HAZEN AND SAWYER
Environmental Engineers & Scientists

Hazen and Sawyer, P.C.
4000 Hollywood Boulevard, 750N
Hollywood, Florida 33021
(954) 987-0066
Fax: (954) 987-2949

CITY OF HALLANDALE BEACH
2009 AGREEMENT

WORK AUTHORIZATION No. 10

BISCAYNE AQUIFER WELLFIELD RELOCATION
DESIGN/PERMIT/CONSTRUCTION MANAGEMENT SERVICES

In accordance with Article 12 of the AGREEMENT between City of Hallandale Beach, Florida and Hazen and Sawyer, P.C. for TRANSPORTATION PLANNING AND ENGINEERING, TRAFFIC STUDIES, UTILITIES, ROADWAYS, GEOTECHNICAL CONSULTING AND TESTING SERVICES, the following scope of services is provided as requested by the City. Compensation shall be on a lump sum for salary costs and reimbursables as set forth in the original agreement.

BACKGROUND

The City of Hallandale Beach (**CITY**) is considering relocating the **CITY** owned wells to the west to prevent saltwater intrusion of the City's water supply. The **CITY** has requested that Hazen and Sawyer, PC (**CONSULTANT**) assist in the development of the proposed wellfield. The **CITY** anticipates a phased approach for the planning, design, and construction of these wells. The approach is summarized below:

Phase 1 – Groundwater Modeling and Assessment (previously performed by MacVicar, Federico, and Lamb)
Phase 2 – Wellfield Development Analysis (completed)
Phase 3 – Test Well Construction (completed)
Phase 4 – Wellfield Modeling and Evaluation
Phase 5 - Wellfield Basis of Design Report and Permitting
Phase 6 - Wellfield Expansion Contract Document Production
Phase 7 – Wellfield Construction

The **CITY** has requested that **CONSULTANT** provide services for Phases 4, 5, 6, and 7 as one work authorization (this work authorization). Phases 4, 5, and 6 are combined as design and permitting and Phase 7 encompasses the construction management services. These services are described hereinafter.

SCOPE OF SERVICES

Due to the nature of well construction, the work will be designed and constructed as two bid packages. The bid packages shall be as follows:

> Bid Package A – Biscayne Aquifer Water Supply Wells: This bid package shall include the drilling and performance of six proposed wells. The package will also include testing during the development of the first two wells to determine hydraulic characteristics for the design of Bid Package B.

Hazen and Sawyer, P.C.
4000 Hollywood Boulevard, 750N
Hollywood, Florida 33021
(954) 987-0066
Fax: (954) 987-2949

Bid Package B – Pumping and Transmission Facilities for the Water Supply Wells: This bid package shall include the construction of pumping, piping, electrical, controls, structures, startup and testing for six proposed wells. The package will also include the interconnecting piping between the six proposed wells.

The project is being completed under two separate bid packages in order to obtain additional design data prior to equipping the wells. The **CITY** requested this approach because it allows for the flexibility to revise the proposed pump and motor selection after completion of the well performance testing conducted during construction of Bid Package A.

Based on preliminary discussions with the **CITY**, the following criteria defines this design:

1. The project shall include the design, construction, equipping, and interconnection of the proposed wells located at Mary Saunders Park in the City of West Park;
2. The proposed Biscayne Aquifer wells are anticipated to produce approximately 1.0 to 2.0 MGD, but exact yield will be determined by site conditions and allowable withdrawals by the South Florida Water Management District (District);
3. The detailed design of the proposed well construction shall require the contractor to perform aquifer performance testing of the production horizon during construction;
4. Pump type and materials of construction will be compatible with nanofiltration treatment of the raw water;
5. Coordination with FPL will be required to size the power supply for new wells;
6. Connections for standby power supply for emergency backup of the wells will be provided. Installed generator capacity will not be designed under this project. The City will provide portable generators for emergency events.

Additionally, the following assumptions were made:

1. It is assumed that no wetlands exist within the project area;
2. It is assumed that **CITY** will obtain all additional required easements and right-of-ways for construction and permanent operation of the wells;
3. It is assumed that the design of the raw water transmission pipeline to the water treatment plant will be completed by others;
4. It is assumed that a complete hydraulic analysis and surge analysis for the transmission pipeline will conducted by others and is not included in this work authorization.

TASK 1 – Preliminary Design

1.1 – Preliminary Well Site Selection

CONSULTANT shall meet with ***CITY*** staff to confirm the location of the proposed wells. It is assumed that the **CITY** will obtain all required easements. It is also assumed that no environmental features exist within the proposed project area. If environmental features such as wetlands exist, additional scope and fee will be required to address such issues. The **CITY** will obtain temporary easements for construction of the wells.

CONSULTANT shall identify pipeline routes to connect the proposed wells to eachother. This task also includes identification of the route for Florida Power and Light (FPL) to provide primary power to the proposed wells. **CONSULTANT** shall coordinate with FPL to identify likely power routes and preliminary easement requirements.

1.2 – Electrical Requirements

CONSULTANT shall evaluate proposed wellfield configuration for electrical power distribution system requirements and make recommendations for system configuration. Contact FPL for preliminary discussion of available options for electrical service.

1.3 – Preliminary Opinion of Probable Construction Cost

CONSULTANT shall prepare a preliminary opinion of the construction cost for the recommended well configuration. The preliminary construction cost estimate shall include the well drilling, raw water pumps, interconnecting raw water pipeline, electrical provisions including generator(s), and remote monitoring and control system. The transmission pipeline shall not be included in this task (by others).

1.4 – Preliminary Project Delivery Schedule

CONSULTANT shall prepare a preliminary project delivery schedule that includes design, permitting, bidding, and construction. The schedule shall be prepared for the overall project; however, the activities will be divided between bid packages A and B.

1.5 – Preliminary Design Technical Memorandum

CONSULTANT shall prepare a draft preliminary design technical memorandum that incorporates the findings developed during Task 1. Eight (8) copies of the draft preliminary design technical memorandum shall be submitted to the ***CITY***.

CONSULTANT shall attend one meeting with the ***CITY*** to collect input on the draft memorandum. This meeting will be scheduled within two week of submittal of the draft memorandum.

Comments received during review of the draft preliminary design technical memorandum review meeting shall be incorporated and a final version of the memorandum shall be prepared. Eight (8) copies of the final preliminary design technical memorandum shall be submitted to the ***CITY***.

TASK 2 – FINAL DESIGN

2.1 – Engineering Design Survey

CONSULTANT shall employ the services of a Certified Land Surveyor in the State of Florida to perform an Engineering Design Survey. The Engineering Design Survey shall include the following:

- In the survey area locate all existing aboveground pipes, valve boxes, water/electrical meter boxes, electrical pull boxes, telephone/cable risers, fences, hydrants, aboveground utilities, wood/concrete utility poles, overhead electrical lines, culverts, guardrails, pavement limits, headwalls, end-walls, manholes, vaults, mailboxes, driveways, side streets, right-of-ways limits, landscaping, traffic signage, other signage and any other improvements;

- Provide boundary survey information that identifies utility, drainage, electric power, and canal easements and rights-of-way; and provide information on existing zoning and setbacks for each zoning code within and adjacent to the survey area;

- Within the survey area survey the locations of vegetation and individual trees (native and exotic). Trees greater than four (4) inches in diameter shall be located and identified as to caliper and type;

- Produce a complete engineering design base map (geometric control plan) including all right-of-ways, easements and plats. The surveyor shall attempt to locate front property corners throughout the project. Data shall be compiled from recorded plats and field located property corners. Establish horizontal and vertical survey base line at 100-foot stations, nails set at 50-foot stations, cross sections at 25-foot stations and benchmark set at every 300-feet station. The Geometric Control Plan shall be related to the Florida State Plan Coordinates and shall be based on NAD 1983/90.

- Prepare sketches and legal description(s) of the properties where the new wells will be located. The ***CITY*** Real Property agent will acquire the easements needed for the new well locations.

- Provide a general description, including aerial photo, showing the location of the proposed raw water pipeline (on the wellfield only) and new FPL power supply. The ***CITY*** Real Property agent will provide all services (including legal description survey) to acquire the easements needed for the proposed raw water transmission pipeline and new FPL power supply.

2.2 – Geotechnical Investigation and Soil Investigations

CONSULTANT shall employ the services of a geotechnical specialty firm, to perform the following work:

- Perform soil borings, in accordance with the Standard Penetration Tests (ASTM D-1586) procedure. One boring shall be performed approximately every 500 feet along the wellfield pipe route. An average depth of 15 feet per boring has been assumed.

- Prepare a Geotechnical Report to provide recommendations on the foundation design for new structures. Geotechnical Report shall include recommendations on pipeline trenching, backfill and compaction.

2.3 – Prepare 60% Contract Documents

CONSULTANT shall prepare the preliminary design (i.e., 60% design stage) contract documents (i.e., drawings and technical specifications). **CONSULTANT** shall prepare cost estimates to provide ***CITY*** with an up to date progress estimate of projected probable construction costs. Estimates will be prepared and forwarded to ***CITY*** at the 60% design completion stage.

CONSULTANT shall schedule review meetings/workshops to receive input at the 60% design completion stage. Based on comments received make subsequent revisions to the documents. This does not include out of scope changes outside of the recommendations identified in the final preliminary design memorandum.

CONSULTANT shall furnish four sets of the 60% contract documents and 60% opinion of probable construction cost for each bid package.

2.4 – Prepare Final Contract Documents

Based on input received at review meeting, prepare the final (100%) contract documents (i.e., drawings and specification) and cost estimate.

CONSULTANT shall conduct a 100% completion stage project peer review to provide QA/QC of the final contract documents and cost estimate prior to submittal. The review shall include final interdisciplinary checks, general coordination and constructability issues, and shall be conducted by senior level personnel.

CONSULTANT shall furnish four sets of the final (100%) contract documents and opinion of probable construction cost for the bid package.
Approximately two weeks after delivery of the final (100%) contract documents schedule a final review meeting so that any changes that may be necessary to meet the project's budgetary requirements can be incorporated. This does not include out of scope changes outside of the recommendations identified in the final preliminary design memorandum.

TASK 3 – PERMITTING

3.1 – Construction Permitting

CONSULTANT shall coordinate and attend up to four meetings with the following regulatory agencies to discuss the requirements for acquiring pre-bid construction permits for this project.

- Broward County
- Florida Department of Environment Protection (FDEP)
- Broward County Health Department
- City of West Park Building Department

CONSULTANT shall coordinate contact with these agencies. Prepare permit applications required for the construction of the new facilities. It is assumed that a Right-of-Way permit is not required as facilities were previously located on ***CITY*** property.

CONSULTANT shall prepare up to three written responses to the regulatory agencies request for additional information (RAI) regarding each permit application referenced above.

It is assumed that the Bid Package A and B contractors shall be responsible for the following:

- Obtaining the water well construction permit required by the South Florida Water Management District (SFWMD).
- Be solely responsible for obtaining bacteriologic clearance in accordance with FAC 62-555.
- Preparation, and submittal of Building Department Construction Permits

It is assumed that the contractor will assist the **CITY** in collection of water samples and the **CITY** performs all laboratory analyses for bacteriological clearances. It is also assumed that the **CITY** shall perform the first laboratory analysis for bacteriological clearances free of charge. If retesting is required due to a positive bacteriological result then the contractor shall pay for all retesting.

3.4 –Production Well Completion Report

CONSULTANT shall prepare a report that summarizes the data collected during well construction. Additionally, the report shall analyze the data collected during well performance testing to evaluate the specific capacity for each well. This data will be used during the selection of pumps during detailed design of Bid Package B. Four copies of the Draft Well Construction Report will be submitted to the **CITY**.

A meeting shall be scheduled within two week of submittal of the draft report to the **CITY**. The purpose of the meeting is to collect **CITY** input on the Draft Well Construction Report. Issue meeting minutes summarizing the meeting. Comments received from **CITY** during review of the Draft Well Construction Report Review Meeting shall be incorporated and a final version of the report shall be prepared. Ten copies of the Final Well Construction Report will be submitted to the **CITY**.

3.5 – Building Department Permit Assistance

CONSULTANT shall supply the contractor with signed and sealed bid-set contract documents for the contractor to apply and acquire a City Building Department permits. The contractor shall be responsible for obtaining the building department permit.

CONSULTANT shall assist the contractor to obtain a construction permit from the City Building Department. Assistance shall include correspondence with the Bid Package A and B contractors and City Building Department, coordination and attendance at meetings with the City Building Department to address comments regarding the design intent, revisions of drawings and specifications to meet the requirements of the City Building Department.

TASK 4 – CONSTRUCTION BID SERVICES

Services to be provided during the bidding and award phase are as follow:

1. Attend pre-bid meeting with prospective bidders;
2. Assist with preparation of and issue addenda as appropriate to interpret or clarify contract documents;
3. Provide **CITY** with a recommendation to make a contract award, as necessary;
4. Prepare six conformed sets of contract documents.

TASK 5 – CONSTRUCTION MANAGEMENT SERVICES

5.1 – General Management

CONSULTANT shall provide services for the management of engineering services during the construction period. Such management activities shall include project coordination with the **CITY**, contractor and resident project representative. Attend coordination meetings with contractors and **CITY** during course of project. General management shall also include scheduling specialty inspections, and general correspondence with **CITY**, construction contractor and subcontractors.

CONSULTANT shall maintain orderly files for correspondence reports of job conferences, shop drawings and sample submission, reproductions of original Contract Documents including all change orders, field orders, additional drawings issued subsequent to the execution of the contract, clarifications and interpretations of the Contract Documents, progress reports, and other project related documents.

CONSULTANT shall receive and log correspondence, change orders, shop drawings, and submittals received from the contractor.

5.2 – Contract Interpretations and Clarifications

CONSULTANT shall prepare and issue necessary technical interpretations and clarifications of the Contract Documents in a timely manner. **CONSULTANT** shall make recommendations on requests of the contractor and the **CITY** as to the acceptability of construction or the interpretation of the technical requirements of the Contract Documents.

5.3 – Change Orders

CONSULTANT shall review the technical appropriateness, project cost and / or schedule impacts because of changes submitted by the contractor, requested by the ***CITY*** or recommended by the ***CONSULTANT***. Changes may be the result of unforeseen conditions or interferences identified by the contractor during the routine progress of work, inadvertent omissions (betterment) issues in the contract documents, or additional improvements requested by the ***CITY*** after the project bid date.

CONSULTANT shall comment on the technical aspects and impact of the change request in terms of project cost and schedule. Prepare change orders and negotiate changes in contract time and cost with the contractor. Prepare an analysis of the change request indicating reasons for acceptance, references to applicable sections of the contract documents that validate or disclaim the change request, and if accepted, a statement noting that the requested cost / schedule impacts are fair and reasonable. **CONSULTANT** shall prepare, recommend and submit for ***CITY***'s approval such change orders.

CONSULTANT's services do not include claims analysis or litigation support.

5.4 – Work Change Directives

Due to the fast track nature of this project, the **CITY** authorizes **CONSULTANT** to issue work change directives. A work change directive shall be a written directive to the contractor issued after contract execution, signed by the **CITY** and recommended by the **CONSULTANT** ordering an addition, deletion or revision in the work. A work change directive shall not change the Contract price or time, but is evident that the parties expect that the change directed or documented by a work change directive will be incorporated into a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Time.

CONSULTANT shall issue work change directives only when necessary to avoid potential project delivery delays associated with the time needed to negotiate and process change orders.

5.5 – Shop Drawings

CONSULTANT shall review shop drawings and any other submittals (except detailed construction progress schedules) that the contractor is required to submit by the Contract Documents. Reviews shall be completed within twenty-one (21) calendar days of **CONSULTANT**'s receipt of the submittal except for special items requiring longer review time if so noted in the Contract Documents. The review shall be for conformance with the design intent and compliance with the information presented in the Contract Documents; to determine the acceptability of materials and equipment proposed by the contractor. Shop drawings shall be returned to the contractor with ***CONSULTANT***'s written comments and recommendations concerning their completeness under the Contract Document.

5.6 – Pay Requests

CONSULTANT shall review the construction contractor's monthly applications for payment and accompanying data and recommend approval of payments due to the construction contractor. **CONSULTANT**'s recommendation of any payment requested in an application for payment shall constitute a representation by **CONSULTANT** to the **CITY** as an experienced and qualified professional, that based on **CONSULTANT**'s Resident Project Representative on-site observations of construction in progress; that, to the best of **CONSULTANT**'s knowledge and belief, that construction has progressed to the point indicated and that the quality of construction is in substantial accordance with the Contract Documents.

5.7 – Construction Schedule Submittal Review

The contractor shall be required to submit detailed construction progress schedules on a monthly basis. **CONSULTANT** shall review the contractor's progress schedule for acceptance. Acceptance shall demonstrate that the schedule is acceptable with respect to the Contract Documents.

TASK 6 – DETAILED OBSERVATION

6.1 – Resident Project Representative

CONSULTANT shall furnish Resident Project Representative (RPR) to observe performance of the work for Bid Package A and one RPR for Bid Package B. The RPR duties and responsibilities for Bid Packages A and B are as follows:

- Construction Observation – Conduct on-site observations of construction in progress to assist in determining if construction is proceeding in substantial accordance with the Contract Documents, and that completed construction

conforms to the Contract Documents. Inform **CONSULTANT** and the Contractor whenever RPR believes that any construction is unsatisfactory, faulty or defective or does not conform to the Contract Documents, or does not meet the requirements of any inspections, tests or approval required to be made, or has been damaged before final payment.

- Photographic Record – Provide a photographic record of the construction, beginning with pre-construction documentation and completing with post-construction photographs. Photographs shall be digital type taken to define the progress of the project and unusual or important construction events as deemed necessary.

- General Coordination – Coordinate submittal of O&M manuals, operation and maintenance training plans and schedules, startup and testing plans and scheduled, and assist the **CITY** to establish a schedule and venue for training sessions. Oversee substantial and final completion inspections, coordinate delivery of spare parts and warranties, and maintain the punch list. Upon RPR issuance of a punch list for a substantially complete work element, the RPR shall follow up to assure that punch list items are corrected and/or completed.

- Coordinate Laboratory Testing – Coordinate with **CITY**'s testing laboratory to schedule water sample collection and laboratory tests as requested by the contractor and required by the Contract Documents.

- Observe Regulatory Agency Inspections – Accompany visiting inspectors representing public or other agencies having jurisdiction over the project, record the outcome of these inspections in the daily reports which shall be recorded on **CONSULTANT**'s standard forms.

- Daily Log – Keep a daily diary and / or log book recording hours on the job site, weather conditions, data pertaining to questions of extras or deductions, list of visiting officials and representatives of manufacturers, fabricators, suppliers and distributors, daily activities, decisions, observations in general and specific observations in more detail as in observing test procedures. Forward the RPR's completed daily logs to the **CITY** on a regular basis.

- Construction Progress Meetings – Chair periodic progress meetings with the construction contractor and the **CITY** to review project status and identify issues that may affect the project schedule. Such issues may include suggested changes and/or methods to keep the project on schedule (except for the construction contractor's means, methods, techniques, sequences or procedures of construction). Prepare and issue written meeting minutes to the **CITY** and the Contractor. Additional representatives of **CONSULTANT** (i.e., technical experts, project manager, etc.) shall accompany the RPR as necessary during the construction period as specific needs arise.

6.2 – Specialty Inspections

For Bid Package A, **CONSULTANT** shall furnish the periodic services of engineering staff experience in water supply well construction to supplement the RPR during the construction period as appropriate to perform specialized inspections associated with work and compliance reporting in accordance with regulating agency construction permit sworn statement requirements.

For Bid Package A, CONSULTANT shall provide a specialty inspector for the testing phase whose duties and responsibilities shall include the following:

- Well Performance Testing – RPR shall coordinate with the well drilling contractor to observe and record hydraulic information during the performance testing of the new wells. The performance testing requirements will be outlined for the well drilling contractor in the Contract Documents. Information to be recorded for use in design of pumping equipment includes:

  - ✓ Pumping rate
  - ✓ Water levels every two minutes during the pumping period
  - ✓ Static water level prior to pumping
  - ✓ Drawdown

- Geological Log – Collection and analysis of drill cutting and preparation of a log of drill cutting lithology.

For Bid Package B, **CONSULTANT** shall furnish the periodic services of the design engineers (i.e., Instrumentation, Electrical, Structural, Mechanical, etc.) to supplement the RPR inspections to ensure compliance with the Contract Documents.

Specialty inspection labor shall include attendance at field meetings when required.

6.3 – Substantial Completion Inspections

Conduct substantial completion inspections when requested by the contractor and the RPR recommends that the work is sufficiently complete to warrant a substantial completion inspection. The following substantial completion inspections are contemplated:

- One substantial completion inspection shall be provided for Bid Package A
- One substantial completion inspection shall be provided for Bid Package B

During the substantial completion inspection the inspection staff shall prepare initial punch list items requiring completion or correction to the satisfaction of **CITY**. The RPR shall be responsible for maintaining the punch-list and issuing updates to the punch-list on a periodic basis.

6.4 – Project Closeout Services

Upon the request of the contractor and concurrence of the RPR and the **CITY**, conduct final inspections of portions of the project as they are finished to determine if construction has been completed in substantial accordance with the contract documents and the construction contractor has fulfilled its obligations there under. The following project closeout inspections are contemplated:

- One project closeout inspection shall be provided for Bid Package A
- One project closeout inspection shall be provided for Bid Package B

Based on the results of the final inspection, judge the work complete or not complete. If the work is judged complete, issue a "notice of final acceptance and recommendation for final payment".

TASK 7 –OPERATIONS AND MAINTENANCE MANUAL

7.1 – Operation and Maintenance Manual Update Assistance

CONSULTANT shall prepare an Operation and Maintenance (O&M) Manual for the proposed wellfield. The manual shall include a description of how the process is designed to operate, control system interface points and general operational procedures. The manual shall also consolidate maintenance information and design parameters for the various equipment items.

Two copies of the draft O&M manual shall be submitted for review and comment. Two final copies of Operation and Maintenance Manuals shall be submitted based on **CITY**'s comments on the draft. Operation and Maintenance manuals shall focus upon providing personnel with a clear description of the process, operating theory, normal and potential abnormal operating conditions and corrective procedures to maintain the process within compliance levels, as well as the following routine policies and procedures:

1. Sampling and frequency
2. Emergency response
3. Equipment checks
4. Lubrication schedules
5. Vendor / Supplier contact information

The O&M manual shall include a schematic illustrating all wells at the wellfield. The O&M manual shall include a well operating and sequencing protocol for startup of treatment plant membrane skids.

Detailed equipment operation and maintenance manuals of all Contractor furnished equipment will be furnished to **CITY** by the Contractor in accordance with the construction contract documents.

TASK 8 – ADDITIONAL SERVICES (as authorized)

CONSULTANT shall provide additional services, at costs agreed upon by the **CITY** and **CONSULTANT** and as authorized by the **CITY**, which may arise during the course of the work that are consistent with the intent of the original work order; but, were not envisioned as part of the original or amended scope of work. **CONSULTANT** shall submit a proposal to perform Additional Services prior to the performance of the work.

ASSUMPTIONS

The following assumptions were made in preparation of the above scope:

1. **CITY** will obtain all required property. Property acquisition services are not included in this work authorization.
2. **CITY** will obtain required easements and right of ways for construction of the wells and interconnecting piping.
3. Transmission piping to the water treatment plant is not included and is assumed to be designed by **CITY** or others.
4. **CITY** will pay for all water quality sampling and analyses required by the contract documents and/or permits. The **CITY** will be responsible for procurement of laboratory testing services.
5. It is assumed that the Florida Power and Light shall be responsible for obtaining construction permits for the construction of their facilities.
6. **CITY** will assist in coordinating site access for construction of the new production wells.
7. It is assumed that additional groundwater investigations are presently being conducted to confirm that the source water is not contaminated.
8. It is assumed that the Biscayne water will be treated at the existing water treatment plant by nanofiltration.
9. Litigation and claims services are not included in this work authorization.
10. The modification to the existing SFWMD Water Use Permit is being prepared under separate work authorization. This work authorization assumes that the permit will be granted to the City and that this wellfield is being designed to supply 9.8 mgd raw water supply to the City (e.g. six, 2 mgd wells).
11. A cost-benefit analysis of raw water supply is not included in this work authorization.
12. The disposal method for the water produced during the development of the wells has not been determined. This work authorization assumes that the well driller will be limited to 8 hours per day of development and that the water will be

disposed of through existing stormwater infrastructure. The design of additional drainage infrastructure is not included in this work authorization.

13. This work authorization is based on a construction period of 9 months for Bid Package A and 12 months for Bid Package B. This work authorization assumes that the wells will be developed in 80 hours or less per well. Detailed observation for well drilling is based on 1/3 time observation. Detailed observation for equipping of wells is based on ½ time observation.
14. The City will pay for all permitting and testing fees.
15. It is assumed that extensive landscaping will not be required for the wellfield. If the services of a landscape architect are required for this design, an amendment to this work authorization will be requested.

COMPENSATION

The compensation for engineering services provided under this work order shall be on a lump sum basis for a total amount of $663,239. A cost breakdown by task for engineering services described in this work authorization follows:

DESCRIPTION	LABOR	REIMBURSABLES	TOTAL
Task 1 – Preliminary Design	$33,800	$10,200	$44,000
Task 2 – Final Design	$203,500	$36,839	$240,339
Task 3 – Permitting/Well Completion Report	$26,700	$100	$26,800
Task 4 – Construction Bid Services	$15,500		$15,500
Task 5 – Construction Contract Administration	$143,300	$1,700	$145,000
Task 6 – Detailed Observation	$143,500		$143,500
Task 7 – O&M Manual	$28,100		$28,100
Subtotal – Labor and Expenses	**$594,400**	**$48,839**	**$643,239**
Optional services (if needed):			
Task 8 – Additional Services	*$20,000*	-	*$20,000*
Total – Labor and Expenses	**$614,400**	**$48,839**	**$663,239**

Pass through costs, such as excess shop drawing reviews, inspection overtime, and contractor proposed substitution reviews shall be billed separately to ***CITY*** for reimbursement by the contractor in accordance with the construction contract documents.

NOTE: It is noted that this scope of services assumes services are based upon 8-hour workdays, Monday through Friday, excluding ***CITY*** holidays. Should longer work hours, or weekend work hours, be requested by the construction contractor and approved by the ***CITY***, an equitable adjustment to ***CONSULTANT***'s fee will be made which may

include overtime rates. Should the construction period extend beyond the contract construction period, appropriate adjustment of services and fee shall be made by amendment to this work authorization.

SCHEDULE

The duration of major work tasks are summarized below:

DESCRIPTION	*Estimated Completion Time from Notice-to-Proceed*[A]
Task 1 – Preliminary Design	3 months[B]
Task 2 – Final Design	7 months[B]
Task 3 – Permitting	9 months[B]
Task 4 – Construction Bid Services	9 months[B]
Task 5 – Construction Contract Administration	30 months[B]
Task 6 – Detailed Observation	30 months[B]
Task 7 – Controls System and Operations Assistance	30 months[B]
Task 8 – Additional Services	30 months[B]
Total Project	30 months[C]

Notes:
A – Will vary depending on CITY procurement process
B – Project schedule dependent on permitting, and shall be revised as needed to reflect most recent completion estimates
C – Overall schedule assumed, and is likely to vary depending on permitting

AUTHORIZATION - HAZEN AND SAWYER, P.C.

Accepted: Patrick A. Davis, P.E.
Vice President

3-24-10
Date: