstration	$ 1,000						$ -		$ -		$ -
		Irrigation technology and/or crop science R&D	$ 1,000						$ -		$ -		$ -
		Partnership and grant opportunities w/CSU Extension, NRCS, USGS, Cons. Districts	$ 1,000						$ -		$ -		$ -
		Subtotal $5,000											
F	**Environmental/Recreation**												
	1	Created Wetlands: develop project concept, determine water requirements, analyze wetlands development costs, including the use of recharge pits, research regional wetlands banks and the market value of wetlands credits. Meet with USACE to review wetlands permitting in upper basin. Prepare feasibility report summarizing wetlands project scope, construction costs, and wetlands banking potential.	$ 5,360					12	$ 1,560	40	$ 3,800		$ -
	2	Volunteer Flow Management Program: investigate the potential quantity and timing of water available for delivery to enhance flows of the Arkansas River below the ranch, under a lease fallowing arrangement, and/or with underground storage. Feasibility report would include preliminary project development cost estimates.	$ 8,660					48	$ 6,240	20	$ 1,900	8	$ 520
		Subtotal $14,020											

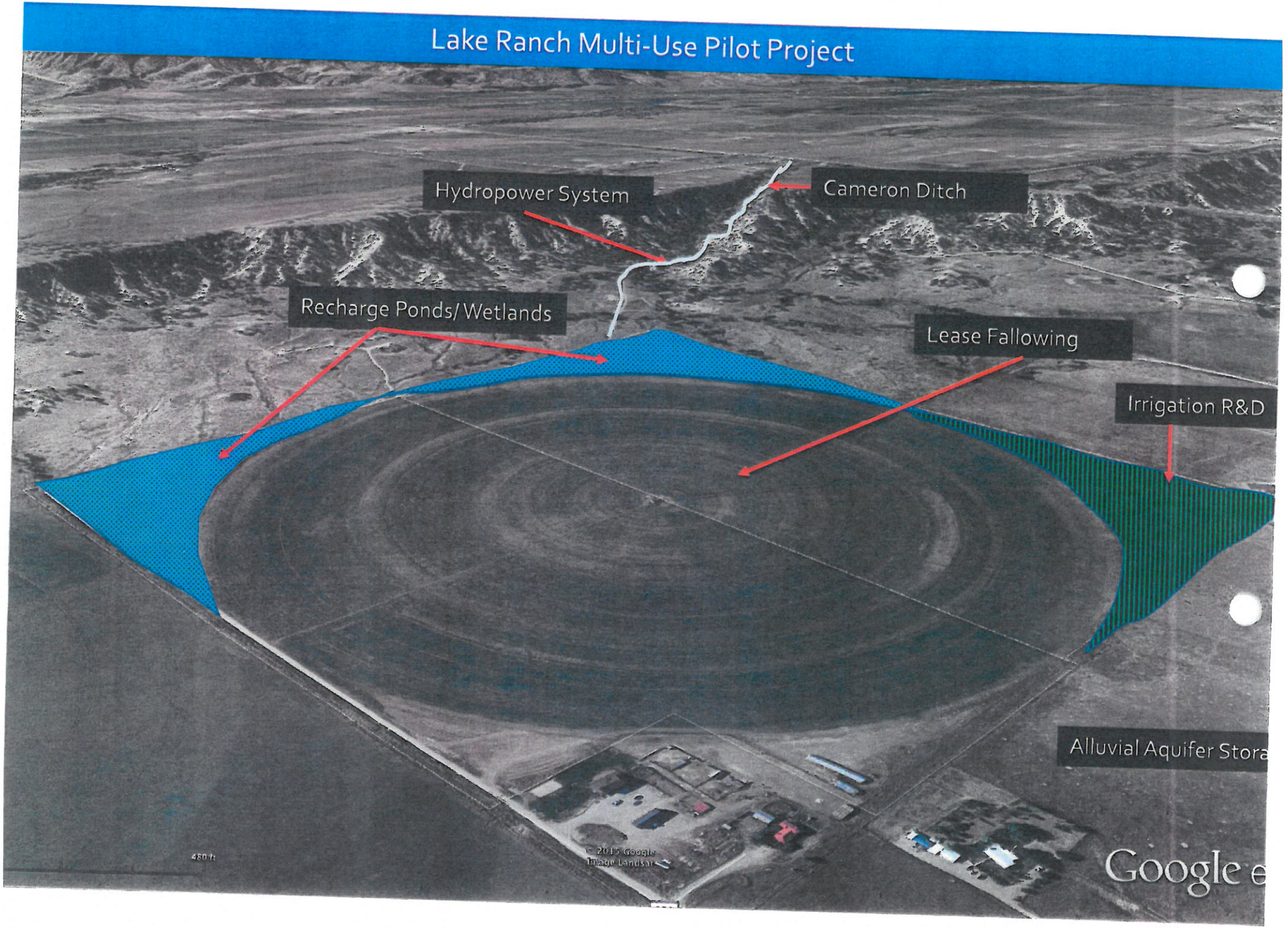
Engineering Total	**$185,645**
Project Management	**$24,065**
Contingency	**$20,000**
Project Total	**$229,710**

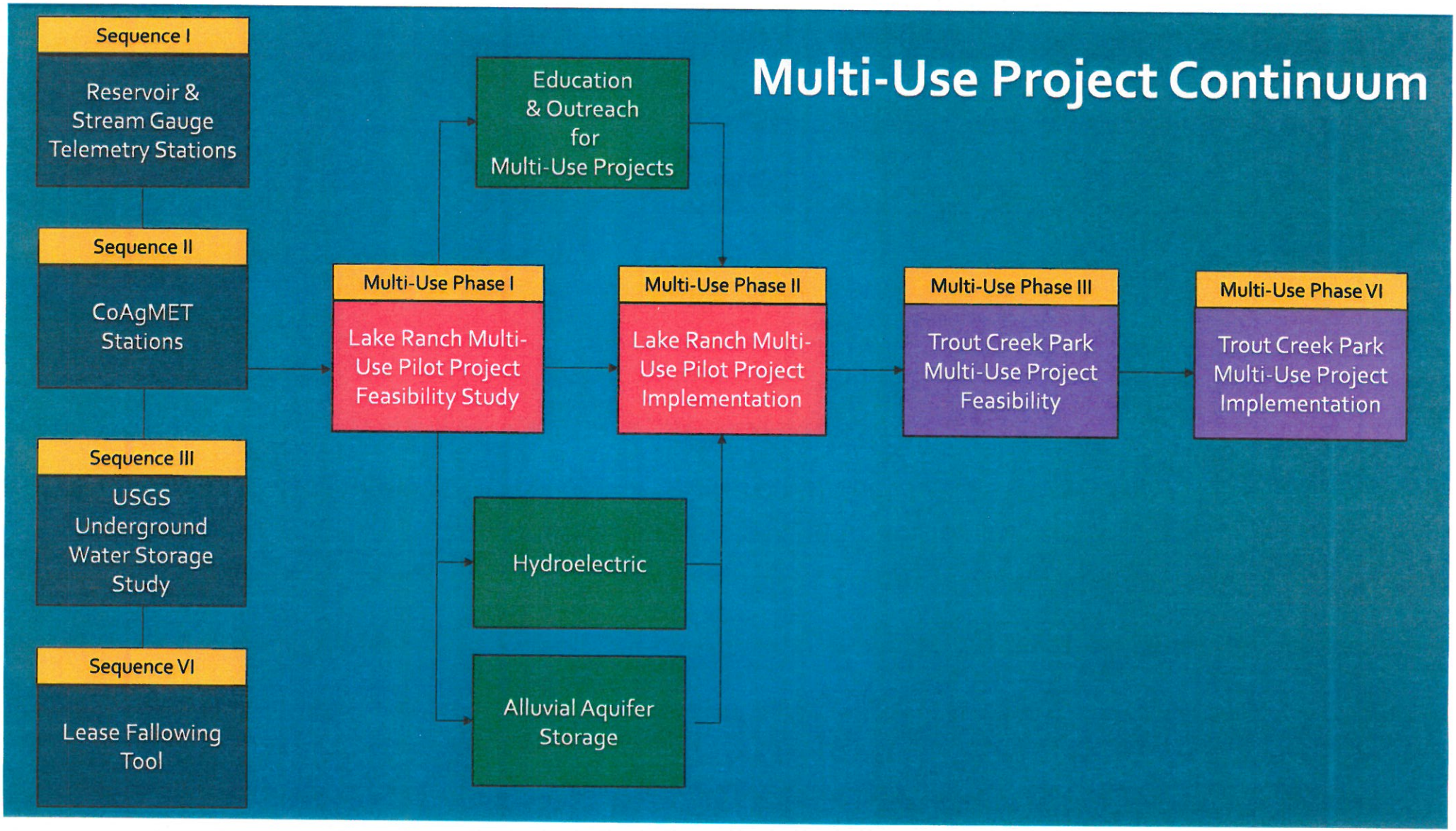
* 10% of Engineering Costs + $5,500 additional Education and outreach cost (PEPO)

Project Location Maps



Lake Ranch Multi-Use Pilot Project




Multi-Use Project Continuum
Sequence I
Reservoir & Stream Gauge Telemetry Stations
Sequence II
CoAgMET Stations
Sequence III
USGS Underground Water Storage Study
Sequence VI
Lease Fallowing Tool
Education & Outreach for Multi-Use Projects
Multi-Use Phase I
Lake Ranch Multi-Use Pilot Project Feasibility Study
Multi-Use Phase II
Lake Ranch Multi-Use Pilot Project Implementation
Multi-Use Phase III
Trout Creek Park Multi-Use Project Feasibility
Multi-Use Phase VI
Trout Creek Park Multi-Use Project Implementation
Hydroelectric
Alluvial Aquifer Storage