

First Amendment To
Contract No. (14)C-15-R
Between
THE CITY OF SUNRISE

And
YOUNGQUIST BROTHERS, INC.

This First Amendment to Contract No. (14) C-15-R The Contract for Construction between the City of Sunrise and Youngquist Brothers, Inc. dated December 11, 2014 is between the CITY OF SUNRISE, a Florida municipal corporation (hereinafter referred to as "CITY") and YOUNGQUIST BROTHERS, INC., (hereinafter referred to as "CONTRACTOR").

WHEREAS, The Contract for Construction (Contract No. (14)C-15-R) (hereinafter referred to as the "Contract") was entered into between the CITY and CONTRACTOR for the construction, testing and operational start-up of the Springtree Industrial Injection Well System, as authorized under the Contract; and

WHEREAS, the CITY required installation of two industrial deep injection wells drilled to approximately 3,000 feet below land surface for the disposal of water treatment concentrate (reject stream) and treated wastewater effluent in accordance with all applicable state and local regulations, and the CONTRACTOR commenced construction activities for this project on January 5, 2015; and

WHEREAS, the CONTRACTOR successfully installed Injection Well No. 1 and successfully installed and tested the entire assembly in accordance with the Contract documents and all contractor-submitted details for the casing pipe, tubing (carrier pipe) and packer assembly (which secures tubing into the base of the well at approximately 3,000 foot depth); and

WHEREAS, during the installation of Injection Well No. 2, the CONTRACTOR encountered an interference, specifically with the inner tubing and packer assembly being lowered into the cemented outer casing at approximately 1,400 feet below land surface; and

WHEREAS, several alternatives for modifying the installation of Injection Well No. 2 have been proposed by the CONTRACTOR and reviewed by the CITY, in order to install a reliable Injection Well No. 2, and the CITY and the CONTRACTOR, recommend turning down or milling of the tubing couplings and packer (mandrel) assembly which will permit passage from approximately 1,400 to 3,000 feet depth; and

WHEREAS, the CITY and the CONTRACTOR have agreed to amend the Contract to require the CONTRACTOR to provide to the CITY a Ten Year Warranty for Injection Well No.2; and

FIRST AMENDMENT TO THE CONTRACT BETWEEN THE CITY OF SUNRISE AND
YOUNGQUIST BROTHERS, INC.

WHEREAS, the CITY and the CONTRACTOR have agreed to amend the Contract to require the CONTRACTOR to perform periodic Mechanical Integrity Tests to ensure the integrity of the inner tubing and packer (mandrel) assembly for Injection Well No. 2; and

WHEREAS, the CONTRACTOR has provided to the CITY an addendum to the Public Construction Bond to include the additional obligations of the CONTRACTOR as set forth in this First Amendment.

NOW THEREFORE, in consideration of the mutual covenants and obligations created hereby, as well as other good and valuable considerations, the parties agree as follows:

1. Recitals Incorporated. The foregoing recitals are incorporated by reference and made part of this First Amendment.

2. The Contract is hereby amended to include the following documents:

- A. Summary of Obstruction and YBI's Proposed Modifications (**Exhibit "A"**);
- B. YBI Proposal (**Exhibit "B"**);
- C. FPI Technical Summary of Modified FRP Injection Tubing (**Exhibit "C"**);
- D. FPI Attestment of YBI's Ability to Modify Couplings (**Exhibit "D"**);
- E. FPI Recommended Tubing Compression Loads (**Exhibit "E"**); and
- F. YBI Modified Packer Assembly Design (**Exhibit "F"**).

3. The Contract is hereby further amended to add a new Subsection 7.5.3 to provide as follows:

7.5.3 In addition to the other warranties set forth in this Section 7.5, the Contractor hereby warrants that Injection Well No. 2 shall be free from all defects in material and workmanship for a period of ten (10) years, as more specifically set forth in the Ten Year Warranty Injection Well No. 2 attached hereto as **Exhibit "G"** and incorporated herein by reference. Contractor agrees to amend / endorse the Public Construction Bond (No. SUR60000243) required by Section 14.3.1 to include the additional obligations set forth in this First Amendment by extending the Public Construction Bond for an additional period of ten (10) years, in the amount of One Million Dollars (\$1,000,000), commencing upon issuance of Florida Department of Environmental Protection's Certificate of Installation for Injection Well No. 2. This Subsection 7.5.3 shall survive final payment by the City, project completion or acceptance by City, as well as the termination of the original Contract No. (14)C-15-R. Upon issuance of

FIRST AMENDMENT TO THE CONTRACT BETWEEN THE CITY OF SUNRISE AND
YOUNGQUIST BROTHERS, INC.

Florida Department of Environmental Protection's Certificate of Installation for Injection Well No. 2, and issuance of the Public Construction Bond (No. SUR60000243) amendment / endorsement as set forth in this Subsection 7.5.3, the CITY agrees to release the Performance Construction Bond (No. SUR60000243), but only to the extent of the original sum of eight million five hundred eight-five thousand eight hundred fifty-eight and 00/100 dollars (\$8,585,858.00) back to CONTRACTOR. CONTRACTOR agrees the Public Construction Bond (No. SUR60000243) as amended / endorsed in accordance with this Subsection 7.5.3 shall not be affected by said release and shall remain in full force and effect for the additional period of ten (10) years.

4. The Contract is hereby further amended to add a new Subsection 7.5.4 to provide as follows:

7.5.4 The Contractor shall complete, at its sole cost and expense, two (2) Mechanical Integrity Tests (MIT) on Injection Well No. 2, in accordance with the standards attached hereto and incorporated herein by reference as **Exhibit "H"**, after the successful completion of the initial annular hydrostatic pressure test (performed during construction) and Certification of Installation for operation as required by the Florida Department of Environmental Protection, as follows:

(1) The first Mechanical Integrity Test shall be performed on a date that is within 90 days prior to the fifth (5th) anniversary of the initial hydrostatic pressure test described above; and

(2) The second Mechanical Integrity Test shall be performed on a date that is within ninety (90) days prior to five (5) years after the 5th anniversary test referenced in (1) above.

This obligation shall survive final payment by the City and termination of this contract.

5. Conflicting Terms. In the event the terms of this First Amendment conflict with those of the Contract, the terms of this First Amendment shall govern. All other terms of the Contract shall remain and continue in full force and effect.

6. Captions. The captions of this First Amendment are for convenience only and are not to be construed as defining or limiting in any way the scope or intent of the provisions of this First Amendment.

7. Effective Date. This First Amendment shall be effective on the date executed by both parties.

FIRST AMENDMENT TO THE CONTRACT BETWEEN THE CITY OF SUNRISE AND
YOUNGQUIST BROTHERS, INC.

IN WITNESS WHEREOF, the parties hereto have made and executed this First Amendment on the respective dates under each signature: The CITY, signing by and through its Mayor, attested to by its City Clerk, duly authorized to execute same and by CONTRACTOR by and through its Vice President, duly authorized to execute same.

CITY

CITY OF SUNRISE, FLORIDA

By: _____
Mayor Michael J. Ryan

_____ day of _____, 201__.

AUTHENTICATION:

Felicia M. Bravo
City Clerk

(SEAL) Seal

Approved as to form:

Kimberly A. Kisslan, City Attorney
City of Sunrise
10770 W. Oakland Park Blvd.
Sunrise, Florida 33351
Telephone: (954) 746-3300

By: _____
Kimberly A. Kisslan
City Attorney

FIRST AMENDMENT TO THE CONTRACT BETWEEN THE CITY OF SUNRISE AND
YOUNGQUIST BROTHERS, INC.

CONTRACTOR

Youngquist Brothers, Inc.

By: _____

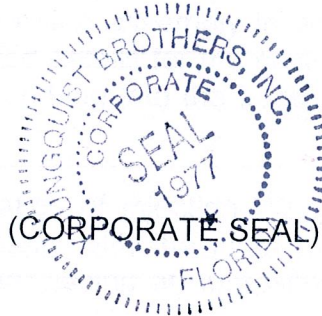
Harvey Youngquist
Vice President

12 day of SEPTEMBER, 2016.

AUTHENTICATE:

Secretary

Timothy Youngquist
Please type name of Secretary



WITNESSES:

Charles Reynolds

Christine Fulbright

EXHIBIT A

Summary of Obstruction and YBI's Proposed Modifications

City of Sunrise, Springtree Water Treatment Plant Class I Injection Well System

Summary of Injection Well IW2 Injection Tubing Installation and Contractor's Proposal to Modify Tubing and Packer Mandrel to Facilitate Tubing Installation to the Required Depth

The injection well design specifies the installation of 26-inch outside diameter (O.D.), 0.500-inch wall thickness (25-inch inside diameter [I.D.]) steel final casing lined with Future Pipe Industries (FPI) Red Box (RB) 1250 fiberglass reinforced plastic (FRP) injection tubing with a 23.5-inch maximum O.D. coupling diameter. The proposed (and accepted) method to seat the injection tubing and seal the annulus between the tubing and casing was by a positive seal packer assembly (commonly referred to as an YBI packer assembly). The YBI packer assembly design is comprised of two components: 1) the outer (female) packer mandrel which is welded within the final casing string and is currently installed at 2,774 feet below pad level (bpl); and 2) the inner (male) packer mandrel that is attached to the base of the FRP injection tubing string and has a maximum O.D. of 23.48 inches. The annulus seal between the injection tubing and the final casing is established by seating and compressing the male packer mandrel inside the female mandrel creating a positive seal.

During installation of the male mandrel and the FRP injection tubing string, an obstruction was encountered at approximately 1,400 feet bpl which prohibited further installation of the tubing and ultimately resulted in the removal of the partial tubing string from the well. The cause and extent of the obstruction was investigated through downhole video surveying and numerous caliper log passes above and below the obstruction. Although the cause of the obstruction could not be 100% confirmed, it is reasonable to assume that a section of final casing was slightly "out-of-round" prior to casing installation or became out-of-round during the installation process. The extent of the obstruction was further investigated by installing a "dummy tool" comprised of three FRP tubing sections and four equally spaced couplings, totaling 90 feet in length and possessing a maximum O.D. (at the couplings) of 23 inches. The 23-inch O.D. dummy tool also was obstructed at approximately 1,400 feet bpl. A single 22.5-inch coupling was then successfully installed below the obstruction near 1,400 feet bpl and to within several feet above the female packer mandrel. Through this investigation it can be concluded that the minimum I.D. of the final casing (near 1,400 feet bpl) is between 22.5 inches and 23 inches.

Based on the results of the investigations, Youngquist Brothers Inc. (YBI) has proposed to reduce (machine down) the coupling O.D. of the RB 1250 sections that would be installed below the obstruction near 1,400 feet bpl. These couplings would have a reduced O.D. of 22.5 inches. The tubing sections installed above the obstruction would have unmodified, larger diameter, couplings. In support of the proposal, YBI has provided documentation from the tubing manufacturer stating that they will warrant the RB 1250 (with machined couplings) to an internal pressure rating of 700 pounds per square inch (psi). FPI also noted that they find it acceptable for YBI to make the necessary modifications to the FRP couplings at YBI's facility in Ft. Myers, Florida. Additional information from the manufacturer describing the properties of the FRP tubing also was provided. Copies of the letters are attached.

YBI also proposed to reduce the maximum O.D. of the male packer mandrel to 22.5 inches to facilitate the installation of the packer below the obstruction near 1,400 feet bpl. The original male packer mandrel included a tapered design with a 23.48-inch maximum O.D. at the top and a 22.03-inch minimum O.D. at the base. The original design would have resulted in a sealing surface area of 501 square inches and approximately 7 inches of the male packer mandrel engaged within the female packer mandrel of the final casing. The modified design, with a 22.5 inch maximum O.D. female packer mandrel, would result in a sealing surface area of 192 square inches and approximately 2.75 inches of the male packer mandrel engaged.

EXHIBIT B

YBI Proposal



Youngquist Brothers, Inc.
15465 Pine Ridge Road
Fort Myers, FL 33908
Phone (239) 489-4444

June 13, 2016

Mr. Rodney Miller
Arcadis U.S., Inc.
Project: 5036WF Sunrise Springtree
RE: Reduced Diameter FRP Couplings and YBI Packer – Revised Packer OD 22.5"

Mr. Miller,

As you know, YBI has been investigating the reduced diameter final steel casing for the past week. We have made progress with the investigation and we have determined that the largest diameter tool able to pass the reduced diameter area at approximately 1400' BLS is 22.6". We therefore believe that the next step is to modify the diameter of the YBI packer and the FRP couplings that will be below the 1400' depth.

We first propose to turn down the couplings on the FRP to a diameter of 22.5". We propose to reduce the diameter of the couplings on the FRP that will be installed below the depth of 1400'. The FRP couplings above 1400' will remain as manufactured (23" OD). A letter detailing the results of turning the couplings to 22.5" OD is provided by Future Pipe and is included as Attachment A with this package.

YBI maintains a state of the art manufacturing and machining facility in Fort Myers, FL. We propose to bring the FRP that requires modification back to our facility to be machined to the proper size (22.5"). A letter from Future Pipe Industries confirming our ability to perform the machining and their willingness to maintain all warranties is provided as Attachment B.

YBI will provide a calibrated Starrett No. 724 caliper that is the ideal tool used to measure the OD of the couplings. This caliper is more accurate than Go/No-Go gauge rings previously discussed. Photos of the caliper are provided as attachment D. YBI will provide the calipers to Arcadis representatives and we will assist as necessary to measure the couplings prior to installation. We propose that the low tolerance of the couplings be 22.4" and the high tolerance be approximately 22.5" diameter. This will confirm that we maintain the 22.5" coupling OD that Future Pipe Industries has designed the updated calculations around.

Secondly, YBI proposed to reduce the diameter of the male portion of the YBI packer assembly. The diameter would be machine turned down to an OD of 22.5". Reducing the diameter of the male packer will reduce the contact surface area of the packer from approximately 501 sq inches to approximately 192 sq inches. The packer compression recommendation from Future Pipe is included with this package as Attachment C.

The surface sealing area of the modified packer will easily meet the design criteria of the injection well. In YBI's opinion, the modified packer will not negatively affect the performance of the injection well over time. We base this opinion on our installation and remediation of multiple types and sizes of injection wells over the past 20 years. The YBI packer system is comprised of two sealing elements that when sealed, provide over 2.75 inches of vertical sealing area and are on average approximately 4 inches thick. In our opinion and experience, the area subjected to corrosion and likely to fail prior to the packer will be the weld made at the joint between the final steel casing and the YBI female packer assembly. I am including a simple drawing, Attachment E, showing the packer and the welded joints mentioned above.

YBI proposed to bring the male YBI packer assembly back to our shop in Fort Myers to be precision machined to 22.5". This will be done on our large diameter precision lathe. The tolerance will be maintained with very high precision.

YBI will utilize the same Starrett caliper as mentioned above to measure and maintain the tolerances of the machining of the male YBI packer. YBI will coordinate with Arcadis and the City on the final tolerance requirement of the YBI male packer, we are proposing 22.5" nominal diameter.

We appreciate your review of this proposal to modify the OD of the FRP couplings and the YBI male packer. We are confident the system will perform as designed.

Please let me know if you have any questions or would like to schedule a meeting or teleconference to discuss any remaining items.

Respectfully,

A handwritten signature in blue ink, appearing to read 'Harvey Youngquist, Jr.', with a stylized flourish at the end.

Harvey Youngquist, Jr.
Vice President
Youngquist Brothers, Inc.
Email: Harvey@youngquistbrothers.com

EXHIBIT C

FPI Technical Summary of Modified FRP Injection Tubing

June 3, 2016

Youngquist Brothers, Inc.
15465 Pine Ridge Rd.
Ft Myers, FL 33908

Attn: Harvey Youngquist
Vice President

Re: Turning Down Red Box® 1250 Couplings

Dear Harvey,

I am writing to provide information concerning the performance variations consequent of turning down the couplings on the 20" Red Box® 1250 casing we have supplied to you for the Sunrise well. In fact, only the internal pressure capacity of the casing is affected by such a modification.

To begin, the basic physical components of the casing are, the body of the pipe, the heavier upset ends of the pipe, the coupling, two female threads, and two male threads. The thinnest wall of the pipe is that of the pipe body. The upsets are thicker so as to accommodate the diameter dimensions of the male threads. The upset area is at each end of the pipe, extends for about 30 inches, and then tapers down to the body diameter. The coupling is thicker than this as explained below.

Internal Pressure

In a typical design process addressing an internal pressure requirement the required wall thickness of the body of the pipe, inclusive of a safety factor, is established first. Then the threaded connection is designed to match that pressure capacity. A threaded connection holds pressure as a consequence of the compression induced between the female (box) and the male (pin) components of the connection. That compression is generated by two elements of the assembled connection.

Complete Pipe System Solutions

Accreditations



AMERICAS | EMEA | GCC | ASIA

The first, referred to as P1, is the compression created by the make-up, by forcing or torquing the threaded tapered pin into the threaded tapered box. At a designated “power tight” position the matching tapers of the pin and box have been forced into one another such that the pin is left in compression and the box in tension. The amount of P1 compression induced by the makeup is a function of three things; i) the degree of penetration of the pin into the box which here can be described as the specified number of turns past the “hand tight” position required to reach the “power tight” position, ii) the strength of the pin, and, iii) the strength of the box. In terms of the strength of the pin and box consider that no matter what penetration one accomplishes, if the box is paper thin and thus can offer no resistance to the pin, little P1 compression can be accomplished. Likewise the pin.

P2 is the compression actually created by the operating internal pressure of the casing at work or at test. The internal pressure serves to force the pin out against the box and add to the compression between the two. Again, and similarly, P2 is in part dependent on the strength of the box. The internal pressure capacity of the connection is the sum of P1 plus P2. (Note that P2 is a case of diminishing returns in that if the internal pressure becomes high enough it serves to act on the small area of the box between the two pin noses and actually push the box away from the pin which results in a leak.)

Therefore, if the coupling is turned down it is weakened and in that weakened state it offers less resistance to the pin, hence less compression between the two, and hence less resistance to internal pressure.

Importantly, P1 and P2 are thoroughly and accurately calculable. A tried and true fairly uncomplicated API published formula is used to design all threaded connections, and it is the basis for the connection design on all threaded Future Pipe tubing, casing, and linepipe. By that formula the turning down of the couplings on the Sunrise 20” casing reduces the sum of P1 and P2 such that the internal pressure capacity of the connection will be 1276 psi.

Tensile Strength

Depending on the wall thickness of the body of the pipe, and hence the internal pressure rating of the pipe, the mode of failure under tension is either thread shear or body failure. In this particular casing size those two are coincidentally equivalent, but both are

considerably lower than the strength of the much thicker coupling. Thus, while the turning down of the coupling does diminish its tensile strength somewhat, it is still considerably stronger than the pipe body or the thread shear, the weakest two points in the casing overall. Thus, turning down the coupling had no impact on the tensile strength of the casing overall. Note that the differing unit strengths of the couplings are due to differing wind angle combinations.

	Unit	Strength	Ult. Tension lbs
Coupling Body at 23" OD	Psi Tensile Strength	13,300	1,551,000
Coupling Body at 22.4" OD	Psi Tensile Strength	14,900	1,270,000
Pipe Body at nom 19.60" OD	Psi Tensile Strength	20,000	971,000
Upset Body	Psi Tensile Strength	20,000	1,300,000
Thread Shear	Psi Shear Strength	2,500	973,000

Collapse

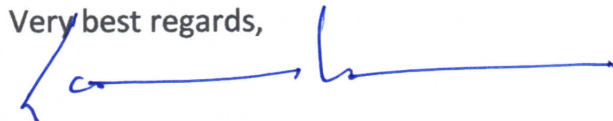
In like manner as the tensile properties, collapse is determined by the cross sectional area relative to the ID. The weakest link is the body of the pipe, far exceeded by the coupling and the upset.

	OD	Cross Sect sq in	Ult. Collapse psi
Coupling Body at 23" OD	23.00	116.6	5,259
Coupling Body at 22.4" OD	22.40	95.3	3,230
Pipe Body at nom 19.60" OD	19.60	48.6	890
Upset Body	20.15	65.0	1,873

Thus, turning down the coupling, while it does decrease the collapse rating of the coupling itself, in that the body is far lower in collapse, the overall rating of the casing remains the same.

I hope this clarifies these issues.

Very best regards,



Lawrence Moore
Consulting Engineer
Future Pipe Industries, Inc

EXHIBIT D

FPI Attestment of YBI's Ability to Modify Couplings

June 3, 2016

Youngquist Brothers, Inc.
15465 Pine Ridge Rd.
Ft Myers, FL 33908

Attn: Harvey Youngquist
Vice President

Re: Turning Down Red Box® 1250 Couplings

Dear Sir,

We have closely followed the recent developments concerning your well installation at the Sunrise location and we appreciate your requirement to turn down some of the couplings on the 20 inch Red Box® 1250 casing we have provided you to an OD of 22.4 inches. We are familiar with your operations and capabilities and we ask that you please accept this letter as our approval and confirmation of your capacity to perform this turn-down operation.

The diminishment of the coupling OD will decrease the internal pressure capacity of the threaded connection to an ultimate value of 1,275 psi. The collapse pressure rating and the tensile strength of the casing will not be affected. We will honor our warranty provided with the original tubing to the extent that the operating conditions respect the now reduced internal pressure capacity of the casing. Our recommendation is that the casing not be operated at a pressure greater than 700 psi.

Very best regards,



Lawrence Moore
Engineering Consultant
Future Pipe Industries, Inc.

Complete Pipe System Solutions

Accreditations



AMERICAS | EMEA | GCC | ASIA

EXHIBIT E

FPI Recommended Tubing Compression Loads

June 9, 2016

Youngquist Brothers Inc.
15465 Pine Ridge Road
Ft. Myers, FL 33908

Re: Sunrise LW-1 and LW-2 Injection Wells

Gentlemen,

Please accept this as our recommendation concerning the completion of the two above-mentioned injection wells. We have examined the operating details you passed to us and we recommend that well LW-1 be set in compression by your bolt down procedure to the following extent, and LW-2 be set without additional bolt down induced compression:

WELL	COMPRESSION	DEPTH FT	PACKER CONTACT AREA	INJECTATE TEMP	BOTTOM HOLE TEMP	PACKER LOAD STATIC	PACKER LOAD OPERATING
LW-1	3.7 IN.	2,985	501 SQ IN	90 F	60 F	165 PSI	232 PSI
LW-2	0*	2,775	192 SQ IN	90 F	60 F	345 PSI	520 PSI

*String weight alone provides 345 psi compression on the 192 sq in packer which will suffice for the 150 psi test. During operation the injection of the 90 deg fluid will expand the string so as to put 520 psi on the packer.

Thank you for your consideration. If you have any further questions please do not hesitate to call.

Very best regards,



Lawrence Moore
Consulting Engineer
Future Pipe Industries, Inc.

Complete Pipe System Solutions

Accreditations



AMERICAS | EMEA | GCC | ASIA

EXHIBIT F

YBI Modified Packer Assembly Design

26" x 0.500" Wall
Steel Casing

20" Red Box 1250psi
FRP Tubing

Sealing Area

2.75"

Weld

Weld

Male YBI Packer (22.5" OD)

Female YBI Packer

22.0342

Weld

Weld

2.3000

1.7000



15465 Pine Ridge
Rd, Fort Myers,
FL 33908

YBI Packer

This drawing is confidential. This drawing and its copyright are the property of
or licensed to the above company and must not be used, disclosed or reproduced in
any form whatsoever except as authorised in writing by the above company. This
drawing must be returned with quotation and/or on completion of job as applicable.

Drawn	Date	Checked	Date
HBV	6/13/16	HBV	6/13/16
Drawing Number		Sheet Size	Scale
Sunrise.dwg		B	N/A
		Project No	Revision
		Sh 1 of 1	0

**TEN YEAR WARRANTY
INJECTION WELL NO. 2**

WHEREAS, YOUNGQUIST BROTHERS, INC. (YOUNGQUIST) has constructed Injection Well No. 2, located at Springtree Wastewater Treatment Plant for and on behalf of the CITY OF SUNRISE (CITY), pursuant to Contract No. (14)C-15-R;

NOW, THEREFORE, YOUNGQUIST hereby warrants to CITY that said Injection Well No. 2 shall be free from defects in material or workmanship for a term of ten (10) years, commencing on the date on which the initial annular hydrostatic pressure test (performed during construction) and Certification of Installation for operation as required by the Florida Department of Environmental Protection (FDEP) has been successfully completed. At any time during the ten-year term, if the mechanical integrity of Injection Well No. 2 is compromised in any way, except for abuse or damage cause by CITY, YOUNGQUIST shall repair or replace, all or such components of the inner tubing and packer assembly of Injection Well No. 2 as may be necessary to render it fully operational.

YOUNGQUIST shall respond to the site of Injection Well No. 2 within forty-eight (48) hours after receipt of written notice from the CITY or the FDEP that the operation of Injection Well No. 2 is not in compliance with Florida Administrative Code 62-532.500, as it may be amended from time to time, and shall repair or replace the inner tubing and packer assembly as soon as practicable.

YOUNGQUIST shall be liable only for the cost of repair or replacement of the inner tubing and packer assembly and restoring the surrounding area to the condition it was in prior to the repair or replacement.

THIS WARRANTY IS IN ADDITION TO THE WARRANTY OF YOUNGQUIST AS SET FORTH IN CONTRACT No. (14)C-15-R.

DATED this 12 day of September, 2016.

YOUNGQUIST BROTHERS, INC.

By: 

Harvey Youngquist, Vice President

EXHIBIT H

STANDARDS AND SPECIFICATIONS
FOR
PERFORMING A TYPICAL MECHANICAL INTEGRITY TEST (MIT)

SECTION 01019

GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 PROJECT LOCATION: This project is located within the City of Sunrise, Springtree Water Treatment Plant (WTP) located at 4350 Springtree Drive, Sunrise, FL 33351.

1.02 SCOPE OF WORK: The Work to be performed by the Contractor includes furnishing all materials, labor, tools, equipment, water, light, power, transportation, superintendence, temporary construction of every nature, and all other services and facilities of every nature whatsoever to perform the Mechanical Integrity Testing (MIT) on the Springtree WTP Injection Well (IW2) as shown on the Drawings and/or as herein described as specified. All Work shall be in accordance with the Contract Documents. The performance of the MIT shall incorporate the following criteria.

A. IW2 shall not be out of service or use to the Owner for more than 36 contiguous hours. After this time has elapsed, the well shall be returned to service, regardless of the status of the test. If additional out of service time for the injection well is required, it shall be re-scheduled but assumed not to occur until the well has been back in regular service at least 12 hours.

B. Upon receipt of 2-hour written notification from the Engineer, the Contractor shall terminate test activities and return the injection well to normal service. The Owner does not intend for this to occur, but this option will be implemented if system flow events dictate need. This means any temporary wellhead modifications need to incorporate this requirement. The Contractor is responsible for coordinating his work schedule with the Engineer.

C. The Contract shall provide 72 hours advance notice to the Engineer of intent to remove the well from service and commence testing work. The Owner will make reasonable efforts to accommodate the shut-down request but reserves the right to delay testing as required to react to system flow events and/or facility performance. Refer to Section 11561 for additional information and considerations relative to work schedule and sequence.

1.03 INTERPRETATION OF CONTRACT DOCUMENTS:

A. Specifications and Drawings included in this Contract establish the performance quality requirements, location and general arrangement of materials and equipment, and establish the minimum standards for quality of workmanship and appearance

B. A part of the Work that is necessary or required to make each installation satisfactory and operable for its intended purpose, even though it is not specifically included in the Specifications or on the Drawings, shall be performed as incidental work as if it were described in the Specifications and shown on the Drawings.

1.04 COORDINATION OF WORK WITH OTHER CONTRACTORS AND PLANT OPERATORS: Contractor will be required to coordinate work efforts with other plant contractors who may be actively working on the project site. It is noted that the work site is on an operating water treatment plant. The Contractor shall coordinate activities to minimize impact on plant operation.

1.05 GRADES, DIMENSIONS AND ELEVATIONS: Grades shown are finished grades. Written dimensions have preference over scaled dimensions.

1.06 EXISTING UTILITIES AND STRUCTURES: The existing utilities and facilities shown on the drawings were located from the Owner's and other records. Guaranty is not made that all existing facilities are shown or that those shown are entirely accurate. The Contractor shall assure himself of any utilities, structures or facilities prior to performing any Work. Prior to the start of Work, the Contractor shall request each utility agency to advise him of the location of their facilities in the vicinity. The Owner and the Engineer will assume no liability for damages sustained or costs incurred because of the Contractor's operations in the vicinity of existing utilities or structures. The Contractor shall notify the Engineer of any deviation between existing conditions and the drawings.

When structures and utilities have been properly shown or marked and are disturbed or damaged in the execution of the Work, they must be repaired immediately in conformance with best standard practice and the approval of the Owner of the damaged utility or structure. In the case of structures and utilities which have not been properly shown or located as outlined above and are disturbed or damaged in the prosecution of the Work, take whatever steps are necessary for safety and notify the affected utility Owner and avoid any actions which might cause further damage to the structure or utility. Should the Work require repairs, changes, or modifications of the Owner's utilities as well as other utilities, it is the responsibility of the Contractor to provide for the maintenance of continuous water, sewage, electric, telephone and other utility services to all present customers of such utilities, unless approval in writing is secured from the applicable utility company or Owner for interpretation of such service.

1.07 PRESERVING WATER QUALITY: The Contractor shall exercise extreme care to minimize degradation of water quality at the site. All necessary provisions shall be taken to insure compliance with the water quality standards of the State of Florida. Refer to Section 11561 for additional information and considerations relative to water quality preservation.

1.08 LIST OF FIGURES:

The figures included with the Contract Documents are actually the record construction drawings for the well and are included for reference only.

1.09 SUBSTITUTIONS:

A. Substitutions will not be permitted on any items specified herein or identified on the drawings where two or more manufacturers have been named unless they are followed by the words "or equal". Substitutions will also not be considered on any specified items whenever they are followed by the words "no substitutions". All substitution requests must be made in writing to the Engineer within five days of the Notice To Proceed.

B. Submit five copies of request for substitution. Include in request:

1. Complete Data substantiating compliance of proposed substitution with Contract Documents.

2. For Products:

- a. Product identification, including manufacturer's name and address.
- b. Manufacturer's literature:
 - (1) Product description.
 - (2) Performance and test data.
 - (3) Reference standards.

- c. Samples.
- d. Name and address of similar projects on which product was used, and date of installation.

- 3. For construction methods:
 - a. Detailed description of proposed method.
 - b. Drawings illustrating methods.

- 4. Itemized comparison of proposed substitute with product or method specified.

- 5. Data relating to changes in construction schedule.

- 6. Relation to separate contracts.

- 7. Accurate cost data on proposed substitution in comparison with product or method specified.

1.10 SANITARY FACILITIES: The Contractor shall provide temporary restroom facilities for field crews. Existing Owner facilities are not available for use by the Contractor.

1.11 WORKING HOURS: All work on this contract, shall be conducted during normal working hours (7 A.M. to 7 P.M.) on weekdays unless prior written approval is given by the Engineer. No work shall be permitted on weekends and Engineer observed holidays without approval from the Engineer. All work requiring FDEP attendance must be performed during regular FDEP working hours. Work also shall be in accordance with Part 1.02 of this specification.

1.12 ACCESS TO THE WORK SITE: The Contractor may use only the roads designated by the Owner for access to the work locations. The Contractor shall be responsible for maintaining, protecting and restoring the routes to the satisfaction of the Owner and Engineer.

1.13 VIDEO TAPING: The Contractor, to the satisfaction of the Engineer, shall video tape or digitally photograph all areas of the construction, staging, etc. A copy of the video tapes in DVD format or copies of the photographs shall be delivered to the Engineer and approved as acceptable before any work or site mobilization occurs.

1.14 FAMILIARITY WITH LAWS: The Contractor is assumed to be in compliance with and familiar with all federal, state and local laws, ordinances, rules, codes and regulations that may in any manner affect the work. Failure to familiarize themselves with applicable laws, etc., shall in no way relieve the Contractor from responsibility.

1.15 RESTORATION OF DAMAGED SURFACES, STRUCTURES AND PROPERTY: Where pavement, fences or other property or surface structures not designated as pay items, have been damaged, removed or disturbed by the Contractor, whether deliberately or through failure to carry out the requirements of the Contract Documents, State laws, municipal ordinances or the specific direction of the Engineer, or through failure to employ usual and reasonable safeguards, such property and surface structures shall be replaced or repaired at the expense of the Contractor to a condition equal to that before Work began within a time frame approved by the Engineer.

1.16 WATER SUPPLY: Potable water is available at the project site and will be provided to the Contractor at no additional cost. When the Contractor utilizes the existing potable water supply at the plant, he shall provide all temporary piping with an in-line meter to quantify the flow rate and total amount of water utilized for this operation. The Contractor shall also install a

pressure reducing backflow prevention device between the injection well and water source. The meter and backflow-preventer assembly shall be acceptable to the Owner.

It is anticipated, but not guaranteed, that treated effluent water will be available for purposes of flushing IW2 prior to and during radioactive tracer survey testing. The Contractor shall coordinate the use of effluent water with the Owner and Engineer. No standby time will be granted waiting for the Owner to supply effluent water to the Contractor. The water needed for testing is further discussed in Specification Section 11561.

1.17 ELECTRICITY: All necessary temporary electrical lines shall be furnished, installed, connected and maintained at the Contractor's expense in a manner satisfactory to the Owner and Engineer and removed at the completion of the work. The Contractor shall perform all work, including utility installations, in accordance with all Federal, State, County and, if applicable, municipal codes and regulations.

1.18 EQUIPMENT REQUIREMENTS: Equipment in first-class working order shall be provided. The Contractor shall provide personnel and equipment having the minimum capabilities necessary to do the described work. No unnecessary delays or work stoppages shall be tolerated because of equipment failure.

1.19 WORK SCHEDULE: Prior to starting the work, the Contractor shall confer with the Engineer to develop an approved work schedule which will permit the project to proceed as normally as practical. The Contractor shall prepare and submit to the Engineer for approval, the detailed testing schedule containing anticipated start and completion dates for each of the testing steps outlined herein.

1.20 FDEP PLAN: The work performed under the specification shall fully comply with the requirements set forth in these documents and the approved FDEP plan for this Mechanical Integrity Test.

1.21 SITE SECURITY: Security at the construction site is given a very high priority by the Owner. The Contractor shall recognize that this project is sensitive in nature as a result of homeland security concerns and the security criteria stipulated herein constitutes a material inducement of the Owner to enter into this contract with the Contractor.

It is noted that the Owner has implemented site security measures which restrict and control entrance to and exit from the site. The Contractor shall anticipate and work within the requirements of the Owner's security measures. The Owner reserves the right to require the Contractor to perform a background check on all agents, licensees, invitees, employees, subcontractors, material-men, workers and suppliers entering the site and supply the results to the Owner. Should this occur, the Contractor shall secure appropriate releases and authorizations from the affected parties prior to performing the background checks. All background checks shall be performed prior to allowing the workers on to the project site. The Owner reserves the right but not the obligation to disallow entrance to the work site of any persons or entities as a result of the background check or other relevant information, regardless of the result of such background check or other relevant information. Background checks shall be in such form and fashion as is acceptable to the Owner but at a minimum shall be performed through the Broward County Sheriff's Department and the Florida Department of Law Enforcement or such other entity, firm or individual acceptable to the Owner, in its' sole discretion. The Contractor shall allow for the time to perform the necessary background checks within the project schedule.

Nothing herein shall confer liability upon the Owner as a result of the security steps and provisions set forth in this contract. Each party who has had a background check performed shall be required

to carry a photo identification and clearance tag shall be required to enter the site and shall be maintained with the person at all times while on site. The Contractor shall provide to the Owner a complete roster of all parties to enter the work site pursuant to this construction and keep said roster updated and current on at least a monthly basis.

1.22 HEALTH AND SAFETY: The Contractor shall have the total responsibility to maintain the site in a safe condition in full compliance with applicable laws and rules. Safe access for the Engineer, Owner and regulatory personnel shall be maintained at all times.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.01 DESCRIPTION OF REQUIREMENTS: The types of submittals controlled by these general requirements include shop drawings, operation and maintenance manuals, instruction manuals, samples, and miscellaneous work-related submittals. The individual submittal requirements are specified herein and in applicable sections for each unit of work. Other submittals as specified in other sections shall follow the requirements of those sections.

1.02 GENERAL SUBMITTAL REQUIREMENTS: Coordination and Sequencing: The Contractor shall coordinate preparation and processing of submittals with performance of the work so that the work will not be delayed by submittals. The Contractor shall allow for adequate review time by the Engineer for the submittals. The Contractor shall coordinate and sequence different categories of submittals for the same work, and for interfacing units of work, so that one will not be delayed for coordination with another. No extension of time will be allowed because of failure to properly coordinate and sequence submittals.

Preparation of Submittals: Provide permanent marking on each submittal to identify project, date, Contractor, subcontractor, submittal name and similar information to distinguish it from other submittals. The marking system used shall be as required by the Engineer. Each submittal shall clearly state where the item is to be installed. Package each submittal appropriately for transmittal and handling. Submittals which are received from sources other than through Contractor's office will be returned without action. All results of testing by independent labs or agencies shall be submitted to the Engineer. This shall include both passing and failing tests.

1.03 SPECIFIC CATEGORY SUBMITTAL REQUIREMENTS: General: Except as otherwise indicated in individual work sections, comply with general requirements specified herein for each indicated category of submittal.

1.04 GENERAL SHOP DRAWING REQUIREMENTS: As soon as practicable and within ten (10) days after the Notice to Proceed, the Contractor, in conformance with the conditions of the contract, shall submit to the Engineer for approval, four (4) copies (in addition to those copies necessary for his own requirements to a maximum of three (3) copies) of all required shop drawings. The Contractor shall submit newly prepared information: do not reproduce contract documents or copy standard printed information as basis of shop drawings. Prepare on reproducible sheets, not less than 8-1/2 in. x 11 in. and not larger than 24 in. x 36 in., except for actual pattern or template type drawings. Prepare shop drawings to accurate scale, except where other form is indicated as acceptable. Show dimensions and note which are based on field measurements, identify materials and products in the work shown. Indicate name of firm which has prepared each shop drawing, and provide appropriate project identification.

Shop drawings submitted to the Engineer for his approval shall first be checked and approved by the Contractor, as indicated by a stamp marked "Checked and Approved" on each copy of the shop drawing. Shop drawings received without the Contractor's "Checked and Approved" stamp will be returned without further action. The Contractor will receive only one marked up return copy of any drawings stamped "Not Approved" or "Revise and Resubmit".

Shop drawings shall be submitted for the following:

1. Project Schedule
2. Shutdown/Testing Plan
3. Drawing showing specification of tool assembly used in the RTS
4. Any other items requested by the Engineer

Product Data: Collect required data into one submittal for each unit of work or system; and mark each copy to show which choices and options are applicable to the project. Include manufacturer's standard printed recommendations for application and use, compliance with standards, application of labels and seals, notation of field measurements which have been checked, and special coordination requirements. Maintain one set of product data for each submittal at the project site, available for reference by the Engineer. For purposes of this submittal, manufacturer's fabrication drawings shall be synonymous with shop drawings.

The Contractor shall not submit product data or allow its use on the project, until compliance with requirements of the contract documents has been confirmed. Submittal is for information and record, unless otherwise indicated.

1.05 DOCUMENTS: Maintain at the job-site one copy of all drawings, specifications; addenda; approved shop drawings; change orders; field orders; other contract modifications; and other approved documents submitted by the Contractor in compliance with various sections of the specifications. Each of these Project Record Documents shall be clearly marked "Project Record Copy" and maintained in good condition; available at all times for review by the Engineer and not used for construction purposes.

PART 2 AND 3 - PRODUCTS AND EXECUTION (not applicable)

SECTION 01400

GENERAL QUALITY CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION OF REQUIREMENTS: Definitions: Specific quality control requirements for the work are indicated throughout the contract documents and are not repeated herein. The requirements for this section are primarily to performances of the work beyond furnishing of manufactured products. The term "Quality Control" includes, but is not necessarily limited to, inspection and testing and associated requirements. This section does not specify or modify Engineer's duties relating to quality control and Contract enforcement.

1.02 RESPONSIBILITY FOR INSPECTIONS AND TESTS: Unless otherwise noted, all testing and inspections required by these specifications shall be performed by a properly certified entity. All costs associated with the testing and inspections shall be the Contractor's responsibility. The Contractor shall also be responsible for all tests or inspections required by any entity having jurisdictional control over the work.

No failure of test agencies, whether engaged by Owner or Contractor, to perform adequate inspections or tests or to properly analyze or report results, shall relieve the Contractor of responsibility for fulfillment of the requirements of the contract documents.

1.03 QUALITY ASSURANCE: General Workmanship Standards: Except as more definitively specified, the Contractor shall comply with recognized workmanship quality standards within the industry as applicable to each unit of work, including ANSI standards where applicable. It is a requirement that each category of trades person or installer performing the work be prequalified, to the extent of being familiar with applicable and recognized quality standards for that category of work, and of being capable of workmanship complying with those standards. The Engineer shall be the sole judge of what constitutes industry workmanship standards.

1.04 PRODUCT DELIVERY-STORAGE-HANDLING: General: Handle, store and protect materials and products, including fabricated components, by methods and means which will prevent damages, deterioration and losses including theft (and resulting delays), thereby insuring highest quality results as the performance of the work progresses. Control delivery schedules so as to minimize unnecessary long-term storage at the project site prior to installation. Contractor shall provide covered, inside storage for all new equipment on the site which is not intended for outside installation. Electrical, hydraulic and pneumatic connections on all equipment shall be protected from the elements. Contractor shall store all material on the project site unless specifically authorized otherwise by the Owner.

1.05 WATER TIGHTNESS: Equipment containing liquids that are not subject to leakage testing, as may be specified elsewhere, shall be free of all leakage when filled to the maximum pressure or static head that could be applied during operation of the facilities. The duration of all leakage testing shall be 48 hours. Any damp areas resulting from the tests shall be considered leaks and shall be repaired. All testing shall be completed prior to the application of coating systems, if any.

PART 2 - PRODUCTS (not applicable)

PART 3 - EXECUTION

3.01 PREPARATION FOR INSTALLATION: Installer's Inspection of Conditions: The Contractor shall require the fabricator and installer of each major unit of work to inspect substrate to receive the work, and conditions under which the work will be performed, and to report (in writing to the Contractor and the Engineer) unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the fabricator and installer.

3.02 INSTALLATION QUALITY CONTROL: Manufacturer's Instructions: Where installations include manufactured products, comply with manufacturer's applicable instructions and recommendations for installation, to whatever extent these are more explicit or more stringent than applicable requirements indicated in the contract documents.

The Contractor shall inspect each item of materials or equipment immediately prior to installation, and reject damaged and defective items.

Provide attachment and connection devices and methods for securing work as it is installed; true to line and level, and within recognized industry tolerances if not otherwise indicated.

The Contractor shall recheck measurements and dimensions of the work, as an integral step of starting each installation.

Install work during conditions of temperature, humidity, exposure, forecasted weather, and status of project completion which will ensure best possible results for each unit of work, in coordination with entire work. Isolate each unit of work from non-compatible work, as required to prevent deterioration.

Mounting Heights: Except as otherwise noted, mount individual units of work at industry-recognized standard mounting heights, for applications indicated. Refer questionable mounting height choices to the Engineer for final decision.

Adjust, clean, lubricate, restore marred finishes, and protect newly installed work, to ensure that it will remain without damage or deterioration during the remainder of the construction period.

SECTION 11561
MECHANICAL INTEGRITY TEST

PART 1 - GENERAL

1.01 SCOPE: The work described in these specifications is for the Mechanical Integrity Test (MIT) of Injection Well No. 2 (IW2) at the City of Sunrise, Springtree Water Treatment Plant (WTP) in Broward County, Florida. All work described shall be performed by the Contractor unless otherwise stated.

The Contractor shall assure himself of the suitability of the well pad to accommodate any equipment to be used, and shall, as a part of this contract, perform whatever modifications will be necessary to accommodate his equipment. The Contractor shall satisfy himself regarding all local conditions affecting his work by personal investigation.

Time is of the essence in completing this program. No unreasonable or avoidable delays will be tolerated in beginning or completing this program. Failure to substantially complete the work outlined in these specifications within the allotted time period, except as a result of an "Act of God" or some other reason or reasons which can reasonably be asserted to be outside of the ability of the Contractor to influence, may result in the assessment of liquidated damages against the Contractor by the Owner.

Unless specifically stated otherwise, the Contractor shall provide all labor, equipment, materials, tools, equipment and utility necessary to complete all work contained within these Specifications. The Contractor shall perform all work, including utility installations, in accordance with all Federal, State, County and, if applicable, municipal codes and regulations. At the completion of testing, the Contractor shall remove all equipment and leave the site in good condition acceptable to the Owner. All depths and material requirements are approximate.

1.02 OUTLINE SPECIFICATION OF WORK

- A. MOBILIZATION
 - 1. Equipment Setup
 - 2. Coordination with Operator and Engineer concerning well operations
- B. MECHANICAL INTEGRITY TESTING
 - 1. Conduct a television survey
 - 2. Conduct a hydrostatic pressure test
 - 3. Conduct temperature, background gamma-ray and radioactive tracer survey logs
- C. DEMOBILIZATION

1.03 SITE ACCESS: The injection well is accessible at the site. An access road is available for mobilization of equipment to the well. The Contractor shall satisfy himself with regard to site access prior to beginning any work and shall, as part of this contract, make any modifications necessary

(subject to the Owner's prior approval) to make the site accessible. Any modifications shall be temporary and must be removed unless determined differently, in advance, by the Owner. The Contractor is responsible for examining site conditions and satisfying himself that it is clear and accessible for his equipment, allowing him to perform the work described in these Specifications.

1.04 DRILLING PAD AND WELLHEAD: An existing reinforced concrete pad exists at the wellhead. The Contractor shall satisfy himself as to its suitability for his equipment and the work contemplated. The Contractor shall repair any damages to the pad caused by performing the specified work to original conditions.

The Contractor shall maintain the well and wellhead so that fluids are not allowed to escape from the well. If fluids should overflow, leak or escape from the pad during an unforeseen emergency, the Contractor shall be responsible to take whatever immediate steps are necessary to stop the flow and clean up the fluids. Within 3 days of any such occurrence, if cleanup is not complete, the Contractor shall provide a written plan to the Engineer to continue cleanup and monitor its effectiveness. Upon approval, the Contractor shall implement the remedial plan. The Contractor shall cooperate with the regulatory agencies with authority over the cleanup and shall secure whatever permits/approvals are necessary to accomplish the cleanup. The Contractor shall be responsible for all remedial activities necessary to the satisfaction of the Owner, the Engineer and the cognizant regulatory agencies.

1.05 DAILY LOG: A detailed daily log shall be maintained by the Contractor during the testing of the injection well. The log shall give a *complete* description of the depth of the testing, operations, and other such pertinent data, including the sizes and lengths of material installed in the well for testing. The daily log shall be maintained on site and available for inspection by any authorized regulatory agency representative, the Engineer, and Owner at all times. A copy of the Daily Log shall be submitted to the Engineer upon completion of the work.

1.06 REMEDIAL WORK: If remedial work proves to be necessary because of accident, loss of tools, defective material, or for any other cause, the Contractor shall propose a method of correcting the problem, in writing. Suggested methods shall be reviewed and approved by the Engineer, the Owner, the Florida Department of Environmental Protection (FDEP) and the Underground Injection Control-Technical Advisory Committee (UIC-TAC) before work proceeds.

1.07 WARRANTY: The work and service shall be warranted under the Contract. All workmanship, materials, and equipment furnished, used, or installed in the work shall be free from defects and flaws, and furnished in accordance with these Specifications. The strength of all parts of all manufactured equipment shall be adequate and as specified. The Contractor shall repair, correct, or replace all damage to the well resulting from failures covered by the warranty.

PART 2 - PRODUCTS – NOT APPLICABLE

PART 3 - EXECUTION

3.01 GENERAL: It is essential that salty or brackish water produced from any source during operations is prevented from contaminating the shallow aquifer which contains fresh water. The well testing shall be accomplished without any overflow. The Contractor shall be required to take all necessary steps to prevent accidental spillage from occurring. If fluids should overflow, leak or escape from the pad during an unforeseen emergency, the Contractor shall be responsible to take whatever immediate steps are necessary stop the flow and clean up the fluids to the satisfaction of

the Engineer and regulatory agencies with jurisdiction. Within 3 days of any such occurrence, if cleanup is not complete, the Contractor shall provide a written plan to the Engineer to continue cleanup and monitor its effectiveness. Upon approval, the Contractor shall implement the plan. The Contractor may be required to install and/or monitor up to 4 shallow monitor wells to measure water quality around the pad. The Contractor shall cooperate with the regulatory agencies with authority over the cleanup and shall secure whatever permits/approvals are necessary to accomplish the cleanup. If an overflow or leak does occur, the Contractor shall be responsible for all remedial activities necessary to the satisfaction of the Owner, the Engineer and regulatory agencies with jurisdiction.

If a "Hurricane Watch" is issued by the National Weather Service, the Contractor shall make certain preparations to include, but not limited to the following:

1. Secure all on-site salt, chemicals, and other additive materials to prevent surface and/or groundwater contamination;
2. Properly secure drilling equipment and rig(s) to prevent damage to the injection well and on-site treatment process equipment.

3.02 OPERATION OF PLANT EQUIPMENT: All existing pumps and valving at the water treatment plant which must be operated for the testing shall be operated by Owner personnel only unless directed otherwise by the Engineer.

3.03 FAILURE DUE TO EXISTING CONDITIONS: In the event that the Contractor exhausts all reasonable efforts and is unable to complete one or more of the described tests to the satisfaction of the Owner and the Engineer, due to existing well conditions, the Contractor shall notify the Owner and the Engineer immediately.

3.04 TELEVISION SURVEY: A color Television (TV) Survey shall be performed in the presence of the Engineer for the entire well, from the top of the injection tubing to the bottom of the open hole. The Contractor shall have the survey performed by a qualified service company using equipment capable of surveying and recording to the bottom of the open hole. The Contractor may use his own equipment if it is capable of surveying as required. The contractor shall furnish proof of the capability of the selected equipment and gain approval from the engineer prior to mobilization to site. It is the Contractor's responsibility to make all arrangements and scheduling for the television survey.

Prior to and during performance of the TV survey, the Contractor shall pump clear, fresh water into IW1 as necessary in order to ensure that the survey is of sufficient clarity to perform an adequate TV survey (as determined by the Engineer). The Contractor should anticipate the need to pump up to 3 tubing volumes of freshwater. It is the Contractor's responsibility to insure that the borehole fluid is of sufficient clarity (as determined by the Engineer) to allow a television survey to be conducted.

The television camera (radial with rotating side-view lens) shall be centralized within the casing and borehole and lowered at a rate specified by the Engineer. It is anticipated that a logging rate of between 20 and 25 feet per minute will meet this requirement. The depth recording is to be accurately and continuously presented on the video copies. Any features of the injection tubing,

as requested by the Engineer, shall be inspected using a rotating side-view camera to obtain a close-up of the feature.

While pumping the fresh water into the well and during the TV survey, the well will be under artesian pressure and may flow. The Contractor shall be required to provide and use a stripper-head assembly and other equipment necessary to keep the well under control at all times. The Contractor shall be required to contain any fluids that might be released at the wellhead, due to his activities.

Five (5) DVD copies of the survey shall be provided to the Engineer. The costs for these services shall be included in the lump-sum price for the TV survey.

3.05 MECHANICAL CLEANING OF THE INJECTION TUBING (IF NECESSARY):

The necessity to perform mechanical cleaning of the FRP injection in order to obtain an acceptable TV survey is not anticipated. If the TV survey shows that cleaning is necessary, as determined by the Engineer, the tubing shall be cleaned in a manner so as to not damage the interior wall of the tubing. After cleaning procedures (if necessary), additional TV survey(s) shall be performed.

3.06 ANNULAR HYDROSTATIC PRESSURE TESTING: The Contractor shall coordinate the date and time of the pressure test so that the FDEP has at least 72 hours' notice prior to the implementation of MIT procedures. The MIT shall be initiated during regular working hours for the FDEP, Monday through Thursday between the hours of 9:00 a.m. and 4:00 p.m.

The Contractor shall install a header assembly with a calibrated pressure gauge to monitor the annular space pressure between the injection tubing and the final casing. The pressure gauge shall be mounted on the wellhead at or near eye level, to make any change in pressure easily discernible. The pressure gauge shall be calibrated within 3 months prior to testing, shall be capable of indicating pressure in increments of 1 pound per square inch (psi) and shall have a range from 0 to 200 psi with an accuracy of +/- 0.25%. Five copies of the pressure-gauge calibration certification shall be provided to the Engineer prior to the initiation of the pressure test and must indicate the date and place of the pressure-gauge calibration.

The annular space shall be placed under a pressure of approximately 150 psi. Preliminary pressure testing witnessed by the Engineer shall be conducted prior to performing the official pressure test with FDEP representatives on site.

The official pressure test shall be witnessed and certified in writing by the Engineer. A maximum pressure change of 5% is allowed over a 60-minute test period. If a pressure change greater than 5% occurs, the test shall be repeated under controlled conditions to the satisfaction of the Engineer and the FDEP. The test will be considered successful if the pressure does not change (increase or decrease) by more than 5%. The Contractor shall relieve the pressure on the injection casing and measure the volume of water discharged from the casing.

3.07 MECHANICAL PACKER TEST (IF NECESSARY): If, after multiple attempts, the annular hydrostatic pressure test is unsuccessful, i.e. the pressure change exceeds 5% (increases or decreases) within a one-hour period, additional testing will be necessary. This may involve installing an inflatable packer inside the injection tubing. If necessary, the following procedures shall be performed.

1. An inflatable packer that is capable of sealing against the interior wall of the injection tubing, shall be set in the last tubing section as near as possible to the base of the tubing. The actual packer-setting depth shall be confirmed, based on the results of the TV survey. The packer shall pressurize through the tubing or work pipe used to install the device (the use of external inflation tubing is not acceptable, except between the bottom section of tubing and the packer device).
2. The tubing shall be filled with potable water and placed under a pressure of approximately 150 psi. A maximum pressure change of 5% is allowed over a 60- minute test period.
3. If a significant pressure change (>5%) occurs, the test shall be repeated under controlled conditions to the satisfaction of the Engineer and the FDEP.
4. The Contractor shall relieve the pressure on the injection casing and measure the volume of water discharged from the casing.
5. Pressure testing shall be witnessed and certified in writing by the Engineer.

3.08 RADIOACTIVE TRACER SURVEY: Upon completion of the television survey and hydrostatic pressure test, a temperature, background gamma-ray and radioactive tracer survey (or "RTS") log shall be performed in the injection well. The Contractor shall employ the services of a company specializing in furnishing and operating the equipment used in collecting this information. The costs for these services shall be included in the lump-sum price for the radioactive tracer survey.

The geophysical tool used for the RTS must be capable of ejecting the radioactive tracer and simultaneously monitoring with "scintillation"-type gamma-ray detectors. A casing collar locator shall be positioned below the tool to precisely locate the bottom of the casing. The tool shall be configured such that one gamma-ray detector will be located above the ejector and two detectors will be located below the ejector. The radioactive material used for the testing shall be *medical grade* Iodine 131. The RTS tool shall be loaded with 5 millicuries (MCI) of Iodine 131. The Contractor shall be required to demonstrate that the Iodine 131 tracer utilized for the RTS is not more than 6 days old on the day that the RTS is performed and the Contractor shall provide a copy of the Iodine 131 certification to the Engineer.

The flowmeter utilized for the test shall be certified as calibrated within the previous 3-month period from date of the pressure test and shall be capable of measuring the flow rate with an accuracy of 5%. Five copies of the calibration certification shall be provided *prior* to the initiation of the MIT procedures and shall indicate the date and place of the flowmeter calibration. Verification of the flowmeter calibration shall be submitted to the FDEP representative prior to commencement of the test.

The RTS shall be witnessed by a Florida-certified Professional Geologist or Professional Engineer. The RTS tests shall be initiated during regular working hours for the FDEP, Monday through Friday and shall be conducted according to the following procedure:

1. For casing flushes, fresh water should be used. Prior to initiation of RTS testing, approximately 110,000 gallons (approximately 3 well volumes) of

freshwater shall be injected to establish a freshwater “bubble” below the final casing seat. The flush volume may include the water injected to perform the TV survey.

2. A combination gamma-ray/high-resolution temperature tool shall be used to initially log the injection well, recording temperature from land surface to the total (accessible) well depth. The high-resolution temperature log shall include a differential temperature log on the same plot. The well shall be “shut-in” for a minimum of 8 hours prior to performing temperature logging.
3. A background gamma-ray log shall be conducted in the interval from the total accessible depth to land surface. A casing-collar locator log shall be used during this survey to locate the base of the final casing. The temperature log and background gamma-ray log shall be performed prior to loading Medical Grade Iodine 131 into the RTS tool.
4. The combination logging tool shall be positioned with the ejector located approximately 5 feet above the bottom of the casing, with one gamma-ray detector above the ejector (GRT), and two gamma-ray detectors below the ejector (one inside the casing above the casing seat [GRM] and one outside the casing below the casing seat [GRB]).
5. A. low-rate dynamic test shall be performed. A low injection rate shall be established using fresh water. The velocity for this test shall be between 3 and 5 feet per minute (equating to a flow rate between 40 and 66 gallons per minute [gpm]). A flowmeter with totalizer and an instantaneous flow-rate indicator shall be installed to monitor the flow rate into the well.
6. Time-drive monitoring shall begin and a 1-MCI slug of tracer material shall be ejected. This release will be confirmed by the middle detector (GRM) and the bottom detector (GRB).
7. Gamma-ray levels shall be monitored for one hour while the tool is held stationary. In the event that the tracer slug is detected by the upper gamma-ray detector (GRT) during the one-hour monitoring period, the operator of the logging tool shall log out of position to a new position approximately 20 feet above the previous position of the RTS tool and logging shall resume for the remainder of the one-hour monitoring period.
8. Following the end of the time-drive monitoring, the RTS tool shall log “out of position” (moving) to at least 200 feet above the highest point where the tracer was detected.
9. Following the out-of-position gamma-ray log, the injection tubing shall be flushed by injecting freshwater equivalent to approximately one injection well volume (approximately 36,700 gallons).
10. Following flushing, the combination logging tool shall be repositioned with the ejector located approximately 5 feet above the bottom of the casing and another gamma-ray log shall be run out of position to at least 200 feet above the highest point where tracer was detected.

11. If tracer movement continues to be detected, multiple out-of-position logs shall be conducted to identify the extent of tracer movement. The out-of-position logs shall be conducted at least 200 above the highest point where tracer was detected.

12. The combination logging tool shall then be repositioned with the ejector located approximately 5 feet above the bottom of the casing. This is the same depth as that used for the first low-rate dynamic test. A low injection rate shall be established using potable water. The flow rate of the second low-rate dynamic test shall be the same as the first low-rate dynamic test. Time-drive monitoring shall begin, a 2.0-MCI slug of tracer material shall be ejected, and the release of the tracer material will be confirmed by detectors GRM and GRB.

13. Step No. 7 (above) shall be repeated with the exception that the logging duration shall be 30 minutes (and not 1 hour).

14. Step No. 8 (above) shall be repeated.

15. Step No. 9 (above) shall be repeated.

16. Step No. 10 (above) shall be repeated.

17. Step No. 11 (above) shall be repeated if necessary.

18. Following completion of the RTS runs, the RTS tool shall be lowered to approximately 5 feet above the uppermost transmissive injection interval in the open hole. The remaining tracer material shall be ejected while flushing with at least one casing volume of freshwater. The RTS tool then shall be lowered to the total depth of the well and a final gamma-ray log shall be performed from the total depth to land surface.

19. Following the final gamma-ray log, the casing shall be flushed by injecting up to 3 well volumes of freshwater as directed by the Engineer.

3.09 DEMOBILIZATION: Upon completion of the work, the Contractor shall disassemble all temporary piping and equipment modifications from the site and demobilize. The injection wellhead shall be reassembled into its original configuration and reconditioned by the Contractor. A rust-inhibitive primer shall be applied to any exposed surface to the satisfaction of the Engineer. All exposed wellhead valves, flanges, flange bolts and appurtenances exposed to view shall be repainted as part of this work and shall be left in a condition acceptable to the Engineer and the Owner. The Contractor shall remove all equipment which is not part of the well and leave the site in a condition acceptable to the Owner.