CITY OF SNOQUALMIE
AGREEMENT FOR CONSULTANT SERVICES
Amendment No. 1
Water, Sewer, and Stormwater Utility Plans

WHEREAS, the City of Snoqualmie (City) entered into an agreement with RH2 Engineering Inc. (RH2) on April 25, 2018 to be completed no later than July 31, 2020; and

WHEREAS, the City has requested RH2 to perform additional services required to complete the Water, Sewer, and Stormwater Utility Plans; and

WHEREAS, RH2 has the resources and capability to perform this work;

NOW, THEREFORE, the parties herein do mutually agree as follows:

Section 1.A of the Agreement shall be deleted and replaced with the following:

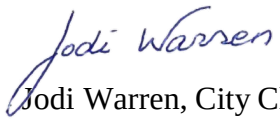
A. The City retains the Consultant to provide the services described in "Exhibit A" to include Amendment No. 1, "the "Work". Any inconsistency between this Agreement and the Scope of Work shall be resolved in favor of this Agreement. The Consultant shall perform the Work according to the terms and conditions of this Agreement.

C. Work shall commence when the City issues a notice to proceed and it shall be completed no later than January 31, 2022, unless the completion date is extended in writing by the City.

Section 2 A. of the Agreement shall be deleted and replaced with the following:

A. The total compensation to be paid to Consultant, including all services and expenses, shall not exceed $944,523 shown on Exhibit B, which shall be full compensation for the work. Consultant shall notify the City when its requests for payment reach eighty-five percent of the total compensation.

CITY OF SNOQUALMIE, WASHINGTON By:_____ Its: Mayor Date: October 26, 2020	CONSULTANT – RH2. By:_____ Typed/Printed Name: Richard L. Ballard Its: Director Date: August 28, 2020

ATTEST:  Jodi Warren, City Clerk Date:	
APPROVED AS TO FORM:	

Bob C. Sterbank, City Attorney
Date:_____

EXHIBIT A
Scope of Work
Amendment No. 1
City of Snoqualmie
Water System Plan, General Sewer and Wastewater Facilities Plan, and Stormwater System Plan Updates

Additional Analyses for Utility Plan Updates and AWIA Risk and Resilience Assessment/Emergency Response Plan

June 2020

Background

Introduction

RH2 Engineering, Inc., (RH2) was retained by the City of Snoqualmie (City) to update the City's Water System Plan (WSP), General Sewer and Wastewater Facilities Plan (GSP), and Stormwater System Plan (SWP). These documents are together referred to as the Utility Plans. The Utility Plan updates evaluate the ability of the City's utility systems to meet the needs of existing and projected future customers throughout the 20-year planning period.

This Scope of Work describes additional tasks that were necessary to complete the Utility Plan updates. These tasks included work to address several changes in proposed development planning and future growth projections, to perform additional updates to the City's hydraulic sewer and stormwater models, to prepare additional analyses and revise Water Reclamation Facility (WRF) flow and loading projections, and to obtain supervisory control and data acquisition (SCADA) system data for the City's Aquifer Storage and Recovery (ASR) study.

This Scope of Work also includes tasks to meet the new requirements of the recently enacted America's Water Infrastructure Act (AWIA). Under the AWIA, the City is facing deadlines in 2021 for the development of a Risk and Resilience Assessment (RRA) and an Emergency Response Plan (ERP) for the water utility. The concurrent development of the RRA and ERP with the finalization of the WSP update presents an opportunity to efficiently meet these new AWIA requirements while maintaining control and security over sensitive information presented in the documents.

Amendment No. 1 also includes a time extension for the contract through January 31, 2022. The time extension is needed to accommodate the project schedule for a utility rate study and the AWIA requirements. The utility rate study is currently underway under separate contract between the City and FCS Group. Elements of the rate study will be incorporated into the final draft of the Utility Plans. The AWIA requirements set completion dates of the documents on or before December 31, 2021.

Additional background on the need for these extra work tasks is provided in the following sections.

Additional Work for Utility Plan Updates

Revisions to Growth Projections. The original contract assumed that the growth projections for the Utility Plans would be based on the City's 2014 *Comprehensive Plan* and the 2017 *Comprehensive Plan Amendment*. The *Comprehensive Plan* projected development within various planning areas throughout the City. The density and location of the projected developments, which include the Snoqualmie Falls and Snoqualmie Mill planning areas, have significant impact on the planning of water and sewer system utilities. Uncertainty in these developments and their timing has led the City to revise the growth projections several times over the course of the Utility Plan update effort. The revised growth projections have subsequently required revisions to the WSP, GSP, and WRF Facility Plan analyses and have extended the project schedule.

Additional Sewer Model Updates. In the original contract, it was assumed that the existing sewer hydraulic model had been prepared to accurately portray the sewer system's current condition. The City found that some of the record drawings used to prepare the model were not accurate when compared to actual field conditions encountered in some areas of the sewer system. The City desired to improve the accuracy of portions of the hydraulic model of its sewer collection system that are critical components to the hydraulic analyses. To update the City's hydraulic sewer model, the City elected to have additional updates made to its model based on record drawings, survey, and measure down information. This additional model development allowed RH2 to improve the accuracy of critical components of the sewer model to be more representative of the existing system. The more accurate model better assesses the hydraulic capacity of the City's sewer system so that a more accurate evaluation can be performed to develop recommendations for sewer collection system improvements.

Additional Stormwater Model Updates. The original contract assumed that an existing Hydrologic Simulation Program – Fortran (HSPF) stormwater model of Snoqualmie Ridge that was developed by the Quadrant Corporation's designer of the Master Planned Community in the 1990s and 2000s would be available for use. After much searching through the City's archives, it was discovered that both the paper and electronic documentation of the models covering the Snoqualmie Ridge Phase I portion of the City were lost or destroyed.

The model needed to be redeveloped because it is essential to the City's Stormwater Management Action Plan (SMAP) planning process required by Ecology under the current NPDES Phase II permit. The model will be used to characterize the volume of stormwater runoff and pollutants derived from that portion of the City, as well as to characterize that portion of the City's eco-hydrologic integrity of the streams based on simulated hydrologic metrics.

SCADA Data Acquisition for ASR Study. The City needed assistance obtaining SCADA data for the City's ASR study, which includes investigation of other water source capacity improvements.

America's Water Infrastructure Act

Introduction

Under the 2018 AWIA, the City is facing deadlines in 2021 for preparation of an RRA and ERP. RH2's intimate knowledge of the City's water system and staff, which has been gained through the preparation of the WSP update, will allow it to work efficiently with the City to facilitate the RRA and to update the City's ERP. The water system must certify compliance with RRA and ERP requirements on a schedule dependent on system size. Recertification will be required every 5 years.

Since the City's service population is between 3,300 and 50,000, the U.S. Environmental Protection Agency (EPA) mandated RRA deadline is June 30, 2021. This project is targeting:

- RRA completion on June 15, 2021; and
- RRA certification on June 30, 2021.

ERP certification is due within six (6) months of RRA certification; therefore, it is due December 30, 2021. This project is targeting:

- ERP completion on December 1, 2021; and
- ERP certification on December 15, 2021.

The RRA and ERP includes the review and development of sensitive information. RH2 will work closely with the City to securely transmit files and information and will restrict file access of sensitive information where required by the City.

Risk and Resilience Assessment (RRA)

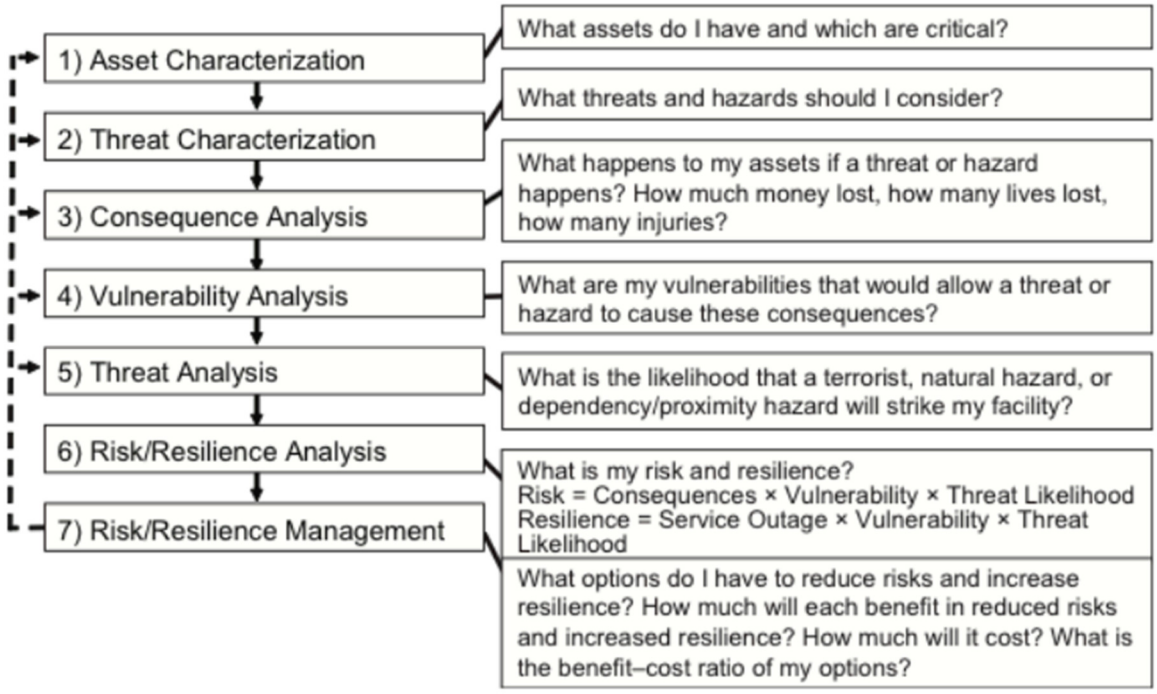
The RRA will include an assessment of the water system assets and an all-hazard approach to threats, including the following:

1. The risk to the system from malevolent acts and natural hazards.
2. The resilience of the pipes and constructed conveyances, physical barriers, source water, water collection and intake, pretreatment, treatment, storage and distribution facilities, and electronic, computer, or other automated systems (including the security of such systems) that are utilized by the system.
3. The monitoring practices of the system.
4. The financial infrastructure of the system.
5. The use, storage, or handling of various chemicals by the system.
6. The operation and maintenance of the system.

The assessment also may include an evaluation of capital and operational needs for risk and resilience management for the system.

RH2 will follow the standards outlined in American Water Works Association/American National Standards Institute (AWWA/ANSI) J100-10 R13 *Risk and Resilience Management of Water and*

Wastewater Systems (J100) when performing the RRA. J100 outlines a seven (7) step Risk Analysis and Management for Critical Asset Protection (RAMCAP) process, as illustrated in the figure that follows.



Emergency Response Plan (ERP)

The findings of the RRA are to be incorporated in the ERP update. The updated ERP must include the following:

1. Strategies and resources to improve the resilience of the system, including the physical security and cybersecurity of the system.
2. Plans and procedures that can be implemented, and identification of equipment that can be utilized, in the event of a malevolent act or natural hazard that threatens the ability of the community water system to deliver safe drinking water.
3. Actions, procedures, and equipment that can obviate or significantly lessen the impact of a malevolent act or natural hazard on the public health and the safety and supply of drinking water provided to communities and individuals, including the development of alternative source water options, relocation of water intakes, and construction of flood protection barriers.
4. Strategies that can be used to aid in the detection of malevolent acts or natural hazards that threaten the security or resilience of the system.
5. Examination of financial infrastructure.
6. Addressing the use, storage, or handling of chemicals.

7. Consideration of operations, maintenance, and asset management.

General Assumptions for RRA and ERP

In preparing this Scope of Work, the following overall assumptions were made. Additional assumptions are listed within the tasks.

- *The City has the institutional knowledge of its water system, and the City must respond quickly to information requests, involve the correct staff, perform timely and thorough reviews of draft documents, and be actively involved in the RRA and ERP development in order to meet the EPA deadlines. RH2's role is to support the City's efforts through collection and organization of relevant information and presentation in a way that allows City decision makers to quickly make informed decisions at key points in the RRA and ERP development.*
- *RRA and ERP documents will be limited to the water system. Impacts of other utility failures will be analyzed (to the extent that their failure impacts the water system) and response coordination planned, but analysis and planning for other utilities (such as wastewater) are outside the scope of this project.*
- *Analysis will include applicable business systems. Applicable business systems are assumed to include those systems and IT directly affecting water operations, such as maintenance and communication systems, as well as financial infrastructure such as accounting, purchasing, billing systems, or third parties used for these services.*
- *Project documents will be provided in electronic format (Word and/or PDF format). Deliverables will be provided in PDF format.*
- *Restrictions to in-person meetings and workshops due to COVID-19 will not impact the schedule and are assumed to continue through much of 2020. All meetings can be held via videoconference using either RingCentral or Microsoft Teams platforms. If in-person meetings are necessary, all participants will adhere to health guidelines for in-person activities in order to protect the health of RH2 and City staff. RH2 staff have visited most facilities in the past and it is assumed that specific questions about certain facilities can be documented by City staff and relayed to RH2 without the need for RH2 to perform site visits.*
- *Infrastructure cost estimates will be Association for the Advancement of Cost Engineering (AACE) Class 5 (conceptual level).*
- *RH2 will rely on the accuracy and completeness of any data, information, survey, or materials generated or provided by the City or others in relation to this Scope of Work.*
- *The City will provide timely feedback on deliverables identified in this Scope of Work.*
- *RRA information may be compiled and processed in AEM Engineering's PARRE™ software. The project budget includes an allowance of $500 to cover the cost of purchasing one (1) license of the PARRE software. The license, along with all data, will be transferred to the City following*

completion of the work for City use in future RRA efforts. The City will be responsible for maintenance of the license for future RRA efforts.

- *The City will be responsible for certifying, via electronic submission to EPA, completion of the RRA and ERP, by the deadlines.*

TASK 5 – ADDITIONAL WORK FOR UTILITY PLAN UPDATES

Task 5.1 – Additional Hydraulic Sewer Model Development

Objective: Update the pipe invert elevations, pipe diameters, manhole rim elevations, and sewer system configuration in the hydraulic model of the City's existing sewer system based on survey, measured depth information, and record drawings so a more accurate hydraulic model can be developed.

Approach:

5.1.1 Coordinate with a surveyor as a subconsultant to obtain rim elevations of manholes along interceptors in the City's sewer system.

5.1.2 Update elevation data in the model by transferring rim elevation data from the survey and measure down information from the City to model manhole nodes. Update elevation data and the sewer system alignments in the model by transferring data from record drawings to the hydraulic model. Review the model for consistency with the *Draft Technical Memorandum* that was prepared for the 384th Avenue SE Sanitary Sewer Capacity Analysis Project.

5.1.3 Coordinate with the City to resolve inconsistencies between the record drawings and the model. Inconsistencies may be the result of unknown pipes in the system, incorrect invert elevations, or incorrect diameter of pipes shown on system mapping.

Assumptions:

- *The City will measure the depth of manholes along interceptors in the City's sewer system for the purpose of incorporating this information into the sewer model.*
- *The City will provide rim and invert elevation and sewer alignment information from record drawings for manholes along interceptors in the City's sewer system for the purpose of incorporating this information into the sewer model.*

RH2 Deliverables:

- SewerCAD model with improved accuracy for use in analyzing the existing and projected system.
- Additional coordination with City to confirm completeness and accuracy of the sewer model.

Task 5.2 – Growth Projection Revisions and Additional Analyses

Objective: Coordinate with the City's Community Development Department to discuss recent and ongoing changes to proposed development plans in and around the City that affect water and sewer utility service. Review and revise the population and employment projections for the water and sewer utility service areas. Update the WSP, GSP and WRF chapters and analyses with the revised projections and discuss the impacts of the projections on the capacity of the water utility.

Approach:

5.2.1 Coordinate with the City's Community Development Department to obtain revised population and employment projections for each of the City's land use planning areas, including the Snoqualmie Falls and Snoqualmie Mill planning areas. Three (3) population and employment projections will be reviewed and re-evaluated.

5.2.2 Using the City's revised population and employment projections, develop projections for the City's water and sewer utility service areas.

5.2.3 Prepare for and attend meetings with the City's Public Works and Community Development Department, City Attorney, and other City staff to review and confirm the population and employment projections, future development timing, and utility service needs. Evaluate and discuss the impact of the projections on the capacity of the water and sewer utilities.

5.2.4 Update the City's WSP to incorporate the revised population and employment projections. The following chapters and analyses will be revised in part for each of the three (3) projections developed by the City.

- Chapter 1 – Introduction
- Chapter 3 – Land Use and Population
- Chapter 4 – Water Demands, including projections
- Chapter 6 – Water Source and Quality, including water rights
- Chapter 7 – Water System Analysis

5.2.5 Update the City's GSP and WRF Facility Plan to incorporate the revised population and employment projections and additional permutations of the flow and loading analyses and projections. The following chapters for the GSP and WRF Facility Plan will be revised in part for each of the three (3) projections developed by the City.

- Chapter 1 – Introduction
- Chapter 3 – Land Use and Population
- Chapter 4 – Wastewater Flow and Load Analysis
- Chapter 6 – Sewer Collection System Evaluation
- Chapter 7 – Existing Treatment Facility Evaluation

- Chapter 8 – Treatment Facility Improvements Alternatives
- Chapter 9 – Treatment Facility Recommended Improvements

5.2.6 Due to the length of time required to finalize the projections, the WSP water quality analyses prepared early in the project schedule have become out of date. Updates to the WSP water quality analysis and water quality monitoring plan are necessary to include recent monitoring results from 2019 and 2020.

Assumptions:

- *Water demand and sewer flow and loading projections will include population and employment projections for the proposed Snoqualmie Mill Site Development. It is uncertain at this time how many and how large the wineries will be, how much wine is expected to be produced at this development, and over what time period (i.e. these wineries may phase in over a period of time). Water demand and sewer flow and loading projections will not include water demand or sewer flow and loading that could be attributed to wine processing at this development.*

RH2 Deliverables:

- Attendance at meetings to review the revised projections.
- WSP chapters that incorporate the updated population and employment projections in the demand projections, projected water system analyses, and capital facilities plan.
- GSP chapters that incorporate all the additional work updates and documentation identified in this Task.

Task 5.3 – Additional Stormwater Model Updates

Objective: Update the current stormwater models of the City's existing stormwater system**.**

Approach:

5.3.1 Search City archives and review stormwater reports and documentation files to identify documentation of the stormwater system in Snoqualmie Ridge Phase I.

5.3.2 Apply data collected from the archived documents to develop the Snoqualmie Ridge Phase I portion of the City-wide HSPF stormwater model.

5.3.3 Review HSPF stormwater model configuration to evaluate whether it matches flows at the E-Creek flow monitoring station.

Assumptions:

- *This effort does not include time for coordination with the City or additional work needed on their planning efforts for the SMAP planning process.*

RH2 Deliverables:

- HSPF and Stormwater Management Model (SWMM) stormwater models for use in analyzing the existing and projected system.
- Coordination with the City to confirm completeness and accuracy of the stormwater models.

Task 5.4 – SCADA Data Acquisition for ASR Study

Objective: Obtain SCADA data requested by the City and Aspect Consulting, LLC (Aspect) for the City's ASR study, including investigation source capacity improvements for the City's drinking water system.

Approach:

5.4.1 Obtain, compile, and deliver SCADA data requested by the City or Aspect.

Assumptions:

- *The City or Aspect will perform quality assurance and quality control (QA//QC) of the data obtained and delivered under this Task. RH2 will not perform QA/QC of this data.*

RH2 Deliverables:

- SCADA data as requested by the City or Aspect.

TASKS FOR RRA AND ERP

TASK 6 – RISK AND RESILIENCE ASSESSMENT AND EMERGENCY RESPONSE PLAN

Task 6.1 – Project Management

Objective: Manage RH2's project team, maintain communications, including phone calls and emails, and attend coordination meetings.

Approach:

6.1.1 Perform Project Management: Provide direction, coordination, and oversight to the RH2 project team. Work includes the following:

- Organize, manage, and coordinate technical disciplines as described herein, and implement QA/QC to perform this Scope of Work in close coordination with City staff.
- Document and retain information generated by the RH2 team during execution of the project.
- Prepare monthly invoices and budget status summaries.
- Create, maintain, and update an internal project schedule. Monitor, modify, and update the project schedule periodically throughout the project to determine potential impacts of proposed changes. Adjust the schedule to reflect the current status of the project and revisions made to this Scope of Work.

6.1.2 Attend Coordination Meetings: Prepare for and attend (in-person or via video conference) coordination meetings with City staff, as requested. Prepare agenda and meeting minutes. *A total of three (3) meetings are assumed for this Scope of Work, in addition to the other workshop meetings identified elsewhere in this Scope of Work.*

RH2 Deliverables:

- Monthly invoices.
- Meeting agendas and minutes.
- Periodic project updates.

Task 6.2 – Project Kickoff

Objective: Streamline communication between the City and RH2. Identify available existing resources. Lay the groundwork for identifying which assets are critical assets.

Approach:

6.2.1 Establish Primary Points of Contact: Work with the City to identify primary points of contact for RH2 and within the City's organization related to different aspects of the system, including:

- Management;
- Operations;
- Engineering;
- Electrical;
- IT/Supervisory Control and Data Acquisition (SCADA);
- Administrative/Billing; and
- Physical Security

6.2.2 Obtain and Review Background Information: Provide the City with initial AWIA Information Request Form. Obtain and organize background information identified in information request form. Review information to assess whether information is relatively sufficient, complete, and up to date. Update information request form and coordinate with the City to obtain or update information as needed. Prepare bibliography of data obtained.

6.2.3 Identify Critical Thresholds: Coordinate with the City to review the organization's mission statement and translate the mission statement into terms that will help determine criticality of assets during an emergency, such as:

- Fire flow (gallons per minute at hydrants);
- Water system pressure (pounds per square inch in distribution system);
- Water quality (specific);
- Water treatment (specific);

- Service disruption length (hours or days);
- Critical customer need requirements (specific); and
- Other.

Provided by City:

- Existing information as identified on the AWIA Information Request Form, including the City's Vulnerability Assessment prepared in response to the 2002 Bioterrorism Act.
- Decision on critical thresholds.

RH2 Deliverables:

- AWIA Information Request Form.
- Bibliography of data.
- Summary of critical thresholds.

Task 6.3 – Threat and Asset Characterization and Creation of Threat-Asset Pairs

Objective: Identify City water system assets and threats. Eliminate non-critical assets and non-feasible threats. Create Threat-Asset (T-A) Pairs for analysis in more detail in future tasks. The purpose of this Task is to narrow the number of assets, threats, and T-A pairs from a comprehensive list to a limited list of the top T-A pairs based on consequence. *For budgeting and planning purposes, it is assumed that this process will begin with a maximum of 250 water system T-A pairs. These T-A pairs then will be ranked and reduced to a top 50 list of T-A pairs for full analysis.*

Approach:

6.3.1 Identify and Characterize Assets: Work with the City and use the available documents and threshold criteria to create an initial asset table and chapter of the RRA Report.

- Use threshold criteria to identify critical assets and to eliminate non-critical assets from further consideration.
- Document why assets are critical.
- Organize and prepare tables and Assets chapter of RRA Report.

6.3.2 Identify and Characterize Threats: Work with the City and other resources to identify and characterize natural hazards, malevolent threats, and dependency/proximity threats.

- Document which threats are likely and deserve additional consideration and which are highly unlikely to this system and area and should be eliminated from further consideration.
- Organize and prepare Threats chapter of RRA Report.

6.3.3 Create T-A Pairs: Pair threats and assets for further analysis.

- Create table of T-A pairs.

6.3.4 Develop Consequence Rating Criteria for Preliminary Screening: Work with the City to identify and document numerical consequence rating criteria that can be used for preliminary screening of the T-A pairs. Consequence categories will include the following:

- Fatalities;
- Serious Injuries;
- Utility economic loss;
- Regional economic loss;
- Environmental impacts;
- Public confidence;
- Service denial (hours or days); and
- Other.

Document the criteria and apply the consequence rating criteria to the T-A pairs and rank them in a table. Organize and prepare Consequence Rating Criteria chapter of RRA Report.

6.3.5 Reduce the Number of T-A Pairs: Work with City staff in a workshop to reduce the number of T-A pairs to no more than 50. The number of T-A pairs will be reduced based upon:

- T-A pairs that can be grouped based on similar assets facing the same threats with similar consequences;
- Bottom-cutting of lower consequence T-A pairs; and
- Professional judgement.

Provided by City:

- Assistance on initial asset identification.
- Review of initial asset table.
- Review of Asset chapter of RRA Report.
- Review of Threats chapter of RRA Report.
- Review of T-A pairs table.
- Agreement upon consequence rating criteria for preliminary screening.
- Review of Consequence Rating Criteria chapter of RRA Report.
- Participation in reducing the number of T-A pairs.

RH2 Deliverables:

- Initial asset table.
- Critical asset table.
- Assets chapter of RRA Report (electronic form only).
- Threats chapter of RRA Report (electronic form only).
- Table of initial T-A pairs.
- Table of initial T-A pairs containing preliminary screening consequence criteria.
- Consequence Rating Criteria chapter of RRA Report (electronic form only).
- Table of T-A pairs to be analyzed for baseline risk and resilience.

Task 6.4 – Calculate Baseline Risk and Resilience

Objective: Identify, calculate, and document values for consequence cost, vulnerability, and threat likelihood that will allow for calculation of baseline risk for each T-A pair. Consider the cost of service denial to calculate the resilience of each T-A pair.

Approach:

6.4.1 Evaluate and Summarize Consequence Costs: Estimate the planning-level costs if a threat is realized against an asset. Organize and prepare Consequence chapter of RRA Report.

6.4.2 Evaluate and Summarize Vulnerability: Calculate the probability (0 = not vulnerable; 1 = highly vulnerable) that the asset will fail if the paired threat occurs using methods such as available data, event trees, path analysis, vulnerability logic diagrams, historical knowledge, and interviews with suppliers. Organize and prepare Vulnerability chapter of RRA Report.

6.4.3 Evaluate Threat Likelihood: Utilize available sources of information to calculate the likelihood of a threat occurring in any given year (1 = certain; 10^{-10} = highly unlikely) for each T-A pair. Organize and prepare Threat Likelihood chapter of RRA Report.

6.4.4 Calculate Baseline Risk of Each T-A Pair: Calculate baseline risk ($ per year) for each T-A pair.

- Multiply the values of Consequence, Vulnerability, and Threat Likelihood developed in this Task.

6.4.5 Calculate Baseline Resilience of Each T-A Pair: Calculate the baseline resilience ($ per year) for each T-A pair.

- Multiply the cost to the City (duration in days multiplied by lost revenue per day) by the vulnerability and threat likelihood. Use the values for vulnerability and threat likelihood as developed in this Task.

Provided by City:

- Review of Consequence chapter of RRA Report.
- Review of Vulnerability chapter of RRA Report.
- Review of Threat Likelihood chapter of RRA Report.
- Review of table of T-A pairs showing values for variables and calculated baseline risk and resilience.

RH2 Deliverables:

- Consequence chapter of RRA Report (electronic form only).
- Vulnerability chapter of RRA Report (electronic form only).
- Threat Likelihood chapter of RRA Report (electronic form only).
- Table of T-A pairs showing values for variables and calculated baseline risk and resilience.

Task 6.5 – Risk and Resilience Management

Objective: Identify potential mitigation measures to reduce the risk and/or increase the resilience of T-A pairs and the system as a whole.

Approach:

6.5.1 Identify Potential Mitigation Measures: Identify up to ten (10) potential mitigation measures to reduce the risk of T-A pairs.

6.5.2 Develop Live-Cycle Cost Estimates for Potential Mitigation Measures: Prepare planning-level costs covering both capital and operations and maintenance costs of the potential mitigation measures.

6.5.3 Calculate Mitigated Risk: Recalculate risk based on revised consequence, vulnerability, and threat likelihood values based on the potential mitigation measure being carried out.

6.5.4 Calculate Benefits of Potential Mitigation Measures: For T-A pairs with reduced risk due to mitigation measures, calculate the following:

- Gross Benefit = Baseline Risk – Mitigation Risk.
- Net Benefit = Gross Benefit – Mitigation Measure Cost.
- Benefit/Cost Ratio = Net Benefit/Mitigation Measure Cost.
- Identify Timeline of Mitigation: Short (immediately), mid-term (1 to 5 years), or long-term (greater than 5 years).

6.5.5 Select Mitigation Measures: Assist the City with determining and prioritizing which potential mitigation measures to include in a prioritized implementation plan. Organize and prepare Risk and Resilience Management chapter of RRA Report.

Provided by City:

- Decide and prioritize which mitigation measures to implement.
- Review Risk and Resilience Management chapter of RRA Report.

RH2 Deliverables:

- Table of T-A pairs showing benefit and potential mitigated risk calculations.
- Risk and Resilience Management chapter, including prioritized implementation plan (electronic form only).

Task 6.6 – Finalize RRA

Objective: Finalize RRA for the City's submittal of the certification letter to EPA.

Approach:

6.6.1 Finalize RRA: Incorporate all chapters and tables previously prepared into a single RRA report. Prepare an executive summary, cover, table of contents, and redacted prioritized implementation plan. Provide to City for review. Prepare final report based on City comments.

Provided by City:

- Review of complete RRA Report.
- Submittal of electronic certification to EPA.

RH2 Deliverables:

- Draft and Final RRA Report (electronic form only).

Task 6.7 – Emergency Response Plan Update

Objective: Prepare a simple and flexible ERP update that incorporates the work of the RRA and addresses new requirements under the AWIA.

Approach:

6.7.1 Review Existing ERP: Review existing ERP (*Emergency Operations Plan* dated September 2002).

6.7.2 Identify Proposed Updates to the ERP: Identify sections of the ERP proposed to be updated and discuss proposed updates with the City to determine which to undertake.

6.7.3 Prepare Initial Draft ERP: Draft the updated ERP to comply with AWIA requirements. Obtain City comments on the initial draft and prepare an updated draft document.

6.7.4 Facilitate ERP Training Workshop and Tabletop Exercise: Participate in an ERP workshop to be conducted at the City's facilities. *It is assumed the workshop will be four (4) hours in duration and the tabletop exercise also will be four (4) hours in duration. The tabletop exercise*

will be able to be held in person since it will be held in approximately October 2021. Facilitate tabletop testing of ERP as follows:

- Participate in a workshop to introduce City staff to the ERP.
- Identify one (1) emergency scenario that will be run during the tabletop exercise.
- Facilitate tabletop exercise to test the ERP.
- Discuss the ERP and the exercise results with participants and identify any needed ERP adjustments.

6.7.5 Finalize ERP: Based on feedback received during Subtask 6.7.4, prepare final ERP and submit to the City.

Provided by City:

- Existing *Emergency Operations Plan* (EOP).
- Review and comment on initial draft ERP.
- Meeting space and arranging for participation of necessary staff to perform an ERP training workshop and tabletop exercise.
- Guidance on updates to make to draft ERP based on the workshop and tabletop exercise result.
- Review of final ERP.
- Submittal of electronic certification to EPA.

RH2 Deliverables:

- Initial Draft ERP (electronic form only).
- Draft ERP (electronic form only).
- Training workshop and tabletop exercise facilitation.
- Final ERP (electronic form only).

EXHIBIT B

Fee Estimate
Amendment No. 1
City of Snoqualmie
Water System Plan, General Sewer and Wastewater Facilities Plan, and Stormwater System Plan Updates
Additional Analyses for Utility Plan Updates and AWIA Risk and Resilience Assessment/Emergency Response Plan
Jun-20

	Description	Total Hours	Total Labor	Total Subconsultant	Total Expense	Total Cost
Task 5	ADDITIONAL WORK FOR UTILITY PLAN UPDATES	351	$ 62,093	$ 21,896	$ 3,901	$ 87,890
5.1	Additional Hydraulic Sewer Model Development	100	$ 16,483	$ 10,918	$ 1,556	$ 28,956
5.2	Growth Projection Revisions and Additional Analyses	245	$ 44,444	$ -	$ 2,294	$ 46,738
5.3	Additional Stormwater Model Updates	-	$ -	$ 10,978	$ -	$ 10,978
5.4	SCADA Data Acquisition for ASR Study	6	$ 1,166	$ -	$ 52	$ 1,218
Task 6	RISK AND RESILIENCE ASSESSMENT AND EMERGENCY RESPONSE PLAN	333	$ 64,994	$ -	$ 2,831	$ 67,825
6.1	Project Management	26	$ 5,568	$ -	$ 270	$ 5,838
6.2	Project Kickoff	17	$ 3,298	$ -	$ 172	$ 3,470
6.3	Threat and Asset Characterization and Creation of Threat-Asset Pairs	63	$ 12,228	$ -	$ 904	$ 13,132
6.4	Calculate Baseline Risk and Resilience	72	$ 13,696	$ -	$ 433	$ 14,129
6.5	Risk and Resilience Management	58	$ 11,102	$ -	$ 389	$ 11,491
6.6	Finalize RRA	17	$ 3,342	$ -	$ 84	$ 3,426
6.7	Emergency Response Plan Update	80	$ 15,760	$ -	$ 578	$ 16,338
	AMENDMENT 1 TOTAL	**684**	**$ 127,087**	**$ 21,896**	**$ 6,732**	**$ 155,714**

Contract Total	
Original Contract Total	$788,809
Previous Amendments	$0
This Amendment	$155,714
Project Total	$944,523