

## AGREEMENT FOR ENGINEERING PROFESSIONAL SERVICES

THIS AGREEMENT is made and entered into on this 22nd day of October, 2014, by and between the City of Manhattan Beach, a municipal corporation ("City") and Hazen and Sawyer, P.C., a New York corporation dba Hazen and Sawyer ("Contractor") (collectively, the "Parties").

### RECITALS

A. City desires to obtain services of Contractor for engineering services to evaluate City's water system disinfection stability and associated regulatory compliance issues.

B. Contractor represents that it is qualified and able to perform the services ("Services") required by this Agreement.

NOW, THEREFORE, in consideration of the Parties' performance of the promises, covenants, and conditions stated herein, the Parties hereto agree as follows:

Section 1. Contractor's Services. Contractor shall perform the Services described in Tasks 1- 5 ("Services") of Exhibit A – Scope of Services, in a manner satisfactory to City and consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. Task 6 in the Scope of Services is excluded from this Agreement.

Section 2. Term of Agreement. This Agreement shall apply to services rendered on or after October 22, 2014, and shall terminate when the work is completed, unless sooner terminated by City.

Section 3. Time of Performance. Contractor shall commence its Services under this Agreement upon receipt of a written notice to proceed from City. Contractor shall complete the Services in conformance with the timeline set forth in Exhibit A (Tasks 1-5), or as otherwise directed by City's representative.

Section 4. Compensation.

(a) City agrees to pay Contractor in accordance with the fee schedule attached hereto as Exhibit B. Except as otherwise stated in subsection (c) of this section, in no event shall Contractor be paid more than \$55,725 during the term of this Agreement. Any terms in Exhibit B, other than the payment rates and schedule of payment, are null and void.

(b) Unless expressly provided for in Exhibit B, Contractor shall not be entitled to reimbursement for any expenses. Any expenses incurred by Contractor that are not expressly authorized by this Agreement will not be reimbursed by City.

(c) The City Manager may authorize cumulative increases for additional work of up to \$20,000. Any additional work in excess of this amount shall be approved by the City Council.

Section 5. Method of Payment. City shall pay Contractor the compensation set forth in Section 4 in accordance with the method and schedule of payment set forth in Exhibit B, attached hereto and incorporated herein. Unless otherwise specified in Exhibit B, Contractor shall submit to City a detailed invoice on a monthly basis for the services performed pursuant to this Agreement. Each invoice shall describe in detail the Services rendered during the period, the Tasks (1-5) to which those Services relate, the days worked, number of hours worked, the hourly rates charged, and the Services performed for each day in the period, as applicable. Within 45 days of receipt of each invoice, City shall pay all undisputed amounts included on the invoice.

Section 6. Independent Contractor. The Parties agree, understand, and acknowledge that Contractor is not an employee of City, but is solely an independent contractor. Contractor expressly acknowledges and agrees that City has no obligation to pay or withhold state or federal taxes or to provide workers' compensation or unemployment insurance or other employee benefits and that any person employed by Contractor shall not be in any way an employee of City. As such, Contractor shall have the sole legal responsibility to remit all federal and state income and social security taxes and to provide for his/her own workers' compensation and unemployment insurance and that of his/her employees or subcontractors. Neither City nor any of its agents shall have control over the conduct of Contractor or any of Contractor's employees. Contractor shall not, at any time, or in any manner, represent that it or any of its agents or employees are in any manner agents or employees of City. Contractor shall indemnify and hold harmless City and its elected officials, officers and employees, servants, designated volunteers, and agents serving as independent contractors in the role of City officials, from any and all liability, damages, claims, costs and expenses of any nature to the extent arising from Contractor's personnel practices. City shall have the right to offset against the amount of any fees due to Contractor under this Agreement any amount due to City from Contractor as a result of Contractor's failure to promptly pay to City any reimbursement or indemnification arising under this Section 6.

Section 7. Assignment. This Agreement shall not be assigned, in whole or in part, by Contractor without the prior written approval of City. Any attempt by Contractor to so assign this Agreement or any rights, duties, or obligations arising hereunder shall be void and of no effect.

Section 8. Responsible Principals.

(a) Contractor's responsible principal, Lynn Grijalva, PE, shall be principally responsible for Contractor's obligations under this Agreement and shall serve as principal liaison between City and Contractor. Designation of another Responsible Principal by Contractor shall not be made without prior written consent of City.

(b) City's Responsible Principal shall be the City Manager, who shall administer the terms of the Agreement on behalf of City.

Section 9. Personnel. Contractor represents that it has, or shall secure at its own expense, all personnel required to perform the Services under this Agreement. All personnel engaged in the work shall be qualified to perform such Services.

Section 10. Permits and Licenses. Contractor shall obtain and maintain during the term of this Agreement all necessary licenses, permits, and certificates required by law for the provision of the Services, including a business license.

Section 11. Interests of Contractor.

(a) Contractor covenants that it presently has no interest and shall not acquire any interest, direct or indirect, which may be affected by the Services, or which would conflict in any manner with the performance of the Services. Contractor further covenants that, in performance of this Agreement, no person having any such interest shall be employed by it. Furthermore, Contractor shall avoid the appearance of having any interest, which would conflict in any manner with the performance of the Services. Contractor shall not accept any employment or representation during the term of this Agreement which is or may likely make Contractor "financially interested" (as provided in California Government Code §§ 1090 and 87100) in any decision made by City on any matter in connection with which Contractor has been retained.

(b) Contractor further warrants and maintains that it has not employed or retained any person or entity, other than a bona fide employee working exclusively for Contractor, to solicit or obtain this Agreement. Nor has Contractor paid or agreed to pay any person or entity, other than a bona fide employee working exclusively for Contractor, any fee, commission, gift, percentage, or any other consideration contingent upon the execution of this Agreement. Upon any breach or violation of this warranty, City shall have the right, at its sole and absolute discretion, to terminate this Agreement without further liability, or to deduct from any sums payable to Contractor hereunder the full amount or value of any such fee, commission, percentage or gift.

(c) Contractor warrants and maintains that it has no knowledge that any officer or employee of City has any interest, whether contractual, non-contractual, financial, proprietary, or otherwise, in this transaction or in the business of Contractor, and that if any such interest comes to the knowledge of Contractor at any time during the term of this Agreement, Contractor shall immediately make a complete, written disclosure of such interest to City, even if such interest would not be deemed a prohibited "conflict of interest" under applicable laws as described in this subsection.

Section 12. Insurance. [Check if Applicable]

(a) Contractor shall at all times during the term of this Agreement carry, maintain, and keep in full force and effect, insurance as follows:

1.  A policy or policies of Comprehensive General Liability Insurance, with minimum limits of \$2,000,000 for each occurrence, combined single limit, against any personal injury, death, loss, or damage resulting from the wrongful or negligent acts by Contractor.

2.  A policy or policies of Comprehensive Vehicle Liability Insurance covering personal injury and property damage, with minimum limits of \$1,000,000 per occurrence combined single limit, covering any vehicle utilized by Contractor in performing the Services required by this Agreement.

3.  Workers' compensation insurance as required by the State of California.

4.  A policy or policies of Professional Liability Insurance (errors and omissions) with minimum limits of \$2,000,000 per claim and in the aggregate. Any deductibles or self-insured retentions attached to such policy or policies must be declared to and be approved by City. Further, Contractor agrees to maintain in full force and effect such insurance for one year after performance of work under this Agreement is completed.

(b) Other Insurance Provisions. The general liability and automobile liability policies are to contain, or be endorsed to contain, the following provisions:

1. City, its officers, officials, employees, designated volunteers and agents serving as independent contractors in the role of City officials, are to be covered as additional insureds as respects: liability arising out of activities performed by or on behalf of Contractor; products and completed operations of Contractor; premises owned, occupied or used by Contractor; or automobiles owned, leased, hired or borrowed by Contractor. The coverage shall contain no limitations on the scope of protection afforded to City, its officers, officials, employees, designated volunteers or agents serving as independent contractors in the role of City officials which are not also limitations applicable to the named insured.

2. For any claims related to this Agreement, Contractor's insurance coverage shall be primary insurance as respects City, its officers, officials, employees, designated volunteers and agents serving as independent contractors in the role of City officials. Any insurance or self-insurance maintained by City, its officers, officials, employees, designated volunteers or agents serving as independent contractors in the role of City officials shall be excess of Contractor's insurance and shall not contribute with it.

3. Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

4. Each insurance policy, except for the professional liability policy, required by this clause shall expressly waive the insurer's right of subrogation against

City and its elected officials, officers, employees, servants, attorneys, designated volunteers, and agents serving as independent contractors in the role of City officials.

5. Each insurance policy required by this Agreement shall be endorsed to state: should the policy be canceled before the expiration date, the issuing insurer shall mail 30 days' prior written notice to City.

6. If insurance coverage is canceled or reduced in coverage or in limits, Contractor shall within two business days of notice from insurer, phone, fax and/or notify City via certified mail, return receipt requested, of the changes to or cancellation of the policy.

(c) City's Risk Manager may, in writing, amend and/or waive any or all of the insurance provisions set forth herein. In such case, Contractor shall comply with the insurance provisions required by City's Risk Manager.

(d) The policy or policies required by this Agreement shall be issued by an insurer admitted in the State of California and with a rating of at least A-;VII in the latest edition of Best's Insurance Guide, unless waived in writing by City's Risk Manager.

(e) Contractor agrees that if it does not keep the insurance required by this Section 12 in full force and effect, City may either immediately terminate this Agreement or, if insurance is available at a reasonable cost, City may take out the necessary insurance and pay, at Contractor's expense, the premium thereon.

(f) All insurance coverages shall be confirmed by execution of endorsements on forms approved by City. The endorsements are to be signed by a person authorized by that insurer to bind coverage on its behalf. All endorsements are to be received and approved by City before services commence. As an alternative to City forms, Contractor's insurer may provide complete, certified copies of all required insurance policies, including endorsements affecting the coverage required by these specifications.

(g) Any deductibles or self-insured retentions must be declared to and approved by City, and shall not exceed \$25,000.

(h) Contractor shall require each of its sub-contractors (if any) to maintain insurance coverage that meets all of the requirements of this Agreement.

Section 13. Indemnification. Contractor shall hold harmless and indemnify City, and its elected officials, officers, employees, servants, designated volunteers, and those city agents serving as independent consultants in the role of city officials (collectively, "Indemnitees"), with respect to any and all claims, demands, damages, liabilities, losses, costs or expenses, including reimbursement of attorneys' fees and costs of defense (collectively, "Claims" hereinafter), including but not limited to Claims relating to death or injury to any person and injury to any property, which arise out of, pertain to, or relate to in whole or in part to the negligence, recklessness, or willful misconduct of Contractor or any of its officers, employees, subcontractors, or agents in the

performance of its services under this Agreement. Contractor shall defend Indemnitees in any action or actions file in connection with any such Claims with counsel of City's choice, and shall pay all costs, judgments, and expenses, including all attorneys' fees and experts' costs actually incurred in connection with such defense. Contractor's obligation to indemnify shall not be restricted to insurance proceeds, if any, received by Contractor or City. All duties of Contractor under this Section shall survive termination of this Agreement.

Section 14. Termination.

(a) City shall have the right to terminate this Agreement for any reason or for no reason upon five calendar days' written notice to Contractor. Contractor agrees to cease all work under this Agreement on or before the effective date of such notice.

(b) City may at any time, for any reason, with or without cause, suspend this Agreement, or any portion hereof, by serving upon Contractor written notice. Upon receipt of such notice, Contractor shall immediately cease all work under this Agreement, unless the notice provides otherwise. If City suspends only a portion of this Agreement, such suspension shall not make void or invalidate the remainder of this Agreement.

(c) In the event of termination or cancellation of this Agreement by City, due to no fault or failure of performance by Contractor, Contractor shall be paid based on the percentage of work satisfactorily performed at the time of termination. In no event shall Contractor be entitled to receive more than the amount that would be paid to Contractor for the full performance of the Services required by this Agreement. Contractor shall have no other claim against City by reason of such termination, including any claim for compensation.

Section 15. City's Responsibility. City shall provide Contractor with all pertinent data, documents, and other requested information as is available for the proper performance of Contractor's Services.

Section 16. Information and Documents.

(a) Contractor covenants that all data, documents, discussion, or other information (collectively "Data") developed or received by Contractor or provided for performance of this Agreement are deemed confidential and shall not be disclosed or released by Contractor without prior written authorization by City. City shall grant such authorization if applicable law requires disclosure. Contractor, its officers, employees, agents, or subcontractors, shall not without written authorization from the City Manager or unless requested in writing by the City Attorney, voluntarily provide declarations, letters of support, testimony at depositions, response to interrogatories or other information concerning the work performed under this Agreement or relating to any project or property located within the City. Response to a subpoena or court order shall not be considered "voluntary," provided Contractor gives City notice of such court order or subpoena.

(b) Contractor shall promptly notify City should Contractor, its officers, employees, agents or subcontractors be served with any summons, complaint, subpoena, notice of deposition, request for documents, interrogatories, request for admissions or other discovery request, court order or subpoena from any party regarding this Agreement and the work performed thereunder or with respect to any project or property located within the City. City retains the right, but has no obligation, to represent Contractor and/or be present at any deposition, hearing or similar proceeding. Contractor agrees to cooperate fully with City and to provide City with the opportunity to review any response to discovery requests provided by Contractor. However, City's right to review any such response does not imply or mean the right by City to control, direct, or rewrite the response.

(c) All Data required to be furnished to City in connection with this Agreement shall become the property of City, and City may use all or any portion of the Data submitted by Contractor as City deems appropriate. Upon completion of, or in the event of termination or suspension of this Agreement, all original documents, designs, drawings, maps, models, computer files containing data generated for the work, surveys, notes, and other documents prepared in the course of providing the Services shall become the sole property of City and may be used, reused or otherwise disposed of by City without Contractor's permission.

(d) Contractor shall maintain complete and accurate records with respect to sales, costs, expenses, receipts and other such information required by City that relate to the performance of the Services. All such records shall be maintained in accordance with generally accepted accounting principles and shall be clearly identified and readily accessible. Contractor shall provide free access to City, its designees and representatives at reasonable times, and shall allow City to examine and audit the books and records, to make transcripts therefrom as necessary, and to inspect all work, data, documents, proceedings and activities related to this Agreement. Such records, together with supporting documents, shall be maintained for a period of 3 years after receipt of final payment.

(e) Contractor's covenants under this Section shall survive the termination of this Agreement.

#### Section 17. Default

(a) Contractor's failure to comply with the provisions of this Agreement shall constitute a default. In the event that Contractor is in default for cause under the terms of this Agreement, City shall have no obligation or duty to continue compensating Contractor for any work performed after the date of default and can terminate this Agreement immediately by written notice to Contractor. If such failure by Contractor to make progress in the performance of work hereunder arises out of causes beyond Contractor's control, and without fault or negligence of Contractor, it shall not be considered a default.

(b) If the City Manager or his delegate determines that Contractor is in default in the performance of any of the terms or conditions of this Agreement, City shall serve Contractor with written notice of the default. Contractor shall have ten (10) days after service upon it of the notice in which to cure the default by rendering a satisfactory performance. In the event that Contractor fails to cure its default within such period of time, City shall have the right, notwithstanding any other provision of this Agreement, to terminate this Agreement without further notice and without prejudice to any other remedy to which it may be entitled at law, in equity or under this Agreement.

Section 18. Changes in the Services. City shall have the right to order, in writing, changes in the Services or the services to be performed. Any changes in the Services requested by Contractor must be made in writing and approved by both Parties.

Section 19. Notice. Any notices, bills, invoices, etc. required by this Agreement shall be deemed received on (a) the day of delivery if delivered by hand during the receiving party's regular business hours or by facsimile before or during the receiving party's regular business hours; or (b) on the second business day following deposit in the United States mail, postage prepaid, to the addresses set forth below, or to such other addresses as the Parties may, from time to time, designate in writing pursuant to this section.

If to City:                      City of Manhattan Beach  
   1400 Highland Avenue  
   Manhattan Beach, California 90266  
   Attn: Raul Saenz

If to Contractor:              Hazen and Sawyer  
   1149 S. Hill Street, Suite 450  
   Los Angeles, CA 90015  
   Attn: Lynn Grijalva, PE

Section 20. Attorneys' Fees. If a party commences any legal, administrative, or other action against the other party arising out of or in connection with this Agreement, the prevailing party in such action shall be entitled to have and recover from the losing party all of its attorneys' fees and other costs incurred in connection therewith, in addition to such other relief as may be sought and awarded.

Section 21. Entire Agreement. This Agreement represents the entire integrated agreement between City and Contractor, and supersedes all prior negotiations, representations, or agreements, either written or oral. This Agreement may be amended only by a written instrument signed by both City and Contractor.

Section 22. Governing Law. The interpretation and implementation of this Agreement shall be governed by the domestic law of the State of California.



Section 23. Venue. Any litigation concerning this Agreement shall take place in the municipal, superior, or federal district court with geographic jurisdiction over the City of Manhattan Beach.

Section 24. City Not Obligated to Third Parties. City shall not be obligated or liable under this Agreement to any party other than Contractor.

Section 25. Exhibits; Precedence. All documents referenced as exhibits in this Agreement are hereby incorporated in this Agreement. In the event of any discrepancy between the express provisions of this Agreement and the provisions of any document incorporated herein by reference, the provisions of this Agreement shall prevail.

Section 26. Corporate Authority. The persons executing this Agreement on behalf of the Parties warrant that they are duly authorized to execute this Agreement on behalf of the Parties and that by their execution, the Parties are formally bound to the provision of this Agreement.

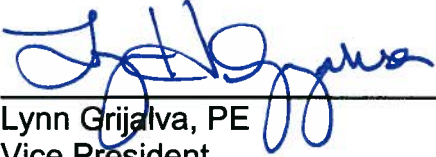
Section 27. Severability. Invalidation of any provision contained herein or the application thereof to any person or entity by judgment or court order shall in no way affect any of the other covenants, conditions, restrictions, or provisions hereof, or the application thereof to any other person or entity, and the same shall remain in full force and effect.

EXECUTED on the date first written above at Manhattan Beach, California.

CITY OF MANHATTAN BEACH

CONTRACTOR: Hazen and Sawyer

\_\_\_\_\_  
Mark Danaj  
City Manager

  
\_\_\_\_\_  
Lynn Grijalva, PE  
Vice President

ATTEST:

October 22, 2014

\_\_\_\_\_  
LIZA TAMURA  
City Clerk

APPROVED AS TO FORM:

  
\_\_\_\_\_  
QUINN M. BARROW  
City Attorney

**EXHIBIT A**

**SCOPE OF SERVICES**

**City of Manhattan Beach**

**RFP # 993-15**

**Engineering Services for Disinfection Residual Stability and Regulatory Compliance**

# SECTION 1: PROPOSED APPROACH

## PROJECT UNDERSTANDING

The City of Manhattan Beach has a reliable source of local groundwater from two wells – Wells 11A and 15. Due to natural aquifer conditions, the wells have compounds that can cause disinfectant residual stability challenges (ammonia) and aesthetic concerns (color, sulfur odor). The natural ammonia is not regulated but has significant implications for water quality. Ammonia can significantly affect disinfection chemistry by forming chloramines. When formed in an uncontrolled manner, inadvertent reactions can occur that cause loss of disinfectant residual and increase the chance for bacterial growth in the distribution system. In addition, excess ammonia is available to ammonia oxidizing bacteria that convert the ammonia to nitrite, causing more loss of disinfectant residual.

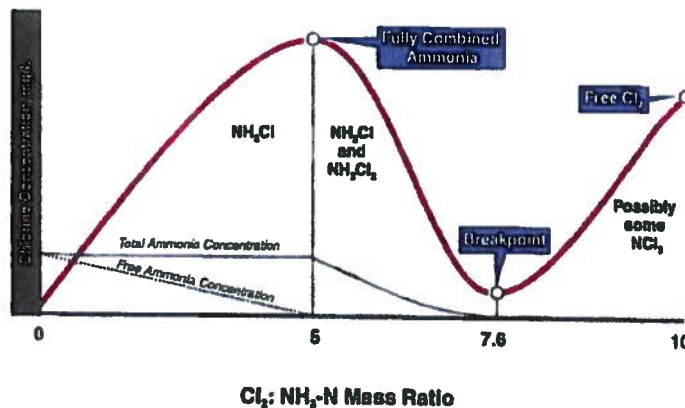
The City operates the wells by blending groundwater with water from the Metropolitan Water District of Southern California (Metropolitan) at Block 35 and Peck Reservoirs. Metropolitan water contains chloramines for secondary disinfection, which is mixed with Manhattan Beach groundwater containing ammonia. The ratio is capped at approximately 75% groundwater to maintain manganese concentrations below the secondary maximum contaminant level (MCL).

Chlorine is currently added into the combined flow with flow pacing of hypochlorite. Variations in the proportion of Metropolitan water and groundwater, as well as variations in groundwater quality, impact the chlorine-to-ammonia ratio of chloramines. If greater than 5:1  $Cl_2:NH_3-N$ , the water can form dichloramines (a strong “swimming pool” odor) or reach breakpoint where ammonia disappears and the chlorine residual drops. If less than 5:1, free ammonia

will be present and ammonia oxidizing bacteria can use the free ammonia as an energy source, degrading the chloramine residual. A strong disinfectant residual is necessary to prevent bacterial regrowth in the distribution system.

The City needs to balance competing water quality regulatory requirements, including:

- Primary and Secondary Maximum Contaminant Levels (MCLs) – groundwater is above the MCL for manganese, requiring blending, and has the potential for formation of nitrite levels above the MCL arising from the natural ammonia
- Total Coliform Rule (TCR)– requiring maintenance of a measurable disinfectant residual in the distribution system and limiting bacterial growth
- Stage 2 Disinfectants and Disinfection Byproducts Rule – regulating byproducts that form when chlorine or chloramines react with natural organics in the water
- Notification Levels (NLs) – the groundwater may have a higher potential for formation of nitrosamines including NDMA, due to the availability of nitrogenous compounds
- Groundwater Rule – achievement of adequate disinfection of well water (CT) can be challenging if natural ammonia is present



Specific tasks that Hazen and Sawyer proposes to perform for the City in this project include:

### **Task 1 – Assess water quality and operations data**

We are very familiar with Manhattan Beach groundwater quality since groundwater was extensively studied by our team in the West Basin Desalination Integration study, which will allow us to minimize costs and time required to complete this project. Four months of weekly groundwater quality data was collected on Well 11A and more limited data on Well 15. The West Basin integration study also involved testing disinfectant residual stability, closely mimicking current operations at the City blending facilities, and formation potential testing for nitrosamines.

In this study, we will first compile City water quality data from the last 5 years of operation to assess water quality, including levels of constituents and fluctuations, which could impact potential control strategies. The current blending approaches at Peck Reservoir and Block 35 will be reviewed and opportunities identified for not only improving disinfectant residual stability but harnessing natural ammonia to the benefit of the City. Options for addressing the natural ammonia will be evaluated to provide the City with an understanding of the outcomes from different approaches. Disinfectant by-product formation tests will be run with the following disinfectant strategies to determine the potential DBPs formed and chemical doses needed to optimize disinfection:

1. Use of natural ammonia to form chloramines
2. Breakpoint of natural ammonia to yield free chlorine then addition of ammonia to form chloramines

The outcome of Task 1 will be an analysis of water quality data and identification of feasible alternatives for attaining more stable operations and compliance with water quality regulations. The deliverable will be a meeting with the City to discuss the findings and strategy for completing the remaining tasks.

### **Task 2 – Evaluate distribution system water quality**

In Task 2, Hazen and Sawyer will develop a short-term monitoring plan for assessing residual (chlorine vs. chloramine) and nitrification in the system, including sampling methods and monitoring frequency. This plan will address distribution system water quality, including TCR and Stage 2 D/DBP Rule compliance in particular.

We propose a two-pronged approach for improving water quality in the Manhattan Beach distribution system. First, we will use the City's hydraulic model to determine if short-term opportunities exist to improve circulation in areas of high water age in the distribution system. To identify any specific factors causing residual loss, we will identify:

- Areas with low disinfectant residuals
- Areas with continual or periodic nitrification episodes
- Areas without nitrification problems
- Water age in the distribution system, including water storage facilities
- Usage patterns of groundwater and blending.

This information will be coupled with information on pipe age and materials to evaluate if specific factors can be identified that are causing disinfectant residual losses. We will also conduct model runs to identify optimal locations for chlorine feed stations to boost chloramines residual in the distribution system. Modeling of residual decay will be compared with residual samples collected in the distribution system to assess the impact of water age on water quality. Additionally, bulk decay tests will be completed for the different sources to develop understanding of how fast the residual is disappearing. This would serve as a good test to verify the impact of different dosing techniques.

Task 2 is important because it will provide the City with insight into the distribution network and determine whether operational adjustments and/or additions would resolve the issues, or if pipe main replacement is necessary to improve the overall water quality to comply with primary and secondary standards.

## Sampling and Analysis Plan Outline

1. **Background**
  - a. Chloramine Fundamentals
  - b. System Operational Strategies
2. **Sampling and Analysis**
  - a. Monitoring Locations
  - b. Sample Collection Procedures
  - c. Monitoring Frequency
  - d. Reporting Frequency
3. **Water Quality Thresholds**
  - a. Action Levels
  - b. Corrective Actions
4. **Summary and Recommendations**

Findings in Task 2 will be provided to the City in the final project technical memorandum.

Recommendations will include potential network looping options, storage operational changes, valving operational changes, and prioritizing distribution system pipe replacements based on the outcome of hydraulic modeling with disinfectant residual analysis.

### Task 3 – Develop sampling and analysis plan for blending facilities and distribution system

In Task 3, we will develop a tailored sampling and analysis plan for City operations staff to monitor chloramines formation and residual stability in the blends of MWD water and groundwater blends, as well as in the distribution system. This plan will be prepared to provide materials for training new staff in chloramines formation and the best practices in maintaining the disinfectant residual throughout the system. An action plan will be developed to provide protocols for addressing any exceedances of water quality thresholds with the purpose of curtailing disinfectant residual losses before becoming severe. Sampling from locations throughout the distribution system will provide insight on where improvements can be accomplished with the operations team.

The deliverables for this task include the sampling and analysis plan and a workshop with City staff to transfer knowledge on chloramine chemistry, methods of control, and interpretation of results to enable long-term success in managing the disinfectant residual, which impacts multiple drinking water treatment regulations.

### Task 4 – Recommend and prioritize capital improvements

We understand that the chemical feed equipment at Peck and Block 35 reservoirs are in need of upgrades and the City would like to add chemical feed systems and equipment housing structures at the wells. In Task 4, we will assist the City in evaluating chemical feed system options, including control loops, online monitoring, and any recommended piping modifications to achieve the recommended blending strategy identified in Task 1. Since ammonia and monochloramine monitoring equipment have been evolving over the past few years, we will conduct a brief survey of multiple utilities using this equipment to determine operational advantages and disadvantages of the options. Based on these findings, we will provide recommendations on chemical feed and monitoring systems for the two City blending facilities. In addition, potential equipment needs and engineering approaches to the integration of chlorine boosting facilities in the distribution system will be assessed and preliminary design information provided in the final technical memorandum.

### Task 5 – Drinking Water Permit Amendment

We anticipate that changes in the disinfection strategy of groundwater recommended in this project will require CDPH review and approval. Findings from the testing in Task 1 will be presented to CDPH and concerns evaluated prior to final recommendation of capital improvements for the system. Our team will assist the City in preparing documentation to apply for a CDPH permit amendment.

### Task 6 – Groundwater Well Water Quality

City water has been, at times, described as having a green tint despite meeting regulatory limits. In this task, we will investigate the source of this color interviewing staff on details of the occurrences, reviewing water quality and production data to look for trends in when the color occurred and evaluating the spatial distribution of complaints in the distribution system compared with other water quality conditions. We will also review the scientific literature

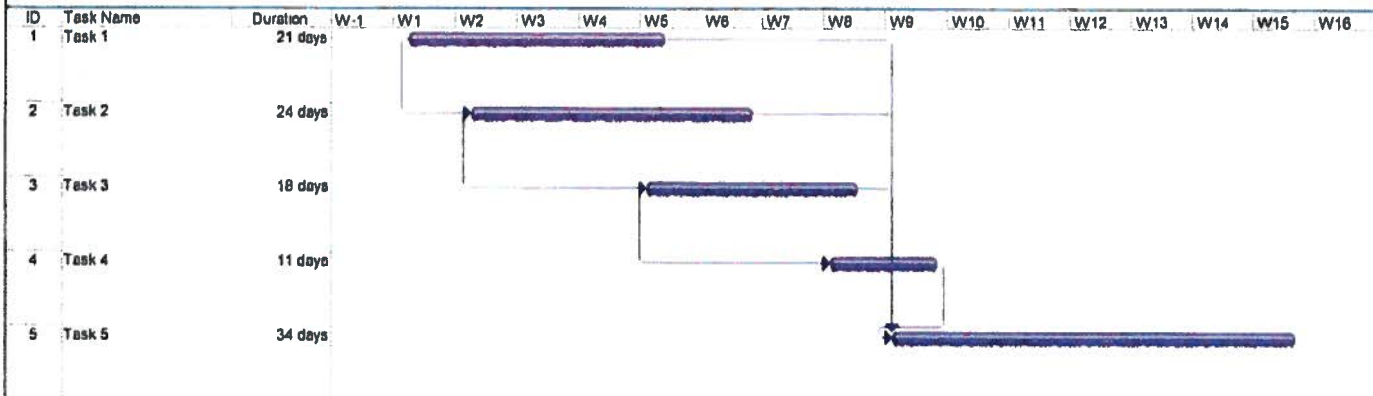
to investigate potential sources of green tint to potable groundwater and provide recommendations to the City on constituents to sample in the well water and/or distribution system to evaluate the cause. It is our understanding that the groundwater color analysis may be addressed separately, and may be considered an optional scope of work.

The final deliverable will be a technical memorandum summarizing key findings of the project and recommendations for system optimization. The initial sampling and analysis results will be presented, and a sampling and analysis plan for future operations will be included in an appendix for ongoing use by City staff.

## **Deliverable**

The final deliverable for this project will be a technical memorandum summarizing key project findings and recommendations for system optimization of disinfection residual control and aesthetic concerns. A sampling and analysis plan for future operations will be included as an appendix to provide a stand-alone document for operations staff.

Manhattan Beach Project Schedule



**EXHIBIT B**

**CONSIDERATION AND METHOD OF PAYMENT**

City of Manhattan Beach

**RFP # 993-15 Engineering Services for Disinfection Residual Stability and Regulatory Compliance**

Task	Task Description	Est. Hrs Ghika \$281	Est. Hrs Blum \$237	Est. Hrs Wu \$140	Est. Hrs Ghu \$180	Est. Hrs Mackenzie \$217	Est. Hrs Roberts \$157	Est. Hrs Chau \$102	Labor Cost	ODCs	Estimated Cost
1	Assess water quality and operations data	2	8	0	16	0	0	28	\$6,242	\$300	\$6,542
2	Evaluate distribution system water quality	2	8	4	16	0	44	16	\$14,475	\$300	\$14,775
3	Develop sampling and analysis plan	2	6	4	16	4	0	40	\$10,493	\$300	\$10,793
4	Prioritize capital improvements	2	4	0	16	16	16	32	\$13,690	\$300	\$13,990
5	Obtaining water permit amendment	4	8	0	8	0	0	28	\$7,384	\$300	\$7,684
	<b>Cumulative Hours</b>	<b>12</b>	<b>34</b>	<b>8</b>	<b>72</b>	<b>20</b>	<b>60</b>	<b>144</b>	<b>\$54,225</b>	<b>\$1,500</b>	<b>\$55,725</b>