CITY OF FORT BRAGG

REQUEST FOR PROPOSALS FOR WATER SYSTEMS DISTRIBUTION MASTER PLAN

The City of Fort Bragg is seeking proposals from qualified consultants interested in contracting with the City to prepare a Water Systems Distribution Master Plan. The purpose of the distribution master plan is to identify and prioritize critical water system improvements to the City of Fort Bragg treated water distribution system to ensure that a resilient system with adequate water facilities necessary to meet current and future demand remains available to customers in perpetuity.

BACKGROUND

The City of Fort Bragg owns and operates its water utility from source water to customer delivery. The City of Fort Bragg has a Water System Study and Master Plan that was completed by John Carollo Engineers, and adopted by the City Council on April 14, 1986 (36 years ago). The purpose of the study and master plan was to evaluate several aspects of the water supply system including present and future water supply sources; water treatment plant components; bypassing Newman Reservoir; physical improvement of existing sources; and computer simulation of the existing and future distribution systems using University of Kentucky's "Computer Analysis of Flow in Pipe Networks." Recommendations within the plan were based on information contained within the 1980 General Plan and were estimated to include development through the year 2000.

Much of the work recommended from the 1986 plan has been completed and numerous changes within the community have taken place affecting current water usage as well as future demand. The City has since adopted new General Plans (2008 and 2012), installed numerous capital improvements to the water system, and worked on a reuse plan for the Mill Site property covering about 1/3 of the City that upon development will create new demands on the water system.

In November 2013, the City contracted with KASL Engineers to prepare a Water Facilities Study, which includes existing water collection, distribution, and capacity. This study also identified and prioritized critical improvements to the City water supply and treated water distribution systems, network modeling of the existing treated water distribution system, and evaluated the capacity of raw water and treated water systems. They created an in-house Network Hydraulic Model of the City's distribution system for the analysis. That model was updated with the proposed industrial north side water extension in 2019.

The City's economic base has been undergoing a major transition for many years. The Georgia Pacific (GP) Lumber Mill (Mill Site), previously the City's largest employer, ceased

operations in 2002. To this day, the undeveloped area of the Mill Site occupying 315 acres is zoned Timber Industrial. Over this same time, the regional fishing industry has been in decline while the local tourism sector has been growing and has roughly offset these economic losses. Consequently, there has been little to no net growth in the City's population for 20 years or more.

The City of Fort Bragg (including the GP property) relies entirely on surface water to meet water demands.

The City's water system includes:

- The **Water Treatment Plant** is located within the City's Corporation Yard at 31301 Cedar Street in Fort Bragg.
- Water supply comes from **three (3) surface water sources**.
    - Two are spring fed; sourced from Waterfall Gulch and Newman Gulch. These two surface diversions flow via gravity through the raw water pipeline to the water treatment plant.
    - The third is a pump drawing water from the Noyo River. The Noyo River diversion includes a wet well at the Noyo River and a pump station that is a separate conduit that carries raw water to the treatment plant.
- A **45-Acre-Foot Reservoir** at the end of Summers Lane that provides emergency water storage during low flow conditions. The reservoir draws and stores water from Waterfall Gulch.
- A **Small Desalination Plant** has been operational since the fall of 2021. The desalination intake is the same as the Noyo River pump. Brackish water in the river occurring during low flows and high ocean tides is pumped to a storage tank at the water treatment plant. The desalination plant treats this brackish water before discharge to the raw water ponds where it is sent to the treatment plant for further processing.
- There are **four (4) Finished Water Tanks: three (3)** 1.5-million-gallon tanks are located at the Corporation Yard, and **one (1)** 0.3-million-gallon tank located on Highway 20 just outside the City Limits.
- Water is supplied to customers primarily via gravity flow through the water **Distribution System**.
    - Gravity delivery uses water service pressures controlled by water surface elevations in the water treatment plant storage.
    - One area of the City referred to as the East Fort Bragg Pressure Zone (EFBPZ) is located where the elevations are too high to be served by gravity. The EFBPZ is served by a pump station located on Willow Street.
- **Smart Meters.** The City recently began the upgrade of all customer meters to **Badger E-Series** Ultrasonic Plus with Integrated Shutoff Valve (installation contract in progress at time of writing RFP).

Update of the existing plan is essential to direct City staff in developing a plan for future needs. The City's water distribution system is critical to the City's water security, so having a relevant master planning document is crucial to understanding and strategically rehabilitating the

system. The proposals should anticipate providing support to the City from Master Planning through Preliminary Engineering Reporting, which culminates in a comprehensive document that can be used to facilitate funding applications, environmental analysis, project design, and construction.

Other Background Variables for Consideration:

a. The City of Fort Bragg is located in an area subject to **seismic activity.**
    - While there are no active earthquake faults in the City, the San Andreas Fault is located approximately nine (9) miles to the west, and the Mayacama fault is 22 miles to the east.
    - Should the Pudding Creek or Noyo River Bridges become unusable following a seismic event, people may not be able to evacuate, emergency access would be blocked, and there is high potential for water distribution line damage/failure in these locations.
    - One of the primary Water Master Plan goals is to create resiliency in the City's water system and thus should address seismic protection of the system against risks associated with the effects of earthquakes, landslides, slope instability, subsidence, tsunami and other hazards including flood and fire.
b. The City's **Water Treatment Plant** is currently undergoing rehabilitation (2022) and includes rehab of water tank #2.
    - The City is transitioning to **Smart Water Meters** and the installation contract is in progress. The new meters will provide 100% reading accuracy (up from the current 94.2% accuracy), and include early leak detection alarms both to the City and customers, helping to prevent water loss and increase cost savings. The project will replace all existing meters (up to 2,700 residential water meters and 300 commercial water meters) in existing water meter boxes.
c. The City is preparing to commence design of the **Water and Sewer Line Extension** for the industrial area north of Pudding Creek to the edge of the City limits. The selected consultant should plan to coordinate with the design engineer selected for this project if it is underway simultaneously with Master Planning. Preliminary hydraulic modelling was performed by KASL in 2019.
d. The City does not have a **Programmatic EIR** for its utility master plans or Capital Improvement Program (CIP). Historically, City practice has been to undertake environmental review as part of each project. The City is interested in understanding the benefits and risks of the timing of the environmental review for utility master planning.
e. The following facilities and infrastructure are **Not Planned for Consideration** with this study, unless distribution system investigation deems necessary:
    a. Existing water sources
    b. Existing raw water transmission pipes
    c. Water treatment facilities
    d. Existing water storage facilities
    e. Waste Water Treatment Plant
    f. Storm drainage facilities

PROJECT DESCRIPTION AND GOALS

The Water Master Plan update is expected to consist of review of the existing Master Plan document. The selected Consultant will need to gain a clear understanding of the current issues and plan for the future by examining the existing customer base, permitted water resources, and anticipating future connections. The project includes updates to modeling/mapping of the water distribution infrastructure via computer modeling to provide recommended improvement projects to ensure resiliency to the City's water infrastructure and improve automation and valve isolation capabilities for better control of the system as a whole. Preliminary Engineering Reports will identify projects with detailed project descriptions, priority ranking, schedules, and budgets. Additionally, the City is seeking recommended strategies for climate change, improving water efficiency, and conservation so the City can efficiently maintain existing infrastructure and plan for the future.

Specific issues that the project should address include maximizing planning potential; minimizing water waste; prioritizing crucial infrastructure needs; identifying leaks in water supply lines; improving automation and isolation capabilities, scheduling of water line replacements; coordinating water draws with other users in the area to maintain instream water resources; and working with local watershed groups to maximize the protection of sensitive fish and other members of native river community.

Implementation of this project is also expected to provide the City with itemized project cost estimates that will be used to coordinate investments in maintaining the City's water system into the future utilizing existing permitted water resources and maintaining ecological integrity in our local watersheds.

SCOPE OF WORK

<u>This contract would consist of the following five (5) major tasks:</u>

All Tasks 1-4 and Alternates assume the consultant will work closely with staff both virtually and on-site for **working meetings** as needed to coordinate and complete the various tasks and deliverables**.**

TASK 1: MASTER PLAN

Review of the existing Master Plan to gain a clear understanding of capacity planning needs, and prepare a distribution system condition assessment including pressure zones, pumps, potentially failing/leaking lines, and all other appurtenances.

TASK 1 DELIVERABLES:

1. Technical report on the existing conditions and constraints of the pipeline and appurtenances, with copies of all data in an appendix.
2. Draft Master Plan Report.

3. Attendance and presentation at up to three (3) City Council meetings, including preparation of staff reports, meeting notes that incorporate all agency comments, and recommendations to Council regarding adoption of the Final Master Plan.
4. Final Master Plan Report including all other deliverables (listed below) both digitally and three (3) bound hard-copy reports.

TASK 2: MAPPING AND MODELING

Work with staff to evaluate robustness of the City's mapping resources (GIS/AutoCAD) to handle a new Master Plan modeling, recommend the appropriate system software, and update the distribution System Map Modeling accordingly. This task will include fieldwork, surveying, geotechnical evaluations, potholing utilities, etc., sufficient for mapping deliverables.

TASK 2 DELIVERABLES:

1. Technical memo evaluating acquisition of existing model (and database) prepared by KASL vs. creating a new distribution system model or some combination of each. The report should analyze staff capabilities and capacity, associated cost of varying options, and benefits or consequences of each.
2. Identify and map existing distribution system by researching and reviewing maps and by performing fieldwork and surveying.
3. Complete a field investigation and assessment of existing conditions and constraints of the pipeline and appurtenances.
4. Survey data: Raw data points and processed data.
5. Complete distribution system database (delivered in selected software) including:
    a. Attributes like mains, valves, hydrants, water meter laterals, pressure zones, pumps, and all other appurtenances; and
    b. Condition Assessment Data of mapped attributes like pipe size, material, coordinates, age (if known), condition index, priority for replacement, etc.
6. Updated modeling/mapping of water infrastructure packaged and delivered to the City staff in the selected program medium.
7. Use the Risk Assessment Condition Index criteria (established in Task 4 Deliverable 3) to the model database to help improve project prioritization.

TASK 3: ANALYZING ENVIRONMENTAL VARIABLES

Evaluate the existing and proposed water sources and the distribution system in relation to existing and proposed water needs to ensure the system is sized for reasonably Expected Growth, Water Shortage Contingency Planning, and Climate Mitigation Strategies given the City's existing water sources and potential alternate sources and given the City's distribution system.

- Review the City's most up-to-date Municipal Services Review report and evaluate reasonably expected Growth Factors for future potable water delivery to:
    - The GP Mill site;
    - North Fort Bragg industrial water line extension from Pudding Creek to edge of City Limits (a 2022/23 programmed CIP project);
    - Further development/annexation of the Harbor areas; and
    - One (1) additional future annexation area, as defined in most updated LAFCO Municipal Services Review. This will likely be east Fort Bragg area.

- Review the City's General Plan (inland and coastal) Element 7 Safety and other Emergency Contingency Planning documents and consider Disaster Mitigation strategies and other environmental factors impacting the City's water resiliency planning including:
    - Impacts of climate change and sea level rise;
    - Analyze geotechnical sensitive areas most subject to seismic activity including earthquakes, landslides, slope instability, subsidence, tsunami, other geologic hazards, flood, and fire;
    - Environmental factors; including soil corrosiveness, pH, ground water, etc.;
    - Environmental Practices; including improving water efficiency, conservation, and working with local watershed groups to maximize the protection of sensitive fish and other members of the native river community.

TASK 3 DELIVERABLES:

1. Technical Report including analysis of future water demand, resiliency planning, and consideration of environmental factors. The report should recommend strategies for Climate Change and other disaster preparedness, address water efficiency and conservation in keeping with environmental constructs and ethical practices, discuss new, innovative, or emerging pipe/water system technologies.
2. Prepare a memo analyzing the cost/benefits of preparing a Programmatic EIR for City utility master plans and proposed Capital Improvement Projects (CIP) and risks of the timing of the environmental review on a project-by-project basis without a comprehensive environmental document.

TASK 4: CAPITAL PROJECT PLANNING

Identify and prioritize critical water system improvements to ensure strategic approach to rehabilitating the system. The study should analyze and prioritize improvements based on information gathered from data analysis, Tasks 1, 2, and 3, meetings with Staff, and ensure first water security of existing customers, followed by recommended improvements for future demand. Improvement strategy should consider:

- Ensuring that adequate water facilities are available to meet current maximum day demands and fire flow demands.
- Capacity Planning and Improvements: Identification of new water demand within the City and recommendations of necessary system modifications to ensure the water demands of future projected growth can be accommodated.
- Analyze the City's current asset management practices for the water distribution system scoping and prioritize future asset management procedures (tracking, evaluating, and replacing aging infrastructure).
- Project Funding Opportunities and funding streams.

TASK 4 DELIVERABLES:

1. Project Practicability Report including hydraulic analysis of any proposed replacement pipeline using material and diameter alternatives based on verified capacity and operational needs.
    a. This task will require either coordination with the consultant (KASL Engineers) who maintains the City's existing proposed projects to run data through

existing hydraulic analysis model, procurement of the existing mode from KASL, or creation of a new model based on recommendations from Task 2 Deliverable 1.

b. Include operations and maintenance costs over anticipated service life. Include maintenance specifications and schedules when new materials are proposed for introduction into City system.
c. Environmental factors; including soil corrosiveness, pH, ground water, etc.;

2. Technical memo of risk-based analysis of likelihood of failure and consequence of failure assessing the existing infrastructure conditions and defined risk assessment condition index criteria to help improve the capital project prioritization.
3. Recommended projects which include for new, innovative, and emerging water system technology as deemed appropriate for given location, budget, and other factors analyzed herein (i.e. pipe-lining, seismic retrofits, flexible piping, grooved systems, grooved pipe joining methods, flexible coupling housing, expansion joints, C909, etc.).
4. Schedule of distribution system rehabilitation projects based on identified priorities funding availability, and feasibility of successful project implementation including factors like staffing.
5. Preliminary Engineering Report for all recommended projects needed to bring the system infrastructure into a fully rehabilitated state including, mapping, detailed project descriptions to support environmental review and permitting analysis for seeking project funding from a variety of State and Federal sources; schedules; cost estimates associated with such improvements; grant funding competitiveness analysis; constructability and performance; and priority ranking.
6. Asset Management Planning recommendations including a valuation of current Assets for use by staff to maintain the system day to day and into the future beyond the proposed rehabilitation projects.

ALTERNATE TASKS:

1. Preparation of CEQA/NEPA determinations and associated studies needed for grant applications.
2. Preparation of Programmatic EIR for CIP projects associated with Utility Master Plans.

AVAILABLE REFERENCE DOCUMENTS:

The following reports and records are available for review and background information:

a. The current Water Master Plan (1986) and Water Facilities Study (2013).
b. Planning and Engineering reports and documents, operational data, geographic information data, regulatory standards and policies, jurisdictional land use documents, proposed developments, City's General Plan (inland and coastal), population projections, Supervisory Control and Data Acquisition (SCADA) settings and controls, meter records, and all other data pertinent to the project.
c. City's Standard Specifications and Standard Plans (2009).
d. Existing water hydraulic distribution model (under ownership of a private engineering firm, but can facilitate information gathering).
e. Existing water distribution maps (ArcGIS and AutoCAD).

f. Historical billing records.
g. Summary of chronic problems by type and locations (e.g. old and weak pipes, unknown pipe alignments, inadequate water pressure issues, water valves not exercised, etc.).
h. Emergency Preparedness planning documents.
i. Other relevant studies as needed.