Authorization for Additional Services

This Agreement is to provide additional professional engineering services for the project identified as follows:

Project Name: Redwood School Well Treatment

Consultant Project Number: FTBG21-004

Date of Original Agreement: July 27, 2021

Additional Services #: 1

The Client and the Consultant are identified as follows:

CLIENT:	City of Fort Bragg	CONSULTANT:	Coleman Engineering, Inc.
Name:	John Smith	Name:	Chad R. Coleman
Title:	Director of Public Works	Title:	President
Address:	416 N. Franklin St.	Address:	1223 Pleasant Grove Blvd., Suite 200
City, ST, Zip:	Fort Bragg, CA 95437	City, ST, Zip:	Roseville, CA 95678
Phone:	707-961-2823	Phone:	916-791-1188
e-mail:	jsmith@fortbragg.com	e-mail:	chad@coleman-eng.com

The following Scope of Additional Services, Schedule, Budget, and Budget Summary are added to the existing agreement referenced above, are effective as of the date signed on the last page and are subject to all of the terms of the original agreement.

1. SCOPE OF ADDITIONAL SERVICES

EXHIBIT A

Background

The City of Fort Bragg, CA (City) has access to a well located at the Redwood Elementary School (School) that is desired to be used as an emergency water supply source for the City's drinking water system. The City would like to utilize this well on a short-term basis to make up for deficiencies in the City's other potable water supplies during times of drought.

The well is hand dug construction to a depth of approximately 16-feet. The well is currently used for irrigation for the School. The City desires to use the well as a drinking water source for its public water system. Due to the shallowness of the well, water pumped from it will be treated as a surface water source.

Project Definition

This project is intended to culminate in production of an Engineering Report to detail the required facilities necessary for the Redwood Well to demonstrate compliance with the State Water Resources Control Board (SWRCB) Division of Drinking Water (DDW) requirements per the California Code of Regulations (CCR) Title 22 Chapter 17. This

Chapter of the CCR applies to water sources considered surface water, which applies to the Redwood Well due to its shallow depth.

The Redwood Well is currently used as an irrigation source for the School. The existing pump installed in the well is stated by the City to provide approximately 40 gpm. Details of the pump are unknown, but it is anticipated that the pump does not meet current drinking water standards. A new pump that complies with current State drinking water standards will be sized to provide 40 psi and sufficient head to account for losses by the treatment facilities and pumped into the City's system via a hydrant.

The anticipated treatment of the Redwood Well will address the following water quality parameters:

- Microbiological contaminants
- Iron, in excess of the secondary MCL
- pH, below the lower secondary MCL

Microbiological Inactivation

Per the cited CCR Chapter, the water disinfection system will require a minimum 4-log microbiological inactivation of per the following table:

Contaminant	Required Inactivation
Cryptosporidium	2-log (99%)
Giardia lamblia	3-log (99.9%)
Viruses	4-log (99.99%)

Microbiological inactivation can be achieved through conventional or direct filtration. Coleman Engineering will research available treatment systems with the goal of minimizing footprint, operations, maintenance, and chemical use much as practical. It is anticipated that disinfection facilities will be required in addition to filtration to achieve 4-log inactivation in total. Chemical injection of sodium hypochlorite is anticipated to be used for disinfection before distribution to the water system.

Iron Removal

Water samples from the Redwood Well taken on 5/24/2021 documented an iron concentration of 390 µg/L, in excess of the secondary maximum contaminant level (MCL) of 300 µg/L. Community water systems, such as the City of Fort Bragg are required to provide water that is in compliance of this MCL. Greensand filtration systems are typical for iron removal. Water pre-treatment may be required before filtration and will be evaluated.

pH Adjustment

A pH of 5.83 was measured in well water samples taken on 5/24/2021, which is below the acceptable range for community water systems of 6.5 to 8.5. Additionally, other treatment processes may require higher pH levels. Therefore, pH adjustment will be necessary. Chemical injection of sodium carbonate (soda ash) or sodium hydroxide are typical methods to raise water's pH levels.

In addition to a new well pump and treatment facilities, Coleman Engineering will recommend accessory systems necessary to discharge treated water into the City's distribution system. The City has identified a nearby hydrant as the connection point to the system. The necessary components of this system will depend on the selection of the treatment systems. Possible components include a small, treated-water storage tank, booster pump, and piping.

Services and Data to be Provided to Coleman Engineering by the City

Prior to commencing engineering services, the City will provide the following services and data to Coleman Engineering:

- Alpha Analytical Laboratories, Inc. Report, Dated 14 June 2021, Work Order 21E2715
- Email Dated July 8, 2021; From Karen Jamgochian, SWRCB DDW; To: John Smith, Heath Daniels, City of Fort Bragg; Subject: Shallow Redwood Well Requirements
- Results from jar testing of the well water performed by BWS Inc.

Scope of Services

TASK 1 – Engineering Report: Water Treatment System

1.1 Project Management: Coleman Engineering will manage the project by coordinating with the Client and sub-consultants, allocating the resources, and planning and organizing its efforts to meet the goals of the Owner. Coleman Engineering has budgeted to attend up to two phone call meetings with the Client during the project. One site visit is budgeted for to meet with the Client at the site to discuss the project and gather information for the Engineering Report.

Additionally, the Coleman Engineering team will stay in contact with the Client using regular informal communications (telephone, e-mail, etc.).

1.2 Treatment System Research and Calculations: Coleman Engineering will coordinate with a water treatment systems supplier to select appropriate treatment components per the Project Description to address the following water quality issues of the Redwood Well:

- 4-log microbiological inactivation through filtration and disinfection
- High levels of iron in excess of the MCL
- Low pH, outside the acceptable regulatory range.

Coleman will also consider well water turbidity levels to provide facilities that comply with CCR Title 22. Coleman will perform necessary calculations to appropriate size and determine the process flow of treatment facilities.

1.3 Pump and Conveyance System: Coleman Engineering will perform calculations and make selections of the following hydraulic facilities as necessary to convey water from the well, through the treatment systems, and into the distribution system via a nearby hydrant:

- Well pump with capacity of 40 gpm and sufficient discharge head for the selected treatment systems
- Polyethylene holding tank of treated drinking water, approximately 250 gallons
- Booster pump, not to exceed 7.5 HP
- Alignment of approximately 500 feet of temporary, above ground, 2-inch diameter site piping
- Associated appurtenances: flow meter, check valve, gate valves, air and vacuum vents, sample taps

1.4 Permit Amendment Application: Coleman Engineering will complete the DDW permit amendment application with the following attachments for the City to submit to DDW for their approval for use of the well as a drinking water source for the City's public water system:

- DDW Permit Amendment Application
- Engineering Report from Task 1.5

1.5 Engineering Report: Coleman Engineering will compose an Engineering Report to submit to DDW describing the proposed treatment facilities. The report is anticipated to have the following outline:

- Existing System Conditions
  - General description of City's water system
  - Redwood well description
- Proposed Well Modifications
  - Submersible well pump
  - Well head discharge piping
- Proposed Treatment Systems
  - Filtration
  - Disinfection
  - Iron Removal
  - pH adjustment
- Connection to City's System
  - Treated water storage
  - Booster pump
  - Piping
- Recommendations
  - Process Flow Diagram

Task 1 Deliverables:

- *Draft Engineering Report*
- *Final Engineering Report*
- *Permit Amendment Application to DDW*

TASK 2 – Consultations and Follow-Up

2.1 Consultations and Follow-Up: Coleman Engineering has budgeted 32 hours to provide assistance and answer questions from the Division of Drinking Water and the City proceeding submittal of the Final Engineering Report. Any hours requested in excess of this amount will required written prior authorization from the City.

Task 2 Deliverables:

No deliverables for Task 2.

Additional Services

The following services are not included in this Scope:

- Detailed design, plans, and specifications of water system improvements
- Topographic surveying
- Geotechnical engineering and recommendations
- Electrical engineering
- Structural engineering

Tasks Not Included in this Scope of Services

This Scope of Services is intended to outline the services offered to the City by Coleman Engineering. The list below is offered as a clarification of the services that are not included, not anticipated, or that will be completed by others.

1. Coleman Engineering CAD standards to be used.
2. No detailed design, construction plans, or specifications will be prepared as part of this Scope of Services (may be offered under a separate contract).
3. Electrical Engineering is not included in these services.
4. Dry utility connections will be provided by the Client.
5. Surveying or mapping are not included in these services.
6. Geotechnical Engineering to characterize site soils and extent of groundwater and rock is not included in this Scope of Services.
7. Utility coordination and design, including potholing will not be provided as part of this Scope of Services.
8. SWPPP preparation is not included but will likely be required during detailed design.
9. No front-end documents including bidding documents, construction contract, general and special conditions, bond forms, etc. to be provided in this phase.
10. The only coordination for approvals that will be made are with the City and the State Water Resources Control Board Division of Drinking Water. No other agencies will be consulted, coordinated with, or sought out for approvals.
11. Obtaining any required construction permits.
12. Full time construction inspection (may be offered under a separate contract).
13. Legal review of bidding documents.
14. Expert witness services (may be offered under a separate contract).
15. Obtaining NPDES permits for discharges from sites (may be offered under a separate contract).
16. Hazardous materials permits or approvals.

2. SCHEDULE

Coleman Engineering will provide services in an expeditious and professional manner. We expect to be informed of overall project schedules and goals and will endeavor to provide services in a manner that compliments and supports those larger project milestones.

3. BUDGET

Coleman Engineering will bill on a Time and Materials basis according to the terms of payment outlined in the Agreement. The estimated budget includes the cost of expenses directly related to the project including mileage, duplication, blueprinting, postage, delivery charges, plotting, outside reproductions, etc.

Coleman Engineering estimates the following budgets will be required to provide the Engineering Report described above. The tasks and budgets below do not include detailed design, construction engineering services, or construction inspection.

Task	Scope Item	Estimated Budget
1	Engineering Report: Water Treatment System	$35,000
2	Consultations and Follow Up	$5,000
	TOTAL ENGINEERING BUDGET =	**$40,000**

4. BUDGET SUMMARY

Original Budget =	$15,000
Sum of Previous Changes to Budget =	$0
Budget of this Scope of Additional Services =	$40,000
New Project Budget =	$55,000

The above is mutually agreed to this _____ day of _____, 2021.

City of Fort Bragg	**Coleman Engineering, Inc.**
By: _____	**By:** Chad R. Coleman
Name: _____	**Name:** Chad R. Coleman, P.E.
Title: _____	**Title:** President
	CA PE #: C 56490

[remainder of this page intentionally blank]