



August 13, 2024

Hayes Morehouse  
Water Pollution Control Plant Manager  
City of San Leandro  
3000 Davis Street  
San Leandro, California 94577

*sent via email to: [HMorehouse@sanleandro.org](mailto:HMorehouse@sanleandro.org)*

**Subject: Proposal for Implementation the Pilot Test of Sludge-Soil-Cement Sludge Stabilization and Preconstruction Design Support at the City of San Leandro Water Pollution Control Plant (WPCP), San Leandro, California**

Dear Mr. Morehouse:

This proposal describes the scope of work and requested budget for Terraphase Engineering (Terraphase) to provide to the City of San Leandro (City) engineering and project management services to implement the sludge-soil-cement stabilization pilot test at the WPCP former polishing pond and to provide engineering design support during construction procurement for the planned full-scale sludge-soil-cement stabilization and treatment wetland construction projects.

Terraphase has provided engineering, planning, and compliance support for the City for planning, design, and engineering of the City's WPCP treatment wetland project since 2019, including development of the following previous key deliverables:

- Treatment Wetland Design Options Evaluation
- Treatment Wetland Preliminary Design Report
- Treatment Wetland 30% Design Plans, Specifications, and Engineers' Cost Estimate (PS&E)
- Treatment Wetland 60% Design PS&E
- Treatment Wetland 90% Design PS&E
- Treatment Wetland 100% Design PS&E
- WPCP Soil Stockpile Evaluation
- WPCP Soil Stockpile and Former Polishing Pond Sludge Risk Evaluation
- WPCP Section 404 Jurisdictional Delineation (with LSA)
- Treatment Wetland New Point-of-Discharge NPDES Permit, SFRWQCB
- CEQA compliance evaluations and air quality compliance documents
- WPCP Biological Assessment (with LSA)
- Bay Restoration Regulatory Integration Team compliance and permitting
- WPCP Former Polishing Pond Sludge Stabilization Pilot Study Work Plan
- WPCP Former Polishing Pond Sludge-Soil-Cement Pilot Study (in progress)
- BAAQMD permitting documents

Based on recent discussions with the City, we understand that the overall project will be constructed under three separate construction contract packages, summarized as follows:

1. WPCP Former Polishing Pond Stabilization Pilot Test: This scope of work is included as Task 1 of this proposal and includes execution of the pilot test under contract to Terraphase.
2. WPCP Former Polishing Pond Stabilization and Earthwork (Stabilization Project): This contract will cover soil stabilization, and fill import/placement and associated earthwork in and around the WPCP former polishing ponds in preparation for treatment wetland construction in the former polishing pond area. Construction scope will include:
  - a. Demolition, clearing and grubbing, of the entire perimeter and surrounding working area of the former polishing pond.
  - b. Sludge-soil-cement stabilization of the former polishing pond surface.
  - c. Import, management, and placement of earth fill atop the stabilized pond surface using import fill up to proposed final pond surface design elevation.
3. Treatment Wetland Construction and Startup (Treatment Wetland Project): This contract will cover all civil, mechanical, water treatment process, and electrical construction for the treatment wetland system, including:
  - a. Construction of the secondary effluent tie-in from the WPCP and associated pumping and dechlorination system.
  - b. Construction of the Membrane Aerated Biofilm Reactor (MABR) nitrification system.
  - c. Construction of conveyance and distribution piping and appurtenances to convey water from the nitrification system to the treatment wetland and distribute water throughout the treatment wetland area.
  - d. Construction of the treatment wetland in the stabilized and filled former polishing pond, including grading of the pond side slopes, installation of subgrade liner, installation of modular treatment bioreactor elements, irrigation piping, topsoil, and erosion control equipment.
  - e. Planting of the treatment wetland including the surrounding side slopes.
  - f. Construction of modifications to the existing outfall vault and pipe system.

The City will serve as Owner of the project and hold all construction contracts, with Terraphase implementing the pilot test under Task 1 of this proposal, providing engineering design support during procurement of the Stabilization Project under Task 2 of this proposal, and providing engineering design support during procurement of the Treatment Wetland Project under Task 3 of this proposal. Terraphase will provide programmatic project management and coordination for this scope of work under Task 4 of this proposal.

## Task 1: Sludge-Soil-Cement Stabilization Pilot Test

Terraphase has continued to work with the City to develop and plan a pilot test for sludge-soil-cement stabilization of the former polishing pond at the City WPCP. The objective of stabilizing the former polishing pond is to strengthen the surface of the pond to a minimum unconfined compressive strength of at least 1,000 pounds per square foot (psf), within an operationally acceptable curing time, to support fill placement and construction of the planned treatment wetland.

Terraphase previously prepared and submitted a Pilot Test Work Plan (Work Plan) and developed and issued a Request for Proposal (RFP) for implementation of the pilot test. This proposal describes the scope of work and

requested budget for implementation of the pilot test, with the selected stabilization contractor under contract to and under the oversight of Terraphase.

## Summary of Pilot Test RFP Process and Subcontractor Selection

Terraphase prepared an RFP based on the Work Plan, which was reviewed by the City, and issued the RFP to two prequalified stabilization contractors with the required experience, equipment, and local capacity. The RFP was issued on June 10, after which the City and Terraphase met with both potential bidders for a pre-proposal meeting at the WPCP to walk the site, discuss the scope and gather questions. Three addenda to the RFP were issued on June 17, June 21, and June 28. The RFP and addenda are included as Attachment A. Proposals were due on July 15, and Terraphase received one proposal, from Odin Environmental, Inc. (Odin).

The Odin proposal was reviewed by the City and Terraphase and was deemed responsive to the RFP. Terraphase met with Odin on July 24 to discuss Terraphase and City questions and provide additional scope clarification. Odin submitted an addendum to their proposal on July 25. The final Odin proposal is included as Attachment B. Terraphase reviewed the revised proposal and recommended awarding the work to Odin; Odin was notified that they were selected to perform the work in accordance with their final proposal on July 29, 2024.

## Task 1 Scope of Work

The proposed scope of work to implement the pilot test is broken into the following tasks:

### Task 1.1: Premobilization

Immediately upon completion of the City-Terraphase contract, Terraphase will complete subcontract execution with Odin and issue a formal Notice to Proceed to Odin. Terraphase and Odin will complete premobilization activities, including:

- Revision of the Terraphase Health and Safety Plan for the site to cover pilot test implementation.
- Preparation for and attendance of a 1-hour project kickoff meeting to be attended by the City, Terraphase, and Odin. Terraphase will prepare the meeting agenda, lead the meeting, and issue meeting minutes. The meeting will be held over teleconference.
  - Terraphase attendees will include Lucas Paz, Shakeel Jogia, and Terraphase's project engineer.
  - Odin attendees will include their operations manager, project superintendent, and project engineer.
- Terraphase review of Odin technical submittals as described in the Work Plan and RFP and follow up coordination with Odin. The following submittals will be submitted by Odin and reviewed by Terraphase (see Attachment 1 for the description of each submittal):
  - Pilot Test Implementation Work Plan
  - Pilot Test Quality Control Plan
  - Contractor's Proposed Geotechnical Testing Laboratory
  - Materials submittals
  - Implementation Schedule

Terraphase will issue Approval to Mobilize upon acceptance of all preconstruction submittals.

### Task 1.2: Pilot Test Implementation and Oversight

Odin will implement the Pilot Test under Terraphase oversight and in accordance with the Terraphase-Odin contract and approved submittals. This task includes the value of the Odin subcontract. In their proposal, Odin estimates field implementation of the pilot test to require one work week on site (see Attachment 2 for Odin's proposal schedule) with 10-hour workdays.

Terraphase will provide full time operational, safety, and quality assurance oversight during field implementation. A field engineer will be present during all field operations, and the proposed budget includes funding for full-time field engineer oversight for up to 6 workdays.

Shakeel Jogia will also be on-site during the first day of mixing operations, and both Shakeel Jogia and Lucas Paz will perform 2 total additional partial-day site visits during implementation. Shakeel Jogia will also provide office-based technical support, response to any subcontractor Requests for Interpretation or technical requests, and logistical coordination throughout field implementation.

During field implementation, Terraphase will prepare and submit a daily report to the City that documents pilot test implementation progress, quality control activities performed and data, technical issues, safety observations, and includes a schedule lookahead through completion of field activities. The daily report will include representative photos of the day's operations.

### Task 1.3: Post-Test In-Situ Sampling

After implementation, a Terraphase field engineer and Odin personnel will mobilize to the site at 3 days, 7 days, and 14 days after demobilization to collect samples of stabilized soil-sludge mixture from each test cell for unconfined compressive strength analysis.

### Task 1.4: Closeout and Completion Reporting

After demobilization, receipt of Odin closeout reporting, and receipt of post-test sample analytical results, Terraphase will close out the Odin subcontract and prepare a closeout report that summarizes the pilot test operation, production rate data, as-built site conditions, quality control activities and conclusions, pilot cell unconfined compressive strength data and conclusions, safety and logistical lessons learned, and technical recommendations for full scale implementation. A draft closeout report will be submitted for City review and finalized per City review comments.

### Task 1.5: Pilot Test Contingency

Terraphase has developed a contingency task to respond to additional unforeseen scope of work that requires additional Terraphase labor level of effort. Terraphase will only access this budget upon approval from the City. Please note that this task does not include additional contingency funding for the Odin subcontract. Any required additional funding for Odin will only be based on an approved change order request to the Odin subcontract.

## Task 2: Stabilization Project Preconstruction Design Support

Terraphase expects the Stabilization Project will be constructed first; after which the stabilized surface will be allowed to undergo settlement before mobilization of the Treatment Wetland Project

## Task 2 Scope of Work

### Task 2.1: Development of Issued for Bid (IFB) Plans, Specifications, and Cost Estimate (PS&E)

The existing design documents for the project do not currently include bid-ready PS&E for the Stabilization Project. Terraphase will prepare the following IFB PS&E documents for use in the Stabilization Project bid package and to review bidder proposals:

- **Scope Delineation:** Terraphase will work with the City to confirm the breakdown of specific construction tasks to be completed in the Stabilization Project contract vs. the subsequent Treatment Wetland Project contract based on the overall scope organization described in this proposal. Construction task delineation will be based on the type of work, necessity of specialized skillset/methods/equipment, when the task needs to be completed within the overall project sequence of work, and physical location of the task. Scope delineation will be documented in a brief technical memorandum and will be approved by the City before proceeding with IFB PS&E development.
- **IFB Design Plans:** Terraphase will compile and adapt existing 100% design drawings and develop up to five new design drawings that depict pond stabilization work areas, soil stockpile locations, staging/support areas, pond clear/grub/demolition areas, design stabilization and post-stabilization clean fill elevations, stabilization/fill sections and details. Adaptation of existing 100% drawings will include minor revisions to these drawings only as needed to clearly depict/delineate the scope of work of the Stabilization Project. Draft IFB design plans will be submitted to the City for review and comment, and this scope of work includes one round of final revisions to incorporate City review.
- **IFB Specifications:** Terraphase will compile and adapt existing 100% project specifications and prepare a new Soil Stabilization specification section. Revision of existing 100% project specifications are assumed to be limited to Division 00, 01, and 02 and are primarily meant to update project and contract information. Development of the new Soil Stabilization specification section will be informed by technical and logistical findings from the earlier soil stabilization pilot test. Draft IFB specifications will be submitted to the City for review and comment, and this scope of work includes one round of final revisions to incorporate City review. The compiled IFB specifications set will be submitted to the City for formatting and incorporation into City format by others.
- **IFB Engineers Cost Estimate:** Terraphase will develop an Engineer's Cost Estimate for the Stabilization Project scope of work as described and delineated in the Stabilization Project IFB Design Plans and Specifications. The estimate will utilize cost and quantity takeoff data from the existing 100% Design Cost Estimate to the extent possible. This task does not include substantial revision of the engineering design being estimated, including substantial revision of quantity takeoffs, except for development of new quantity takeoffs associated with stabilization and overlying fill construction tasks. Unit cost data will be escalated as needed to reflect 2025 economic factors. The draft IFB estimate will be submitted to the City for review and comment, and this scope of work includes one round of final revisions to incorporate City review.

## Task 2.2: Design Support during RFP<sup>1</sup> Development

Terraphase will provide engineering design support during preparation of the RFP for construction of the Soil Stabilization project. The RFP<sup>1</sup> will be prepared by others, with Terraphase providing engineering support as requested by the City. This task includes:

- Respond to technical requests during RFP<sup>1</sup> preparation by others.
- Complete one round of review of the draft RFP<sup>1</sup> from an engineering/design perspective prior to City issuance.

## Task 2.3: Bid Period Design Support

Terraphase will provide engineering design support during the construction bid period, including:

- Pre-bid conference: The pre-bid conference will be planned, scheduled, and led by the City or others, with Terraphase project leads, including the project manager and design lead, to provide technical support at the City's direction. The conference agenda and all other materials will be prepared by others. Post-conference summary and actions will be provided by others.
- Bidder question response and RFP<sup>1</sup> addenda: Terraphase project leads will review bidder questions as they are submitted to the City and support the City in development of up to three RFP<sup>1</sup> addenda. Addenda will consist of written/narrative question responses, recommended revisions to technical content in the RFP, or revision markups to IFB plans and specifications.
- Proposal review and evaluation: Terraphase will review all proposals received by the City and attend one teleconference to discuss any engineering/design feedback arising from proposal review.

All communication with bidders during the bid period will be led by the City or others.

## Task 3: Treatment Wetland Project Preconstruction Design Support

The Treatment Wetland Project will mobilize after an assumed 6-month stabilized surface settlement period after completion of the Stabilization Project.

### Task 3 Scope of Work

#### Task 3.1: Development of IFB PS&E

Terraphase will complete minor updates to the existing 100% design documents for use in the Treatment Wetland Project bid package:

- IFB Design Plans: Terraphase will complete minor revisions to the 100% design drawings as needed to incorporate into the Treatment Wetland Project RFP<sup>1</sup>. Terraphase expects design plan revisions to be limited to hatching out work completed under the earlier Stabilization Project and updating project title blocks for IFB version control. This task does not include substantial revision of the actual engineering design elements depicted in the existing 100% plans. The compiled IFB plan set will be submitted to the City for incorporation into the RFP<sup>1</sup>.

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<sup>1</sup> Or other City-designated construction bid/procurement document (e.g. Request for Bid).

- **IFB Specifications:** Terraphase will complete minor revisions to the 100% project specifications as needed to incorporate the specifications into the Treatment Wetland Project RFP<sup>1</sup>. Terraphase expects specification content revisions to be limited to removing content associated with work completed under the earlier Stabilization Project. This task does not include substantial revision of the actual engineering elements depicted in the existing 100% specifications. The compiled IFB specifications set will be submitted to the City for formatting and incorporation into City format by others.
- **IFB Engineers Cost Estimate:** Terraphase will update the 100% design cost estimate for the Treatment Wetland Project. The estimate will delineate cost items that are to be built under the Treatment Wetland Project contract, but otherwise does not include substantial revision of the engineering design being estimated. Unit cost data will be escalated as needed to reflect 2025 costs. The draft IFB estimate will be submitted to the City for review and comment, and this task includes one round of final revisions to incorporate City review.

### Task 3.2: Design Support during RFP<sup>1</sup> Development

Terraphase will provide engineering design support during preparation of the RFP<sup>1</sup> for construction of the Treatment Wetland project. The RFP<sup>1</sup> will be prepared by others, with Terraphase providing engineering support as requested by the City. This task includes:

- Respond to technical requests during RFP<sup>1</sup> preparation by others.
- Complete one round of review of the draft RFP<sup>1</sup> from an engineering/design perspective prior to City issuance.

### Task 3.3: Bid Period Design Support

Terraphase will provide engineering design support during the construction bid period, including:

- **Pre-bid conference:** The pre-bid conference will be planned, scheduled, and led by the City or others, with Terraphase project leads, including the project manager and design lead, to provide technical support at the City's direction. The conference agenda and all other materials will be prepared by others. Post-conference summary and actions will be provided by others.
- **Bidder question response and RFP<sup>1</sup> addenda:** Terraphase project leads will review bidder questions as they are submitted to the City and support the City in development of up to six RFP<sup>1</sup> addenda. Addenda will consist of written/narrative question responses, recommended revisions to technical content in the RFP<sup>1</sup>, or revision markups to IFB plans and specifications.
- **Proposal review and evaluation:** Terraphase will review all proposals received by the City and attend one teleconference to discuss any engineering/design feedback arising from proposal review.

All communication with bidders during the bid period will be led by the City or others.

## Task 4: Project Management and Coordination

Terraphase will provide project and financial management of the proposed scope of work, including:

- During execution of Task 1, Terraphase will provide weekly updates to the City throughout the premobilization, field implementation, and post-test sampling phases of the project. After submittal of the draft closeout report, Terraphase and the City will meet to discuss report comments and lessons learned from the pilot test to be incorporated into the final pilot test closeout report and planning and development of the full-scale stabilization project.
- Attendance of two 1-hour construction procurement kickoff meetings with the City, one for each contract package (Tasks 2 and 3). The kickoff meeting will be planned and scheduled by others, with Terraphase responsible for preparing materials limited to Terraphase's design support role.
- Coordination and communication of project status during active Terraphase involvement during Tasks 2 and 3, including internal technical coordination and weekly status updates with the City. This update will include update of a project status and issues table and weekly teleconference status meeting with the City, Terraphase project manager (Lucas Paz, PhD), and Terraphase design support lead (Shakeel Jogia, PE, PMP, CCM).
- Low-level project status coordination with the City during the inactive period between completion of Task 2 and initiation of Task 3 to account for stabilized surface settlement after completion of the Soil Stabilization Project and before installation of the treatment wetland. This task assumes brief monthly updates with the City for an up to 6-month inactive period.
- Project financial management and invoicing.

## Schedule

Terraphase has submitted this proposal with the intention of meeting the submittal schedule for the City's September 2024 Council meeting. Terraphase is prepared to initiate the proposed scope of work immediately upon receipt of the City's authorization to proceed.

### Task 1 Schedule

Terraphase expects to begin the premobilization phase of the project in late September 2024, complete the pilot test in October 2024, and submit the closeout report in December 2024. The project schedule will be updated after the following milestones:

1. Completion of City-Terraphase contracting.
2. Approval of Odin's project schedule submittal.
3. After receiving analytical results from post-test sampling.

### Tasks 2 & 3 Schedule

Terraphase anticipates initiating Task 2 in early 2025, after completion of the Sludge-Soil-Cement pilot test, to allow for implementation in the second quarter of 2025.

Treatment Wetland construction will initiate after completion of the Soil Stabilization Project and after sufficient time to allow the stabilized surface to settle before construction of the treatment wetland components in the pond area. Terraphase currently assumes a 6-month settlement period but will work with the City to confirm the duration of the post-stabilization settlement period and schedule initiation of Task 2; likely in the fourth quarter of 2024.



## Budget

Terraphase will perform the services described herein on a time-and-materials utilizing Terraphase's 2024 Schedule of Charges with a 10% discount and otherwise in accordance with the previously agreed upon Terms and Conditions of the existing contract between Terraphase and the City. The total requested budget for the proposed scope of work is **\$266,624**.

A breakdown of this effort is included in Table 1 (attached). Detailed sub-task level breakdowns for Tasks 1 through 3 are included in Tables 2 through 4, respectively (attached). Terraphase will not exceed this budget without prior authorization from the City.

## Closing

We appreciate the opportunity to support the City on this important project. If you have any questions regarding this proposal or would like to discuss any adjustments to our approach, please contact Shakeel Jogia at 510-388-0692 / shakeel.jogia@terrphase.com or Dr. Lucas Paz at 510-697-1238 / lucas.paz@terrphase.com.

Sincerely,  
For Terraphase Engineering Inc.



Shakeel Jogia, PE, PMP, CCM  
Principal Engineer



Lucas W. Paz, PhD, CPESC, QSD, QISP ToR  
Principal Hydrologist

### Attachments:

- Table 1: Total Project Cost Breakdown
- Table 2: Task 1 Cost Breakdown: Pilot Test Implementation
- Table 3: Task 2 Cost Breakdown: Stabilization Project Design Support
- Table 4: Task 3 Cost Breakdown: TW Project Design Support
- Attachment A: RFP and Addenda
- Attachment B: Odin Proposal and Addendum

## References

Terraphase Engineering, *Sludge-Soil-Cement Stabilization Work Plan, Proposed Treatment Wetland, Water Pollution Control Plant, San Leandro California*; 5/21/2024

**Table 1 - Total Project Cost Breakdown**

Proposal for Sludge-Soil-Cement Pilot Test Implementation and Engineering Support During Construction Procurement  
Water Pollution Control Plant, San Leandro, CA

Category	Units	2024 Standard Rate	Discount	Rate	Task 1: Sludge-Soil-Cement Stabilization Pilot Test		Task 2: Soil Stabilization Preconstruction Design Support		Task 3: Treatment Wetland Preconstruction Design Support		Task 4: PM & Coordination		Total	
					Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
<b>Labor</b>														
Senior Principal	Hour	\$ 303.00	10%	\$ 272.70	6	\$ 1,636	4	\$ 1,091	0	\$ -	10	\$ -	10	\$ 2,727
Principal	Hour	\$ 286.00	10%	\$ 257.40	106	\$ 27,284	109	\$ 28,057	78	\$ 20,077	60	\$ 15,444	353	\$ 90,862
Senior Associate	Hour	\$ 266.00	10%	\$ 239.40	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
Associate	Hour	\$ 250.00	10%	\$ 225.00	8	\$ 1,800	12	\$ 2,700	55	\$ 12,375	10	\$ 2,250	85	\$ 19,125
Senior Project	Hour	\$ 235.00	10%	\$ 211.50	117	\$ 24,746	54	\$ 11,421	12	\$ 2,538	10	\$ 2,115	193	\$ 40,820
Project	Hour	\$ 219.00	10%	\$ 197.10	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
Senior Staff 2	Hour	\$ 202.00	10%	\$ 181.80	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
Senior Staff 1	Hour	\$ 183.00	10%	\$ 164.70	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
Staff 2	Hour	\$ 164.00	10%	\$ 147.60	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
Staff 1	Hour	\$ 144.00	10%	\$ 129.60	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
Senior Technician	Hour	\$ 149.00	10%	\$ 134.10	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
Technician 3	Hour	\$ 129.00	10%	\$ 116.10	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
Technician 2	Hour	\$ 109.00	10%	\$ 98.10	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
Technician 1	Hour	\$ 91.00	10%	\$ 81.90	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
Senior Editor/ Senior Project Coordinator	Hour	\$ 158.00	10%	\$ 142.20	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
Editor 2/Project Coordinator 2/Accountant 2	Hour	\$ 140.00	10%	\$ 126.00	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
Editor 1/Project Coordinator 1/Accountant 1	Hour	\$ 117.00	10%	\$ 105.30	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
Administrator/Project Assistant/Billing Specialist	Hour	\$ 98.00	10%	\$ 88.20	0	\$ -	0	\$ -	0	\$ -	12	\$ 1,058	12	\$ 1,058
<b>Total Terraphase Labor</b>						<b>\$ 55,466</b>		<b>\$ 43,268</b>		<b>\$ 34,990</b>		<b>\$ 20,867</b>		<b>\$ 154,592</b>
<b>Direct Costs</b>														
<i>Subcontractor</i>														
Odin Environmental (Pilot Test Contractor)	T&M NTE	\$ 1.00		\$ 1.00	94500	\$ 94,500		\$ -		\$ -		\$ -	94500	\$ 94,500
RSI (Structural Engineering)	T&M NTE	\$ 1.00		\$ 1.00		\$ -		\$ -	2400	\$ 2,400		\$ -	2400	\$ 2,400
PSI (Electrical Engineering)	T&M NTE	\$ 1.00		\$ 1.00		\$ -		\$ -	2400	\$ 2,400		\$ -	2400	\$ 2,400
<b>Total Subcontractor Costs</b>						<b>\$ 94,500</b>		<b>\$ -</b>		<b>\$ 4,800</b>		<b>\$ -</b>		<b>\$ 99,300</b>
<i>Other Direct Costs</i>														
<b>Total Other Direct Costs</b>						<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>
Direct Cost Handling			10%	10.0%		\$ 9,450		\$ -		\$ 480		\$ -		\$ 9,930
<b>Total Direct Costs</b>						<b>\$ 103,950</b>		<b>\$ -</b>		<b>\$ 5,280</b>		<b>\$ -</b>		<b>\$ 109,230</b>
<b>Terraphase Equipment/Supplies (ERS)</b>														
Truck/Vehicle (day)	Day	\$ 196.00		\$ 196.00	10	\$ 1,960		\$ -		\$ -		\$ -	10	\$ 1,960
iPad and Electronic Field Data (day)	Day	\$ 38.00		\$ 38.00	10	\$ 380		\$ -		\$ -		\$ -	10	\$ 380
Field Health and Safety and Decon Supplies (daily fee)	Day	\$ 32.00		\$ 32.00	9	\$ 288		\$ -		\$ -		\$ -	9	\$ 288
<b>Total Terraphase Equipment/Supplies (ERS)</b>						<b>\$ 2,628</b>		<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>		<b>\$ 2,628</b>
<b>Travel Costs</b>														
Mileage	mile	\$ 0.670		\$ 0.670	140	\$ 93.80	60	\$ 40.20	60	\$ 40.20		\$ -	260	\$ 174.20
<b>Total Travel Costs</b>						<b>\$ 93.80</b>		<b>\$ 40.20</b>		<b>\$ 40.20</b>		<b>\$ -</b>		<b>\$ 174.20</b>
<b>Total Estimated Project Unit Costs</b>						<b>\$ 162,138</b>		<b>\$ 43,309</b>		<b>\$ 40,310</b>		<b>\$ 20,867</b>		<b>\$ 266,624</b>

**Table 2 - Task 1 Cost Breakdown: Pilot Test Implementation**

Proposal for Sludge-Soil-Cement Pilot Test Implementation and Engineering Support During Construction Procurement  
Water Pollution Control Plant, San Leandro, CA

Category	Units	2024 Standard Rate	Discount	Rate	Task 1.1: Premobilization		Task 1.2: Implementation and Oversight		Task 1.3: Post Test In-Situ Sampling		Task 1.4: Closeout and Reporting		Task 1.5: Pilot Test Contingency		Total	
					Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
<b>Labor</b>																
Senior Principal	Hour	\$ 303.00	10%	\$ 272.70	2	\$ 545	2	\$ 545		\$ -	2	\$ 545		\$ -	6	\$ 1,636
Principal	Hour	\$ 286.00	10%	\$ 257.40	22	\$ 5,663	40	\$ 10,296	4	\$ 1,030	32	\$ 8,237	8	\$ 2,059	106	\$ 27,284
Senior Associate	Hour	\$ 266.00	10%	\$ 239.40		\$ -		\$ -		\$ -		\$ -		\$ -	0	\$ -
Associate	Hour	\$ 250.00	10%	\$ 225.00	8	\$ 1,800		\$ -		\$ -		\$ -		\$ -	8	\$ 1,800
Senior Project	Hour	\$ 235.00	10%	\$ 211.50	9	\$ 1,904	76	\$ 16,074	12	\$ 2,538	8	\$ 1,692	12	\$ 2,538	117	\$ 24,746
Project	Hour	\$ 219.00	10%	\$ 197.10		\$ -		\$ -		\$ -		\$ -		\$ -	0	\$ -
Senior Staff 2	Hour	\$ 202.00	10%	\$ 181.80		\$ -		\$ -		\$ -		\$ -		\$ -	0	\$ -
Senior Staff 1	Hour	\$ 183.00	10%	\$ 164.70		\$ -		\$ -		\$ -		\$ -		\$ -	0	\$ -
Staff 2	Hour	\$ 164.00	10%	\$ 147.60		\$ -		\$ -		\$ -		\$ -		\$ -	0	\$ -
Staff 1	Hour	\$ 144.00	10%	\$ 129.60		\$ -		\$ -		\$ -		\$ -		\$ -	0	\$ -
Senior Technician	Hour	\$ 149.00	10%	\$ 134.10		\$ -		\$ -		\$ -		\$ -		\$ -	0	\$ -
Technician 3	Hour	\$ 129.00	10%	\$ 116.10		\$ -		\$ -		\$ -		\$ -		\$ -	0	\$ -
Technician 2	Hour	\$ 109.00	10%	\$ 98.10		\$ -		\$ -		\$ -		\$ -		\$ -	0	\$ -
Technician 1	Hour	\$ 91.00	10%	\$ 81.90		\$ -		\$ -		\$ -		\$ -		\$ -	0	\$ -
Senior Editor/ Senior Project Coordinator	Hour	\$ 158.00	10%	\$ 142.20		\$ -		\$ -		\$ -		\$ -		\$ -	0	\$ -
Editor 2/Project Coordinator 2/Accountant 2	Hour	\$ 140.00	10%	\$ 126.00		\$ -		\$ -		\$ -		\$ -		\$ -	0	\$ -
Editor 1/Project Coordinator 1/Accountant 1	Hour	\$ 117.00	10%	\$ 105.30		\$ -		\$ -		\$ -		\$ -		\$ -	0	\$ -
Administrator/Project Assistant/Billing Specialist	Hour	\$ 98.00	10%	\$ 88.20		\$ -		\$ -		\$ -		\$ -		\$ -	0	\$ -
<b>Total Terraphase Labor</b>						<b>\$ 9,912</b>		<b>\$ 26,915</b>		<b>\$ 3,568</b>		<b>\$ 10,474</b>		<b>\$ 4,597</b>		<b>\$ 55,466</b>
<b>Direct Costs</b>																
<i>Subcontractor</i>																
Odin Environmental (Pilot Test Contractor)	T&M NTE	\$ 1.00		\$ 1.00		\$ -	94500	\$ 94,500		\$ -		\$ -		\$ -	94500	\$ 94,500
<b>Total Subcontractor Costs</b>						<b>\$ -</b>		<b>\$ 94,500</b>		<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>		<b>\$ 94,500</b>
<i>Other Direct Costs</i>																
<b>Total Other Direct Costs</b>						<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>
Direct Cost Handling			10%	10.0%		\$ -		\$ 9,450		\$ -		\$ -		\$ -		\$ 9,450
<b>Total Direct Costs</b>						<b>\$ -</b>		<b>\$ 103,950</b>		<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>		<b>\$ 103,950</b>
<b>Terraphase Equipment/Supplies (ERS)</b>																
Truck/Vehicle (day)	Day	\$ 196.00		\$ 196.00		\$ -	6	\$ 1,176	3	\$ 588		\$ -	1	\$ 196	10	\$ 1,960
IPad and Electronic Field Data (day)	Day	\$ 38.00		\$ 38.00		\$ -	6	\$ 228	3	\$ 114		\$ -	1	\$ 38	10	\$ 380
Field Health and Safety and Decon Supplies (daily fee)	Day	\$ 32.00		\$ 32.00		\$ -	6	\$ 192	3	\$ 96		\$ -		\$ -	9	\$ 288
<b>Total Terraphase Equipment/Supplies (ERS)</b>						<b>\$ -</b>		<b>\$ 1,596</b>		<b>\$ 798</b>		<b>\$ -</b>		<b>\$ 234</b>		<b>\$ 2,628</b>
<b>Travel Costs</b>																
Mileage	mile	\$ 0.670		\$ 0.670	0	\$ -	80	\$ 53.60	60	\$ 40.20		\$ -		\$ -	140	\$ 93.80
<b>Total Travel Costs</b>						<b>\$ -</b>		<b>\$ 53.60</b>		<b>\$ 40.20</b>		<b>\$ -</b>		<b>\$ -</b>		<b>\$ 93.80</b>
<b>Total Estimated Project Unit Costs</b>						<b>\$ 9,912</b>		<b>\$ 132,515</b>		<b>\$ 4,406</b>		<b>\$ 10,474</b>		<b>\$ 4,831</b>		<b>\$ 162,138</b>

**Table 3 - Task 2 Cost Breakdown: Stabilization Project Design Support**

Proposal for Sludge-Soil-Cement Pilot Test Implementation and Engineering Support During Construction Procurement  
Water Pollution Control Plant, San Leandro, CA

Category	Units	2024 Standard Rate	Discount	Rate	Task 2.1: Development of IFB PS&E		Task 2.2: RFP Design Support		Task 2.3: Bid Period Design Support		Task 2 Total	
					Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
<b>Labor</b>												
Senior Principal	Hour	\$ 303.00	10%	\$ 272.70	4	\$ 1,091		\$ -		\$ -	4	\$ 1,091
Principal	Hour	\$ 286.00	10%	\$ 257.40	58	\$ 14,929	20	\$ 5,148	31	\$ 7,979	109	\$ 28,057
Senior Associate	Hour	\$ 266.00	10%	\$ 239.40		\$ -		\$ -		\$ -	0	\$ -
Associate	Hour	\$ 250.00	10%	\$ 225.00	12	\$ 2,700		\$ -	0	\$ -	12	\$ 2,700
Senior Project	Hour	\$ 235.00	10%	\$ 211.50	50	\$ 10,575		\$ -	4	\$ 846	54	\$ 11,421
Project	Hour	\$ 219.00	10%	\$ 197.10		\$ -		\$ -		\$ -	0	\$ -
Senior Staff 2	Hour	\$ 202.00	10%	\$ 181.80		\$ -		\$ -		\$ -	0	\$ -
Senior Staff 1	Hour	\$ 183.00	10%	\$ 164.70		\$ -		\$ -		\$ -	0	\$ -
Staff 2	Hour	\$ 164.00	10%	\$ 147.60		\$ -		\$ -		\$ -	0	\$ -
Staff 1	Hour	\$ 144.00	10%	\$ 129.60		\$ -		\$ -		\$ -	0	\$ -
Senior Technician	Hour	\$ 149.00	10%	\$ 134.10		\$ -		\$ -		\$ -	0	\$ -
Technician 3	Hour	\$ 129.00	10%	\$ 116.10		\$ -		\$ -		\$ -	0	\$ -
Technician 2	Hour	\$ 109.00	10%	\$ 98.10		\$ -		\$ -		\$ -	0	\$ -
Technician 1	Hour	\$ 91.00	10%	\$ 81.90		\$ -		\$ -		\$ -	0	\$ -
Senior Editor/ Senior Project Coordinator	Hour	\$ 158.00	10%	\$ 142.20		\$ -		\$ -		\$ -	0	\$ -
Editor 2/Project Coordinator 2/Accountant 2	Hour	\$ 140.00	10%	\$ 126.00		\$ -		\$ -		\$ -	0	\$ -
Editor 1/Project Coordinator 1/Accountant 1	Hour	\$ 117.00	10%	\$ 105.30		\$ -		\$ -		\$ -	0	\$ -
Administrator/Project Assistant/Billing Specialist	Hour	\$ 98.00	10%	\$ 88.20		\$ -		\$ -		\$ -	0	\$ -
<b>Total Terraphase Labor</b>						<b>\$ 29,295</b>		<b>\$ 5,148</b>		<b>\$ 8,825</b>		<b>\$ 43,268</b>
<b>Direct Costs</b>												
<i>Subcontractor</i>												
RSI (Structural Engineering)	T&M NTE	\$ 1.00		\$ 1.00		\$ -		\$ -		\$ -	0	\$ -
PSI (Electrical Engineering)	T&M NTE	\$ 1.00		\$ 1.00		\$ -		\$ -		\$ -	0	\$ -
<b>Total Subcontractor Costs</b>						<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>
<i>Other Direct Costs</i>												
<b>Total Other Direct Costs</b>						<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>
Direct Cost Handling			10%	10.0%		\$ -		\$ -		\$ -		\$ -
<b>Total Direct Costs</b>						<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>
<b>Terraphase Equipment/Supplies (ERS)</b>												
Truck/Vehicle (day)	Day	\$ 196.00		\$ 196.00		\$ -		\$ -		\$ -	0	\$ -
IPad and Electronic Field Data (day)	Day	\$ 38.00		\$ 38.00		\$ -		\$ -		\$ -	0	\$ -
Field Health and Safety and Decon Supplies (daily fee)	Day	\$ 32.00		\$ 32.00		\$ -		\$ -		\$ -	0	\$ -
<b>Total Terraphase Equipment/Supplies (ERS)</b>						<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>
<b>Travel Costs</b>												
Mileage	mile	\$ 0.670		\$ 0.670		\$ -		\$ -	60	\$ 40.20	60	\$ 40.20
<b>Total Travel Costs</b>						<b>\$ -</b>		<b>\$ -</b>		<b>\$ 40.20</b>		<b>\$ 40.20</b>
<b>Total Estimated Project Unit Costs</b>						<b>\$ 29,295</b>		<b>\$ 5,148</b>		<b>\$ 8,866</b>		<b>\$ 43,309</b>

**Table 4 - Task 3 Cost Breakdown: TW Project Design Support**

Proposal for Sludge-Soil-Cement Pilot Test Implementation and Engineering Support During Construction Procurement  
Water Pollution Control Plant, San Leandro, CA

Category	Units	2024 Standard Rate	Discount	Rate	Task 3.1: Development of IFB PS&E		Task 3.2: RFP Design Support		Task 2.3: Bid Period Design Support		Task 1 Total	
					Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
<b>Labor</b>												
Senior Principal	Hour	\$ 303.00	10%	\$ 272.70		\$ -		\$ -		\$ -	0	\$ -
Principal	Hour	\$ 286.00	10%	\$ 257.40	12	\$ 3,089	20	\$ 5,148	46	\$ 11,840	78	\$ 20,077
Senior Associate	Hour	\$ 266.00	10%	\$ 239.40		\$ -		\$ -		\$ -	0	\$ -
Associate	Hour	\$ 250.00	10%	\$ 225.00	14	\$ 3,150	10	\$ 2,250	31	\$ 6,975	55	\$ 12,375
Senior Project	Hour	\$ 235.00	10%	\$ 211.50	12	\$ 2,538		\$ -		\$ -	12	\$ 2,538
Project	Hour	\$ 219.00	10%	\$ 197.10		\$ -		\$ -		\$ -	0	\$ -
Senior Staff 2	Hour	\$ 202.00	10%	\$ 181.80		\$ -		\$ -		\$ -	0	\$ -
Senior Staff 1	Hour	\$ 183.00	10%	\$ 164.70		\$ -		\$ -		\$ -	0	\$ -
Staff 2	Hour	\$ 164.00	10%	\$ 147.60		\$ -		\$ -		\$ -	0	\$ -
Staff 1	Hour	\$ 144.00	10%	\$ 129.60		\$ -		\$ -		\$ -	0	\$ -
Senior Technician	Hour	\$ 149.00	10%	\$ 134.10		\$ -		\$ -		\$ -	0	\$ -
Technician 3	Hour	\$ 129.00	10%	\$ 116.10		\$ -		\$ -		\$ -	0	\$ -
Technician 2	Hour	\$ 109.00	10%	\$ 98.10		\$ -		\$ -		\$ -	0	\$ -
Technician 1	Hour	\$ 91.00	10%	\$ 81.90		\$ -		\$ -		\$ -	0	\$ -
Senior Editor/ Senior Project Coordinator	Hour	\$ 158.00	10%	\$ 142.20		\$ -		\$ -		\$ -	0	\$ -
Editor 2/Project Coordinator 2/Accountant 2	Hour	\$ 140.00	10%	\$ 126.00		\$ -		\$ -		\$ -	0	\$ -
Editor 1/Project Coordinator 1/Accountant 1	Hour	\$ 117.00	10%	\$ 105.30		\$ -		\$ -		\$ -	0	\$ -
Administrator/Project Assistant/Billing Specialist	Hour	\$ 98.00	10%	\$ 88.20		\$ -		\$ -		\$ -	0	\$ -
<b>Total Terraphase Labor</b>						<b>\$ 8,777</b>		<b>\$ 7,398</b>		<b>\$ 18,815</b>		<b>\$ 34,990</b>
<b>Direct Costs</b>												
<i>Subcontractor</i>												
RSI (Structural Engineering)	T&M NTE	\$ 1.00		\$ 1.00		\$ -	2400	\$ 2,400		\$ -	2400	\$ 2,400
PSI (Electrical Engineering)	T&M NTE	\$ 1.00		\$ 1.00		\$ -	2400	\$ 2,400		\$ -	2400	\$ 2,400
<b>Total Subcontractor Costs</b>						<b>\$ -</b>		<b>\$ 4,800</b>		<b>\$ -</b>		<b>\$ 4,800</b>
<i>Other Direct Costs</i>												
<b>Total Other Direct Costs</b>						<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>
Direct Cost Handling			10%	10.0%		\$ -		\$ 480		\$ -		\$ 480
<b>Total Direct Costs</b>						<b>\$ -</b>		<b>\$ 5,280</b>		<b>\$ -</b>		<b>\$ 5,280</b>
<b>Terraphase Equipment/Supplies (ERS)</b>												
Truck/Vehicle (day)	Day	\$ 196.00		\$ 196.00		\$ -		\$ -		\$ -	0	\$ -
IPad and Electronic Field Data (day)	Day	\$ 38.00		\$ 38.00		\$ -		\$ -		\$ -	0	\$ -
Field Health and Safety and Decon Supplies (daily fee)	Day	\$ 32.00		\$ 32.00		\$ -		\$ -		\$ -	0	\$ -
<b>Total Terraphase Equipment/Supplies (ERS)</b>						<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>
<b>Travel Costs</b>												
Mileage	mile	\$ 0.670		\$ 0.670		\$ -		\$ -	60	\$ 40.20	60	\$ 40.20
<b>Total Travel Costs</b>						<b>\$ -</b>		<b>\$ -</b>		<b>\$ 40.20</b>		<b>\$ 40.20</b>
<b>Total Estimated Project Unit Costs</b>						<b>\$ 8,777</b>		<b>\$ 12,678</b>		<b>\$ 18,856</b>		<b>\$ 40,310</b>