The City’s current Utility System Master Plan was adopted in 2008 and projected utility requirements to the year 2030. This project is a comprehensive update that will allow the City to plan for future growth, improve wastewater system operation, and support development occurring within the Rapid City service area.

The master plan update and accompanying wastewater collection system hydraulic model recalibration will allow the City to accomplish the following objectives:

- Update the Geographical Information System (GIS) database and hydraulic model. Recalibrate the hydraulic model.
- Identify improvements required to support growth of the wastewater utility over a 100-year planning period (2015, 2025, 2045, and 2115 infrastructure needs). The hydraulic modeling will be the primary tool for this evaluation.
- Assess collection system facility assets (excluding the Water Reclamation Facility)
- Survey using Global Positioning System (GPS) for GIS feature definition
- Provide policies, processes, and procedures for planning and operation of the collection system. Includes review of City of Rapid City (City) design criteria and recommendations.
- Provide assistance in helping the City in improving water and wastewater utility asset management
- Identify next steps in water quality protection with respect to septic systems
• Provide capital improvement plan and master plan report. To include mapping showing proposed improvements that demonstrate smart growth expansion, existing system improvements, and replacement of aging assets. Provide development community with guidance for development and submittals
• Provide additional support services for the Water Utility System Master Plan.
• Provide training and on-call services.
• Develop an asset registry for water and wastewater to be used with City financial software.

The master plan update and model recalibration project is organized into 12 tasks. A brief description of each task is included below. For each of the tasks, the contract budget amount is indicated.

**TASK 100 – PROJECT INITIATION, RECURRING MEETINGS, AND MANAGEMENT, $141,127**

This task provides administrative management, technical oversight, project initiation activities, and travel for the project. Sub-tasks include the following:

• Prepare and Finalize Project Execution Plan
• Data/Information Request
• Review and Incorporation of Previous Reports
• Workshop 1-1 – Project Initiation
• Recurring Meetings
• Project Management and Administration

**TASK 200 – GIS DATA AND GPS DATA COLLECTION AND VERTICAL CORRECTION, $100,777**

This task included the data collection and field work necessary to update the existing GIS wastewater database, and the development of procedures for collection of data in the future. Sub-tasks include the following:

• GIS Wastewater System Feature Update
• NGVD29 to NAVD88 Vertical Datum/Elevation Conversion
• New Manhole Identification and Inventory Development
• GPS Field Survey
• GPS Survey of Wastewater Service Lines
• Workshop 2-1 – GIS Review and GPS Field Survey Workflows and Results
TASK 300 – HYDRAULIC MODEL RECALIBRATION/UPDATE, $121,417

The intent of this task is to update the City’s existing hydraulic model to current inventory and flow loading conditions. Sub-tasks include the following:

- Collection System Operations Review.
- GIS Data Extraction and Hydraulic Model Inventory Update
- GIS/Hydraulic Model Inventory Update and Maintenance Procedures
- Previous Flow Monitoring Data Review
- Historical Population, Wastewater Flow, and Per Capita Use Rates
- Future Service Area Population and Wastewater Flow Projections
- Workshop 3-1 – Hydraulic Model Update and Future Flow Projections
- Hydraulic Model Calibration Data Development and Input
- Hydraulic Model Calibration
- Collection System Design Criteria
- Workshop 3-2 – Model Calibration and Existing System Deficiencies

TASK 400 – HYDRAULIC MODELING ANALYSES AND IMPROVEMENTS PLANNING, $124,889

This task includes analyses of the hydraulic model including the existing system, short term, medium term and long term system needs. The result of this modeling and analysis will provide the City with a guideline for sewer improvements needed over the next 100 years to accommodate anticipated growth. Sub-tasks include the following:

- Existing System Analysis
- Long-Term Hydraulic Modeling Analyses
- Medium-Term Hydraulic Modeling Analyses
- Short-Term Hydraulic Modeling Analyses
- Develop System Improvement Alternatives
- Develop Hydraulic Model Results and System Improvement Alternatives
- Workshop 4-1 – Hydraulic Model Results and System Improvement Alternatives
- Recommended Alternative Analyses and Improvement Planning
- Workshop 4-2 – Recommended Alternatives Analysis and Overall Plan

TASK 500 – WASTEWATER FACILITY ASSESSMENTS AND REPLACEMENT CAPITAL IMPROVEMENT PLAN (CIP) DEVELOPMENT, $50,902

The purpose of this task is to establish a recommended CIP (cost and timing) for replacement of existing wastewater collection system facilities. The assessment will include assessing general facility condition; establishment of facility criticality; development of facility useful life and remaining useful life; development of replacement costs; and staging of replacements into a recommended CIP. Sub-tasks include the following:

- Review Wastewater Facility Information and Compile Inventory Listing
- Establish Useful Life Values for Wastewater Facilities
- Establish Criticality Ranking For Wastewater Facilities
- Workshop 5-1 – Wastewater Facility Inventory, Criticality, and Useful Life Values
- Conduct Facility Site Tours and Determine Remaining Useful Life De-rating Score
- Develop Facility Replacement Costs
- Develop Facility Replacement CIP
- Wastewater Facility Assessment and Replacement CIP TM
- Workshop 5-2 – Wastewater Facility Replacement CIP

**TASK 600 – PIPELINE REPLACEMENT PLANNING AND CIP DEVELOPMENT, $51,621**

The intent of this task is to establish and implement a pipeline replacement CIP program based on a logical prioritization of pipe replacement needs and a basis for annual pipeline replacement budgets. Sub-tasks include the following:

- Compile Pipe Installation Decade, Materials, SSO and Break/Collapse History
- Pipe Attribute Data
- GIS Based Pipe Inventory Analysis and Development of Risk Criteria
- Risk of Failure and Replacement Priority Ranking Evaluation
- Develop Pipeline Rehabilitation/Replacement Costs
- Pipe Replacement Budget Strategy Evaluation
- Pipeline Replacement Priority and Budget Strategy Evaluation TM
- Workshop 6-1 – Pipeline Replacement Priorities and Budget Strategies
- Develop Pipeline Replacement CIP

**TASK 700 – ASSET MANAGEMENT, $151,941**

The intent of this task is to establish an overall asset management policy and framework for the City for the water and wastewater utilities and support enhancements to the City’s use of Cityworks. Sub-tasks include the following:

- Wastewater GIS Database Schema Review
- Asset Management Policy
- Asset Management Framework Outline
- Asset Management Work Processes for Cityworks
- To-Be Asset Management Work Processes Implementation for Cityworks
**TASK 800 – DEFINITION OF POLICIES, PROCESSES, AND PROCEDURES, $151,987**

The intent of this task is to identify policies, processes, and procedures that will be included in the Wastewater Utility System Master Plan work. The policies, processes, and procedures will be coordinated with the Water Utility System Master Plan where appropriate. The following sub-tasks are included in this task:

- Master Plan Updates, Amendments, and Revisions
- GIS and Model Maintenance and Update Procedures
- Wastewater System Surface and Service Line Feature GPS Definition
- Project Development Submittal Requirements for Evaluation and GIS/Model Integration
- Design Criteria Review and Amendments
- Review of Potential Wastewater System Base Map Accessibility Approaches and Systems
- Review of Existing and Future IT Hardware Requirements for Hydraulic Modeling and GIS Functions in Public Works and Utility Maintenance
- Asset Management Policy, Framework, and Work Processes
- Septic Conversion Framework Evaluation and Implementation

**TASK 900 – CAPITAL IMPROVEMENT PLAN AND MASTER PLAN REPORT, $154,771**

This task includes the documentation of the CIP plan and writing the Master Plan report. The following sub-tasks are included in this task:

- Recommended CIP
- Workshop 9-1 - Recommended CIP Review
- Draft Reports
- Workshop 9-2 – Draft Reports Review
- Draft Final Reports
- Final Reports and Deliverables

**TASK 1000 – ADDITIONAL SERVICES SUPPORT, $216,790**

As the Water Utility System Master Plan project has progressed, additional items have been identified as necessary to complete or enhance the project. Some items require coordination between water and wastewater, others are specific to water infrastructure. Sub-tasks include the following:

- Bulk Customer Meetings
- Development of Card Files from GPS Survey of Water Service Lines
- Water GIS Database Schema Review
- Reconciliation of GPS Survey Data with Existing GIS Data
- General Valve Box Condition Assessment Acquisition
- Infrastructure Design Criteria Manual Update – Section 1
- Revision of Future Population and Employment Distribution and Establishment of Service Boundary Guidelines
- Alternative CIP Development

**TASK 1100 – TRAINING AND CONTINUING SERVICES SUPPORT, $70,751**
The City has previously committed staff for maintaining and providing GIS and hydraulic modeling services. Through the model update and recalibration process, inform and train City staff in model structure, construction, scenario management, use of the model, and database interface. This task arranges for on the job training as the work progresses so that City staff is fully involved in the modeling efforts and process as they occur. The following training tasks are planned:

- Training
- Continuing On-Call Modeling Support Services

**TASK 1200 – ASSET REGISTRY DEVELOPMENT FOR WATER AND WASTEWATER FACILITIES, $49,240**
This task includes the development of an asset registry for water and wastewater to be used with City financial software. Specific sub-tasks include:

- Current Process Understanding and Data Gathering
- Hierarchy Structure and Asset Naming Convention Development for Wastewater Facilities
- Asset Registry Development for Selected Wastewater Facilities
- Hierarchy Structure and Asset Registry Development for Water Facilities
- Technical Memorandum and Training Workshop