Scope of Work
Gunnison Basin Implementation Plan

Introduction

The Gunnison River Basin's current and projected consumptive and nonconsumptive water needs were most recently assessed in the Statewide Water Supply Initiative (SWSI) 2010, and summarized in the SWSI 2010 Gunnison Basin Report. This report identified a future "gap" between projected municipal and industrial (M & I) supplies and needs, as well as current and projected agricultural shortages. In response to the Governor's call for a Colorado Water Plan, each Basin Round Table (BRT) is charged with developing a Basin Implementation Plan (BIP). The purpose of the Basin Implementation Plan is to further develop projects and methods to meet municipal, industrial, agricultural, environmental, and recreational needs. This effort involves an analysis of basin-wide needs; identification of constraints and opportunities in meeting those needs; an analysis of the ability for proposed projects and methods to meet the basin water supply gaps; and finally, recommended implementation strategies to promote the success of selected projects. In addition, this process is guided by basin goals and measurable outcomes developed by the Gunnison Basin Round Table (GBRT) and applied to measure the success of projects selected in the plan.

For the GBRT, selective hydrologic modeling with Colorado's Decision Support Systems (CDSS) could enhance this analysis. These basin-wide modeling tools could help to quantify and locate water supply options in the basin through an analysis of multiple use options, reservoir enlargements or reoperations, potential project competition, or the identification of other issues. Since these models were previously developed for the basin and represent a majority of the needs in the basin over a long-term study period, they could serve as an excellent platform to analyze basin-wide needs. Additionally, Wilson Water Group staff have extensive experience with modeling in the basin, having enhanced and refined the CDSS consumptive use and surface water allocation models that represent Gunnison basin hydrology, uses, operations, and legal constraints. This scope of services includes proposed modeling work in Tasks 3 & 4 that will be directly guided by input from the GBRT.

Results from the first phase of the Colorado River Water Availability Study are ideally suited to help answer some of the less intensive inquiries concerning constraints and opportunities in the basin. As one of the primary developers of this study, Wilson Water Group is uniquely positioned to use these study results as they were originally intended: to help water managers geographically assess future availability under variable conditions using the results available through the State's CRWAS Data Viewer.

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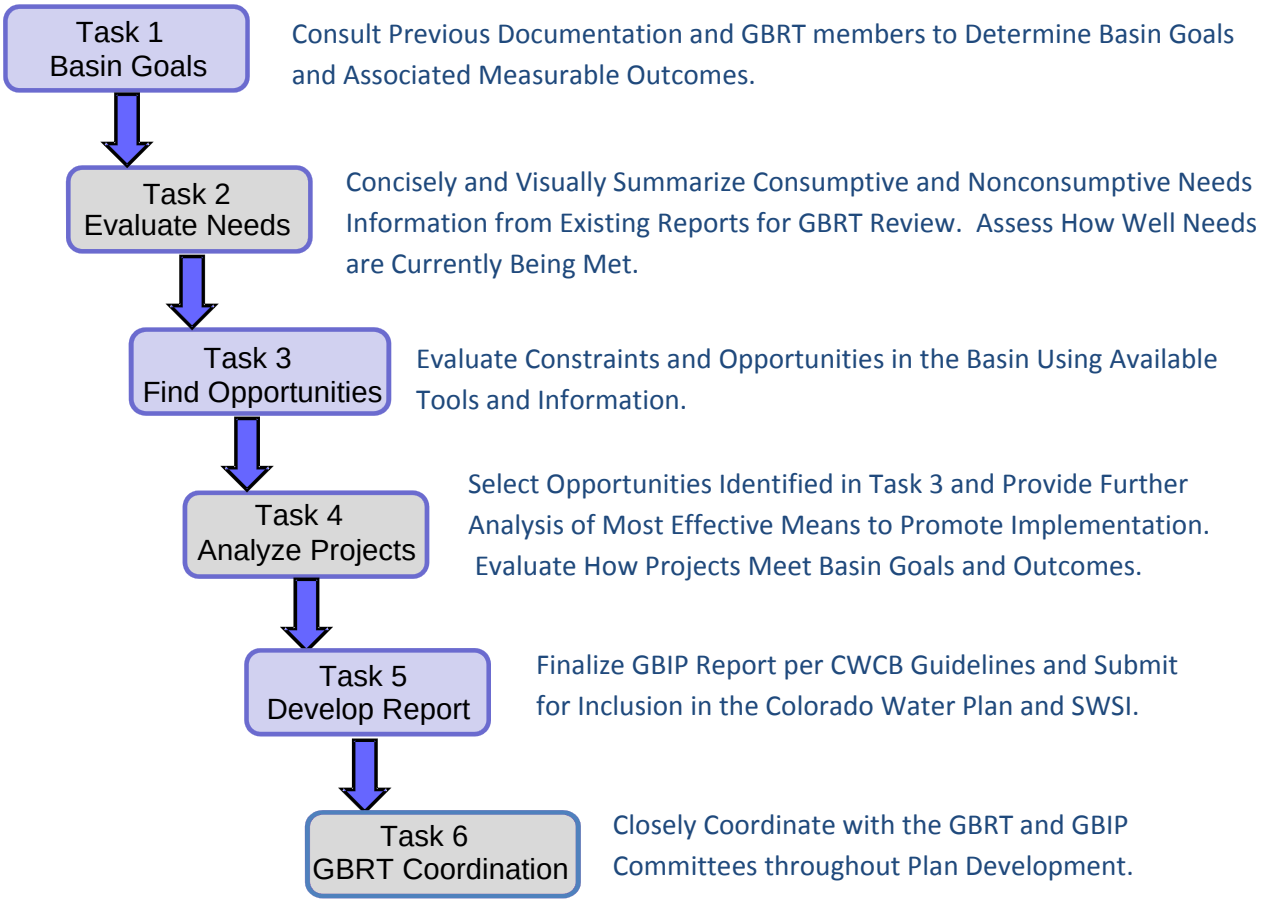
Proposed Scope of Services

The following figure summarizes our proposed task approach. The following scope of services describes each task, deliverable, schedule, and associated budget, Wilson Water Group proposes to assist the GBRT in completing the GBIP. This scope includes a thorough review of previously developed information such as: SWSI reports, basin and project-specific studies, the Colorado River Water Availability Study and associated outputs, the Trampe Risk Assessment Document, as well as information from local water users and GBRT representatives. Wilson Water Group envisions completing each task in close coordination with the GBRT to ensure that the plan accurately reflects their prioritized goals and objectives.



Task 1: Development of Basin Goals and Measureable Outcomes

This task allows the GBRT to discuss water management challenges in the basin, define specific short and long-term goals, and then articulate measureable outcomes to ensure that these goals are being met over time. Initially, these goals will be drawn from the summary of strategies in the SWSI 2010 Gunnison Basin Report, SWSI 2010, SWSI 1, IBCC efforts, and other CWCB materials. Other documentation such as the Trampe Risk Assessment Document and the Gunnison River Basin Handbook will also be used to create an initial draft of basin goals which will be further refined by GBRT input.

Approach

Wilson Water Group staff will work with the CWCB to create an initial draft list of basin goals from known materials. Examples of potential measureable outcomes will also be provided with the draft list. Wilson Water Group staff will facilitate a half-day workshop with the GBIP Committee to discuss and refine the list before presenting it to the full GBRT for discussion. Discussion will highlight water management challenges in the basin, define the goals and measureable outcomes for the GBIP, and address how the goals and outcomes are consistent with future SWSI efforts and the Colorado Water Plan. The discussion and agreed upon goals and outcomes will be summarized in *Section 1* of the GBIP report, and will guide the efforts for the remaining project tasks.

Materials that may help inform the Basin Goals and Measureable Outcomes may include, but are not limited to:

- SWSI 2010 Gunnison Basin Report
- All other SWSI documentation
- IBCC documents
- Other basin round table documents (e.g. Metro Basin white papers on supply and conservation)
- GBRT Initial Draft of Principles, Policies, and Priorities
- Gunnison River Basin Handbook
- Trampe Risk Assessment Document

Deliverable

- Draft and final lists of Basin Goals and Measureable Outcomes, ultimately included in *Section 1* of the GBIP report.

Schedule

Wilson Water Group anticipates working with the GBRT and GBIP Committee to substantially complete this task between October and December of 2013. Any comments received after this time will be incorporated into the final GBIP report.

Task 2: Evaluate Consumptive and Nonconsumptive Needs

There have been many previous efforts to identify, summarize, and forecast consumptive and nonconsumptive demands in the Gunnison Basin. In this task, Wilson Water Group will work with the GBIP Committee to identify and compile the existing reports, developed at the state and local level, and review these reports for pertinent water planning information. Understanding the current and projected consumptive and nonconsumptive needs is the first step to helping the GBRT determine how well they are currently meeting their needs, associated constraints, and where there may be unrealized opportunities to meet the basin goals detailed in Task 1.

Approach

With direction from the GBIP Committee, Wilson Water Group will identify and compile reports with information on consumptive and nonconsumptive needs relevant to the GBRT Basin Goals and Measureable Outcomes. Wilson Water Group has been intimately involved with the development of CDSS models and reports in the basin, which account for a majority of the current consumptive (i.e. agricultural) demands in the basin, reflect the current basin irrigation practices and operations, and include a portion of the basin's nonconsumptive demands. This understanding will be supplemented with information from locally sponsored projects as well as state-guided efforts including: SWSI reports, the Drought Mitigation and Response Plan, and IBCC/BRT documents. Upon direction from the GBRT, this task will also likely include the use of the Nonconsumptive Toolbox recently developed by the CWCB.

Pertinent information will be gleaned from each report and presented to the GBIP Committee with clear visual displays. This visual overview will highlight areas where consumptive and nonconsumptive needs overlap with current uses; allowing an initial assessment of competing interests in the basin. A clear visual representation is critical for Task 3, where water availability will be included as an additional overlay. The committee will then decide which information to consider for the project and how to resolve conflicting information. This list of existing reports, and a short summary of how the information pertains to the GBIP, will be included in *Section 2* of report.

Deliverable

- Clear and concise information summaries, visual displays, and meeting materials for GBIP Committee workshop, as appropriate.
- A list of existing reports, and a short summary of how the consumptive and nonconsumptive information pertains to the GBIP as a whole, will be included in *Section 2* of report.

Schedule

Wilson Water Group anticipates working with the GBRT and GBIP Committee to substantially complete this task between October and December of 2013. Any comments received after this time will be incorporated into the final GBIP report.

Task 3: Evaluate Consumptive and Nonconsumptive Constraints and Opportunities

The purpose of this task is to help the GBRT better understand constraints and opportunities to meeting their consumptive and nonconsumptive needs and then investigate specific solutions to help meet the identified Basin Goals and Measureable Outcomes. Since the irrigation practices, water rights, demands, and operations of a single water user can have an impact on water available for others, a basin-wide approach that accounts for these factors is required to investigate constraints and opportunities. Once appropriate opportunities have been identified, a further analysis of selected projects to meet these opportunities will be performed in Task 4.

The current CDSS consumptive use and surface water models provide an excellent platform for identifying and investigating consumptive and nonconsumptive constraints and opportunities. The CDSS reflects over 85 percent of water users in the basin explicitly, encompass a study period that reflects variable hydrologic conditions (e.g. dry, wet and average periods), and reflects 100 percent of the agricultural demands, associated water rights, and operations in the basin. Wilson Water Group's experience with the modeling tools allows us to easily revise model input to reflect additional or projected consumptive or nonconsumptive needs as desired by the GBRT, and use model output to evaluate nonconsumptive needs on tributaries explicitly included in the model. Our basin experience, coupled with our general hydrology expertise, will allow us to assess opportunities on tributaries not currently included in the CDSS models.

For less intensive inquiries concerning constraints and opportunities in the basin, results from the first phase of the Colorado River Water Availability Study will be utilized. As one of the primary developers of this study, Wilson Water Group is uniquely positioned to use these study results as they were originally intended: to help water managers geographically assess future availability under variable conditions using the State's CRWAS Data Viewer. Water physically and legally available to meet identified future consumptive and nonconsumptive needs will be includes as an additional overlay to highlight constraints and opportunities.

Approach

Task 3.1: Consumptive Needs, Constraints, and Opportunities.

Wilson Water Group will compare the current and projected consumptive needs defined in Task 2 to the agricultural, municipal, livestock, and reservoir demands currently included in the CDSS models. We will then discuss the level of implementation desired by the GBIP Committee to reflect these needs in modeling efforts with sufficient detail to understand the location and extent of current and projected constraints and opportunities. When applicable, more efficient solutions, such as the use of the CRWAS Data Viewer will be used. Wilson Water Group will implement model revisions as appropriate, provide the GBIP Committee a summary of the model results for variable hydrologic conditions, and/or utilize the CRWAS Data Viewer to examine project-specific implications if possible.

In addition to constraints or opportunities due to hydrological, legal, and operational conditions as identified by the model results, Wilson Water Group will work with the GBIP Committee to identify interstate or operational issues that may impact the evaluation. Wilson Water Group will tailor the

summary result presentation in terms of the Basin Goals and Measureable Outcomes as they pertain to consumptive needs, noting that constraints and opportunities identified for consumptive needs may also benefit or impact nonconsumptive needs.

Task 3.2: Nonconsumptive Needs, Constraints, and Opportunities.
Wilson Water Group will initially review the nonconsumptive needs and projects information identified by the SWSI 2010 process. After geographically comparing the needs and existing/planned projects, Wilson Water Group staff will extend the analysis by using the CDSS model, and/or utilize the applicability of the available CRWAS Data Viewer as appropriate.

This determination will overlay mapping of the nonconsumptive needs to determine if the tributaries and stream reaches are explicitly reflected in the models. If the reaches or lake & reservoirs are reflected in the model, the model output of streamflow conditions, reservoir contents, and consumptive demands within the reach will be used to determine the constraint on a nonconsumptive need. Wilson Water Group will also discuss the options and level of implementation desired by the GBIP Committee to reflect the tributary and stream reaches and/or lakes & reservoirs for the analysis of nonconsumptive needs. Finally, Wilson Water Group will implement model revisions as appropriate, and provide the GBIP Committee a summary of the model results for variable hydrologic conditions.

In addition to constraints or opportunities due to hydrological, legal, and operational conditions as identified by the model results, Wilson Water Group will work with the GBIP Committee to identify jurisdictional conflicts, regulatory constraints, or other recreational or environmental issues that may impact the constraint or opportunity evaluation. Wilson Water Group will tailor the summary result presentation in terms of the Basin Goals and Measureable Outcomes as they pertain to nonconsumptive needs.

Task 3.3: Constraint and Opportunity Mapping and Summary. Wilson Water Group will develop the final list, with supporting maps and quantitative analysis data, for consumptive and nonconsumptive needs, constraints, and opportunities for inclusion in *Section 3.1* of the report.

The constraint and opportunity analysis performed in Tasks 3.1 and 3.2 will include a review of major water users in the basin, controlling structures, the portion of demands that are met vs. shortages, and water availability throughout the basin. Wilson Water Group will use the analysis, and interviews of state officials as needed, to compile the following information in this task for inclusion in *Sections 3.2, 3.3* and *3.4* of the report.

- Major controlling structures & calling water rights within each Water District
- Period when general water administration begins and ends
- Irrigated Acreage
- Major reservoirs
- Major exports
- Interstate issues that may affect the basin

- Location and magnitude of consumptive and nonconsumptive shortages (supply vs. demand imbalances) under variable hydrologic conditions

Deliverable

- Enhanced CDSS consumptive use and surface water allocation models. Note the standard CDSS model documentation will not be updated; however enhancements will be captured in the GBIP report and associated model input files.
- Mapping and summary products described in Task 3.3 that supports *Sections 3.1* through *3.4* of the GBIP report.
- Meeting materials and information summaries for GBIP Committee discussions, as appropriate.

Schedule

Wilson Water Group anticipates working with the GBRT and GBIP Committee to gather initial information for discussion in December 2013. Depending on the level of detailed modeling required to adequately analyze constraints and opportunities, efforts may extend into the first quarter of 2014 with substantial completion of the task by March 2014. Any comments received after this time will be incorporated into the final GBIP report.

Task 4: Develop, Analyze, and Implement Projects and Methods

As the primary focus of the GBIP effort, Wilson Water Group will assist the GBRT in assessing how well the proposed projects and methods selected to address opportunities identified in Task 3 meet the Basin Goals and Measureable Outcomes. Wilson Water Group will work closely with the GBIP Committee to finalize and prioritize a list of proposed projects and methods to investigate in this task, along with determining the most strategic means for testing and implementing each project or method.

The analysis of Task 3 will be used to inform which projects the GBRT and its Committee select as appropriate for further analysis. The enhanced CDSS models will be the tool of choice along with the CRWAS Data Viewer, as appropriate. Specific projects will be added as necessary. Via an iterative process, the GBIP Committee will engage the Wilson Water Group to identify and test options to optimize basin operations to meet Basin Goals and Measureable Outcomes as identified in Task 1 as practicable.

Approach

Task 4.1: Finalize List of Project and Methods and Document Impact on Needs. Recommend a list of projects and methods that, based on our analyses, are estimated to meet consumptive and nonconsumptive needs and the Basin Goals and Measureable Outcomes defined in Task 1, and that can be feasibly implemented in the basin. Discuss these recommendations with the GBIP Committee to develop a finalized list of projects and methods for inclusion in *Section 4* of the GBIP report. Additionally, document the extent to which the final list of projects and methods will meet the consumptive and nonconsumptive needs and the Basin Goals and Measureable Outcomes under variable hydrological conditions.

Task 4.2: Develop Implementation Strategies. Depending on the final projects and methods selected by the GBRT, Wilson Water Group can assist the GBIP Committee with:

- Developing cost information (capital and O/M), potential partners, lead entity, volume of water, and timing for any new projects and methods that are added to the list.
- Identifying opportunities for multi-purpose/cooperative projects.
- Preparing materials (e.g. Education Action Plans) to support educational/outreach presentations at the BRT or IBCC level.
- Identifying funding mechanisms and strategies for implementing water supply projects and methods.
- Developing timelines for projects, with key tasks and milestones.

Any implementation strategies developed in this task will be documented for inclusion in *Section 5* of the GBIP report.

Deliverable

- CDSS consumptive use and surface water allocation model scenarios reflecting the implementation and analysis of specific projects and methods. Note the standard CDSS model documentation will not be updated; however enhancements will be clearly captured in the GBIP report and associated model input files.
- Analysis and data summaries that support *Sections 4, 5, & 6* of the GBIP report.
- Meeting materials and information summaries for Committee discussions, as appropriate.

Schedule

Wilson Water Group anticipates working with the GBRT and GBIP Committee pull together initial information for discussion in December 2013. Depending on the level of detailed modeling required to adequately analyze projects and methods, efforts may extend into the first quarter of 2014 with substantial completion of the task by March 2014. Any comments received after this time will be incorporated into the final GBIP report.

Task 5: Develop the Gunnison Basin Implementation Plan Report

The culmination of the effort undertaken in Tasks 1 through 4 is the Gunnison Basin Implementation Plan Report. The analyses, and much of the supporting documentation, will be completed in the previous tasks; therefore the effort in this task focuses on the compiling the data and documentation into the CWCB-recommended plan report format.

Approach

Develop the GBIP draft documentation for initial review by the GBIP Committee. Incorporate any comments, concerns, or revisions and develop the final documentation. Following is the recommended table of contents; some of the sections may not be pertinent to the GBIP and, if so, will not be included.

Executive Summary

Section 1 Basin Goals and Measurable Outcomes

Section 2 Evaluate Consumptive and Nonconsumptive Needs

2.1 Nonconsumptive Needs

2.2 Consumptive Needs

Section 3 Evaluate Consumptive & Nonconsumptive Constraints and Opportunities

3.1 Current Basin Water Operations and Hydrology

3.2 Water Management and Water Administration (Optional)

3.3 Hydrologic Modeling (Optional)

3.4 Shortages Analysis

Section 4 Projects and Methods

4.1 Education, Participation & Outreach

4.2 Watershed Health

4.3 Conservation Projects and Methods

4.4 New Multi-Purpose, Cooperative, and Regional Projects and Methods

4.5 M&I Projects and Methods (i.e. projects, conservation, reuse, drought planning)

4.6 Agricultural Projects and Methods

4.7 Nonconsumptive Projects and Methods

4.8 Interbasin Project and Methods (optional)

Section 5 Implementation Strategies for the Projects and Methods

Section 6 How the Plan meets the Roundtables' Goals and Measurable Outcomes

Deliverable

- Draft GBIP Report
- Final GBIP Report incorporating GBRT comments and suggestions

Schedule

Wilson Water Group anticipates drafting sections of the report throughout the project. Initial drafts of GBIP sections will be prepared for discussion at the GBIP Committee meeting in December 2013. A final draft GBIP document will be summarized by April 15, 2014. Any further comments and revisions will be incorporated into the final GBIP document by September 15, 2014.

Task 6: GBRT Coordination Meetings

Wilson Water Group envisions very close coordination with the GBRT throughout the project, beginning with a project kick-off meeting and culminating with the Basin Implementation Plan report. Throughout these efforts, Wilson Water Group will meet with the GBRT as a whole to understand the perspectives of all the individuals on the BRT, provide progress updates, and present the final project results. Additionally, Wilson Water Group recommends more frequent workshop with the smaller GBIP Committee to address specific plan tasks.

Approach

In this task, Wilson Water Group is proposing the following meetings/workshops with the GBRT:

- **Project Kick-off Meeting with GBRT**. Ideally this meeting will be held in conjunction with a regularly scheduled BRT meeting, and result in a common understanding of the project scope, availability and source of project data, and schedule.
- **Progress Updates with GBRT**. Attend the GBRT meetings quarterly to provide a project status, summary of results to date, and summary of future efforts. The proposed budget reflects four progress update meetings.
- **Plan Development Workshops with GBIP Committee.** Meet as necessary with the GBIP Committee on project-specific tasks via conference calls or remote conferencing tools (e.g. GoTo Meeting). The proposed budget reflects an hour-long meeting each month.

Deliverables

- Meeting materials, including progress updates and agendas.

Schedule

Wilson Water Group anticipates working with the GBRT and GBIP Committee throughout the project as detailed above to ensure appropriate coordination.

Project Budget

The following table summarizes the estimated budget for each task.

Project Task	Budget
Task 1: Basin Goals and Measureable Outcomes	$ 15,000
Task 2: Evaluate Needs	$ 25,000
Task 3: Evaluate Constraints and Opportunities	$ 50,000
Task 4: Analyze Projects and Methods	$ 50,000
Task 5: Develop GBIP Report	$ 40,000
Task 6: GBRT Coordination Meetings	$ 20,000
Total	**$ 200,000**

Project Schedule

The following table summarizes the estimated schedule for each task. Wilson Water Group anticipates completing the GBIP within the timeframe specified by the CWCB, pending the availability of the GBRT, GBIP Committee, and materials provided by the State or other consultants. Initial drafts of GBIP sections for review by the GBIP Committee in December 2013 will not include final information from the proposed modeling and analyses in Tasks 3 and 4. Depending on the level of detailed modeling required to adequately analyze projects and methods, efforts under Tasks 3 and 4 may extend into the first quarter of 2014. This work will be completed and summarized for the final draft document in April 2014, and refined as necessary for inclusion in the final document in September 2014.

Project Task	Anticipated Completion*
Task 1: Basin Goals and Measureable Outcomes	Dec. 2013
Task 2: Evaluate Needs	Dec. 2013
Task 3: Evaluate Constraints and Opportunities	Mar. 2014
Task 4: Analyze Projects and Methods	Mar. 2014
Task 5: Develop GBIP Report	Sept. 2014
Task 6: GBRT Coordination Meetings	Sept. 2014

*Schedule based on October 1, 2013 contract award and notice to proceed

Decision Support System Development and Training

A decision support system is an information-driven system that manages data and provides tools to access and analyze these data to make informed decisions. Raw data, including tabular and GIS-based mapping information, is stored and managed so it can be easily updated and extracted. Analysis tools, including water demand and allocation models, are used to analyze current and potential water supply scenarios. The analysis tools change raw data into useful information that can be applied by decision makers to address anticipated planning issues, and to answer "what if" and "how much" water supply and demand questions that arise in the future.

There are based assumptions that drive most traditional water resource plans, including that past hydrology can be used to represent the range of hydrology likely to be seen in the future; economic outlook models and population forecasts can be used to reasonably predict ranges of future water demands; and current policies and procedures can be expected to dictate how future demands are satisfied. The planning reports that result from this static methodology address water issues identified at the time of the planning study – and may be out of date before the study is completed. A decision support system uses a more proactive method, as it is comprised of a series of data and analysis tools which can be used to dynamically address both anticipated and unanticipated water issues.

Wilson Water Group staff members have worked closely with several entities to develop both statewide and client-specific Decision Support Systems. Erin Wilson has taken a lead role, working with the Colorado Water Conservation Board and the Colorado State Engineer's Office during the development of the State of Colorado's Decision Support System (CDSS). Both Erin Wilson and Kara Sobieski are the "go-to" experts to provide training sessions to state personnel, water providers, and other water resource consultants. We have answered planning questions for clients using the CDSS database, GIS, and modeling tools in every river basin in Colorado, including investigating water availability and reservoir uses considering future climate projected supply for the Colorado Water Availability Study.

Interstate Basin Planning

The ability to fully develop existing water supplies and plan for future uses is increasingly dependent on interstate basin issues, including water quality requirements, flow requirements for endangered species recovery programs, and interstate compacts requirements. Wilson Water Group staff members understand these issues and how they may impact our client's water supply and demand planning options. We use a variety of tools to understand interstate basin issues, including results from water allocation and operational models such as StateMod and RiverWare.

Wilson Water Group staff members have been involved with interstate basin issues ranging from developing and reviewing the Consumptive Uses and Losses Reports for the Upper Colorado River Basin compact commission, to modeling Colorado and New Mexico flows to meet endangered species requirements on the San Juan River. Erin Wilson represents east and west slope water users in Colorado providing technical over-site and assistance on Reclamation's Colorado River Water Supply and Demand Study. This basin study specifically looks at supply and demand imbalances related to compact requirements.

RATE SCHEDULE
Effective through December 31, 2013

	Hourly Rate
PRINCIPAL	$ 180.00
SENIOR PROJECT MANAGER	$ 160.00
PROJECT MANAGER	$ 140.00
PROJECT ENGINEER/HYDROLOGIST	$ 110.00
STAFF ENGINEER/HYDROLOGIST	$ 90.00
ADMINISTRATIVE SUPPORT	$ 75.00

Costs associated with prints, copies, and telephones are indirect expenses and are included in the above rates. Travel costs associated with airfares, airport parking, hotels, and meals will be billed as direct expenses. Mileage for automobile travel more than 100 miles from the Wilson Water Group office will be billed at the current Federal GSA POV mileage reimbursement rate.