

SCOPE OF SERVICES

INTRODUCTION

The Storage Tank Replacement Project involves the design of two steel bolted epoxy lined 200,000-gallon tanks on reinforced concrete foundations at each of three County closed landfills: Roblar Closed Landfill, Sonoma Closed Landfill, and Guerneville Closed Landfill. In addition, the project includes a similar design to replace one of three potable water tanks that make up the Fitch Mountain Water System (FMWS). The design will include all ancillary piping, electrical, and control systems necessary to integrate the new tanks into the existing leachate collection and recovery system (LCRS) and the FMWS. The proposed storage tanks shall be designed to fit in the available locations at each site. For the LCRSs, the tanks should have the same inlet/outlet inverts so they can be used in conjunction with one another or independently. Tank specifications shall account for the necessary coatings and protective measures to ensure longevity for the intended utilization of leachate storage. It is also desirable that all tanks for the three sites share a similar if not identical design parameters.

The following tasks describe the scope of services to be performed by GHD (hereinafter “Consultant”) for the Leachate and Potable Water Storage Project (hereinafter “Project”). The Consultant may also suggest technical or procedural innovations that have been used successfully on other engagements and which may enhance the Project and provide the County with better service delivery.

The Scope of Services below incorporates all requirements in the RFP by reference with additional items that are specific to Consultant’s project delivery approach. Consultant will adjust this Scope of Services, with County’s approval, in order to meet the requirements and expectations for this Project.

Following submittal of the 60% Design Package, several scope changes were recommended based on requests from the County and findings from the geotechnical investigation. These additional scope items include:

- Design of leachate fill stations at Guerneville and Sonoma Closed Landfill sites. This includes a leachate pump; standpipe with shutoff valve; concrete pads for pumps and pipes and truck filling; a sump and sump pump; level controls and power; and associated drainage for the fill station.
- Design of a roughly 50-foot long and 6.5-foot-high retaining wall at the Roblar Closed Landfill site. The retaining wall is not expected to require deep foundations.
- Partial deep foundation design at the Hilltop site to mitigate differential settlement.

Design of leachate fill stations

After initial discussions with GHD, the County coordinated with Republic Services, who operates the landfill sites, to confirm there would be a long-term benefit to have fill stations in place. Based on these discussions, the County and Republic Services determined that fill stations would reduce the time needed to empty the leachate tanks into the hauling trucks, thus creating a long-term cost savings since a portion of hauling costs are associated with time spent filling the trucks. Currently fill times for hauling trucks range from 18 to 22 minutes, and the County and Republic services would like to reduce this time by 50%. This would not only reduce the fill time for a single truck but would minimize the potential of having a second truck in waiting

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while the first truck is being filled. Given the site layouts and accessibility, the County determined the fill stations are appropriate at Guerneville and Sonoma, but not Roblar.

The fill station design would include the following design elements:

- Leachate pump with capability of filling a 5,000-gallon hauling truck in approximately 10 minutes.
- 10-foot stainless steel standpipe with shutoff valve, that unloads leachate into the top of the hauling trucks via a hatch. This standpipe can be similar to the standpipes sold by Cal West Rain.
- Concrete pad to place leachate pump and standpipe on. Concrete drainage ditch around pad to collect any leachate that is spilled.
- A roughly 8-foot by 8-foot concrete pad around truck loading area to collect any leachate that is spilled during truck loading. Exact size may vary by site and will need to be confirmed during detailed design.
- Sump and sump pump to collect spilled leachate and transfer back to leachate storage tanks.
- Level controls and power for the leachate pump and sump pump. Including development of single line diagrams.

GHD's scope will include design of the elements summarized above, and incorporation into the existing leachate storage tank design at Guerneville and Sonoma. Scope will also include the development of associated technical specification sections and inclusion in the construction cost estimate. The following assumptions are made:

- County will provide hauling truck specifications to confirm length and height of largest hauling trucks.
- Site drainage improvements, aside from the truck filling area and concrete pad for the standpipe will not be included in this scope.
- County will specify control preference for leachate pumping.

Retaining Wall Scope

As part of the original scope of work, Miller Pacific Engineering Group, Inc. (MPEG) completed geotechnical investigations at each of the closed landfill and potable water sites. At the Roblar site, MPEG found that soil conditions around the tank area can only support a 2:1 (horizontal:vertical) slope without requiring a retaining wall. The proposed location for the new storage tanks is the same location as the existing storage tanks, which is surrounded by the landfill access road, a steep uphill slope, Roblar Road and the pump house and generator. GHD assessed multiple grading scenarios to avoid requiring a retaining wall, however, due to limited space, grading the slope on all sides so that it's within the 2:1 requirement is not possible without impacting the access road or Roblar Road.

GHD has developed a grading scheme which minimizes the length and height of the retaining wall with the

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intent of reducing design and construction costs. The figure below provides a snapshot of the proposed grading and retaining wall, which is designated in pink. The retaining wall is anticipated to be maximum 6.5-feet tall and roughly 50-feet long. It should be noted that this is a conceptual level design, and the retaining wall height and length will be confirmed during detailed design.

While the retaining wall is not expected to require a deep foundation, it will be an intricate design to balance constructability and over excavation of the existing grade. Soil or rock nails may be required, which would contribute to the complexity of the design.

Hilltop Tank

site is located in an area with varying bedrock depths. As part of MPEG's geotechnical investigation, two borings were drilled on the northern and southern portions of the tank. The boring on the northern side of the tank encountered bedrock at roughly a 3-foot depth, while the southern boring encountered bedrock at roughly a 12-foot depth. Since uniform bedrock is not provided, there is a risk for differential settlement of the tank. To mitigate this issue, MPEG recommends using a shallow ring foundation on the northern portion of the tank, and a cast in drilled hole (CIDH) piles at the southern portion of the tank to provide additional bearing capacity to minimize differential settlement.

Standard tank designs use shallow foundations, such as shallow rings. Only in unique circumstances is deep foundations recommended due to the specialized design requirements as well as the associated design and construction cost. Circumstances that would require deep foundations are typically only determined after geotechnical exploration is complete and confirmation of their necessity is revealed. Since GHD's initial scope and fee assumed standard foundation design (shallow foundation), the additional effort associated with designing deep foundations requires an amendment. GHD's additional scope of services in this amendment includes:

- Coordination with geotechnical engineer to obtain necessary design criteria for the CIDH piles, including end bearing capacity, lateral active and passive pressures, and LPile parameters.
- Structural modelling to confirm deep foundation design.
- Design of drilled piers for use by the tank manufacturer in finalizing the tank foundation design.
- Completion of associated design calculations and analyses.
- Development of technical specifications associated with deep foundation design.

TASKS

TASK 1 - PROJECT ADMINISTRATION, MANAGEMENT, AND COORDINATION

TASK 1.1: PROJECT INITIATION

Consultant's Project Manager will prepare a Project Work Plan and staff assignments. The project manager will schedule and attend a kick-off meeting with the County confirm Project requirements and details with the County in a mini design workshop so the design team has a clear understanding of

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County expectations for all Project elements and systems prior to initiating any design work. Consultant will discuss the tank material types available and the coating and lining system options for County and stakeholder consideration. County staff and the Fitch Mountain Water System operator, Russian River Utility (RRU), will attend the design workshop to provide the design team with their first-hand knowledge of the systems, operations, maintenance issues, and challenges the design team should be aware of. County staff and RRU will provide any available information needed to begin design, such as available mapping, reports and data. Consultant will prepare an agenda and distribute minutes after the meeting.

TASK 1.2: PROJECT COORDINATION AND REPORTING

Consultant's Project Manager will oversee the design team and coordinate with the County during the entire course of the project, including phone calls, email, and other correspondences necessary to successfully deliver the design and support to the County during construction. This task includes preparing a monthly progress report. Consultant's monthly Project reporting will include a narrative summary of task accomplishments during the reporting period, problems encountered or anticipated, activities scheduled for the next reporting period, and quality control program outcomes. Each month, County will receive a cost report organized by task showing the current period and cumulative expenditures to date, the approved budget, and the budget balance remaining. The Consultant's baseline MS Project will be updated monthly and provided to the County.

TASK 1.3: PROJECT MEETINGS

Consultant's Project Manager will organize and schedule monthly progress meetings to discuss issues and proposed resolutions to those issues in order to drive the Project forward toward completion. Consultant will also attend bi-weekly conference calls.

Consultant's Project Manager will schedule design review meetings with the County to discuss the review comments and receive feedback on the 30% Preliminary Design, 60% Design Development and 90% Design deliverables. Our key goals during these meetings are to receive County feedback, clearly understand the comments and concerns, and make sure the construction estimate is aligned with the County's available funding.

During the ongoing COVID-19 pandemic Consultant will utilize MS Teams video conferencing, or other screen sharing platforms for meetings that cannot be attended in person, and will use other digital resources to deliver this project in a safe and efficient manner and to protect the health and safety of all involved.

TASK 1.4: DESIGN QUALITY MANAGEMENT

The Quality Manager will develop a Project Quality Plan (PQP) documenting the QA and QC process that will be followed for the Project. This task includes an internal 15% project QA review, periodic design checks, QA/QC reviews, quality review meetings, and quality process documentation. Project quality documentation will be included with each deliverable.

Task 1 Deliverables:

- Project Work Plan (pdf)
- Project Quality Plan (pdf)

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- Meeting agenda and minutes (pdf)
- Monthly invoice, progress report and schedule update

TASK 2. DOCUMENT REVIEW, DATA COLLECTION AND SITE INVESTIGATION

TASK 2.1: REVIEW EXISTING DOCUMENTS

Consultant will collect and review existing documents, data, maps, record drawings and reports. The team will coordinate with County staff to obtain information on the proposed Project needed for design and site specific requirements that must be incorporated into the construction documents. Consultant will contact utility companies, including AT&T (phone), Cablecom (CATV) and PG&E (power and gas). It is understood that information on existing utilities provided by utility owners may not be complete (for example, vertical location of certain utilities may not be available) and cannot be verified during design. Utility information provided by the owners of the utilities will be compared against information obtained during the field visits and surveys to approximate the location of the existing utilities on the plans.

TASK 2.2: PERFORM SITE VISITS

Consultant will schedule site visits with the County to observe and document the existing conditions at each of the closed landfill sites and the Madrone Tank site. A key goal of the site visits is to meet with the leachate system operators and water system operator to identify any constructability issues, discuss maintenance issues and challenges, and confirm connections to the existing leachate pumping system, existing water system and telemetry systems.

TASK 2.3: TOPOGRAPHIC AND BOUNDARY SURVEY

Consultant's surveying, crew will perform a topographic survey at each of the closed landfill sites, and boundary survey at all sites except the Roblar Closed Landfill site. Research indicates that the Roblar Closed Landfill site is all within County of Sonoma boundaries and right-of-way.

The topographic survey of each site will be prepared at a drawing scale of 1 inch = 20 feet, unless otherwise requested, with a one-foot contour interval. The topographic survey will include the following:

- Topographic survey will include all necessary work to produce a topographic map, including features such as, but not limited to; building corners and elevations, curb lines, utility boxes, cleanouts, valves, manholes (including rim, invert and pipe information where accessible), utility markings on the pavement, utility poles, driveway and doorway locations, sidewalks, trees six (6) inches and larger, retaining wall, and any other pertinent information that could apply to the Project during design.
- Topographic survey will be provided on North American Vertical Datum of 1988 as established by GNSS observations.
- Topographic map to horizontally relate to California Coordinate System of 1983, Epoch 2017.50.

Prior to beginning, the survey areas will be reviewed and confirmed with the County to ensure the area is sufficient for the design, and addresses the County's expectations for each site.

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2.3.1 Guerneville Closed Landfill Site Topographic Survey

Topographic survey coverage area will include the proposed leachate storage tanks site, burn waste area, existing leachate storage, metal recycling collection area and access road to and including the existing upper and lower leachate collection areas and pumps.

2.3.2 Guerneville Closed Landfill Site Boundary Survey

A partial boundary retracement is recommended for this site. Consultant will perform the following:

- Boundary retracement and collect field data in sufficient detail to locate the westerly boundary of the Project site.
- Plot easements shown on latest title report (IF FURNISHED BY COUNTY).
- Locate fence lines, existing iron pipe property corners, and any features indicating lines of possession.

2.3.3 Roblar Road Closed Landfill Site Topographic Survey

Topographic survey coverage area will include the proposed leachate storage tanks site, existing collection and pump station, the access road down to the looped turn around and the full width of Roblar Road fronting the Project.

2.3.4 Sonoma Closed Landfill Site Topographic Survey

Topographic survey coverage area will include the proposed leachate storage tanks site and proposed access road to the south, the existing storage area, and the roadways in the image area of the proposed tank site and to the existing leachate collection and pump stations.

2.3.5 Sonoma Closed Landfill Site Boundary Survey

Consultant will perform a boundary survey of this site. Consultant's sub-consultant for survey work, Cinquini & Passarino, Inc. (CPI), filed a Record of Survey of this site in May of 2008. CPI will perform the following task:

- Field collect previous set monumentation in the vicinity of the Project site data in sufficient detail to depict the boundary adjacent to the Project site.
- Plot easements shown on latest title report (IF FURNISHED BY COUNTY).
- Locate fence lines, existing iron pipe property corners, and any features indicating lines of possession.

2.3.6 Fitch Mountain Water System Madrone Tank Site Topographic Survey

Topographic survey coverage area will include the area within the fenced tank site, 10 feet beyond the fence line and the access road down to Madrone Avenue.

2.3.7 Fitch Mountain Water System Madrone Tank Site Boundary Survey

Consultant will perform a boundary retracement to locate the adjacent northerly boundary line of the tank parcel based on existing record information. They will perform the following tasks:

- Perform a boundary retracement and collect field data in sufficient detail to locate the boundary lines of the tank parcel.
- Plot easements shown on latest title report (IF FURNISHED BY COUNTY).
- Locate fence lines, existing iron pipe property corners, and any features indicating lines of possession.

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Note: if a material discrepancy is found between record information and the monuments located in the field, a Record of Survey will be required.

2.3.8 Fitch Mountain Water System Hilltop Tank Site Topographic Survey

Topographic survey coverage area will include the area within the fenced tank site, 10 feet beyond the fence line and the access road down to Hilltop Road.

2.3.9 Fitch Mountain Water System Hilltop Tank Site Boundary Survey

Consultant will perform a boundary retracement to locate the adjacent northerly boundary line of the tank parcel based on existing record information. They will perform the following tasks:

- Perform a boundary retracement and collect field data in sufficient detail to locate the boundary lines of the tank parcel.
- Plot easements shown on latest title report (IF FURNISHED BY COUNTY).
- Locate fence lines, existing iron pipe property corners, and any features indicating lines of possession.

Note: if a material discrepancy is found between record information and the monuments located in the field, a Record of Survey will be required.

2.3.10 Fitch Mountain Water System Del Rio Tank Site Topographic Survey

Topographic survey coverage area will include the area within the fenced tank site, 10 feet beyond the fence line and the access road.

2.3.11 Fitch Mountain Water System Del Rio Tank Site Boundary Survey

Consultant will perform a boundary retracement to locate the adjacent northerly boundary line of the tank parcel based on existing record information. They will perform the following tasks:

- Perform a boundary retracement and collect field data in sufficient detail to locate the boundary lines of the tank parcel.
- Plot easements shown on latest title report (IF FURNISHED BY COUNTY).
- Locate fence lines, existing iron pipe property corners, and any features indicating lines of possession.

Note: if a material discrepancy is found between record information and the monuments located in the field, a Record of Survey will be required.

Task 2.3 Deliverables:

- One (1) original full-size sealed Topographic Survey Map with the boundary/right of way for each site, three (3) hard copies and electronic (pdf).
- AutoCAD “dwg” files for each site used to create the hardcopy survey maps for use in design.

2.4 : GEOTECHNICAL INVESTIGATION

Consultant will perform a geotechnical investigation at each of the Guerneville, Roblar Road and Sonoma closed landfill sites, and the Fitch Mountain Water System Madrone Water Tank, Hilltop Tank, and Del Rio Tank sites to evaluate site geologic conditions and provide geotechnical criteria and recommendations for use in Project planning, design, and construction.

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2.4.1 Geotechnical Investigation

Consultant will perform a design level geotechnical investigation to aid in the design and construction of the proposed leachate tanks and potable water tank. The investigation will include the following items:

- Site reconnaissance to observe and document existing conditions.
- Coordination with Underground Service Alert (USA) to mark underground utilities in areas of potential subsurface exploration.
- Subsurface exploration consisting of two to three borings at each site utilizing portable or track-mounted drilling equipment over a three-day period. It is anticipated that the borings will extend 20 to 30-feet below the ground surface or at least 5-feet in to weathered bedrock.
- Review of readily available, published geologic mapping and geotechnical background information from Consultant's in-house library.
- Laboratory testing to characterize subsurface soils and aid in our geotechnical evaluation. Laboratory testing will include moisture content; dry density; unconfined compressive strength; plasticity index; and Caltrans corrosion resistance.
- Evaluation of geologic hazards and mitigation measures including surface fault rupture, seismic shaking, liquefaction potential, seismic induced settlement, lurching & ground cracking, erosion, seiche & tsunami, flooding, settlement, expansive soil, slope instability and soil corrosion.
- Engineering analyses to develop design level geotechnical recommendations and design criteria related to foundations, site grading, retaining walls, seismic design, and other geotechnical- related items.

Consultant will prepare a draft geotechnical investigation report which summarizes the subsurface exploration and laboratory testing programs, evaluation of relevant geologic hazards, and geotechnical recommendations and design criteria. The report will be included with the 30% design submittal for County review. Comments will be addressed and incorporated into the final geotechnical investigation report, which will be included with the 60% design submittal.

2.4.2 Supplemental Consultation and Geotechnical Plan Review

Consultant will provide geotechnical consultation as requested during the design process and as the Project plans are being prepared. When the plans are near completion (90% Design), Consultant will review the plans to confirm that the intent of their recommendations has been incorporated. A review letter will be provided to the County.

Task 2.4 Deliverables:

- Draft Geotechnical Investigation Report: Four (4) hard copies and electronic (pdf).
- Final Geotechnical Investigation Report: Four (4) hard copies and electronic (pdf).
- Geotechnical review letter: Four (4) hard copies and electronic (pdf).

2.5 : HAZARDOUS MATERIALS CHARACTERIZATION

Consultant will coordinate leachate sample collection with on-site landfill staff prior to arrival at each of the three Sonoma County Landfill sites. Laboratory supplied sample containers will be used to collect leachate samples from the existing storage tanks at each of the landfill sites. Laboratory analysis of leachate samples will be performed to aid in the design of the new storage tanks. The

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samples will be analyzed for water soluble sulfate, water soluble chloride, pH and resistivity. The data will be used to inform the design of the tank coating systems, piping coating systems and other designs related to corrosion engineering.

Soil samples for chemical analysis will be collected while drilling soil borings for the geotechnical evaluation of the proposed storage tank sites. A set of three soil samples will be collected at depths of 0.5 feet, 3 feet, and 6 feet below grade at each of the three landfill sites. The soil samples will be preserved in proper soil sample containers, labelled, logged on to a chain of custody document, and placed in a cooler for transport to a California-certified analytical laboratory specified by Consultant. The laboratory will composite the three soil samples from each landfill site and perform the below analyses on the composited sample. Soil samples will include: total petroleum hydrocarbons as gasoline, diesel, and oil (by EPA Method 8015), volatile organic compounds (by EPA Method 8260 – full scan), and CAM 17 metals (by EPA Method 6010/7471). The results of these analyses will be used to determine if contaminants are present in soil generated during grading and foundation excavation, and assure proper disposal of excess soil generated during construction.

Following sampling and analysis, Consultant will prepare a brief letter report summarizing the sampling and characterization activities and reporting the results of the laboratory testing.

Task 2.5 Deliverable:

- Brief hazardous materials characterization letter: Four (4) hard copies and electronic (pdf).

TASK 3. TANK RELOCATION PLAN

TASK 3.1: LEACHATE STORAGE TANK REPLACEMENT

This task is based on the assumption that the new leachate tanks at all three sites (Guerneville, Roblar, and Sonoma) will be constructed near but not on the same footprint as the existing tanks to allow for continuous operation of the leachate collection and recovery system (LCRS) without interruption during construction. Consultant will develop a plan for each site to address the uninterrupted flow of leachate from the existing LCRS to the new LCRS during construction and during the switch over from the existing tanks to the new tanks. Each plan will show the existing and new tanks, existing underground leachate piping, pumping systems, control conduits, and other relevant information. Requirements will be included on the plans for the contractor to protect the existing facilities during construction, provide temporary facilities, coordinate with County LCRS operation staff and related items without dictating means and methods except where necessary to maintain uninterrupted operation of the LCRS. Consultant will develop this plan in parallel with the design drawings and include it as part of the design package. The plan will be progressively updated and refined in each submittal with County input.

TASK 3.2: FITCH MOUNTAIN MADRONE WATER TANK

The new potable water storage tank at the Fitch Mountain Madrone Tank site will be constructed in the same location as the existing storage tank. This requirement will necessitate installation of a temporary water storage tank / bypass system in order to maintain water service to the Madrone pressure zone. Madrone Avenue is very narrow, the level area of the tank site is small and there is limited space to store and stage construction and temporary facilities within the property boundaries. Consultant will coordinate with RRU to develop a feasible plan for a temporary storage tank, or redistribution of potable water from the Del Rio and Hilltop pressure zones to service the customers of the Madrone pressure

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zone. The plan will include temporary piping, electrical, instrumentation, and other requirements to provide uninterrupted potable water service while the new tank is being constructed. The plan will address access, staging, demolition, geological and environmental issues related to the relocation and eventual decommissioning of the existing storage tank and related infrastructure that is subject to the relocation and eventual decommissioning of the tank. Consultant will develop a plan to maintain water storage and delivery for the entire system until the new storage. Consultant will develop this plan in parallel with the design drawings and include it as part of the design package. The plan will be progressively updated and refined in each submittal with County input.

TASK 3.2: FITCH MOUNTAIN HILLTOP WATER TANK

The new potable water storage tank at the Fitch Mountain Hilltop Tank site will be constructed in the same location as the existing storage tank. This requirement may necessitate installation of a temporary water storage tank to maintain water service to the Hilltop pressure zone. Hilltop Road is very narrow, the level area of the tank site is small and there is limited space to store and stage construction and temporary facilities within the property boundaries. GHD will coordinate with RRU to develop a feasible plan for a temporary storage tank, or redistribution of potable water from the Del Rio and Madrone pressure zones to service the customers of the Hilltop pressure zone. The plan will include temporary piping, electrical, instrumentation, and other requirements to provide uninterrupted potable water service while the new tank is being constructed. The plan will address access, staging, demolition, geological and environmental issues related to the relocation and eventual decommissioning of the existing storage tank and related infrastructure that is subject to the relocation and eventual decommissioning of the tank. GHD will develop a plan to maintain water storage and delivery for the entire system until the new storage. GHD will develop this plan in parallel with the design drawings and include it as part of the design package. The plan will be progressively updated and refined in each submittal with County input.

TASK 3.2: FITCH MOUNTAIN DEL RIO WATER TANK

The new potable water storage tank at the Fitch Mountain Del Rio Tank site will be constructed in the same location as the existing storage tank. This requirement may necessitate installation of a temporary water storage tank to maintain water service to the Del Rio pressure zone. Access from Villa Chanticleer Road is very narrow, the level area of the tank site is very small and there is limited space to store and stage construction and temporary facilities within the property boundaries. GHD will coordinate with RRU to develop a feasible plan for a temporary storage tank, or redistribution of potable water from the Hilltop and Madrone pressure zones to service the customers of the Del Rio pressure zone. The plan will include temporary piping, electrical, instrumentation, and other requirements to provide uninterrupted potable water service while the new tank is being constructed. The plan will address access, staging, demolition, geological and environmental issues related to the relocation and eventual decommissioning of the existing storage tank and related infrastructure that is subject to the relocation and eventual decommissioning of the tank. GHD will develop a plan to maintain water storage and delivery for the entire system until the new storage. GHD will develop this plan in parallel with the design drawings and include it as part of the design package. The plan will be progressively updated and refined in each submittal with County input.

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TASK 4. ENVIRONMENTAL REVIEW DOCUMENTS

In accordance with the RFP Scope of Work, the Sonoma County Permit Resources Management Department (PRMD) will prepare the CEQA and NEPA environmental documents and all necessary permits for the Project.

TASK 4.1: CEQA AND NEPA SUPPORT

Consultant will support the PRMD in their preparation of the CEQA and NEPA environmental compliance documents and the draft and final environmental documents and permits for the Projects. Consultant will review the draft Project description and provided suggested edits and prepare up to two (2) exhibits for each tank site based on the 30% design submittal in Phase 5.1.

TASK 4.2: STORMWATER PERMITTING

Based on the nature of the improvements, anticipated area of ground disturbance, and new impervious surface area created by the new tanks, it is unlikely that this Project will require a Storm Water Pollution Prevention Plan (SWPPP) or Low Impact Development (LID). The Project will not alter existing drainage patterns and is not adding new drainage facilities. Based on Sonoma County Code Section 11.04.010.A the Project is exempt from a construction grading permit because grading work is considered "Regular Construction Grading," because the Project is located within the public right-of-way or property, involves excavation and fills for structures and is located at landfills. The Project is not constructing new drainage features; therefore a drainage report is not required.

Consultant will complete and submit the Storm Water LID Determination Worksheet for each tank site.

Consultant will incorporate requirements for the contractor to prepare a Water Pollution Control Plan (WPCP) in accordance with State requirements into the technical specifications.

Task 4.2 Deliverables:

- Storm Water LID Determination Worksheet for each tank site (pdf) ➤
- Tank Site Exhibits (pdf)

TASK 5. ENGINEERING DESIGN AND BID DOCUMENTS PREPARATION

This task is based on the development of two separate sets of construction documents: one set of construction documents for the Replacement Leachate Storage Tanks at Closed Landfill Sites, and one set of construction documents for the Replacement of the Fitch Mountain Water System Water Storage Tank sites (Madrone, Hilltop, and Del Rio). Each set of construction documents will consist of plans, technical specifications and an opinion of probable construction cost. It is assumed that retaining walls can be avoided with thoughtful grading. Consultant will notify the County immediately if it is determined that a retaining wall is necessary.

TASK 5.1: PRELIMINARY DESIGN (30% DESIGN)

Consultant will prepare a preliminary Basis of Design Technical Memorandum (BOD TM) describing the Project, Project requirements, and design basis for all Project elements. The BOD TM will include a brief description of the geotechnical recommendations and information related to the site survey and boundaries. Based on input from the County and other stakeholders Consultant will include an updated analysis of the tank material types and coating and lining systems for the 30% preliminary design

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drawings for the leachate storage tank Project and the Madrone potable water storage tank Project. The drawings will include site and utility plans, tank plans and elevations, tank sections, tank foundation, and preliminary details piping and tank appurtenances. Consultant will also include the preliminary tank relocation plan, a pothole plan to for potential utility conflicts, a preliminary single-line diagram and details of the instrumentation systems and existing telemetry connections. Consultant will prepare outline specifications identifying the required sections. Consultant will develop an Engineer's Opinion of Probable Construction Cost (Cost Estimate) with an appropriate construction contingency.

Following submission, Consultant will schedule and attend a design review meeting with the County, as described in Task 1.3.

Task 5.1 Deliverables:

- 30% Preliminary Basis of Design Technical Memorandum: Four (4) hard copies and electronic (pdf)
- 30% Drawings: Four (4) full-size (22"x34") hard copies on bond and electronic (pdf)
- 30% Outline Specifications: Four (4) hard copies and electronic (pdf and docx)
- 30% Cost Estimate: Four (4) hard copies and electronic (pdf and xlsx)
- 30% Design QC Review Documentation (pdf)

TASK 5.2: DESIGN DEVELOPMENT (60% DESIGN)

Following the 30% design review meeting and receipt of County comments Consultant will prepare a complete set of drawings including all anticipated details with the intent of delivering as complete a design as possible for County review. The 30% design drawings will be updated and advanced including the tank relocation plan and pothole plan, and include a temporary erosion and sediment control plan. Consultant will develop technical specifications based on the 30% outline specifications incorporating project-specific requirements. Consultant will rely on County standard specifications where possible and develop additional specifications for the Projects to clearly describe the construction requirements. Project specific details, layouts and specifications will be included for all systems.

Consultant will update the BOD TM and update the Cost Estimate and present it in a bid schedule format with an appropriate construction contingency and including bid item payment descriptions. Consultant will also incorporate the County's front-end contract documents, bid forms, and other documents prior to the submittal.

Following submission, Consultant will schedule and attend a design review meeting with the County, as described in Task 1.3.

Task 5.2 Deliverables:

- 60% Basis of Design Technical Memorandum: Four (4) hard copies and electronic (pdf)
- 60% Drawings: Four (4) full-size (22"x34") hard copies on bond and electronic (pdf)
- 60% Contract and Specifications: Four (4) hard copies and electronic (pdf and docx)
- 60% Cost Estimate: Four (4) hard copies and electronic (pdf and xlsx)
- 60% Design QC Review Documentation (pdf)

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TASK 5.3: CONSTRUCTION DOCUMENTS (90% PS&E)

Following the 60% design review meeting and receipt of County comments Consultant will prepare the 90% design submittal. The intent of the 90% PS&E is to address all County comments from the 60% submittal and provide an updated design that is essentially complete (pre-final) and inclusive of all design information, details, schedules, notes, and technical specifications. The BOD TM and drawings will be finalized, tracked change specification edits will be incorporated and any new edits will be shown with “tracked changes” for ease of County review. The technical specifications will incorporate all Project requirements, include the County provided front-end specifications, and be consistent and thorough. Consultant will update the Cost Estimate to address comments and incorporate finalized quantities and unit prices.

Following submission Consultant will schedule and attend a design review meeting with the County, as described in Task 1.3.

Task 5.3 Deliverables:

- 90% Basis of Design Technical Memorandum: Four (4) hard copies and electronic (pdf)
- 90% Drawings: Three (3) half-size (11”x17”) hard copies and electronic (pdf)
- 90% Contract and Specifications: Three (3) hard copies and electronic (pdf and docx)
- 90% Estimate: Three (3) hard copies and electronic (pdf and xlsx)
- 90% Design QC Review Documentation (pdf)

TASK 5.4: FINAL DESIGN (100% PS&E)

Following the 90% design review meeting and receipt of comments Consultant will finalize the plans, specifications and estimate for bidding. All County comments will be addressed, and the finalized plans and specifications will be stamped and signed by the discipline engineers in responsible charge. All final documents will be remediated for ADA Compliance using the County’s DTPW House Styles format, as specified in Task 5.4 of the RFP. Consultant will send the final deliverable to the County to advertise for public bids.

Task 5.4 Deliverables:

- 100% Basis of Design Technical Memorandum: Four (4) hard copies and electronic (pdf)
- 100% Drawings: Six (6) full-size (22”x34”) hard copy on bond and electronic (pdf and dwg)
- 100% Contract and Specifications: Six (6) hard copies and electronic (pdf and docx)
- 100% Cost Estimate: Six (6) hard copies and electronic (pdf and xlsx)
- 100% Design QC Review Documentation (pdf)
- All final design submittals, bid documents, and drawings, are to be remediated for ADA Compliance prior to final submittal to the County. In addition, all submittals should conform to DTPW House Style Template (See Attachment A).

TASK 5.5: Re-DESIGN (100% PS&E)

SCOPE OF SERVICES

Per request from the County, Consultant update the leachate tank front end and technical specifications based on a revised format provided by the County. In addition, Consultant shall update the cost estimate to include revised costs following a delay in bidding the project.

Scope and budget to update the water tank front end and technical specifications and cost estimate are not included.

TASK 6. BID ASSISTANCE

The County intends to construct the leachate storage tanks and the Madrone Water Tank in 2022. The Hilltop and Del Rio tanks will be constructed at a future date. Consultant will be available during the bid period to assist the County with any technical questions related to the design and to prepare any technical bid document revisions which the County may need to be issued by addenda. Questions received from proposers and subsequent responses will be communicated through the County. Questions from proposers that are directed to Consultant will be re-directed to the County for proper documentation. Consultant will respond to up to five (5) RFIs related to technical items and the design.

Consultant will assist the County with preparing Addenda as appropriate to clarify, correct, or change design- related items in the Bid Documents in response to questions and clarification requests received during the Project's bid phase. It is assumed that the County will issue all Addenda to proposers. This scope item assumes assistance in the preparation of up to two (2) addenda.

Consultant will attend the pre-bid conference and site visits and assist the County in conducting the pre-bid conference. Consultant will prepare minutes from the pre-bid conference and assist the County in documenting questions asked.

Consultant will be available to provide the bid services described above for up to two (2) bid procurements for the leachate tank. However, Consultant assumes bid support for the Madrone water tank will occur at a later date. Scope and budget to support bid services for the Madrone water tank are not included.

Consultant will assist the County in reviewing the bids received with the intent of confirming the lowest responsive and responsible bidder.

Upon Contractor selection, Consultant will prepare Conformed Construction Documents incorporating changes made to the bid documents.

Task 6 Deliverables:

- Responses to questions and RFIs (electronic)
- Support documentation issued with addenda, including revised drawings and revised technical specifications (electronic)
- Pre-bid conference meeting minutes (electronic)
- Conformed Construction Documents: Six (6) full-size hard copies of plans on bond and technical specifications.

SCOPE OF SERVICES

TASK 7. CONSTRUCTION SUPPORT SERVICES

TASK 7.1: CONSTRUCTION ENGINEERING SUPPORT

During construction, Consultant will review key technical submittals and shop drawings, respond to Contractor Requests for Information (RFIs), and attend Project meetings and site visits as indicated below. Consultant shall perform the following tasks:

- Review of forty-two (42) submittals; including 1 resubmittal of each
- Responding to twenty-five (25) RFIs
- Attending thirty (30) on-site construction meetings
- Consultant shall provide periodic construction observation of the bolted steel tanks and has budgeted for 80 hours of construction observation at each tank site. This amount can be adjusted as needed with input from the County to provide the amount of construction oversight the County is seeking.
- Perform a punch list site walk with the County and Contractor at each tank site to review the completed work and confirm the Project was constructed in general accordance with the construction documents.
- Review Contractor as-built drawings for each tank site to confirm changes made during construction are accurately documented for County records. Provide additional edits, as needed, for complete and accurate as-built drawings.
- Design change during construction and change order reviews are not included in this task.

Task 7.1 Deliverables:

- Site observation reports with photographs (PDF)
- Punch list for each tank site (PDF)

TASK 7.2: GEOTECHNICAL CONSTRUCTION OBSERVATION AND TESTING

During construction, Consultant's geotechnical sub-consultant, Miller Pacific Engineering Group (MPEG), will perform the following activities during leachate tank construction:

- Guerneville: one (1) site visit for tank foundation and concrete inspection and two (2) site visits to complete compaction testing.
- Roblar: Four (4) site visits for drilled piers inspection, concrete inspection, key and bench observation.
- Sonoma: Four (4) site visits for subgrade inspection, and complete backfill and compaction testing.

Task 7.2 Deliverables:

- Daily field report (PDF)

SCOPE OF SERVICES

TASK 8. ADDITIONAL GEOTECHNICAL SERVICES

As outlined in the Del Rio Tank geotechnical report developed by Miller Pacific Engineering Group, Inc. (MPEG) and previously provided to the County, the Del Rio Tank site appears to be located on an old landslide. The landslide extent and expected movement and settlement during a strong seismic event are currently unknown. MPEG and GHD will complete a supplemental geotechnical investigation and evaluate the stability of the existing tank pad under static and seismic conditions, and model various stability improvement options (retaining structures or ground improvement) to determine if expected seismic displacement can be within acceptable levels.

This additional geotechnical investigative work will include:

- Obtain and review aerial photos available from public and private resources;
- Site inspection by Engineering Geologist to map extent of landslide area;
- Subsurface exploration with 2 or 3 borings to approximate depths of 20 feet;
- Laboratory testing to determine engineering properties;
- Geologic cross section and model for static and pseudo-static slope stability analyses;
- Calculate factors of safety and expected displacements with and without mitigation measures, and;
- Incorporate results, recommendations and design criteria into final geotechnical report.

Task 8.0 Deliverables:

- Updated Draft Geotechnical Investigation Report for the Roblar Site in electronic (pdf).
- Final Geotechnical Investigation Report for the Roblar Site in electronic (pdf)

TASK 9. ADDITIONAL CONSTRUCTION SUPPORT SERVICES

Consultant will provide additional construction support services for the leachate tanks as requested by the County. This task is intended to provide additional scope and budget beyond the original budget included in Task 7.1. Effort for this task will be billed as time and materials.

Consultant may perform the following tasks at the County's request:

- Response to an estimated eight (8) additional RFIs (beyond the 25 completed to date) may be required to complete the leachate tanks construction. GHD has budgeted 8 hours per submittal review and response, including resubmittal response.
- Response to an estimated five (5) additional Submittals (beyond the 42 completed to date) may be required to complete the leachate tanks construction. GHD has budgeted 8 hours per RFI review and response, including resubmittal response.
- Attendance at an estimated ten (10) additional weekly meetings (beyond the 30 completed to date) may be required to complete the leachate tanks construction. GHD has budgeted for one (1) staff to attend a one-hour virtual meeting.
- Anvil has requested two punchlist walks for each site; while GHD only budgeted for one punchlist walk per site. GHD expects to complete three (3) additional two-hour punchlist walks.
- Support for an estimated one (1) design change may be required to complete the leachate tanks construction.

SCOPE OF SERVICES

- Support for an estimated three (3) Change Order reviews through the remainder of the leachate tanks project.

Task 9.0 Deliverables:

- Punch list for each tank site (PDF)
- Design change documentation (PDF)
- Change order review comments (email)

TASK 10. DCM01 Design Changes and Support

During construction of the leachate tanks at the Roblar location there were unforeseen field conditions resulting in a redesign and additional work at this site. The unforeseen conditions were related to drainage. The work was performed immediately as this site then became the critical path for construction. The additional work included:

- GHD worked with Miller Pacific Engineering Group and Anvil Builders to assess unforeseen drainage concerns
- GHD prepared runoff calculations and new drawings to address drainage, resulting in the following additions and changes to the original design:
 - Regrading the site
 - New underground drainage pipes
 - Additional guardrails
 - New retaining wall
 - Improved slope stability and erosion control measures
 - New AC pavement across the site
- GHD supported the County in review of Anvil Builders proposed change orders associated with these construction design changes