

**Professional Services for Mechanical Integrity Testing of Deep Injection**

**Wells IW-1 and IW-2**

**And**

**Operating Permit Renewal Services**

**at the City of Key West**

**Richard A Heyman Environment Protection Facility**

**Prepared for**

**City of Key West Utilities Department**

**July 7, 2023**



**PEREZ ENGINEERING**  
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**PROFESSIONAL SERVICES FOR MECHANICAL INTEGRITY TESTING  
OF DEEP INJECTION WELLS IW-1 AND IW-2  
AND  
OPERATING PERMIT RENEWAL SERVICES  
SCOPE OF SERVICES**

**I. PROJECT DESCRIPTION**

The City of Key West (CITY) owns the Richard A. Heyman Environmental Protection Facility deep injection well system. The deep injection well system is utilized for disposal of treated wastewater. This Proposal presents the scope of services for consulting services for renewing the deep injection well system operating permit and mechanical integrity testing of deep injection wells IW-1 and IW-2.

The CITY is authorized to operate the injection well system under the conditions of Florida Department of Environmental Protection (FDEP) Operating Permit No. 327710-002-UO/5W. As specified in Rule 62-528.440, Florida Administrative Code (FAC), deep injection wells must undergo a permit renewal every 5 years. The current operating permit was issued on January 24, 2020 and expires on January 24, 2025. The conditions of the current permit require that an application for renewal of the operating permit be submitted at least 60 days prior to the current permit expiration date. Therefore, an application to renew the deep injection well system operating permit must be submitted to FDEP on or before November 25, 2024.

As specified in Rule 62-528, Florida Administrative Code (FAC), deep injection wells must demonstrate both internal and external mechanical integrity every 5 years. Mechanical integrity testing (MIT) for injection well IW-1 was last completed on April 3, 2019. Therefore, the next MIT for IW-1 must be performed no later than April 2, 2024. The most recent MIT of IW-2 was performed on April 8, 2019. Therefore, the next MIT for IW-2 is due no later than April 7, 2024. An MIT plan for the injection wells is required to be submitted to FDEP for approval no later than 90 days prior to the MIT due date. Therefore, the MIT plan is required to be submitted to FDEP no later than January 3, 2024 and January 8, 2024, for IW-1 and IW-2, respectively.

Internal mechanical integrity testing will consist of performance of a video survey, temperature log, and pressure test on each of the injection wells. External mechanical integrity will consist of conducting a radioactive tracer survey (RTS) of the wells. A RTS is conducted by ejecting a radioactive tracer at the base of the well casing under low-rate injection conditions and monitoring its movement with gamma ray detectors.

In order to conduct the operating permit renewal and the MIT on the injection wells, Perez Engineering & Development, Inc (PE&D) has requested McNabb

Hydrogeologic Consulting, Inc. (MHC) to assist PE&D with professional consulting services for the MIT. These services are listed in Tasks 1 through 6 below.

This project consists of the following:

1. Renew the injection well system operating permit.
2. Prepare and submit to the Florida Department of Environmental Protection (FDEP) a Mechanical Integrity Testing plan.
3. Prepare technical specifications for inclusion with bid documents.
4. Provide bidding services.
5. Provide MIT field observation services.
6. Prepare a Mechanical Integrity Testing Report for each injection well providing an interpretation of the MIT data and historical monitoring well water quality and water level data.

## **II. SCOPE OF SERVICES**

### **Task 1 - Operating Permit Renewal Services**

- 1) Prepare a draft Class I deep injection well operating permit renewal application with supporting information. The permit renewal permit application will include:
  - A comprehensive well inventory of all wells within a three (3) mile radius of the deep injection well system. The well inventory will include review of well permitting records at the South Florida Water Management District, Southwest Florida Water Management District, Florida Geological Survey (Oil & Gas, and Geologic Investigations sections), United States Geological Survey, and FDEP. Wells identified within a 3-mile radius of the injection well system will be identified on an Area of Review Map and information (construction details, well use, permit number) for each well will be summarized on an accompanying table.
  - Map and cross sections showing the local and regional geology and hydrogeology will be prepared. The cross sections will depict geologic formations and hydrogeologic units, the estimated depth of the Underground Source of Drinking Water (USDW), and the direction of fluid movement within identified USDWs.
  - Documentation of mechanical integrity of the deep injection well system.
  - Tables and graphs of operating data for the injection well and both zone of the dual-zone monitor well. An interpretation of the data will be included with the application supporting information.
  - A proposed injection well system monitoring program.

- An updated injection well system plugging and abandonment plan with an estimated cost.
  - Demonstration of Financial Responsibility documentation.
- 2) Provide City with the draft permit application.
  - 3) Incorporate draft application review comments and distribute to the City for final review.
  - 4) Incorporate final review comments and distribute the permit application to the City.
  - 5) Respond to up to two (2) FDEP request for information (RFI) regarding the permit application.
  - 6) Review draft permit and provide comments to the City and FDEP.
  - 7) Attend FDEP draft permit public notice meeting.
  - 8) Review Notice of Intent to Issue an operating permit and provide comments to the City and FDEP.

**Task 2 - Mechanical Integrity Testing Plan Preparation:** Prepare a detailed mechanical integrity testing plan for both deep injection wells. The testing plan will include provisions for evaluating the internal and external mechanical integrity of each well. Internal mechanical integrity will be demonstrated by performing a video survey, temperature log, and a pressure test on each injection well. External mechanical integrity will be demonstrated by conducting a radioactive tracer survey (RTS) of both wells. A RTS is conducted by ejecting a radioactive tracer at the base of the well casing under dynamic conditions and monitoring its movement with gamma ray detectors. Response to an unlimited number of RFIs from the FDEP related to the MIT plan is included with this task.

**Task 3 - Mechanical Integrity Technical Specifications Preparation:** Prepare Technical Specifications and a Bid Form for the performance of the MIT work. A draft of the Technical Specifications and Bid Form will be prepared and submitted to the City for review and comment. Following a two (2) week review and comment period, the City's comments will be incorporated into the documents.

**Task 4 - Bid Phase Services:** Prepare Addenda, if required, and assist in the awarding of the contract for conducting the MIT work. Alternate contracting methods such as piggy-backing onto an existing MIT contract shall be included in this task.

**Task 5 - Mechanical Integrity Testing Field Services:** Provide resident observation services during the MIT work. Staff experienced in the construction and testing of Class I injection wells will perform resident observation. Review and processing of shop drawings through final acceptance, review of Contractor's payment applications with recommendations to the CITY for payment, and recommendation for final acceptance by the CITY is also included in this task.

**Task 6 - Mechanical Integrity Testing Reports Preparation:** Following completion of the MIT work, reports summarizing the MIT work will be prepared. The reports will also provide a summary and interpretation of the previous five (5) years of the injection well system operating and monitoring data. A draft of the reports will be submitted to the CITY for review and comment. Upon receipt of review comments, the MIT reports will be finalized and eight (8) copies of each report will be prepared for distribution. Response to up to two (2) RFIs related to the MIT reports is also included in this task.

### **III. ASSUMPTIONS**

1. CITY to provide an electronic copy of the CITY's front-end documents for inclusion with the technical specifications in the Contract Documents for bidding purposes.
2. A well service contractor will contract with the CITY for the performance of the MIT.
3. Any updates to the deep injection well operation and maintenance (O&M) manual are not included in this task order. Modifications to the O&M manual are not anticipated to be necessary.
4. The CITY will pay all permit processing fees associated with the operating permit renewal.

### **IV. DELIVERABLES**

1. Draft operating permit renewal application distributed to PE&D and the City
2. Final operating permit renewal application
3. Draft mechanical integrity testing plans
4. Final mechanical integrity testing plans
5. Draft technical specifications with front end documents and bid form ready for bidding
6. Final technical specifications
7. Signed and sealed MIT Report

### **V. COMPENSATION**

Professional fees will be on a Lump Sum basis. The Lump Sum amount of compensation is shown on Table 1.

**Table 1  
COMPENSATION  
PROFESSION SERVICES FOR MECHANICAL INTEGRITY TESTING OF IW-1 AND IW-2**

Task	Labor Cost
1 – Operating Permit Renewal	\$40,620
2 – MIT Plans Preparation	\$8,090
3 – Technical Specifications	\$11,040
4 – Bid Phase Services	\$1,730
5 – Field Services	\$22,520
6 – MIT Reports	\$27,260
Total	\$111,260

**VI. COMPLETION DATES**

Following are the estimated completion times. Dates are from execution of the Work Order.

<u>Draft Application to CITY</u>	<u>45 days after Notice to Proceed</u>
<u>Final Application</u>	<u>7 days after receipt of comments</u>
<u>RFI Responses</u>	<u>21 days after receipt of RFI</u>
<u>Draft Permit Review Comments</u>	<u>7 days after receipt of draft permit</u>
<u>Draft MIT Plans</u>	<u>45 days after Notice to Proceed</u>
<u>Final MIT Plans</u>	<u>7 days after receipt of comments</u>
<u>Draft Specs</u>	<u>75 days after Notice to Proceed</u>
<u>Final Specs</u>	<u>7 days after receipt of comments</u>
<u>Draft MIT Reports</u>	<u>21 days after completion of testing</u>
<u>Final MIT Reports</u>	<u>7 days after receipt of comments</u>




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**Allen E. Perez, P.E.**

