COLORADO WATER CONSERVATION BOARD

WATER SUPPLY RESERVE ACCOUNT
2006-2007 GRANT APPLICATION FORM

Upper Mountain Counties Water Needs Assessment

Name of Water Activity/Project **River Basin Location**

Amount of Funds Requested	Please Check Applicable Box		Approval Letter Signed By Roundtable Chair and Description of Results of Evaluation and Approval Process
$43,587 - Metro $130,763 - South Platte	☑	Basin Account	☑ Yes
	☐	Statewide Account	☐ No

*** For the Basin Account, the Application Deadline is 60 Days Prior to the Bimonthly CWCB meeting. The CWCB meetings are posted at www.cwcb.state.co.us and are generally the third week of the month.**

*** For the Statewide Account, the Application Deadline is 60 Days Prior to the March and September CWCB Board Meetings.**

* In completing the application you may attach additional sheets if the form does not provide adequate space. If additional sheets are attached please be sure to reference the section number of the application that you are addressing (i.e., A.1. etc.).

Instructions: This application form must be submitted in electronic format (Microsoft Word or Original PDF are preferred). The application can be emailed or a disc can be mailed to the address at the end of the application form. The Water Supply Reserve Account Criteria and Guidelines can be found at http://cwcb.state.co.us/IWMD/. **The criteria and guidelines should be reviewed and followed when completing this application**. You may attach additional sheets as necessary to fully answer any question, or to provide additional information that you feel would be helpful in evaluating this application. Include with your application a cover letter summarizing your request for a grant. If you have difficulty with any part of the application, contact Rick Brown of the Intrastate Water Management and Development (Colorado Water Conservation Board) for assistance, at (303) 866-3514 or email Rick at rick.brown@state.co.us.

Generally, the applicant is also the prospective owner and sponsor of the proposed water activity. If this is not the case, contact the Rick Brown before completing this application.

Water Supply Reserve Account – Grant Application Form
Form Revised May 2007

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

1. Applicant Name(s): Clear Creek County on behalf of Upper Mountain Counties Water Needs Consortium

Mailing address: c/o Berten Weaver
PO Box 2000
Georgetown, CO 80444

Taxpayer ID#: 84-6000-751 Email address: bweaver@co.clear-creek.co.us

Phone Numbers: Business: (303) 679-2455
Home: (303) 679-2455
Fax: (303) 679-2484

2. Person to contact regarding this application if different from above:

Name: Berten Weaver

Position/Title Community Development Director Clear Creek County

3. Provide a brief description of your organization below: see "Description of Applicant" in Part 2 of Criteria and Guidance for required information.

The Consortium Memorandum of Understanding (MOU) is attached.

The Upper Mountain Counties Water Needs Consortium consists of the four upper mountain counties in the South Platte River basin head waters, Park, Jefferson, Clear Creek, and Gilpin counties. The areas within these counties that are in the foothills and mountains have been populated primarily through subdivisions relying on individual on-lot wells and sewage disposal systems. The study area is that part of Jefferson County that is mountainous, that part of Park County east of Kenosha Pass, all of Clear Creek county, and all of Gilpin county.

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

The contracting entity is that shown on the Consortium MOU.

Part B. - Description of the Water Activity – Please Refer to Criteria and Guidance Document for Eligibly Requirements

1. Name of water activity/project:

Upper Mountain Counties Water Needs Assessment and Water Supply Analysis

What is the purpose of this grant application?

☐ Environmental compliance and feasibility study

☐ Technical Assistance regarding permitting, feasibility studies, and environmental compliance

☑ Studies or analysis of structural, nonstructural, consumptive, nonconsumptive water needs, projects

Study or Analysis of:

- ☐ Structural project or activity
- ☐ Nonstructural project or activity
- ☑ Consumptive project or activity
- ☐ Nonconsumptive project or activity

☐ Structural and/ or nonstructural water project or activity

2. Describe how the water activity meets these **Threshold Criteria.**

1. The water activity meets the eligibility requirements outlined in Part 2 of the Criteria and Guidelines.

   This water activity meets the eligibility requirement by providing a water needs assessment for the study area and an evaluation of the long term sustainability of the various aquifer systems in the study area taking into consideration current and future water demands, consumptive use and recharge.

2. The water activity is consistent with Section 37-75-102 Colorado Revised Statutes. The requirements/language from the statute is provided in Part 3 of the Criteria and Guidelines.

   The water needs assessment will not restrict the ability of the holder of a water right to use or to dispose of that water right in any manner permitted by Colorado law and is consistent with CRS 37-75-102.

3. 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.

   The Upper Mountain Counties Water Supply Consortium presented its application to the South Platte and Metro Basin Roundtables and was approved in the amounts noted above by both roundtables during their March meetings. The meeting notes from the meeting should reflect the approval.

4. The water activity meets the provisions of Section 37-75-104(2), Colorado Revised Statutes. The requirements/language from the statute is provided in Part 3 of the Criteria and Guidelines.

   The water needs assessment meets the provisions of CRS 37-75-104 (2)(c) by improving the water needs assessment in the study area and identifying possible areas where long term sustainability of the aquifer systems may merit additional attention and/or analysis.

3. For Applications that include a request for funds from the Statewide Account, describe how the water activity meets the **Evaluation Criteria**. See Part 3 of Criteria and Guidelines.

This section is not applicable as no funds are being requested from a Statewide Account.

4. Please provide an overview of the water project or activity to be funded including – type of activity, statement of what the activity is intended to accomplish, the need for the activity, the problems and opportunities to be addressed, expectations of the participants, why the activity is important, the service area or geographic location, and any relevant issues etc. Please include any relevant TABOR issues that may affect the Contracting Entity. Please refer to Part 2 of Criteria and Guidance document for additional detail on information to include.

The Upper Mountain County Water Needs Assessment and Water Supply Analysis purpose is to provide a more accurate assessment of the water needs of the study area which is highly dependent upon ground water in fractured and faulted bedrock aquifers. The area has been developed and subdivided into thousands of lots relying on on-lot wells and on-lot sewage disposal systems. Many of the lots were created prior to May, 1972 when the 1972 Land Use Act was enacted (SB-35). The owners of these lots pre-1972 are entitled to have a household use only well under a presumption of no injury to other vested water rights (CRS 37-92-602). If all of these lots are improved and homes constructed on them, there is the potential of having water supply issues related to sustainability and water quality. This analysis will assist the counties in determining if potential problems could result from the buildout of all the platted lots and if they need to take action to reduce the potential problems in areas where they can occur. The study will also look at recharge potential for these bedrock aquifer systems using information from a recent USGS study in Jefferson County in the Turkey Creek Watershed. Water supply needs, water consumptive use, return flows from on-lot sewage disposal systems, and recharge from precipitation will be presented in GIS maps showing areas of sustainability and areas where there could be a decline in aquifer levels or water quality.

5. Please summarize the proposed scope of work. Please refer to Part 2 of the Criteria and Guidance document for detailed requirements. On the following page there is an example format for the Scope of Work. You can use the example format or your own format, provided that comparable information is included.

   The scope of work should outline by task how the water activity will be accomplished. It is important that the scope of work detail the specific steps, activities/procedures that will be followed to accomplish the water activity and the specific products/deliverables that will be accomplished. The scope of work should include but not be limited to: task description, key personnel, budget, schedule and deliverables and the final report/project documentation upon completion of the water activity.

   See attached Scope of Work and Budget.

Suggested Format for Scope of Work

The scope 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 scope of work and budget, and in return, the State of Colorado is receiving the deliverables/products specified. Summarized below is a suggested format for the Scope of Work.

I. Task 1

- Description of task:
- Method or procedure that will be used or followed to accomplish the task and identify who will undertake the task:
- Description of the major deliverables/products that will be produced upon successful completion of the task:

Task 2 (Repeat the above format for each task)

II. Personnel

Provide a list of key water activity/project participants and their qualifications to accomplish the water activity/project. If specific individuals or firms have not yet been identified indicate the types of expertise that will be sought (i.e. professional engineering firm, registered land surveyor, aquatic biologist etc.).

III. Budget

A detailed budget by task, which includes the level of effort (hours) and rates. Any unit costs or other direct costs must be specified (i.e. mileage, number of miles, dollars per mile). For an example budget format – See Attachment 1 at the end of this application.

If applicable, the budget should also detail the source and amount of matching funds and/or in-kind contributions, if any. If applicable, the budget should also include any other outstanding or previously applied for funding that also supports the water activity:

IV. Schedule

A detailed project schedule including key milestones and the dates these are expected to be completed.

NOTE: Costs incurred prior to execution of a contract or purchase order are not subject to reimbursement.

6. Water Availability and Sustainability – this information is needed to assess the viability and effectiveness of the water project or activity. Please provide a description of each water supply source to be utilized for, or the water body to be affected by, the water activity. For water supply sources being utilized, describe its location, yield, extent of development, and water right status. For water bodies being affected, describe its location, extent of development, and the expected effect of the water activity on the water body, in either case, the analysis should take into consideration a reasonable range of hydrologic variation.

The main purpose of this analysis is to determine the long term availability of ground water in the fractured and faulted bedrock aquifers in the study area and evaluate if the use of ground water at buildout for the four county study area can be sustained. The study will use information on precipitation in the study area from 1950 to the present, recharge related to this precipitation, and increased use of ground water as the area has developed to take into consideration a range of hydrologic variation over the period which included wet, average, and dry periods of precipitation.

7. Please provide a brief narrative of any related or relevant previous studies.

A related study which was conducted in much greater detail than this proposed needs analysis is the USGS Water Resources Investigations Report 03-4034 entitled “Hydrologic Conditions and Assessment of Water Resources in the Turkey Creek Watershed, Jefferson County, Colorado, 1998-2001. This study provides a good estimate of the long term recharge (1949 to 1999) for the study area for four types of bedrock aquifer systems: metamorphic, intrusive, fault zone, and Pikes Peak granite. This information on recharge will be used in the study area as it is similar in geology to estimate recharge to the aquifer systems in the study area.

In addition, the following reports will be reviewed during the study:

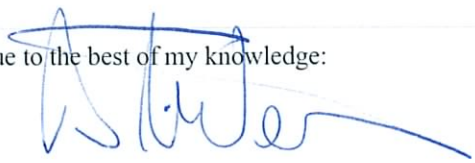
Hydrologic Information and Conditions of Water Resources in Clear Creek County, Jan Krasson, March 25, 1976.

Geologic control of supply and quality of water in the mountainous part of Jefferson County, Colorado, Colorado Geological Survey Bulletin 36 by W.E. Hofstra and D.E. Hall, 1975.

8. Additional Information – If you feel you would like to add any additional pertinent information please feel free to do so here.

This analysis will greatly assist the four counties in having a better understanding of the impacts of growth related to the buildout of existing platted lots many of which were created prior the 1972 Land Use Act. This legislation resulted in an orderly process to subdivide land and to show that the water supply for the proposed subdivision is dependable, both physically and legally, and that vested water rights would not be injured.

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

Signature of Applicant: 

Print Applicant's Name: Berten Weaver

Project Title: Upper Mountain Counties Water Needs Assessment and Water Supply Analysis

Return this application to:

Mr. Rick Brown
Intrastate Water Management and Development Section
COLORADO WATER CONSERVATION BOARD
1580 Logan Street, Suite 600
Denver, CO 80203

To submit applications by Email, send to: rick.brown@state.co.us

Reference Information

The following information is available via the internet. The reference information provides additional detail and background information regarding these criteria and guidelines and water policy issues affecting our state.

Sample Contract and Purchase Order – Create Link

Colorado Water Conservation Board Policies

Loan and Grant policies and information are available at - http://cwcb.state.co.us/Finance/

Water Supply Reserve Account Criteria and Guidelines –

http://cwcb.state.co.us/IWMD/tools.htm#Water_Supply_Reserve_Account

Interbasin Compact Committee and Basin Roundtables

Interbasin Compact Committee By-laws and Charter – http://dnr.state.co.us/Home/ColoradoWaterforthe21stCentury/Interbasin+Compact+Committee/IbccHomePage.htm

Basin Roundtable By-laws – http://dnr.state.co.us/Home/ColoradoWaterforthe21stCentury/IbccHome.htm

Legislation

House Bill 05-1177 - Also known as the Water for the 21st Century Act – http://cwcb.state.co.us/IWMD/statutes.htm

House Bill 06-1400 – Adopted the Interbasin Compact Committee Charter – http://cwcb.state.co.us/IWMD/statutes.htm

Senate Bill 06-179 – Created the Water Supply Reserve Account – http://cwcb.state.co.us/IWMD/statutes.htm

Statewide Water Supply Initiative

General Information - http://cwcb.state.co.us/IWMD/

Phase 1 Report - http://cwcb.state.co.us/IWMD/PhaseIReport.htm

Attachment 1

ample Budget Table: Please note that this budget table is an example and will need to be adapted to fit each individual application. In the tables below please list the personnel by specialty/ expertise i.e. project manager, project engineer, etc. Also, tasks should correspond to the scope of work of your project and the number of tasks listed will vary accordingly.

Total Costs				
	Labor	Other Direct Costs	Matching Funds (If Applicable)	Total Project Costs
Task 1 - (Specify name of task)				
Task 2 -				
In-Kind Contributions				
Total Costs:				

1) Identify specific source and amount by task.

Example Titles

Example Project Personnel: Hourly Rate:	Project Manager	Project Engineer	Geologist	Scientist	Graphics/ Designer	Clerical		Total Costs
Task 1 -								
Task 2 -								
Total Hours:								
Cost:								

Other Direct Costs						
Item: Units: Unit Cost:	Copies No.	Materials	Equipment/ Supplies	Mileage Miles		Total
Task 1 -						
Task 2 -						
Total Units:						
Total Cost:						

In-Kind Contributions (If Applicable)				
Project Personnel: Hourly Rate:				Total
Task 1 -				
Task 2 -				
Total Hours:				
Total Cost:				

Scope of Work – Upper Mountain Counties Water Needs Assessment

This Scope of Work is divided into four sections as suggested in the Grand Application Instructions. Section 1 provides a description of each major task associated with the project along with a functional description of who will be completing the work and a description of the deliverables associated with the task. Section 2 lists the key personnel proposed for the project along with a brief description of their relevant project experience. Section 3 presents a detailed breakdown of the costs to complete the study and Section 4 presents the proposed Project Schedule.

Section 1 Task Summary

Introduction and Background

In 2003, the Colorado Water Conservation Board (CWCB) completed the Statewide Water Supply Initiative (SWSI). That study included estimates of water demands in the South Platte River Basin through 2030. While SWSI provided a valuable coarse assessment of water demands for the municipal, industrial, and agricultural sectors, concerns were raised by representatives of the four Upper Mountain Counties (UMC) to the South Platte River Basin Roundtable (Park, Jefferson, Clear Creek, and Gilpin) that the analysis did not properly consider the water supply demands and available water resources for that part of the basin. Specifically, Park, Clear Creek, Gilpin, and a portion of Jefferson County have been primarily populated in the foothills and mountains through subdivision lots where residences have been built relying on on-lot domestic wells serving each home and with on-lot sewage disposal systems. The water supply issues related to current and future populations relying on these on-lot systems need to be more thoroughly evaluated than what was done in SWSI. Also, UMC water providers to areas not relying on on-lot systems need to be contacted and their needs and supplies evaluated. A water provider is that entity, public or private, that is responsible for providing water to four or more residences and/or commercial user.

Given this background, we believe it is appropriate and opportune for a study to be undertaken under the auspices of HB-1177 and the South Platte Basin Roundtable to accurately identify water needs, available water supplies, and any shortages that may exist in the Upper Mountain Counties and identify projects and or actions that may be needed to address any shortages to areas on community water supplies or areas where depletions of the aquifer systems may be occurring or expected to occur. The study area is to include the mountainous areas of Jefferson County, the part of Park County east of Kenosha Pass, Gilpin, and Clear Creek Counties.

Study Objectives

The objectives of the proposed study are to:

1. Interview the UMC counties to determine current and projected populations and the status of current platted lots as to existing uses and projected uses to 2050 in the study area.

2. Interview UMC water providers for current and future water demands to 2050 including water demands related to recreation and tourism.

3. Identify existing lots (improved or unimproved) that may rely on domestic and commercial wells and estimate the water demand related to these lots based on various build-out assumptions.

4. Evaluate existing information on geology and precipitation for the mountain counties in order to estimate the amount of aquifer recharge from precipitation that is available for evaluating long term sustainable water supplies.

5. Assess the long term sustainability of the various aquifer systems in the mountain counties taking into consideration recharge and water demands related to current and future water needs.

6. Identify any water demands related to tourism resulting from future recreational projects such as ski or snow boarding areas.

Tasks

This work plan is divided into seven major tasks with multiple sub-tasks under each, addressing each of the objectives. The following is a list and description of tasks to be completed under this scope of work. The area of study will be Clear Creek County, Gilpin County, Park County east of Kenosha Pass, and the mountain part of Jefferson County.

Task 1 Interview Counties for Information Impacting Water Demand

1.1 Determine current and projected populations based on County estimates

The UMC counties will be interviewed to determine current and projected populations including the populations related to permanent and second home residences. This information will be more reliable than those obtained from the state demographer during SWSI.

1.2 Determine the number of platted lots and related zoning in each county

The counties will be interviewed to determine the status of existing platted lots in each county and zoning for them. Those that are not improved will be identified and the type of potential development for them evaluated for impact on future water demand assuming different levels of build out. This may be another way to estimate future water demands if population growth projections are not readily available. The lots that have been improved will be used to estimate current water demands based

on the use of the lots such as permanent residences, second home residences, or commercial demands. To the extent possible, the GIS's for each county will be used to assist in this task.

1.3 Quantify unplatted private property in each county

The counties will be interviewed to identify unplatted private property in each county and the zoning for these areas so that a water demand can be projected for these lands at different levels of build out. To the extent possible, the GIS's for each county will be used to assist in this task.

Task 1 Assumptions

- One meeting with each County to gather information.
- GIS data provided by the counties will be of sufficient quality to complete Task 1.
- Upper Mountain Counties assistance in setting up the meeting with each county to make sure the appropriate county representatives attend the meeting to avoid follow-up meetings.
- If Park County does not have GIS data for the study area, then simplifying assumptions based on the number of platted lots acquired from plat maps may have to be made and the work effort increased with more staff time.

Task 1 Deliverables

- Population estimates for current and 2050 conditions for permanent, semi-permanent, and transitory populations.
- The number of platted lots and type of zoning for them will be provided along with any GIS mapping of these lots.
- The unplatted private property will be identified, related zoning, and GIS mapping of these areas provided.

Task 2 Interview water providers for information on current and projected water demands

2.1 Determine information available from towns and water providers

Since towns and water providers have information on water demands related to a central water delivery system and not areas relying on individual on-lot wells, these entities must be surveyed to determine if they have information on current and projected water demands to the year 2050 including those related to recreation and tourism. The counties can assist in identifying the towns and water providers within their individual counties that need to be surveyed. These water providers will be surveyed to determine if they have a water conservation plan filed with the Colorado Water Conservation Board's Office of Water Conservation. If these entities have GIS maps for their respective service areas, they will be included as a GIS overlay on the county GIS base maps.

2.2 Determine information available from the WQCD on public water providers within each county

If information is not completely available from the towns and water providers, the Water Quality Control Division (WQCD) will be contacted for water use information reports from public water providers in each county to supplement any missing data on current water supply demands. Growth projections from Task 1 can be used to estimate future demands for these water providers.

2.3 Obtain DWR well file data and evaluate for information on central water providers

The Division of Water Resources (DWR) well file data should be obtained and if possible, a GIS overlay prepared for use in mapping existing commercial and municipal wells on the GIS base maps. This information may identify other water providers that should be interviewed.

Task 2 Assumptions

- Upper Mountain Counties assistance in identifying water providers to interview and to provide contact information for water provider personnel to interview.
- Conference calls with up to 20 water providers located within the Upper Mountain Counties.
- One meeting at the WQCD to review reports.
- One meeting with DWR to obtain GIS data or well location database for inclusion in a GIS data set.

Task 2 Deliverables

- A GIS map of commercial or municipal water wells for each county.
- Identification of the sources of water for water providers including surface water and ground water sources.
- Estimates of current and 2050 water demands for the water providers.

Task 3 – Water Demands for Areas Relying on Domestic and Commercial Wells will be Estimated

3.1 Estimate the water demand for existing platted lots relying on commercial and domestic wells

Based on the information from Task 1, the water demands for platted lots relying on wells will be provided based on the type of well permit expected to be available from DWR for the lot, i.e. commercial, household use only (HUO) or domestic with the majority expected to be HUO type wells. Those subdivisions with small lots where the spacing requirements between a well and a septic tank or leach field may prevent the construction of a residence without combining lots will have to be taken into consideration in this task. The annual water demand will be assumed to be 0.30 acre-foot for a

permanent residence (268 gallons per day) with a HUO well and 1.0 acre-foot for a domestic well which are granted for tracts of land greater than 35 acres. Commercial wells with meters will be surveyed to assist in estimating water demands for commercial uses. Different levels of build out for unimproved platted lots will have to be assumed in order to provide a range of water demands to 2050. A GIS map of water demand for these areas may be helpful to show areas of more dense development and related water demand.

3.2 Estimate the water demand for unplatted private property in each county that would rely on domestic or commercial wells

Using the information from Task 1, estimate the water demand for unplatted property in each county based on the current zoning to project water demands for these areas. The same assumptions set forth in Task 3.1 will be used to estimate annual water demand. Different levels of build out will have to be assumed in order to provide a range of water demands to 2050. A GIS map of water demand for these areas may be helpful in depicting areas with more dense development and related water demand.

Task 3 Assumptions

- Discussion with some water providers about water demand in the study area may result in a lower requirement for a permanent residence and if so, this value may be used.

Task 3 Deliverables

- Estimates of water demands for existing platted lots with GIS mapping.
- Estimates of water demands for unplatted private property with GIS mapping.

Task 4 – Recharge of Aquifer Systems will be Estimated

4.1 Long term annual precipitation available over the four counties will be obtained

The information from the National Weather Service and NOAA on long-term annual precipitation and seasonal precipitation for the four counties will be obtained and GIS maps if available acquired.

4.2 Geologic mapping of the various aquifer systems will be obtained

The available geologic maps for the four counties will be obtained using information available from the USGS, CGS, and DWR file information. These maps will be combined into a GIS geologic overlay in order to assist in estimating recharge to the aquifer systems.

4.3 Annual recharge to aquifer systems will be estimated

The information available from the USGS study in the Turkey Creek watershed in Jefferson County (Water Resources Investigations Report 03-4034) will be used to estimate recharge to aquifer systems based on the geology and annual precipitation. The aquifer systems are those defined in the above report and include metamorphic, intrusive, fault-zone, and Pikes Peak Granite. To the extent that the alluvial aquifers

are mapped, this study will attempt to determine if there are any potential long term water supply concerns based on the location of known alluvial wells from the DWR data base. These estimates will be shown on GIS overlay maps for the four counties.

The authors of the USGS study in the Turkey Creek watershed will be consulted to see if they can assist in properly using the report to estimate recharge for various aquifer systems, specifically Cliff Bossong and Jonathan Saul Caine. It may be necessary to conduct some random sampling of fractures in outcrop areas to compare with the fractures found in the Turkey Creek watershed study. Other experts involved in the study such as Mike Wireman with the EPA, Ed Weeks with the USGS, and Peter Barkmann with the CGS should be consulted or used as an advisory committee.

Return flows from on-lot sewage disposal systems will be estimated using information available from DWR and the Colorado School of Mines studies. In addition, any localized impacts upon runoff and related recharge to aquifer systems due to land use activities need to be evaluated and if necessary, mitigation activities such as retention basins proposed.

Task 4 Assumptions

- It is assumed that for Task 4.1 data will be available in the form of a map that indicated long-term average precipitation and that this information will not be recreated using historic data.

- Existing geologic maps for the study area will be used and at the smallest scale uniformly available.

- The USGS Report (Water Resources Investigations Report 03-4034) estimates long term recharge (1949 to 1999) for four types of aquifer systems; metamorphic, intrusive, fault-zone, and Pikes Peak granite, and this recharge estimates will be used for similar rock types in the study area.

- The counties will identify areas where impervious surfaces have impacted runoff and possibly recharge.

Task 4 Deliverables

- Annual and seasonal precipitation estimates for the four counties with GIS overlays.

- Geologic mapping for the four counties along with GIS overlays.

- Estimates of long term annual recharge to the various aquifer systems for the four counties along with GIS overlays.

- Mitigation activities such as detention basins to increase recharge in areas where land use patterns from impervious surfaces have impacted runoff and related recharge to the aquifer systems.

Task 5 – Long Term Sustainability of the Aquifer Systems will be Evaluated

5.1 Ground water level data will be evaluated for any long term trends

The available ground water level data that may be available will be acquired to determine if any water level trends are apparent. The information from Jefferson County staff, Roy Laws, will be acquired along with any other data such as from DWR and the USGS.

5.2 Areas with known aquifer water supply concerns will be identified

The counties, towns, and water providers will be surveyed for known aquifer water supply concerns such as water quantity, water quality, infrastructure, or water level concerns. This information will be evaluated for impact on the long term sustainability of the aquifer systems.

5.3 Long term physical sustainability of various aquifer systems will be evaluated

The estimated annual depletions for various aquifer systems based on water demand estimates for various periods up to 2050 will be compared with estimates of long term annual recharge. Areas where aquifer levels may be expected to decline will be identified and these areas mapped using a GIS overlay. Areas with aquifers in a sustainable condition will be also identified and these areas mapped using a GIS overlay. Sustainability is defined for this study as the ability to use the aquifer systems to meet current and future needs without mining of the aquifers and without significant degradation of the quality of the ground water.

Task 5 Assumptions

- One meeting with Roy Laws, DWR, and USGS to acquire water level data.
- One phone interview with each county, town, and water provider to discuss water supply concerns will be conducted with approximately 30 entities.

Task 5 Deliverables

- Areas with known ground water level declines will be shown on GIS maps.
- Areas with known aquifer supply concerns will be shown on GIS maps.
- GIS Maps showing aquifer systems with long term sustainable conditions and aquifer systems with long term unsustainable conditions.

Task 6 – Water Needs for Future Recreation and Tourism Demands will be Estimated

The counties will be surveyed for possible new recreation or tourism related water demands (consumptive) that may develop in the future such as new ski areas or snow boarding areas. The water supply for these possible new projects will be assumed to be provided by the developer of the project and this task is to identify associated water demands that may occur that would impact the surrounding area.

Task 6 Assumptions

- One interview of each county's appropriate planning official will be conducted to identify possible new recreation or tourism related water demand.

Task 6 Deliverables

- A description and location of possible new recreation and tourism projects.
- An estimate of the water requirements related to these projects that could impact the surrounding area from demands for restrooms, restaurants, and gas stations.

Task 7 – Draft and Final Report

A draft and final report will be provided to the Upper Mountain Counties summarizing Tasks 1-6. One meeting will be held with the Upper Mountain Counties to discuss the draft report contents and received comments. An additional meeting will be held with the Upper Mountain Counties after the final report is completed to prepare a presentation on the results to the South Platte Roundtable. A presentation that summarizes the report that could be utilized in public meetings will be created for the Upper Mountain Counties

Task 7 Assumptions

- Draft and final report will be provided in electronic format with 8 hard copy reports produced for the Upper Mountain Counties.

Task 7 Deliverables

- Draft and final report in electronic and hard copy format.
- Presentations summarizing results of study

Section 2 Key Personnel

Relevant project experience for the key personnel proposed for the Upper Mountain Counties Water Needs Assessment are presented in this section.

Hal Simpson, P.E. – Technical Director

Hal Simpson currently is a consulting engineer in water resources management. He retired following 34 years of service to the State of Colorado with the last 15 years as State Engineer and Director of the Division of Water Resources. He was appointed State Engineer on August 7, 1992. As State Engineer, Mr. Simpson was responsible for the direction and management of the Division of Water Resources, which has a staff of 265 FTE and a budget of approximately $23 million. The Division is responsible for distribution and administration of water in accordance with statutes and interstate compacts; the implementation of a statewide dam safety program; the permitting of the use of ground water and construction of wells; the collection and dissemination of data on water use and stream flow; and conducting various studies concerning water resources and the availability of water supplies. The State Engineer is Colorado's commissioner on five interstate compacts and is responsible for assuring compliance with these compacts. The State Engineer is also the Executive Director of

the Colorado Ground Water Commission and is the Secretary of the Board of Examiners for Water Well and Pump Installation Contractors.

CDM Project Staff

Kelly DiNatale, P.E. – Project Director

Mr. DiNatale has 26 years of experience in the planning, design, construction, and operations and maintenance of raw water supply, water quality, watershed protection, reservoir management, water treatment, and wastewater treatment facilities. He has directed and managed local, regional and statewide water supply planning efforts. Mr. DiNatale served as Technical Director for the Colorado Statewide Water Supply Initiative (SWSI).

Nicole Rowan, P.E. – Project Manager

Ms. Rowan has over 12 year experience and is a senior project manager who focuses on water supply, watershed management and natural resources projects. She is the project manager for the Statewide Water Supply Initiative (SWSI) and for CDM's current contract with Colorado Department of Natural Resources (DNR) to provide technical support to the Interbasin Project Compact process.

Michael Smith – Senior Hydrologist

Mr. Smith has more than 27 years of experience directing and conducting environmental investigations for waste disposal and remediation, mining, and water resources projects. His experience includes a diversity of hydrogeologic field investigations, monitoring network design and implementation, computer simulation of groundwater and vadose zone systems, solute and nonaqueous phase liquid (NAPL) transport, and extensive interaction with regulatory agencies.

Gordon McCurry – Senior Hydrogeologist

Dr. McCurry has more than 20 years of experience in groundwater hydrology relating to water resources evaluation and aquifer remediation. His experience includes the investigation, characterization, and modeling of aquifer systems for projects nationwide. Dr. McCurry's areas of technical expertise include numerical simulation of groundwater flow and contaminant transport, wellhead protection, aquifer hydraulics testing and analysis, stream/aquifer interactions, design of groundwater remediation systems, and regulatory compliance.

Robbie Parsons – GIS Specialist

Mr. Parsons has 21 years of experience as an environmental specialist/GIS specialist performing complex GIS and database analysis. He has extensive experience in the area of systems management including hardware and software setup. Additionally, he is involved in several implementation and development tasks related to GIS involving private sector and federal government projects.

Mark McCluskey, P.E. – Project Engineer

Mr. McCluskey is an environmental engineer who specializes in water resources. His expertise includes hydrologic modeling. Mr. McCluskey's software experience includes MODFLOW, MODFLOW SURFACT, UCODE, PEST, DYNFLOW, Groundwater Vistas, ArcInfo, ArcGIS, HEC-RAS, Fortran, VBA, SHAPE, @RISK, EPAnet, LINDO, MathCAD, MINITAB, and Kypipe.

Matt Bliss – Engineer

Mr. Bliss is a water resources engineer experienced with groundwater and surface water planning and modeling. He has collaborated on several groundwater models, groundwater sustainability studies, and surface water planning studies including water rights evaluations.

Section 3 Budget

A detailed breakdown of the estimated labor, other direct costs, and subconsultants for the proposed project is presented in the following matrix.

Upper Mountain Counties Water Needs Assessment Budget

Personnel	Project Director	Senior Hydrologist/ Hydrogeologist	Project Manager	Project Engineer	GIS Specialist	Engineer	Senior Support Services	Staff Support	Labor Hours	Labor Cost
Rate/Hour[1]	$195	$185	$165	$115	$120	$95	$85	$65		
Task										
1.1	2		2	16				4	24	$2,800
1.2	2		2	4	20	4		2	34	$4,100
1.3	2		2	4	16	4		2	30	$3,600
2.1	4		4	40				4	52	$6,300
2.2				4		4		2	10	$1,000
2.3			2	2	8			2	14	$1,700
3.1	2		2	16				2	22	$2,700
3.2	2		2	12	8	4		2	30	$3,600
4.1				4					4	$500
4.2		80		40	60	40	2	8	230	$31,100
4.3	8	80	16	40	16	40	2	8	210	$30,000
5.1		12							12	$2,200
5.2	4	16	4	60				8	92	$11,800
5.3	4	16	8	24	24			4	80	$11,000
6			4	12					16	$2,000
7	16	40	40	80	40	40		24	280	$36,500
Labor Totals	46	244	88	358	192	136	4	72	1140	$150,900

[1]Estimated hourly rates based on invoicing at 3.1 times raw labor rates

Other Direct Costs and Subconsultants

Task	ODCs	Subconsultant (Hal Simpson, P.E.)	Total
1.1	$100	$1,200	$1,300
1.2	$100	$600	$700
1.3	$100	$600	$700
2.1	$200	$2,400	$2,600
2.2	$50	$300	$350
2.3	$100	$600	$700
3.1	$100	$600	$700
3.2	$100	$600	$700
4.1	$50	$300	$350
4.2	$200	$3,000	$3,200
4.3	$200	$3,000	$3,200
5.1	$50	$300	$350
5.2	$100	$600	$700
5.3	$100	$600	$700
6	$100	$600	$700
7	$500	$6,000	$6,500
Totals	$2,150	$21,300	$23,450

Upper Mountain Counties Water Needs Assessment Budget Summary

Cost Summary

Task	Labor Cost	Other Direct Costs	Subconsultants	Total Project Costs
1.1	$2,800	$100	$1,200	$4,100
1.2	$4,100	$100	$600	$4,800
1.3	$3,600	$100	$600	$4,300
2.1	$6,300	$200	$2,400	$8,900
2.2	$1,000	$50	$300	$1,350
2.3	$1,700	$100	$600	$2,400
3.1	$2,700	$100	$600	$3,400
3.2	$3,600	$100	$600	$4,300
4.1	$500	$50	$300	$850
4.2	$31,100	$200	$3,000	$34,300
4.3	$30,000	$200	$3,000	$33,200
5.1	$2,200	$50	$300	$2,550
5.2	$11,800	$100	$600	$12,500
5.3	$11,000	$100	$600	$11,700
6	$2,000	$100	$600	$2,700
7	$36,500	$500	$6,000	$43,000
			Total	$174,350

In-kind Contributions

Jefferson County GIS Data	$3,150
Park County GIS Data	$1,000
Clear Creek County GIS Data	$1,640
Gilpin County GIS Data	$2,280
total	$8,070

Section 4 Project Schedule

The proposed project schedule is presented in the graphic below. The schedule is presented as months from contract inception. It is anticipated that the project will be completed within six months.

Upper Mountain Counties Water Needs Assessment Schedule

Task	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
Notice to Proceed	x					
Task 1.1						
Task 1.2						
Task 1.3						
Task 2.1						
Task 2.2						
Task 2.3						
Task 3.1						
Task 3.2						
Task 4.1						
Task 4.2						
Task 4.3						
Task 5.1						
Task 5.2						
Task 5.3						
Task 6						
Task 7						

INTERGOVERNMENTAL AGREEMENT ESTABLISHING THE UPPER MOUNTAIN COUNTIES WATER NEEDS ASSESSMENT CONSORTIUM

Recitals

A. In 2003, the Colorado Water Conservation Board (CWCB) completed the Statewide Water Supply Initiative (SWSI). That study included estimates of water demands in the South Platte River Basin through 2030. While SWSI provided a valuable coarse assessment of water demands for the municipal, industrial, and agricultural sectors, concerns were raised by representatives of the four Upper Mountain Counties (UMC) to the South Platte River Basin Roundtable (Park, Jefferson, Clear Creek, and Gilpin) that the analysis did not properly consider the water supply demands and available water resources for that part of the basin. Specifically, Park, Clear Creek, Gilpin, and a portion of Jefferson County have been primarily populated in the foothills and mountains through subdivision lots where residences have been built relying on on-lot domestic wells serving each home and with on-lot sewage disposal systems. The water supply issues related to current and future populations relying on these on-lot systems need to be more thoroughly evaluated than what was done in SWSI. In addition, UMC water providers serving areas not relying on on-lot systems need to have their needs and supplies evaluated to complete an understanding of UMC resources and needs.

B. By joining together the signatories hereto have an opportunity through funding available to Water Basin Roundtables under §37-75-101 et seq., CRS to perform a study to accurately identify water needs, available water supplies, and any shortages that may exist in the Upper Mountain Counties and identify projects and or actions that may be needed to address any shortages to areas on community water supplies or areas where depletions of the aquifer systems may be occurring or expected to occur. The study area is to include the mountainous areas of Jefferson County, the part of Park County east of Kenosha Pass, Gilpin, and Clear Creek Counties. This study is more specifically described in Exhibit A attached hereto and made a part hereof ("Upper Mountain Counties Water Needs Assessment"). CDM, an engineering firm which previously has conducted needs assessments for River Basin Roundtables and who, therefore, is deemed especially capable of performing the study, is proposed to perform the Upper Mountain Counties Water Needs Assessment ("Contractor").

C. The signatories hereto are political subdivisions or agencies of political subdivisions of the state of Colorado authorized to enter into this agreement pursuant to §29-1-203, CRS who desire to work together to seek and obtain a grant for and to conduct the Upper Mountain Counties Water Needs Assessment for their respective and mutual benefits.

D. This agreement is intended to set forth the terms and conditions for the cooperative effort of this consortium.

THEREFORE, in consideration of their mutual promises the undersigned agree as follows:

1. The members of the Upper Mountain Counties Water Needs Assessment Consortium ("Members") shall be the signatories hereto. Those eligible to be Members are Clear Creek County, Gilpin County, Jefferson County, Park County or any agency or department thereof authorized to enter into this agreement.

2. The Consortium is a cooperative effort of the Members and is not a separate legal entity.

3. This agreement shall commence on the date of its execution by any two Members. This agreement shall continue in effect until the Upper Mountain Counties Water Needs Assessment, and all obligations under any grant received therefor, have been completed.

4. The Consortium shall apply for a grant from the South Platte River Basin Roundtable and/or Metro Roundtable to conduct the Upper Mountain Counties Water Needs Assessment substantially as described in Exhibit A hereto. If a grant or grants for the cost of the study is received, the Consortium will contract with CDM to perform the study on the terms set forth in CDM's standard contract attached hereto as Exhibit B or other terms as may be agreed upon.

5. Clear Creek County, in its name, is designated and authorized as the Consortium's agent to apply to the Roundtable(s) for the grant, to negotiate and contract with CDM and any other subcontractor reasonably appropriate for conducting the study at a total cost not to exceed to the total sum of the grant(s), and to perform the terms of the grant(s) and contract(s) on behalf of and for the benefit of the Consortium. Clear Creek County shall periodically but not less than annually, or upon request of a Member, report to the Members the actions taken as agent for the Consortium and, specifically, the status of and performance of the grant(s) and the contract(s). The Members shall indemnify to the extent allowed by law and hold harmless Clear Creek County from losses, damages and claims alleged or suffered by third parties arising out of or relating to Clear Creek County's good faith performance, acting with reasonable care, of the provisions of this paragraph.

6. Clear Creek County will provide the agent services at its own expense. In addition, each Member shall use its best efforts in cooperating with the Contractor in the performance of the Upper Mountain Counties Water Needs Assessment, and specifically will (1) select an employee to serve as the Consortium's and Contractor's point of contact, (2) provide to the Contractor GIS parcel data for use in the study, (3) provide to the Contractor existing information on current and projected populations and current and projected land uses, (4) identify to the Contractor water service providers within its jurisdiction, (5)

identify to the Contractor any known, suspected or projected water quantity or quality issues within the study area, and (6) identify to the Contractor current or projected recreational projects related to tourism which may have peculiar water demands. The information and assistance to be supplied by each Member to the Contractor is further set forth in Exhibit A hereto.

7. Clear Creek County designates Berten Weaver, Community Development Director, PO Box 2000, 401 Argentine Street, Georgetown, CO 80444, tel. 303-679-2455, as its point of contact for the purposes of the study and the performance of this agreement.

8. Members of the Consortium shall confer with respect to the performance of this agreement upon the request of any Member or at such times as the Members agree upon. Decisions of the Consortium shall be made by majority vote of the total Members. Members may confer by physical or telephonic meeting. Clear Creek County shall keep the record of the decisions and actions of the Consortium in the performance of this agreement which records shall be available to any Member at any reasonable time.

9. The Members acknowledge and agree that each is relying on the performance of the other(s) under this agreement, and that all actions or changes of positions undertaken pursuant thereto are made in such reliance.

10. This agreement shall bind and inure to the benefit of the Members. No Member may assign or transfer any of its rights or obligations hereunder.

11. Each Member shall insure its risks arising out of or relating to this agreement as it deems appropriate. Nothing in this agreement shall be deemed a waiver by any Member, alone or acting cooperatively hereunder, of the provisions of the Colorado Governmental Immunity Act.

/////

Next pages are signature pages

This Intergovernmental Agreement Establishing the Upper Mountain Counties Water Needs Assessment Consortium is executed this 5th day of March, 2008, by:

CLEAR CREEK COUNTY,
By and through its Board of County Commissioners

Kevin O'Malley, Vice-Chairman

ATTEST:

Beth Luther, Deputy County Clerk

This Intergovernmental Agreement Establishing the Upper Mountain Counties Water Needs Assessment Consortium is executed this 11 day of March, 2008, by:

GILPIN COUNTY,
By and through its Board of County Commissioners

Jeanne Nicholson, Chairman

ATTEST:

Sharon E. Cate
County Clerk
Deputy

This Intergovernmental Agreement Establishing the Upper Mountain Counties Water Needs Assessment Consortium is executed this ___ day of _____, 2008, by:

JEFFERSON COUNTY,
By and through its Board of County Commissioners

_____
_____, Chairman

ATTEST:

_____
County Clerk

This Intergovernmental Agreement Establishing the Upper Mountain Counties Water Needs Assessment Consortium is executed this ___ day of _____, 2008, by:

PARK COUNTY,
By and through its Board of County Commissioners

_____
_____, Chairman

ATTEST:

_____
County Clerk

This Intergovernmental Agreement Establishing the Upper Mountain Counties Water Needs Assessment Consortium is executed this ___ day of _____, 2008, by:

_____

By:_____

EXHIBIT A

Scope of Work - Upper Mountain Counties Water Needs Assessment

This Scope of Work is divided into four sections as suggested in the Grand Application Instructions. Section 1 provides a description of each major task associated with the project along with a functional description of who will be completing the work and a description of the deliverables associated with the task. Section 2 lists the key personnel proposed for the project along with a brief description of their relevant project experience. Section 3 presents a detailed breakdown of the costs to complete the study and Section 4 presents the proposed Project Schedule.

Section 1 Task Summary

Introduction and Background

In 2003, the Colorado Water Conservation Board (CWCB) completed the Statewide Water Supply Initiative (SWSI). That study included estimates of water demands in the South Platte River Basin through 2030. While SWSI provided a valuable coarse assessment of water demands for the municipal, industrial, and agricultural sectors, concerns were raised by representatives of the four Upper Mountain Counties (UMC) to the South Platte River Basin Roundtable (Park, Jefferson, Clear Creek, and Gilpin) that the analysis did not properly consider the water supply demands and available water resources for that part of the basin. Specifically, Park, Clear Creek, Gilpin, and a portion of Jefferson County have been primarily populated in the foothills and mountains through subdivision lots where residences have been built relying on on-lot domestic wells serving each home and with on-lot sewage disposal systems. The water supply issues related to current and future populations relying on these on-lot systems need to be more thoroughly evaluated than what was done in SWSI. Also, UMC water providers to areas not relying on on-lot systems need to be contacted and their needs and supplies evaluated. A water provider is that entity, public or private, that is responsible for providing water to four or more residences and/or commercial user.

Given this background, we believe it is appropriate and opportune for a study to be undertaken under the auspices of HB-1177 and the South Platte Basin Roundtable to accurately identify water needs, available water supplies, and any shortages that may exist in the Upper Mountain Counties and identify projects and or actions that may be needed to address any shortages to areas on community water supplies or areas where depletions of the aquifer systems may be occurring or expected to occur. The study area is to include the mountainous areas of Jefferson County, the part of Park County east of Kenosha Pass, Gilpin, and Clear Creek Counties.

Study Objectives

The objectives of the proposed study are to:

1. Interview the UMC counties to determine current and projected populations and the status of current platted lots as to existing uses and projected uses to 2050 in the study area.
2. Interview UMC water providers for current and future water demands to 2050 including water demands related to recreation and tourism.
3. Identify existing lots (improved or unimproved) that may rely on domestic and commercial wells and estimate the water demand related to these lots based on various build-out assumptions.
4. Evaluate existing information on geology and precipitation for the mountain counties in order to estimate the amount of aquifer recharge from precipitation that is available for evaluating long term sustainable water supplies.
5. Assess the long term sustainability of the various aquifer systems in the mountain counties taking into consideration recharge and water demands related to current and future water needs.
6. Identify any water demands related to tourism resulting from future recreational projects such as ski or snow boarding areas.

Tasks

This work plan is divided into seven major tasks with multiple sub-tasks under each, addressing each of the objectives. The following is a list and description of tasks to be completed under this scope of work. The area of study will be Clear Creek County, Gilpin County, Park County east of Kenosha Pass, and the mountain part of Jefferson County.

Task 1 Interview Counties for Information Impacting Water Demand

1.1 Determine current and projected populations based on County estimates

The UMC counties will be interviewed to determine current and projected populations including the populations related to permanent and second home residences. This information will be more reliable than those obtained from the state demographer during SWSI.

1.2 Determine the number of platted lots and related zoning in each county

The counties will be interviewed to determine the status of existing platted lots in each county and zoning for them. Those that are not improved will be identified and the type of potential development for them evaluated for impact on future water demand assuming different levels of build out. This may be another way to estimate future water demands if population growth projections are not readily available. The lots that have been improved will be used to estimate current water demands based on the use of the lots such as permanent residences, second home residences, or commercial demands. To the extent possible, the GIS's for each county will be used to assist in this task.

1.3 Quantify unplatted private property in each county

The counties will be interviewed to identify unplatted private property in each county and the zoning for these areas so that a water demand can be projected for these lands at different levels of build out. To the extent possible, the GIS's for each county will be used to assist in this task.

Task 1 Assumptions

- One meeting with each County to gather information.
- GIS data provided by the counties will be of sufficient quality to complete Task 1.
- Upper Mountain Counties assistance in setting up the meeting with each county to make sure the appropriate county representatives attend the meeting to avoid follow-up meetings.
- If Park County does not have GIS data for the study area, then simplifying assumptions based on the number of platted lots acquired from plat maps may have to be made and the work effort increased with more staff time.

Task 1 Deliverables

- Population estimates for current and 2050 conditions for permanent, semi-permanent, and transitory populations.
- The number of platted lots and type of zoning for them will be provided along with any GIS mapping of these lots.
- The unplatted private property will be identified, related zoning, and GIS mapping of these areas provided.

Task 2 Interview water providers for information on current and projected water demands

2.1 Determine information available from towns and water providers

Since towns and water providers have information on water demands related to a central water delivery system and not areas relying on individual on-lot wells, these entities must be surveyed to determine if they have information on current and projected water demands to the year 2050 including those related to recreation and tourism. The counties can assist in identifying the towns and water providers within their individual counties that need to be surveyed. These water providers will be surveyed to determine if they have a water conservation plan filed with the Colorado Water Conservation Board's Office of Water Conservation. If these entities have GIS maps for their respective service areas, they will be included as a GIS overlay on the county GIS base maps.

2.2 Determine information available from the WQCD on public water providers within each county

If information is not completely available from the towns and water providers, the Water Quality Control Division (WQCD) will be contacted for water use information reports from public water providers in each county to supplement any missing data on current water supply demands. Growth projections from Task 1 can be used to estimate future demands for these water providers.

2.3 Obtain DWR well file data and evaluate for information on central water providers
The Division of Water Resources (DWR) well file data should be obtained and if possible, a GIS overlay prepared for use in mapping existing commercial and municipal wells on the GIS base maps. This information may identify other water providers that should be interviewed.
Task 2 Assumptions

- Upper Mountain Counties assistance in identifying water providers to interview and to provide contact information for water provider personnel to interview.
- Conference calls with up to 20 water providers located within the Upper Mountain Counties.
- One meeting at the WQCD to review reports.
- One meeting with DWR to obtain GIS data or well location database for inclusion in a GIS data set.

Task 2 Deliverables

- A GIS map of commercial or municipal water wells for each county.
- Identification of the sources of water for water providers including surface water and ground water sources.
- Estimates of current and 2050 water demands for the water providers.

Task 3 – Water Demands for Areas Relying on Domestic and Commercial Wells will be Estimated

3.1 Estimate the water demand for existing platted lots relying on commercial and domestic wells
Based on the information from Task 1, the water demands for platted lots relying on wells will be provided based on the type of well permit expected to be available from DWR for the lot, i.e. commercial, household use only (HUO) or domestic with the majority expected to be HUO type wells. Those subdivisions with small lots where the spacing requirements between a well and a septic tank or leach field may prevent the construction of a residence without combining lots will have to be taken into consideration in this task. The annual water demand will be assumed to be 0.30 acre-foot for a permanent residence (268 gallons per day) with a HUO well and 1.0 acre-foot for a domestic well which are granted for tracts of land greater than 35 acres. Commercial wells with meters will be surveyed to assist in estimating water demands for commercial uses. Different levels of build out for unimproved platted lots will have to be assumed in order to provide a range of water demands to 2050. A GIS map of water demand for these areas may be helpful to show areas of more dense development and related water demand.

3.2 Estimate the water demand for unplatted private property in each county that would rely on domestic or commercial wells

Using the information from Task 1, estimate the water demand for unplatted property in each county based on the current zoning to project water demands for these areas. The same assumptions set forth in Task 3.1 will be used to estimate annual water demand. Different levels of build out will have to be assumed in order to provide a range of water demands to 2050. A GIS map of water demand for these areas may be helpful in depicting areas with more dense development and related water demand.

Task 3 Assumptions

- Discussion with some water providers about water demand in the study area may result in a lower requirement for a permanent residence and if so, this value may be used.

Task 3 Deliverables

- Estimates of water demands for existing platted lots with GIS mapping.
- Estimates of water demands for unplatted private property with GIS mapping.

Task 4 - Recharge of Aquifer Systems will be Estimated

4.1 Long term annual precipitation available over the four counties will be obtained

The information from the National Weather Service and NOAA on long-term annual precipitation and seasonal precipitation for the four counties will be obtained and GIS maps if available acquired.

4.2 Geologic mapping of the various aquifer systems will be obtained

The available geologic maps for the four counties will be obtained using information available from the USGS, CGS, and DWR file information. These maps will be combined into a GIS geologic overlay in order to assist in estimating recharge to the aquifer systems.

4.3 Annual recharge to aquifer systems will be estimated

The information available from the USGS study in the Turkey Creek watershed in Jefferson County (Water Resources Investigations Report 03-4034) will be used to estimate recharge to aquifer systems based on the geology and annual precipitation. The aquifer systems are those defined in the above report and include metamorphic, intrusive, fault-zone, and Pikes Peak Granite. To the extent that the alluvial aquifers are mapped, this study will attempt to determine if there are any potential long term water supply concerns based on the location of known alluvial wells from the DWR data base. These estimates will be shown on GIS overlay maps for the four counties.

The authors of the USGS study in the Turkey Creek watershed will be consulted to see if they can assist in properly using the report to estimate recharge for various aquifer systems, specifically Cliff Bossong and Jonathan Saul Caine. It may be necessary to conduct some random sampling of fractures in outcrop areas to compare with the fractures found in the Turkey Creek watershed study. Other experts involved in the study such as Mike Wireman with the EPA, Ed Weeks with the USGS, and Peter Barkmann with the CGS should be consulted or used as an advisory committee.

Return flows from on-lot sewage disposal systems will be estimated using information available from DWR and the Colorado School of Mines studies. In addition, any localized impacts upon runoff and related recharge to aquifer systems due to land use activities need to be evaluated and if necessary, mitigation activities such as retention basins proposed.

Task 4 Assumptions

- It is assumed that for Task 4.1 data will be available in the form of a map that indicated long-term average precipitation and that this information will not be recreated using historic data.
- Existing geologic maps for the study area will be used and at the smallest scale uniformly available.
- The USGS Report (Water Resources Investigations Report 03-4034) estimates long term recharge (1949 to 1999) for four types of aquifer systems; metamorphic, intrusive, fault-zone, and Pikes Peak granite, and this recharge estimates will be used for similar rock types in the study area.
- The counties will identify areas where impervious surfaces have impacted runoff and possibly recharge.

Task 4 Deliverables

- Annual and seasonal precipitation estimates for the four counties with GIS overlays.
- Geologic mapping for the four counties along with GIS overlays.
- Estimates of long term annual recharge to the various aquifer systems for the four counties along with GIS overlays.
- Mitigation activities such as detention basins to increase recharge in areas where land use patterns from impervious surfaces have impacted runoff and related recharge to the aquifer systems.

Task 5 – Long Term Sustainability of the Aquifer Systems will be Evaluated

5.1 Ground water level data will be evaluated for any long term trends

The available ground water level data that may be available will be acquired to determine if any water level trends are apparent. The information from Jefferson County staff, Roy Laws, will be acquired along with any other data such as from DWR and the USGS.

5.2 Areas with known aquifer water supply concerns will be identified

The counties, towns, and water providers will be surveyed for known aquifer water supply concerns such as water quantity, water quality, infrastructure, or water level concerns. This information will be evaluated for impact on the long term sustainability of the aquifer systems.

5.3 Long term physical sustainability of various aquifer systems will be evaluated

The estimated annual depletions for various aquifer systems based on water demand estimates for various periods up to 2050 will be compared with estimates of long term

annual recharge. Areas where aquifer levels may be expected to decline will be identified and these areas mapped using a GIS overlay. Areas with aquifers in a sustainable condition will be also identified and these areas mapped using a GIS overlay. Sustainability is defined for this study as the ability to use the aquifer systems to meet current and future needs without mining of the aquifers and without significant degradation of the quality of the ground water.

Task 5 Assumptions

- One meeting with Roy Laws, DWR, and USGS to acquire water level data.
- One phone interview with each county, town, and water provider to discuss water supply concerns will be conducted with approximately 30 entities.

Task 5 Deliverables

- Areas with known ground water level declines will be shown on GIS maps.
- Areas with known aquifer supply concerns will be shown on GIS maps.
- GIS Maps showing aquifer systems with long term sustainable conditions and aquifer systems with long term unsustainable conditions.

Task 6 - Water Needs for Future Recreation and Tourism Demands will be Estimated

The counties will be surveyed for possible new recreation or tourism related water demands (consumptive) that may develop in the future such as new ski areas or snow boarding areas. The water supply for these possible new projects will be assumed to be provided by the developer of the project and this task is to identify associated water demands that may occur that would impact the surrounding area.

Task 6 Assumptions

- One interview of each county's appropriate planning official will be conducted to identify possible new recreation or tourism related water demand.

Task 6 Deliverables

- A description and location of possible new recreation and tourism projects.
- An estimate of the water requirements related to these projects that could impact the surrounding area from demands for restrooms, restaurants, and gas stations.

Task 7 - Draft and Final Report

A draft and final report will be provided to the Upper Mountain Counties summarizing Tasks 1-6. One meeting will be held with the Upper Mountain Counties to discuss the draft report contents and received comments. An additional meeting will be held with the Upper Mountain Counties after the final report is completed to prepare a presentation on the results to the South Platte Roundtable. A presentation that summarizes the report that could be utilized in public meetings will be created for the Upper Mountain Counties

Task 7 Assumptions

- Draft and final report will be provided in electronic format with 8 hard copy reports produced for the Upper Mountain Counties.

Task 7 Deliverables

- Draft and final report in electronic and hard copy format.
- Presentations summarizing results of study

Section 2 Key Personnel

Relevant project experience for the key personnel proposed for the Upper Mountain Counties Water Needs Assessment are presented in this section.

Hal Simpson, P.E. - Technical Director

Hal Simpson currently is a consulting engineer in water resources management. He retired following 34 years of service to the State of Colorado with the last 15 years as State Engineer and Director of the Division of Water Resources. He was appointed State Engineer on August 7, 1992. As State Engineer, Mr. Simpson was responsible for the direction and management of the Division of Water Resources, which has a staff of 265 FTE and a budget of approximately $23 million. The Division is responsible for distribution and administration of water in accordance with statutes and interstate compacts; the implementation of a statewide dam safety program; the permitting of the use of ground water and construction of wells; the collection and dissemination of data on water use and stream flow; and conducting various studies concerning water resources and the availability of water supplies. The State Engineer is Colorado's commissioner on five interstate compacts and is responsible for assuring compliance with these compacts. The State Engineer is also the Executive Director of the Colorado Ground Water Commission and is the Secretary of the Board of Examiners for Water Well and Pump Installation Contractors.

CDM Project Staff

Kelly DiNatale, P.E. - Project Director

Mr. DiNatale has 26 years of experience in the planning, design, construction, and operations and maintenance of raw water supply, water quality, watershed protection, reservoir management, water treatment, and wastewater treatment facilities. He has directed and managed local, regional and statewide water supply planning efforts. Mr. DiNatale served as Technical Director for the Colorado Statewide Water Supply Initiative (SWSI).

Nicole Rowan, P.E. - Project Manager

Ms. Rowan has over 12 year experience and is a senior project manager who focuses on water supply, watershed management and natural resources projects. She is the project manager for the Statewide Water Supply Initiative (SWSI) and for CDM's current contract with Colorado Department of Natural Resources (DNR) to provide technical support to the Interbasin Project Compact process.

Michael Smith - Senior Hydrologist

Mr. Smith has more than 27 years of experience directing and conducting environmental investigations for waste disposal and remediation, mining, and water resources projects. His experience includes a diversity of hydrogeologic field investigations, monitoring network design and implementation, computer simulation of groundwater and vadose zone systems, solute and nonaqueous phase liquid (NAPL) transport, and extensive interaction with regulatory agencies.

Gordon McCurry - Senior Hydrogeologist

Dr. McCurry has more than 20 years of experience in groundwater hydrology relating to water resources evaluation and aquifer remediation. His experience includes the investigation, characterization, and modeling of aquifer systems for projects nationwide. Dr. McCurry's areas of technical expertise include numerical simulation of groundwater flow and contaminant transport, wellhead protection, aquifer hydraulics testing and analysis, stream/aquifer interactions, design of groundwater remediation systems, and regulatory compliance.

Robbie Parsons - GIS Specialist

Mr. Parsons has 21 years of experience as an environmental specialist/GIS specialist performing complex GIS and database analysis. He has extensive experience in the area of systems management including hardware and software setup. Additionally, he is involved in several implementation and development tasks related to GIS involving private sector and federal government projects.

Mark McCluskey, P.E. - Project Engineer

Mr. McCluskey is an environmental engineer who specializes in water resources. His expertise includes hydrologic modeling. Mr. McCluskey's software experience includes MODFLOW, MODFLOW SURFACT, UCODE, PEST, DYNFLOW, Groundwater Vistas, ArcInfo, ArcGIS, HEC-RAS, Fortran, VBA, SHAPE, @RISK, EPAnet, LINDO, MathCAD, MINITAB, and Kypipe.

Matt Bliss - Engineer

Mr. Bliss is a water resources engineer experienced with groundwater and surface water planning and modeling. He has collaborated on several groundwater models, groundwater sustainability studies, and surface water planning studies including water rights evaluations.

Section 3 Budget

A detailed breakdown of the estimated labor, other direct costs, and subconsultants for the proposed project is presented in the following matrix.

Upper Mountain Counties Water Needs Assessment Budget Summary

Cost Summary

Task	Labor Cost	Other Direct Costs	Subconsultants	Total Project Costs
1.1	$2,800	$100	$1,200	$4,100
1.2	$4,100	$100	$600	$4,800
1.3	$3,600	$100	$600	$4,300
2.1	$6,300	$200	$2,400	$8,900
2.2	$1,000	$50	$300	$1,350
2.3	$1,700	$100	$600	$2,400
3.1	$2,700	$100	$600	$3,400
3.2	$3,600	$100	$600	$4,300
4.1	$500	$50	$300	$850
4.2	$31,100	$200	$3,000	$34,300
4.3	$30,000	$200	$3,000	$33,200
5.1	$2,200	$50	$300	$2,550
5.2	$11,800	$100	$600	$12,500
5.3	$11,000	$100	$600	$11,700
6	$2,000	$100	$600	$2,700
7	$36,500	$500	$6,000	$43,000
			Total	$174,350

In-kind Contributions

Jefferson County GIS Data	$3,150
Park County GIS Data	$1,000
Clear Creek County GIS Data	$1,640
Gilpin County GIS Data	$2,280
total	$8,070

Upper Mountain Counties Water Needs Assessment Budget

Personnel	Project Director	Senior Hydrologist/ Hydrogeologist	Project Manager	Project Engineer	GIS Specialist	Engineer	Senior Support Services	Staff Support	Labor Hours	Labor Cost
Rate/Hour[1]	$195	$185	$165	$115	$120	$95	$85	$65		
Task										
1.1	2		2	16				4	24	$2,800
1.2	2		2	4	20	4		2	34	$4,100
1.3	2		2	4	16	4		2	30	$3,600
2.1	4		4	40				4	52	$6,300
2.2				4		4		2	10	$1,000
2.3			2	2	8			2	14	$1,700
3.1	2		2	16				2	22	$2,700
3.2	2		2	12	8	4		2	30	$3,600
4.1				4					4	$500
4.2		80		40	60	40	2	8	230	$31,100
4.3	8	80	16	40	16	40	2	8	210	$30,000
5.1		12							12	$2,200
5.2	4	16	4	60				8	92	$11,800
5.3	4	16	8	24	24			4	80	$11,000
6			4	12					16	$2,000
7	16	40	40	80	40	40		24	280	$36,500
Labor Totals	46	244	88	358	192	136	4	72	1140	$150,900

[1]Estimated hourly rates based on invoicing at 3.1 times raw labor rates

Other Direct Costs and Subconsultants

Task	ODCs	Subconsultant (Hal Simpson, P.E.)	Total
1.1	$100	$1,200	$1,300
1.2	$100	$600	$700
1.3	$100	$600	$700
2.1	$200	$2,400	$2,600
2.2	$50	$300	$350
2.3	$100	$600	$700
3.1	$100	$600	$700
3.2	$100	$600	$700
4.1	$50	$300	$350
4.2	$200	$3,000	$3,200
4.3	$200	$3,000	$3,200
5.1	$50	$300	$350
5.2	$100	$600	$700
5.3	$100	$600	$700
6	$100	$600	$700
7	$500	$6,000	$6,500
Totals	$2,150	$21,300	$23,450

Section 4 Project Schedule

The proposed project schedule is presented in the graphic below. The schedule is presented as months from contract inception. It is anticipated that the project will be completed within six months.

Upper Mountain Counties Water Needs Assessment Schedule

Task	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
Notice to Proceed	x					
Task 1.1						
Task 1.2						
Task 1.3						
Task 2.1						
Task 2.2						
Task 2.3						
Task 3.1						
Task 3.2						
Task 4.1						
Task 4.2						
Task 4.3						
Task 5.1						
Task 5.2						
Task 5.3						
Task 6						
Task 7						

EXHIBIT B

TO THE INTERGOVERNMENTAL AGREEMENT
ESTABLISHING THE UPPER MOUNTAIN COUNTIES
WATER NEEDS ASSESSMENT CONSORTIUM

STANDARD FORM OF AGREEMENT
BETWEEN
OWNER AND ENGINEER

THIS IS AN AGREEMENT made as of , 20 between ("OWNER") and ("ENGINEER").

OWNER intends to (the "Project").

OWNER and ENGINEER in consideration of their mutual covenants herein agree in respect of the performance or furnishing of services by ENGINEER with respect to the Project and the payment for those services by OWNER as set forth below. Execution of this Agreement by ENGINEER and OWNER constitutes OWNER's written authorization to ENGINEER to proceed on the date first above written with the Services described in Article 1 below. This Agreement will become effective on the date first above written.

ARTICLE 1 – SCOPE OF SERVICES

1.1 ENGINEER agrees to perform for OWNER services as described in Exhibit A (hereinafter referred to as "Services") in accordance with the requirements outlined in this Agreement.

ARTICLE 2 – TIMES FOR RENDERING SERVICES

2.1 The specific time period for the performance of ENGINEER's Services are set forth in Exhibit A.

2.2 If the specific periods of time for rendering services or specific dates by which services are to be completed are changed through no fault of ENGINEER, the rates and amounts of compensation provided for herein shall be subject to equitable adjustment. If OWNER has requested changes in the scope, extent, or character of the Project, the time of performance and compensation for ENGINEER's services shall be adjusted equitably.

2.3 If ENGINEER's services are delayed or suspended in whole or in part by OWNER for more than three months through no fault of ENGINEER, ENGINEER shall be entitled to equitable adjustment of rates and amounts of compensation provided for elsewhere in this Agreement to reflect, among other things, reasonable costs incurred by ENGINEER in connection with such delay or suspension and reactivation and the fact that the time for performance under this Agreement has been revised

ARTICLE 3 – OWNER'S RESPONSIBILITIES

OWNER shall do the following in a timely manner so as not to delay the services of ENGINEER and shall bear all costs incident thereto:

3.1 Pay the ENGINEER in accordance with the terms of this Agreement.

3.2 Designate in writing a person to act as OWNER's representative with respect to the services to be performed or furnished by ENGINEER under this Agreement. Such person will have complete authority to transmit instructions, receive information, interpret, and define OWNER's policies and decisions with respect to ENGINEER's services for the Project.

3.3 Provide all criteria and full information as to OWNER's requirements for the Project, including, as applicable to the Services, design objectives and constraints, space, capacity and performance requirements, flexibility and expandability, and furnish copies of all design and construction standards

which OWNER will require to be included in the Drawings and Specifications.

3.4 Assist ENGINEER by placing at ENGINEER's disposal all available information pertinent to the Project including previous reports and, as applicable to the Services, any other data relative to design or construction of the Project, all of which ENGINEER shall be entitled to rely upon.

3.5 Give prompt written notice to ENGINEER whenever OWNER observes or otherwise becomes aware of any development that affects the scope or time of performance or furnishing of ENGINEER's Services or any defect or conformance in ENGINEER's Services or in the work of any Contractor.

3.6 Bear all costs incident to compliance with the requirements of this Article 3.

ARTICLE 4 – PAYMENTS TO ENGINEER FOR SERVICES

4.1 Methods of Payment for Services of ENGINEER.

4.1.1 OWNER shall pay ENGINEER for Services performed or furnished under this Agreement or as described in Exhibit A. The amount of any excise, VAT, or gross receipts tax that may be imposed shall be added to the compensation shown in Exhibit .

4.1.2 Invoices for Services will be prepared in accordance with ENGINEER's standard invoicing practices and will be submitted to OWNER by ENGINEER at least monthly. Invoices are due and payable on receipt.

4.1.3 If OWNER fails to make any payment due ENGINEER for services and expenses within thirty days after receipt of ENGINEER's invoice therefor, the amounts due ENGINEER will be increased at the rate of 1.0% per month (or the maximum rate of interest permitted by law, if less) from said thirtieth day; and, in addition, ENGINEER may, after giving seven days' written notice to OWNER, suspend services under this Agreement until ENGINEER has been paid in full all amounts due for services, expenses and charges. Payments will be credited first to interest and then to principal. In the event of a disputed or contested billing, only that portion so contested may be withheld from payment, and the undisputed portion will be paid.

OWNER agrees to pay ENGINEER all costs of collection including but not limited to reasonable attorneys' fees, collection fees and court costs incurred by ENGINEER to collect properly due payments.

ARTICLE 5 – GENERAL CONDITIONS

5.1 Standard of Care

The standard of care for all professional engineering and related services performed or furnished by ENGINEER under this Agreement will be the care and skill ordinarily used by members of ENGINEER's profession practicing under similar conditions at the same time and in the same locality.

5.2 Opinions of Probable Construction Cost

ENGINEER's opinions of probable Construction Cost, as applicable to the Services, provided for herein are to be made on the basis of ENGINEER's experience and qualifications and represent ENGINEER's best judgment as an experienced and qualified professional engineer generally familiar with the construction industry. However, since ENGINEER has no control over the cost of labor, materials, equipment, or services furnished by others, or over the Contractor's methods of determining prices, or over competitive bidding or market conditions, or when the Project will be constructed ENGINEER cannot and does not guarantee that proposals, bids, or actual Construction Cost will not vary from opinions of probable Construction Cost prepared by ENGINEER. If OWNER wishes greater assurance as to probable Construction Cost, OWNER shall employ an independent cost estimator.

5.3 Termination

The obligation to provide further services under this Agreement may be terminated by either party upon thirty days' written notice in the event of substantial failure by the other party to perform in accordance with the terms thereof through no fault of the terminating party. In the event of any termination, ENGINEER will be paid for all services rendered and reimbursable expenses incurred to the date of termination and, in addition, all reimbursable expenses directly attributable to termination.

5.4 Use of Documents

5.4.1 All Documents are instruments of service in respect to this Project, and ENGINEER shall retain an ownership and property interest therein (including the copyright and the right of reuse at the discretion of the ENGINEER) whether or not the Project is completed.

5.4.2 OWNER may rely upon that data or information set forth on paper (also known as hard copies) that the OWNER receives from the ENGINEER by mail, hand delivery, or facsimile, are the items that the ENGINEER intended to send. Files in electronic media format of text, data, graphics, or other types that are furnished by the ENGINEER to the OWNER are furnished only for convenience, not reliance by the OWNER. Any conclusion or information obtained or derived from such electronic files will be at the OWNER's sole risk. In all cases, the original hard copy of the documents takes precedence over the electronic files.

5.4.3 Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the OWNER agrees that it will perform acceptance tests or procedures within 60 days, after which the OWNER shall be deemed to have accepted the data thus transferred. Any transmittal errors detected within the 60-day acceptance period will be corrected by the ENGINEER.

5.4.4 When transferring documents in electronic media format, the ENGINEER makes no representations as to long-term compatibility, usability, or readability of such documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the ENGINEER.

5.4.5 OWNER may make and retain copies of documents for information and reference in connection with use on the Project by OWNER. ENGINEER grants OWNER a license to use the Documents on the Project, extensions of the Project, and other projects of OWNER, subject to the following limitations: (1) OWNER acknowledges that such Documents are not intended or represented to be suitable for use on the Project unless completed by ENGINEER, or for use or reuse by OWNER or others on extensions of the Project or on any other project without written verification or adaptation by ENGINEER; (2) any such use or reuse, or any modification of the Documents, without written verification, completion, or adaptation by ENGINEER, as appropriate for the specific purpose intended, will be at OWNER's sole risk and without liability or legal exposure to ENGINEER or to ENGINEER's Consultants; (3) OWNER shall indemnify and hold harmless ENGINEER and ENGINEER's Consultants from all claims, damages, losses, and expenses, including attorneys' fees, arising out of or resulting from any use, reuse, or modification without written verification, completion, or adaptation by ENGINEER; (4) such limited license to OWNER shall not create any rights in third parties.

5.4.6 If ENGINEER at OWNER's request verifies or adapts the Documents for extensions of the Project or for any other project, then OWNER shall compensate ENGINEER at rates or in an amount to be agreed upon by OWNER and ENGINEER.

5.5 Controlling Law

This Agreement is to be governed by the law of the principal place of business of ENGINEER.

5.6 Mutual Waiver of Consequential Damages

Notwithstanding any other provision of this Agreement to the contrary, neither party including their officers, agents, servants and employees shall be liable to the other for lost profits or any special, indirect, incidental, or consequential damages in any way arising out of this Agreement however caused under a claim of any type or nature based on any theory of liability (including, but not limited to: contract, tort, or warranty) even if the possibility of such damages has been communicated.

5.7 Limitation of Liability

In no event shall ENGINEER's total liability to OWNER and/or any of the OWNER's officers, employees, agents, contractors or subcontractors for any and all injuries, claims, losses, expenses or damages whatsoever arising out of or in any way related to this agreement from cause or causes, including, but not limited to, ENGINEER's wrongful act, omission, negligence, errors, strict liability, breach of contract, breach of warranty, express or implied, exceed the total amount of fee paid to ENGINEER under this agreement or $50,000, whichever is greater.

5.8 Successors and Assigns

5.8.1. OWNER and ENGINEER each is hereby bound and the partners, successors, executors, administrators and legal representatives of OWNER and ENGINEER (and to the extent permitted by paragraph 5.8.2 the assigns of OWNER and ENGINEER) are hereby bound to the other party to this Agreement and to the partners, successors, executors, administrators and legal representatives (and said assigns) of such other party, in respect of all covenants, agreements and obligations of this Agreement.

5.8.2. Neither OWNER nor ENGINEER may assign, sublet or transfer any rights under or interest (including, but without limitation, moneys that may become due or moneys that are due) in this Agreement without the written consent of the other, except to the extent that any assignment, subletting or transfer is mandated by law or the effect of this limitation may be restricted by law. Unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under this Agreement.

5.8.3. Unless expressly provided otherwise in this Agreement:

5.8.3.1. Nothing in this Agreement shall be construed to create, impose or give rise to any duty owed by ENGINEER to any Contractor, Subcontractor, Supplier, other person or entity, or to any surety for or employee of any of them, or give any rights in or benefits under this Agreement to anyone other than OWNER and ENGINEER.

5.8.3.2. All duties and responsibilities undertaken pursuant to this Agreement will be for the sole and exclusive benefit of OWNER and ENGINEER and not for the benefit of any other party.

5.9 Notices

Any notice required under this Agreement will be in writing, addressed to the appropriate party at the address which appears on the signature page to this Agreement (as modified in writing from time to time by such party) and given personally, by registered or certified mail, return receipt requested, by facsimile, or by a nationally recognized overnight courier service. All notices shall be effective upon the date of receipt.

5.10 Severability

Any provision or part of the Agreement held to be void or unenforceable under any law or regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon OWNER and ENGINEER, who agree that the Agreement shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

5.11 Changed Conditions

If concealed or unknown conditions that affect the performance of the Services are encountered, which conditions are not ordinarily found to exist or which differ materially from those generally recognized as inherent in the Services of the character provided for under this Agreement or which could not have reasonably been anticipated, notice by the observing party shall be given promptly to the other party and, if possible, before conditions are disturbed. Upon claim by the ENGINEER, the payment and schedule shall be equitably adjusted for such concealed or unknown condition by change order or amendment to reflect additions that result from such concealed, changed, or unknown conditions.

5.12 Environmental Site Conditions

It is acknowledged by both parties that ENGINEER's scope of services does not include any services related to Constituents of Concern, as defined in Article 6. If ENGINEER or any other party encounters an undisclosed Constituent of Concern, or if investigative or remedial action, or other professional services, are necessary with respect to disclosed or undisclosed Constituents of Concern as defined in Article 6, then ENGINEER may, at its option and without liability for consequential or any other damages, suspend performance of services on the portion of the Project affected thereby until OWNER: (1) retains appropriate specialist consultant(s) or contractor(s) to identify and, as appropriate, abate, remediate, or remove the Constituents of Concern, and (2) warrants that the Site is in full compliance with applicable Laws and Regulations.

If the presence at the Site of undisclosed Constituents of Concern adversely affects the performance of ENGINEER's services under this Agreement, then the ENGINEER shall have the option of (1) accepting an equitable adjustment in its compensation or in the time of completion, or both; or (2) terminating this Agreement for cause on 30 days' notice.

OWNER acknowledges that ENGINEER is performing professional services for OWNER and that ENGINEER is not and shall not be required to become an "arranger," "operator," "generator," or "transporter" of hazardous substances, so defined in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, which are or may be encountered at or near the Site in connection with ENGINEER's activities under this Agreement.

5.13 Insurance

ENGINEER shall procure and maintain insurance for protection from claims under workers' compensation acts, claims for damages because of bodily injury including personal injury, sickness or disease or death of any and all employees or of any person other than such employees, and from claims or damages because of injury to or destruction of property.

5.14 Discovery

ENGINEER shall be entitled to compensation on a time and materials basis when responding to all requests for discovery relating to this Project and to extent that ENGINEER is not a party to the lawsuit.

5.15 Nondiscrimination and Affirmative Action

In connection with its performance under this Agreement, ENGINEER shall not discriminate against any employee or applicant for employment because of race, color, creed, religion, age, sex, marital status, sexual orientation or affectional preference, national origin, ancestry, citizenship, physical or mental

handicap or because he or she is a disabled veteran or veteran of the Vietnam era. ENGINEER shall take affirmative action to ensure that qualified applicants are employed and that employees are treated during employment without regard to their race, color, creed, religion, age, sex, marital status, sexual orientation or affectional preference, national origin, ancestry, citizenship, physical or mental handicap or because he or she is a disabled veteran or veteran of the Vietnam era. Such actions shall include recruiting and hiring, selection for training, promotion, fixing rates or other compensation, benefits, transfers and layoff or termination.

5.16 Force Majeure

Any delays in or failure of performance by ENGINEER shall not constitute a default under this Agreement if such delays or failures of performance are caused by occurrences beyond the reasonable control of ENGINEER including but not limited to: acts of God or the public enemy; expropriation or confiscation; compliance with any order of any governmental authority; changes in law; act of war, rebellion, terrorism or sabotage or damage resulting therefrom; fires, floods, explosions, accidents, riots; strikes or other concerted acts of workmen, whether direct or indirect; delays in permitting; OWNER's failure to provide data in OWNER's possession or provide necessary comments in connection with any required reports prepared by ENGINEER, or any other causes which are beyond the reasonable control of ENGINEER. ENGINEER's scheduled completion date shall be adjusted to account for any force majeure delay and ENGINEER shall be reimbursed by OWNER for all costs incurred in connection with or arising from a force majeure event, including but not limited to those costs incurred in the exercise of reasonable diligence to avoid or mitigate a force majeure event.

5.17 Waiver

Non-enforcement of any provision by either party shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Agreement.

5.18 Headings

The headings used in this Agreement are for general reference only and do not have special significance.

5.19 Subcontractors

ENGINEER may utilize such ENGINEER's Subcontractors as ENGINEER deems necessary to assist in the performance of its Services.

5.20 Coordination with Other Documents

It is the intention of the parties that if the ENGINEER's Services include design then the Standard General Conditions will be used as the General Conditions for the Project and that all amendments thereof and supplements thereto will be generally consistent therewith. Except as otherwise defined herein, the terms which have an initial capital letter in this Agreement and are defined in the Standard General Conditions will be used in this Agreement as defined in the Standard General Conditions. The term *"defective"* will be used in this Agreement as defined in the Standard General Conditions.

5.21 Purchase Order

Notwithstanding anything to the contrary contained in any purchase order or in this Agreement, any purchase order issued by OWNER to ENGINEER shall be only for accounting purposes for OWNER and the pre-printed terms and conditions contained on any such purchase order are not incorporated herein, shall not apply to this Agreement, and shall be void for the purposes of the Services performed by ENGINEER under this Agreement.

5.22 Dispute Resolution

In the event of any dispute between the parties arising out of or in connection with the contract or the services or work contemplated herein; the parties agree to first make a good faith effort to resolve the dispute informally. Negotiations shall take place between the designated principals of each party. If

the parties are unable to resolve the dispute through negotiation within 45 days, then either party may give written notice within 10 days thereafter that it elects to proceed with non-binding mediation pursuant to the commercial mediation rules of the American Arbitration Association. In the event that mediation is not invoked by the parties or that the mediation is unsuccessful in resolving the dispute, then either party may submit the controversy to a court of competent jurisdiction. The foregoing is a condition precedent to the filing of any action other than an action for injunctive relief or if a Statute of Limitations may expire.

Each party shall be responsible for its own costs and expenses including attorneys' fees and court costs incurred in the course of any dispute, mediation, or legal proceeding. The fees of the mediator and any filing fees shall be shared equally by the parties.

ARTICLE 6 – DEFINITIONS

6.1 Whenever used in this Agreement the following terms have the meanings indicated which are applicable to both the singular and the plural.

6.1.1 Services
The services to be performed for or furnished to OWNER by ENGINEER described in this Agreement.

6.1.2 Agreement
This Agreement between OWNER and ENGINEER for Professional Services including those exhibits listed in Article 7.

6.1.3 Constituent of Concern
Any substance, product, waste, or other material of any nature whatsoever (including, but not limited to, Asbestos, Petroleum, Radioactive Material, and PCBs) which is or becomes listed, regulated, or addressed pursuant to [a] the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq, ("CERCLA")l [b] the Hazardous Materials Transportation Act, 49 U.S.C. §§1801 et seq.; [c] the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. ("RCRA"); [d] the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; [e] the Clean Water Act, 33 U.S.C. §v1251 et seq.; [f] the Clean Air Act, 42 U.S.C. §§7401 et seq.; and [g] any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

6.1.4 Construction Cost – ♦
The total cost to OWNER of those portions of the entire Project designed or specified by ENGINEER. Construction Cost does not include ENGINEER's compensation and expenses, the cost of land, rights-of-way, or compensation for or damages to properties, or OWNER's legal, accounting, insurance counseling or auditing services, or interest and financing charges incurred in connection with the Project or the cost of other services to be provided by others to OWNER pursuant to Article 3. Construction Cost is one of the items comprising Total Project Costs.

6.1.5 Documents
As applicable to the Services, the data, reports, drawings, specifications, record drawings and

♦ This provision is applicable for projects where ENGINEER provides Design, Bidding and/or Construction Phase Services.

other deliverables, whether in printed or electronic media format, provided or furnished by ENGINEER to OWNER pursuant to the terms of this Agreement.

6.1.6 Contractor - ♦
The person or entity with whom OWNER enters into a written agreement covering construction work to be performed or furnished with respect to the Project.

6.1.7 ENGINEER's Subcontractor.
A person or entity having a contract with ENGINEER to perform or furnish Services as ENGINEER's independent professional subcontractor engaged directly on the Project.

6.1.8 Reimbursable Expenses.
The expenses incurred directly in connection with the performance or furnishing of Services for the Project for which OWNER shall pay ENGINEER as indicated in Exhibit .

6.1.9 Resident Project Representative - ♦
The authorized representative of ENGINEER who will be assigned to assist ENGINEER at the site during the Construction Phase. The Resident Project Representative will be ENGINEER's agent or employee and under ENGINEER's supervision. As used herein, the term Resident Project Representative includes any assistants of Resident Project Representative agreed to by OWNER. The duties and responsibilities of the Resident Project Representative are set forth in Exhibit B, "Duties, Responsibilities and Limitations of Authority of Resident Project Representative" ("Exhibit B").

6.1.10 Standard General Conditions - ♦
The Standard General Conditions of the Construction Contract (No.) of the Engineers Joint Contract Documents Committee.

6.1.11 Total Project Costs - ♦
The sum of the Construction Cost, allowances for contingencies, the total costs of design professional and related services provided by ENGINEER and (on the basis of information furnished by OWNER) allowances for such other items as charges of all other professionals and consultants, for the cost of land and rights-of-way, for compensation for or damages to properties, for interest and financing charges and for other services to be provided by others to OWNER under Article 3.

ARTICLE 7 – EXHIBITS AND SPECIAL PROVISIONS

7.1 This Agreement is subject to the provisions of the following Exhibits which are attached to and made a part of the Agreement:

Exhibit A - Engineer's Services, Owner's Responsibilities, Time for Performance, Method of Payment, and Special Provisions.

Exhibit B - Duties,Responsibilities and Limitations of Authority of the Resident Project Representative. (Use when RPR Services are provided.)

This Agreement (consisting of Pages 1 to inclusive), and the Exhibits identified above constitute the entire agreement between OWNER and ENGINEER and supersede all prior written or oral understandings. This Agreement may only be amended, supplemented, modified, or canceled by a duly executed written instrument.

♦ This provision is applicable for projects where ENGINEER provides Design, Bidding and/or Construction Phase Services.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement to be effective as of the date first above written.

OWNER:	ENGINEER:
By:	By:
Title:	Title:
Date:	Date:
Address for giving notices:	Address for giving notices:

EXHIBIT A
TO AGREEMENT BETWEEN
OWNER AND ENGINEER
(STUDY AND REPORT)

This is an exhibit attached to and made a part of the Agreement dated , 20 , between (OWNER) and (ENGINEER) for professional services.

1.0 ENGINEER'S SERVICES

1.1 Study and Report Phase
Upon this Agreement becoming effective, ENGINEER shall::

1.1.1 Consult with OWNER to clarify and define OWNER's requirements for the Project and review available data.

1.1.2 Advise OWNER as to the necessity of OWNER's providing or obtaining from others data or services which are not part of ENGINEER's Services, and assist OWNER in obtaining such data and services.

1.1.3 Identify and analyze requirements of governmental authorities having jurisdiction to approve the portions of the Project specified by ENGINEER with whom consultation is to be undertaken in connection with the Project.

1.1.4 Evaluate various alternate solutions available to OWNER as described herein, and, after consultation with OWNER, recommend to OWNER those solutions which in ENGINEER's judgment best meet OWNER's requirements for the Project.

1.1.5 Prepare a report (the "Report") which will contain the statement of OWNER's requirements for the Project and, as appropriate, will contain schematic layouts, sketches and conceptual design criteria with appropriate exhibits to indicate the considerations involved and those alternate solutions available to OWNER which ENGINEER recommends. This Report will be accompanied by ENGINEER's opinion of Total Project Costs for each solution which is so recommended for the Project, including the following: opinion of probable Construction Cost, allowances for contingencies including costs of design professional and related services based on information furnished by OWNER for allowances and other items and services included within the definition of Total Project Costs.

1.1.6 Furnish the Report to and review it with OWNER.

1.1.7 Revise the Report in response to OWNER's comments, as appropriate, and furnish final copies of the Report in the number set forth herein.

1.1.8 Submit the Report within the stipulated period indicated herein.

1.1.9 ENGINEER's Services under the Study and Report Phase will be considered complete at the earlier of (1) the date when the Report has been accepted by OWNER or (2) thirty days after the date when such Report is delivered to OWNER for final acceptance, plus in each case such additional time as may be considered reasonable for obtaining approval of governmental authorities having jurisdiction to review the portions of the Project specified by ENGINEER, if such approval is to be obtained during the Study and Report Phase.

The duties and responsibilities of ENGINEER during the Study and Report Phase as set forth in this paragraph 1.1 are amended and supplemented as follows:

2.0 OWNER'S RESPONSIBILITIES

2.1 Furnish to ENGINEER, as requested by ENGINEER for performance of Services as required by the Contract Documents, the following:

2.1.1 Data prepared by or services of others, including without limitation explorations and tests of subsurface conditions at or contiguous to the site, drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site, or hydrographic surveys;

2.1.2 The services of an independent testing laboratory to perform all inspections, tests and approvals of samples, materials and equipment;

2.1.3 Appropriate professional interpretation of all of the foregoing;

2.1.4 Environmental assessments, audits, investigations and impact statements, and other relevant environmental or cultural studies as to the Project, the site and adjacent areas;

2.1.5 Field surveys for design purposes and property, boundary, easement, right-of-way, topographic and utility surveys or data, including relevant reference points;

2.1.6 Property descriptions;

2.1.7 Zoning, deed and other land use restrictions; and

2.1.8 Other special data or consultations not covered in Article 1.0.

OWNER shall be responsible for, and ENGINEER may rely upon, the accuracy and completeness of all reports, data, and other information furnished pursuant to this paragraph. ENGINEER may use such reports, data, and information in performing or furnishing services under this Agreement.

2.2 Provide access to and make all provisions for ENGINEER to enter upon public and private property as required for ENGINEER to perform services under this Agreement.

2.3 Provide labor and safety equipment to open and protect manholes and/or to operate valves and hydrants as required by the ENGINEER.

2.4 Provide, as may be required for the Project:

2.4.1 Accounting, bond and financial advisory, independent cost estimating and insurance counseling services;

2.4.2 Such legal services as OWNER may require or ENGINEER may reasonably request with regard to legal issues pertaining to the Project, including any that may be raised by Contractor; and

2.4.3 Such auditing services as OWNER may require to ascertain how or for what purpose Contractor has used the moneys paid on account of the Contract Price.

2.5 Bear all costs incident to compliance with the requirements of the OWNER's Responsibilities.

The OWNER's responsibilities as set forth in this paragraph 2.0 are amended and supplemented as follows:

3.0 TIME PERIOD FOR PERFORMANCE

The time periods for the performance of ENGINEER's Services as set forth in Article 2 of said Agreement are as follows:

4.0 METHOD OF PAYMENT

The method of payment for Services rendered by ENGINEER shall be as set forth below:

5.0 SPECIAL PROVISIONS

The following special provisions and/or other considerations or requirements are applicable to their Agreement: