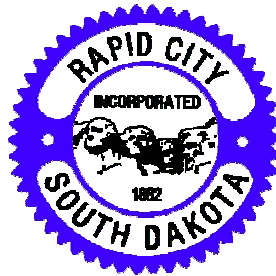


PROFESSIONAL ENGINEERING SERVICES CONTRACT



**Utility System Master Plan – Phase II
City of Rapid City Project No. PW05-1447**



ENGINEER: Burns & McDonnell Engineering Co., Inc.

PROFESSIONAL ENGINEERING SERVICES CONTRACT

March 6, 2006

Project: Utility System Master Plan – Phase II
City of Rapid City Project No. PW05-1447

Owner Information:

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SCOPE OF SERVICES

The following is the Scope of Services to be provided by Burns & McDonnell Engineering Company, Inc., (hereinafter ENGINEER) for the City of Rapid City, located in Rapid City, South Dakota, (hereinafter OWNER).

1. Project Initiation and Coordination

- 1.1. Project Kick-off meeting – The ENGINEER will conduct a project kick-off meeting at the OWNER's facilities to include the following agenda items:
 - A. Review goals and objectives
 - B. Identify key project issues/OWNER concerns
 - C. Review project schedule/budget
 - D. Discuss project team and roles (including subconsultants)
 - E. Outline communication protocol
- 1.2. Monthly Status meetings – Monthly status meeting will be held between the OWNER and ENGINEER beginning in the month following the kick-off meeting and ending at the Project Completion Date. When possible, these meetings will be held by teleconference. It has been assumed that a minimum of six meetings will be held by teleconference. The ENGINEER will provide an agenda for each meeting, provide a status report at each meeting, and prepare meeting minutes for distribution to the Project Team.
- 1.3. Project Website Maintenance and Operation – During Phase I of the Utility Master Plan Project, the ENGINEER setup a project website to allow for centralization of reports and data collected during the project. The website includes FTP capabilities and tabs for project management, meeting agendas and minutes, existing data and reports, project team member information, as well as deliverables for this project. During Phase II, the ENGINEER will continue to maintain

and manage the project website for use by the project team through the Project Completion Date. The website will be reviewed monthly and adjustments will be made if necessary. In addition to the routine maintenance and adjustments a complete copy of all the data placed on the website will be developed at the end of the project to serve as a project archive and data warehouse.

- 1.4. Public Website Maintenance and Operation – During Phase I of the Utility Master Plan Project, the ENGINEER setup a website for access by the general public that includes a project overview, Frequently Asked Questions regarding master planning, contact information for the Rapid City Project Manager, and information on public meetings. The website is accessible via a link on the www.rcgov.org website. This public website will remain active up to the Project Completion Date and will need periodic updates and maintenance over the life of the project to keep the public informed as to the major milestones and activities of the project. These updates will include the following.
 - 1.4.1. Information will be added to the site as preliminary results and major milestones are completed.
 - 1.4.2. Important dates and announcements about meetings and public interaction will be added to the website.
 - 1.4.3. It is estimated that the website will need a monthly update for the duration of the project.
- 1.5. Public Meetings/Interested Party Meetings – The ENGINEER will conduct meetings with the general public and interested parties as follows:
 - 1.5.1. Public Meetings (3) - To ensure the project team solicits public input and to inform the general public of progress on the project, the ENGINEER will conduct three (3) community open house sessions that are open to the general public. It is assumed that these meetings will be held approximately every 6 months as the project progresses, with the final meeting occurring upon completion of all deliverables. The City will be responsible for advertising these meetings and coordinating meeting locations.
 - 1.5.2. Interested Party Meetings (3) – To ensure the project team solicits public input and to inform the External Interested Parties of progress on the project, the ENGINEER will conduct three (3) Interested Party meetings. It is assumed that these meetings will be held approximately every 6 months as the project progresses, with the final meeting occurring upon completion of all deliverables. The Interested Party meetings will be held the day before or after the Public Meetings, and will require the same presentation materials as the Public Meetings. At a minimum, the City will send invitations to the External Interested Parties identified in Exhibit A, as well as other interested parties identified in the course of the project. No additional meetings with Interested Parties, private water systems, or large water customers are included in this scope or work unless required for the successful completion of a specific task.
- 1.6. Council/Staff Presentations – The ENGINEER will provide up to three two-hour formal presentations to staff and council as determined necessary by the City’s Project Manager.
- 1.7. Project Management – Management of the project team will be conducted by the ENGINEER’S designated Project Manager with assistance from others including the Assistant Project Manager and Task Managers. This task will include general management of the project and project team

including coordination of the project team, coordination/monitoring of field activities, and general coordination and communication with City staff.

2. Prepare Geodatabases

- 2.1. Water Distribution System Geodatabase – The ENGINEER will develop a Geodatabase of the water distribution system using the City’s existing data (i.e. no field collection). This includes the following subtasks:
- 2.1.1. Collect and scan to TIF format water distribution system wall maps.
 - 2.1.2. Geo-reference scanned images of water distribution system maps to align with the City’s existing base mapping and City’s GPS data for valves and hydrants.
 - 2.1.3. Digitize water distribution system data on the geo-referenced scanned maps into the GIS Geodatabase.
 - 2.1.4. Attribute the water distribution system features to include data such as pipe materials and lengths as shown on the scanned maps.
 - 2.1.5. Prepare check plots and attribute tables and perform QA/QC review.
 - 2.1.6. Identify data gaps within the collection system data that was not present on the wall maps.
 - 2.1.7. Collect additional information from City as-built record drawings to fill data gaps and to acquire construction date data.
 - 2.1.8. Develop a feature numbering scheme for the water distribution system features.
 - 2.1.9. Develop a preliminary draft digital map book of the spatially corrected water distribution system. Submit the map book to City in digital format and two hardcopy map book sets for review/comment.
 - 2.1.10. Incorporate the City review comments and update the water distribution system geodatabase.
 - 2.1.11. Work with Utility Maintenance staff to identify pressure zone boundary valves, broken valves, left handed valves, and partially closed valves, and update the water distribution system geodatabase with the valve information.
 - 2.1.12. Create additional water distribution system attribute data as follows:
 - Using ArcGIS, generate start and stop node IDs for each pipe segment
 - Using ArcGIS, extract approximate ground surface elevations for each point feature in the water distribution system based on available topography.
 - Using ArcGIS, assign preliminary roughness coefficients to pipe features.
 - 2.1.13. Provide final draft digital map book and two hardcopy sets for review to City.
 - 2.1.14. Incorporate the City staff comments and finalize the water distribution system geodatabase.
 - 2.1.15. The final water distribution system geodatabase will be submitted to the City in a MS Access personal Geodatabase electronic file.
 - 2.1.16. Assist City with the loading of the data in the City’s SQL server geodatabase.
- 2.2. Wastewater Collection System Geodatabase/GPS/Survey – The ENGINEER will collect field data for the wastewater collection system and develop a Geodatabase. This includes the following subtasks:
- 2.2.1. Project Start Up including coordination of rental, safety and other equipment.
 - 2.2.2. Start-up survey, including calibration of GPS to 20 City control points, setting up data collectors, and setting control on Cowboy Hill.

- 2.2.3. Field data collection of survey grade GPS manhole location (X, Y coordinates), rim elevation, and depth to invert. Field work will include the daily setup/teardown of base station (50 Days @ 2 hrs/day), GPS survey of up to 5000 Manholes, field attribution of Manhole data, digital photography of manhole interior, and daily download of GPS data and digital photography. Manholes will be inspected from the ground surface without manhole entry.
 - 2.2.4. QA/QC of field data (10% of Total Manholes)
 - 2.2.5. Intermediate data check deliverable. At the completion of 300 manholes the system will be compiled into a Microsoft Access personal geodatabase and delivered to the City for review. The review will verify that data meets the City's needs and the data structure works with the City's GIS.
 - 2.2.6. Daily digital data attribution activities, including checking of field collected data, correlation of attributes and photos with survey data, analysis of linework, and extraction of available existing sewer GIS data.
 - 2.2.7. QA/QC of data attribution work.
 - 2.2.8. Field Work Management including creation of daily work area maps and weekly work completion mapping, preparing weekly field work progress reports, preparing Safety Protocol and Standard Operating Procedures, and conducting daily Safety/Progress Meetings.
 - 2.2.9. Review wastewater collection system naming convention and develop up to 3 alternatives for feature naming standards.
 - 2.2.10. Apply and/or check the feature naming system for the wastewater collection system features.
 - 2.2.11. Compile wastewater collection system geodatabase in the Microsoft Access personal geodatabase deliverable.
 - 2.2.12. Assist City staff with the loading of the data in the City's SQL server geodatabase.
- 2.3. Growth Projections and Future Land Use Geodatabase
- 2.3.1. Prepare geodatabase of existing zoning and development data utilizing existing landuse and zoning data, actual development data, available growth data provided by City's Growth Management department, and the future landuse study data. Create a topologically correct future landuse layer.
 - 2.3.2. Collect and digitize any future landuse plans that are not currently in GIS and append to the future landuse layer.
 - 2.3.3. Create and use topology rules to correct data overlaps, voids, and errors in the future landuse layer. Develop a decision matrix and protocol for the cleaning the landuse data, submit to City for review and comment, complete the final topologically correct future landuse layer.
 - 2.3.4. Submit a draft future landuse personal Geodatabase to City for review and comment. Address City staff comments and integrate changes.
 - 2.3.5. Complete a review, analysis, and adjustment of the 25 year and ultimate planning boundaries considering the newly created future landuse plan. Submit the boundaries to City for review and approval. After City staff review, finalize the 25 year and ultimate planning boundaries.
 - 2.3.6. Overlay the 25 year and ultimate planning boundaries with the future landuse data. Append County future landuse data to the Geodatabase, and use County data to fill any data gaps in areas without growth projections.

- 2.3.7. Deliver the final future landuse data to City as a Microsoft Access personal geodatabase. Address City comments and deliver the final geodatabase.

3. Develop Forecasts

- 3.1. Review Historical Water Demands and Metered Use – Tabulate and review historical (5-years) records of annual day, maximum day, and maximum hour water demands. Calculate representative 24-hour demand patterns from SCADA records. Tabulate and review records of customer counts. Tabulate and review (5-years) records of historical annual metered watered sales by billing classes, and determine per-capita rates and unaccounted-for water percentages. Identify current wholesale customer demands and contracted amounts. Review the distribution of metered sales using the Geodatabase. Select design peaking factors, per-capita rates and percentages for demand projections.
- 3.2. Review Historical WRF and Lift Station Flow Records – Tabulate and review historical recorded wastewater flows to the WRF, including annual average dry weather, peak dry weather, and wet weather peak flows. Select design per-capita rates and peaking factors for future flow projections. Estimate annual infiltration flows based on WRF flows and metered water sales. Tabulate lift station operating records for the prior 2 years (run times or metered flows) to estimate flows in tributary areas.
- 3.3. Develop Water/Wastewater Projections – Collect available population and land use projections from Growth Management, state agencies, and other sources. Discuss projections with City, and select the appropriate growth rate for the next 25 years for use in this study. Determine from the Geodatabase the existing and future land use totals by water pressure zone and wastewater drainage areas.

Based on population growth and design criteria, ENGINEER will estimate future water demands and wastewater flows for existing conditions and future design years. Establish basis for demands in the Geodatabase for assignment to the hydraulic models.

- 3.4. Future Water Rights Planning – ENGINEER will analyze the City’s existing water rights as it relates to short term and long term future needs and provide recommendations for the City’s Long Term Water Rights Acquisition Program. The growth rate selected in Task 3.3 will be used to evaluate water rights needs.
- 3.5. Policy/Ordinance Review – The ENGINEER will conduct a review of ordinances and policies related to the public works department and conduct a Phase II ordinance review of and rate structure review to include an analysis of the following areas:
- Additional compilation and review of ordinances/policies
 - Sewer and water revenue adequacy
 - Flexibility in rate adjustments
 - Adequacy of development charges and fees
 - Further review of state statutes
 - Public opinion of rates and charges
 - Impact of future capital requirements (See Task No. 8.4)
 - General review of public works policies/ordinances

This task does not include a comprehensive rate study at this time. However, the financial forecast presented in the following tasks can be utilized to complete a comprehensive rate study in the future if the City decides to complete such a study. The Phase II tasks are broken down as follows:

- 3.5.1. Additional compilation and review of ordinances/policies – Compile and finalize review of ordinances and policies associated with the public works department and provide recommendations for potential improvements. In addition to the review, look at potential impacts of ‘leap frog’ development and provide a summary of these impacts.
- 3.5.2. Sewer and water revenue adequacy – Prepare a financial forecast of net revenues to determine the adequacy of revenues provided by existing rates. This forecast should include projections of annual revenues under existing rates and the annual revenue requirement, including all operation and maintenance expenses, capital requirements, debt service requirements, and margins, by year for a future period. The financial forecast should identify the overall change in revenue required to provide for adequate funding to meet all recurring annual operating and capital expenditures, to cover all debt service requirements, and to maintain sufficient cash balances and capital reserves.
- 3.5.3. Flexibility in rate adjustments – Complete a more detailed evaluation of the water and sewer rate ordinances to determine the flexibility allowed for rate adjustments. This includes clarifying the process for future adjustments once a plan has been adopted by the City and determining if an inconsistency exists between the water and sewer process.
- 3.5.4. Adequacy of development charges and fees – Complete an analysis of the existing development charges and fees to determine if the level of charges covers the costs associated with system expansions that are passed on to developers.
- 3.5.5. Further review of state statutes – Complete a more detailed review of South Dakota state statutes concerning rate increases and modifications to ensure that the current process followed by the City falls within the state guidelines.
- 3.5.6. Public opinion of rates and charges – Complete a public opinion survey of a representative sample of citizens regarding City water and sewer rates.
- 3.5.7. General review of public works policies/ordinances – Complete a review of all policies associated with the public works department and provide recommendations for revisions. This will include a review of the City’s water conservation measures.

4. Wastewater Collection System Analysis

4.1. Flow & Rainfall Monitoring – The ENGINEER will conduct a field testing program to determine the City’s sanitary sewer flows. The evaluation will characterize dry-weather and wet weather flows in the system including impacts of inflow and infiltration (I/I). The evaluation will include the following:

- Prepare a flow and rainfall monitoring plan. The sites will be selected based on access and strategic locations to obtain overall basin flows. Field inspect the potential monitoring sites for hydraulic suitability, accessibility, and safety and finalize the locations.
- Lease, install, and maintain temporary flow meters at up to twelve sites for a period of 60 days.

- Lease, install and maintain temporary rain gages at up to three sites for a period of 60 days.
- Interrogate the flow meters and rain gages on a weekly cycle.
- Remove the flow meters and rain gages at the end of the monitoring period.
- Provide quality control review of the monitoring data.
- Prepare and submit for City review a technical memorandum summarizing the flow and rainfall monitoring results.

4.2. Develop Base, Infiltration and Inflow Factors – Evaluate WTF historical flow records to determine total system annual average flow, average dry weather flow, peak dry weather flow and historical wet weather flows. Process the temporary monitor flow and rainfall data to determine average dry weather flow, peak daily dry weather flow, peak wet weather flow for each rain event and relationship between rainfall and infiltration/inflow flows. Recommend areas for future identification and evaluation of sources of infiltration and inflow.

4.3. Prepare Hydraulic Model – Prepare an all main base wastewater system model from the wastewater geodatabase. The data layers representing the collection system, land use, parcels, roads, aerial photos, and topography will be integral in developing the model. Manhole and sewer information such as diameter, length, material, year of installation, slope, and elevations will be linked directly from the GIS to the collection system model. Additionally, GIS layers for lift stations and force mains will be used or generated for the system and linked to the model so that the data can be pulled directly from the GIS into the model. Additional detail needed for modeling lift stations (capacities, wet well data) and the outfall to the WRF will be added.

Existing wastewater flow distribution will be assigned spatially from the geodatabase as a percentage of metered sales, adjusted for monitored average flow rates. Dry and wet weather flow patterns will be input.

Establish sewer design criteria including minimum slopes, minimum velocity, definition of sewer overloading (allowable D/d), and the percent of overload allowed before a relief is considered. Establish, in consultation with City, wet weather design storm for analysis (1-year, 5-year, or 10-year frequency). Criteria will consider Engineer's experience, Owner's current design criteria and state requirements. Discuss analysis criteria with the Owner prior to proceeding with the hydraulic analyses. Staffing and future maintenance requirements for the models (water and wastewater) will also be determined and included in the Final Report.

4.4. Hydraulic Model Calibration – Conduct an initial series of analyses to calibrate the model against the flow data for both dry and wet weather conditions. Modify model parameters to achieve computer-calculated dry and wet weather peak flows and flow patterns that are in reasonable agreement with monitored conditions.

Once the model is calibrated to wet weather conditions, prepare a verification analysis to test the model's performance.

4.5. Analysis of Existing System – Using the calibrated hydraulic model, perform a system hydraulic analysis for existing dry weather conditions. Compare peak dry weather flows against available pipe and pumping capacity and determine whether dry weather capacity constraints exist.

Perform hydraulic analyses of peak wet weather flow conditions for the selected design storm frequency. Determine for each modeled sewer the peak flows, the percent of available capacity used, and parallel or relief sewer needs. Establish the current level of storm protection provided by any overloaded lines.

- 4.6. Identify/Review Critical Facilities – Prepare a listing of potentially critical facilities to include facilities that, if out of service due to collapse, power outage, or other failure, would result in a loss of service to either more than 10 percent of the population or critical customers such as hospitals. Provide the listing to the City and jointly select which (if any) vulnerabilities will be addressed in the recommended capital improvements plan. Provide a listing in the final report to include critical facilities, identified improvements, and operational alternatives for rerouting when applicable.
- 4.7. Prepare 10 Year and 25 Year Models – Prepare a layout drawing of new gravity sewers, pump stations and force mains as needed to extend service to projected development for planning years 10 and 25 years out. Include the extension sewers in the Geodatabase. Utilize the GIS to determine ground elevations and preliminary slopes for the extension sewers considering minimum depth requirements and connections to existing sewers.

Establish the 10 and 25 year model scenarios within the modeling software with appropriate linkage to the Geodatabase.

Utilize the Geodatabase to assign future wastewater flows to the 10 and 25 year models.

- 4.7.1. Analyze 10 and 25 Year Systems – Perform system hydraulic analyses for future dry weather conditions for the 10 and 25 year models. Identify future dry weather capacity constraints.

Perform hydraulic analyses of peak wet weather flow conditions for the selected design storm frequency for the 10 and 25 year models. Determine for each modeled sewer the peak flows, the percent of available capacity used, and parallel or relief sewer needs. Establish the current level of storm protection provided by any overloaded lines.

- 4.7.2. Determine Future Pipe and Lift Station Requirements – Prepare detail tabulations of future sewer pipe, lift station and force mains for each design year. Establish the required diameter, slope and capacity of extension sewers. Establish the future lift station firm capacities. Size force mains to convey the peak flow rates.
- 4.7.3. Evaluate Impact of Serving Septic Tank Areas – Conduct additional analyses to determine the additional facilities that may be required to convert areas now served with septic tanks (as identified in the Geodatabase using County information on septic tank locations) to municipal sewer service. The evaluation will consist of the following:
- Determine wastewater flows for septic tank areas based on population densities and typical wastewater flow parameters for sewer customers;
 - Extend in the model additional gravity trunk sewers to septic tank areas (not including collector sewers to individual customer properties); and
 - Conduct one 25 year peak wet weather flow analysis and evaluate whether future pipes and lift stations would require resizing to serve septic tank areas.

- 4.7.4. Evaluate Service Area Alternatives – The analysis of future system requirements will include a preliminary plan for new facilities to service growth areas within the planning area.

Alternative plans may include modifications to existing facilities or new sewers, pump stations, and force mains. The alternatives may include:

- Parallel or replacement sewers
- Infiltration/inflow reduction
- Abandonment of pumping stations and rerouting of flows by gravity
- New gravity sewer service to growth areas
- Rehabilitation of pump station or sewer
- Replacement or parallel force mains
- Alternate alignments
- Interim solutions until growth warrants new construction
- Other considerations to address recent system or planning changes

Service alternatives evaluated for areas not tributary to the existing WRF will include pumping to WRF gravity sewers; pumping and force main direct to WRF; and gravity sewerage to a new satellite treatment facility.

- 4.8. Regulatory Review and CMOM Program Requirements – Provide a brief summary of existing and expected future regulatory requirements for the wastewater collection system, including:
- Discharge monitoring report requirements (and known overflow locations, if any);
 - Owner’s Infiltration/Inflow management activities; and
 - The current status of the Capacity, Management, Operation and Management (CMOM) program. A brief summary of the key CMOM components will be included.
- 4.9. QA/QC and City Review of Preliminary Analysis – Provide an overall QA/QC review of the preliminary collection system analysis prepared in the foregoing tasks in accordance with ENGINEER’s quality control program. Resolve QA/QC comments and questions and deliver five (5) copies of the preliminary evaluation (exhibits, charts and tables as needed) to the City for review and comment.
- 4.10. Prepare Final Collection System Analysis – Address City comments and prepare the final Collection System Analysis. The final evaluation will be incorporated into the final Utility System Master Plan report.

5. Wastewater Treatment Evaluation

- 5.1. Review Discharge Permit Requirements – The project team shall review the current discharge permit requirements including the surface water discharge permit and the ground water discharge permit. The surface water discharge permit will be discussed with SDDENR and future discharge permit considerations will be reviewed and discussed. The ground water discharge permit, which is related to the now closed land application site, and the requirements

of subsequent closure plans will also be reviewed and discussed. Both discharge permits and their related conditions will be considered as they pertain to long-term planning.

In addition, terms and conditions of potential future surface water discharge permits for regional facilities in the Box Elder Creek and Spring Creek Drainage Basins will be discussed and coordinated with SDDENR so that if required, future requirements and capital costs of regional treatment facilities can be conceptually established.

- 5.2. Regional Water Quality Planning – The project team shall review previous planning documents related to multi-basin drainage, wastewater generation, and regional treatment facilities. Certain regional treatment plants (i.e., Spring Creek Drainage Basin and the Box Elder Creek Drainage Basin) were identified during previous wastewater collection and treatment facility planning projects related to the Rapid City service area, adjacent service areas, and the existing Water Reclamation Facility. The previous planning documents will be reviewed and evaluated as they relate to long-term planning for the City of Rapid City. This task will be closely coordinated with the water rights portion of the Utility System Master Plan. The focus will be on “trigger” points that require subsequent regional, local, and facility planning on a more detailed scale.
- 5.3. Evaluate Existing WRF – Since the City recently completed a detailed Facility Plan for the existing WRF (June, 1999), the project team (Owner and Engineer) concluded that a detailed evaluation of the existing WRF is not required as part of Phase II of the Utility System Master Plan. It was concluded that effort should be made to establish anticipated major equipment replacement or upgrade projects that may occur during the WRF planning period (to year 2018, per 1999 Facility Plan) so that a CIP can be developed. The improvements will be based upon the City following the current long-term plan established by the Facility Plan and based upon currently known permit limits for biochemical oxygen demand, total suspended solids, ammonia nitrogen, and dissolved oxygen. Planning for nutrient removal (i.e., total nitrogen reduction or phosphorus reduction) shall not be considered. The project team shall conduct a one-day workshop with the applicable Engineering Services and WRF staff to address the City’s long-term planning and CIP needs. Based on an interactive discussion with the WRF staff and conceptual level evaluations of long-term needs for the facility, a CIP will be developed.
- 5.4. Determine Future Regional Wastewater Treatment Alternatives – Based upon the results and conclusions of Tasks 5.1 and 5.2, conceptual level alternatives for regional wastewater treatment for new regional facilities will be determined. The alternatives will be developed and be consistent with anticipated level(s) of treatment and overall treatment system considerations. This task will involve close coordination with the potential future permitting and water quality planning issues identified in tasks 5.1 and 5.2 as well as the forecasting and wastewater collection system planning task series (i.e., Task Series 3 and 4).
- 5.5. Evaluate Future WRF Costs – In association with tasks 5.1 through 5.4, planning level cost opinions shall be developed for the requirements for future facilities. The planning level or "order-of-magnitude" opinions of probable construction costs will be preliminary in detail and shall be intended for the evaluation of alternatives to allow identification of the most economical alternative and/or general fiscal planning and will be based on a specific month/year as well as an ENR Construction Cost Index.

The order-of-magnitude opinions of probable costs will be based primarily on our experience and judgement as a professional consultant combined with information from past experience, vendors, and published sources. Since the ENGINEER has no control over weather, cost and availability of labor, material and equipment, labor productivity, construction contractor's procedures and methods, unavoidable delays, construction contractor's methods of determining prices, economic conditions, government regulations and laws (including the interpretation thereof), competitive bidding or market conditions and other factors affecting such opinions or projections; consequently, the final project costs will vary from the opinions of costs presented in the Utility System Master Plan and funding needs must be carefully reviewed prior to making specific financial decisions or establishing final budgets.

- 5.6. Prepare Preliminary Wastewater Treatment Evaluation – The evaluation will be completed using both economic and non-economic factors. The evaluation criteria will be development in conjunction with the entire project team to ensure that the future facility planning process remains objective. The evaluation will be contained in a draft report and will summarize the permitting issues, water quality planning issues, pertinent water rights issues, existing WRF issues, future wastewater treatment requirements, and future regional treatment issues.
- 5.7. QA/QC and City Review of Preliminary Evaluation – Our project team shall provide an overall QA/QC review of the preliminary wastewater treatment evaluation in accordance with ENGINEER's quality control program. Our project team will resolve QA/QC comments and questions and deliver five (5) copies of the preliminary evaluation (exhibits, charts and tables as needed) to the City for review and comment.
- 5.8. Prepare Final Wastewater Treatment Evaluation – The applicable comments resulting from the QA/QC process and City review will be addressed in the final evaluation. The final evaluation will be incorporated into the final Utility System Master Plan report.

6. Water Distribution System Analysis

- 6.1. Field Inspection and Testing Program – Perform a field pressure testing program to develop model calibration and verification data. Up to 10 temporary pressure recorders will be setup at hydrants to continuously monitor pressure at strategic locations in the distribution system for two days. The City will assist with installation of the recorders and check valve positions to ensure accuracy of the pressure readings. SCADA system data will be collected by the City for the high service pumping stations and storage facilities for the test period. Collect large customer metered records for the test period. Determine water demands during the testing program, select critical hours suitable for calibration and verification model analyses, and tabulate calibration criteria. A field test plan will be developed with City staff prior to testing to address problem areas or areas with potentially closed or broken valves.
- 6.2. Develop Modeling Design Criteria – Establish potable water system design criteria for the hydraulic model as follows:
 - Review the existing water system piping age and material data in the Geodatabase and the results of the field pressure testing program. Using Engineer's experience select initial Hazen Williams friction coefficients for the initial hydraulic model analyses.

- Tabulate water system design criteria considering state requirements, City standards and Engineer's experience. Discuss criteria with the Owner prior to proceeding with the hydraulic analyses.

6.3. Prepare Distribution System Model – Prepare a base water system model from the water Geodatabase. The data layers representing the distribution system, land use, parcels, roads, aerial photos, and topography will be integral in developing the base water system. Pipe information such as length, material, year of installation, and C-value will be linked directly from the GIS to the distribution system model. Node information such as elevation, coordinate, and demand will be linked from the GIS to the model as well. Additionally, GIS layers for tanks, reservoirs, and pumps will be used or generated for the system and linked to the model so that the data can be pulled directly from the GIS into the model.

Skeletonization tools provided within the hydraulic modeling software will be used to remove inconsequential pipes, such as fire hydrant connections, from the model network. The skeletonization of the system will result in a more efficient, easier to operate hydraulic model. The linkage with the geodatabase will be maintained.

Additional detail needed for modeling key facilities (pump stations, control valves, reservoirs, etc.) will be added. The existing base water demand allocation will be imported from the metered water sales Geodatabase. Unaccounted-for water use will be distributed across the system, and maximum day and hour demands will be determined in the model from peaking factors and demand patterns.

- 6.4. Distribution System Model Calibration – Apply existing demand to the model and debug. Conduct calibration analyses to adjust the model to accurately simulate the system performance during field testing program and during historical peak demands.
- 6.5. Analysis of Existing System – The base calibrated model will be run under existing maximum day, maximum hour, and minimum hour/storage replenishment conditions to determine the strengths and weaknesses of the existing water distribution system including fire flow, storage capacity and system pressure. Evaluate existing system deficiencies and determine immediate improvement needs.
- 6.6. Identify/Review Critical Facilities – Prepare a listing of potentially critical facilities to include facilities that, if out of service due to main break or other failure, would result in a loss of service to either more than 10 percent of the population or critical customers such as hospitals. Provide the listing to the City and jointly select which (if any) vulnerabilities will be addressed in the recommended capital improvements plan. Provide a listing in the final report to include critical facilities, identified improvements, and operational alternatives for rerouting when applicable.
- 6.7. Prepare 10 Year and 25 Year Models – Evaluate the pressure zone boundaries appropriate to the growth areas. Prepare a layout drawing of new grid mains, pump stations, and other facilities as needed to extend service to projected development for planning years 10 and 25 years out. Include the future facilities in the Geodatabase. Utilize the GIS to determine ground elevations of model nodes.

Establish the 10 and 25 year model scenarios within the modeling software with appropriate linkage to the Geodatabase.

Utilize the Geodatabase to assign future demands to the 10 and 25 year models. Establish scenarios in the model to simulate operations and demands for maximum day, maximum hour, and minimum hour/storage replenishment conditions. Establish an additional scenario for a typical average day extended period simulation (24-hour cycle) for water age analysis.

- 6.7.1. Analyze 10 and 25 Year Systems – Evaluation of the model for year 10 and 25 demands will be conducted to determine the necessary system improvements to meet system supply, pressure and fire flow goals, and assist in CIP development. For each design year, conduct maximum day, maximum hour, and minimum hour/storage replenishment condition analyses. Improvements will determine the size of pipeline that needs to be installed to supply future development, whether installed by the City or a developer. For each design year, conduct an analysis and prepare an exhibit showing available fire flow throughout the system highlighting low availability areas. Identify fire improvement mains for any significantly deficient areas.

Elevated storage capacity and location for future storage for growth areas will be evaluated. Conduct a 25 year extended period simulation of water age to predict aging in the City's current storage volume. Consider modifications or reducing excess facilities if needed.

- 6.7.2. Determine Future Pipe and Pump Station Requirements – Prepare detail tabulations of future water mains, pump stations, control or division valves, and storage facilities. Establish the required sizing of each facility.

- 6.7.3. Evaluate Impact of Service Private Water System Areas – Conduct additional analyses to determine the additional facilities that may be required to convert areas now served in private water system areas (as identified in the Geodatabase for populated areas not currently water customers) to municipal water service. The evaluation will consist of the following:

- Determine demands based on population densities and typical municipal customer demands;
- Layout in the model additional water mains to extend water service to areas of private water systems (not to individual customer properties);
- Conduct one 25 year maximum hour analysis to assess impact of the additional demand and evaluate whether additional facilities will be required to serve the private water system areas.

- 6.8. Regulatory Review – Conduct a review of potential regulatory issues for the water distribution system and incorporate into the analysis.

- 6.9. QA/QC and City Review of Preliminary Analysis – Provide an overall QA/QC review of the preliminary water distribution system analysis and indicated improvements in accordance with ENGINEER's quality control program. Resolve QA/QC comments and questions and deliver

five (5) copies of the preliminary analysis (exhibits, charts and tables as needed) to the City for review and comment.

- 6.10. Prepare Final Distribution System Analysis – Address City comments and prepare final Distribution System Analysis. The final evaluation will be incorporated into the final Utility System Master Plan report.

7. WTP Evaluation

- 7.1. Review Existing and Future SDWA Requirements – The ENGINEER is under contract to evaluate the existing water treatment plant and SDWA requirements under Rapid City Project No. W04-1425, *Water Facilities Planning and Jackson Springs Water Treatment Facility Reconstruction*. The information collected under this project will be incorporated into the Utility System Master Plan.
- 7.2. Evaluate Existing WTP – The existing Surface WTP will be evaluated as it relates to source water utilization and physical condition in Phase 1B of the Facility Plan Project, and the actual facility plan will be finalized in Phase 2. The information obtained under the Facility Plan Project will be coordinated with this project to analyze each process component and subsequently develop, screen, and evaluate alternatives that address the City's long-term planning needs. Our team will look at the "big picture" and evaluate the overall system considerations including water quality.
- 7.3. Determine Future WTP Process Alternatives – Process alternatives will be considered based on information collected during this project and the Facility Plan Project including capacity, water quality issues, operational issues, and future needs.
- 7.4. Evaluate Future WTP Costs – Additions or modifications to the WTP will be evaluated and incorporated into the Utility System Master Plan.
- 7.5. QA/QC and City Review of Preliminary Evaluation – Provide an overall QA/QC review of the preliminary WTP Evaluation and indicated improvements in accordance with ENGINEER's quality control program. Resolve QA/QC comments and questions and deliver five (5) copies of the preliminary evaluation (exhibits, charts and tables as needed) to the City for review and comment.
- 7.6. Prepare Final WTP Evaluation – The applicable comments resulting from the QA/QC process will be addressed in the final evaluation. The final evaluation will be incorporated into the final Master Plan report.

8. Develop CIP

- 8.1. Identify CIP Projects List – Based on the water and wastewater system facilities determined in the existing and future year analyses, and the water treatment plant and WRF evaluations, determine a listing of logical capital improvement projects.

- 8.2. Prepare CIP Cost Opinions – The ENGINEER will prepare estimated project costs based on 2007 dollars, including allowances for construction costs, engineering, administration, and contingencies.
- 8.3. Develop CIP Schedule – A project schedule will be prepared by the ENGINEER prioritizing the recommended improvements. Input will be provided by the City for this task.
- 8.4. Evaluate CIP Impacts on Existing Rates – Utilizing the financial forecast model developed in Task No. 1; evaluate the impact of future capital improvement requirements on the financial targets. Identify the overall change in revenue required to provide for adequate funding to meet the capital expenditures.
- 8.5. Prepare Funding Plan – Develop financing plans for the City based on schedules of project dates acceptable to the City and estimated costs based on the developed capital improvement projects. Depending upon the magnitude of the capital improvement program, additional SRF loans or debt financing may be indicated during the study period to augment funds generated by water and wastewater charges. The recommended financing strategy of the capital improvement program will be based on consideration of available funding, existing revenue bond covenants and other requirements, impact on utility rate levels, and utility policy. The relative benefits of various combinations of cash versus debt financing, and alternative debt terms and maturity schedules will be considered. Up to three financing plan alternatives will be examined for the City. The analyses will be conducted on the City's existing financial planning and a spreadsheet rate design model that reflects current revenue and cost levels.
- 8.6. Conceptual CIP Management and Estimating System – Work with City staff to determine the requirements and needs for the CIP management and project estimating system. The existing IFAS and CIP management system will be analyzed with City staff and then the software vendor will be contacted to determine if the additional functionality desired by the City can be added. The project estimating requirements and needs of the City will be collected and compiled into a conceptual requirements memo.
- 8.7. Prepare Preliminary Capital Improvements Program – Based on the foregoing tasks, prepare a preliminary Capital Improvements Program document including CIP exhibits for the water and wastewater systems; tabulations of recommended projects along with cost and schedule information; and summary descriptions and justifications for each recommended project.
- 8.8. QA/QC and City Review – Provide an overall QA/QC review of the preliminary Capital Improvements Program in accordance with ENGINEER's quality control program. Resolve QA/QC comments and questions and deliver five (5) copies of the preliminary CIP to the City for review and comment.
- 8.9. Prepare Final Capital Improvements Program – Address City comments and prepare final Capital Improvements Program. The final Program will be incorporated into the final Utility System Master Plan report.

9. Prepare Final Report

- 9.1. Prepare Preliminary Report – Prepare and submit five (5) copies of the preliminary Final Report. The City will review the report and provide comments to the ENGINEER. City comments will be discussed and incorporated into the report.
- 9.2. Prepare Executive Summary – Prepare and submit five (5) copies of a draft Executive Summary for the Final Report. The Executive Summary will be a stand-alone document intended for the non-technical reader interested in overall master planning concepts, findings, and recommendations. The City will provide review comments to the ENGINEER. City comments will be discussed and incorporated into the Executive Summary.
- 9.3. Prepare Draft Version of Final Report – Prepare draft version of the Final Report to incorporate City review comments.
- 9.4. QA/QC and City Review – Provide an overall QA/QC review of the draft Final Report in accordance with ENGINEER’s quality control program. Resolve QA/QC comments and questions and deliver five (5) copies of the draft Final Report to the City for final review and comment.
- 9.5. Prepare Final Report – The ENGINEER will prepare and submit twenty-five (25) copies of the Final Report to the City and twenty-five (25) copies of the Executive Summary. The report will include an Executive Summary. Following the City’s review and incorporation of comments, the ENGINEER will print the final report and provide on CD the original electronic files (Word, AutoCAD, Visio, Adobe PDF) to the City. Computer models will also be provided to the City. Modeling software will be purchased by the City and is not included in this scope.

10. Model / GIS Training

- 10.1. Provide Hydraulic Models Delivery Workshops (2) – City staff will be provided with model files, and model results documentation for the wastewater collection model and for the water distribution model to be loaded onto one City-owned computer.

A one-day workshop will be conducted for each model (2 workshops) to review the construction and design of each model, linkage to the geodatabase, steps to using the model for future analyses and steps to keeping the model updated. (Additional training in model use can be provided as supplemental services or secured from the software vendor)

- 10.2. Provide GIS Delivery Workshop – A one-day GIS delivery workshop will be conducted to review the contents and design of the geodatabase. Discussion will include requirements for training on the GIS software, and steps required to maintain the information in the geodatabase.

11. Maintenance Management System

- 11.1. Software Review/Selection – Interview City regarding desired functionality and develop a selection matrix. Research available software packages, prepare a preliminary short list and set up vendor demonstrations for short listed packages. Following demonstrations, assist City in selecting the top two packages for further evaluation.

- 11.2. Pilot Implementation – Request pilot test versions of the top two packages. Develop pilot case workflows and procedures for each package, and assist City staff in implementing each package as a pilot test. In consultation with City, determine the best fit software, prepare a quote request to the vendor, review quote and assist City in the final selection.
- 11.3. Implementation – Assist City in software procurement; planning the implementation process; establishing test case documentation and training; deploying test case workflow scenarios and refining the test cases; and establishing the working/live environment operation. The implementation process will include the implementation of 6 of the main workflows that were assessed during phase I of the utility master plan. The workflows necessary to carry out these processes will be developed and implemented for usage within the City. The data necessary to carry out workflows that don't directly pertain to master planning data will not be collected but the geodatabase will be setup to house this information as the City acquire this information. The processes will include new tap connection activities, TV and sewer back up processes, water/sewer repair processes. Custom software development to modify the functionality of the maintenance management system is not included in this scope and would be an added expense.
- 11.4. Software Training and Deployment – Prepare training materials and provide a training seminar for the utility maintenance staff. Implement the initial workflows in a working/live environment. Assist City to phase out legacy processes. Conduct one meeting with City to review system performance vs. goals.
- 11.5. Support Services – Provide up to 160 Hours of support services including general consultation, debugging, establishing linkage to the geodatabase, or application of the system to develop a maintenance plan. The support includes four 2 day on-site visits with City staff on a quarterly basis after implementation to insure that the system is fulfilling the City's needs and that it is being implemented within the maintenance workflows.

12. Utility Billing Software

- 12.1. Software Evaluation – Utility billing software requirements will be developed in conjunction with City staff. The requirements will be compiled into a comparison matrix by which each software package can be compared. Available billing software will be researched and loaded into the comparison matrix. The billing software packages will be compared with the matrix and the top 3 software packages will be short listed. Software demonstrations will be setup with the top 3 software vendors so that the City can compare the final 3 vendors. The City can then select the best vendor and software and work with the vendor to provide implantation services.

13. CAD Submittal Standards & Import Tools

- 13.1. Standard Review and Modifications – The City's existing CAD standards will be reviewed for completeness and data structure. The standard will be compared against other industry standards to determine if any adjustments are needed to the existing standard so that utility information can be easily extracted from a CAD files and loaded to the City's GIS. Any adjustments will be discussed with City staff and a final revised standard will be developed in conjunction with City staff.

- 13.2. CAD Data Transition Tool – A tool to parse the water and wastewater utilities from a City standard CAD drawing, into the utility geodatabase will be developed. The tool will allow the City to automatically extract the necessary information from the CAD environment and place it in the GIS environment. The development of the tool will be coordinated with City staff to insure that it fits the City’s needs and is comfortable to use for Public Works and GIS staff.

The tool will not address the conversion of every feature within the CAD file, such as parcels, row, etc. The tool will focus on the water and wastewater utilities and could be expanded to collect the additional information by the City staff. The tool will rely on the CAD standard to work and any file received by the City that does not match the standard will not be automatically useable within the translation tool. The implementation of the new CAD standard within the new development submittal process is not included in this scope.

14. **As-Built Drawing Scanning and Referencing**

- 14.1. Data Scanning and Collection Procedure Development – The procedure for the collection and scanning of the as-builts/construction drawings will be developed and documented for usage during this task and as a deliverable to the City. The City will be able to use the process and documentation to continue scanning activities during the transition period between hardcopy and digital drawing submittals. The drawings to be scanned are assumed to be any drawing that pertains to the City’s utility systems. The total number of drawings to be scanned is estimated to be 24,000 pages.
- 14.2. Acquisition of Drawings – The drawings will be collected from the City and will be out of the City’s control for a maximum of 5 days. A document check out log will be developed so that the City staff will know where a drawing is at any time. Upon completion of the scanning of the drawings, they will be returned to the same location as they were collected. This task does not include the re-organization or cataloging
- 14.3. Scanning of Drawings – The drawings will be scanned on a large format scanner at 400 dpi. The scanner will be purchased as part of this contract (cost will not exceed \$21,000) and provided to the City upon completion of the scanning activities. All maintenance, supplies, and repairs to the scanner from the date of purchase will be the responsibility of the City. No maintenance or repairs shall be made without prior approval from the City’s Project Manager. Each set of drawings will be split apart and scanned page by page. Each drawing set will be combined into a multi-page pdf document. Once the multi-page pdf has been created it will be connected to the City’s GIS road centerline file. The road centerline file will be used as is and will not be edited during the scanning process.

An intermediate deliverable will be provided to the City once approximately 200 drawings have been scanned and tied to the road centerline. This intermediate deliverable will provide an opportunity to check data structure and operation within the City’s environment. At this time, a total data size will be estimated to determine how much digital storage space will be required within the City’s environment to house all the new scanned images.

- 14.4. Final Drawing Submittal – The final deliverable will include the multi-page pdf files for each of the utility related drawings and a data linkage table that connects each drawing file to the City’s

road centerline. Coordination with City staff will be done to load the scanned images and the data linkage table into the City's environment.

RESPONSIBILITIES OF OWNER

The OWNER shall provide the following:

Assistance by placing at ENGINEER's disposal all available information pertinent to the assignment including GIS data, growth management and land use plans, water use data, water rights documentation, water quality data, previous master plans, maintenance records and procedures, and physical data on tanks and pump stations that are required and requested by ENGINEER. ENGINEER shall rely on information made available by the OWNER as accurate without independent verification. In addition, the OWNER shall assist in schedule coordination of meetings, workshops, and field services with City to ensure the objectives can be completed in a timely manner.

DELIVERABLES

The OWNER will be provided deliverables as outlined in the Scope of Services. Any draft copies for review by the OWNER will be provided in electronic (.pdf) format. One final electronic copy (on CD) and twenty-five final hard copies will be provided.

Reuse of Documents: All documents prepared or furnished by ENGINEER (and ENGINEER'S independent professional associates and ENGINEERS) pursuant to this Agreement are instruments of service in respect of the Project, and ENGINEER shall have the ownership and property interest therein whether or not the Project is completed. Any reuse without written verification or adaptation by ENGINEER for the specific purpose intended will be at OWNER'S sole risk and without liability or legal exposure to ENGINEER, or to ENGINEER'S independent professional associates or ENGINEERS, and OWNER shall indemnify and hold harmless ENGINEER and ENGINEER'S independent professional associates and ENGINEERS from and against all claims, damages, losses, and expenses, including attorneys' fees arising out of or resulting therefrom. Any such verification or adaptation will entitle ENGINEER to further compensation at rates to be agreed upon by OWNER and ENGINEER.

Electronic Media: Any electronic media (computer disks, tapes, and similar items) furnished with respect to ENGINEER'S services are for OWNER'S information and convenience only. Such media are not to be considered part of ENGINEER'S instruments of service. (Due to the potential that information contained in electronic media can be modified by OWNER or others, ENGINEER, at its option, may remove all indicia of ENGINEER'S ownership and involvement from each electronic display.) ENGINEER shall not be liable for loss or damage directly or indirectly, arising out of use of electronic media including, but not limited to, any loss of business or incidental or consequential damage. OWNER shall assume all risk and release, indemnify, and hold harmless ENGINEER, its officers, directors, employees, servants, agents, successors, and assigns, from and against each and every claim or cause of action that OWNER or others may have or which may arise in the future respecting use of the electronic media.

TIME OF SERVICE

ENGINEER will proceed with providing the services set forth herein immediately upon execution of this Agreement. The Phase II services will be completed within 500 calendar days of the Notice to Proceed (referred to as the *Project Completion Date* within this agreement), with the exception of the support services identified in Task 11.5. Task 11.5 will be completed 365 calendar days after Project Completion Date. Major milestones within the project are as follows:

- Completion of Task 2 (*Preparation of Geodatabases*) – 270 calendar days from notice to proceed
- Completion of Tasks 4.3 & 6.3 (*Preparation of Hydraulic Models*) – 360 calendar days from notice to proceed
- Completion of Tasks 8 (*Develop CIP*) – 420 calendar days from notice to proceed
- Completion of Tasks 9 (*Final Report*) – 460 calendar days from notice to proceed

COST REIMBURSIBLE NOT TO EXCEED

A. Amount of Payment:

1. For services performed, OWNER shall pay ENGINEER the sum of amounts determined as follows:
 - a. For time spent by personnel, payment at the hourly rates indicated on the attached fee schedule. Such rates include overhead and profit. The schedule is effective for the length of this contract.
 - b. For expenses incurred by ENGINEER, such as authorized travel and subsistence including airfare, food, lodging, automobile rental, commercial services, and incidental expenses, the cost to ENGINEER.
 - c. For reproduction, printing, long-distance telephone calls, facsimile transmissions, company vehicle usage, testing apparatus, computer services and computer-assisted drafting (CAD), amounts will be charged according to the ENGINEER's standard rates as identified in this contract.
 - d. For professional services rendered by others as subcontractor(s) to ENGINEER will be billed at the cost to ENGINEER plus 10 percent.
2. Total payment for the Scope of Services described herein shall not exceed One Million Five-Hundred Fifty-Five Thousand Seven-Hundred Fourteen dollars (\$1,555,714) without written approval of OWNER. Exhibit D presents a detailed Professional Engineering Services Fee Estimate.
3. ENGINEER shall not begin work on any phase of the project without written authorization by the OWNER.

TERMS AND CONDITIONS

The attached Terms and Conditions for Professional Services is incorporated and made a part of this Agreement.

BURNS & MCDONNELL ENGINEERING CO.

ACCEPTED:

ATTEST:

By _____

By _____

Title Vice President

Title Associate

Date _____

Date _____

CITY OF RAPID CITY

ACCEPTED:

ATTEST:

By _____

By _____

Title Mayor

Title Finance Officer

Date _____

Date _____

EXHIBIT A: PROJECT TEAM MEMBERS, STAKEHOLDERS, AND INTERESTED PARTIES**City of Rapid City – Utility System Master Plan (Phase II)**

<i>Project Team Members</i>	
	<ul style="list-style-type: none"> • Project Manager (Dan Coon) • Public Works Director (Dirk Jablonski) • Project Engineer – Engineering Services (Stacey Titus) • Water Division Superintendent (John Wagner) • Water Reclamation Superintendent (Dave Van Cleave) • Growth Management (Bob Dominicak) • Citizen Representative (George Dunham) • Citizen Representative (Jim Bell)
<i>Stakeholders</i>	
	<ul style="list-style-type: none"> • IT (Computer Center) • Fire • Growth Management • Public Works <ul style="list-style-type: none"> - Engineering Services - Water - Water Reclamation - Utility Maintenance • Finance • City Council
<i>Interested Parties</i>	
Internal	
	<ul style="list-style-type: none"> • City Attorney • Parks & Recreation • Police • Airport
External	
	<ul style="list-style-type: none"> • DENR • Development Community <ul style="list-style-type: none"> - Development Appeals Review Board • Pennington/Meade Counties • Large Water Customers <ul style="list-style-type: none"> - Ellsworth AFB - Rapid Valley Sanitary District - Chapel Lane Water Company • RC Chamber of Commerce • Game, Fish and Parks • US Bureau of Reclamation • US Geological Survey • Rapid City Conservancy District (Irrigators) • General Public

EXHIBIT B: SCHEDULE OF HOURLY PROFESSIONAL SERVICE BILLING RATES

Position Classification	Classification level	Hourly Billing Rate
General Office	5	\$49.00
Technician	6	\$52.00
Assistant	7	\$60.00
	8	\$82.00
	9	\$92.00
Staff	10	\$101.00
	11	\$111.00
Senior	12	\$119.00
	13	\$131.00
Associate	14	\$145.00
	15	\$152.00
Principal	16	\$159.00
	17	\$166.00

Notes:

1. Position classifications listed above refer to the firm's internal classification system for employee compensation. For example, "Associate", "Senior", etc., refer to such positions as "Associate Engineer", "Senior Architect", etc.
2. The hourly rates shown above are effective for services through completion of this contract, and are subject to revision thereafter.
3. Monthly invoices will be submitted for payment covering services and expenses during the preceding month. Invoices are due upon receipt.

EXHIBIT C - SCHEDULE OF REIMBURSABLE EXPENSES

Schedule of Reimbursable Expenses									
Description	Unit Cost								
Personal Mileage:	\$0.445								
Reproduction/Printing:	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">8.5"x 11" Copies White</td> <td style="text-align: right;">\$0.09/sheet</td> </tr> <tr> <td>24" x 34" Drawings White Bond</td> <td style="text-align: right;">\$0.48/sheet</td> </tr> <tr> <td>24" x 34" Drawings Mylar</td> <td style="text-align: right;">\$9.90/sheet</td> </tr> <tr> <td>8.5"x 11" Copies Color</td> <td style="text-align: right;">\$1.00/sheet</td> </tr> </table>	8.5"x 11" Copies White	\$0.09/sheet	24" x 34" Drawings White Bond	\$0.48/sheet	24" x 34" Drawings Mylar	\$9.90/sheet	8.5"x 11" Copies Color	\$1.00/sheet
8.5"x 11" Copies White	\$0.09/sheet								
24" x 34" Drawings White Bond	\$0.48/sheet								
24" x 34" Drawings Mylar	\$9.90/sheet								
8.5"x 11" Copies Color	\$1.00/sheet								
Long Distance Telephone:	Cost								
Postage:	Cost								
Courier:	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">2 hour</td> <td style="text-align: right;">\$22</td> </tr> <tr> <td>1 hour</td> <td style="text-align: right;">\$35</td> </tr> </table>	2 hour	\$22	1 hour	\$35				
2 hour	\$22								
1 hour	\$35								
Travel Expenses:									
Airfare:	Cost								
Lodging:	Cost								
Meals:	Cost								
Rental Car:	Cost								
Vehicle Expense:									
Sedan (4-door)	\$58/day + \$0.21/mile								
SUV – 4WD	\$65/day + \$0.25/mile								

Total of billable hours plus reimbursable expenses shall not exceed the maximum Cost Reimbursable Not to Exceed Amount allowed under the contract, without a written amendment executed by the parties.

EXHIBIT D**CONFIDENTIAL**

PERSONNEL EFFORT
RAPID CITY, SOUTH DAKOTA
UTILITY SYSTEM MASTER PLAN

TASK NO.	ACTIVITY NAME	Total B&McD Labor		Subconsultants Total Labor		Total Labor		Direct Expenses	Subtotals
		Hrs	Cost	Hrs	Cost	Hrs	Cost	Cost	Costs
1	PROJECT INITIATION AND COORDINATION	1,240	\$159,848	218	\$21,628	1,458	\$181,476	\$12,703	\$194,180
2	PREPARE GEODATABASES	1,125	\$128,187	3,925	\$219,225	5,050	\$347,412	\$43,405	\$390,816
3	DEVELOP FORECASTS	574	\$77,386	144	\$15,840	718	\$93,226	\$6,526	\$99,752
4	WASTEWATER COLLECTION SYSTEM ANALYSIS	984	\$121,798	48	\$104,012	1,032	\$225,810	\$9,104	\$234,914
5	WW TREATMENT EVALUATION	284	\$37,816	58	\$6,083	342	\$43,899	\$3,073	\$46,972
6	WATER DISTRIBUTION SYSTEM ANALYSIS	1,190	\$142,648	72	\$7,194	1,262	\$149,842	\$11,489	\$161,331
7	WTP EVALUATION	202	\$26,420	0	\$0	202	\$26,420	\$1,849	\$28,269
8	DEVELOP CIP	506	\$64,716	26	\$2,541	532	\$67,257	\$4,708	\$71,965
9	PREPARE FINAL REPORT	290	\$30,678	20	\$1,870	310	\$32,548	\$2,278	\$34,826
10	MODEL/GIS TRAINING	116	\$12,936	24	\$2,244	140	\$15,180	1,063	\$16,243
11	MAINTENANCE MANAGEMENT SYSTEM	1,101	\$126,355	0	\$0	1,101	\$126,355	8,845	\$135,200
12	UTILITY BILLING SOFTWARE	108	\$13,060	0	\$0	108	\$13,060	914	\$13,974
13	CAD SUBMITTAL STANDARDS & IMPORT TOOLS	130	\$15,230	36	\$3,498	166	\$18,728	1,311	\$20,039
14	AS-BUILT DRAWING SCANNING AND REFERENCING	94	\$11,186	882	\$47,223	976	\$58,409	\$27,189	\$85,598
<i>Subtotals:</i>			\$968,264		\$431,357		\$1,399,621	\$134,457	\$1,534,078
<i>Travel Expenses:</i>									\$21,636
<i>Total Master Planning and Modeling Effort</i>									\$1,555,714

BURNS & MCDONNELL ENGINEERING COMPANY, INC.
TERMS AND CONDITIONS FOR PROFESSIONAL SERVICES

Project: UTILITY SYSTEM MASTER PLAN - PHASE IIDate of Letter, Proposal or Agreement: MARCH 6, 2006Client: CITY OF RAPID CITYClient Signature: _____
5. PROFESSIONAL RESPONSIBILITY - LIMITATION OF REMEDIES**1. SCOPE OF SERVICES**

For the above-referenced Project, Burns & McDonnell Engineering Company, Inc. ("BMCD") will perform the services set forth in the above-referenced Letter, Proposal or Agreement, in accordance with these Terms and Conditions. BMCD has relied upon the information provided by Client in the preparation of the Proposal, and shall rely on the information provided by or through Client during the execution of this Project as complete and accurate without independent verification.

2. PAYMENTS TO BMCD

A. Compensation will be as stated in the above-referenced Letter, Proposal or Agreement. Statements will be in BMCD's standard format and are payable upon receipt. Time is of the essence in payment of statements, and timely payment is a material part of the consideration of this Agreement. A late payment charge will be added to all amounts not paid within 30 days of statement date and shall be calculated at 1.5 percent per month from statement date. Client shall reimburse any costs incurred by BMCD in collecting any delinquent amount, including reasonable attorney's fees. If a portion of BMCD's statement is disputed, Client shall pay the undisputed portion by the due date. Client shall advise BMCD in writing of the basis for any disputed portion of any statement.

B. Taxes as may be imposed on professional consulting services by state or local authorities shall be in addition to the payment stated in the above-referenced Letter, Proposal or Agreement.

3. INSURANCE

A. During the course of performance of its services, BMCD will maintain Worker's Compensation insurance with limits as required by statute, Employer's Liability insurance with limits of \$1,000,000 and Commercial General Liability and Automobile Liability insurance each with combined single limits of \$1,000,000.

B. If the Project involves on-site construction, construction contractors shall be required to provide (or Client may provide) Owner's Protective Liability Insurance naming Client as a Named Insured and BMCD as an Additional Insured or to endorse Client and BMCD using ISO form CG 20 10 11 85 endorsement or its equivalent as Additional Insureds on all construction contractor's liability insurance policies covering claims for personal injuries and property damage in at least the amounts required of BMCD in 3 A above. Construction contractors shall be required to provide certificates evidencing such insurance to Client and BMCD. Contractor's compensation shall include the cost of such insurance including coverage for contractual and indemnification obligations herein.

C. Client and BMCD release each other and waive all rights of subrogation against each other and their officers, directors, agents, or employees for damage covered by property insurance during and after the completion of BMCD's services. A provision similar to this shall be incorporated into all construction contracts entered into by Client, and all construction contractors shall be required to provide waivers of subrogation in favor of Client and BMCD for damage covered by any construction contractor's property insurance.

4. INDEMNIFICATION

A. To the extent allowed by law, Client will require all construction contractors to indemnify, defend and hold harmless Client and BMCD from any and all loss where loss is caused or alleged to be caused in whole or in part by the construction contractors, their employees, agents, subcontractors or suppliers.

B. If this Project involves construction and BMCD does not provide consulting services during construction including, but not limited to, on-site monitoring, site visits, site observation, shop drawing review and/or design clarifications, Client agrees to indemnify and hold harmless BMCD from any liability arising from this Project or Agreement, except to the extent caused by BMCD's negligence.

A. BMCD will exercise reasonable skill, care and diligence in the performance of its services and will carry out its responsibilities in accordance with customarily accepted professional practices. If BMCD fails to meet the foregoing standard, BMCD will perform at its own cost, the professional services necessary to correct errors and omissions reported to BMCD in writing within one year from the completion of BMCD's services for the Project. No warranty, express or implied, is included in this Agreement or regarding any drawing, specification, or other work product or instrument of service.

~~B. In no event will BMCD be liable for any special, indirect or consequential damages including, without limitation, damages or losses in the nature of increased Project costs, loss of revenue or profit, lost production, claims by customers of Client or for governmental fines or penalties.~~ PDF

C. BMCD's aggregate liability for all damages connected with its services for the Project not excluded by the preceding subparagraph, whether or not covered by BMCD's insurance, will not exceed the ~~greater of \$100,000 or the compensation paid for BMCD's services~~ ^{\$1,000,000}. PDF

D. These mutually negotiated obligations and remedies stated in this Paragraph 5, Professional Responsibility - Limitation of Remedies, are the sole and exclusive obligations of BMCD and remedies of Client, whether liability of BMCD is based on contract, warranty, strict liability, tort (including negligence), indemnity or otherwise.

6. PERIOD OF SERVICE AND SCHEDULE

The provisions of this Agreement have been agreed to in anticipation of the orderly and continuous progress of the Project through completion of the services stated in the Proposal. BMCD's obligation to render services hereunder will extend for a period, which may reasonably be required for the completion of said services. BMCD shall make reasonable efforts to comply with deliverable schedules (if any) and consistent with BMCD's professional responsibility.

7. COMPUTER PROGRAMS OR MODELS

Any use, development, modification, or integration by BMCD of computer models or programs does not constitute ownership or a license to Client to use or modify such computer models or programs.

8. ELECTRONIC MEDIA AND DATA TRANSMISSIONS

A. Any electronic media (computer disks, tapes, etc.) or data transmissions furnished (including Project Web Sites or CAD file transmissions) are for Client information and convenience only. Such media or transmissions are not to be considered part of BMCD's instruments of service. BMCD, at its option, may remove all indicia of its ownership and involvement from each electronic display.

B. BMCD shall not be liable for loss or damage directly or indirectly, arising out of Client's use of electronic media or data transmissions.

9. DOCUMENTS

A. All documents prepared by BMCD pursuant to this Agreement are instruments of service in respect of the Project specified herein. They are not intended or represented to be suitable for reuse by Client or others in extensions of the Project beyond that now contemplated or on any other Project. Any reuse, extension, or completion by Client or others without written verification, adaptation, and permission by BMCD for the specific purpose intended will be at Client's sole risk and without liability or legal exposure to BMCD.

B. In the event that BMCD is to reuse, copy or adapt all or portions of reports, plans or specifications prepared by others, Client represents that Client either possesses or will obtain permission and necessary rights in copyright, patents or other proprietary rights and will be responsible for any infringement claims by others. Client warrants the completeness, accuracy and efficacy of the information, data, and design provided by or through Client (including prepared for Client by others), for which BMCD shall rely on to perform and complete its services.

(continued on reverse side)

10. ESTIMATES, SCHEDULES, FORECASTS, AND PROJECTIONS

Estimates, schedules, forecasts, and projections prepared by BMCD relating to loads, interest rates and other financial analysis parameters, construction costs and schedules, operation and maintenance costs, equipment characteristics and performance, and operating results are opinions based on BMCD's experience, qualifications and judgment as a professional. Since BMCD has no control over weather, cost and availability of labor, material and equipment, cost of fuel or other utilities, labor productivity, construction contractor's procedures and methods, unavoidable delays, construction contractor's methods of determining prices, economic conditions, government regulations and laws (including the interpretation thereof), competitive bidding or market conditions and other factors affecting such estimates or projections, BMCD does not guarantee that actual rates, costs, quantities, performance, schedules, etc., will not vary significantly from estimates and projections prepared by BMCD.

11. POLLUTION

In view of the uncertainty involved in investigating and recommending solutions to environmental problems and the abnormal degree of risk of claims imposed upon BMCD in performing such services, notwithstanding the responsibility of BMCD set forth in Paragraph 5.A; to the maximum extent allowed by law, Client agrees to release, defend, indemnify and hold harmless BMCD and its officers; directors, employees, agents, consultants and subcontractors from all liability, claims, demands, damages, losses, and expenses, including, but not limited to, claims of Client and other persons and organizations, reasonable fees and expenses of attorneys and consultants, and court costs, except where there has been a final adjudication that the damages were caused by BMCD's willful disregard of its obligations under this Agreement. Such indemnification includes claims arising out of or in any way relating to the actual, alleged, or threatened dispersal, escape, or release of, or failure to detect or contain, chemicals, wastes, liquids, gases or any other material, irritant, contaminant or pollutant.

12. ON-SITE SERVICES

A. Project site visits by BMCD during investigation, observation, construction or equipment installation, or the furnishing of Project representatives shall not make BMCD responsible for construction means, methods, techniques, sequences or procedures; for construction safety precautions or programs; or for any construction contractor(s)' failure to perform its work in accordance with the contract documents.

B. Client shall disclose to BMCD the location and types of any known or suspected toxic, hazardous or chemical materials or wastes existing on or near the premises upon which work is to be performed by BMCD's employees or subcontractors. If any hazardous wastes not identified by Client are discovered after a Project is undertaken, Client and BMCD agree that the scope of services, schedule and compensation may be adjusted accordingly. Client agrees to release BMCD from all damages related to any pre-existing pollutant, contaminant, toxic, or hazardous substance at the site.

13. CHANGES

Client shall have the right to make changes within the general scope of BMCD's services, with an appropriate change in compensation and schedule, upon execution of a mutually acceptable amendment or change order signed by authorized representatives of Client and BMCD.

14. TERMINATION

Services may be terminated by Client or BMCD by seven (7) days' written notice in the event of substantial failure to perform in accordance with the terms hereof by the other party through no fault of the terminating party. If so terminated, Client shall pay BMCD all amounts due BMCD for all services properly rendered and expenses incurred to the date of receipt of notice of termination, plus reasonable costs incurred by BMCD in terminating the services. In addition, Client may terminate the services for Client's convenience upon payment of twenty percent of the yet unearned and unpaid estimated, lump sum, or not-to-exceed fee, as applicable.

15. DISPUTES, NEGOTIATIONS, MEDIATION

~~A. If a dispute arises relating to the performance of the services to be provided and should that dispute result in litigation, it is agreed that the substantially prevailing party (as determined in equity by the court) shall be entitled to recover all reasonable costs of litigation, including staff time, court costs, attorney's fees and other related expenses.~~ PDF

~~B. The parties shall participate in good faith negotiations to resolve any and all disputes. Should negotiations fail, the parties agree to submit to and participate in a third party facilitated mediation as a condition precedent to resolution by litigation. Unless otherwise agreed to, mediation shall be conducted under the rules of the American Arbitration Association.~~ PDF

C. Causes of action between the parties shall accrue, and applicable statutes of limitation shall commence to run the date BMCD's services are substantially complete.

16. WITNESS FEES

A. BMCD's employees shall not be retained as expert witnesses, except by separate written agreement.

B. Client agrees to pay BMCD pursuant to BMCD's then current schedule of hourly labor billing rates for time spent by any employee of BMCD responding to any subpoena by any party in any dispute as an occurrence witness or to assemble and produce documents resulting from BMCD's services under this Agreement.

17. CONTROLLING LAW AND VENUE

This Agreement shall be subject to, interpreted and enforced according to the laws of the State of Colorado, without regard to any conflicts of law provisions. Parties agree to submit to the exclusive venue and jurisdiction of the 18th Judicial District in the County of Douglas, State of Colorado, or the United States District Court for the District of Colorado. ~~STATE OF SOUTH DAKOTA, 7th JUDICIAL CIRCUIT, PENNINGTON COUNTY~~ PDF

18. RIGHTS AND BENEFITS - NO ASSIGNMENT

BMCD's services will be performed solely for the benefit of Client and not for the benefit of any other persons or entities. Neither Client nor BMCD shall assign or transfer interest in this Agreement without the written consent of the other.

19. ENTIRE CONTRACT

These Terms and Conditions and the above-referenced Letter, Proposal or Agreement contain the entire agreement between BMCD and Client relative to BMCD's services for the Project herein. All previous or contemporaneous agreements, representations, promises and conditions relating to BMCD's services for the Project are superseded. Since terms contained in purchase orders do not generally apply to professional services, in the event Client issues to BMCD a purchase order, no preprinted terms thereon shall become part of this Agreement. Said purchase order documents, whether or not signed by BMCD, shall be considered only as an internal document of Client to facilitate administrative requirements of Client's operations.

20. SEVERABILITY

Any unenforceable provision herein shall be amended to the extent necessary to make it enforceable, if not possible, it shall be deleted and all other provisions shall remain in full force and affect.

- END -