

# STAFF REPORT



ITEM NO. **15**  
CITY OF OCEANSIDE

DATE: August 17, 2011

TO: Honorable Mayor and City Councilmembers

FROM: Water Utilities Department

SUBJECT: **PROFESSIONAL SERVICES AGREEMENT WITH GEOSCIENCE SUPPORT SERVICES INCORPORATED FOR PROFESSIONAL SERVICES RELATED TO FEASIBILITY OF SEAWATER DESALINATION IN THE MISSION NARROWS**

## **SYNOPSIS**

Staff and the Utilities Commission recommend that the City Council approve a professional services agreement with Geoscience Support Services Incorporated of Claremont in an amount not to exceed \$1,357,450 for professional services related to feasibility for seawater desalination in the Mission Narrows; and authorize the City Manager to execute the agreement.

## **BACKGROUND**

The City has performed a preliminary pilot study for the feasibility of treating seawater utilizing the reverse osmosis process. The feasibility report recommended next steps to include boring test wells within the Mission Narrows on the San Luis Rey River, conducting long-term aquifer testing and developing a three-dimensional ground water flow model. Geoscience Support Services will drill test wells and monitoring wells adjacent to the river and test pumping of the wells to determine if there is sufficient capacity for long term pumping that would be of beneficial use to provide additional water for treatment at the Mission Basin Desalting Facility. Upon completion of the test drilling and pumping, the consultant will prepare a model to help determine the sustainability of the groundwater pumping rates. The consultant is also required obtain all necessary permits and prepare all CEQA documentation required to perform the work. The project is scheduled to take a year to complete not including staff review time.

## **ANALYSIS**

On April 18, 2011, a Request for Proposal (RFP) was sent to four consulting firms for hydro-geologists to establish additional exploratory wells within the Mission Narrows and to determine the effective pumping rates of the San Luis Rey River (Exhibit A). On May 17, 2011, the Water Utilities Department received proposals from two of the four consulting firms; staff performed a review of the proposals for accuracy and completeness. Staff has determined that the proposal includes the required items as outlined in the RFP (Exhibit B).

**FISCAL IMPACT**

The Fiscal Year 11-12 approved budget for the Ocean Desalination Geotechnical project (908824700715.5305) is \$1,900,000 and the amount to evaluate the seawater feasibility is \$1,357,450 (Exhibit C). Therefore, adequate funds will be available for the project.

**CITY ATTORNEY'S ANALYSIS**

The referenced documents have been reviewed by the City Attorney and approved as to form.

**INSURANCE REQUIREMENTS**

The City's standard insurance requirements will be met.

**COMMISSION OR COMMITTEE REPORT**

The Utilities Commission approved staff's recommendation at its regularly scheduled meeting on July 19, 2011.

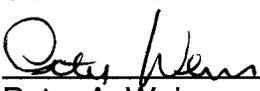
**RECOMMENDATIONS**

Staff and the Utilities Commission recommend that the City Council approve a professional services agreement in an amount not to exceed \$1,357,450 with Geoscience Support Services Incorporated of Claremont for professional services related to feasibility for seawater desalination in the Mission Narrows; and authorize the City Manager to execute the agreement.

PREPARED BY:

  
\_\_\_\_\_  
Greg Blakely  
Administration Manager

SUBMITTED BY:

  
\_\_\_\_\_  
Peter A. Weiss  
City Manager

REVIEWED BY:

Michelle Skaggs-Lawrence, Deputy City Manager

  
\_\_\_\_\_

Cari Dale, Water Utilities Director

\_\_\_\_\_

Terri Ferro, Financial Services Director

  
\_\_\_\_\_

- Exhibit A – Request for Proposal Mailing List
- Exhibit B – Consultant's Rating Form
- Exhibit C – Professional Services Agreement

Seawater Desalination Exploratory Drilling and Monitoring Wells  
RFP Mailing List

Company	Address	City	State	Zip	First Name	Last Name	Phone	Fax
Thomas Hardin	23692 Birtcher Drive	Lake Forest	CA	92630	Mark	Wildemuth	(949) 420-3030	
Geoscience Support Services, Inc.	P.O. Box 220	Claremont	CA	91711	Dr. Dennis E.	Williams	(909) 451-6650	(909) 451-6638
Hydrometrics Water Resources	519 17th Street, Ste. 500	Oakland	CA	94612	Derrick	Williams	(510) 903-0458	
Ninyo & Moore	5710 Ruffin Road	San Diego	CA	92123	Elizabeth	Morud	(858) 576-1000	



CONSULTANT PROPOSAL RATING FORM

NAME OF FIRM: Crosswaters B Thomas Hanson  
 PROJECT: Expenditure Review & Improvement Plans

DATE: 6/14/11  
 PROJECT NO.: 906014700715

ITEM	POINTS	CONSULTANT'S RATING				
		A	B	C	D	E
<b>QUALIFICATIONS OF FIRM PERSONNEL</b>						
A. Specialized expertise of members	15	14	13			
B. Adequacy of staff and resources.	15	14	13			
<b>RECORD OF PERFORMANCE ON WORKSIMILAR IN SCOPE</b>						
A. Comparable work (local area preferred).	10	10	6			
B. Proposal submitted by Oceanside firm.	6	0	0			
C. Proposal included an Oceanside firm as part of a consulting team.	4	4	0			
D. Additional points based on abilities, qualifications, and commitment of Oceanside firm.	5	0	0			
<b>ABILITY TO PROVIDE SERVICES</b>						
A. Ability to complete job on time.	10	9	8			
<b>QUALITY OF PROPOSAL</b>						
A. Satisfactorily address all objectives.	10	9	6			
B. Provide additional amplifying information.	5	4	3			
C. Presentation, clarity, neatness.	5	5	4			
<b>WORKER PERFORMANCE FOR THE PAST 12 MONTHS</b>						
A. No work in past 12 months.	10	10	10			
B. Work in past 12 months - deductions based on Contract amount.						
<b>TOTALS:</b>	105	670	740	0	0	0

RANKING:

1 Crosswaters  
 2 Thomas Hanson  
 3 \_\_\_\_\_  
 4 \_\_\_\_\_  
 5 \_\_\_\_\_

RATED BY: \_\_\_\_\_  
 Name/Title: Greg Blakely, Water Division Manager  
 Name/Title: \_\_\_\_\_  
 Name/Title: \_\_\_\_\_  
 Name/Title: \_\_\_\_\_  
 Date: \_\_\_\_\_



## CITY OF OCEANSIDE

### PROFESSIONAL SERVICES AGREEMENT

THIS AGREEMENT, dated 12-JUL, 2011 for identification purposes, is made and entered into by and between the CITY OF OCEANSIDE, a municipal corporation, hereinafter designated as "CITY", and GEOSCIENCE SUPPORT SERVICES, INC., hereinafter designated as "CONSULTANT".

#### RECITALS

- A. CITY desires to obtain professional engineering services from an independent contractor for the above named project.
- B. CONSULTANT has submitted a proposal to provide engineering services for the CITY in accordance with the terms set forth in this Agreement.
- C. CITY desires to contract with CONSULTANT as an independent contractor and CONSULTANT desires to provide services to CITY as an independent contractor.
- D. CONSULTANT has demonstrated its competence and professional qualifications necessary for the satisfactory performance of the services designated herein by virtue of its experience, training, education and expertise.

#### **NOW, THEREFORE, THE PARTIES MUTUALLY AGREE AS FOLLOWS:**

- 1.0 **SCOPE OF WORK.** The CONSULTANT desires to provide professional services for the feasibility of seawater desalination in the Mission Narrows project is more particularly described in the CONSULTANT's scope of services dated June 1, 2011, attached hereto and incorporated herein as Exhibit A.
- 1.1 **PROFESSIONAL SERVICES PROVIDED BY CONSULTANT.** The professional services to be performed by CONSULTANT shall consist of but not be limited to the following:
  - 1.1.1 Work closely with the Water Utilities Director in performing work in accordance with this Agreement in order to receive clarification as to the result which the CITY expects to be accomplished by CONSULTANT. The Water Utilities Director, under the authority of the City Manager, shall be the CITY'S authorized representative in the interpretation and enforcement of all work performed in connection with this Agreement. The Water Utilities Director may delegate authority in connection with this Agreement to the Water Utilities Director's

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908824700715

designees. For the purposes of directing the CONSULTANT'S performance in accordance with this Agreement, the Water Utilities Director delegates authority to Greg Blakely, Administration Manager.

- 1.1.2 In compliance with Government Code section 7550, the CONSULTANT shall include a separate section in the proposal prepared pursuant to this Agreement, which contains a list of all the subcontractors and dollar amounts of all contracts and subcontracts required for the preparation of work described in this Agreement.
- 1.1.3 Visit and carefully examine the location of the project as often as necessary to become acquainted with all conditions which are visible or could reasonably be discovered, and which might have an impact upon the construction of the project.
  - a. Provide periodic visits to the site to monitor progress.
  - b. Attend meetings with the Water Utilities Director or their designees.
  - c. Obtain all necessary permits from other regulatory agencies and other Departments. CONSULTANT shall participate in the completion of such forms and pay for any applicable fees.
  - d. Provide all necessary surveying and testing required for design, including geotechnical engineering services if required during construction.
- 1.2 **SERVICES PROVIDED BY CITY.** The CITY shall perform the following services:
  - 1.2.1 Provide access to all public improvement plans and records and furnish one copy of drawings and reports requested.
  - 1.2.2 Upon request, verify the location of existing CITY owned utilities.
  - 1.2.3 Provide all legal advertising mailings and postings required.
  - 1.2.5 Provide overall project management.

2.0 **TIMING REQUIREMENTS**

- 2.1 Time is of the essence in the performance of work under this Agreement and the following timing requirements shall be strictly adhered to unless otherwise modified in writing as set forth in Section 2.8. Failure by CONSULTANT to strictly adhere to these timing requirements may result in termination of this Agreement by the CITY and the assessment of damages against the CONSULTANT for delays.
- 2.2 Phase I. CONSULTANT shall prepare and deliver a copy of the Task I report to the Water Utilities Director within 60 calendar days of the execution of this Agreement. No work shall be performed by CONSULTANT beyond the Phase I stage until the Water Utilities Director has given written approval of the preliminary design and authorization to perform Phase II.
- 2.3 Phase II. CONSULTANT shall prepare and deliver a copy of the Task II report to the Water Utilities Director within 30 calendar days of the Notice to Proceed with Phase II. No work shall be performed by CONSULTANT beyond the Phase II stage until the Water Utilities Director has given authorization to perform Phase III.
- 2.4 Phase III. CONSULTANT shall prepare and deliver a copy of the Task III A report to the Water Utilities Director within 60 calendar days of the Notice to Proceed with Phase III. No work shall be performed by CONSULTANT beyond the Phase III stage until the Water Utilities Director has given authorization to perform Phase IV.
- 2.5 Phase IV. CONSULTANT shall prepare and deliver a copy of the Task III B report to the Water Utilities Director within 90 calendar days of the Notice to Proceed with Phase IV. No work shall be performed by CONSULTANT beyond the Phase IV stage until the Water Utilities Director has given authorization to perform Phase V.
- 2.6 Phase V. CONSULTANT shall prepare and deliver a copy of the Task IV report to the Water Utilities Director within 90 calendar days of the Notice to Proceed with Phase V. No work shall be performed by CONSULTANT beyond the Phase V stage until the Water Utilities Director has given.

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- 2.7 Phase VI. CONSULTANT shall prepare and deliver the final report to the Water Utilities Director within 10 calendar days of the Water Utilities Director's written request.
- 2.8 CONSULTANT shall submit all requests for extensions of time for performance in writing to the Water Utilities Director no later than ten (10) calendar days after the start of the condition which purportedly caused the delay, and not later than the date on which performance is due. The Water Utilities Director shall review all such requests and may grant reasonable time extensions for unforeseeable delays which are beyond CONSULTANT'S control.
- 2.9 For all time periods not specifically set forth herein, the CONSULTANT shall respond in the most expedient and appropriate manner under the circumstances, by either telephone, fax hand delivery or mail.
- 3.0 **DESIGN CRITERIA AND STANDARDS.** All work shall be performed in accordance with applicable CITY, state and federal codes and criteria. In the performance of its professional services, CONSULTANT shall use the degree of care and skill ordinarily exercised by consultants under similar conditions.

All plans shall be ink drawn on standard mylar sheets available from the CITY at no cost to CONSULTANT. Contract specifications shall conform to the CITY'S specification procedures and the format of the CITY'S standard form Contract Documents for Public Works Construction.

- 4.0 **INDEPENDENT CONTRACTOR.** CONSULTANT'S relationship to the CITY shall be that of an independent contractor. CONSULTANT shall have no authority, express or implied, to act on behalf of the CITY as an agent, or to bind the CITY to any obligation whatsoever, unless specifically authorized in writing by the Water Utilities Director. The CONSULTANT shall not be authorized to communicate directly with, nor in any way direct the actions of, any bidder or the construction contractor for this project without the prior written authorization by the Water Utilities Director. CONSULTANT shall be sole responsible for the performance of any of its employees, agents or subcontractors under this agreement.

CONSULTANT shall report to the CITY any and all employees, agents and consultants performing work in connection with this project, and all shall be subject to the approval of the CITY.

- 5.0 **CITY BUSINESS LICENSE.** Prior to the commencement of any work under this agreement, the CONSULTANT shall obtain and present a copy of an Oceanside City Business License to the Water Utilities Director.
- 6.0 **WORKERS' COMPENSATION.** Pursuant to Labor Code section 1861, the CONSULTANT hereby certifies that the CONSULTANT is aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for Workers' Compensation or to undertake self-insurance in accordance with the provisions of that Code, and the CONSULTANT will comply with such provisions and provide certification of such compliance as a part of these Award Documents. The certification shall be in accordance with Subsections 7.3 through 7.8 of this Agreement.
- 7.0 **LIABILITY INSURANCE.**
- 7.1 CONSULTANT shall, throughout the duration of this Agreement, maintain comprehensive general liability and property damage insurance, or commercial general liability insurance, covering all operations of CONSULTANT, its agents and employees, performed in connection with this Agreement including, but not limited to, premises and automobile.
- 7.2 CONSULTANT shall maintain liability insurance in the following minimum limits:

Comprehensive General Liability Insurance  
(bodily injury and property damage)

Combined Single Limit Per Occurrence	\$ 1,000,000
General Aggregate	\$ 2,000,000*

Commercial General Liability Insurance  
(bodily injury and property damage)

General limit per occurrence	\$ 1,000,000
General limit project specific	\$ 2,000,000

<u>Automobile Liability Insurance</u>	\$ 1,000,000
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\*General aggregate per year, or part thereof, with respect to losses or other acts or omissions of CONSULTANT under this Agreement.

- 7.2.1 If coverage is provided through a Commercial General Liability Insurance policy, a minimum of 50% of each of the aggregate limits shall remain available at all times. If over 50% of any aggregate limit has been paid or reserved, the CITY may require additional coverage to be purchased by the CONSULTANT to restore the required limits. The CONSULTANT shall also notify the CITY'S Project Manager promptly of all losses or claims over \$25,000 resulting from work performed under this contract, or any loss or claim against the CONSULTANT resulting from any of the CONSULTANT'S work.
- 7.3 All insurance companies affording coverage to the CONSULTANT for the purposes of this Section shall add the City of Oceanside as "additional insured" under the designated insurance policy for all work performed under this Agreement. Insurance coverage provided to the CITY as an additional insured shall be primary insurance and other insurance maintained by the CITY, its officers, agents and employees shall be excess only and not contributing with insurance provided pursuant to this Section.
- 7.4 All insurance companies affording coverage to the CONSULTANT pursuant to this Agreement shall be insurance organizations authorized by the Insurance Commissioner of the State of California to transact business of insurance in the state or be rated as A-X or higher by A.M. Best.
- 7.5 All insurance companies affording coverage shall provide thirty (30) days written notice to the CITY should the policy be cancelled before the expiration date. For the purposes of this notice requirement, any material change in the policy prior to the expiration shall be considered a cancellation.
- 7.6 CONSULTANT shall provide evidence of compliance with the insurance requirements listed above by providing a Certificate of Insurance and applicable endorsements, in a form satisfactory to the City Attorney, concurrently with the submittal of this Agreement.
- 7.7 CONSULTANT shall provide a substitute Certificate of Insurance no later than thirty (30) days prior to the policy expiration date. Failure by the CONSULTANT to provide such a substitution and extend the policy expiration date shall be considered a default by CONSULTANT and may subject the CONSULTANT to a suspension or termination of work under the Agreement.

7.8 Maintenance of insurance by the CONSULTANT as specified in this Agreement shall in no way be interpreted as relieving the CONSULTANT of any responsibility whatsoever and the CONSULTANT may carry, at its own expense, such additional insurance as it deems necessary.

8.0 **PROFESSIONAL ERRORS AND OMISSIONS INSURANCE.** Throughout the duration of this agreement and four (4) years thereafter, the CONSULTANT shall maintain professional errors and omissions insurance for work performed in connection with this Agreement in the minimum amount of One Million dollars (\$1,000,000).

CONSULTANT shall provide evidence of compliance with these insurance requirements by providing a Certificate of Insurance.

9.0 **CONSULTANT'S INDEMNIFICATION OF CITY.** CONSULTANT shall indemnify and hold harmless the CITY and its officers, agents and employees against all claims or lawsuits for damages to persons or property arising out of the negligent acts, errors, omissions or wrongful acts or conduct of the CONSULTANT or its employees, agents, subcontractors or others in connection with the execution of the work covered by this Agreement, except for those claims arising from the willful misconduct, sole negligence or active negligence of the CITY, its officers, agents or employees. CONSULTANT'S indemnification shall include any and all costs, expenses, expert fees, attorneys' fees and liability assessed against or incurred by the CITY, its officers, agents or employees in defending against such claims or lawsuits, whether the same proceed to judgment or not. Further, CONSULTANT, at its own expense, shall, upon written request by the CITY, defend any such suit or action brought against the CITY, its officers, agents or employees resulting or arising from the tortious acts or omissions of the CONSULTANT.

CONSULTANT'S indemnification of CITY shall not be limited by any prior or subsequent declaration by the CONSULTANT.

10.0 **ERRORS AND OMISSIONS.** In the event that the Water Utilities Director determines that the CONSULTANT'S negligence, misconduct, errors or omissions in the performance of work under this Agreement has resulted in expense to CITY greater than would have resulted if there were no such negligence, errors or omissions in the plans or contract specifications,

CONSULTANT shall reimburse CITY for the additional expenses incurred by the CITY, including engineering, construction and/or restoration expense. Nothing herein is intended to limit CITY'S rights under Sections 7, 8 or 9.

11.0 **NO CONFLICT OF INTEREST.** The CONSULTANT shall not be financially interested in any other CITY contract for this project. For the limited purposes of interpreting this section, the CONSULTANT shall be deemed a "City officer or employee", and this Section shall be interpreted in accordance with Government Code section 1090. In the event that the CONSULTANT becomes financially interested in any other CITY contract for this project, that other contract shall be void. The CONSULTANT shall indemnify and hold harmless the CITY, under Section 9 above, for any claims for damages resulting from the CONSULTANT'S violation of this Section.

12.0 **OWNERSHIP OF DOCUMENTS.** All plans and specifications, including details, computations and other documents, prepared or provided by the CONSULTANT under this Agreement shall be the property of the CITY. The CITY agrees to hold the CONSULTANT free and harmless from any claim arising from any use, other than the purpose intended, of the plans and specifications and all preliminary sketches, schematics, preliminary plans, architectural perspective renderings, working drawings, including details, computation and other documents, prepared or provided by the CONSULTANT. CONSULTANT may retain a copy of all material produced under this Agreement for the purpose of documenting their participation in this project.

13.0 **COMPENSATION.**

13.1 For work performed by CONSULTANT in accordance with this Agreement, CITY shall pay CONSULTANT in accordance with the schedule of billing rates set forth in Exhibit "A", attached hereto and incorporated herein by reference. No rate changes shall be made during the term of this Agreement without prior written approval of the Water Utilities Director. CONSULTANT'S compensation for all work performed in accordance with this Agreement shall not exceed the total contract price of \$ 1,357,450.

No work shall be performed by CONSULTANT in excess of the total contract price without prior written approval of the Water Utilities Director.

CONSULTANT shall obtain approval by the Water Utilities Director prior to performing any work which results in incidental expenses to CITY as set forth in Section 13.2.2.

- 13.2 CONSULTANT shall maintain accounting records including the following information:
  - 13.2.1 Names and titles of employees or agents, types of work performed and times and dates of all work performed in connection with this Agreement which is billed on an hourly basis.
  - 13.2.2 All incidental expenses including reproductions, computer printing, postage, mileage and subsistence.
- 13.3 CONSULTANT'S accounting records shall be made available to the Water Utilities Director for verification of billings, within a reasonable time of the Water Utilities Director's request for inspection.
- 13.4 CONSULTANT shall submit monthly invoices to CITY. CITY shall make partial payments to CONSULTANT not to exceed the total contract price within thirty (30) days of receipt of invoice, subject to the approval of the Water Utilities Director, and based upon the following partial payment schedule:
  - 13.4.1 Prior to submittal of the Task I report, partial payments shall not exceed \$140,000.
  - 13.4.2 Prior to submittal of the Task II report, partial payments shall not exceed \$130,000.
  - 13.4.3 Prior to submittal of the Task III A report, partial payments shall not exceed \$375,000.
  - 13.4.4 Prior to submittal of the Task III B report, partial payments shall not exceed \$575,000.
  - 13.4.5 Prior to submittal of the Task IV report, partial payments shall not exceed \$75,000.
  - 13.4.6 Prior to submittal of the Task V report, partial payments shall not exceed \$56,698

- 14.0 **TERMINATION OF AGREEMENT.** Either party may terminate this Agreement by providing thirty (30) days written notice to the other party.

If any portion of the work is terminated or abandoned by the CITY, then the CITY shall pay CONSULTANT for any work completed up to and including the date of termination or abandonment of this Agreement, in accordance with Section 13. The CITY shall be required to compensate CONSULTANT only for work performed in accordance with the Agreement up to and including the date of termination.

- 15.0 **ASSIGNMENT AND DELEGATION.** This Agreement and any portion thereof shall not be assigned or transferred, nor shall any of the CONSULTANT’S duties be delegated, without the express written consent of the CITY. Any attempt to assign or delegate this Agreement without the express written consent of the CITY shall be void and of no force or effect. A consent by the CITY to one assignment shall not be deemed to be a consent to any subsequent assignment.

This Agreement shall inure to the benefit of and be binding upon the parties hereto and their respective successors and assigns.

- 16.0 **ENTIRE AGREEMENT.** This Agreement comprises the entire integrated understanding between CITY and CONSULTANT concerning the work to be performed for this project and supersedes all prior negotiations, representations or agreements.

- 17.0 **INTERPRETATION OF THE AGREEMENT.** The interpretation, validity and enforcement of the Agreement shall be governed by and construed under the laws of the State of California. The Agreement does not limit any other rights or remedies available to CITY.

The CONSULTANT shall be responsible for complying with all local, state and federal laws whether or not said laws are expressly stated or referred to herein.

Should any provision herein be found or deemed to be invalid, the Agreement shall be construed as not containing such provision and all other provisions, which are otherwise lawful, shall remain in full force and effect, and to this end the provisions of this Agreement are severable.

18.0 **AGREEMENT MODIFICATION.** This Agreement may not be modified orally or in any manner other than by an Agreement in writing, signed by the parties hereto.

19.0 **DISPUTE RESOLUTION.**

- a. Any controversy or claim arising out of or relating to this Agreement, or concerning the breach or interpretation thereof, shall be first submitted to mediation, the cost of which shall be borne equally by the parties.
- b. No suit shall be brought on this contract unless all statutory claims filing requirements have been met.

20. **NOTICES.** All notices, demands, requests, consents or other communications which this Agreement contemplates or authorizes, or requires or permits either party to give to the other, shall be in writing and shall be personally delivered or mailed to the respective party as follows:

**TO CITY:**

City of Oceanside  
Water Utilities Director  
300 North Coast Highway  
Oceanside, CA 92054

**TO CONSULTANT:**

Dennis E. Williams, Ph.D.  
Geoscience Support Services, Inc.  
P.O. Box 220  
Claremont, CA 91711

Either party may change its address by notice to the other party as provided herein.

Communications shall be deemed to have been given and received on the first to occur:

- a. Actual receipt at the offices of the party to whom the communication is to be sent, as designated above, or
- b. Three (3) working days following the deposit in the United States mail of registered or certified mail, postage prepaid, return receipt requested, addressed to the offices of the party to whom the communication is to be sent, as designated above.

21.0 **SIGNATURES.** The individuals executing this Agreement represent and warrant that they have the right, power, legal capacity and authority to enter into and to execute this Agreement on behalf of the respective legal entities of the CONSULTANT and the CITY.

**IN WITNESS WHEREOF** the parties hereto for themselves, their heirs, executors, administrators, successors and assigns do hereby agree to the full performance of the covenants herein contained and have caused this Professional Services Agreement to be executed by setting hereunto their signatures on the dates indicated below:

GEOSCIENCE SUPPORT SERVICES, INC.

CITY OF OCEANSIDE

By:   
Name/Title  
Dennis E. Williams/President

By: \_\_\_\_\_  
Peter A. Weiss, City Manager

Date: 12-JUL-11

Date: \_\_\_\_\_

By:   
Name/Title  
Meridee E. Williams/CFO

Date: 12-JUL-11

APPROVED AS TO FORM:

  
City Attorney

95-3200498  
Employer ID No.

**NOTARY ACKNOWLEDGMENTS OF CONSULTANT MUST BE ATTACHED.**

# CALIFORNIA JURAT WITH AFFIANT STATEMENT

- See Attached Document (Notary to cross out lines 1-6 below)  
 See Statement Below (Lines 1-6 to be completed only by document signer[s], *not* Notary)

1 \_\_\_\_\_  
2 \_\_\_\_\_  
3 \_\_\_\_\_  
4 \_\_\_\_\_  
5 \_\_\_\_\_  
6 \_\_\_\_\_

Signature of Document Signer No. 1 \_\_\_\_\_ Signature of Document Signer No. 2 (if any) \_\_\_\_\_

State of California  
County of Los Angeles

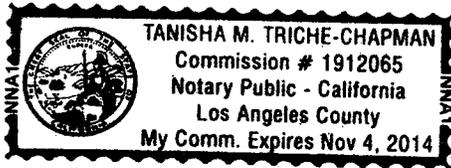
Subscribed and sworn to (or affirmed) before me  
on this 12 day of July, 2011,  
by \_\_\_\_\_  
(1) Meridee E. Williams  
Name of Signer

proved to me on the basis of satisfactory evidence  
to be the person who appeared before me  (.)

(and  
(2) Dennis E. Williams  
Name of Signer

proved to me on the basis of satisfactory evidence  
to be the person who appeared before me.)

Signature Tanisha M. Triche-Chapman  
Signature of Notary Public



Place Notary Seal Above

## OPTIONAL

*Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.*

### Further Description of Any Attached Document

Title or Type of Document: Professional Services Agreement

Document Date: July 12, 2011 Number of Pages: Fifteen

Signer(s) Other Than Named Above: \_\_\_\_\_

RIGHT THUMBPRINT  
OF SIGNER #1  
Top of thumb here



RIGHT THUMBPRINT  
OF SIGNER #2  
Top of thumb here





## SCOPE OF SERVICES

### 1.0 PERMITTING & ENVIRONMENTAL SUPPORT

Tetra Tech will provide the expertise and experience necessary to address the many permitting and environmental requirements that will need to be addressed for this project. Tetra Tech will identify relevant agencies, assist with determining the required permits, and facilitate meetings with regulators, and the Project Team. Tetra Tech will take the lead on preparation of necessary permit applications and environmental documents.

There are many unknowns surrounding the regulatory requirements of this project, particularly with respect to the ground water discharge permits. Whenever possible, the Project Team will identify the most cost effective means of meeting permitting and environmental requirements, and will attempt to develop alternative options should the need arise. GEOSCIENCE has included the fees associated with the San Diego County drilling permits within our cost proposal. It is assumed that GEOSCIENCE will pay all other permit fees. It is further assumed that the any permit waivers required by the California Coastal Commission will be obtained by the City during the CEQA process. For cost estimating purposes we have assumed a moderate level of effort for the permitting and environmental work. However, should the scope of this permitting phase increase significantly due to more stringent regulatory requirements, our cost proposal for this phase may require renegotiation.

### 1.1 Analysis of Project Impacts - California Environmental Quality Act (CEQA)

For this task, we have assumed that the proposed investigation of Mission Narrows would require preparation of an Initial Study (IS) to analyze potential impacts in compliance with the California Environmental Quality Act (CEQA) and to identify potential site constraints. On the basis of the evaluation made in the Initial Study, a recommendation will be made regarding the determination of the appropriate CEQA document to be prepared for the project (e.g., Mitigated Negative Declaration [MND] or Environmental Impact Report [EIR]). For cost estimating purposes, it is assumed that preparation of an MND with the Initial Study (IS/MND) will be adequate and that preparation of an EIR will not be necessary. Should it be determined that an EIR will be necessary, those services can be provided for an additional fee.

#### 1.1.1 Preliminary Draft IS/MND

The proposed project would be evaluated in the IS/MND to define the range of potential environmental impacts. The physical, biological, social, and economic environment associated with the project will be analyzed using the CEQA Environmental Checklist, which includes a mandatory finding of significance as a summary of any significant impacts determined during the analysis of the proposed project. The Project Team will prepare a preliminary draft IS/MND and submit an electronic copy to the City for review and comment. It is anticipated that only one round of consolidated written comments will be necessary.

#### 1.1.2 Draft IS/MND

Once one consolidated set of comments on the preliminary draft IS/MND is received from the City, they will be included and/or addressed and the draft IS/MND document will be produced. Up to twenty-five

(25) copies with a maximum page count of 100 pages each of a Draft version of the IS/MND will be prepared. It is assumed that the City will prepare and file the required Notice of Completion and Notice of Intent to Adopt a Negative Declaration. It is also assumed that the City will forward these notices to the appropriate agencies for proper filing, and posting for public review.

### **1.1.3 Response to Comments and Final IS/MND**

The Project Team will address any comments generated during the public review period, provide a written response to comments, and complete a Final IS/MND. Should the project be approved, it is anticipated that the City will prepare the Notice of Determination.

## **1.2 Permitting**

### **1.2.1 USACE Permitting (Section 404 Permit Request for Use of a Nationwide Permit)**

For project-related impacts to waters subject to regulatory authority, permits necessary to satisfy Clean Water Act Section 404 will be required. For purposes of this proposal, it is assumed that impacts to jurisdictional waters will be within thresholds detailed for existing Nationwide Permits. The subsequent Section 404 permitting would then entail a request from the United States Army Corps of Engineers (USACE) for use of an existing Nationwide Permit. If necessary, services can be provided to complete the Individual Permit for an additional fee. For this task, we will complete the following activities:

#### ***Initiate and Participate in a Pre-application Consultation with the USACE***

With concurrence of the City of Oceanside, the Project Team will forward a copy of the final jurisdictional delineation report, completed by others, to the USACE. We will seek concurrence with our findings in the form of a Preliminary Jurisdictional Determination issued by the USACE. Follow up contact will be made with USACE by telephone and/or email to ensure timely review of the delineation report.

Should a field meeting with the USACE project engineer be required to discuss delineation results, project alternatives, and mitigation strategies, it will be requested that the City arrange the meeting. The ultimate goal will be to seek concurrence from the USACE for the delineation results in the form of a Preliminary Jurisdictional Determination.

#### ***Draft and Submit Section 404 Pre-Construction Notification (PCN)***

We have assumed that the Request for Use of Nationwide would require completion of a PCN. At the time of a Notice to Proceed and the Pre-Application meeting, a PCN form will be filled out that will include appropriate graphics and a description of the project with the following elements:

- Purpose and need for the project,
- Project description,
- Summary of impacts,
- Mitigation measures to include avoidance of impacts to Waters of the United States, and
- A site map showing construction details, location of jurisdictional Waters of the United States, and temporary and permanent disturbance.

This information and filled out Application Form ENG Form 4345 would be submitted to the USACE for review and comment as part of the PCN.

In advance of discussions and submittal of the PCN with the USACE, we would discuss preferable strategies such as in-kind or on-site versus off-site in-lieu mitigation scenarios with the City. No agreements with the USACE or any other regulator for mitigation associated with this project will be made by the project Team without expressed written authorization by the City of Oceanside.

### **1.2.2 Streambed Alteration Agreement (California Department of Fish and Game Code 1600)**

For any project-related impacts to waters subject to regulatory authority, California Department of Fish and Game (CDFG) Code 1600 et. seq. will also be required. Our technical approach to completing the permitting related to receiving a Streambed Alteration Agreement is as follows.

Pursuant to Division 2, Chapter 6, Sections 1600-1603 of the California Fish and Game Code, the CDFG regulates all diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream or lake, which support fish or wildlife. The CDFG defines a "stream" (including creeks and rivers) as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. The proposed project may require a Streambed Alteration Agreement between the City of Oceanside and the CDFG. Once the CDFG is in receipt of the final CEQA analysis, we will hold a meeting with the CDFG representative at the project site to discuss site conditions and any conditions that may be placed in the final Agreement;

The Project Team will submit the following information to the CDFG in a Streambed Alteration Agreement application:

- A completed Notification of Lake or Streambed Alteration Form (Form 2023),
- A copy of the map prepared to identify the project area,
- A copy (electronic) of the Categorical Exemption and receipt of CDFG filing fees, and
- Determination of any required mitigation strategy for any losses of Waters of the State.

The Project Team will follow up this initial submittal by coordinating with CDFG to answer any questions that they may have regarding the documents. This will help to ensure timely processing of this application.

### **1.2.3 CRWQCB Permitting (Section 401 Water Quality Certification)**

In conjunction with Section 404 for dredge and fill activities, this project will be required to comply with Section 401 for water quality criteria. The resource agency responsible for ensuring compliance with Section 401 is the California Water Quality Control Board San Diego Region (CRWQCB). This task would include the following activities:

#### ***Apply for a Water Quality Certification***

Concurrently with submitting the request for use of a Nationwide Permit, a Water Quality Certification (Section 401) would be applied for from the CRWQCB. This activity would include completing appropriate documentation and forwarding it and the relevant fee to the specific resource agency. The project and alternatives to the project plus mitigation strategy would be identified in the Water Quality Certification application. Upon requested by the CRWQCB, a field meeting will be scheduled to meet at the project site and review site conditions. Any discussions with the CRWQCB regarding this project would be conducted only with concurrence of the City of Oceanside.

### ***Draft and Submit Application for Water Quality Certification***

The application form will be completed with the following information:

- Name of Applicant,
- Project Description,
- Project Permitting/Licensing and CEQA Compliance,
- Affected Waters,
- Impact Avoidance, Minimization and Mitigation, and
- Signature of Responsible Party.

#### **1.2.4 Mitigation Strategy Discussions and Negotiations**

The Project Team will work with the City to discuss mitigation strategies that would minimize or avoid impacts to sensitive environmental resources. We anticipate a total of three meetings for these discussions. The Project Team will provide a memo documenting meeting discussions.

#### **1.3 Coordination with Planning Department on Adoption of SWPPP**

The Project Team will coordinate with the City Planning Department to develop the framework for a Storm Water Pollution Prevention Plan (SWPPP).

#### **1.4 Preparation of NPDES Permit Application**

The Project Team will prepare a Notice of Intent (NOI) to discharge construction dewatering to surface waters. The NOI process includes completion of the NOI form and submittal to the Regional Board. The NOI form will include description of dewatering activity, volume of anticipated dewatering, schedule of dewatering, and property owner and contractor information. The Regional Board dewatering permit process will require a fee for processing. For cost estimating purposes, it is assumed that filing fees will be provided by the City.

### ***Site Characterization and Water Quality Assessment***

Existing ground water quality data will be obtained by GEOSCIENCE for existing wells within the vicinity of the Mission Narrows. A water quality assessment will be conducted based on a specific list of constituents consistent with the requirements for dewatering permit applications. The water quality data will be analyzed for general permit compliance and comparison to basin water quality standards. Should it be necessary to conduct ground water sampling to determine background water quality, GEOSCIENCE will sample the existing test well as part of Task 1.6.

### ***Dewatering Plan Development***

The Project Team will develop a project dewatering plan that will describe the process and procedures to be conducted during the dewatering operations. Best management practices needed to protect surface water from the dewatering operations will be provided. The dewatering plan will list the general permit conditions, inspections, and annual reporting requirements.

### ***Technical Services***

The Project Team will provide limited support for technical services that may be encountered as part of obtaining a dewatering permit from the Regional Board. This task may include permit conditions compliance, and coordination with the contractor with dewatering permit compliance. GEOSCIENCE will be responsible for enforcing compliance and overseeing monitoring requirements specified by the dewatering permit (see Task 1.6).

### **1.5 Drilling Permits**

GEOSCIENCE will work with the drilling contractor and the County of San Diego Department of Environmental Health to obtain the necessary permits required for borehole drilling and well installation. GEOSCIENCE understands the proper siting of monitoring wells to achieve the purpose at hand and is experienced with monitoring well design and requirements as set forth in the County of San Diego Site Assessment and Mitigation (SAM) manual. It is envisioned that the technical specifications should provide most of the information necessary for the drilling permit applications. Drilling permit fees are included in our cost proposal.

### **1.6 Discharge Compliance**

GEOSCIENCE will work with the drilling contractor and coordinate with the RWQCB during all discharges to land and/or the San Luis Rey River to ensure that all applicable regulatory requirements are adhered to. This, at a minimum, will include:

- Collection of background ground water quality characterization samples,
- Coordination and collection of discharge water quality samples under chain-of-custody protocol,
- Field water quality analyses to ensure that simple effluent limitations are being met,
- Tracking and tabulation of discharge volumes,
- Discharge reporting to the RWQCB.

Laboratory fees for background ground water quality sampling, including 126 priority pollutants and chronic and acute toxicity testing are included in our cost proposal.

## **2.0 LONG-TERM AQUIFER PUMPING TEST (EXISTING TEST WELL)**

This phase of the work involves utilizing the existing test well (1C/TW1) and monitoring wells (1A/MW1 and 1B/MW2) within the Mission Narrows for conducting a long-term aquifer pumping test. In February 2002, the test well was pumped for a period of 5 hours and 38 minutes. Pumping the well for a much longer period of time at a sustainable pumping rate, in addition to monitoring of water levels within existing nearby monitoring wells will enable improved estimation of aquifer parameters such as transmissivity and storativity. If sufficient production rates can be achieved, time-drawdown data may provide insight into recharge boundaries such as the canyon walls.

### **2.1 Preparation of Detailed Work Plan**

GEOSCIENCE will prepare a detailed work plan to serve as a guidance document during the work at the existing test well within the Mission Narrows. The work plan will include a protocol for evaluating the current condition of the well, redevelopment of the well, and conducting aquifer pumping tests. Items included in the technical specifications will include (but are not necessarily limited to) the following:

- Required permits.
- Compliance with discharge requirements, as necessary.

- Job conditions (e.g. noise suppression, drilling waste, runoff management, power, lighting, water, security, sanitation and work damage).
- Mobilization, demobilization, site cleanup and restoration.
- Equipment, materials, and records to be furnished by the contractor.
- Records to be kept by the contractor.
- Downhole video camera surveys.
- Well redevelopment, including:
  - Initial airlift development between packers.
  - Development by pumping.
- Aquifer pumping and recovery tests.
- Ground water sampling.

GEOSCIENCE will submit an electronic copy of a 100% DRAFT version of the work plan to the City for review and comment. Upon incorporation of any comments, GEOSCIENCE will submit two (2) hard copies and an electronic copy of the 100% FINAL version.

GEOSCIENCE will subcontract Bakersfield Well & Pump Company of Bakersfield, California to conduct the redevelopment and testing work.

## **2.2 Contractor Coordination**

GEOSCIENCE will coordinate with the drilling contractor, will be available to answer questions regarding the work plan, and will meet at the site with the contractor to evaluate site constraints, including access, security, site footprint, best management practices, etc. GEOSCIENCE will coordinate a schedule to mobilize to the site and begin the work. During mobilization and set up, it will be necessary for GEOSCIENCE to be onsite to ensure that the equipment is set up at the correct location and that equipment, fencing, discharge piping and other issues are addressed in a way that is acceptable to the City and the requirements of any regulatory agencies and permits.

## **2.3 Downhole Video Survey**

The existing test well was constructed in January 2002 and consists of 6-inch diameter 304L stainless steel well screen located from 80 to 220 ft below ground surface (bgs), and PVC blank casing from ground surface to 80 ft bgs and from 220 to 230 ft bgs. It will be necessary to perform a downhole video survey of the existing test well to assess the condition of the well casing and screen and to verify that it is structurally sound and in suitable condition for redevelopment and testing. The video survey should be conducted using equipment that includes a downhole closed-circuit color television camera with downhole and side-scan (i.e., “dual-cam”) capability. The video survey should be conducted throughout the entire length of the casing and screen. GEOSCIENCE will provide full-time onsite inspection during video logging of the well during which time notes will be made regarding its condition. If the well is deemed to be in acceptable condition, recommendations will be made regarding future redevelopment and testing of the well.

## **2.4 Well Redevelopment**

It is anticipated that the existing test well will require some level of redevelopment work to prepare it for aquifer pump testing. At this time, that work is expected to consist of mechanical development through swabbing and airlifting, and pumping and surging. GEOSCIENCE will provide onsite inspection during the development of the test well to ensure that the well is developed in accordance with the

provisions of the technical specifications and to determine when the well is adequately developed for the pumping test.

Water generated during well development will be discharged to the San Luis Rey River in accordance with applicable National Pollutant Discharge Elimination System (NPDES) permits. For cost estimating purposes, this proposal assumes that discharge to the River will require minimal treatment for suspended sediment and entrained solids. More advanced treatment methods (e.g., GAC, reverse osmosis, etc.) were not considered due to the uncertain nature of the permitting process and the significant costs involved. Whenever possible, discharge and percolation within the banks of the River will be explored.

## 2.5 Aquifer Pumping Tests

Once the well development process is considered complete, aquifer pumping tests will be performed on the test well to determine well and aquifer characteristics, and to identify possible recharge boundaries within the Mission Narrows. GEOSCIENCE will provide part-time inspection during the pumping tests to ensure that quality data is being collected. However, a representative of the contractor will be present at the site at all times that the well is pumping. The following aquifer pumping tests will be performed:

- **Step Drawdown Pumping Test:** time drawdown measurements will be made to determine the specific capacity and well efficiency relationships necessary to provide an indication of sustainable production rates. Typically three to four rates are selected for pumping, beginning with the lowest rate and progressing to the highest.
- **Constant Rate Pumping and Recovery Test:** time drawdown and recovery measurements will be made to estimate aquifer parameters. The two existing nearby monitoring wells will also be monitored to obtain information related to ground water level interference and to allow calculation of aquifer storativity.

The February 2002 pumping test at the existing test well was short-term and did not provide sufficient data to properly determine aquifer parameters or possible recharge boundaries. As such, it is proposed that the constant-rate pumping test be conducted for a period of 5 days such that the effects of pumping within the Narrows can be properly evaluated. During testing, the test well and surrounding monitoring wells will be equipped with surface-read pressure transducers with continuous data logging capability. Following completion of the constant rate test, recovery measurements shall be taken for a minimum of four hours.

During the pumping test, GEOSCIENCE will periodically monitor the dissolved oxygen, oxidation reduction potential (ORP), pH, electrical conductivity, and temperature of the ground water. Toward the end of the constant rate pumping test, GEOSCIENCE will collect ground water samples from the test well to be analyzed for selected water quality constituents. Typical constituents would include general mineral and physical properties, total and dissolved metals, and silica.

Water generated during aquifer testing will be discharged to the San Luis Rey River in accordance with applicable National Pollutant Discharge Elimination System (NPDES) permits. For cost estimating purposes, this proposal assumes that discharge to the River will require minimal treatment for suspended sediment and entrained solids. More advanced treatment methods (e.g., GAC, reverse osmosis, etc.) were not considered due to the uncertain nature of the permitting process and the

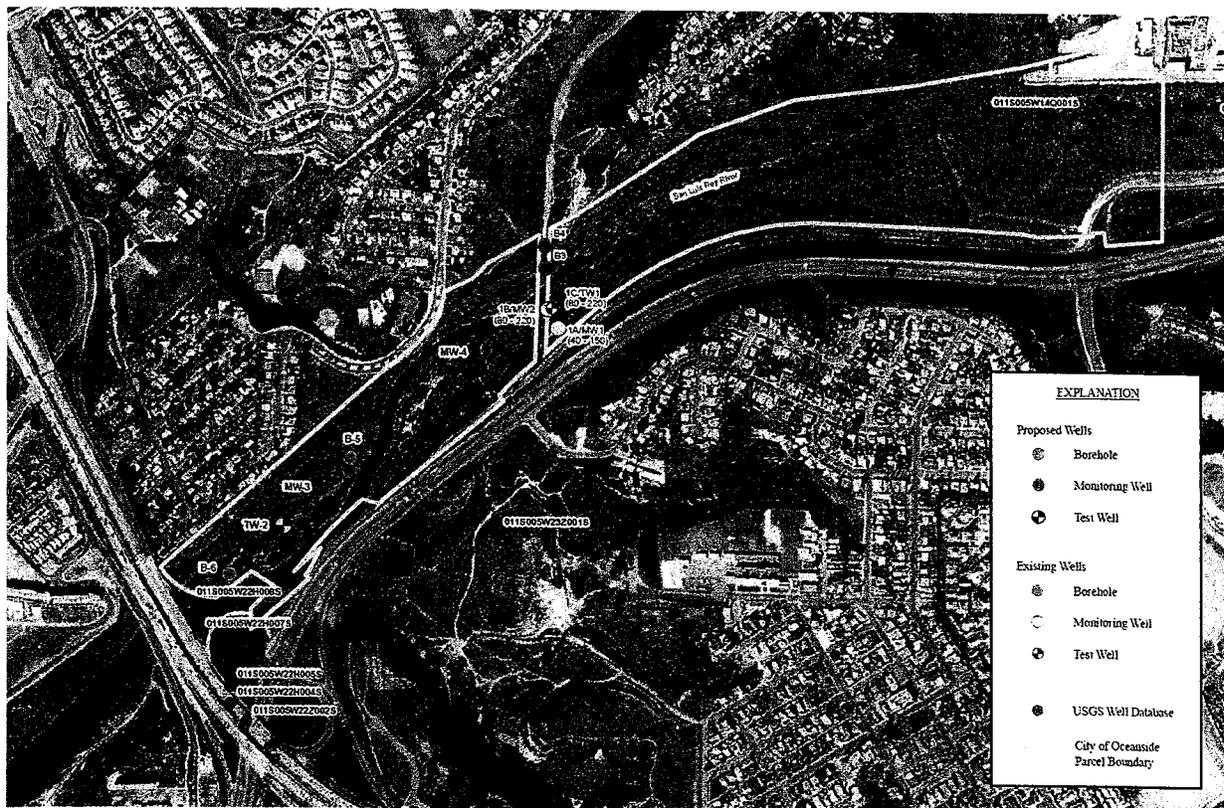
significant costs involved. Whenever possible, discharge and percolation within the banks of the River will be explored.

## 2.6 Summary Letter Report

GEOSCIENCE will prepare a letter report presenting a summary of the aquifer pumping tests and outlining recommendations for proceeding with further investigations within the Narrows. Should results appear favorable, recommendations may include additional exploratory drilling and/or installation of supplemental test wells to better characterize other less understood portions of the Mission Narrows.

## 3.0 SUPPLEMENTAL FIELD INVESTIGATION

Should evaluation of the existing test well provide favorable results, it will be recommended to embark on a supplemental field investigation of the Narrows area. This will involve further characterization of the Mission Narrows through additional exploratory drilling and monitoring well installation. It is recommended that up to four (4) exploratory boreholes be drilled within the Narrows. These boreholes will provide valuable information regarding alluvial lithology and bedrock depth in areas that have not yet been characterized. It is further recommended that two (2) of those borehole be completed as monitoring wells for use during subsequent phases of the project. If conditions appear favorable based on the results of the borehole drilling and monitoring well installation, installation of a new test well in the Mission Narrows may be recommended. The proposed locations of the boreholes, monitoring wells, and test well are shown below. These locations are preliminary and may be adjusted based on drilling constraints, and the lithologies encountered during drilling.



### 3.1 Preparation of Detailed Work Plan and Technical Specifications

GEOSCIENCE will prepare a detailed work plan for the drilling and testing program at the Mission Narrows. The work plan will describe details of the proposed borehole drilling and monitoring well installation, including preliminary permitting investigation, locations, soil sampling intervals, mechanical grading analysis procedures, monitoring well design and construction, development, and water quality sampling. The work plan will also include a quality assurance/quality control plan for data evaluation and management.

GEOSCIENCE will prepare detailed technical specifications for the exploratory drilling and monitoring well construction to be included as an appendix within the work plan. Items included in the technical specifications will include (but are not necessarily limited to) the following:

- Borehole and monitoring well locations, depths, and dimensions;
- Expected geohydrologic conditions;
- Permits to be acquired;
- Compliance with discharge requirements;
- Job conditions (e.g. noise suppression, drilling waste, runoff management, power, lighting, water, security, sanitation and work damage);
- Abandoned boreholes;
- Mobilization, demobilization and cleanup;
- Recommended drilling method;
- Potential drilling problems;
- Equipment, materials, and records to be furnished by the contractor;
- Records to be kept by the contractor;
- Well drilling and construction, including:
  - Drilling of exploratory boreholes,
  - Soil sampling with California modified sampler,
  - Geophysical borehole logging,
  - Borehole destruction,
  - Monitoring well casing and screen installation,
  - Filter pack material selection and approved placement method,
  - Cement seal installation.
- Well development, including:
  - Initial airlift development,
  - Development by pumping.
- Wellhead completion.

Boart Longyear will be subcontracted by GEOSCIENCE to conduct the exploratory drilling and monitoring well installation. GEOSCIENCE will submit an electronic copy of a 100% DRAFT version of the work plan to the City for review and comment. Upon incorporation of any comments, GEOSCIENCE will submit two (2) hard copies and an electronic copy of the 100% FINAL version.

### 3.2 Contractor Coordination

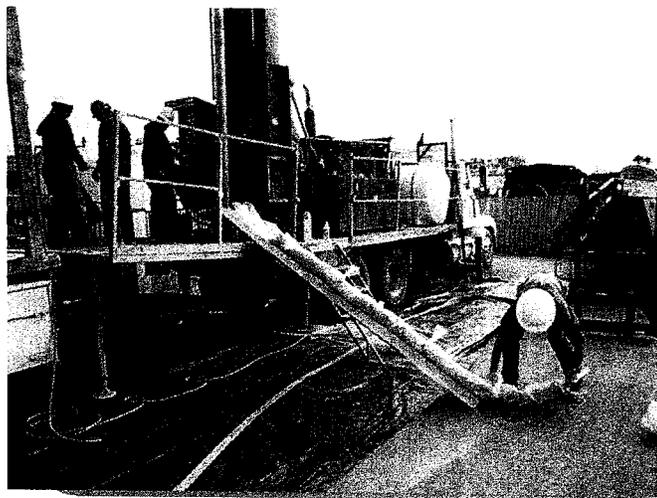
GEOSCIENCE will coordinate with the drilling contractor, will be available to answer questions regarding the work plan, and will meet at the site with the contractor to evaluate site constraints, including access, security, site footprint, best management practices, etc. GEOSCIENCE will coordinate a schedule to

mobilize to the site and begin the work. During mobilization, set up, and moving between sites, it will be necessary for GEOSCIENCE to be onsite to ensure that the equipment is set up at the correct location and that equipment, fencing, discharge piping and other issues are addressed in a way that is acceptable to the City and the requirements of any regulatory agencies and permits.

### 3.3 Exploratory Boreholes

It is recommended that up to four (4) exploratory boreholes be drilled within the Mission Narrows area to determine the thickness of aquifer sediments and aquifer permeability in areas that have not yet been characterized.

The recommended drilling method for the exploratory boreholes is the sonic method. The sonic drilling method uses an 8-inch diameter outer casing (i.e., drill string) that is vibrated (at 50 to 150 cycles per second) into the ground using a sonic drill head to stabilize and hold open the borehole. An inner casing (i.e., 6 inch core barrel attached to 2 7/8-inch diameter drill rods) is vibrated ahead of the outer casing to collect undisturbed formation materials in the form of a core sample. The core barrel is brought up to the surface in order to retrieve the core sample, which is extruded into visqueen sleeves.



GEOSCIENCE will provide full-time inspection during the drilling of each exploratory borehole. Soil core samples will be collected continuously during drilling of the exploratory boreholes. Upon collection, all soil cores will be placed in visqueen bags and stored on site in a designated area for later transport to GEOSCIENCE's laboratory for sieve analysis. Each bag will be photographed and properly labeled in the field with the boring number, sample depth interval, and date of collection. Samples will be visually classified in the field in accordance with the Unified Soil Classification System (USCS). All sample collection, logging, and analysis will be conducted by a California Professional Geologist under the supervision of a California Certified Hydrogeologist.

Additional soil samples will be collected at selected intervals during drilling using a California Modified Sampler (2.4 inch inside diameter and 3.0 inch outside diameter) lined with brass or stainless steel rings or tubes. Samples will be obtained at each sampling interval by driving the sampler into the formation using a weighted hammer. Retrieved sample rings/tubes will be logged in the field, capped, labeled and submitted for analysis of vertical and horizontal hydraulic conductivity, and total porosity. A total of eight (8) core samples will be collected from the exploratory boreholes.

GEOSCIENCE will perform the mechanical grading analysis (i.e., sieve analysis) of selected depth intervals in our in-house laboratory. The sieve analysis will be performed in order to obtain grain size distribution curves of borehole materials and develop preliminary estimates of aquifer permeability. The mechanical grading analysis will also provide a basis for designing the filter pack of subsequent monitoring wells.

### **3.4 Geophysical Borehole Logging**

GEOSCIENCE personnel will provide onsite inspection during geophysical borehole logging (specifically dual induction logging) of each exploratory borehole. In order to run the geophysical borehole surveys, the boreholes will be temporarily cased with 4-inch diameter Schedule 80 PVC casing prior to borehole destruction or completion as monitoring wells. The geophysical logs will be reviewed to identify permeable and non-permeable zones, and as a basis for monitoring well design.

The data collected during drilling, soil sample characterization, and geophysical logging will be used as a basis to determine if the exploratory boreholes will be completed as monitoring wells. If conditions are favorable, two of the four exploratory boreholes will be completed as nested monitoring wells (see Task 3.5). Any exploratory borehole not completed as a monitoring well will be backfilled from the total depth to the ground surface with cement-bentonite grout or other approved medium in accordance with County of San Diego Department of Environmental Health regulations.

### **3.5 Nested Monitoring Wells**

It is anticipated that nested monitoring wells will be constructed within two of the four exploratory boreholes. Monitoring wells will enable the collection of background ground water level data (including the influence of tides), drawdown interference data during future pumping tests, and depth-specific ground water quality data to assess salinity within the Narrows.

#### **3.5.1 Monitoring Well Construction**

The exact completion details (i.e., total depth and screened intervals) of each monitoring well will be determined upon review of the exploratory borehole data. However, it is anticipated that each nested monitoring well will be completed with two (“shallow” and “deep”) 2-inch diameter Schedule 40 PVC blank casings and screen. The annulus for each monitoring well will be backfilled with a filter medium (sand/gravel) to be selected based on sieve analysis of soil samples collected during exploratory borehole drilling. The filter medium will be backfilled to at least 10 feet above the top of the screened section of the deep well. A hydrated bentonite pellet seal, not less than 10 ft thick, will be backfilled above the lowermost filter pack. Filter pack will be placed from the top of the bentonite seal to 10 ft above the uppermost screened section. The remaining annulus will be backfilled with a minimum 3-ft transition seal and a minimum 20-ft cement-bentonite grout seal to the ground surface. The monitoring wells will be completed at the ground surface with an above ground monument, lockable cover, and crash posts. The surface completion will conform to all requirements of the County of San Diego Site Assessment and Mitigation (SAM) manual.

GEOSCIENCE will provide inspection during monitoring well construction to ensure that the wells are completed in accordance with the well design and SAM manual requirements.

#### **3.5.2 Monitoring Well Development**

Following installation, each monitoring well will be developed by airlifting in combination with swabbing or bailing. Turbid ground water will be brought to the ground surface by forcing compressed air through the airlift pipe. Following airlift development, the wells will be pumped using a 2-inch diameter submersible pump. Development will continue until water pumped from the wells has a turbidity of less than 10 nephelometric turbidity units (NTUs). It is anticipated that each monitoring well completion will be developed for approximately 40 hours, depending on the time required to produce clear water that is

free of suspended sediment. Ground water generated during the development process will be temporarily contained at each drilling site until suspended sediment has settled out.

### **3.5.3 Ground Water Sampling**

GEOSCIENCE will collect ground water samples immediately following development of each monitoring well completion. These samples will be collected in laboratory-prepared containers and submitted under chain-of-custody protocol, to a State of California Certified analytical laboratory for analysis. In addition to general mineral and physical analysis, the samples will also be analyzed for total dissolved organic carbon, general microbial quality, volatile organic compounds (VOCs), total and dissolved metals, and additional inorganic constituents such as bromide, iodide, and silica. Laboratory fees are included in our cost proposal.

Ground water quality analyses will provide baseline water quality signatures for the aquifer(s) and will provide supporting information for NPDES compliance.

### **3.5.4 Monitoring Well Equipping**

GEOSCIENCE will equip each monitoring well completion with downhole pressure transducers equipped with conductivity sensors to obtain a baseline record of ground water levels and salinity during tidal fluctuations and changing climatic conditions. The transducers will also provide ground water level interference and salinity data during future aquifer pumping tests.

### **3.6 Survey**

The location of each of the borehole and monitoring locations will be surveyed by a licensed surveyor. The survey will include horizontal spatial location and the elevation of top of casing, top of monument, and the well pad.

### **3.7 Summary Recommendation Letter - Exploratory Drilling**

Following borehole drilling and monitoring well installation (borehole lithology, geophysical logs, and ground water quality), GEOSCIENCE will prepare a letter presenting the results of the exploratory work, and recommendations for further testing. Depending on the results of the exploratory drilling and monitoring well testing, it may be recommended to drill a new vertical well in the Mission Narrows such that further aquifer pumping tests can be conducted farther downstream along the Narrows.

### **3.8 Drilling and Construction of a New Vertical Test Well**

Based on the results of exploratory drilling and monitoring well installation, it may be recommended that a new test well be installed in Mission Narrows at the proposed location shown on the map shown previously. Preliminarily, it is recommended that the new test well be constructed of stainless steel with louvered style well screen of sufficient diameter to allow the well to be tested at high flow rates, and such that the well may be integrated into the future full-scale feed water supply system. This will also allow the aquifers in Mission Narrows to be stressed such that valuable information regarding aquifer sustainability and ground water quality can be assessed.

#### **3.8.1 Preparation of Work Plan and Detailed Technical Specifications**

GEOSCIENCE will prepare a detailed work plan for drilling of the test well within the Mission Narrows. The work plan will describe details of the borehole drilling and well installation, including preliminary

permitting investigation, location, soil sampling intervals, mechanical grading analysis procedures, anticipated well design and construction, development, and water quality sampling. The work plan will also include a quality assurance/quality control plan for data evaluation and management.

GEOSCIENCE will prepare detailed technical specifications for the exploratory drilling and monitoring well construction to be included as an appendix within the work plan. Items included in the technical specifications will include (but are not necessarily limited to) the following:

- Well location and conceptual well design;
- Expected geohydrologic conditions;
- Permits to be acquired;
- Compliance with discharge requirements;
- Job conditions (e.g. noise suppression, drilling waste, runoff management, power, lighting, water, security, sanitation and work damage);
- Abandoned boreholes;
- Mobilization, demobilization and cleanup;
- Recommended drilling method;
- Potential drilling problems;
- Equipment, materials, and records to be furnished by the contractor;
- Records to be kept by the contractor;
- Well drilling and construction, including:
  - Borehole drilling,
  - Alignment, plumbness, borehole integrity, and drilling speed,
  - Well casing and screen installation,
  - Filter pack material selection and approved placement method,
  - Annular cement seal installation.
- Well development, including:
  - Initial airlift development between packers,
  - Development by pumping.
- Aquifer pumping and recovery tests;
- Well disinfection; and
- Wellhead completion.

Boart Longyear will be subcontracted by GEOSCIENCE to conduct the drilling, installation, development, and testing of the test well. GEOSCIENCE will submit an electronic copy of a 100% DRAFT version of the work plan to the City for review and comment. Upon incorporation of comments, GEOSCIENCE will submit two (2) hard copies and an electronic copy of the 100% FINAL version.

### **3.8.2 Contractor Coordination**

GEOSCIENCE will coordinate with the drilling contractor, will be available to answer questions regarding the work plan, and will meet at the site with the contractor to evaluate site constraints, including access, security, site footprint, best management practices, etc. GEOSCIENCE will coordinate a schedule to mobilize to the site and begin the work. During mobilization and set up it will be necessary for GEOSCIENCE to be onsite to ensure that the equipment is set up at the correct location and that equipment, fencing, discharge piping and other issues are addressed in a way that is acceptable to the City and the requirements of any regulatory agencies and permits.

### **3.8.3 Borehole Drilling**

The recommended drilling method for the test well installation is the dual rotary casing advance method. This method of drilling utilizes a lower rotary drive to advance steel casing up to 40 inches in diameter through unconsolidated overburden. Hydraulically powered jaws located in the lower drive unit lock onto the steel casing and are capable of exerting a number of rotational forces (i.e. pulldown or pullback with both clockwise and counterclockwise movements) during casing advancement or extraction. An upper, or tophead, rotary drive unit is used to simultaneously pull down and rotate a “dual wall” drill string that is placed in the borehole through the center of the casing. As formation materials are being removed through the rotating dual wall drill string, the borehole is advanced while rotating the casing using the lower drive. Once the total depth of the borehole has been reached, the dual wall drill string is removed and the screen and casing assembly can be installed. The outer casing is subsequently rotated or rocked back and forth as it is retracted from the borehole using the lower rotary drive.

GEOSCIENCE will provide full-time inspection during the borehole drilling. Formation samples will be collected at 5-ft intervals (or more frequently depending on the stratigraphy encountered). Upon collection, all soil samples will be stored in properly labeled Zip-Loc® style bags and stored on site in a designated area for later transport to GEOSCIENCE’s laboratory for sieve analysis. Samples will be visually identified as to material type and production potential by logging them in the field using the Unified Soil Classification System (USCS). All sample collection, logging, and analysis will be conducted by a California Professional Geologist under the supervision of a California Certified Hydrogeologist.

### **3.8.4 Mechanical Grading Analysis**

Utilizing the visual and geophysical logs collected from the pilot borehole, up to eight (8) samples per well will be selected for mechanical grain size (i.e. sieve) analysis at the GEOSCIENCE in-house laboratory. The results of the analyses will be used as a basis for preparing custom filter pack and well screen designs for the test well and will aid in assessing aquifer permeability, sand migration potential, and uniformity coefficients.

### **3.8.5 Preparation of Final Well Design**

The dimensions of the test well casing and screen, and the materials used to manufacture them will be determined based on the results of borehole lithology, and the geophysical logs obtained from the exploratory drilling phase.

Use of a properly designed and installed filter pack will control sand production from the well when pumping. Selection of filter pack material will be determined from mechanical grading analysis, and will be designed based on industry standards regarding pack-to-aquifer ratios. The size of the screen openings will be designed to allow a minimal but acceptable amount of filter pack material to move through the screen. This controlled movement of filter pack material will permit the proper development of the filter pack and near-well zone.

Based on results from the mechanical grading analyses, GEOSCIENCE will design the filter pack with a pack to aquifer ratio of between 10 and 25. Terzaghi’s criteria for the movement of fines through the filter pack, and for the permeability of the aquifer and filter pack, will also be adhered to. The design criteria for the filter pack will ultimately be determined by the borehole’s individual characteristics.

Based on borehole lithology and mechanical grain size analysis, targeted aquifers will be identified. The final well design will include recommended depth intervals and diameters for the well casing and screen, recommended borehole diameter(s), and the proper screen opening size to complement the filter pack design. Recommended depths for the well appurtenances and deep annular seals will also be provided as necessary.

The recommended design will be submitted to the City in letter format for review and comment before implementation in the field. As necessary, GEOSCIENCE will attend one meeting in Oceanside to discuss the draft well design recommendations.

### **3.8.6 Installation of Casing, Screen, Filter Pack, and Annular Seal**

Full-time inspection will be provided during the installation of casing, screen, appurtenances, filter pack and annular seal to ensure that all materials are furnished and placed in accordance with the recommended design and the technical specifications. Prior to installation, GEOSCIENCE personnel will inspect the casing and screen diameters and slot openings for compliance with the specified design. As the filter pack and cement seal is being installed, GEOSCIENCE personnel will track the volume placed against the volume calculated to ensure that there are no voids forming or bridging occurring within the annular space.

### **3.8.7 Well Development by Airlifting and Swabbing**

Initial well development by airlifting and swabbing is an extremely important component of the well completion and development process. As such, GEOSCIENCE recommends at least 60 hours of initial airlift development depending on the length of well screen. GEOSCIENCE will provide part-time inspection during the airlift development process and will closely monitor discharge water turbidity and sand content to track the development progress.

### **3.8.8 Well Development by Pumping and Surging**

GEOSCIENCE will monitor final development by pumping on a part-time basis. Tests for sand content and specific capacity will be performed frequently to measure the advancement of the development process, and to ensure that the well is fully developed before beginning aquifer pumping tests. It is assumed that at least 60 hours of development by pumping and surging will be necessary for development of the test well.

### **3.8.9 Aquifer Pumping Tests**

Once the well development process is considered complete, aquifer pumping tests will be performed on the test well to determine well and aquifer characteristics, and to further characterize possible recharge boundaries within the Mission Narrows. GEOSCIENCE will provide part time inspection during the pumping tests to ensure that quality data is being collected. The following aquifer pumping tests will be performed:

- **Step Drawdown Pumping Test:** time drawdown measurements will be made to determine the specific capacity and well efficiency relationships necessary to provide an indication of sustainable production rates. Typically three to four rates are selected for pumping, beginning with the lowest rate and progressing to the highest.

- **Constant Rate Pumping and Recovery Test:** time drawdown and recovery measurements will be made to estimate aquifer parameters. Nearby monitoring wells will also be monitored to allow calculation of aquifer storativity.

It is recommended that the constant-rate pumping test be conducted for a period of at least 5 days such that the effects of recharge boundaries can be properly evaluated. During testing, the test well and surrounding monitoring wells will be equipped with surface-read pressure transducers with continuous data logging capability. Following completion of the constant rate test, recovery measurements shall be taken for a minimum of four hours.

During the pumping test, GEOSCIENCE will monitor the dissolved oxygen, oxidation reduction potential (ORP), pH, electrical conductivity, and temperature of the ground water. Toward the end of the constant rate pumping test, GEOSCIENCE will collect ground water samples from the test well to be analyzed for selected water quality constituents. In addition to general mineral and physical analysis, the samples will also be analyzed for total dissolved organic carbon, general microbial quality, volatile organic compounds (VOCs), total and dissolved metals, and additional inorganic constituents such as bromide, iodide, and silica. Laboratory fees are included in our cost proposal.

Water generated during aquifer testing will be discharged to the San Luis Rey River in accordance with applicable National Pollutant Discharge Elimination System (NPDES) permits. For cost estimating purposes, this proposal assumes that discharge to the River will require minimal treatment for suspended sediment and entrained solids. More advanced treatment methods (e.g., GAC, reverse osmosis, etc.) were not considered due to the uncertain nature of the permitting process and the significant costs involved. Whenever possible, discharge and percolation within the banks of the River will be explored.

### **3.8.10 Wellhead Completion and Post-Construction Site Condition**

GEOSCIENCE will provide inspection of the final wellhead completion to ensure that the well casing and appurtenances are finished as described by the technical specifications and the requirements of the SAM manual relating to surface completions. The post-construction condition of the well site will also be inspected to ensure that all equipment, materials, and trash have been removed and that the site has been restored as close as possible to its original condition.

### **3.9 Survey**

The location of each of the borehole and monitoring locations will be surveyed by a licensed surveyor. The survey will include horizontal spatial location and the elevation of top of casing, top of monument, and the well pad.

### **3.10 Supplemental Field Investigation Summary Report**

At the conclusion of the aquifer pumping tests and supplemental field investigation, GEOSCIENCE will analyze the data gathered and will prepare a report that summarizes the details of the drilling and testing. The results and findings of the field investigation will be the basis for generation and calibration of a follow on ground water flow and solute transport model of the area. The ground water model will provide the information necessary to design a full scale coastal wellfield, estimate potential ground water level and water quality changes, and impacts to the Narrows area from pumping of that wellfield.

The summary report will include the following:

- Chronology of activities,
- Lithologic logs based on the drill cuttings from the monitoring wells and test well,
- Geophysical (electric) logs,
- Relevant geohydrologic cross-sections,
- As-built diagrams of the monitoring and test wells,
- Description of methods used to evaluate aquifer pumping tests and results of analysis,
- Water quality (field and laboratory) analysis,
- Other pertinent data, analytical results, findings, recommendations and conclusions.

The report, along with all figures, tables and appendices, will be submitted as a 100% DRAFT in electronic form and as four (4) bound hard copies. Upon incorporation of comments from the City, GEOSCIENCE will submit four (4) bound hard copies of the 100% FINAL report and an electronic copy on CD.

#### **4.0 GROUND WATER FLOW AND VARIABLE DENSITY SOLUTE TRANSPORT MODEL**

A three-dimensional ground water flow and variable density solute transport model (SEAWAT Version 4, developed by the USGS) will be constructed of the Mission Narrows and Oceanside coastal area in order to estimate full scale project yield and potential impacts from the proposed feed water intake system. SEAWAT Version 4 is a model program developed by the USGS to simulate three-dimensional, variable density, groundwater flow and solute transport in porous media.

##### **4.1 Develop Conceptual Model with Model Boundary Conditions**

GEOSCIENCE will use the historical geohydrological data from the Oceanside area as well as the data collected during the aquifer pumping test and supplemental field investigation to establish the model domain, boundary conditions, and conceptualization of the coastal aquifer system. Where appropriate, conceptualization from previous models of the Mission Basin will be utilized. The type of data to be evaluated will include sediment types and stratigraphy, vertical and lateral extent of alluvial materials, ground water levels, aquifer parameters from pumping tests, stream flow, and surface and ground water quality. The model will consist of multiple layers with the smallest model cell size being appropriately sized in order to accurately model the intake systems.

##### **4.2 Generate Model Input Files**

Model input data files will include, but not be limited to, ground surface elevations, initial water elevations, tidal elevation data, initial salinity concentrations, hydraulic conductance and stage of the nearby San Luis Rey River. Model input data will also include characterization of seawater quality, the fresh water-salt water interface, the dispersion zone of the interface, and its variability with depth and time. Boundary conditions will include:

- Constant head,
- Prescribed flux, and
- Mixed boundary (general head).

Model input files will include model layer elevations, water level elevations, and water quality (i.e. TDS) concentration maps generated using Geographic Information System (GIS) software.

#### **4.3 Calibrate to Test Pumping Conditions and Monitoring Well Observations**

The Oceanside ground water flow model will be calibrated to both steady-state and transient conditions using both observed ground water level, ground water quality, and fluid resistivity log data from the test wells, monitoring wells, and exploratory boreholes. Predictive model runs will be performed to simulate changes in ground water elevations and salinity with both time and space for various well input configurations.

#### **4.4 Develop Preliminary Near Shore Production Well Configurations**

Multiple model runs will be made to determine localized interference effects and optimum well spacing and yield. To accomplish this, an iterative process will be followed which will consist of generating input well files using varied well screen length, well production, and well field configurations, and identifying potential spatial and temporal water level and water quality changes. Up to three (3) well field configurations will be developed and evaluated using the calibrated ground water model. Analysis of the well field scenarios will enable the evaluation of project feasibility, potential ground water and surface water impacts at the San Luis Rey River, and potential for induced inland seawater intrusion and water quality changes from a full-scale feed water supply system.

#### **4.5 Prepare Ground Water Model Analysis Technical Memorandum**

GEOSCIENCE will prepare a technical memorandum that summarizes the results of the ground water model analysis. The technical memorandum will include a description of the conceptual model, graphics showing boundary conditions and geohydrologic parameters, statistics describing the model calibration, descriptions and graphics of the well field configurations evaluated, and the findings regarding potential ground water level declines, seawater intrusion, and water quality changes that could be expected from pumping a full scale near shore well field. The technical memorandum will provide recommendations regarding an optimum well field configuration.

The technical memorandum will be submitted as a 100% DRAFT in electronic form and as four (4) bound hard copies. Upon incorporation of comments from the City, GEOSCIENCE will submit four (4) bound hard copies of the FINAL memorandum and an electronic copy on CD.

### **5.0 PROJECT MANAGEMENT & ATTENDANCE AT MEETINGS**

Effective control of a project's scope, schedule and budget is fundamental to achieving a quality project. GEOSCIENCE knows that understanding and managing the interrelationship of these three elements largely determines the project's success with respect to budget. Scope creep increases cost and produces delay. Delays increase costs and cause critical milestones to be missed. GEOSCIENCE understands these issues and has demonstrated ability to organize tasks, manage the level of effort, develop and monitor a critical-path schedule, and compare actual costs to planned costs at key milestones; by using these organizational techniques as well as good communication with the client, GEOSCIENCE delivers a quality project on time and within budget. GEOSCIENCE will provide informal weekly project updates throughout the course of the project and daily email updates when active field work is taking place.

Upon being given Notice to Proceed, GEOSCIENCE will schedule a project kick-off meeting with key members of the Project Team and City personnel. The primary objective of the project kick-off meeting will be to meet face-to-face with key project individuals to make sure that everyone understands the intent, objectives, tasks, budgets, schedules, milestones, and deliverables. The kick-off meeting also

identifies the individuals who are responsible for implementing each part of the work. Additionally, this meeting provides a forum for discussion of critical path tasks such as permitting and environmental work how those tasks can be efficiently expedited.

In order to maintain effective communication, GEOSCIENCE will conduct periodic project update meetings with the City to present the status of the project deliverables and to coordinate any outstanding requirements. In addition to the kick-off meeting, GEOSCIENCE will prepare for and attend up to eight (8) additional meetings throughout the course of the project. It is anticipated that three (3) of those meetings will include presentation of results and recommendations to City personnel following each successive phase of the project. Meeting agendas will be prepared by GEOSCIENCE for all project meetings and meeting minutes will be provided as necessary.

## COST PROPOSAL

Our cost proposal and level of effort for each task outlined in our scope of services is provided in the table on the following page. A breakdown of costs by project task and contractor/subconsultant fees is summarized as follows:

Project Task	GEOSCIENCE	Tetra Tech	Contractor / Subconsultant/Permit Fees	Total Cost
Task 1 – Permitting & Environmental Support	\$45,130	\$60,405	\$37,000	\$142,535
Task 2 – Long-Term Aquifer Pumping Test on Existing Test Well	\$42,485	\$0	\$92,545	\$135,030
Task 3A – Supplemental Field Investigation - Exploratory Drilling & Monitoring Well Installation	\$106,287	\$4,000	\$271,653	\$381,940
Task 3B – Supplemental Field Investigation - Vertical Test Well Installation	\$87,400	\$4,000	\$499,363	\$590,763
Task 4 – Three-Dimensional Ground Water Flow & Variable Density Solute Transport Model	\$83,390	\$0	\$0	\$83,390
Task 5 – Project Management and Meetings	\$14,540	\$3,500	\$0	\$18,040
8% Markup on Tetra Tech				\$5,752
<b>TOTAL COST</b>	<b>\$379,232</b>	<b>\$71,905</b>	<b>\$900,561</b>	<b>\$1,357,450</b>

**Cost Proposal for Geohydrologic Consulting and Contractor Services  
 Related to Feasibility of Seawater Desalination in the Mission Narrows, Oceanside, California**

GEOSCIENCE SUPPORT SERVICES, INC.											TETRA TECH								TOTAL COST		
Task Description	Principal Hydrologist	Senior Geohydrologist	Project Geohydrologist	Sr. Staff Geohydrologist and Staff Geohydrologist	Technical Illustrator	Clerical	Labor	Reimbursable Expenses <sup>1</sup>	Contractor / Subconsultant Costs	GSSI Total Cost	Project Director	Principal Environmental Planner / Soil Scientist	Surveyor	CAD/GIS	Contracts / Admin	Clerical	Labor	Reimbursable Expenses <sup>1</sup>		TETRA TECH Total Cost	
Hourly Rate:	\$260	\$180	\$150	\$115	\$100	\$75					\$175	\$110	\$200	\$119	\$85	\$65					
<b>1.0 PERMITTING AND ENVIRONMENTAL SUPPORT</b>																					
1.1	Analysis of Project Impacts per CEQA and Preparation of CEQA Documents (assumes IS/MND will be sufficient, and City to take lead)										12	174		30	4	4		\$ 25,410	\$ 1,282	\$ 26,692	\$ 28,182
1.2	USACE Section 404 Permitting, Including Preparation and Submittal of Pre-Construction Notification, Preparation of CDFG Streambed Alteration Agreement Application, RWQCB Permitting (Section 401 Water Quality Certification), and Mitigation Strategy Negotiations (assumes three (3) meetings)										12	124		24	6	6		\$ 19,496	\$ 1,051	\$ 20,547	\$ 22,037
1.3	Coordination with City Planning Department for Adoption of SWPPP										2	16		4	2	2		\$ 2,886	\$ -	\$ 2,886	\$ 4,016
1.4	Preparation of NPDES Permit Application										4	60		20	4	4		\$ 10,280	\$ -	\$ 10,280	\$ 17,060
1.5	Acquire Drilling Permits from San Diego County Department of Environmental Health (includes drilling permit fees and follow-up reporting for SAM compliance)																	\$ -	\$ -	\$ -	\$ 9,395
1.6	Coordinate Compliance with Discharge Requirements, Including Collection of Background Ground Water Quality Characterization Samples, Coordination and Collection of Discharge Water Quality Samples, Field Water Quality Analyses, Tracking and Tabulation of Discharge Volumes, and Reporting to Regional Board (includes laboratory fees for one (1) background water quality sample suite; assumes 4 discharge reports)																	\$ -	\$ -	\$ -	\$ 24,845
	SUBCONSULTANT SERVICES AND PERMIT FEES - Includes 8% Markup on Subcontractor (PERMITTING COORDINATION)																	\$ -	\$ -	\$ -	\$ 37,000
	<b>Subtotal</b>																	\$ 58,072	\$ 2,333	\$ 60,405	\$ 142,535
<b>2.0 LONG-TERM AQUIFER PUMPING TEST (EXISTING TEST WELL)</b>																					
2.1	Preparation of Detailed Work Plan																	\$ -	\$ -	\$ -	\$ 4,970
2.2	Contractor Coordination and Inspection During Mobilization																	\$ -	\$ -	\$ -	\$ 3,085
2.3	Inspect Downhole Video Survey and Provide Redevelopment Recommendations																	\$ -	\$ -	\$ -	\$ 2,975
2.4	Inspect Well Redevelopment by Airlifting and Swabbing, and Pumping and Surging (assumes 24 hours development)																	\$ -	\$ -	\$ -	\$ 4,130
2.5	Inspect Aquifer Pumping Tests and Collect Ground Water Quality Samples (includes laboratory fees; assumes step test, 5-day constant rate test, and recovery measurements with part-time inspection)																	\$ -	\$ -	\$ -	\$ 17,795
2.6	Prepare Letter Report Summarizing the Results of the Aquifer Pumping Tests and Providing Recommendations for Future Investigations																	\$ -	\$ -	\$ -	\$ 9,530
	CONTRACTOR SERVICES - BAKERSFIELD WELL & PUMP - Includes 8% Markup on Drilling Contractor (REDEVELOPMENT AND TESTING OF EXISTING TEST WELL)																	\$ -	\$ -	\$ -	\$ 92,545
	<b>Subtotal</b>																	\$ -	\$ -	\$ -	\$ 135,030
<b>3.0A SUPPLEMENTAL FIELD INVESTIGATION - EXPLORATORY DRILLING AND MONITORING WELL INSTALLATION <sup>2</sup></b>																					
3.1	Preparation of Detailed Work Plan with Technical Specifications for Exploratory Borehole Drilling and Monitoring Well Installation, Including Field Reconnaissance																	\$ -	\$ -	\$ -	\$ 15,785
3.2	Contractor Coordination, Including Inspection During Mobilization																	\$ -	\$ -	\$ -	\$ 3,085
3.3	Inspect Drilling and Sampling of Exploratory Boreholes (includes laboratory fees for analysis of eight (8) core samples for hydraulic conductivity; assumes full-time inspection of four (4) boreholes to 220 ft)																	\$ -	\$ -	\$ -	\$ 24,972
3.4	Inspect Geophysical Borehole Logging (assumes full-time inspection of four (4) boreholes)																	\$ -	\$ -	\$ -	\$ 4,220
3.5.1	Evaluate Geophysical Borehole Logs and Soils Samples, Conduct MGA on Selected Soil Samples, Design Monitoring Wells, and Provide Inspection During Nested Monitoring Well Installation																	\$ -	\$ -	\$ -	\$ 9,080
3.5.2	Inspect Monitoring Well Development by Swabbing & Airlifting and Pumping & Surging (assumes full-time inspection and 20 hours development per monitoring)																	\$ -	\$ -	\$ -	\$ 12,210



**Cost Proposal for Geohydrologic Consulting and Contractor Services  
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GEOSCIENCE SUPPORT SERVICES, INC.											TETRA TECH						TOTAL COST			
Task Description	Principal Hydrologist	Senior Geohydrologist	Project Geohydrologist	Sr. Staff Geohydrologist and Staff Geohydrologist	Technical Illustrator	Clerical	Labor	Reimbursable Expenses <sup>1</sup>	Contractor / Subconsultant Costs	GSSI Total Cost	Project Director	Principal Environmental Planner / Soil Scientist	Surveyor	CAD/GIS	Contracts / Admin	Clerical		Labor	Reimbursable Expenses <sup>1</sup>	TETRA TECH Total Cost
Hourly Rate:	\$260	\$180	\$150	\$115	\$100	\$75					\$175	\$110	\$200	\$119	\$85	\$65				
3.5.3 Collect Ground Water Quality Samples from each monitoring well completion and Deliver to Laboratory (includes laboratory fees)		1		4			\$ 640	\$ 9,680	\$ -	\$ 10,320							\$ -	\$ -	\$ -	\$ 10,320
3.5.4 Equip Nested Monitoring Wells with Pressure / Water Quality Transducers (includes purchase of four (4) AquaTROLL 200 transducers)		4		24			\$ 3,480	\$ 13,625	\$ -	\$ 17,105							\$ -	\$ -	\$ -	\$ 17,105
3.6 Survey Monitoring Well Locations, and Top of Casing, Monument, and Well Pad		1		8			\$ 1,100	\$ 125	\$ -	\$ 1,225			20				\$ 4,000	\$ -	\$ 4,000	\$ 5,225
3.7 Prepare Letter Report Providing a Summary of Exploratory Drilling and Monitoring Well Installation and Recommendations and Approach for Future	4	30		8	8	1	\$ 8,235	\$ 50	\$ -	\$ 8,285							\$ -	\$ -	\$ -	\$ 8,285
CONTRACTOR SERVICES - BOART LONGYEAR - Includes 8% Markup on Drilling Contractor (EXPLORATORY DRILLING AND MONITORING WELL INSTALLATION)							\$ -	\$ -	\$ 271,653	\$ 271,653							\$ -	\$ -	\$ -	\$ 271,653
<b>Subtotal</b>							\$ 76,525	\$ 29,762	\$ 271,653	\$ 377,940							\$ 4,000	\$ -	\$ 4,000	\$ 381,940
<b>3.0B SUPPLEMENTAL FIELD INVESTIGATION - VERTICAL TEST WELL INSTALLATION<sup>2</sup></b>																				
3.8.1 Preparation of Work Plan and Detailed Technical Specifications for Test Well Drilling, Construction, Development, and Testing of One Vertical Test Well	1	8	16	12	6	2	\$ 6,230	\$ -	\$ -	\$ 6,230							\$ -	\$ -	\$ -	\$ 6,230
3.8.2 Contractor Coordination, Including Inspection During Mobilization		8	4	8			\$ 2,960	\$ 125	\$ -	\$ 3,085							\$ -	\$ -	\$ -	\$ 3,085
3.8.3 Inspect Borehole Drilling and Sampling of Cuttings (assumes full-time inspection and 220 ft total depth)		1	2	24			\$ 3,240	\$ 250	\$ -	\$ 3,490							\$ -	\$ -	\$ -	\$ 3,490
3.8.4 Perform Mechanical Grading Analyses to Support Test Well Design (assumes 6 samples)		2		10			\$ 1,510	\$ -	\$ -	\$ 1,510							\$ -	\$ -	\$ -	\$ 1,510
3.8.5 Prepare Design of Casing, Screen, Filter Pack & Annular Seals	2	16					\$ 3,400	\$ -	\$ -	\$ 3,400							\$ -	\$ -	\$ -	\$ 3,400
3.8.6 Inspect Installation of Casing, Screen, Filter Pack & Annular Seals (assumes full time inspection)	1	2	4	24			\$ 3,980	\$ 250	\$ -	\$ 4,230							\$ -	\$ -	\$ -	\$ 4,230
3.8.7 Inspect Initial Development by Swabbing and Airlifting (assumes part-time inspection and 60 hours of development)	1	2	4	48			\$ 6,740	\$ 750	\$ -	\$ 7,490							\$ -	\$ -	\$ -	\$ 7,490
3.8.8 Inspect Final Development by Pumping and Surging (assumes part-time inspection and 60 hours of development)	1	2	4	48			\$ 6,740	\$ 750	\$ -	\$ 7,490							\$ -	\$ -	\$ -	\$ 7,490
3.8.9 Inspect Aquifer Pumping Tests and Collect Title 22 Ground Water Quality Samples (includes laboratory fees and assumes step test, 5-day constant rate test, and recovery measurements with part-time inspection)	2	8	8	96			\$ 14,200	\$ 3,595	\$ -	\$ 17,795							\$ -	\$ -	\$ -	\$ 17,795
3.8.10 Inspect Wellhead Completion and Post-Construction Site Condition		1		8			\$ 1,100	\$ 125	\$ -	\$ 1,225							\$ -	\$ -	\$ -	\$ 1,225
3.9 Survey Well Location, Top of Casing, Monument, and Well Pad		1		8			\$ 1,100	\$ 125	\$ -	\$ 1,225			20				\$ 4,000	\$ -	\$ 4,000	\$ 5,225
3.10 Analyze Data and Prepare Report Summarizing Aquifer Pumping Tests, Exploratory Drilling and Monitoring Well Installation, and Test Well Installation, Including Recommendations Regarding Future Work	8	60	60	40	32	4	\$ 29,980	\$ 250	\$ -	\$ 30,230							\$ -	\$ -	\$ -	\$ 30,230
CONTRACTOR SERVICES - BOART LONGYEAR - Includes 8% Markup on Drilling Contractor (TEST WELL DRILLING, CONSTRUCTION, DEVELOPMENT, AND TESTING)							\$ -	\$ -	\$ 499,363	\$ 499,363							\$ -	\$ -	\$ -	\$ 499,363
<b>Subtotal</b>							\$ 81,180	\$ 6,220	\$ 499,363	\$ 586,763							\$ 4,000	\$ -	\$ 4,000	\$ 590,763



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GEOSCIENCE SUPPORT SERVICES, INC.											TETRA TECH							TOTAL COST			
Task Description	Principal Hydrologist	Senior Geohydrologist	Project Geohydrologist	Sr. Staff Geohydrologist and Staff Geohydrologist	Technical Illustrator	Clerical	Labor	Reimbursable Expenses <sup>1</sup>	Contractor / Subconsultant Costs	GSSI Total Cost	Project Director	Principal Environmental Planner / Soil Scientist	Surveyor	CAD/GIS	Contracts / Admin	Clerical	Labor		Reimbursable Expenses <sup>1</sup>	TETRA TECH Total Cost	
Hourly Rate:	\$260	\$180	\$150	\$115	\$100	\$75					\$175	\$110	\$200	\$119	\$85	\$65					
<b>4.0</b>	<b>THREE-DIMENSIONAL GROUND WATER FLOW AND VARIABLE DENSITY SOLUTE TRANSPORT MODEL</b>																				
4.1	Develop Conceptual Model and Boundary Conditions	2	60		32			\$ 15,000	\$ -	\$ -	\$ 15,000							\$ -	\$ -	\$ -	\$ 15,000
4.2	Generate Model Input Files	2	40		60			\$ 14,620	\$ -	\$ -	\$ 14,620							\$ -	\$ -	\$ -	\$ 14,620
4.3	Calibrate Model to Test Pumping Conditions and Monitoring Well Observations	4	60		32			\$ 15,520	\$ -	\$ -	\$ 15,520							\$ -	\$ -	\$ -	\$ 15,520
4.4	Develop and Model Preliminary Near-Shore Production Well Configurations	4	80		40	8		\$ 20,840	\$ -	\$ -	\$ 20,840							\$ -	\$ -	\$ -	\$ 20,840
4.5	Prepare Ground Water Model Analysis Technical Memorandum	8	40		32	32	6	\$ 16,610	\$ 800	\$ -	\$ 17,410							\$ -	\$ -	\$ -	\$ 17,410
	<i>Subtotal</i>							\$ 82,590	\$ 800	\$ -	\$ 83,390							\$ -	\$ -	\$ -	\$ 83,390
<b>5.0</b>	<b>PROJECT MANAGEMENT AND ATTENDANCE AT MEETINGS</b>																				
5.1	Prepare for and Attend Project Kick-Off Meeting (Including preparation of meeting agendas and minutes)	4	4					\$ 1,760	\$ 100	\$ -	\$ 1,860	4						\$ 700	\$ -	\$ 700	\$ 2,560
5.2	Prepare for and Attend Eight (8) Additional Progress Meetings (Including preparation of meeting agendas and minutes)	16	40		8			\$ 12,280	\$ 400	\$ -	\$ 12,680	16						\$ 2,800	\$ -	\$ 2,800	\$ 15,480
	<i>Subtotal</i>							\$ 14,040	\$ 500	\$ -	\$ 14,540							\$ 3,500	\$ -	\$ 3,500	\$ 18,040
	<b>TOTAL HOURS AND COST:</b>	<b>75</b>	<b>699</b>	<b>208</b>	<b>1,218</b>	<b>112</b>	<b>21</b>	<b>\$ 329,365</b>	<b>\$ 49,867</b>	<b>\$ 900,561</b>	<b>\$ 1,279,793</b>	<b>50</b>	<b>374</b>	<b>40</b>	<b>78</b>	<b>16</b>	<b>16</b>	<b>\$ 69,572</b>	<b>\$ 2,333</b>	<b>\$ 71,905</b>	<b>\$ 1,351,698</b>
																		8% Markup on Tetra Tech:		\$ 5,752	

Notes:

<sup>1</sup> Reimbursable expenses include report reproduction, environmental report, mailing charges, field equipment, and mileage.

<sup>2</sup> All drilling and construction inspection costs assume total borehole depths of approximately 220 ft below ground surface. It should be noted that additional costs, which cannot be foreseen at this time, are sometimes incurred due to equipment breakdowns on the part of the drilling contractor, and/or problems in material procurement or construction. Additional inspection hours for such field-related problems are not included in the above costs. Additional inspection beyond that outlined in this cost proposal can be provided, as necessary, on a time and materials basis.

**TOTAL PROJECT FEE: \$ 1,357,450**



## PRELIMINARY PROJECT SCHEDULE

The following general project schedule reflects an anticipated Notice of Award date of August 1, 2011. Upon Notice-To-Proceed, GEOSCIENCE will prepare an updated and more detailed project schedule in preparation for the project kick-off meeting. The schedule will be in the Gantt format and will show a detailed task outline, interdependencies, and deliverable milestones. Once a greater understanding of the permitting and regulatory requirements is achieved, the schedule will be revised. Additionally, during the course of the project, the schedule will be updated as needed.

### CAPACITY TO PERFORM WORK

Our capacity to perform the work on this contract is excellent at this time, and we can fully commit all staff necessary to complete this work. Having recently completed a majority of our backlog, our team is energized and prepared to start on this well project with the City of Oceanside. Our staff is fully committed to serving this contract and prepared to begin work immediately.

**Preliminary Project Schedule**

Task	Description	2011					2012						
		Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
1.0	Permitting and Environmental	■	■										
2.0	Long-Term Aquifer Pumping Test (Existing Test Well), Analysis, and Reporting			■									
3.0A	Exploratory Drilling and Monitoring Well Installation, Analysis, and Reporting				■	■							
3.0B	Vertical Test Well Installation, Analysis, and Reporting						■	■	■				
4.0	3-Dimensional Flow & Solute Transport Modeling, Analysis, and Reporting										■	■	■

