

Statement of Work

WATER ACTIVITY NAME – La Plata River Water Resources Operations Model

GRANT RECIPIENT – La Plata Water Conservancy District

FUNDING SOURCE – Statewide Water Supply Reserve Account

INTRODUCTION AND BACKGROUND

The La Plata River Water Resources Operations Model will be a robust and accurate baseline model for the La Plata River. The model will integrate groundwater and surface water and provide a invaluable tool for water users and the Office of the State Engineer (SEO) to use to optimize water resources planning with the basin.

The Long Hollow Reservoir (LHR) will be built near the state line, in order to improve compliance with the La Plata River Compact and optimize beneficial use of water in Colorado (see Figure 1). By allowing Colorado's Compact delivery obligations to be met from the reservoir releases rather than suffer the transportation losses associated with delivery in the River channel, La Plata Water Conservancy District will be able to operate upstream exchange to ditches otherwise called out by the Compact. The proposed project will develop a model and methods for determining the most efficient and effective means for La Plata River operations. This study will take into account the new conditions presented by the operations of the LHR Compact Pool as well as LHR exchange water. The proposed study will benefit irrigators, the State, and SEO while meeting environmental and Compact requirements.

OBJECTIVES

It is expected that the proposed model will:

- 1) Allow the SEO to evaluate alternative Compact compliance delivery conduits and assess any impact on water users.
- 2) Allow LPWCD to assess, optimize and account for LHR operations including reservoir filling (whether directly or by groundwater recharge), account for and optimize the anticipated upstream exchange, and evaluate alternative reservoir operations regimes.
- 3) Quantify exchange water by ditch and develop an Allocation Plan for the exchange water in LHR that is adopted by ditch companies and LPWCD.
- 4) Allow water users and developers to evaluate alternative water development strategies in manner that does not injure existing water users.

TASKS

Task 1: Refine and Improve the baseline La Plata River Model in StateMod

Description:

The study will begin by refining and improving the existing Colorado Decision Support System's StateMod model for the La Plata River basin in Colorado. Additional data and nodes will be added, updated and refined. Groundwater return flows and/or depletions will be added to the model. All of the additional inputs will be used to run the model with historic diversion records in order to establish a more robust baseline condition for the La Plata River.

Method:

- Review and enhance irrigated acreage assessment by ditch and/or by water rights
- Refine inputs for irrigation and reservoir operations using input from irrigators, reservoir operators, commissioners and records
- Update datasets with current records from HydroBase, CDSS, USGS gages, WRCC, groundwater field measurements and other sources
- Obtain parameters for modeling groundwater return flows from irrigation and recharge; Hydrographs of wells and groundwater studies will be a source of inputs for model
- Develop more nodes to include input for tributaries and groundwater return flows
- Refine assumptions on Compact calls
- Develop historical model data set and documentation
- Run and calibrate the baseline model, including simulating split river conditions

Deliverables:

- Documentation of all input parameters and assumptions
 - All files for the DMIs TSTool and State DMI used to create the historical model data set.
 - Narrative, geographic and other documentation of input parameters
- StateMod model for La Plata River including LHR
 - Includes groundwater return flows modeling
 - Includes simulation of split river conditions
 - Tabulation of monthly diversions, broken down by ditch and by direct vs. exchange diversions, for all basin diversions included in the model
- All information will be made available to SEO, CWCB and others for future use and updates

Task 2: Analyze means of administering the La Plata River and LHR

Description:

Several aspects of river operations and accounting will be analyzed using the improved model, and recommendations for accounting and administration will be made based on results.

Method:

LHR predictive model

- Using the historical data set, revise demands, water rights, return flows and operations to reflect current conditions for the model period (aka calibrate model)
- Model futile calls and operations of Compact Pool

- Quantification of exchange water associated with LHR District Pool releases
- Appropriate allocation of exchange water to ditches based on historical data
- Means of accounting for direct flow diversions and exchange water diversions

Alternate conveyance feasibility and associated impacts

- Develop a baseline of operations and streamflow during late-season call periods when Compact Pool is empty
- Model alternate conveyance of Compact water via up to three irrigation ditches
- Assess the potential groundwater recharge and/or depletions related to baseline and alternative conveyance methods

Deliverables:

- StateMod model for operations of LHR and quantification of exchange water
 - All associated documentation
- Findings and recommendations for operations of Compact Pool
- Findings and recommendations for quantification and allocation of exchange water
- Findings and recommendations for potential means of alternative conveyance of late-season Compact water

Task 3: Collaboration amongst LPWCD, SEO and water users

Description:

Personnel working on the model will meet with LPWCD, water users and SEO staff to obtain information and buy-in on the operating parameters used in the model. This will include criteria for administration of the Compact Pool, groundwater administration based on recharge, and strategies for exchange water accounting. Meetings throughout the study period will help to support that the findings of the model being adopted and implemented by the SEO.

Method:

Meetings may occur in Denver, Durango and/or on-site, as necessary, and will be coordinated by the project manager.

Deliverables:

- Documented meetings between modelers, LPWCD, SEO and/or water users
- Guidance from SEO on development of model

Task 4: Develop Allocation Plan

Description:

The exchange water quantified in Task 2 will be used to develop an Allocation Plan for the District Pool. The plan will be used to reach agreements with all participating ditches anticipated to receive exchange water. The agreements with ditches and associated payments for exchange water will provide the capital for operations and maintenance of LHR.

Method:

An Allocation Plan will be developed based on:

- Quantification of exchange water by the model using historical data (see Task 2)
- Negotiations with Ditches
- Discussions on model parameters and/or accuracy with modelers
- Maintaining compliance with environmental requirements, Compact Pool requirements and La Plata River Compact

Deliverables:

- A summary of the Allocation Plan will be provided to the CWCB describing the overall agreements and value of exchange water
- A detailed Allocation Plan will be prepared for LPWCD for use in operations of LHR

Task 5: Documentation, Reporting and Recommendations

Description:

Bi-annual reporting will be completed per CWCB requirements. A summary report will be prepared and made available to the CWCB, SEO and public.

Method:

A summary report will be prepared, including the following:

- Documentation of assumptions and data used in the model to facilitate future use and updates of the model
- Results and discussion of the analyses on administration and accounting
- Summary of Allocation Plan
- Recommendations and tools for administration (such as spreadsheets and models)
- Preliminary recommendations on alternative conveyance methods

Deliverables:

- Status reports to the CWCB on the progress of the project, obstacles and budget will be provided bi-annually
- Final report for the project
 - Report will include spreadsheets, graphs, mapping, model inputs and/or other formats to best represent the study methods and results
 - A draft report will be prepared; LPWCD and the SEO will have the opportunity to make comments and revisions
 - A final report will be provided in hard copy and electronic format
 - Report will be made available to LPWCD, CWCB, SEO and other entities as appropriate

REPORTING AND FINAL DELIVERABLE

See Task 4 above.

BUDGET

The proposed project will be completed by qualified modeling experts (Hertzman Consulting, LLC and Leonard Rice Engineers, Inc.) and by Bikis Water Consultant, LLC which has extensive experience in LHR, the La Plata River and specific water rights concerns. Support and guidance will be provided, as needed, by the LPWCD water attorney, Adam Reeves, Esq. with Maynes, Bradford, Shipp & Sheftel, LLP. The LPWCD Board, ditch companies and water rights owners, and the SEO will be involved with the development and implementation of the project as an in-kind contribution. Qualifications of key personnel are available upon request.

Table 1. Total Costs				
Task	Labor Cost	Direct Cost	Total Costs	In-Kind
	(1)	(2)	(3)	(4)
1. Refine and Improve the baseline La Plata River Model in StateMod	\$34,950	\$3,275	\$38,225	LPWCD and water users
2. Model scenarios for La Plata River Operations and Exchange Water Allocation	\$20,098	\$1,860	\$21,957	LPWCD and water users
3. Collaboration with stakeholders and model refinement	\$27,625	\$2,013	\$29,638	LPWCD, SEO, water users
4. Allocation Plan	\$45,293	\$3,099	\$48,392	LPWCD and water users
5. Documentation, Reporting and Recommendations	\$37,114	\$3,261	\$40,375	LPWCD
Total Costs	\$165,080	\$13,508	\$178,588	-
Statewide Grant			\$148,823	-
LPWCD Matching Funds (20% of Statewide)			\$29,765	-

Notes:

(1) Labor costs shown in Table 1a (below).

(2) Direct Costs equal 10% of labor costs (excluding Legal). Direct costs include mileage, copies, software, travel time, etc.

(3) Total Project Cost equals sum of columns 1 and 2.

(4) In-Kind contributions consist of time from LPWCD Board, Ditch Companies, SEO and other stakeholders. These contributions are not quantified or counted as matching funds.

Table 1a. Budget per Personnel				
Task	Prof Staff	Tech & Admin	Legal	Total
	(1)	(2)	(3)	(4)
1. Baseline Modeling	\$30,750	\$2,000	\$2,200	\$34,950
2. Modeling Scenarios	\$15,598	\$3,000	\$1,500	\$20,098
3. Collaboration & Model Refinement	\$18,125	\$2,000	\$7,500	\$27,625
4. Allocation Plan	\$27,993	\$3,000	\$14,300	\$45,293
5. Reporting	\$26,614	\$6,000	\$4,500	\$37,114
Total Costs	\$119,080	\$16,000	\$30,000	\$165,080

Notes:

(1) Professional staff includes project manager, modeling experts and support staff. Rates range from \$65/hr to \$175/hr.

(2) Technicians and Administrative Assistant rates range from \$44/hr to \$60/hr.

(3) Legal fees are a lump sum of \$30,000 for the project and have been approximately allocated per task.

(4) Equals sum of columns 1 through 3.

SCHEDULE

Task	Start Date	Finish Date
1. Refine and Improve the baseline La Plata River Model in StateMod	Upon NTP	NTP + 3 months
2. Analyze means of administering the La Plata River and LHR	Upon Completion of Task 1	Task 1 + 3 months (Task 2 and 3 to be completed concurrently)
3. Collaboration with Stakeholders and Model Refinement		
4. Allocation Plan	Upon Completion of Task 2 and 3	Task 2 and 3 + 4 months
4. Documentation, Reporting and Recommendations	Upon Completion of Tasks 2 and 3	Task 2 and 3 + 5 months
Total Project	NTP	NTP + 11 months

NTP= Notice to Proceed