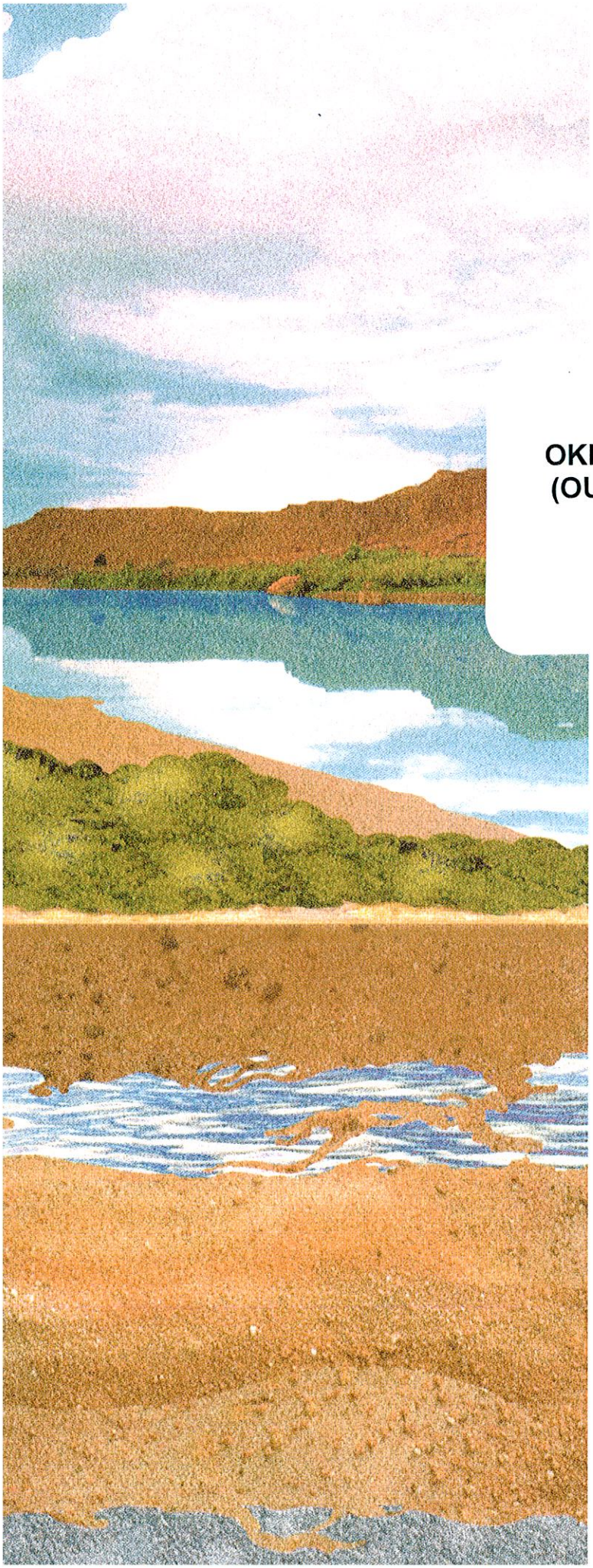


RESPONSES TO REQUEST
FOR INFORMATION
OKEECHOBEE UTILITY AUTHORITY (OUA) WASTEWATER TREATMENT FACILITY EXPANSION
OKEECHOBEE, FLORIDA
FDEP FILE NO.: 40824-071-UC
August 10, 2009

Andreyev Engineering, Inc.

- *Groundwater*
- *Environmental*
- *Geotechnical*
- *Materials Testing*

RESPONSES TO REQUEST
FOR INFORMATION
OKEECHOBEE UTILITY AUTHORITY
(OUA) WASTEWATER TREATMENT
FACILITY EXPANSION
OKEECHOBEE, FLORIDA
FDEP FILE NO.: 40824-071-UC
August 10, 2009

Andreyev Engineering, Inc.

SANFORD OFFICE
4055 St. John's Parkway
Sanford, Florida 32771
407-330-7763
Fax: 407-330-7765

▼ Groundwater ▼ Environmental ▼ Geotechnical ▼ Construction Materials Testing

August 10, 2009
AEI Project No.: GPGW-05-0430

To: Florida Department of Environmental Protection
400 N. Congress Avenue
Suite 200
West Palm Beach, Florida 33401

Attention: Mr. Joseph May, P.G.
Program Manager, Underground Injection Control

Subject: Responses to Request for Information (RFI) dated June 26, 2009 Construction Permit Application for Operational Testing – OUA WWTP
FDEP File No.: 40824-071-UC
Okeechobee Utility Authority (OUA) Wastewater Treatment Facility Expansion
Okeechobee, Florida

Dear Mr. May:

On behalf of the Okeechobee Utility Authority (OUA), Andreyev Engineering, Inc. (AEI) is pleased to submit the following responses to the RFI comments received from you in connection with the construction permit application for operational testing of the exploratory/injection well at the OUA Wastewater Treatment Facility expansion located at 1335 39th Boulevard (Cemetery Road) in Okeechobee, Florida.

Please continue with the review of this application. Thank you in advance for your assistance and for an expeditious review.

Should you have any questions or comments regarding the information presented herein, please do not hesitate to contact the undersigned at 407-330-7763.

Sincerely,
ANDREYEV ENGINEERING, INC.

Raymond W. Jones, P.E.
Vice-President
Florida Registration No.: 58079

Responses to FDEP RFI dated June 26, 2009

1. Response Items 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 12 – the Department concurs with these responses.

Thank you.

2. Response Item 11 - As required by Rule 62-528.435(9), F.A.C., a permittee must demonstrate and maintain financial responsibility and resources necessary to close, plug, and abandon the underground injection well system. The letter from the City's attorney identifying the attorney as representing the City, and attesting that it is a local government is acceptable. However, the following financial responsibility information must still be submitted and approved by the Department:

• A detailed plugging and abandonment plan for the injection well and associated monitor well based on actual well construction.

• Itemized costs associated with the plugging and abandonment plan above (cement, gravel, geophysical logging, mobilization-demobilization, etc.), plus a 15-20% contingency.

• A drawing showing the configuration of the injection well and associated monitor well after plugging (location of cement, gravel, etc.)

• The Comprehensive Annual Financial Report for the latest completed fiscal year for the Okeechobee Utility Authority.

• If the total costs above are greater than $160,124.20 (current financial responsibility Certification) a new signed/notarized Certification of Financial Responsibility form, signed by an individual authorized to bind the local government to such an agreement, which certifies unconditionally the obligation of the Okeechobee Utility Authority to perform plugging and abandonment of its injection well system, for the injection and monitoring well.

This original Financial Responsibility documentation must be submitted to Mr. Joe Haberfeld, FDEP, Mail Station 3530, Bureau of Water Facilities, 2600 Blair Stone Road, Tallahassee, FL, 32399-2400. Please send a copy of the transmittal letter for any financial responsibility documentation to the SED in West Palm Beach.

The Certification of Financial Responsibility was submitted directly to Mr. Joe Haberfeld of FDEP by the Executive Director of Okeechobee Utility Authority (OUA) on July 16, 2009. Pursuant to Mr. Joe Habefeld's follow-up email dated July 24, 2009, the OUA Injection Well facility has demonstrated Financial Responsibility.

A drawing showing the configuration of the injection well and the dual zone monitoring well after plugging is shown in the attached Figure 1 entitled "Injection Well System Plug and Abandonment Diagram".

4. General - The background analysis for the injection zone and both monitoring zones (Appendix H of the "Report on the Construction and Testing of Exploratory Well EW-1 and Monitor Well DZMW-1") was missing bromate, chlorine, chlorine dioxide, chlorite, haloacetic acids, anthracene, butylbenzylphthallate, dimethylphthallate, naphthalene, phenanthrene, aldrin, dieldrin, 2-chlorophenol, phenol, and 2,4,6,-trichlorophenol. These parameters should be analyzed for background concentrations for both the injection zone and monitor zones before any injection into the well is allowed.

The background water samples were tested for the parameters listed in the Exploratory Well Construction Permit issued on August 17, 2007. The additional sixteen (16) parameters mentioned above were not in the list of parameters required by the permit.

If the Department determines that these additional parameters are required at this stage, then additional samples of groundwater from the exploratory/injection well (EW-1/IW-1) and the dual zone monitoring well, DZMW-1 will have to be collected. To expedite the issuance of the construction permit for operational testing, it is requested that any additional required groundwater sampling be made a condition of the permit.

5. General – Please submit the testing plan/procedures for the radioactive tracer test and temperature log to be conducted on the injection well.

The radioactive tracer survey (RTS) plan and procedures were previously submitted, and the current permit includes conditions for completion of the RTS. To assist the review process, the testing plan/procedures for the radioactive tracer survey (RTS) and temperature log are presented again in Attachment A.

6. General - Please submit the testing plan/procedures for the short term injection testing.

The plan/procedures for short term injection testing are presented as Attachment B.

7. General - The operations and maintenance manual should be submitted with this application.

A draft copy of the operations and maintenance manual is presented as Attachment C.

8. Response Item 12: The original embossing impression seal has been affixed on application form Page 3 of 14. However, this page is a copy, hence, the signature of the engineer is not original but a photocopy. Please resubmit this page with the professional engineer embossing impression seal affixed and original signatures.

The page 3 of 14 of the application form with professional engineer embossing impression seal and original signatures are presented as Attachment D.

9. Response Item 14: Submit signed and sealed drawings to show:
The design features for surge control and water hammer protection do not address sudden loss of power when the injection system is in operation. Please address sudden loss of power when the injection system is in operation.

The Waste Water Treatment Facility has backup emergency power generation system to provide emergency power to the injection well system. The backup power generator system will become automatically on after sudden loss of grid supply.

Surge protection for the deep injection well system is provided by a series of combination vacuum/air release valves and vacuum breaker valves located on the pipeline between the pumping station and on the injection well. The locations of the air release valves are shown on the signed and sealed Sheet Nos. M-22 and M-23 of the Metzger and Willard, Inc. drawing set that was previously presented in Appendix 2 of AEI response to FDEP RFI #1 dated January 28, 2009 submitted on February 27, 2009. For convenience, copies of sheets M-22 and M-23 are presented again in

Attachment E of this submittal.

Additional surge protection is provided by a 4-inch diameter combination vacuum/air release located on top of the injection wellhead piping. The location of the air release valve is present on Figure 4 of the Draft Operations and Maintenance Manual (Draft O&M Manual) presented in Attachment C.

10. Response Item 19: Certificate of completion by the engineer of record {Rule 62-528.455(1)(c)3, FAC.; and (B)(1)c of DEP Form 62-528.900(1)} could not be located in the submittal. Please submit the certificate of completion.

A signed and sealed completion certificate by the engineer of record is presented in Attachment F.

Operation and Maintenance Manual (O&M):
The RFI response states that a draft O&M would be submitted within 30 days of the response which was received on March 3, 2009. The draft O&M will be reviewed when it is received by the Department. The draft O&M must be submitted and approved by the Department prior to approval of operational testing.

11. Please submit the portion of the draft O&M that pertains to the injection well system. (Extensive equipment cut sheets/specifications need not be submitted, or may be submitted on a CD. These however must be part of the O&M at the facility for immediate availability to the operators.)

The draft O&M manual is presented in Attachment C. Additional equipment operation and reference manuals are included in the attached CD.

12. Response Item 20: Please submit surface equipment (including pumping station, piping, pressure gauges and flow meters and all appurtenances) completion certificate. (The response stated that this will be submitted as part of the O&M.)

Completion certificates for surface equipment are presented in Attachment G.

13. Response Item 21: Please submit description of surge and water hammer control and emergency discharge management plan procedures. (The response stated that this will be submitted as part of the O&M.)

The description of the surge protection system is presented in Page 5 of the Draft O&M Manual in Attachment C. For emergency discharge, the existing three holding ponds and one reclaimed water storage pond of the waste water treatment plant are available. Two of the holding ponds are lined and encompass an area of two acres each. The third holding pond is unlined and has a plan area of 17 acres. The reclaimed water storage pond is lined and occupies a land area of about 18.1 acres. The signed and sealed Sheet No. C-3 of the drawing set prepared by Metzger and Willard, Inc. submitted in Appendix 2 of AEI response to FDEP RFI #1 dated January 28, 2009, shows the location of these holding ponds. A copy of Sheet C-3 is presented in Attachment E of this submittal for ease of reference.

In the event of planned maintenance on the injection well or impending hurricane event, the 18.1 acre reclaimed storage pond will be lowered sufficiently to provide up to 10 days of storage. This is also discussed on pages 7 and 15 of the Draft O&M Manual.

14. Response Item 22: Please submit the emergency discharge system. The emergency discharge plan must be fully constructed and operational (ready to operate) prior to approval of operational testing.

(The response stated that this will be submitted as part of the O&M.)

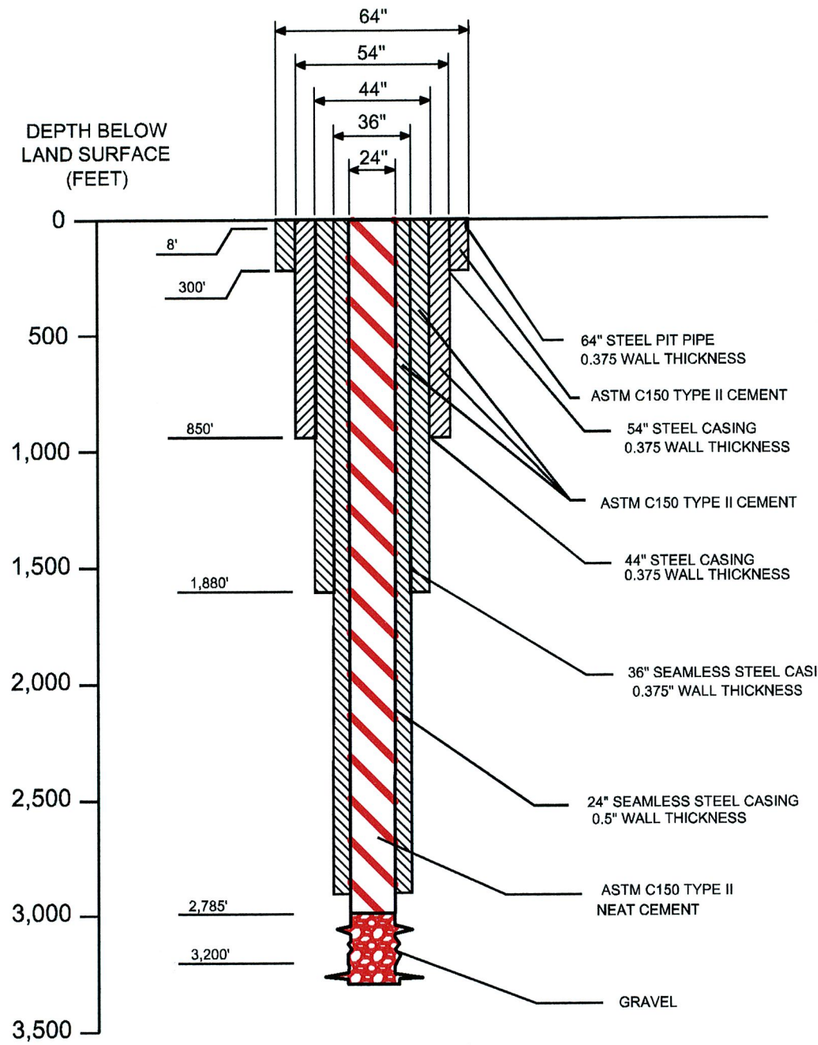
Injection well IW-1 is provided with two (2) 24" FG Gate Valves to completely shut-off and isolate the injection well in case of an emergency.

The emergency discharge system is fully constructed and operational at the site. The existing onsite holding ponds and spray fields of the wastewater treatment plant as described in response to Item No. 13 above will be available to dispose of emergency discharges. The signed and sealed layouts of the existing emergency bypass system were shown in Sheets C-12 and C-13 of the Metzger and Willard, Inc. drawing set previously submitted as Appendix 2 of AEI response to FDEP RFI #1 dated January 28, 2009. Copies of Sheets C-12 and C-13 are presented again in Attachment E for ease of reference.

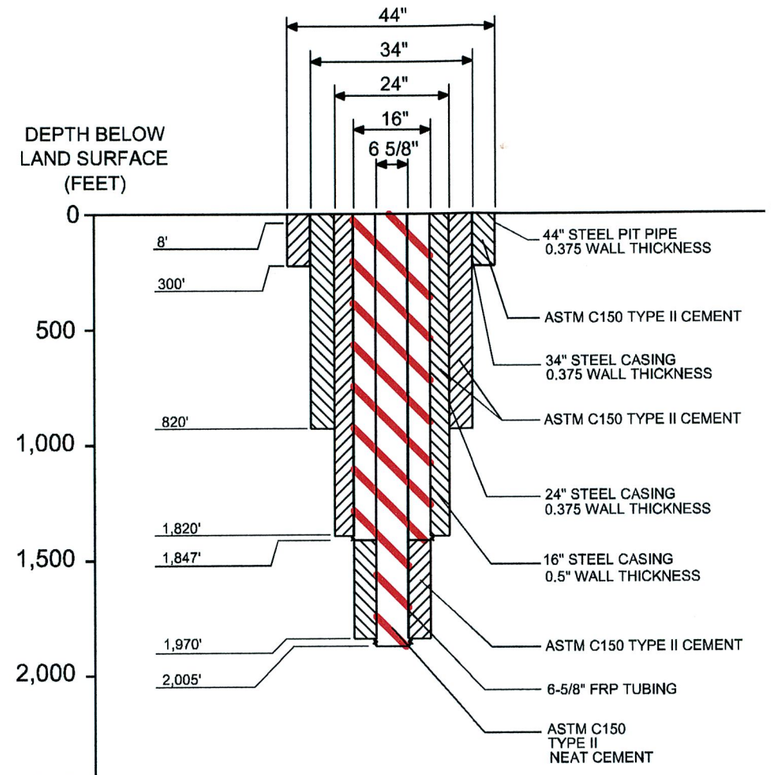
15. Response Item 23: Awaited please submit Calibration certificates for pressure gauges and flow meters. (The response stated that this will be submitted as part of the O&M.)

The calibration certificates for the pressure gauges and flow meters are presented in Attachment H.

FIGURE



INJECTION WELL IW-1
N.T.S.



DUAL-ZONE MONITOR WELL DZMW-1
N.T.S.

Raymond W. Jones, P.E.
FL Registration No.: 58079

Andreyev Engineering, Inc.
SANFORD OFFICE
4055 St. Johns Parkway
Sanford, Florida 32771
407-330-7763
Fax: 407-330-7765
Certificate of Authorization: 7634

DRILLING AND TESTING PLAN
OKEECHOBEE WWTF EXPANSION
UIC INJECTION WELL PROJECT
OKEECHOBEE, FLORIDA

APPROXIMATE SCALE:	DATE: 07/10/09	ENGINEER: SA
N.T.S.	PN: GPGW-05-0430	DRAWN BY: MS

INJECTION WELL SYSTEM
PLUG AND ABANDONMENT DIAGRAM
FIGURE 1

ATTACHMENT A
RADIOACTIVE TRACER SURVEY AND TEMPERATURE LOG

RADIOACTIVE TRACER SURVEY (RTS)
Okeechobee Utility Authority - Injection Well IW-1 at Cemetery Road WWTF

Prior to injection testing, a radioactive tracer survey (RTS) and temperature log will be completed in accordance with 62-528.300,(6),(c) FAC.

A. Prior to starting the RTS testing, the following shall be noted/completed:

1. The procedures for the RTS test contained herein will have to be approved by FDEP by obtaining a Well Construction and Injection Testing Permit.

2. The RTS shall be completed by a company specializing in furnishing and operating equipment used in collecting this information.

3. The geophysical tool supplied for the RTS must be capable of ejecting the radioactive tracer (Iodine 131) and simultaneously monitoring the gamma-ray detectors using crystalscintillation detectors equipped with photo-multiplier tubes.

4. The contractor shall be responsible for scheduling the test to allow the FDEP 72 hours notice before the initiation of the testing.

5. The test shall be conducted as directed by the Engineer, according to the following procedure outline.

6. An FDEP-approved source of water shall be utilized for all casing flushes. Potable water may be used for the low rate dynamic tests and as a water source to establish a freshwater "bubble" below the injection casing seat. However, if potable water is not available within a reasonable distance from the site, it is expected that treated effluent from the wastewater treatment plant will be used instead of potable water. The quality of water and/or the level of treatment provided to the water used for injection will have to be approved by FDEP prior to any injection/flushing taking place.

7. The Contractor shall install temporary piping to the proposed water supply.

8. If utilizing a potable water supply, the Contractor shall equip the piping with a reduced-pressure backflow preventer, and the Contractor shall connect the piping to the injection well's wellhead assembly.

9. The Contractor shall install a booster pump, as necessary, to achieve an acceptable flow rate of water into the injection test well for casing flushes during the RTS.

10. The Contractor shall install a calibrated flowmeter (accurate to within 5%) in-line with the temporary piping to monitor and record the pumping rate during the initial well flush and subsequent RTS casing flushes.

11. Proof of flowmeter calibration shall be provided to the FDEP. Otherwise, the means and methods of providing the required flow rate to the injection test well

for the purposes of the RTS casing flushing procedures (pipe and pump sizing) shall be at the discretion of the Contractor.

12. Five copies of the calibration certificates for each flowmeter, with the time and date of calibration specified within the previous 3-month period, shall be submitted to the Engineer.

13. The ("medical-grade") iodine-product manufacturer's data shall be submitted to the Engineer.

B. The RTS testing shall be conducted according to the following procedures:

1. Prior to initiation of RTS testing, a freshwater "bubble" below the injection casing seat shall be established by pumping a quantity of water equivalent to 226,000 gallons (approximately 3 injection well volumes).

2. A combination gamma-ray/temperature tool shall be used to initially log the injection well, recording temperature from land surface to the total well depth. The high resolution temperature log shall also include a differential temperature log plot.

3. A background gamma-ray log shall be conducted in the interval from total depth to land surface. A casing-collar locator log shall be used during this survey to locate the base of the well casing.

4. The combination logging tool shall be positioned with the ejector located approximately 5 feet above the bottom of the (outer) 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. Documentation of the radioactive-tracer injection time must be provided and the tracer injection time must be calibrated to ±1 millisecond. No time lag between ejection and monitoring is permitted.

6. A low injection rate of water shall be established. The Contractor shall supply all water required for this use. The flow rate for this test shall be 117 gpm, equating to a velocity of approximately 5 feet per minute. A 0 to 250 gpm, impeller type flowmeter with a totalizer and an instantaneous flow-rate indicator shall be installed to monitor the flow rate into the well.

7. Time-drive monitoring shall begin and a 1 .O-MCI slug of tracer material shall be ejected. This release shall be confirmed by detectors GRM and GRB.

8. Gamma-ray levels shall be monitored for one hour. In the event that the tracer slug is detected by the upper gamma-ray detector (GRT), during the one-hour monitoring period of a dynamic RTS test, the operator of the logging tool may log out of position to a new position approximately 20 feet above the previous position of the RTS tool and shall resume (continue) time-drive monitoring for the remainder of the one-hour monitoring period. If the tracer slug is again detected by the GRT detector, the operator may repeat the procedure and log out of

position to a new position approximately 20 feet above the previous position of the RTS tool.

9. A gamma-ray log shall be run out of position. In the event that upward fluid movement is detected by the GRT detector, prior to the out-of-position logging pass, the out-of-position logging pass shall be performed to at least 2,550 feet, or at least 200 feet above the highest point of fluid movement, if so detected.

10. Following the out-of-position gamma-ray log, the casing shall be flushed by injecting water to remove evidence of tool staining on the RTS instrument.

11. During the casing flush and during any subsequent casing flushing procedures, the RTS logging tool shall be positioned at the approximate location of the highest level (elevation) that the tool was placed for the preceding dynamic-phase RTS log.

12. Following flushing, the combination logging tool shall be repositioned with the ejector located approximately 5 feet above the bottom of the (outer) casing and another gamma-ray log shall be run out-of-position to 2,550 feet or at least 200 feet above the highest point of fluid movement, if so detected.

13. The combination logging tool then shall be positioned with the ejector located approximately 5 feet above the bottom of the (outer) casing. This is the same depth as that used for the first low-rate dynamic test. 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 1.5-MCI slug of tracer material shall be ejected, and the release of the tracer material shall be confirmed by detectors GRM and GRB.

14. Gamma-ray levels shall be monitored for 30 minutes during the second low flow test. In the event that the tracer slug is detected by the upper gamma-ray detector (GRT), during the 30 minute monitoring period of the dynamic RTS test, the operator of the logging tool may log out of position to a new position approximately 20 feet above the previous position of the RTS tool and shall resume (continue) time-drive monitoring for the remainder of the monitoring period. This procedure may be repeated, if necessary, as referenced in Step #7 above.

15. A gamma-ray log shall be run out of position. In the event that upward fluid movement is detected by the GRT detector, prior to the out-of-position logging pass, the out-of-position logging pass shall be performed to at least 2,700 feet, or at least 200 feet above the highest point of fluid movement, if so detected.

16. This procedure may be repeated, if necessary.

17. Following the out-of-position gamma-ray log, the casing shall be flushed to remove evidence of tool staining on the RTS instrument.

18. The RTS tool shall be emptied of any remaining Iodine 131 into the first high flow zone below the final casing and then conducting the final gamma-ray log from total depth of the well to land surface.

ATTACHMENT B
INJECTION TESTING PLAN

INJECTION TESTING PLAN
Okeechobee Utility Authority - Injection Well IW-1 at Cemetery Road WWTF

The injection test will consist of a background, pumping, and recovery phase, each of which are discussed below. Barometric pressure will be collected throughout each phase of the injection test. The injection pressure will be monitored with the Rosemont Smart Family Hart pressure transmitter already installed in the injection well. The flow rate and volume of flow will be measured with the already installed Venturi Flow Meter fitted with Rosemount integral manifold and Rosemont differential pressure and multivariable transmitter. The monitor well, DZMW-1water level data throughout each phase of the injection test will be collected with the Druck depth and level pressure sensors already installed in the upper and lower zones of the monitor well.

Water provided by Okeechobee Utility Authority Cemetery Road WWTF will serve as the water source during the injection phase of the injection test. Details regarding temporary or permanent piping and pumps to convey sufficient water volumes and flows to IW-1 must be worked out prior to setting up for testing.

Preliminary Test – A minimum of 6-hours prior to beginning the background data collection phase of the test, a preliminary test will be performed to ensure that recording equipment is working properly and the target pumping rate can be achieved. This will also allow the injection well casing to be filled with the water that will be used for the injection test and background water level data collection.

Background Data Collection Phase – A minimum of 24-hours of background water level data will be collected. The well cannot be disturbed during this phase of the test. During this time water level in both monitor zones and pressure at the injection wellhead and barometric pressure will be recorded.

Pumping Phase – The pumping phase of the injection test will take place following completion of background data collection and will last for 24 hours. The pumping phase will consist of injecting into the injection well at a rate of approximately 2,000 gpm for 8 hours, 1,000 gpm for 8 hours, and finally 500 gpm for 8 hours. The total volume of water anticipated to be used during the test is 1.7 million gallons.

Water level in both monitor zones and pressure at the injection wellhead and barometric pressure will be continuously recorded. Flowrate data will be collected and recorded continuously using data recording equipment.

Recovery Data Collection Phase – Upon completion of pumping into IW-1, the recovery data collection phase will begin. Recovery phase water level monitoring and recording will continue for 24 hours for both monitor zones of DZMW-1 and at IW-1. Both tidal and barometric data will also be collected during this period. A Rosemount data recorder will be used to collect injection wellhead pressure data during the recovery phase of the injection test. The wells can not be disturbed during this phase of the test.

Data Interpretation - Upon completion of the recovery data collection phase, the test data, including barometric, monitor well water level, and injection wellhead pressure and flowrate data will be compiled, interpreted, and submitted to the FDEP for review.

ATTACHMENT C
DRAFT OPERATIONS & MAINTENANCE (O&M) MANUAL

DEEP INJECTION WELL SYSTEM
OPERATIONS AND MAINTENANCE MANUAL

For

OKEECHOBEE UTILITY AUTHORITY (OUA)
CEMETERY ROAD WASTEWATER TREATMENT FACITLITY
OKEECHOBEE, FLORIDA

Prepared by

ANDREYEV ENGINEERING, INC.
4055 ST. JOHNS PARKWAY
SANFORD, FLORIDA 32771
(407)-330-7763

Draft

JULY 8, 2009

TABLE OF CONTENTS

TABLES

FIGURES

ATTACHMENTS

SECTION 1
Introduction

This Operation and Maintenance (O&M) Manual has been prepared by Andreyev Engineering, Inc. (AEI) to serve as a guide for the operation and maintenance of the deep injection well (DIW) system at the Okeechobee Utility Authority (OUA) Cemetery Road Wastewater Treatment Plant (WWTP) in Okeechobee County, Florida. The location of the site is presented in Figure 1. An aerial photograph showing the location of the DIW system on the site is presented in Figure 2.

This manual is to be used in conjunction with the equipment manufacturer's Operation and Maintenance Manuals provided in the *Okeechobee Utility Authority, Okeechobee WWTP Expansion to 3.0 MGD, Contract No. 2, Final O & M Manual, Volumes 1 to 11.* The guidelines and procedures that follow are necessary for safe and efficient system operation. Operating personnel for OUA WWTP must fully understand the function and interrelationship of all components contained within the DIW system to ensure that the disposal system functions properly and to prevent unscheduled maintenance or repairs.

The preparation of this manual follows the guidelines set forth in Chapter 62-528 of the Florida Administrative Codes (F.A.C.).

1.1 Operator Responsibility

The injection well system is an integral part of the OUA Cemetery Road Wastewater Treatment Facility and must be operated and maintained by skilled personnel to ensure the safe and efficient operation.

The State of Florida regulates the operation of Class I injection well systems under the requirements of Chapter 62-528, F.A.C., and in accordance with specific conditions provided in the injection well system permit. The operators must operate this facility in compliance with these requirements. Furthermore, the operator should be familiar with Chapter 62-528, F.A.C., and must ensure that copies of the injection well system permit and Monthly Operating Reports are accessible at the plant at all times.

The operator should have a good working knowledge of pumps, motors, electrical and electronic equipment, hydraulics, water treatment, and good safety practices. The operator should also interpret, record, file, and report system operating and monitoring data.

Successful plant operation depends on qualified personnel and adequate supplies to enable a prompt, thorough response to system maintenance requirements and to correct system problems.

1.2 General System Description

The OUA Cemetery Road WWTP deep injection well system currently consists of one Class I 24-inch diameter deep injection well (IW-1), dual-zone monitor well (DZMW-1), and control and monitoring instrumentation. The deep injection well system was designed for disposal of non-hazardous domestic wastewater after pretreatment, secondary treatment, filtration and high level disinfection at the OUA Cemetery Road Wastewater Treatment Facility. The planned injection rate of the injection well system is 8.0 million gallons per day (MGD). The OUA Cemetery Road WWTF after expansion under Contract No. 2 will have a capacity of 3.0 MGD.

The existing effluent disposal system consists of onsite sprayfield application and offsite reuse. After treatment, the effluent from the wastewater treatment plant is currently diverted to three holding ponds and one reclaimed water storage pond. Two of the holding ponds are lined and encompass an area of two acres each. The third holding pond is unlined and has a plan area of 17 acres. The reclaimed water storage pond is lined and occupies a land area of about 18.1 acres.

The Florida Department of Environmental Protection (FDEP) issued permit number 40824-44-UC to OUA to allow the construction of Exploratory Well (EW-1) and one associated dual zone monitoring well (DZMW) on August 17, 2007. A copy of the FDEP permit is provided in Attachment A.

SECTION 2

System Description

2.1 Deep Injection Well System Description

The primary disposal method for non-hazardous domestic wastewater after pretreatment, secondary treatment, filtration and high-level disinfection from the Cemetery Road WWTF is deep injection well IW-1. The deep injection well system consists of one deep injection well, a dual-zone monitor well, control panels, and associated instrumentation. The wastewater treatment plant has adequate alternate holding ponds and spray fields for emergency discharge.

2.1.1 Injection Well IW-1

The injection well was constructed in accordance with the design and construction standards of Chapter 62-528, F.A.C., and in accordance with the general and specific conditions of construction permit 40824-44-UC. The well was constructed with four concentric steel casings (54-, 44-, 36-, and 24-inch outside diameters) and an open hole injection zone drilled with a nominal 22.5-inch diameter drill bit. The final casing (24-inch diameter) has a wall thickness of 0.50 inches. The final casing was installed to a depth of 2,765 feet below land surface (bls). IW-1 has an open hole interval from 2,778 to 3,205 feet bls. A completion diagram of IW-1 is provided in Figure 3. Figure 4 provides a diagram of the injection wellhead.

The injection well is located on a 20 by 20 foot injection well pad. The injection well pad provides a stable working surface for maintenance and testing of the injection well. Figure 4 provides a diagram of the IW-1 injection well pad.

2.1.2 Dual-Zone Monitor Well

Dual-zone monitor well DZMW-1 is located on the monitor well pad 145 feet to the southwest of IW-1. DZMW-1 was constructed in accordance with FDEP construction permit number 40824-44-UC.

The monitor well was constructed with three concentric steel casings (34-, 24-, and 16-inch outside diameters) and a nominal 6-5/8 inch diameter FRP final casing. The well was constructed to monitor possible upward migration of injected fluid from the Boulder Zone into overlying zones. The upper monitor zone of DZMW-1 monitors the interval from 1,825 to 1,845 feet bls. Background water samples indicate the native water in this interval is brackish, with a chloride and TDS concentration of approximately 3,575 and 5,740 mg/L, respectively. The hydraulic head of this zone is approximately 4 feet above the North American Vertical Datum of 1988 (NAVD 88). A Dayton Deep Well Submersible Pump (Model 1L2X7) is used to purge the upper zone well casing prior to sample collection. It has a 1/2-horsepower electric motor. The operating instructions and Parts manual for the pump are included in Attachment B.

The lower monitor zone of DZMW-1 monitors the interval from 1,970 to 1,990 feet bls. Native water in the interval is brackish and the hydraulic head is approximately 18 feet below NAVD 88. Chloride and TDS concentrations from background sampling for this interval are approximately 3,750 and 6,150 mg/L, respectively. A Dayton Deep Well

Submersible pump is used to purge the lower zone well casing prior to sample collection. It has a 1/2-horsepower, submersible motor. The operating instructions and Parts manual for the pump are included in Attachment B.

If injected fluid were to migrate from the Boulder Zone, the relatively low-density fluid would move upward into the monitor zones. In such an event, water quality changes within the affected monitor zone will occur. These water quality changes typically include a decrease in chloride and total dissolved solids (TDS) concentration and a decrease in specific conductivity. An increase in water level of the affected monitor zone would also occur if injected fluid were to migrate to intervals monitored by DZMW-1. Figures 5 and 6 provide a well completion diagram and a wellhead diagram of DZMW-1, respectively. A diagram of the monitor well pad is provided in Figure 6.

2.2 Injection System Process Instrumentation and Equipment

Instrumentation and equipment associated with the injection well system include pressure transmitters, level transmitters, flow meters, pressure switches, self priming deep well submersible sample pumps, and associated piping and fittings.

Table 2-1 details the equipment and instrumentation used in the DIW system. The operator is encouraged to consult the equipment manufacturers' operation and maintenance literature provided in Attachment B of this O & M Manual and the *Okeechobee Utility Authority, Okeechobee WWTP Expansion to 3.0 MGD, Contract No. 2, Final O & M Manual, Volumes 1 to 11* for further technical information associated with the DIW system.

Table 2-1 Injection Well System Equipment and Instrumentation

DESCRIPTION	TAG NUMBER
Deep Injection Well 1 (IW-1)	
Pressure Transmitter	OIW-PT-C001
Pressure Gauge	OIW-PI-C001
Flow Transmitter	OIW-FT-C001
Flow Element	OIW-FE-C001
Air Vacuum Release Valve	OIW-AV-C005
24" Wellhead Gate Valve	OIW-BV-C017
24" Effluent Pipe Gate Valve	OIW-BV-C018
1" Wellhead Sample Valve	OIW-BV-C009
Pressure Gauge Isolation Valve	OIW-BV-C013
Air Vacuum Release Valve Isolation Valve	OIW-BV-C029
Pressure Transmitter Isolation Valve	OIW-BV-C011

DESCRIPTION	TAG NUMBER
Dual-Zone Monitor Well (DZMW-1)	
Submersible Sample Pump (lower zone)	OMW-P-C001
Centrifugal Sample Pump (upper zone)	OMW-P-C002
Lower Zone Level Indicator	OMW-LI-C001
Lower Zone Level Element and Transmitter	OMW-LT-C001
Lower Zone Level Indicator Ball Valve	OMW-BV-C003

Lower Zone Flow Isolation Ball Valve	OMW-BV-C004
Lower Zone Air Vacuum Relief Valve	OMW-AV-C007
Lower Zone Totalizing Flowmeter	OMW-FM-C001
Lower Zone Sample Tap Ball Valve	OMW-BV-C005
Lower Zone Purge Tank Isolation Globe Valve	OMW-BV-C001
Upper Zone Level Transmitter	OMW-LT-C002
Upper Zone Pressure Gauge	OMW-PI-C001
Upper Zone Air Vacuum Relief Valve	OMW-AV-C013
Upper Zone Air Vacuum Isolation Ball Valve	OMW-BV-C012
Upper Zone Level Transmitter Isolation Ball Valve	OMW-BV-C016
Upper Zone Flow Isolation Ball Valve	OMW-BV-C002
Upper Zone Sample Tap Ball Valve	OMW-BV-C006
Upper Zone Totalizing Flowmeter	OMW-FM-C002
Upper Zone Purge Tank Isolation Globe Valve	OMW-BV-C017

2.3 Surge Protection System

Surge protection for the deep injection well system is provided by a series of combination vacuum/air release valves and vacuum breaker valves located on the pipeline between the pumping station and the injection wells. Additional surge protection is provided by a 4-inch diameter combination vacuum/air release located on top of the injection wellhead piping.

2.4 Emergency Power Supply

The injection well will not be needed or operated during a power outage. If there is power outage, the plant would stop making large volumes of water. The Waste Water Treatment Facility has backup emergency power generation system to provide emergency power to the injection well system monitoring and recording equipment during a power outage. Still, manual read pressure gauge units are provided to allow manual backup monitoring.

2.5 Flow Rate and Pressure Instrumentation

2.5.1 Injection Well

The flow rate for the DIW is measured by a Venturi Flow Meter with cast iron body and 316 SS throat (BIF Model 20181-24) and Rosemont integral manifold (Model 305RC32B11B4) with Rosemont differential pressure and multivariable transmitter (Model 3051S1C D2A2A11A2EM9). The flowmeter is located near the effluent pump station (PS5). The flow transmitter sends a 4-20 mA output to the process control center. The flowmeter range is 0 to 10,000 gpm. The reference manuals for Rosemount 3051S series Scalable Pressure, Flow and Level Solutions and Rosemount Manifolds are included in Attachment B.

Injection pressure is monitored at the wellhead with a Rosemount Smart Family Hart pressure-indicating transmitter (model No. 3051TG2A2B21AS5B4M5). The pressure transmitter works by transmitting 4-20-mA electrical signals from the sensor module to the output electronics at the injection well data recorder where pressure is recorded. The

pressure transmitter range is 0 to 150 psi. The reference manual for Rosemount Model 3051 Pressure Transmitter is included in Attachment B.

2.5.2 Dual Zone Monitoring Well

The upper zone of the monitoring well is monitored by a Druck depth and level pressure sensor (Model PTX 1230) with pressure range of 0 to 150 psi. The components include the Druck sensor module, sensor termination enclosure (STE 110) and digital display Precision Digital PD 675 and operate by transmitting a 4-20 mA signal from the sensor to the data recorder. The reference manuals for the Model PTX 1230 sensor and Precision Digital Display PD 675 are included in Attachment B.

The lower monitor zone is equipped with a Druck depth and level pressure sensor (Model PTX-1230) with pressure range of 0 to 150 psi. The components include the Druck sensor module, sensor termination enclosure (STE 110) and digital display Precision Digital PD 675 and operate by transmitting a 4-20 mA signal from the sensor to the data recorder. The reference manuals for the Model PTX 1230 sensor and Precision Digital Display PD 675 are included in Attachment B.

SECTION 3
System Operating and Monitoring

3.1 General Information

Before operating any equipment associated with the DIW system, the operator should consult the instructions contained in the attachments to this manual and the *Okeechobee Utility Authority, Okeechobee WWTP Expansion to 3.0 MGD, Contract No. 2, Final O & M Manual, Volumes 1 to 11* to assist with repair during equipment malfunction.

3.2 Emergency Discharge Procedures

Injection well IW-1 is provided with two (2) 24" FG Gate Valves to completely shut-off and isolate the injection well in case of an emergency. Water from the facility would then be directed to existing holding ponds and spray fields of the wastewater treatment plant to dispose of emergency discharge on-site.

3.3 Monitoring Data Collection and Reporting

Injection system monitoring data are collected to provide a record of system performance and to guide the operator in locating and solving operational problems. This record represents the only direct indication of injection system performance and serves to substantiate decisions and recommendations for future work on the well. It also provides information FDEP requires as stipulated in the construction and operating permit (when issued).

Typical deep injection well injection pressures will range from approximately 22 to 42 psi. Monitoring and reporting of the DIW operating pressure is required by the FDEP DIW permit. A database of monthly average injection pressure should be maintained to allow comparison of current average pressures with historic average pressures to determine if an increase in average pressure is occurring over time. The operator should maintain an electronic spreadsheet of monthly maximum and average wellhead pressure and monthly average and maximum injection rates. These data should be graphed to identify any trends in well performance. An increase may be an indication that an obstruction such as a large rock is partially blocking the borehole below the base of the casing. The plant superintendent should be notified if such a trend is observed.

Table 3-1 lists the monitoring reporting requirements for the injection system.

Table 3-1 Reporting Requirements for Deep Injection Well System

Monitoring Station	Parameter	Frequency
Injection Wells	Primary/Secondary DWS/Free Froms	At Start-up
	Flowrate	Continuous
	Wellhead Pressure	Continuous

	Maximum, minimum, and average pressure	Daily/Monthly
	Maximum, minimum, and average flow	Daily/Monthly
	Total volume effluent injected	Daily/Monthly
DZMW-1 both monitoring zones	Primary/Secondary DWS/Free Froms	Prior to Start-up
	Water Level referenced to NAVD	Continuous
	Maximum, Minimum, and Average Water Level (ft. NAVD) or pressure (psi)	Daily/Monthly
	Specific Conductivity	Weekly*
	pH	Weekly*
	Chloride	Weekly*
	Temperature	Weekly*
	Total Dissolved Solids (TDS)	Weekly*
	Total Phosphorous	Weekly*
	Sulfate	Weekly*
	Sodium	Weekly*
	Calcium	Weekly*
	Magnesium	Weekly*
	Potassium	Weekly*
	Bicarbonate	Weekly*
	Ammonia (mg/L)	Weekly
	Total Kjeldahl Nitrogen (mg/L)	Weekly
	Iron	Monthly
Wastestream	Total Dissolved Solids	Weekly*
	Chloride	Weekly*
	Specific Conductivity	Weekly*
	pH	Weekly*
	Temperature	Weekly*
	Ammonia (mg/L)	Monthly
	Total Kjeldahl Nitrogen (mg/L)	Monthly
	Nitrate + Nitrite as N (mg/L)	Monthly
	Total Suspended Solids (TSS)** (mg/L)	Daily
	Maximum Total Suspended Solids (TSS)**	Monthly
	Average Total Suspended Solids (TSS)** (mg/L)	Monthly

	Fecal Coliform (number/100 mL)	Daily
	Fecal Coliform (number/100mL), percent below detection limit	Monthly
	Fecal Coliform (number/100mL), maximum	Monthly
DWS - Drinking Water Standards * Frequency decreased to monthly following operational testing and Department approval. ** All TSS samples shall be grab samples. The samples are to be taken after filtration and before disinfection.		

3.3.1 Monitoring Data Monthly Report

The monitoring data for the Monthly Operating Report are to be compiled on the injection well and monitor well data recorders located on the injection well system monitoring control panel in the Process Control room of the operations building. The injection well data recorder records both injection rate and wellhead pressure continuously. The monitor well data recorder records water level in feet above the submersible level transducer (Druck PTX 1230) installed at 55 feet below pad level or -19 feet NAVD 88 for the lower zone of DZMW-1. The upper monitor zone water level is recorded in feet above the pressure transducer installed at a depth of 115 feet below pad level at an elevation of -79 feet NAVD 88. Water level in the monitor zones should be reported relative to NAVD on the Monthly Operating Reports.

To convert the recorded lower zone water level to a water level relative to NAVD, the water level reading (in feet) must be added to the elevation at which the transducer is installed, which in this case is -19 feet NAVD 88. For example, if the data recorder indicates the water level of the lower zone is 40 feet, the water level relative to NAVD is 21 feet NAVD 88 (40 + (-19) = 21 feet NAVD 88).

To convert the recorded upper zone water level to a water level relative to NAVD, the elevation to which the pressure transducer was installed should be added to the water level displayed on the data recorder. The upper monitor zone transducer was installed to an elevation of -79 feet NAVD 88. Therefore, if for example, the data chart recorder indicates a water level of 120 feet, the water level relative to NAVD is 41 feet NAVD 88 (120 + (-79) = 41 feet NAVD 88).

Moderate fluctuations in the water level of the monitor well are anticipated and naturally occurring. However, a consistent trend of increasing or decreasing water level in either of the monitor zones should be reported to the plant supervisor. The plant supervisor should then have the pressure transducer for the monitoring zone in which the trend is occurring recalibrated to ensure the data is correct.

The Monitoring Operating Report forms, contained in Attachment C, should be completed for submittal to the FDEP.

3.3.2 Monitor Well Water Quality Sampling and Reporting

Water quality samples are to be collected weekly during operational testing of the injection well system and monthly thereafter from the two monitoring zones in the dual-zone monitor well unless specified otherwise in the operating permit. The samples are compared to the pre-injection water quality samples and previous water quality samples to detect any changes that may be caused if migration of the injected fluid were to occur. A duplicate sample should be collected when sampling the monitor wells for future reference. These samples may be disposed of at a later date when the plant supervisor has confirmed that there are no anomalies associated with each particular sampling event.

Water samples should be collected after purging three casing volumes of water from the upper monitor zone. The lower monitor zone should be sampled after purging four casing volumes of water to ensure the zone is completely purged. Table 3-2 presents monitor well sampling information for both the upper and lower monitor zones.

Table 3-2 Monitor Well Sampling Information

Monitor Zone	Purge Volume (gal.)	Purge Rate (gpm)	Purge Duration
Upper	48,300	2.5	322 hours
Lower	13,700	10	23 hours

It is important that monitor zone purging not exceed the duration indicated above by more than 20% to ensure the zone is not over-purged and cause undesirable upcoming of fluids and allow collection of reliable water level data for each zone.

Some variation in reported values is normal, however, if injected fluid migrates into the monitoring zones, the water samples will show a freshening trend from background chloride, TDS, and specific conductance values. Significant deviations from background water quality, pressures, or water level values should be reported immediately to the plant supervisor. If anomalies are observed in any of these parameters, the sampling routine should be repeated as soon as possible to verify if there are actual deviations from background data. The actual sample routine is as follows:

1. Record the totalizer reading for both zones of the monitoring well.
2. Open the lower zone isolation ball valve (OMW-BV-C004) and the upper zone isolation ball valve (OMW-BV-C002).
3. Turn on the lower and upper zone sample pumps (OMW-P-C001 and OMW-P-C002, respectively). Note the time that the sample pumps were turned on.
4. Run the sample pumps according to Table 3 that indicates the specified time that corresponds to the amount of water purged.
5. After the specified amount of time, open the lower zone sample ball valve (OMW-BV-C005) and collect duplicate samples.
6. Close the lower zone isolation and sample valves.
7. After the specified amount of time, open the upper zone sample ball valve (OMW-BV-C006) and collect duplicate samples.
8. Contact the laboratory for the sample pickup.

Be sure that information from the water quality analyses has been recorded on the proper form (sample data forms are contained in Attachment C). The form should be completed and filed as soon as the results are received from the laboratory.

3.3.3 Specific Injectivity Testing and Reporting

The injection well is required to undergo a specific injectivity test on a monthly basis during operational testing of the system to detect any changes that may occur in the injection well over time. The frequency of the specific injectivity testing is typically reduced to quarterly following completion of operational testing. The test is performed at a given rate of injection and the injection pressure is recorded. The specific injectivity index, which is then derived, is used to compare the relative performance of the well over time.

Each injectivity test will require the participation of two plant personnel. The total time to complete the injectivity test is about 1 hour. The test participants should adhere to the following protocol for injectivity testing:

1. Cease injection into the injection well. This activity should be scheduled and coordinated with the plant supervisor.

2. After ceasing injection into the injection well allow the well to sit undisturbed for 5 to 10 minutes, or until the pressure stabilizes. The pressure after it has stabilized is referred to as the "shut-in" pressure.

3. Record the shut-in pressure of the injection well after 10 minutes. A sample Injectivity Form is provided in Attachment C.

4. Once shut-in pressure has been recorded, begin injection into the injection well at a rate of approximately 2,000 gallons per minute (gpm).

5. Note the time when flow becomes stable.

6. After the injection rate has become stable for 10 minutes, record the time, injection pressure, and injection rate.

7. Perform the injectivity calculation for the test and complete the Data Forms (see Sample Data Form provided in Attachment C).

8. Subtract the shut-in pressure from the injection pressure. This calculation yields the pressure difference.

9. Divide the rate (gpm) by the pressure difference (psi) to obtain the injectivity index. Use the forms provided to report the injectivity index.

10. A data base of injectivity index values for the injection well should be kept by the plant staff. These data should be plotted on an injectivity index versus date graph. The most recent injectivity index should be compared to historic injectivity data to identify abrupt changes in well performance. If the injectivity index has significantly decreased from the last injectivity test or a trend of decreasing injectivity is identified, inform the plant superintendent.

11. Include the injectivity test results with the monthly report forms submitted to the FDEP.

SECTION 4
Maintenance

Section 4 provides guidelines for the continuing management of a maintenance program for the DIW system. A good preventive maintenance program enables successful plant operation by minimizing both expensive emergency repairs and unexpected interruption of the operation schedules. This manual should be used in conjunction with the *Okeechobee Utility Authority, Okeechobee WWTP Expansion to 3.0 MGD, Contract No. 2, Final O & M Manual, Volumes 1 to 11* to develop the overall maintenance program for the DIW system.

The responsibility for general and preventive maintenance resides primarily with the operator. Therefore, it is imperative that all injection system operations personnel know and follow required maintenance procedures.

4.1 Maintenance and Lubrication Records

A good maintenance program includes an effective record keeping system that provides schedules for routine maintenance tasks as well as information on past equipment performance and repairs. Its usefulness is directly dependent on the operator's diligence in keeping it up-to-date.

The operator should review the equipment manufacturer's information contained in Attachment B of this O & M Manual and the *Okeechobee Utility Authority, Okeechobee WWTP Expansion to 3.0 MGD, Contract No. 2, Final O & M Manual, Volumes 1 to 11.* The suggested maintenance and preventative maintenance should be incorporated into the normal plant operations procedures.

4.2 Electrical Maintenance

Only qualified, experienced electricians should maintain major electrical equipment in accordance with the recommendations of the manufacturer. Operating personnel may do minor inspection, lubrication, and simple routine maintenance. The operator should consult with the plant supervisor to review any specific maintenance procedures that have been outlined in the equipment manufacturer's information.

The maintenance instructions contained herein are general. Maintenance of individual pieces of equipment should be performed specifically in accordance with the manufacturer's recommendations contained in the reference manuals included in Attachment B of this O & M manual and the *Okeechobee Utility Authority, Okeechobee WWTP Expansion to 3.0 MGD, Contract No. 2, Final O & M Manual, Volumes 1 to 11.* Operating procedures and unexpected ambient conditions, such as excessive rain, wind, dust, or vibration, may dictate more intensive maintenance schedules than those recommended herein or by the manufacturer.

Electrical equipment maintenance and repair is dangerous, especially for personnel lacking proper qualifications. The following safety procedures should be followed when working on electrical equipment:

1. Have qualified electricians perform all but simple routine maintenance. If the operator has not been instructed how to maintain a specific piece of electrical equipment, he should consult with the plant supervisor or contact an electrician. Record voltage and

amperage readings prior to working on each motor. Report increasing amperage or unusual voltages to the plant supervisor.

2. Do not wear loose clothing and ties around rotating machinery.

3. When inspecting energized equipment, wear safety glasses to avoid injury to the eyes.

4. Before disassembling or working on electrical equipment, make sure the equipment is de-energized. Treat all electrical equipment as if it were energized even when the circuit is de-energized (consult with an electrician).

5. Tag any open breaker or disconnect, and, if possible, lock it in the OPEN position.

6. Keep all electrical control panels, safety switches, and electrical instruments, such as transmitters, clean inside and out. Low pressure air is a suggested technique.

7. Megger low-voltage rotating equipment using a 500-volt megger. The megger reading should be 1 megohm minimum. Readings should be recorded and compared with previous readings, as a decreasing megger reading indicates deteriorating insulation or excessive dirt or moisture. Loose connections, unusual motor temperatures, and hot bearings should be checked with an infrared scanner. Hand-held infrared scanners are available from electrical suppliers. It is recommended to purchase one of these units to scan equipment such as motors, control panels, and other moving parts. Record these readings and report any increases in temperature. Perform yearly infrared thermal photography to analyze for hot spots.

Bearings should be lubricated in accordance with the manufacturer's recommendations. Avoid excessive lubrication, since lubricant contact with insulating surfaces can cause deterioration and accumulation of dirt, thereby decreasing effectiveness of the insulation.

Reference should be made to the *Okeechobee Utility Authority, Okeechobee WWTP Expansion to 3.0 MGD, Contract No. 2, Final O & M Manual, Volumes 1 to 11* for additional information on electrical maintenance procedures.

4.2.1 Daily

Conduct a daily walk-through of the plant and injection system to inspect electrical equipment. Keep the area clean, and look for sources of leaks or unusual heat, noise, or odors. On rotating equipment with sleeve bearings, check oil levels and ensure that oil rings turn with their shafts. On rotating equipment with slip rings or commutators, check for excessive sparking.

4.2.2 Monthly

Inspect motors on rotating equipment monthly. Ensure that each shaft is free of oil or grease from bearings; start machines and note whether operational speed is attained within 1 to 2 minutes. Check slip rings and commutators for excessive sparking during starting, and check bearings for excessive heat or noise.

4.3 Mechanical Maintenance

All mechanical equipment within the reuse water (or out of spec reuse water) disposal system requires periodic inspection, lubrication, and adjustment. Regular mechanical maintenance is essential to ensure good operating condition and proper performance. Regular maintenance also provides opportunities for locating and correcting minor malfunctions to avoid major problems.

Operating personnel should familiarize themselves with the procedures provided in manufacturers' information in the *Okeechobee Utility Authority, Okeechobee WWTP Expansion to 3.0 MGD, Contract No. 2, Final O & M Manual, Volumes 1 to 11* for suggested mechanical maintenance for all pumps, valves, motors, instrumentation, and other major equipment within the DIW system. Detailed records should be kept of all work performed in addition to written schedules of regular tasks necessary for monitoring the DIW system. The following are general checklists of maintenance tasks and general injection system operations to be performed at the intervals noted.

4.3.1 Daily

1. Check for unusual odors or noise that would indicate motors are running hot during sampling of the monitor zones.

2. Check the water level in the surge tank to verify proper system operation.

3. Inspect injection, monitor well, and annulus tank recorders for variation from normal operation. Notify the plant supervisor if deviations are noted.

4.3.2 Weekly

1. Perform lubrication as recommended in the equipment manufacturers' information contained in the *Okeechobee Utility Authority, Okeechobee WWTP Expansion to 3.0 MGD, Contract No. 2, Final O & M Manual, Volumes 1 to 11.*

2. Collect monitor zone water quality samples.

4.3.3 Monthly

1. Exercise all valves in the injection system.

2. Review and check the surge protection alarm system to be sure all alarms are functioning properly.

3. Perform maintenance suggested by the equipment manufacturer's information contained in the *Okeechobee Utility Authority, Okeechobee WWTP Expansion to 3.0 MGD, Contract No. 2, Final O & M Manual, Volumes 1 to 11.*

4. Inspect electric motors for wear, noise, over-heating, and loose connections. Record voltage and amperage readings of each motor. Report increasing amperage or unusual voltages to the plant supervisor.

5. Inspect flow transmitter at injection well wellhead for trapped air; bleed if necessary.

6. Complete and submit monthly reports.

7. Calibrate all instrumentation associated with the injection system on a semi-annual basis at a minimum.

4.3.4 Yearly

1. Have a qualified electrician inspect electrical items for proper operation and condition.

2. Review maintenance records to ensure that all scheduled maintenance has been completed.

3. Review monthly and quarterly monitoring reports and look for deviations or trends in the monitoring parameters.

In accordance with FAC 62-528.425(1)d, a mechanical integrity test (MIT) of the injection wells is required every 5 years. A MIT consists of pressure testing of the casing and injection tubing, video inspection of the injection tubing, and open hole interval, and performance of a high-resolution temperature log and radioactive tracer. Pressure testing of the casing and injection tubing will be performed simultaneously by pressurizing the injection well annulus to the test pressure. During the MIT, it will be necessary for the well to remain off line and wastewater diverted to the onsite holding ponds and reclaimed water storage pond. The plant supervisor should be consulted to schedule testing and the wastewater levels in the holding ponds and reclaimed water storage pond should be lowered to generate sufficient storage volume to accommodate the anticipated effluent volume during the duration of the MIT. The well will be out of service for an estimated 4 to 6 days. The 18.1 acre lined reclaimed water pond has sufficient storage capacity to accommodate more than 10 days of plant flows @ 3.0 MGD.

4.4 Rotating Equipment

The following maintenance procedures apply to rotating equipment only after it has been turned off and not moving:

1. Blow out dirt from windings. Clean out magnetic particles that may be clinging to poles.

2. Drain and replace oil in the seal cavity and bearing housing. Inspect pedestal bearings for excessive heat by placing a contact-type thermometer against the housing while the pump is in operation.

3. Check end play of shafts. Under load, machines without thrust bearings should not be riding against the thrust collar of either bearing. This condition can cause heating and failure of the bearing.

4. On rotating equipment with commutators or slip rings, check brush tension and brush wear. Make sure brushes are free in the brush holder. Replace brushes as required. Sand in new brushes when brush replacement is required. Check commutators and slip rings for wear, scratches, or pitting. Dress as required.

5. Check foot bolts, end shield bolts, pulleys, couplings, gear and journal set screws, and keys. See that all covers and guards for pulleys, couplings, etc., are in good condition and securely fastened. Observe operation during starting and running.

4.5 Instrumentation Maintenance

These maintenance instructions are general. Maintenance of individual pieces of equipment should be performed specifically in accordance with the recommendations of the manufacturer contained in the *Okeechobee Utility Authority, Okeechobee WWTP Expansion to 3.0 MGD, Contract No. 2, Final O & M Manual, Volumes 1 to 11.*

Modern instrumentation and control equipment require periodic maintenance to be kept in proper operating condition. Every 3 months, open the instruments and/or withdraw them from their cases; inspect the instruments, and clean with a soft brush. The instruments that have moving parts should be lightly lubricated in accordance with the instructions of the manufacturer. Do not over-lubricate. Check for interference between moving parts as required. Look for sources of unusual heat, sound, or odors. Keep electronic instruments free from dust and moisture.

Check the calibration annually on instruments, gauges, and pressure switches. If possible, they should be calibrated in-place, using the piping, wiring, and fluids of the processes, calibrating a whole sub-system at once. This method is the cheapest and most reliable because it does not require removing the instrument and it avoids errors such as bad connections and leaks after reinstallation. The disadvantages are that it will disrupt the process, and that it may be difficult to obtain sufficient accuracy and range. Consult with the plant supervisor to determine which method is appropriate.

Calibrate pressure gauges and pressure switches by connecting to a pressure header with a bleed valve and a pressure valve connected to an air tank. Use a gauge of known accuracy and recent calibration for a reference. Gauges should be checked annually.

Calibrate electronic instruments such as 4/20 mA outputs using an appropriate electrical meter. The use of a hand-held signal generator is useful in checking these units. Reading outputs with an electrical meter or generating an input and reading the instruments display will dictate the need for calibration. Consult specific instrument calibration instructions prior to attempting the correction of anomalies. Electronic and electrical equipment operates best in a clean and controlled environment. Keeping the equipment clean and free of moisture is the best procedure to avoid costly repairs.

SECTION 5
Safety

A safety program is generally defined by the management, but day-to-day participation in the program is the responsibility of all employees. Section 5 presents an overview of the safety program recommended for operation of the deep injection well (DIW) system.

5.1 General Precautions

Written emergency instructions must be placed in the Process Control Room and must be accessible to all personnel. These instructions should include: the telephone number and address of the company safety office and the nearest doctor; emergency numbers for the fire department, electric power company, and police station; and first aid instructions.

Plant personnel should be trained in first aid and CPR, with recertification given annually. Drills, particularly resuscitation exercises, should also be conducted periodically. Physical injuries can be minimized through the following measures: an established employee training program; adequate lighting; an orderly and scheduled housekeeping program; proper identification of all equipment; maintaining the disconnecting equipment in good repair; and wearing proper protective clothing, such as safety shoes, waist harness, and hard hats, at all times.

There are major hazards that employees may encounter at a DIW installation. Known hazards include physical injuries, infections, electrical shock, burns, and drowning.

Electricity is a hazard that requires careful attention. Ordinary 110-volt electricity can be fatal. Since electricity kills by paralyzing the nervous system and stopping muscular action, it is essential that the victim be freed from the live conductor promptly by use of a dry stick or other non-conductor. Never use bare hands to remove a live wire.

5.2 Safety Equipment

It is important that all operating personnel understand the necessity of using available safety equipment at all times. There is no excuse for injury or unnecessary damage to the plant if proper equipment is available but not used.

All safety equipment must be checked, cleaned, and repaired at regular intervals. Recommended safety equipment includes the following:

- One complete first aid kit
- Easily accessible fire extinguisher in each building

- Eyewash with shower
- Adequate amounts of appropriate signs to warn personnel of potential hazards

5.3 Personal Safety Practices

This section gives some general safety practices that should be followed on a daily basis in operating the injection well system. The importance of the properly following established safety and equipment procedures cannot be overemphasized.

Basic personal safety measures include, but are not limited to, the following:

1. To avoid back strain, lift equipment straight up, using leg muscles instead of back muscles.
2. Ensure that first aid equipment is readily available for treating minor cuts, burns, and wounds.
3. Never open high-voltage equipment switchboards unless standing on a suitable rubber mat.
4. Pick up all tools and practice good housekeeping.
5. Keep walkways free of grease and oil and clean spills immediately.
6. Do not use electrical panels as racks for clothing or tools.
7. Do not use gasoline as a cleaning fluid.
8. Do not inhale solvent fumes.
9. Use portable lighting equipment to provide proper visibility in areas where permanent lighting facilities are not available.
10. Regularly practice putting on and using self contained breathing equipment to ensure quick, proper use in times of emergency.
11. Upon completion of servicing belts, gears, and other exposed moving machine parts, promptly replace guards that have been removed.
12. Adequately mark pipelines and faucets that contain non-potable water.

5.4 Electrical Safety

Guidelines for electrical safety include, but are not limited to, the following:

1. Never check or repair any instrument or equipment unless you have made sure that it is de-energized by disconnecting the unit from its source of power.
2. Utilize lock out and tag procedures for de-energizing equipment.
3. When working near electricity, do not ground yourself on pipes or drains.
4. Allow only authorized properly trained personnel to work on electrical equipment or to make repairs.
5. Keep all electrical controls accessible and well marked. Post warning signs at appropriate places.
6. Place rubber mats on the floor in front of electrical panels.

7. Never use metal ladders around or beneath electrical equipment. Do not raise pipes or other metal into electrical gear above.

8. Treat all wires as though they are "live" wires, including those in circuit breakers.

9. Ground all electrical tools.

10. In case of electric shock, free the victim from the live conductor by use of a dry stick or other non-conductor. Never use bare hands to remove a live wire. If the victim has stopped breathing, immediately apply artificial respiration until breathing is restored or until instructed by emergency medical personnel to stop.

11. Only carbon dioxide-type fire extinguishers should be used around electrical equipment.

12. Before disassembling or working on electrical equipment, make sure the equipment is de-energized. Tag the open breaker or disconnect, and, if possible, lock it in the OPEN position. In addition, ground all phases rated higher than 600 volts.

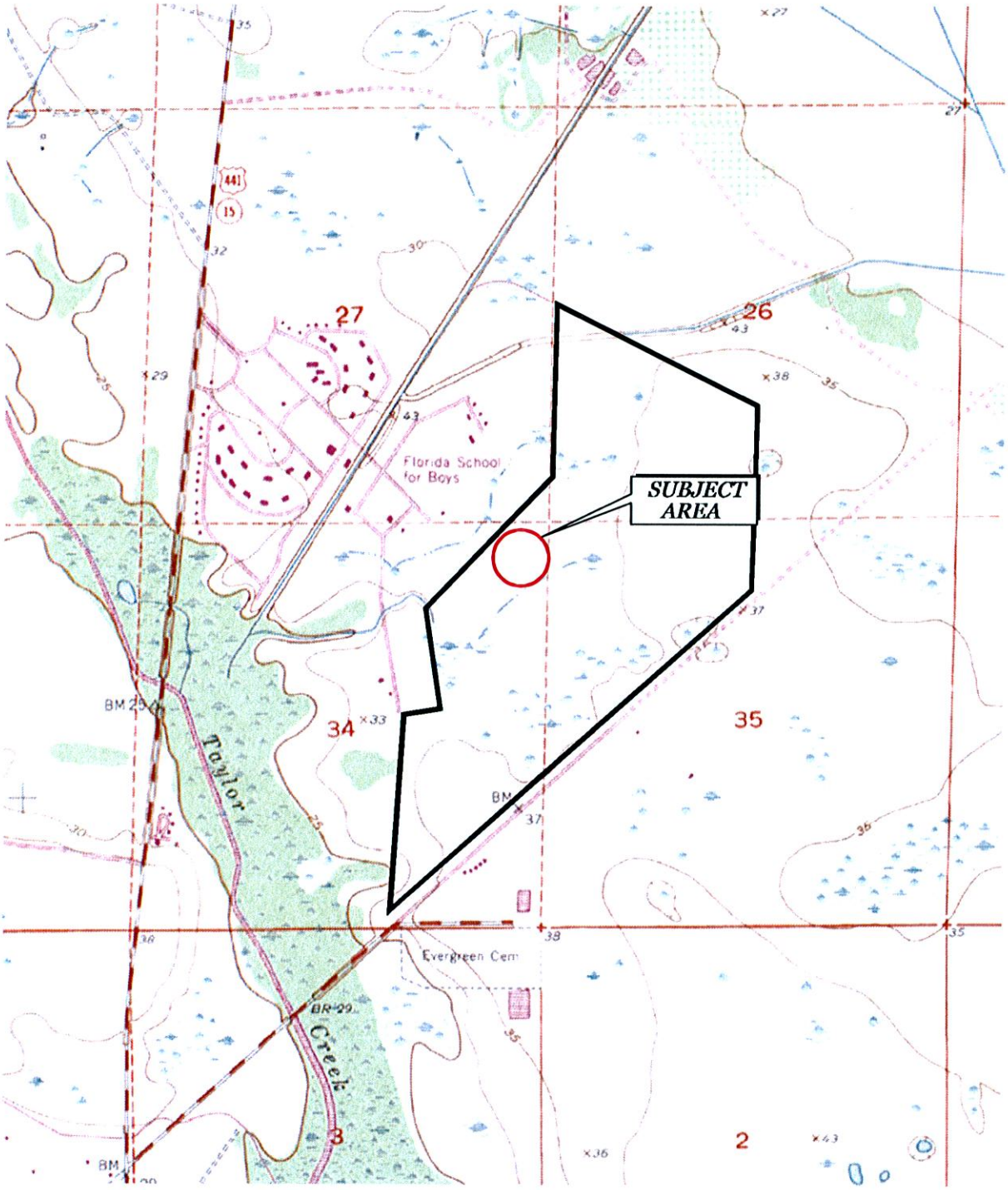
5.5 Accident Report

In the event of any injury, the following action should be taken:

- Notify plant supervisor as soon as possible, but within 24 hours. If necessary, seek medical attention.
- Complete any investigation report forms that may be required and consult plant supervisor.
- Complete any Worker's Compensation forms and consult plant supervisor.

Failure to follow proper reporting procedures may result in disqualification for benefits under Worker's Compensation law. It is in the employee's best interest to ensure that all incidents that result in injuries are promptly brought to a supervisor's attention and properly recorded.

FIGURES



REFERENCE: U.S.G.S. "TAYLOR CREEK SE, FLORIDA" QUADRANGLE MAP

SECTION: 27 AND 34
TOWNSHIP: 36 SOUTH
RANGE: 35 EAST

ISSUED: 1953
PHOTOREVISED: 1972

LEGEND

PROPERTY BOUNDARY

Andreyev Engineering, Inc.

APPROXIMATE SCALE:	DATE: 10/27/08	ENGINEER: SA
1"=2000'	PN:GPGW-05-0430	DRAWN BY: MS

OKEECHOBEE WWTF EXPANSION
UIC INJECTION WELL PROJECT

OKEECHOBEE, FLORIDA

SITE VICINITY MAP

FIGURE 1

NORTH

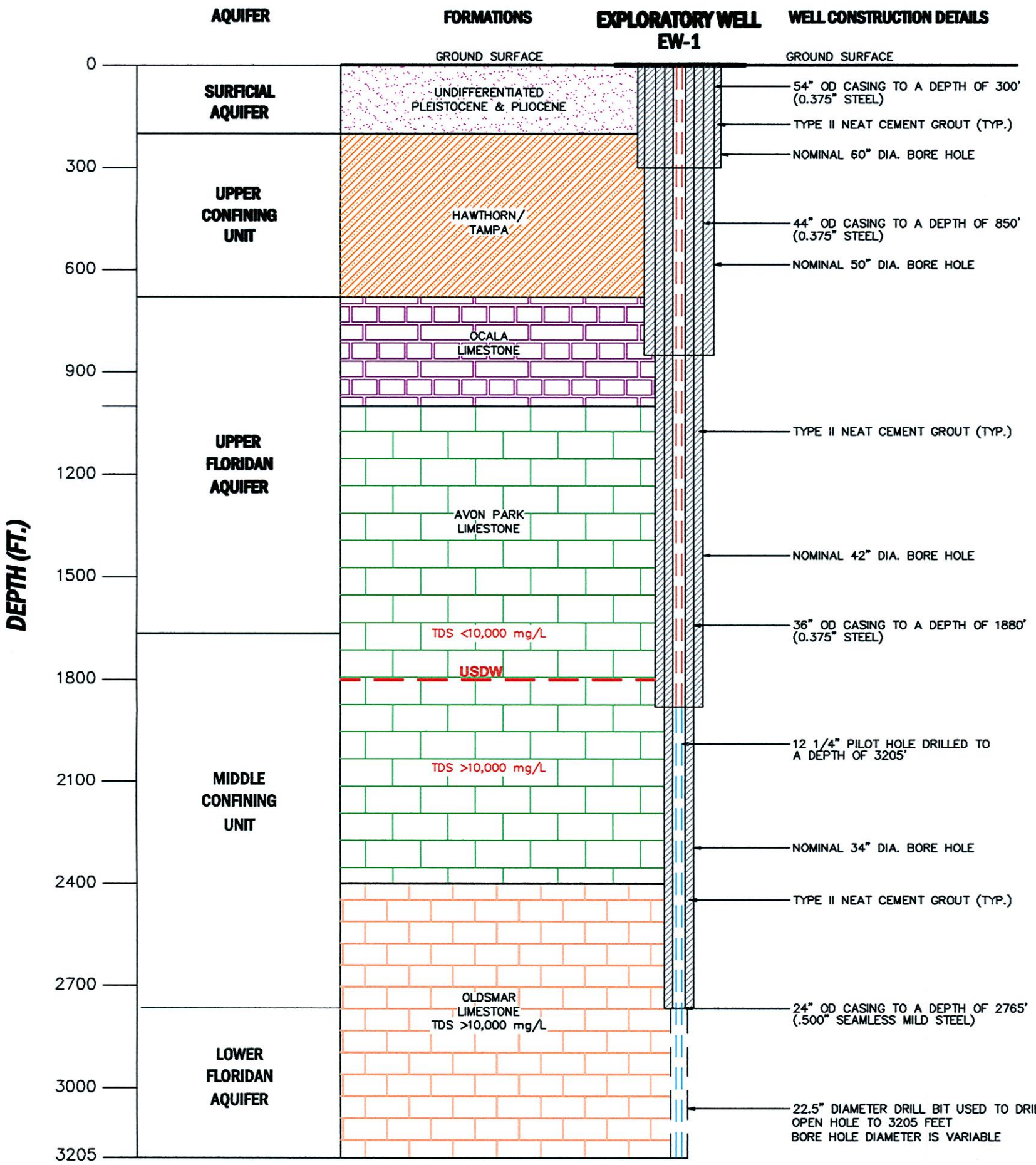
LEGEND

- ● PROPOSED DEEP INJECTION WELL LOCATION
- ◔ PROPOSED EXPLORATORY WELL/ MONITORING WELL LOCATION
- ⊙ EXISTING WELL AS IDENTIFIED ON SFWMD WEBSITE

Raymond W. Jones, P.E.
FL Registration No.: 58079

Andreyev Engineering, Inc.
SANFORD OFFICE
4055 St. Johns Parkway
Sanford, Florida 32771
407-330-7763
Fax: 407-330-7765
Certificate of Authorization: 7634

APPROXIMATE SCALE: 1"=1500'	DATE: 10/27/08	ENGINEER: SA	OKEECHOBEE WWTF EXPANSION UIC INJECTION WELL PROJECT
	PN: GPGW-05-430	DRAWN BY: MS	A.O.R. AERIAL PHOTO
			FIGURE 2



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OKEECHOBEE WWTF EXPANSION
UIC INJECTION WELL PROJECT
OKEECHOBEE, FLORIDA

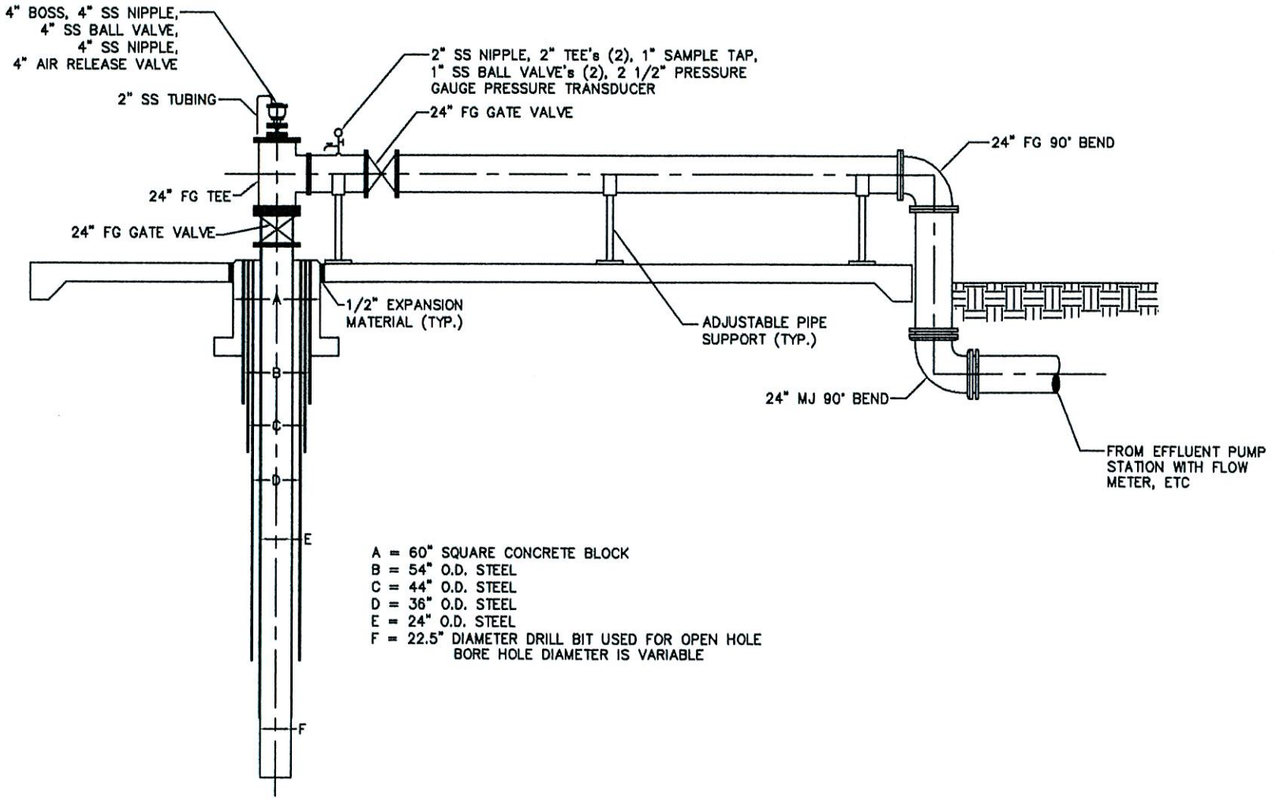
EXPLORATORY WELL CONSTRUCTION DETAIL

FIGURE 3

APPROXIMATE SCALE:	DATE: 02/25/09	ENGINEER: RJ
N.T.S.	PN:GPGW-05-0430	DRAWN BY: MS

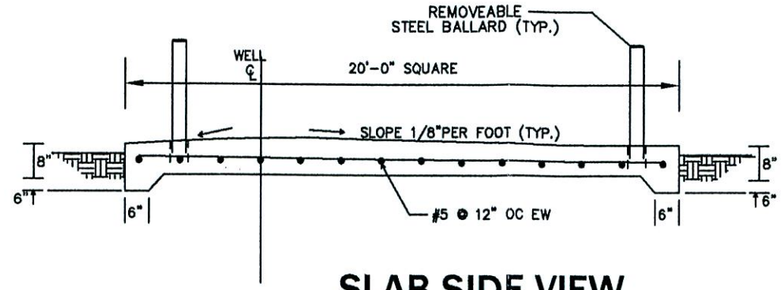
Raymond W. Jones, P.E.
FL Registration No.: 58079

RAYMOND W. JONES — STATE OF FLORIDA — PROFESSIONAL ENGINEER

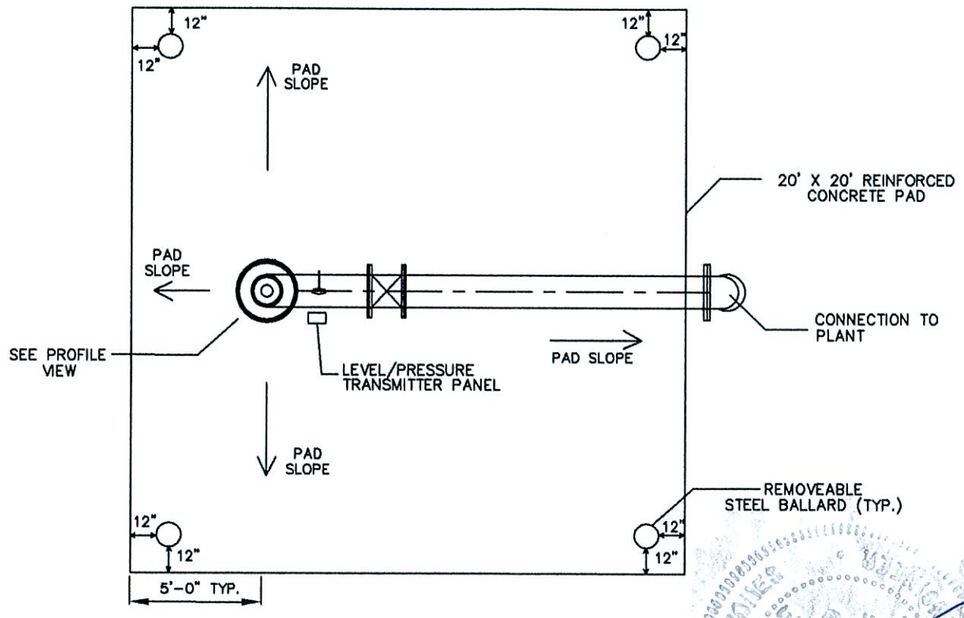


A = 60" SQUARE CONCRETE BLOCK
B = 54" O.D. STEEL
C = 44" O.D. STEEL
D = 36" O.D. STEEL
E = 24" O.D. STEEL
F = 22.5" DIAMETER DRILL BIT USED FOR OPEN HOLE
BORE HOLE DIAMETER IS VARIABLE

PROFILE VIEW



SLAB SIDE VIEW



TOP VIEW

SEE PROFILE VIEW FOR DETAILS

Raymond W. Jones, P.E.
FL Registration No.: 58079

Andreyev Engineering, Inc.
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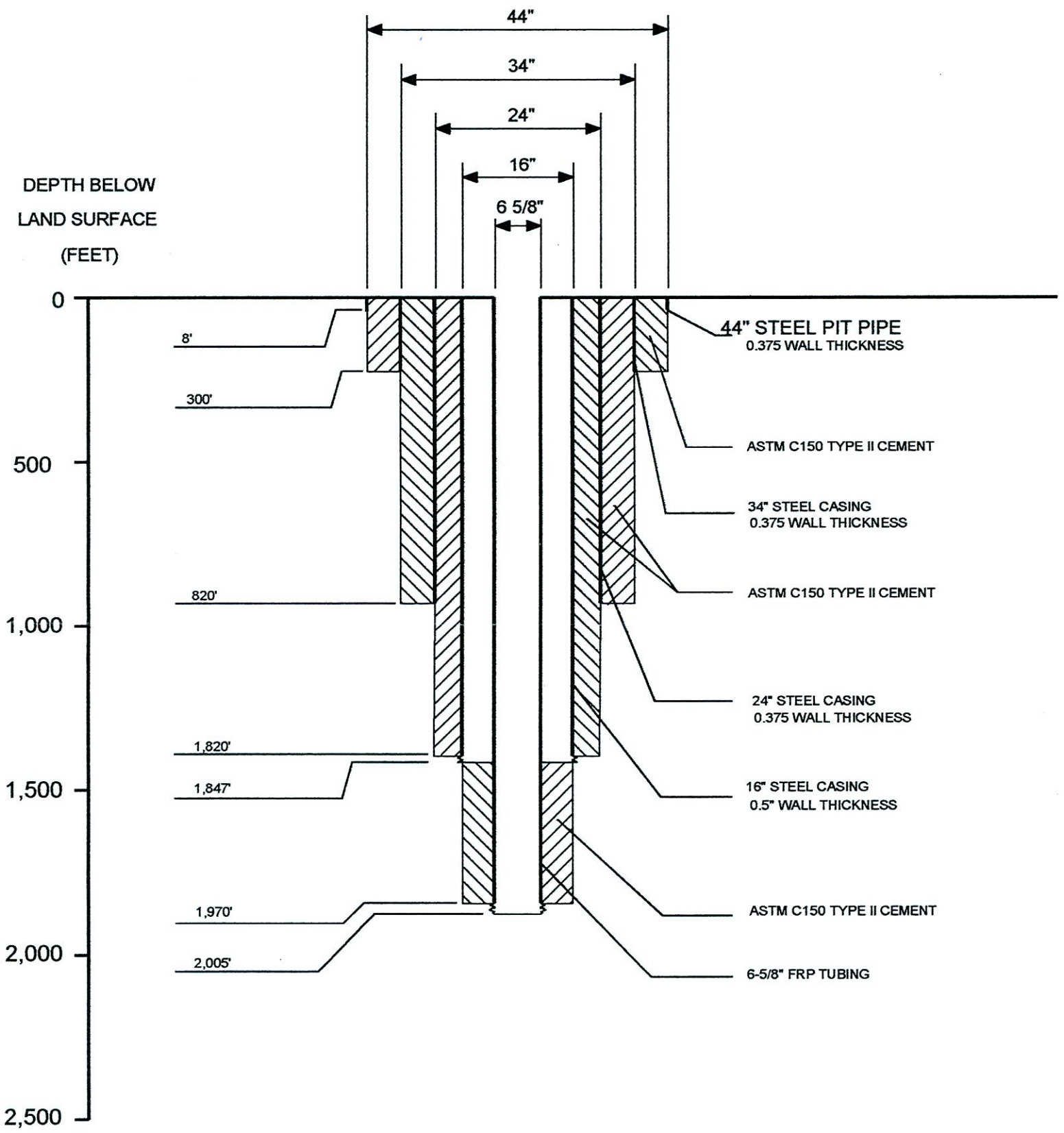
DRILLING AND TESTING PLAN
OKEECHOBEE WWTF EXPANSION
UIC INJECTION WELL PROJECT
OKEECHOBEE, FLORIDA
EXPLORATORY/INJECTION WELL HEAD DETAIL
FIGURE 4

APPROXIMATE SCALE:	DATE: 02/25/09	ENGINEER: SA
N.T.S.	PN:GPGW-05-0430	DRAWN BY: MS

DUAL ZONE
MONITORING WELL



NOT TO SCALE

Raymond W. Jones, P.E.
FL Registration No.: 58079

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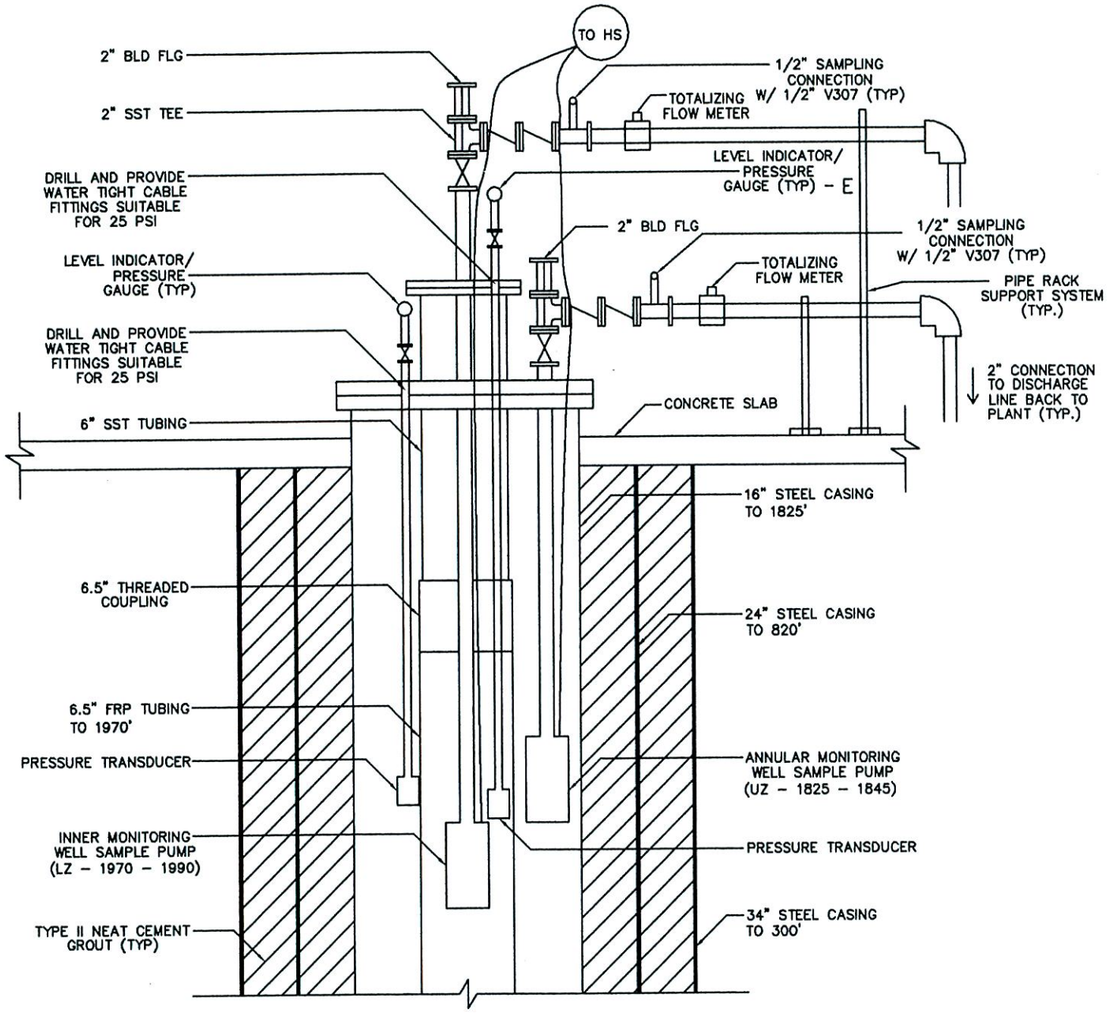
DRILLING AND TESTING PLAN
OKEECHOBEE WWTF EXPANSION
UIC INJECTION WELL PROJECT
OKEECHOBEE, FLORIDA

DUAL ZONE MONITORING WELL CONSTRUCTION DETAIL

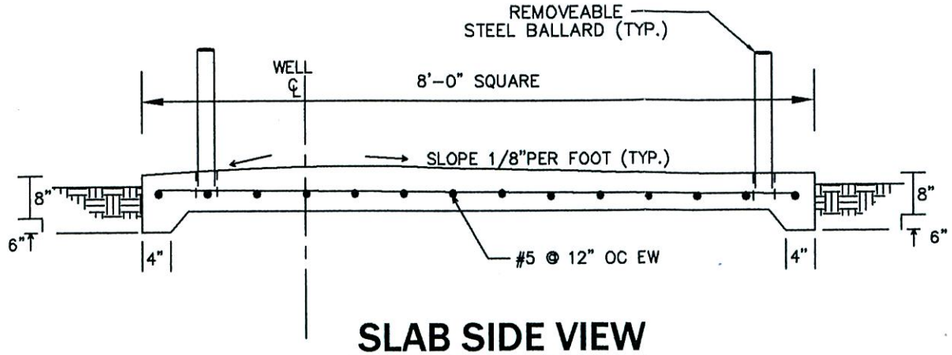
APPROXIMATE SCALE:	DATE: 02/25/09	ENGINEER: RJ
N.T.S.	PN: GPGW-05-0430	DRAWN BY: MS

FIGURE 5

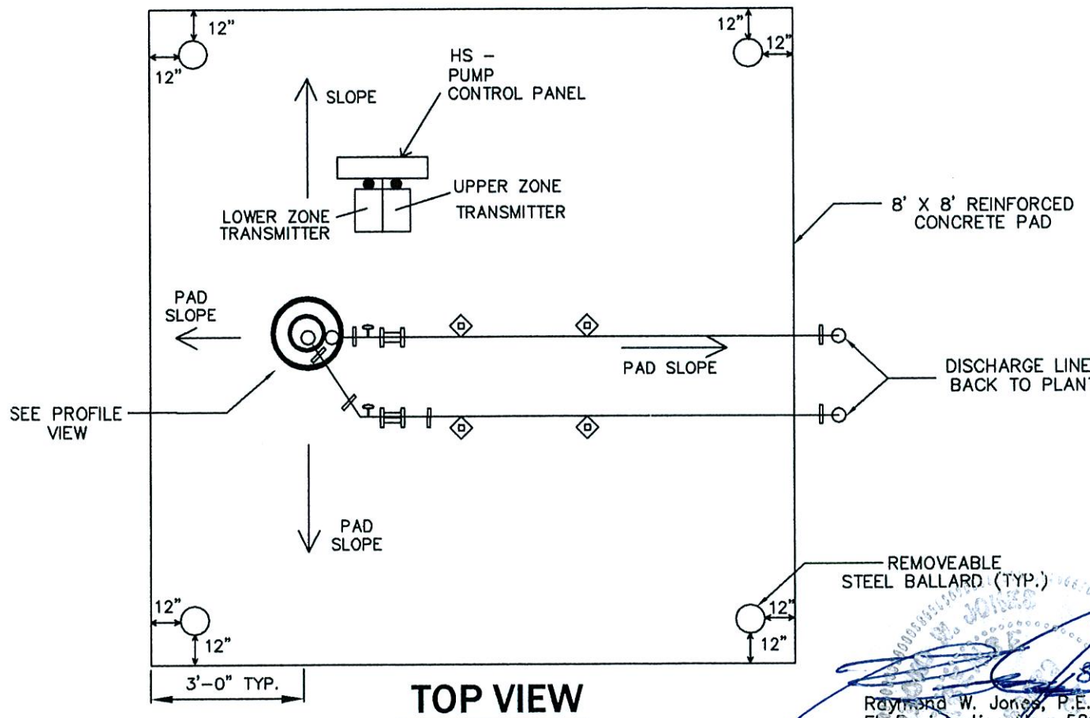


PROFILE VIEW

(SEE CASING CONSTRUCTION DETAILS IN FIGURE 14)



SLAB SIDE VIEW



TOP VIEW

8/14/09
Raymond W. Jones, P.E.
FL Registration No.: 58079

Andreyev Engineering, Inc.
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APPROXIMATE SCALE:	DATE: 02/25/09	ENGINEER: SA
N.T.S.	PN:GPGW-05-0430	DRAWN BY: MS

DRILLING AND TESTING PLAN
OKEECHOBEE WWTF EXPANSION UIC INJECTION WELL PROJECT
OKEECHOBEE, FLORIDA
DUAL ZONE MONITORING WELL HEAD DETAIL
FIGURE 6

ATTACHMENT A
FDEP CONSTRUCTION PERMIT # 40824-44-UC

Department of
Environmental Protection

Southeast District
400 N. Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Charlie Crist
Governor

Jeff Kottkamp
Lt. Governor

Michael W. Sole
Secretary

August 17, 2007
ELECTRONIC CORRESPONDENCE

NOTICE OF PERMIT

John F. Hayford, PE
Executive Director
Okeechobee Utility Authority
100 SW 5th Avenue
Okeechobee, FL 34974-4221

OKEECHOBEE COUNTY
UIC - Okeechobee Utility Authority
Cemetery Road Wastewater Treatment Facility
FILE: 40824-44-UC
Class V Group 9 Exploratory Well EW-1 and MW-1

Dear Mr. Hayford:

Enclosed is Permit Number 40824-44-UC, to construct an exploratory well system for Okeechobee Utility Authority, consisting of a Class V Group 9 exploratory well, EW-1, with one associated dual zone monitoring well, MW-1, issued pursuant to Section(s) 403.087, Florida Statutes and Florida Administrative Codes 62-4, 62-520, 62-522, 62-528, 62-550 and 62-660. The system is located at the Okeechobee Utility Authority Cemetery Road Wastewater Treatment Facility.

Any party to this Order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, Mail Stop 35, 3900 Commonwealth Blvd., Tallahassee, Florida 32399-3000; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this Notice is filed with the Clerk of the Department.

Should you have any questions, please contact Heidi Vandor, PG, or Joseph R. May, PG, of this office at (561) 681-6695 or (561) 681-6691, respectively.

Executed in West Palm Beach, Florida.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

For _____ 8/16/07
Jack Long — Date
District Director
Southeast District

JL/LAB/JRM/HV
cc: Rich Deuerling, FDEP/TAL
Steve Anderson, SFWMD/WPB
George Heuler, FDEP/TLH
Heidi Vandor, FDEP/WPB
Nancy Marsh, USEPA/ATL
Ray Jones, Andreyev Eng

CERTIFICATE OF SERVICE

This is to certify that this NOTICE OF PERMIT and all copies were mailed before the close of business on August 17, 2007 to the listed persons.
Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to the §120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

_____ August 17, 2007
Clerk — Date

Department of
Environmental Protection
Southeast District
400 N. Congress Avenue, Suite 200
West Palm Beach, Florida 33401

PERMITTEE:
John F. Hayford, PE
Executive Director
Okeechobee Utility Authority
100 SW 5th Avenue
Okeechobee, FL 34974-4221

PERMIT/CERTIFICATION NO: 40824-44-UC
DATE OF ISSUE: August 17, 2007
EXPIRATION DATE:August16,2009
COUNTY: St. Lucie
POSITION: 27° 17' 59"N / 80° 48' 48"W

PROJECT: Okeechobee Utility Authority - Cemetery Road Wastewater Treatment Facility
Exploratory well EW-1 and association monitoring well MW-1

This permit is issued under the provisions of Chapter 403.087, Florida Statutes (F.S.), and Florida Administrative Code (F.A.C.) Rules 62-4, 62-520, 62-522, 62-528, 62-550, and 62-660. The above named permittee is hereby authorized to perform the work or construct the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

TO CONSTRUCT AND TEST: a Class V Group 9 exploratory well, EW-1, consisting of a 24-inch diameter final casing, and an associated dual zone monitor well, MW-1. The purpose of the exploratory well is to obtain site specific hydrogeologic information, to determine the feasibility of repermitting the exploratory well as a Class I injection well, for the future disposal and monitoring of treated municipal wastewater at the Okeechobee Utility Authority Cemetery Road Wastewater Treatment Facility.

Under this permit, only the construction and testing of EW-1 and MW-1 is permitted. Based on the regional correlation of hydrogeologic data, the proposed injection is into the Boulder Zone in the lower Oldsmar Formation in the open hole interval of approximately 2900 and 3200 feet below land surface (bls); with the underground source of drinking water (USDW) estimated at about 1700 feet bls. The confinement of the injection zone from overlying USDW aquifers and fluid movement adjacent to the well bore will be monitored by the dual zone monitoring well, MW-1. The upper monitoring interval is designed to monitor within, and near the base of the USDW. The lower monitoring interval is for the purpose of monitoring below the lowermost USDW. The proposed 50 foot monitoring intervals are estimated at approximately 1650 feet and 1900 feet. All described depths are estimated and based upon extrapolations of regional data; exact depths will be based on site specific information obtained during construction and testing subject to Department approval as stated in the permit.

IN ACCORDANCE WITH: Application to Construct a Class V Group 9 exploratory well received February 8, 2006 in SED, and received in Tallahassee on April 12, 2006; Request for Information (RFI) via meeting and teleconference on April 20, 2006; request from OUA to suspend processing on April 20, 2006; response to RFI received in the form of a revised application on June 19, 2006; RFI sent on July 28, 2006; response to RFI received on October 20, 2006; RFI sent on December 6, 2006; response to RFI received on December 27, 2006; RFI dated February 21, 2007; response to RFI received on February 26, 2007; Certificate of Financial Responsibility approved on April 17, 2007; publication of the Notice of Draft Permit in The Okeechobee News newspaper on May 9, 2007; and in consideration of public comment received as a result of the public meeting held on June 13, 2007 at 10:00 am.

LOCATED AT: Okeechobee Utility Authority, 1339 N.E. 39th Boulevard (Cemetery Road) Wastewater Treatment Facility, Okeechobee, Okeechobee County, Florida

TO SERVE: Okeechobee Utility Authority, Cemetery Road Wastewater Treatment Facility, service area.

SUBJECT TO: General Conditions 1-24 and Specific Conditions 1-11.

GENERAL CONDITIONS:

The following General Conditions are referenced in Florida Administrative Code Rule 62-528.307.

1) The terms, conditions, requirements, limitations and restrictions set forth in this permit are "permit conditions" and are binding and enforceable pursuant to Section 403.141, F.S.

2) This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action.

3) As provided in subsection 403.087(7), F.S., the issuance of this permit does not convey any vested rights or exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor infringement of federal, state, or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in this permit.

4) This permit conveys no title to land, water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

5) This permit does not relieve the permittee from liability for harm to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefrom; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

6) The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed and used by the permittee to achieve compliance with the conditions of this permit, or are required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7) The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at reasonable times, access to the premises where the permitted activity is located or conducted to:

   a) Have access to and copy any records that must be kept under conditions of this permit;
   b) Inspect the facility, equipment, practices, or operations regulated or required under this permit; and
   c) Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

   Reasonable time will depend on the nature of the concern being investigated.

8) If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

   a) A description of and cause of noncompliance; and
   b) The period of noncompliance, including dates and times; or, if not corrected the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent the recurrence of the noncompliance. The permittee shall be responsible for any and all

damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9) In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is proscribed by Sections 403.111 and 403.73, F.S. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10) The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance; provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11) This permit is transferable only upon Department approval in accordance with rules 62-4.120 and 62-528.350, F.A.C. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12) This permit or a copy thereof shall be kept at the work site of the permitted activity.

13) The permittee shall comply with the following;

a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records shall be extended automatically unless the Department determines that the records are no longer required.

b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

c) Records of monitoring information shall include:

i) the date, exact place, and time of sampling or measurements;
ii) the person responsible for performing the sampling or measurements;
iii) the dates analyses were performed;
iv) the person responsible for performing the analyses;
v) the analytical techniques or methods used;
vi) the results of such analyses.

d) The permittee shall furnish to the Department, within the time requested in writing, any information which the Department requests to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit.

e) If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

14) All applications, reports, or information required by the Department shall be certified as being true, accurate, and complete.

15) Reports of compliance or noncompliance with, or any progress reports on, requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each scheduled date.

16) Any permit noncompliance constitutes a violation of the Safe Drinking Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

17) It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

18) The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.

19) This permit may be modified, revoked and reissued, or terminated for cause, as provided in 40 CFR Sections 144.39(a), 144.40(a), and 144.41 (1998). The filing of a request by the permittee for a permit modification, revocation or reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

20) The permittee shall retain all records of all monitoring information concerning the nature and composition of injected fluid until five years after completion of any plugging and abandonment procedures specified under Rule 62-528.435, F.A.C. The permittee shall deliver the records to the Department office that issued the permit at the conclusion of the retention period unless the permittee elects to continue retention of the records.

21) All reports and other submittals required to comply with this permit shall be signed by a person authorized under Rules 62-528.340(1) or (2), F.A.C. All reports shall contain the certification required in Rule 62-528.340(4), F.A.C.

22) The permittee shall notify the Department as soon as possible of any planned physical alterations or additions to the permitted facility. In addition, prior approval is required for activities described in Rule 62-528.410(1)(h), F.A.C.

23) The permittee shall give advance notice to the Department of any planned changes in the permitted facility or injection activity which may result in noncompliance with permit requirements.

24) The permittee shall report any noncompliance which may endanger health or the environment including:

    a) Any monitoring or other information which indicates that any contaminant may cause an endangerment to an underground source of drinking water; or
    b) Any noncompliance with a permit condition or malfunction of the exploratory well system which may cause fluid migration into or between underground sources of drinking water.

    Information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within five days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

SPECIFIC CONDITIONS

1. GENERAL REQUIREMENTS

a. This permit is to construct and test the Okeechobee Utility Authority, Cemetery Road Wastewater Treatment Facility Class V Group 9 exploratory well, EW-1, and associated dual zone monitoring well, MW-1. This permit does not authorize the construction or testing of any other well or wells associated with this facility, except as specified in this permit.

b. The permittee shall give advance notice to the Department of any planned changes in the permitted facility or injection activity which may result in noncompliance with permit requirements.

c. Pursuant to Rule 62-4.080(3), F.A.C., a permittee may request that a permit be extended as a modification of an existing permit. A request for an extension is the responsibility of the permittee and shall be submitted to the Department before the expiration of the permit. In accordance with Rule 62-4.070(4), F.A.C., a permit cannot be extended beyond the maximum five year statutory limit. Should construction and testing need to continue beyond five year limit of this permit, the permittee must renew this construction permit.

d. This permit shall be subject to all requirements of Okeechobee County and the South Florida Water Management District regarding the construction and testing of this exploratory well.

e. No fluid shall be injected without written authorization from the Department, with the exception of fluids required for drilling operations. The issuance of this permit does not obligate the Department to authorize its operation, unless the well, monitoring system and surface appurtenances qualifies for an authorization. Note: exploratory wells do not inject as part of the testing program.

f. No underground injection is allowed that causes or allows movement of fluid into an underground source of drinking water (USDW) if such fluid movement may cause a violation of any primary drinking water standard or may otherwise adversely affect the health of persons. Note: exploratory wells do not inject as part of the testing program.

g. Signatories and Certification Requirements

i. All reports and other submittals required to comply with this permit shall be signed by a person authorized under Rules 62-528.340(1) or (2), F.A.C.

ii. In accordance with Rule 62-528.340(4), F.A.C., all reports shall contain the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

2. SITE REQUIREMENTS

a. The measurement points for all construction and testing operations shall be surveyed and referenced to the North American Vertical Datum (NAVD) of 1988 prior to the onset of construction activities.

b. Four surficial aquifer monitoring wells, identified as Pad Monitoring Wells (PMWs), shall be located at the corners of the exploratory well drilling pad and identified by location number and pad location, (i.e., NW, NE, SW, and SE). If located in a traffic area, the well head(s) must be protected by a traffic bearing enclosure and cover. Individual cover(s) must lock and be specifically marked to identify the well and its purpose.

   i. These wells shall be sampled and analyzed prior to the onset of drilling for chlorides, conductivity, temperature, and water level (relative to NAVD 1988). Initial analyses must be submitted prior to the initiation of work.

   ii. These wells are to be retained in service, sampled weekly for the above parameters during the construction and testing phases, through the completion of mechanical integrity testing.

   iii. If these wells are retained in service, they shall also be sampled 48 hours prior to any maintenance, testing or repairs to the system, which represent an increased potential for accidental discharge to the surficial aquifer. The results of these analyses shall be submitted to the Department within 30 days of the completion of the activity. The permittee must request, and shall obtain Department authorization prior to discontinuing sampling of the PMWs and also for plugging and abandonment of the PMWs.

   The results of the analyses shall be submitted to the Department with the weekly well construction report. An FDEP Southeast District Summary Sheet is attached for your use when reporting the above information.

3. **CONSTRUCTION AND TESTING REQUIREMENTS**

a. The Department shall be notified within 48 hours after work has commenced.

b. Blow-out preventers or equal shall be installed on the exploratory well prior to penetration of the Floridan Aquifer System.

c. Hurricane Preparedness - Upon the issuance of a "Hurricane Watch" by the National Weather Service, the preparations to be made shall include but are not limited to the following:

   i. Secure all on-site chemicals, and other stockpiled additive materials to prevent surface and/or ground water contamination.

   ii. Properly secure drilling equipment and rig(s) to prevent damage to well(s) and on-site treatment process equipment as well as public property.

d. Waters spilled during construction or testing shall be contained and properly disposed.

e. UIC-TAC review and Department approval are required for the following stages of construction and testing, pursuant to Chapter 62-528, F.A.C.

   i. Final updated contract documents, and project startup date.

   ii. A drilling and system construction schedule shall be submitted to the Department and the Underground Injection Control–Technical Advisory Committee (UIC-TAC) prior to site preparation for the exploratory well system.

   iii. Pre-construction monitoring data, including results and interpretation of the four shallow pad monitoring wells.

   iv. Intermediate casing seat.

v. Final casing seat.

vi. Proposed cementing procedures (including cement volumes, number of stages) for the intermediate and final casing must be submitted with the caliper logs (reamed sections)

vii. Monitoring zone selection and casing seat(s).

viii. Mechanical integrity testing

ix. Short term injection testing

f. The formation evaluation program shall consist of the construction, testing and geophysical logging program, the formation core sampling program and the packer testing program.

g. The construction, testing and geophysical logging program shall be implemented in accordance with this permit and as proposed in the "Revised Application for Exploratory Well Construction and Testing Permit" received by the Department on June 19, 2006; the RFI response received on October 23, 2006 Attachment 10 that includes the drilling and testing plan for MW-1; and the RFI response received on December 27, 2006 Attachment D that includes the drilling and testing plan for EW-1.
All depths specified are approximate. Final depths will be determined based on site specific data obtained during construction and testing, and are subject to the conditions of this permit. The program shall, at a minimum, include:

Exploratory Well EW-1

Install 54-inch diameter surface casing to approximately 700 feet bpl:
temperature-static, after each cement stage

Drill 12-inch diameter pilot hole to approximately 700 feet bpl:
Dual induction log with SP, gamma ray, caliper, magnetic deviation survey

Ream 50-inch diameter hole to approximately 700 feet bpl:
caliper

Drill 12-inch diameter pilot hole to approximately 1900 feet bpl:
Below 1200 feet, at every rod change sample for conductivity, chlorides, TDS.
Dual induction log with SP, fluid resistance-static and pumping, temperature-static and pumping, gamma ray, flowmeter-static and pumping, caliper, borehole compensated acoustic log with variable density display, video survey (downhole radial color TV survey with rotating lens), magnetic deviation survey

Ream 42-inch diameter hole to approximately 1800 feet bpl:
caliper

Set 36-inch diameter intermediate casing to approximately 1800 feet bpl:
temperature-static, after each cement stage; pressure test

Drill 12-inch diameter pilot hole to approximately 3200 feet bpl:
Dual Induction log with SP, fluid resistance-static and pumping, temperature-static and pumping, gamma ray, flowmeter-static and pumping, caliper, borehole compensated acoustic log with variable density display, video survey (downhole radial color TV survey with rotating lens), magnetic deviation survey, BHTV may be substituted for a video in the event the video is poor quality.

Ream 34-inch diameter hole to approximately 2900 feet bpl:
caliper

Set 24-inch diameter final casing to approximately 2800 feet bpl:
temperature-static, after each cement stage, cement bond log with variable density display, gamma ray; pressure test

Drill 22.5-inch diameter hole from approximately 2900 to 3200 feet bpl:
Fluid resistance-static, temperature-static, gamma ray, caliper, borehole compensated acoustic log with variable density display, video survey, BHTV may be substituted for a video in the event the video is poor quality

Monitor Well MW-1

Drill 12-inch diameter pilot hole to approximately 700 feet bpl:
Gamma ray, caliper, magnetic deviation

Ream 30.5-inch diameter hole to approximately 700 feet bpl:
Caliper, magnetic deviation

Set 24-inch diameter casing to approximately 700 feet bpl:
Temperature-static, after each cement stage, gamma ray

Drill 12-inch diameter pilot hole to approximately 1900 feet bpl:
Below 1200 feet, at every rod change sample for conductivity, chlorides, TDS
Fluid resistance-static and pumping, temperature-static and pumping, gamma ray, flowmeter-static and pumping, caliper, dual induction log with SP, borehole compensated acoustic log with variable density display, magnetic deviation, optional video

Ream 23.5-inch diameter hole to approximately 1500 feet bpl:
Caliper, magnetic deviation

Set 16-inch diameter casing to approximately 1500 feet bpl (to top interval of UMZ):
Temperature-static, after each cement stage
Pressure test

Ream 14.5-inch diameter hole to approximately 1550 feet bpl (to bottom interval of UMZ):
Perform step drawdown test and perform water quality sampling and analysis

Continue to ream 14.5-inch hole to approximately 1850 feet bpl (to bottom interval of LMZ):
Fluid resistance-static and pumping, temperature-static and pumping, gamma ray, flowmeter-static and pumping, caliper, dual induction log with SP, borehole compensated acoustic log with variable density display, magnetic deviation, optional video

Set 6-inch diameter casing to 1800 feet bpl (to top of LMZ):
Temperature-static and, gamma ray after each cement stage
Pressure test

Complete well to 1850 feet bpl:
Fluid resistance-static, temperature, gamma ray, caliper, video survey, cement bond log with variable density display

The pumping logs for EW-1 and MW-1 shall be run while pumping the borehole at a rate that adequately stresses the confining units, as shown by head loss across the beds, and allows the log interpreter to clearly identify the confining beds.

h. A formation core sampling program shall be implemented. The core samples are to be analyzed so that the results can be used in the demonstration of confinement. For this reason, the core samples shall be collected in the anticipated lower confining sequence, from the base of the USDW to the top of the injection zone. The number of cores shall be sufficient to accomplish this and it is reasonably anticipated that six or more may be required.

i. The packer testing shall be implemented in accordance with this permit and as proposed in the documents listed in SC 3.g. The program shall, at a minimum include 11 packer tests.

j. Packer tests will be conducted to isolate the base of the USDW in EW-1 and MW-1

   i. At least one straddle packer test conducted in each proposed monitoring zone of MW-1.

   ii. At least six packer tests shall be conducted from the lowermost zone of the base of the USDW to the top of the proposed injection horizon. These packer tests will be used for the demonstration of confinement. For this reason the packer tests will be performed in the anticipated confining zones. To the extent feasible, the packer tests shall be performed over intervals that do not include high hydraulic conductivity beds.

   iii. Water samples shall be collected from each packer test, and analyzed for total dissolved solids, chlorides, conductivity, ammonia, total Kjeldahl nitrogen and sulfate. A 2.5 gallon water sample from intervals where sufficient water is available, shall be collected at the end of the packer test. These samples shall be shipped to the Florida Geological Survey Hydrogeology Program, 903 W. Tennessee Street, Tallahassee, Florida 32304.

k. Throughout the construction phase, all of the required monitoring data shall be tabulated and graphed on a weekly basis for inclusion into the weekly construction progress reports submitted on a weekly basis to the Department. Should anomalous chlorides or TDS be detected in the shallow pad monitor wells during the exploratory well system construction phase, an assessment plan shall be submitted, for Department review and approval, to address whether or not the changed water quality conditions have occurred because of activities during well construction. Should the Department determine that the changed water quality conditions are attributable to activities during well construction, then a report (including an assessment plan) shall be submitted to address appropriate remediation measures (if any).

l. The depth of the USDW and the background water quality of the monitoring zones shall be determined during drilling and testing. Determination of the depth of the USDW shall be accomplished, interpreted, analyzed using the following information:

   i. Water samples from packer tests with analysis and interpretation

   ii. Aquifer performance test data with analysis and interpretation

   iii. Geophysical logging upon reaching the total depth of the appropriate pilot hole interval using, as a minimum, the following logs: caliper, gamma, dual induction, borehole compensated sonic, pumping flow meter, temperature, and fluid resistivity.

   iv. Plots of sonic porosity and apparent formation fluid resistivity (RWA). Interpretation will include the calculation of sonic porosity and RWA, and the input parameters used will be provided.

m. The confinement of the injection zone, from overlying aquifers, shall be monitored by the dual zone monitoring well MW-1 and a regular monitoring program. The lower interval is to be located within a transmissive interval below the base of the USDW (i.e., where the total dissolved solids concentration value of the ground water is greater than 10,000 mg/L) and the monitoring zone as

a near as is appropriate to the top of the injection zone. The upper interval shall ideally be located within a transmissive interval immediately above the base of the lowermost USDW (the TDS value of the ground water is less than or equal to 10,000 mg/L). The data and analysis supporting the selection of these monitoring intervals shall be simultaneously submitted to the Department and the UIC-TAC — after the collection, interpretation and analysis of all the required data (geophysical logs, cores, and fluid sample analyses). The hydrogeologic evaluation of the proposed monitoring zone will be submitted only after the collection, interpretation and analysis of all required date (geophysical logs, cores, fluid sample analyses, and packer tests). The final selection of the specific upper and lower monitoring intervals shall be approved by the Department.

n. To identify the upper and lower monitoring zones, the following information shall be analyzed, interpreted and submitted:

   i. television survey (borehole imaging)

   ii. the permeability of the transition zone in the vicinity of the USDW

   iii. packer test data including water quality (as a minimum, total dissolved solids, chlorides, ammonia, total Kjeldahl as nitrogen, and specific conductivity)

   iv. the specific capacity of the proposed upper and lower monitoring zones

   v. the identification of the base of the USDW

o. Recommended casing depths in EW-1 and the monitoring intervals in MW-1 shall be accompanied by technical justification, geophysical logs with engineering and geological interpretations and water quality data. Department approval shall be based on the permittee's presentation that shows compliance with Department rules and this permit.

p. Confinement shall be demonstrated using, at a minimum, directly measured lithologic properties, geophysical evidence, and tests performed while pumping the formation, as described below:

   i. Formation tests shall include flow meter logs, packer tests, water quality sampling during packer tests, and analysis of drawdown curves measured during packer tests. These tests shall be conducted under pumping conditions to directly measure the hydraulic properties of the confining beds.

   ii. For the purpose of determining confinement, flow meter, temperature and fluid resistivity logs shall be run in the pilot hole from the base the USDW to the total depth of the well, under pumping conditions, at a pumping rate that adequately stresses the confining beds (as demonstrated by head loss across the beds), so that the permeability of the zones within the potential confining intervals can be evaluated.

   iii. Other geophysical logs will be used as indirect evidence to deduce or correlate formation properties measured in pumping tests and direct lithologic sample analysis.

   iv. Lithologic properties of core samples measured in the laboratory shall include: hydraulic conductivity (vertical and horizontal), Young's modulus/elastic formation factor, Archie's cementation exponent and coefficient, and specific gravity.

q. If effluent is encountered or suspected during pilot hole drilling and testing, the Department shall be notified immediately by telephone and in writing and immediate appropriate precautionary measures shall be taken to prevent any upward fluid movement. These measures include pumping barite through the drill rod to form a density balance plug to prevent any upward fluid

movement. The permittee will then provide full documentation of the event to the Department which shall include, but not be limited to, geophysical logging, packer testing and thief sampling. If the presence of effluent is confirmed, the permittee will notify the Department of its plan to place a cement plug or drillable packer assembly just above the documented presence of effluent, prior to continuation of testing of the pilot hole.

r. Mechanical integrity of the exploratory well shall be determined pursuant to Rule 62-528.300(6)(b)2, and (c), F.A.C.

   i. The pressure test shall be accepted if tested at 1.5 times the expected operating pressure with a test tolerance of a total change not greater than 5 percent, above or below initial pressure.

   ii. Verification of pressure gauge calibration must be provided to the Department representative at the time of the test and in the certified test report.

   iii. Pad monitoring wells shall be sampled and waters analyzed for water depth, chlorides, total dissolved solids, temperature and specific conductivity one week prior to the onset of the mechanical integrity testing. (A copy of the SED reporting sheet is attached.)

s. UIC-TAC meetings are scheduled on the second and fourth Tuesday of each month subject to a five working day prior notice and timely receipt of critical data by all UIC-TAC members. Emergency meetings may be arranged when justified to avoid construction delays.

t. Department approval at a scheduled UIC-TAC meeting shall be based on the permittee's presentation that shows compliance with Department rules and this permit.

u. No drilling operations shall begin without an approved disposal site for drilling fluids, cuttings, or waste. It shall be the permittee's responsibility to obtain the necessary approval(s) for disposal prior to the start of construction. Any formation waters discharged to surface or surficial aquifer waters during an aquifer performance test shall require an Industrial Wastewater permit from the Department, unless otherwise authorized.

v. An interpretation of all test results and geophysical logs must be submitted with all submittals.

4. QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

a. Pursuant to Rule 62-528.440(5)(b), F.A.C., the Professional Engineer(s) of Record shall certify all documents related to the completion of the exploratory (including the associated Floridan Aquifer monitoring well). The Department shall be notified immediately of any change of the Engineer(s) of Record.

b. In accordance with Chapter 492, F.S., all documents prepared for the geological/hydrogeological evaluation of this exploratory well system shall be signed and sealed by a Florida Licensed Professional Geologist or qualified Florida Registered Professional Engineer.

c. Continuous on-site supervision by qualified personnel (engineer and/or geologist) is required during all testing, geophysical logging and cementing operations.

d. The permittee shall calibrate all pressure gauges, flow meters and other related equipment on a semi-annual basis using standard engineering methods and ensure they are in proper operating condition at all times. Laboratory equipment, methods, and quality control will follow EPA guidelines as expressed Standard Methods for the Examination of Water and Wastewater.

e. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures.

f. All water quality samples required by this permit shall be collected and analyzed in accordance with Department Standard Operating Procedures (SOP), pursuant to the Department Quality Assurance, Chapter 62-160, F.A. C. The various components of the collection the Department SOPs are found in DEP-SOP-001/01 (Field Procedures) and DEP-SOP-002/-1 (Laboratory Procedures).

5. REPORTING REQUIREMENTS

a. All reports and surveys required by this permit shall be submitted concurrently to all the members of the Underground Injection Control - Technical Advisory Committee (UIC-TAC). The distribution shall be made to the UIC-TAC representatives from these agencies. :

- Department of Environmental Protection, West Palm Beach and Tallahassee
- South Florida Water Management District (SFWMD), West Palm Beach
- United States Geological Survey (USGS), Miami, and,
- EPA-Region IV, special advisors to the UIC-TAC

Copies are not required to be submitted to any UIC-TAC member who submits to the permittee a written request to be omitted as a recipient of specific correspondence. At their request, EPA may be omitted from distribution except for applications, permit modification requests and final reports.

b. The Department and other applicable agencies must be notified of any unusual or abnormal events occurring during construction, and in the event the Permittee is temporarily unable to comply with the provisions of the permit (e.g., on-site spills, artesian flows, large volume circulation losses, equipment damage due to: fire, wind and drilling difficulties, etc.). Notification and information shall be provided within 24 hours from the time the permittee becomes aware of the circumstances, either in person, by telephone or by electronic mail, to the UIC Program staff, SED office in West Palm Beach. A written submission shall also be provided within five days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

c. The Department shall be notified at least 72 hours prior to all testing for mechanical integrity.

d. All testing for mechanical integrity must be initiated during normal business hours, Monday through Friday.

e. The permittee shall submit weekly construction progress reports no later than two calendar days immediately following the week of record to the Southeast District and Tallahassee offices of the Department. An e-mail submittal may be made within the required two calendar days and the written copy within seven calendar days, which shall be appropriately certified and signed as required by this permit. These reports shall include, at a minimum, the following information:

i. A cover letter summary of the daily engineer report, driller's log and a projection for activities in the next reporting period.

ii. Daily engineer's reports and work log with detailed descriptions of all drilling progress, cementing, testing, logging, deviations surveys and casing installation activities with appropriate interpretations.

iii. Copies of the driller's logs, description of deviation surveys, details of the addition of salt or other materials to suppress flow, and include the date, depth and amount of material used.

iv. Description the type of testing performed including geophysical and video logs and pumping tests, including the data, with interpretations.

v. Lithologic and geophysical logs and water quality test results, with interpretations.

vi. An interpretation of all test results and geophysical logs as they relate to the week's activities, submitted with the latest test results and logs, submitted under ii) and iii) above.

vii. Weekly water quality analysis and water levels for the four pad monitoring wells.

viii. A certified evaluation of all logging and test results must be submitted with test data.

ix. Well development records.

x. Description of drill cutting at least every 10 feet and at every formation change.

xi. Description of the formations encountered.

xii. Description of work during installation and cementing of casing, including the amounts of casing and cement used. Details of cementing operations shall include the number of cementing stages, and the following information for each stage of cement: cement slurry composition, specific gravity, pumping rate, volume of cement pumped, theoretical fill depth, actual tag depth. From both the physical tag and the geophysical logs, a percent fill shall be calculated. An explanation of any deviation between actual versus theoretical fill shall also be provided.

xiii. Detailed description of any unusual construction related events or problems encountered during the reporting period and current status.

xiv. An evaluation and interpretation of all test results shall be submitted with all test data.

f. Upon completion of analysis of cores and sample cuttings recovered during the construction of the monitoring well and exploratory well, the permittee shall contact the Underground Injection Control Section of the Department of Environmental Protection for transfer to the Florida State Geologic Survey.

g. Department approval shall be based on the permittee's presentation that shows compliance with Department rules and this permit. Casing seat requests, as a minimum, shall include technical justification and interpretations of all data, utilizing the following information:

- Lithologic and geophysical logs with interpretations.
- Water quality data.
- Identification of confining units.
- Identification of monitoring zones.
- Drilling rate and weight on bit data, with interpretations related to the casing seat
- Casing depth evaluation (mechanically secure formation, potential for grout seal).
- Identification of the base of the USDW using water quality, RWA plots, and log interpretations.

h. Department approval shall be based on the permittee's presentation that shows compliance with Department rules and this permit. The injection test request shall contain the following:

- Cement bond logs and interpretation
- Temperature logs performed after each cementing stage
- Theoretical versus actual cement calculations
- Final downhole TV survey with interpretation
- Water quality analysis of injection fluid from every source
- Planned injection procedures
- All required weekly progress report information must be current, and received by the Department
- Certification of mechanical integrity and test results, with interpretation, including a copy of all logs and final video survey.

i. Department approval shall be based on the permittee's presentation that shows compliance with Department rules and this permit. Monitoring Zone requests shall contain the following:

- Identification of the base of the USDW.
- Identification of confining beds.
- Water quality of proposed monitoring zone.
- Transmissivity or specific capacity of proposed monitoring zone.
- Packer test drawdown curves and interpretation.

j. The Florida Geological Survey (FGS) is currently involved in a study that is investigating the upper Floridan aquifer. Fort his reason, it is requested that several 500 ml samples of ambient groundwater be collected from the monitoring intervals where the interval/packer tests will be conducted. Dr. Jon Arthur at the FGS will arrange for the samples to be collected, and he can be contacted at the Hydrogeological Investigations Section, Florida Geological Survey, at 903 West Tennessee Street, Tallahassee, Florida, 32304-7700, phone number (850)488-9380. The samples may be delivered to the SED UIC program office if not delivered directly to the FGS.

k. A 2.5 gallon sample of formation fluid may also be requested for collection from the completed well, or zones. Samples should be labeled with the well number, depth of sample, and collection method. Dr. Jon Arthur at the FGS will arrange for the samples to be collected and can be contacted at the Hydrogeological Investigations Section, Florida Geological Survey, at 903 West Tennessee Street, Tallahassee, Florida, 32304-7700, phone number (850)488-9380. The samples may be delivered to the SED UIC program office if not delivered directly to the FGS.

l. Upon completion of construction and testing, the permittee shall:

i. submit a final well completion report, also referred to as a final construction and engineering report. This report shall include a complete set of as-built signed and sealed engineering drawings. The report shall be signed and sealed by a Florida licensed professional engineer and professional geologist, as required by this permit.

ii. contact the UIC Section of the Department of Environmental Protection in Tallahassee to arrange for the transfer of the following items to the State Geologist at the Florida Geological Survey, 903 West Tennessee Street, Tallahassee, Florida 32304-7707:

- cuttings obtained during well construction
- cores obtained during well construction when no longer needed by the permittee
- water samples obtained during well construction and testing
- geophysical logs performed during well construction and testing
- copy of the final well completion report

m. Any failure of the exploratory well monitoring and recording equipment for a period of more than 48 hours shall be reported within 24 hours to the Department. A written report describing the incident shall also be given to the Department within five days of the start of the event. The final report shall contain a complete description of the occurrence, a discussion of the cause(s) and the steps being taken to reduce, eliminate, and prevent recurrence of the event, and all other pertinent information deemed necessary by the Department.

n. The permittee shall report any noncompliance which may endanger health or the environment, including:

   i. Any monitoring or other information which indicates that any contaminant may cause an endangerment to an underground source of drinking water; or

   ii. Any noncompliance with a permit condition or malfunction of the exploratory well system which may cause fluid migration into or between underground sources of drinking water.

   iii. Information shall be provided orally within 24 hours of the time the permittee becomes aware of the circumstances. A written submission shall also be provided within five days of the time the permittee becomes aware of the circumstances. The written condition shall contain a written description of the noncompliance and the cause, the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

6. SURFACE EQUIPMENT

a. The surface equipment for the exploratory well system shall maintain compliance with Chapter 62-600, F.A.C. for water hammer control, screening, access for logging and testing, reliability and flexibility in the event of damage to the well and piping. A regular program of exercising the valves integral to the well head shall be instituted. At a minimum, these valves shall be exercised during the regularly scheduled injectivity testing.

b. The exploratory well and monitoring well surface equipment and piping shall be kept free of corrosion at all times.

c. Spillage onto the exploratory well pad during construction activities, and any waters spilled during mechanical integrity testing, other maintenance, testing or repairs to the system shall be contained by an impermeable wall around the edge of the pad and directed to a sump pump which in turn discharges to the pumping station wet well or via other approved means to the exploratory well system.

d. The exploratory well construction pad with impermeable perimeter retaining wall shall be maintained and retained in service for the life of the exploratory well, unless otherwise authorized by the Department. The exploratory and monitoring well pad(s) are not, unless specific approval is obtained from the Department, to be used for storage of any material or equipment at any time.

e. The four surficial aquifer pad monitoring wells installed at the corners of the well pad shall be secured, maintained, and retained in service, through the construction and future operational testing, unless otherwise authorized by the Department.

f. The integrity of the monitoring zone sampling systems shall be maintained at all times. Sampling lines shall be clearly and unambiguously identified by monitoring zone at the point at which samples are drawn. All reasonable and prudent precautions shall be taken to ensure that

samples are properly identified by monitoring zone and that samples obtained are representative of those zones. Sampling lines and equipment shall be kept free of contamination with independent discharges and no interconnections with any other lines.

7. EMERGENCY DISPOSAL

a. All applicable federal, state, and local permits shall be in place to allow for any alternate discharges due to emergency or planned outage conditions.

b. Any proposed changes in emergency disposal methods shall be submitted for Department review and Department approval prior to implementation.

c. The alternate disposal method shall be maintained in working order at all times upon approval of operational testing, if applicable. When the well goes into operation, further reference should be made to the Draft Operation and Maintenance manual when it becomes available at the time of operational testing.

d. In the event of an emergency and/or discharge, or other abnormal event where the permittee is temporarily unable to comply with any of the conditions of this permit due to breakdown of equipment, power outages, destruction by hazard or fire, wind, or by other cause, the Department shall be notified in person or by telephone within 24 hours of the incident. A written report describing the incident shall also be submitted to the Department within five days of the start of the incident. The written report shall contain a complete description of and discuss the cause of the emergency and/or discharge, and if it has been corrected, the anticipated time the discharge is to continue, the steps being taken to reduce, eliminate, and prevent recurrence of the event, and all other information deemed necessary by the Department.

8. FINANCIAL RESPONSIBILITY

a. The permittee shall maintain the resources necessary to close, plug and abandon the exploratory and associated monitoring well at all times pursuant to Rule 62-528.435(9), F.A.C.

b. The permittee shall review annually the plugging and abandonment cost estimates. An increase of 10 percent or more over the cost estimate upon which financial responsibility is based shall require the permittee to submit documentation to obtain an updated Certificate of Demonstration of Financial Responsibility.

c. In the event the mechanism used to demonstrate financial responsibility should become invalid for any reason, the permittee shall notify the Department of Environmental Protection in writing within 14 days of such invalidation. The permittee shall then within 30 days of said notification submit to the Department for approval new financial documentation in order to comply with Rule 62-528.435(9), F.A.C., and the conditions of this permit.

d. Plugging and Abandonment and Alternate Use Plans

i. A permittee who is unable to operate the well to met its intended purpose shall within 180 days of Department notification:

- Submit a plugging and abandonment permit application per Rules 62-528.625 and Rules 62-528.645, F.A.C., or
- Submit a request for an alternate use plan for the well for Department approval, and is subject to any necessary permits or modifications to permits as may be required by the Department or any other agency, or
- Implement the plugging and abandonment plan.

9. PERMIT EXTENSIONS AND RENEWALS

a. Pursuant to Rule 62-4.080(3), F.A.C., a permittee may request that a permit be extended as a modification of an existing permit. A request for an extension is the responsibility of the permittee and shall be submitted to the Department before the expiration of the permit. In accordance with Rule 62-4.070(4), F.A.C., a permit cannot be extended beyond the maximum 5-year statutory limit.

Issued this 17 day of August, 2007

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

for

Jack Long
District Director
Southeast District

JL/LAB/JRM/HV

SOUTHEAST DISTRICT UIC SECTION
SURFICIAL AQUIFER MONITORING WELL (SAMW) REPORT

FACILITY NAME _____
REPORT MONTH/YR. _____

OPERATOR NAME _____ LICENSE # _____

EXPLORATORY WELL # _____ PERMIT # _____

SAMPLING DATE _____ TIME _____

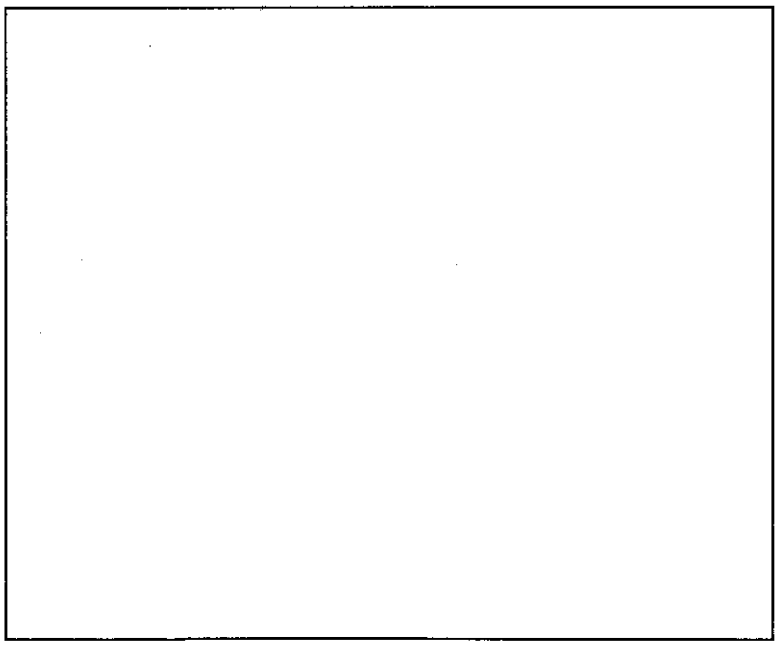
	SAMW #1	SAMW #2	SAMW #3	SAMW #4
LOCATION	NE CORNER	NW CORNER	SE CORNER	SW CORNER
ELEVATION OF TOC* (NAVD)				
DEPTH TO WATER (TOC*)				
WATER LEVEL (NAVD)				
CHLORIDE (mg/L)				
CONDUCTIVITY(µmhos/cm)				
TOTAL DISOLVED SOLIDS (mg/L)				
TEMPERATURE (° C)				

* TOC: indicates the "top of the casing" of the Surficial Aquifer Monitoring Well

ANALYZED BY_____ SAMPLED BY _____

PHONE # _____ TITLE _____

SITE PLAN OF SAMW LOCATIONS



PRIMARY DRINKING WATER STANDARDS

PARAMETER

Alachlor (Polychlorinated Biphenyl or PCB)
Aldicarb
Aldicarb sulfoxide
Aldicarb sulfone
Aroclors (Polychlorinated Biphenyls or PCBs)
Alpha, Gross
Antimony
Arsenic
Atrazine
Barium
Benzene
Benzo(a)pyrene
Beryllium
Bis(2-ethylhexyl) adipate (Di(2-ethylhexyl) adipate)
Bis(2-ethylhexyl) phthalate (Di(2-ethylhexyl) phthalate)
Cadmium
Carbofuran
Carbon Tetrachloride (Tetrachloromethane)
Chlordane
Chlorobenzene (Monochlorobenzene)
Chloroethylene (Vinyl Chloride)
Chromium
Coliforms, Total
Cyanide
2,4-D (2,4-Dichlorophenoxyacetic acid)
Dalapon (2,2-Dichloropropionic acid)
Dibromochloropropane (DBCP)
1,2-Dibromoethane (EDB, Ethylene Dibromide)
1,2-Dichlorobenzene (o-Dichlorobenzene)
1,4-Dichlorobenzene (p-Dichlorobenzene or Para Dichlorobenzene)
1,2-Dichloroethane (Ethylene dichloride)
1,1-Dichloroethylene (Vinylidene chloride)
1,2-Dichlorethylene (cis-1,2-Dichloroethylene or trans-1,2-Dichloroethylene)
cis-1,2-Dichloroethylene (1,2-Dichlorethylene)
trans-1,2-Dichloroethylene (1,2-Dichlorethylene)
Dichloromethane (Methylene chloride)
1,2-Dichloropropane
Di(2-ethylhexyl) adipate (Bis(2-ethylhexyl) adipate)
Di(2-ethylhexyl) phthalate (Bis(2-ethylhexyl) phthalate)
Dinoseb
Diquat
EDB (Ethylene dibromide, 1,2-Dibromoethane)
Endothall
Endrin
Ethylbenzene
Ethylene dichloride (1,2-Dichloroethane)
Fluoride
Glyphosate (Roundup)
Gross Alpha
Heptachlor
Heptachlor Epoxide
Hexachlorobenzene (HCB)
gamma-Hexachlorocyclohexane (Lindane)
Hexachlorocyclopentadiene
Lead

PRIMARY DRINKING WATER STANDARDS, CONT'D

PARAMETER

Lindane (gamma-Hexachlorocyclohexane)
Mercury
Methoxychlor
Methylene chloride (Dichloromethane)
Monochlorobenzene (Chlorobenzene)
Nickel
Nitrate (as N)
Nitrite (as N)
Total Nitrate + Nitrite (as N)
Oxamyl
p-Dichlorobenzene or Para Dichlorobenzene (1,4-Dichlorobenzene)
Pentachlorophenol
Perchloroethylene (Tetrachloroethylene)
Picloram
Polychlorinated biphenyl (PCB or Aroclors)
Radium
Roundup (Glyphosate)
Selenium
Silver
Silvex (2,4,5-TP)
Simazine
Sodium
Styrene (Vinyl benzene)
Tetrachloroethylene (Perchloroethylene)
Tetrachloromethane (Carbon Tetrachloride)
Thallium
Toluene
Toxaphene
2,4,5-TP (Silvex)
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene, TCE)
Trihalomethanes, Total
Vinyl Chloride (Chloroethylene)
Xylenes (total)

SECONDARY DRINKING WATER STANDARDS

PARAMETER

Aluminum
Chloride
Color
Copper
Ethylbenzene
Fluoride
Foaming Agents (MBAS)
Iron
Manganese
Odor
pH
Silver
Sulfate
Toluene
Total Dissolved Solids (TDS)
Xylenes
Zinc

OTHER PARAMETERS

Ammonia
Nitrogen (organic)
Total Kjeldahl Nitrogen
Total Phosphorus (phosphate)

Specific Conductance
Biological Oxygen Demand
Chemical Oxygen Demand
Temperature °C

ATTACHMENT B
REFERENCE MANUALS FOR ROSEMOUNT MODEL 3051 PRESSURE TRANSMITTER, ROSEMOUNT MODEL 3051S SCALABLE PRESSURE, FLOW AND LEVEL SOLUTIONS, ROSEMOUNT INTEGRAL MANIFOLDS, DRUCK PTX DEPTH AND LEVEL SENSORS, PRECISION DIGITAL PD 675 DISPLAY AND DAYTON DEEP WELL SUBMERSIBLE PUMPS

ATTACHMENT C
MONTHLY OPERATING REPORT AND INJECTIVITY FORMS

UNDERGROUND INJECTION CONTROL SECTION
MONTHLY OPERATING REPORT DATA SUMMARY

FACILITY OUA, Cemetery Rd WWTF

PHONE # 863-763-9460

REPORT MONTH/YEAR _____

PERMIT NUMBER 40824-044-UC

PERMIT EXPIRATION DATE _____

Injection Well Data

	IW-1		IW-2	
MAXIMUM MONTHLY INJECTION PRESSURE	_____	psi	_____	psi
MINIMUM MONTHLY INJECTION PRESSURE	_____	psi	_____	psi
AVERAGE MONTHLY INJECTION PRESSURE	_____	psi	_____	psi
SHUT-IN PRESSURE	_____	psi	_____	psi
AXIMUM MONTHLY FLOW RATE	_____	MGD	_____	MGD
MINIMUM MONTHLY FLOW RATE	_____	MGD	_____	MGD
AVERAGE MONTHLY FLOW RATE	_____	MGD	_____	MGD
TOTAL MONTHLY VOLUME INJECTED	_____	MG	_____	MG
MONTHLY MAXIMUM OF DAILY VOLUME INJECTED	_____	MG	_____	MG
MONTHLY MINIMUM OF DAILY VOLUME INJECTED	_____	MG	_____	MG
MONTHLY AVERAGE OF DAILY VOLUME INJECTED	_____	MG	_____	MG

MONITOR WELL WATER LEVEL DATA

	UPPER ZONE		LOWER ZONE	
MAXIMUM MONTHLY WATER LEVEL	_____	feet NAVD 88	_____	feet NAVD 88
MINIMUM MONTHLY WATER LEVEL	_____	feet NAVD 88	_____	feet NAVD 88
AVERAGE MOINTHLY WATER LEVEL	_____	feet NAVD 88	_____	feet NAVD 88

Date _____

Signed _____

MONTHLY OPERATING REPORT DATA SUMMARY

FACILITY OUA, Cemetery Rd WWTF

PHONE # 863-763-9460

REPORT MONTH/YEAR _____

PERMIT NUMBER 40824-044-UC

PERMIT EXPIRATION DATE _____

UPPER MONITOR ZONE WATER QUALITY DATA

DZMW-1 UPPERZONE (1,825 TO 1,845 feet) – weekly* parameters

	Week 1	Week 2	Week 3	Week 4	Week 5	Average
Sample Date						
Total Dissolved Solids (mg/L)						
Chloride (mg/L)						
Conductivity (umhos/cm)						
Ammonia Nitrogen (as N) (mg/L)						
TKN as N (mg/L)						
Total Phosphorus (mg/L)						
Sulfate as SO4 (mg/L)						
pH (S.U.)						
Field Temperature						
Sodium (mg/L)						
Calcium (mg/L)						
Potassium (mg/L)						
Magnesium (mg/L)						
Bicarbonate (mg/L)						

* Frequency decreased to monthly following operational testing and Department approval.

Date _____

Signed _____

UNDERGROUND INJECTION CONTROL SECTION
MONTHLY OPERATING REPORT DATA SUMMARY

FACILITY OUA, Cemetery Rd WWTF
PHONE # 863-763-9460

REPORT MONTH/YEAR _____
PERMIT NUMBER 40824-044-UC
PERMIT EXPIRATION DATE _____

LOWER MONITOR ZONE WATER QUALITY DATA

DZMW-1 LOWERZONE (1,970 TO 1,990 feet) – weekly* parameters

	Week 1	Week 2	Week 3	Week 4	Week 5	Average
Sample Date						
Total Dissolved Solids (mg/L)						
Chloride (mg/L)						
Conductivity (umhos/cm)						
Ammonia Nitrogen (as N) (mg/L)						
TKN as N (mg/L)						
Total Phosphorus (mg/L)						
Sulfate as SO4 (mg/L)						
pH (S.U.)						
Field Temperature						
Sodium (mg/L)						
Calcium (mg/L)						
Potassium (mg/L)						
Magnesium (mg/L)						
Bicarbonate (mg/L)						

* Frequency decreased to monthly following operational testing and Department approval.

Date _____

Signed _____

UNDERGROUND INJECTION CONTROL SECTION
MONTHLY OPERATING REPORT DATA SUMMARY

FACILITY OUA, Cemetery Rd WWTF
PHONE # 863-763-9460

REPORT MONTH/YEAR _____
PERMIT NUMBER 40824-044-UC
PERMIT EXPIRATION DATE _____

WASTESTREAM WATER QUALITY DATA

WASTESTREAM) – weekly* parameters

	Week 1	Week 2	Week 3	Week 4	Week 5	Average
Sample Date						
Total Suspended Solids (mg/L)						
Maximum Total Suspended Solids (mg/L)						
Average Total Suspended Solids (mg/L)						
Chloride (mg/L)						
Conductivity (umhos/cm)						
TKN as N (mg/L)						
Fecal Coliform (number/100 mL) Present below detection limit						
Fecal Coliform (number/100 mL), maximum						
pH (S.U.)						
Field Temperature (degrees C)						

* Frequency decreased to monthly following operational testing and Department approval.

Date _____

Signed _____

UNDERGROUND INJECTION CONTROL SECTION
MONTHLY OPERATING REPORT DATA SUMMARY

FACILITY OUA, Cemetery Rd WWTF
PHONE # 863-763-9460

REPORT MONTH/YEAR _____
PERMIT NUMBER 40824-044-UC
PERMIT EXPIRATION DATE _____

Note: Totalizer Reading collected at 7 AM – All other readings from 7 AM to 7 AM

Injection Well IW-1

Day of Month	Flowrate and Volume					Wellhead Pressure		
	Totalizer Reading (mg)	Volume Injected (gpm)	Minimum Flowrate (gpm)	Maximum Flowrate (gpm)	Average Flowrate (gpm)	Minimum Pressure (psi)	Maximum Pressure (psi)	Average Pressure (psi)
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31/1								
1								

Total								
Max.								
Min.								
Average								

Date _____

Signed _____

UNDERGROUND INJECTION CONTROL SECTION
MONTHLY OPERATING REPORT DATA SUMMARY

FACILITY OUA, Cemetery Rd WWTF
PHONE # 863-763-9460

REPORT MONTH/YEAR
PERMIT NUMBER 40824-044-UC
PERMIT EXPIRATION DATE

DZMW-1 Monitoring Parameters

Day of Month	DZMW-1 Upper Zone (1825 to 1845 feet)			DZMW-1 Lower Zone (1970 to 1990 feet)		
	Minimum Water Level (feet NAVD 88)	Maximum Water Level (feet NAVD 88)	Average Water Level (feet NAVD 88)	Minimum Water Level (feet NAVD 88)	Maximum Water Level (feet NAVD 88)	Average Water Level (feet NAVD 88)
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31/1						
1						

Max.						
Min.						
Average						

Date _____

Signed _____

OUA Cemetery Road WWTP
Deep Inspection Well System

Injectivity Testing Form

SHUT-IN PRESSURE	
MINUTES AFTER SHUT-IN	CALIBRATED PRESSURE GAUGE READING AT WELLHEAD (psi)
1	
5	
15	

Facility: OUA – Cemetery Road WWTP

Compiled by: _____

Well Name: IW-1

Date of Test: _____

FDEP Permit No.: _____

Telephone: _____

TIME COLUMN 1	INJECTION WELL SHUT-IN PRESSURE AFTER 30 MINUTES (PSI) COLUMN 2	PUMP NUMBER(S) ON-LINE COLUMN 3	INJECTION RATE (gpm) AND (mgd) COLUMN 4	INJECTION PRESSURE AFTER 10 MINUTES OF PUMPING COLUMN 5	PRESSURE DIFFERENTIAL (5) – (2) (psi) COLUMN 6	INJECTIVITY INDEX (4) / (6) (PSI) COLUMN 7

NOTES:

1. INJECTIVITY INDEX (GPM/PSI) IS:

$$\frac{\text{INJECTION RATE (GPM) (COLUMN 4)}}{\text{(INJECTION PRESSURE (PSI)) (COLUMN 5)} - \text{(SHUT-IN PRESSURE (PSI)) (COLUMN 2)}}$$

2. FOR MORE INFORMATION REGARDING EXECUTION OF THIS TEST CONSULT THE INJECTIVITY TESTING PROTOCOL IN THE O&M MANUAL

Date: _____ Signed: _____

ATTACHMENT D
SIGNED AND SEALED PAGE 3 OF 14 OF APPLICATION

DEP Form No:	62-528.900(1)
Form Title:	Application to Construct/ Operate/Abandon Class I, III, or V Injection Well Systems
Effective Date:	
DEP Application No.:	(Filled in by DEP)

PART III. Statement by Applicant and Engineer

A. Applicant

I, the owner/authorized representative* of Okeechobee Utility Authority, certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. I understand that this certification also applies to all subsequent reports submitted pursuant to this permit. Where construction is involved, I agree to retain the design engineer, or other professional engineer registered in Florida, to provide inspection of construction in accordance with Rule 62-528.455(1)(c), F.A.C.

Signed — Date: 7/22/09

John F. Hayford, Executive Director
Name and Title (Please Type)

(863) 763-9460
Telephone Number

*Attach a Letter of Authorization.

B. Professional Engineer Registered in Florida

This is to certify that the engineering features of this injection well have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgement, that the well, when properly maintained and operated, will discharge the effluent in compliance with all applicable statutes of the State of Florida and the rules of the Department. It is also agreed that the undersigned will furnish the applicant a set of instructions for proper maintenance and operation of the well.

Signed

Raymond W. Jones, P.E.
Name (Please Type)

Andreyev Engineering, Inc.
Company Name (Please Type)

(Please Affix Seal)

4055 St. Johns Parkway, Sanford, FL 32771
Mailing Address (Please Type)

Florida Registration No. 58079 Date 8-14-09 Phone No. 407-330-7763

ATTACHMENT E
COPIES OF DRAWING SHEETS FROM METZGER WILLARD, INC. DRAWING SET

NORTH

EFFLUENT SAMPLE PUMP
CL2/pH MONITOR
TO MCC400 AND PLC 400 TO SCADA SYSTEM

ADDENDUM No.1
SHEET M-22: AUTOMATIC SAMPLER SHALL BE INSTALLED TO SAMPLE FROM THE EFFLUENT PUMP STATION WET WELL. SAMPLER SHALL BE FLOW PACED AND CONTROLLED BY THE FLOW METER ASSEMBLIES.

ADDENDUM No.2
SHEET M-22: PROVIDE AN 18-INCH DIAMETER FLANGE COUPLING ADAPTER BETWEEN THE TWO SETS OF PUMPS.

V M-21

PUMP 1
PUMP 2
PUMP 3
FUTURE PUMP 4

HATCH COVERS OR GRATED OPENINGS (REMOVABLE) AT CONTRACTOR'S OPTION. SIZE AS RECOMMENDED BY PUMP SUPPLIER.

AUTOMATIC SAMPLER

AIR RELEASE VALVE LOCATION (TYP.)

18" SPOOL PIECES (TYP. OF 7)

18" BLIND FLANGE

PIPE SUPPORT (TYP.)

18"x18" FG TEE WITH BOSS FITTING FOR ARV

24" SPOOL PIECE WITH BOSS FITTING FOR PRESSURE GAUGE ASSEMBLY

18" FG 90° BEND

V M-23

18" SPOOL PIECES (TYP. OF 3)

18"x18" FG TEE (TYP. OF 3)

DPT

24" VENTURI METER

18" DIP TO EXISTING REJECT POND

W M-23

18" FG 90° BEND

18" SPOOL PIECE WITH BOSS FITTING FOR PRESSURE GAUGE ASSEMBLY

18" VENTURI METER

DPT = DIFFERENTIAL PRESSURE TRANSMITTER

24" DIP TO FUTURE WELL

PRESSURE TRANSMITTER FROM WELL
WIRED TO MCC400 AND PLC400 AND TO SCADA SYSTEM

PLAN

RECORD DRAWING
INFORMATION SUPPLIED BY:
WHARTON-SMITH, INC.
☐ REVISIONS ■ NO REVISIONS
DATE: JANUARY 2009
Metzger & Willard Inc., Certificate of Authorization No. 2888, assumes no responsibility for the verification of information supplied by others.

METZGER & WILLARD, INC.
Civil • Environmental Engineers • Surveyors
8500 Hidden River Parkway, Suite 550
Tampa, Florida 33637 (813) 977-6005
Certificate of Authorization No. 2888 - L.B. #7302

JOB No.	11340.05
DESIGNED	S.G.M.
DRAWN	J.M.S.
CHECKED	
DATE	01/2007

No.	DATE	BY	APP	REVISION DESCRIPTION

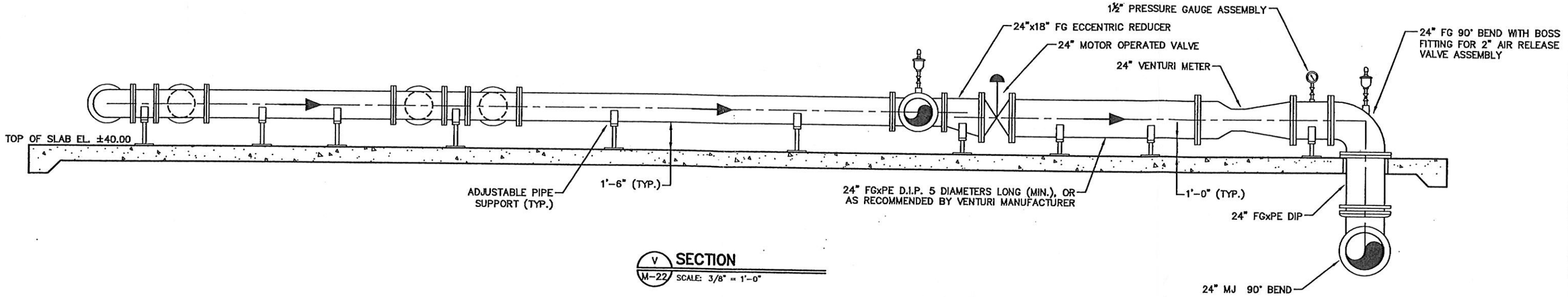
SCALE
0 1' 2' 4'
3/8" = 1'-0"

Okeechobee Utility Authority
WASTEWATER TREATMENT PLANT EXPANSION TO 3.0 MGD

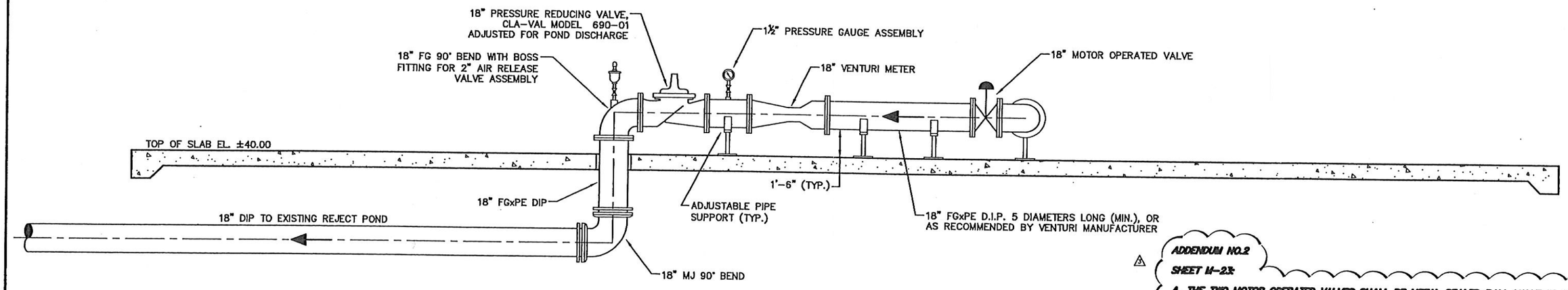
PROPOSED EFFLUENT PUMP STATION (PS5) – PLAN

SUSAN C. MARTELLI, P.E. No. 37840
2/24/09

SHEET NUMBER
M-22



V SECTION
M-22 SCALE: 3/8" = 1'-0"



W SECTION
M-22 SCALE: 3/8" = 1'-0"

RECORD DRAWING

INFORMATION SUPPLIED BY:
WHARTON-SMITH, INC.

☐ REVISIONS ■ NO REVISIONS

DATE: JANUARY 2009

Metzger & Willard Inc., Certificate of Authorization No. 2888, assumes no responsibility for the verification of information supplied by others.

ADDENDUM NO.2

SHEET M-23:

A. THE TWO MOTOR OPERATED VALVES SHALL BE METAL SEALED BALL VALVE IN ACCORDING WITH SPECIFICATIONS.

B. PROVIDE 24-INCH FLANGE TEE WITH BLIND FLANGE TAPPED FOR 24-INCH AIR RELEASE VALVE IN LIEU OF 24-INCH 90 DEGREE BEND WITH BOSS

C. PROVIDE 18-INCH flange with blind flange TAPPED FOR 2-INCH AIR RELEASE VALVE IN LIEU OF 18-INCH 90 DEGREE BEND WITH BOSS 2-INCH AIR RELEASE VALVE ASSEMBLY

METZGER & WILLARD, INC.
Civil • Environmental Engineers • Surveyors
8500 Hidden River Parkway, Suite 550
Tampa, Florida 33637 (813) 977-6005
Certificate of Authorization No. 2888 – L.B. #7302

JOB No.	11340.05					
DESIGNED	S.G.M.					
DRAWN	J.M.S.					
CHECKED		3	01/2009	P.F.		RECORD DRAWINGS
DATE	01/2007	No.	DATE	BY	APP	REVISION DESCRIPTION

SCALE
0 1' 2' 4'
3/8" = 1'-0"

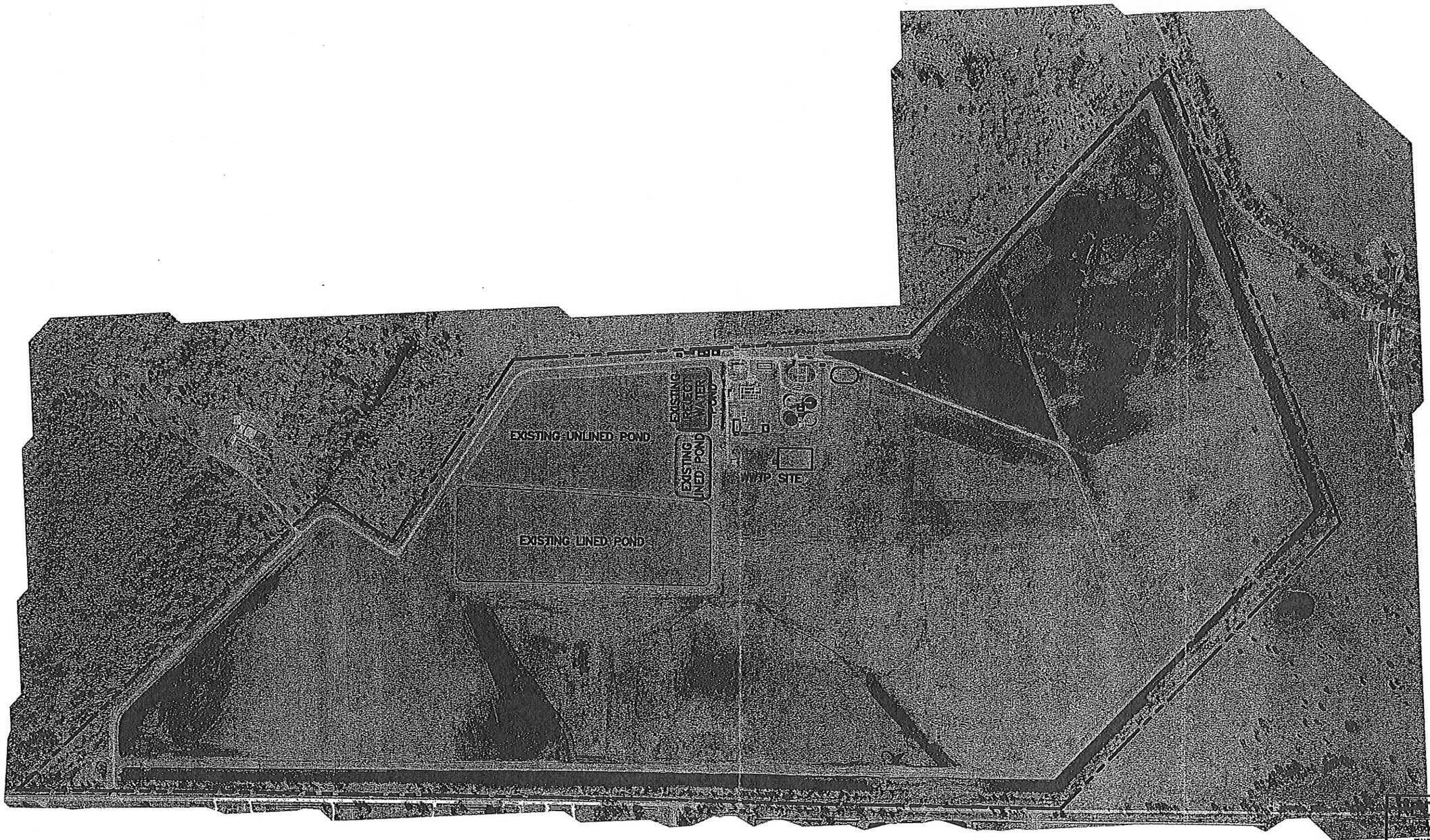
Okeechobee Utility Authority

WASTEWATER TREATMENT PLANT EXPANSION TO 3.0 MGD

PROPOSED EFFLUENT PUMP STATION (PS5) – SECTIONS

SUSAN G. MARTELLI P.E. NO. 37840
2/24/09

SHEET NUMBER
M-23



RECORD DRAWING

INFORMATION SUPPLIED BY:
WHARTON-SMITH, INC.

☐ REVISIONS ■ NO REVISIONS

DATE: JANUARY 2009

Metzger & Willard Inc., Certificate of Authorization No. 2888, assumes no responsibility for the verification of information supplied by others.

METZGER & WILLARD, INC.
Civil • Environmental Engineers • Surveyors
8600 Hidden River Parkway, Suite 550
Tampa, Florida 33637 (813) 977-6005
Certificate of Authorization No. 2888 – L.B. #7302

JOB No.	11340.05					
DESIGNED	S.G.M.					
DRAWN	J.M.S.					
CHECKED		3	1/2009	P.F.		RECORD DRAWING
DATE	01/2007	No.	DATE	BY	APP	REVISION DESCRIPTION

SCALE
300 0 150 300 600
1" = 300'

Okeechobee Utility Authority

WASTEWATER TREATMENT PLANT EXPANSION TO 3.0 MGD

AERIAL – PROPOSED FACILITIES

SUSAN G. MARTELLI P.E. NO. 37940
2/24/09

SHEET NUMBER
C-3

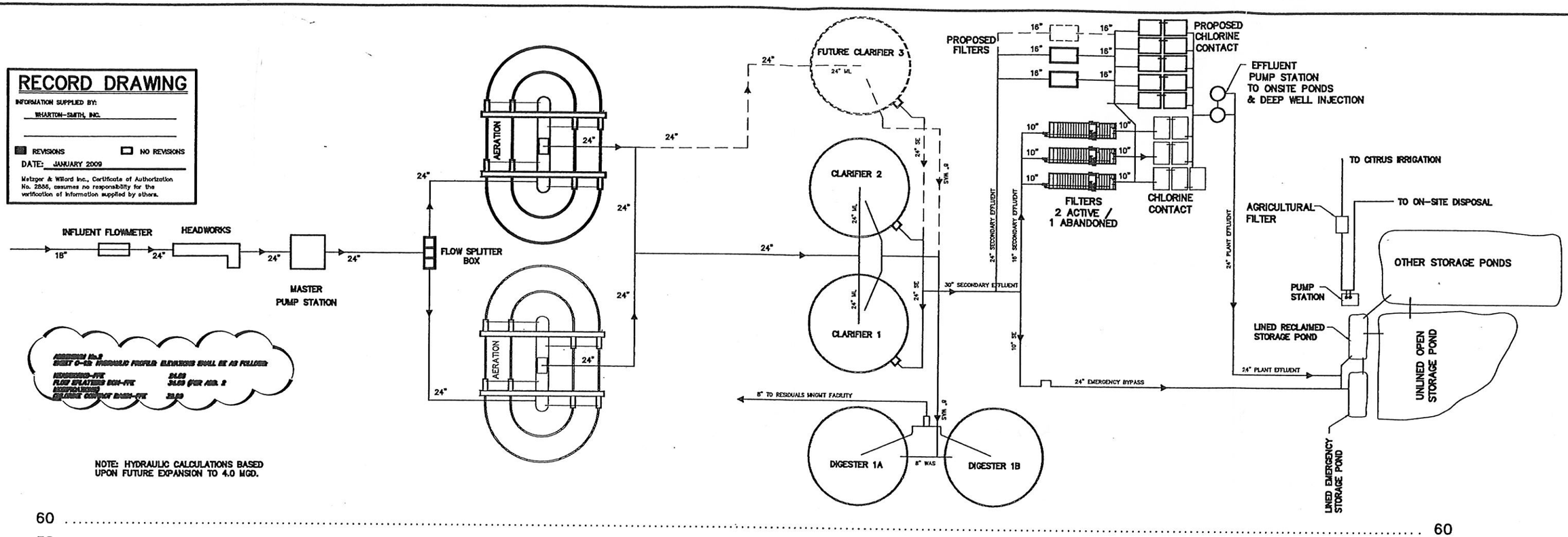
RECORD DRAWING

INFORMATION SUPPLIED BY:
WHARTON-SMITH, INC.

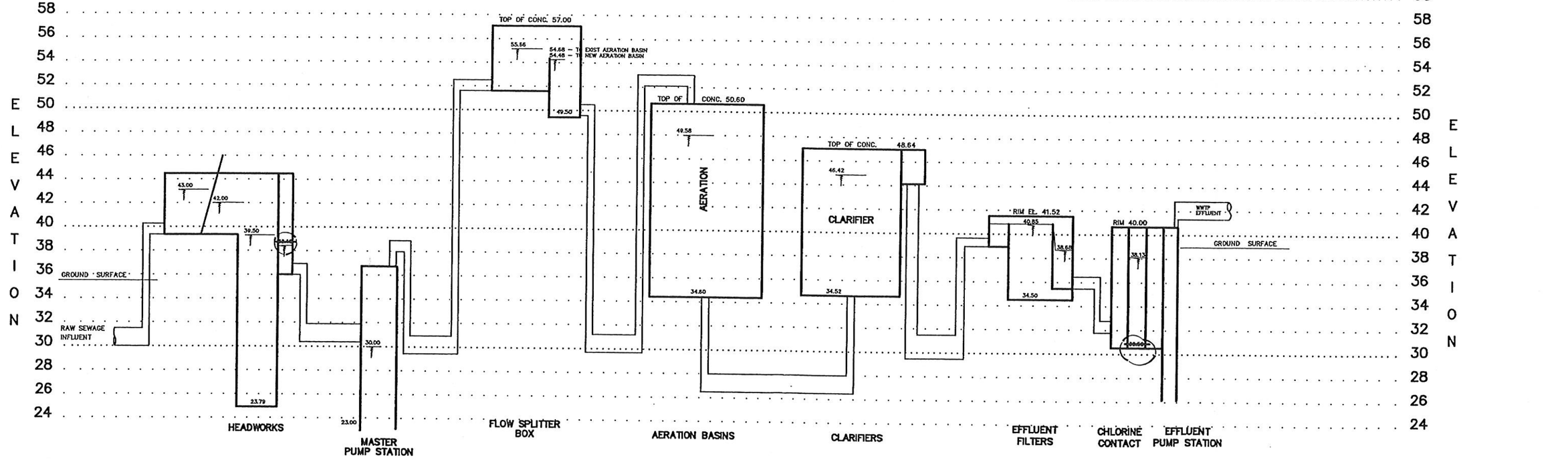
■ REVISIONS □ NO REVISIONS

DATE: JANUARY 2009

Metzger & Willard Inc., Certificate of Authorization No. 2885, assumes no responsibility for the verification of information supplied by others.



NOTE: HYDRAULIC CALCULATIONS BASED UPON FUTURE EXPANSION TO 4.0 MGD.



METZGER & WILLARD, INC. Civil • Environmental Engineers • Surveyors 8600 Hidden River Parkway, Suite 550 Tampa, Florida 33637 (813) 977-6005 Certificate of Authorization No. 2885 – L.B. #7302	JOB No.	11340.05					
	DESIGNED	S.G.M.					
	DRAWN	J.M.S.					
	CHECKED		3	01/2009	P.F.		RECORD DRAWING
	DATE	01/2007	No.	DATE	BY	APP	REVISION DESCRIPTION

SCALE: NO SCALE

Okeechobee Utility Authority

WASTEWATER TREATMENT PLANT EXPANSION TO 3.0 MGD

HYDRAULIC PROFILE & SCHEMATIC FLOW DIAGRAM 1 MGD

SUSAN G. MARTELL P.E. NO. 57940 2/24/09

SHEET NUMBER C-12

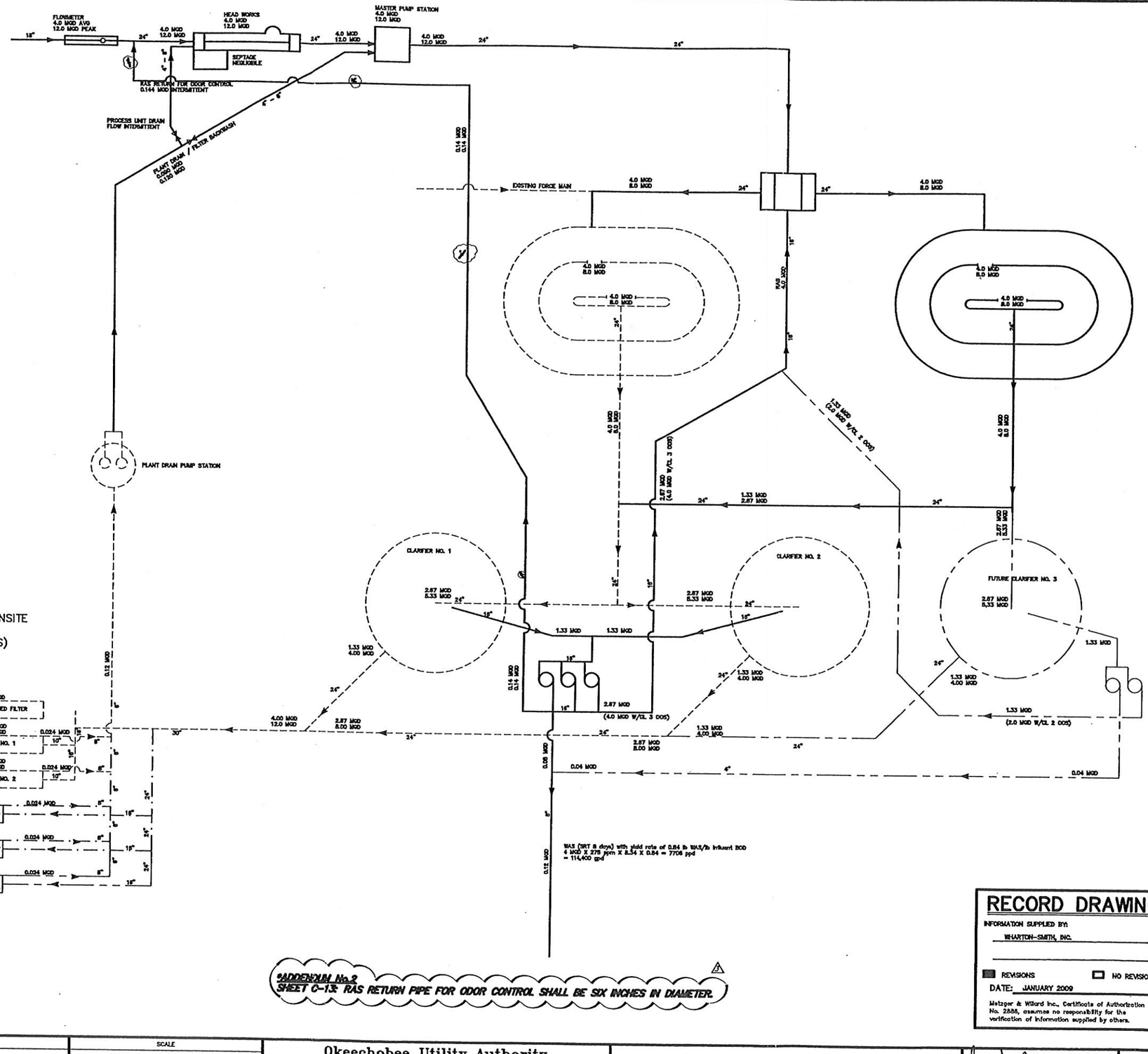
LEGEND:

---------- EXISTING

—·—·—·— CONTRACT No. 1 (NOT IN CONTRACT)

———— CONTRACT No. 2

— — — — FUTURE (NOT IN CONTRACT)



*ADDENDUM No.2
SHEET C-13: RAS RETURN PIPE FOR ODOR CONTROL SHALL BE SIX INCHES IN DIAMETER. 2

RECORD DRAWING

INFORMATION SUPPLIED BY:
WHARTON-SMITH, INC.

REVISIONS ☐ NO REVISIONS

DATE: JANUARY 2009

Metzger & Willard Inc., Certificate of Authorization No. 2888, assumes no responsibility for the verification of information supplied by others.

METZGER & WILLARD, INC.
Civil • Environmental Engineers • Surveyors
8500 Hidden River Parkway, Suite 550
Tampa, Florida 33637 (813) 977-6005
Certificate of Authorization No. 2888 – L.B. #7302

JOB No.	11340.05					
DESIGNED	S.G.M.					
DRAWN	J.M.S.					
CHECKED		3	01/2009	P.F.		RECORD DRAWING
DATE	01/2007	No.	DATE	BY	APP	REVISION DESCRIPTION

SCALE: NO SCALE

Okeechobee Utility Authority

WASTEWATER TREATMENT PLANT EXPANSION TO 3.0 MGD

FLOW DIAGRAM

SUSAN G. MARTELLI, P.E. NO. 37840 — 2/24/09

SHEET NUMBER: C-13

ATTACHMENT F
INJECTION WELL COMPLETION CERTIFICATE

NOTIFICATION OF COMPLETION OF CONSTRUCTION FOR WASTEWATER FACILITIES OR ACTIVITIES

1. Instructions

a. In accordance with Rule 62-620.410, F.A.C., this form must be submitted to the Department's appropriate district office or approved local program prior to placing a newly constructed facility or modified portion of an existing facility into operation for any purpose other than testing for leaks and equipment operation.
b. Each applicable item must be completed in full. Where attached sheets or other technical documentation are used in lieu of the blank spaces provided, indicate appropriate cross-references in the spaces.
c. Three (3) copies of this notification with supporting documentation shall be submitted with this form.
d. All information is to be typed or printed in ink. Dates are to be entered in MM/DD/YR format.

2. Facility Information

a. Permit Number 40824-071-UC b. Facility Identification Number _____

c. Project/Facility Name Okeechobee Utility Authority Cemetery Road WWTP

d. Contact Name: John F. Hayford, PE
Number and Street 100 SW 5th Avenue
City/State/Zip Code Okeechobee FL 34974
Telephone 863.763.9460

3. Description of Facilities to be Placed into Operation:

Deep Well Injection facility associated with WWTP Expansion

4. Description of Substantial Deviations from the Permit, Approved Preliminary Design Report, and Application Materials:

N/A

5. Implementation Dates

a. Actual Date Construction Began	09/20/07
b. Scheduled Date to Place Facilities into Operation	12/31/08
c. Scheduled Date to Attain Operational Level	12/31/10
d. Scheduled Date to Submit DEP Form 62-620.910(13)[1]	06/30/11

[1]In accordance with Rule 62-620.410, F.A.C., DEP Form 62-620.910(13) Notification of Availability of Record Drawings and Final Operation and Maintenance Manuals must be submitted within six month after the facilities are placed into operation.

6. Certifications

a. Applicant or Authorized Representative

I certify that the statements made in this notification and all attachments are true, correct and complete to the best of my knowledge and belief. I agree to operate and maintain these facilities in such a manner as to comply with the provisions of Chapter 403, F.S., Chapter 62-620, F.A.C., and all other applicable rules of the Department.

(Signature of Applicant or Authorized Representative[2]) 8/13/09 (Date)

Name (Please Type) John F. Hayford, PE Company Name Okeechobee Utility Authority
Title Executive Director Company Address 100 SW 5th Avenue
Phone 863.763.9460 City/State/Zip Code Okeechobee FL 34974

b. Applicant or Authorized Representative (For Domestic Wastewater Facilities Only)

I certify that an appropriate draft operation and maintenance manual for these domestic wastewater facilities, which has been examined by a professional engineer as certified below, is available and located at 1339 39th Boulevard (Cemetery Rd),Okeechobee FL and can be submitted upon request.

(Signature of Applicant or Authorized Representative[2]) 8/13/09 (Date)

Name (Please Type) John F. Hayford, PE Company Name Okeechobee Utility Authority
Title Executive Director Company Address 100 SW 5th Avenue
Phone 863.763.9460 City/State/Zip Code Okeechobee FL 34974

c. Professional Engineer Registered in Florida

I certify that the facilities listed above have been completed to the point where the facilities are functionally complete. I further certify that construction on these facilities has proceeded substantially in accordance with the permit and the approved preliminary design report and application materials, or that deviations noted above will not prevent the system from functioning in compliance with all applicable statutes of the State of Florida and rules of the Department when properly operated and maintained. These determinations have been based upon on-site observation of construction, scheduled and conducted by me or by a project representative under my direct supervision, for the purpose of determining if the work proceeded in compliance with the permit and the approved preliminary design report and application materials.

Company Name: Andreyev Engineering, Inc. Name (please type) Raymond W. Jones, P.E.
Company Address: 4055 St. Johns Parkway
City/State/Zip Code Sanford, FL 32771
Phone Number: 407-330-7763

(Seal, Signature, Date, and Registration Number)
8-14-09

[2]If signed by the authorized representative, attach a letter of authorization.

ATTACHMENT G
COMPLETION CERTIFICATES OF SURFACE EQUIPMENT

MANUFACTURER'S CERTIFICATION OF PROPER INSTALLATION

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Venturi Meter
PROJECT NO:	11339.05	SPEC. SECTION:	13329

I HEREBY CERTIFY THAT THE ABOVE-REFERENCED EQUIPMENT/SYSTEM HAS BEEN: (Check Applicable)

- ☐ Installed in accordance with manufacturer's recommendations.
- ☐ Inspected, checked and adjusted.
- ☐ Serviced with proper initial lubricants.
- ☐ Electrical and mechanical connections meet quality and safety standards.
- ☐ All applicable safety equipment has been properly installed.
- ☐ System has been performance tested, and meets or exceeds specified performance requirements (when complete system of one manufacturer).

COMMENTS: _____

I, the undersigned Manufacturer's Representative, hereby certify that I am (i) a duly authorized representative of the manufacturer, (ii) empowered by the manufacturer to inspect, approve, and operate his equipment and (iii) authorized to make recommendations required to assure that the equipment furnished by the manufacturer is complete and operational, except as may be otherwise indicated herein. I further certify that all information contained herein is true and accurate.

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
2-5-09	12-10-08	02-05-09
DATE	DATE	DATE

MANUFACTURER'S SERVICES

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Venturi Meters
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	13329

The following is a list of manufacturers services required by the specifications:

A. TESTING

- Functional Test: Reference Functional Test Form.

B. TRAINING

- OWNER's operating personnel shall be trained in operation and maintenance of equipment at startup. Instruction shall be given in operation, service, adjustments and routine maintenance.

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
2-5-09 DATE	12-10-08 DATE	02-05-09 DATE

FUNCTIONAL TEST

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Venturi Meters
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	13329

TESTING:

- After the system is in full operation, a full operating test shall be performed in the presence of the ENGINEER, the OWNER and a qualified manufacturer's representative. The Contractor shall furnish all labor, materials, supervision and equipment required for such test and shall correct any deficiencies noted, by repairing or replacing the defective component, and retesting as required until the equipment meets the satisfaction of the ENGINEER. A minimum of one complete 8-hour day shall be furnished to satisfy the full load operating test requirements. However, approval of the preliminary test by the ENGINEER shall not constitute final acceptance of the equipment furnished.

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
2-5-09 DATE	12-10-08 DATE	02-05-09 DATE

SPARE PARTS

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Venturi Meters
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	13329

The following list contains the spare parts turned over to the owner:

- None required.

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
2-5-09	12-10-08	02-05-09
DATE	DATE	DATE

TRAINING

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Venturi Meters
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	13329

The following were in attendance at the training for the equipment listed above:

Date of Training: ______

Name	Signature
Clifton McNeil	[signature]
Ignacio Gomez	[signature]
TRACY Cook	[signature]
James Struthers	[signature]
Steve Sienck	[signature]

[signature]	Rod Hedl / [signature]	Joseph W Clark
FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
2-5-09	12-10-08	02-05-09
DATE	DATE	DATE

WARRANTY

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Venturi Meters
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	13329

The warranty for the above referenced equipment/system is as follows:

- The work shall be guaranteed for a period of one full year from the date of final acceptance.

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
2-5-09 DATE	12-10-08 DATE	02-05-09 DATE

MANUFACTURER'S CERTIFICATION OF PROPER INSTALLATION

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Metal Seated Ball Valves
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	11323

I HEREBY CERTIFY THAT THE ABOVE-REFERENCED EQUIPMENT/SYSTEM HAS BEEN: (Check Applicable)

- [x] Installed in accordance with manufacturer's recommendations.
- [x] Inspected, checked and adjusted.
- [x] Serviced with proper initial lubricants.
- [x] Electrical and mechanical connections meet quality and safety standards.
- [x] All applicable safety equipment has been properly installed.
- [x] System has been performance tested, and meets or exceeds specified performance requirements (when complete system of one manufacturer).

COMMENTS: _____

I, the undersigned Manufacturer's Representative, hereby certify that I am (i) a duly authorized representative of the manufacturer, (ii) empowered by the manufacturer to inspect, approve, and operate his equipment and (iii) authorized to make recommendations required to assure that the equipment furnished by the manufacturer is complete and operational, except as may be otherwise indicated herein. I further certify that all information contained herein is true and accurate.

FOR OWNER/ENGINEER (PRINT/SIGN)	C.D. Swano IV FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
1-28-09 DATE	08-21-08 DATE	08-21-08 DATE

MANUFACTURER'S SERVICES

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Metal Seated Ball Valves
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	11323

The following is a list of manufacturers services required by the specifications:

A. INSTALLATION AND TESTING
- A manufacturer's representative for the equipment specified herein shall be present at the jobsite for the number of man-hours listed exclusive of travel time.
  1. Two (2) hours for installation assistance, inspection and conformation of the correctness of the installation.

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
1-28-09	08-21-08	08-21-08
DATE	DATE	DATE

SPARE PARTS

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Metal Seated Ball Valves
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	11323

The following list contains the spare parts turned over to the owner:

- One set of all special tools required for normal operation and maintenance shall be provided. * NO SPECIAL TOOLS REQUIRED.
- The manufacturer shall furnish a complete list of recommended spare parts necessary for the first five (5) years of operation of the pumping system with the costs of those items.

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
	C.D. SNOAD	
1-28-09	08-21-08	08-21-08
DATE	DATE	DATE

TRAINING

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	2618.20609 2624.20609
EQPT TAG NO:		EQPT/SYSTEM:	Metal Seated Ball Valves
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	11323

The following were in attendance at the training for the equipment listed above:

Date of Training: 08-21-2008

Name	Signature
Steve Sterki	[signature]
[illegible]	[signature]
Jimbo Stratton	[signature]
Tracy A Cook	Tracy A Cook

1-28-09	C.D. SNEAD III [signature]	[signature]
FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
[signature]	08-21-08	08-21-08
DATE	DATE	DATE

WARRANTY

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Metal Seated Ball Valves
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	11323

The warranty for the above referenced equipment/system is as follows:

- The work shall be guaranteed for a period of one year from the date of final acceptance.

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
1-28-09 DATE	DATE	08-21-08 DATE

GUARANTEE

Before this valve was shipped to you, it was tested with both hydraulic and pneumatic pressure and performed satisfactorily.

If, however, despite all our precautions you suspect something is wrong with the valve, advise us and we will send a replacement immediately, or instruct you otherwise.

DO NOT TAKE THE VALVE APART

You then return the original valve to the stocking distributor from whom you purchased it, or to us for inspection (shipping charges prepaid).

When paid in full seller will replace or repair any defective valve returned to seller, prepaid by purchaser, within one year from the date of shipment. Seller will not reimburse purchaser for any labor charges or any other expenses incurred in removing or replacing any defective valve. There is no warranty of fitness or merchantability other than as expressly stated herein. Valve and Primer Corporation, WITHOUT NOTICE, hereby reserves the right to change any component parts, which in the opinion of its Engineering Department will improve our product and its serviceability.

Valve and Primer Corporation will not be liable for any failure or delay in performance due in whole or in part to any cause beyond its control. IN NO EVENT WILL VALVE AND PRIMER CORPORATION BE LIABLE FOR ANY INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE SALE OR THE USE OF ANY OF ITS PRODUCTS OR SERVICES.

THESE PRODUCTS ARE NOT MANUFACTURED, SOLD OR INTENDED FOR PERSONAL, FAMILY OR HOUSEHOLD USE.

APCO Willamette®

VALVE AND PRIMER CORPORATION
1420 S.WRIGHT BLVD • SCHAUMBURG, ILLINOIS, USA 60193-4599
847/524-9000 • FAX: 847/524-9007 • 800/323-6969

MANUFACTURER'S CERTIFICATION OF PROPER INSTALLATION

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Generator System
PROJECT NO:	11340.05/ 11344.06	SPEC. SECTION:	16620

I HEREBY CERTIFY THAT THE ABOVE-REFERENCED EQUIPMENT/SYSTEM HAS BEEN:
(Check Applicable)

- o Installed in accordance with manufacturer's recommendations.
- o Inspected, checked and adjusted.
- o Serviced with proper initial lubricants,
- o Electrical and mechanical connections meet quality and safety standards.
- o All applicable safety equipment has been properly installed.

COMMENTS: _____

I, the undersigned Manufacturer's Representative, hereby certify that I am (i) a duly authorized representative of the manufacturer, (ii) empowered by the manufacturer to inspect, approve, and operate his equipment and (iii) authorized to make recommendations required to assure that the equipment furnished by the manufacturer is complete and operational, except as may be otherwise indicated herein. I further certify that all information contained herein is true and accurate.

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
12/A/12		
5/9/08 DATE	5/9/08 DATE	5/9/08 DATE

MANUFACTURER'S SERVICES

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Generator System
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	16620

The following is a list of manufacturers services required by the specifications:

- **Service Contract:**
  The supplier of the generator power system shall include a five (5) year full service contact for maintenance of the complete engine/generator set. Scheduled oil sampling shall be included in order to forecast and minimize engine failure. The supplier of the equipment shall provide a quarterly (every three months) oil sample analysis.

- **Inspection and Instruction:**
  The equipment manufacturer shall furnish the services of a competent and experienced representative, who has complete knowledge of proper operation and maintenance of equipment, for a period of not less than one (1) day to inspect the installed equipment, supervise the initial test run, and to provide instructions to the operating personnel. The visit will be for checking and inspecting the equipment after it is installed, and shall be allocated solely to the instruction of operating personnel in operation and maintenance of the equipment. This instruction period shall be scheduled at least ten days in advance with the OWNER and shall take place prior to start-up and acceptance by the OWNER. The final copies of operation and maintenance manuals shall be delivered to the OWNER prior to scheduling the instruction period.

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
RJPR		
5/1/08. DATE	5/9/08 DATE	5/7/08 DATE

PERFORMANCE TEST (ONSITE)

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Generator System
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	16620

The manufacturer shall provide the following testing as specified in the specification:

- **Tests: On-Site:**

  Conduct operating tests to show the generator set will start automatically, pick up the load, shut down and reset as specified. In addition, manual operation shall be satisfactorily demonstrated. Load test shall include two (2) separate 4-hour running tests at full rated KW load after installation at the site. Starting tests shall include two (2) automatic starts with engine cold. Demonstrate capability of five (5) fifteen second crankings at firing speed with a 15 second rest between each cranking. Demonstrate capability of picking up the connected load. Voltage dip upon addition of any prescribed load shall not exceed 20%.

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
5/9/08 DATE	5/9/08 DATE	5/9/08 DATE

PANTROPIC POWER CAT

GENERATOR LOAD BANK TEST REPORT

CUSTOMER NAME: Okeechobee WTP
DATE: 05/08/08

ENGINE MODEL #: 3516B
GENSET SERIAL #: N/A
ENGINE SERIAL #: PBR00171
GENERATOR SERIAL #: G6A00109

Generator Set Ratings

Kva	1640
Volts	480

KW	1640

Hz	60
RPM	1800

Technician:

				VOLTS			AMPS						
TIME	P.F.	KW	HZ	AB	BC	CA	A	B	C	TEMP	OIL PSI	FUEL PSI	GPH
0.00	1	1641	60	477	477	481	1977	1977	1975	181	63	61	110
0.15	1	1640	60	477	477	481	1977	1977	1975	183	59	61	109.6
0.30	1	1640	60	477	477	481	1977	1977	1975	185	59	61	109.3
0.45	1	1641	60	477	477	481	1977	1977	1975	185	58	61	109.6
1.00	1	1640	60	477	477	481	1977	1977	1975	185	58	61	109.4
1.15	1	1640	60	477	477	481	1977	1977	1975	183	58	61	109.8
1.30	1	1640	60	477	477	481	1977	1977	1975	183	58	61	108.9
1.45	1	1641	60	477	477	481	1977	1977	1975	183	58	61	108.8
2.00	1	1641	60	477	477	481	1977	1977	1975	183	58	61	108
2.15	1	1640	60	477	477	481	1977	1977	1975	185	58	61	110.2
2.30	1	1637	60	477	477	481	1977	1977	1975	187	58	61	109.7
2.45	1	1642	60	477	477	481	1977	1977	1975	183	58	61	108.6
3.00	1	1641	60	477	477	481	1977	1977	1975	183	58	61	108.2
3.15	1	1640	60	477	477	481	1977	1977	1975	183	58	61	108.9
3.30	1	1641	60	477	477	481	1977	1977	1975	183	58	61	108.2
3.45	1	1641	60	477	477	481	1977	1977	1975	183	58	61	109.1
4.00	1	1640	60	477	477	481	1977	1977	1975	183	58	61	108.6

TEST PERFORMED BY: KHARI HERBERT

TOTAL TEST TIME: 4

PANTROPIC POWER CAT

GENERATOR LOAD BANK TEST REPORT

CUSTOMER NAME: Okeechobee WTP
DATE: 05/09/08

ENGINE MODEL #: 3516B
GENSET SERIAL #: N/A

ENGINE SERIAL #: PBR00171
GENERATOR SERIAL #: G6A00109

Generator Set Ratings

Kva	1640
Volts	480

KW	1640

Hz	60
RPM	1800

Technician:

				VOLTS			AMPS						
TIME	P.F.	KW	HZ	AB	BC	CA	A	B	C	TEMP	OIL PSI	FUEL PSI	GPH
0.00	1	1644	60	478	480	480	1981	1981	1977	183	63	65	107.9
0.15	1	1640	60	477	478	481	1978	1978	1976	185	60	61	108.8
0.30	1	1640	60	478	477	481	1978	1978	1976	185	58	61	109.5
0.45	1	1640	60	477	477	481	1978	1978	1976	183	58	61	110
1.00	1	1640	60	478	478	481	1978	1978	1976	185	58	61	109.8
1.15	1	1640	60	479	478	481	1978	1978	1976	183	58	61	108.6
1.30	1	1640	60	478	478	481	1978	1978	1976	183	58	61	108.7
1.45	1	1640	60	478	477	481	1978	1978	1976	183	58	61	108.8
2.00	1	1640	60	477	477	481	1978	1978	1976	183	58	61	109.6
2.15	1	1640	60	477	477	481	1978	1978	1976	185	58	61	108.7
2.30	1	1640	60	477	477	481	1978	1978	1976	185	58	61	109.7
2.45	1	1640	60	477	477	481	1978	1978	1976	185	58	61	108.4
3.00	1	1640	60	477	477	481	1978	1978	1976	185	58	61	109
3.15	1	1640	60	479	477	481	1978	1978	1976	183	57	61	110.7
3.30	1	1640	60	477	477	481	1978	1978	1976	185	57	61	108.4
3.45	1	1640	60	478	477	481	1978	1978	1976	185	57	61	109.4
4.00	1	1640	60	477	477	481	1978	1978	1976	185	57	61	108.6

TEST PERFORMED BY: KHARI HERBERT

TOTAL TEST TIME: 4

Pantropic Power

Pantropic Power Products, Inc

Day 1 5/8/08
Package # CAT00000JPBR00171

CAT

GENERATOR LOAD BANK TEST REPORT

CUSTOMER NAME: _____ WORK ORDER NO: _____

SERVICE ADDRESS: Okeechobee WWTP

ENGINE MODEL: 3516 ENGINE SER NO: PBR00171

GENERATOR MODEL: SR-4B - GD GENERATOR SER NO: G6A00109

TESTED WITH: REACTIVE LOAD _____ RESISTIVE LOAD ✓ BUILDING LOAD _____

GENERATOR SET RATINGS: KVA: 2050 KW: 1640 HZ: 60 RPM: 1800

VOLTAGE: 480 RATED AMPS: 2465 PF: .8

TESTED AT 1.0 PF. START HOUR METER READING: 1.4

HE	OIL PSI	FUEL PSI	WATER TEMP	HZ	VOLTAGE AB	VOLTAGE BC	VOLTAGE AC	AMPERES A	AMPERES B	AMPERES C	KVA	KW
12:30	59	61	183	60	477	477	481	1978	1978	~~1978~~ 1975	1640	1640
12:45	59	61	185	60	477	477	481	1978	1978	1975	1640	1640
13:00	58	61	185	60	477	477	481	1978	1978	1975	1640	1640
13:15	58	61	185	60	477	477	481	1978	1978	1975	1640	1640
13:30	58	61	185	60	477	477	481	1978	1978	1975	1640	1640
13:45	58	61	185	60	477	477	481	1978	1978	1975	1640	1640
14:00	58	61	185	60	477	477	481	1978	1978	1975	1640	1640
14:15	58	61	185	60	477	477	481	1978	1978	1975	1640	1640
14:30	58	61	185	60	477	477	481	1978	1978	1975	1640	1640
14:45	57	61	185	60	477	477	481	1978	1978	1975	1640	1640
15:00	57	61	185	60	477	477	481	1978	1978	1975	1640	1640
:15	57	61	183	60	477	477	481	1978	1978	1975	1640	1640

TIME	OIL PSI	FUEL PSI	WATER TEMP	HZ	VOLTAGE AB	VOLTAGE BC	VOLTAGE AC	AMPERES A	AMPERES B	AMPERES C	KVA	KW
15:30	57	61	185	60	477	477	481	1978	1978	1975	1640	1640
15:45	57	61	185	60	477	477	481	1978	1978	1975	1640	1640
16:00	57	61	185	60	477	477	481	1978	1978	1975	1640	1640
16:15	57	61	185	60	477	477	481	1978	1978	1975	1640	1640
16:30	57	61	185	60	477	477	481	1978	1978	1975	1640	1640

END HOUR METER READING: 5.4 TOTAL TEST TIME: 4.0

TEST PERFORMED BY: Chari Herbert / EPS DATE: 5/8/02

TEST WITNESSED BY: w/s 2h+ Allen DATE: 5/8/02

COMMENTS:

Pantropic Power Day 2 5/9/08 Package # CAT00000JPBR00171

Pantropic Power Products, Inc

GENERATOR LOAD BANK TEST REPORT

CUSTOMER NAME: _____ WORK ORDER NO: _____

SERVICE ADDRESS: Okeechobee WATP

ENGINE MODEL: 3516 ENGINE SER NO: PBR00171

GENERATOR MODEL: SR-4B GD GENERATOR SER NO: G6A00109

TESTED WITH: REACTIVE LOAD _____ RESISTIVE LOAD ✓ BUILDING LOAD _____

GENERATOR SET RATINGS: KVA: 2050 KW: 1640 HZ: 60 RPM: 1800

VOLTAGE: 480 RATED AMPS: 2465 PF: .8

TESTED AT 1.0 PF. START HOUR METER READING: 5.4

ME	OIL PSI	FUEL PSI	WATER TEMP	HZ	VOLTAGE AB	BC	AC	AMPERES A	B	C	KVA	KW
8:30	60	61	180	60	478	478	481	1981	1981	1977	1644	1644
8:45	60	61	183	60	478	478	481	1981	1981	1977	1642	1642
9:00	58	61	185	60	478	478	481	1978	1978	1976	1640	1640
9:15	58	61	185	60	478	478	481	1978	1978	1976	1640	1640
9:30	57	61	185	60	478	478	481	1978	1978	1976	1640	1640
9:45	57	61	185	60	478	478	481	1978	1978	1976	1640	1640
10:00	57	61	183	60	478	478	481	1978	1978	1976	1640	1640
10:15	57	61	183	60	478	478	481	1978	1978	1976	1640	1640
10:30	57	61	183	60	478	478	481	1978	1978	1976	1640	1640
10:45	57	61	183	60	478	478	481	1978	1978	1976	1640	1640
11:00	57	61	183	60	478	478	481	1978	1978	1976	1640	1640
11:15	57	61	183	60	478	478	481	1978	1978	1976	1640	1640

TIME	OIL PSI	FUEL PSI	WATER TEMP	HZ	VOLTAGE AB	VOLTAGE BC	VOLTAGE AC	AMPERES A	AMPERES B	AMPERES C	KVA	KW
11:30	57	61	185	60	478	478	480	1978	1978	1976	1640	1640
11:45	57	61	185	60	478	478	481	1978	1978	1976	1640	1640
12:00	57	61	185	60	478	478	481	1978	1978	1976	1640	1640
12:15	57	61	185	60	478	478	481	1978	1978	1976	1640	1640
12:30	57	61	185	60	478	478	481	1978	1978	1976	1640	1640

END HOUR METER READING: 9.4 TOTAL TEST TIME: 4 Hrs

TEST PERFORMED BY: Khari Herbert EPS DATE: 5/9/08

TEST WITNESSED BY: c/s V.J. Johnson DATE: 5/9/08

COMMENTS: Phase Rotation at ATS is CW CABC both sources

GENERATOR EQUIPMENT INSTRUCTION / TRAINING

Project: DVA Cemetery Road. WWTP Expansion

This is to certify that the individuals listed below have been instructed on proper operation and maintenance of the generator set equipment that has been furnished by Pantropic Power Products, Inc. for this project.

Pantropic Power Products, Inc. provision of this training is intended to familiarize and instruct site personnel on the design concept, and general operation and maintenance of the furnished generator set equipment. The generator set equipment parts, operation and maintenance manuals should also be reviewed for additional specific operation and maintenance information.

Provision of this training in not intended to imply that the recipients are Factory qualified or licensed by Pantropic Power Products, Inc. or Caterpillar, Inc. to perform the business of maintenance and/or repair of the generator set equipment. Pantropic Power Products, Inc., Caterpillar, Inc. and it's employees are not responsible or liable for any damages (consequential or direct) which may result from any trainee misunderstanding of this training, trainee lack of skill, operator error, or from any equipment failures or damages resulting from improper operating or improper maintenance of the generator set equipment by the end user's authorized operation/maintenance personnel.

Trainee Personnel in Attendance

	Print Name	Signature
1	Steven Sienki	
2	Ignacio Gomez	
3	JOHN MCNEIL	
4	Jeff James Stewart	
5		
6	E CKANDS	
7		
8		

Pantropic Instructor: _____ Training Date: 5/28/08

SPARE PARTS

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Generator System
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	16620

The following list contains the spare parts turned over to the owner:

- None

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
2/10/12		
5/9/08 DATE	5/9/08 DATE	5/9/08 DATE

TRAINING

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Generator System
PROJECT NO:	1134005 / 1134406	SPEC. SECTION:	16620

The following were in attendance at the training for the equipment listed above:

Date of Training: 10:00 AM 5-23-08

Name	Signature
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

SEE LIST ABOVE	SEE LIST ABOVE	SEE LIST ABOVE
FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
DATE	DATE	DATE

WARRANTY

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Generator System
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	16620

The warranty for the above referenced equipment/system is as follows:

- Equipment furnished under this section shall be guaranteed against defective parts or workmanship under terms of the manufacturer's and dealer's standard warranty, for a period of one (1) year from date of start up of the system.

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
5/9/08 DATE	5/9/08 DATE	5/9/08 DATE

Effective with sales to the first user on or after August 1, 2005

CATERPILLAR LIMITED WARRANTY

Industrial Engine Products and Electric Power Generation Products Worldwide*

(*excluding the Commonwealth of Independent States)

Caterpillar Inc. or any of its subsidiaries ("Caterpillar") warrants new and Remanufactured engines and electric power generation products sold by it (including any products of other manufacturers packaged and sold by Caterpillar) and operating outside the Commonwealth of Independent States (formerly USSR), to be free from defects in material and workmanship.

A different warranty statement applies to product operating in the Commonwealth of Independent States. Copies of this warranty may be obtained by writing Caterpillar Inc., 100 N.E. Adams St., Peoria, IL USA 61629.

This warranty does not apply to Caterpillar Motoren (CM) product, engines sold for use in on-highway vehicle or marine applications, engines in machines manufactured by or for Caterpillar, 3500 and 3600 Family engines used in locomotive applications, 3000 Family engines, C0.5 through C4.4 and ACERT (C6.6, C7, C9, C11, C13, C15, C18, C27, and C32) engines used in industrial applications, or Caterpillar brand batteries. These products are covered by other Caterpillar warranties.

This warranty is subject to the following:

Warranty Period

- For Uninterruptible Power Supply (UPS) systems, the warranty period is 12 months after date of delivery to the first user.
- For new industrial engines and electric power generation products (excluding UPS systems), the warranty period is 12 months (24 months for Automatic Transfer Switch (ATS) product, mobile agricultural and standby electric power generation applications) after date of delivery to the first user.
- For all Remanufactured engines, the warranty period is 6 months (12 months for mobile agricultural and standby electric power generation applications) after date of delivery to the first user.

Caterpillar Responsibilities

If a defect in material or workmanship is found during the warranty period, Caterpillar will, during normal working hours and through a place of business of a Caterpillar dealer or other source approved by Caterpillar:

- Provide (at Caterpillar's choice) new, Remanufactured or Caterpillar-approved repaired parts or assembled components needed to correct the defect.

Note: Items replaced under this warranty become the property of Caterpillar.

- Replace lubricating oil, filters, coolant and other service items made unusable by the defect.
- Provide reasonable or customary labor needed to correct the defect, including labor to disconnect the product from and reconnect the product to its attached equipment, mounting, and support systems, if required.

For new 3114, 3116 and 3126 engines and electric power generation products (including any new products of the other manufacturers packaged and sold by Caterpillar):

- Provide travel labor, up to four hours round trip if, in the opinion of Caterpillar, the product cannot reasonably be transported to a place of business of a Caterpillar dealer or other source approved by Caterpillar (travel labor in excess of four hours round trip, and any meals, mileage, lodging, etc. is the user's responsibility).

For all other products:

Provide reasonable travel expenses for authorized mechanics, including meals, mileage, and lodging, when Caterpillar chooses to make the repair on-site.

User Responsibilities

The user is responsible for:

- Providing proof of the delivery date to the first user.
- Labor costs, except as stated under "Caterpillar Responsibilities", including costs beyond those required to disconnect the product from and reconnect the product to its attached equipment, mounting and support systems.
- Travel expenses not covered under "Caterpillar Responsibilities".
- All costs associated with transporting the product to and from the place of business of a Caterpillar dealer or other source approved by Caterpillar.
- Premium or overtime labor costs.
- Parts shipping charges in excess of those which are usual and customary.
- Local taxes, if applicable.
- Costs to investigate complaints, unless the problem is caused by a defect in Caterpillar material or workmanship.
- Giving timely notice of a warrantable failure and promptly making the product available for repair.
- Performance of the required maintenance (including use of proper fuel, oil, lubricants and coolant) and items replaced due to normal wear and tear.
- Allowing Caterpillar access to all electronically stored data.

(continued on reverse side...)

Limitations

Caterpillar is not responsible for:

- Failures resulting from any use or installation which Caterpillar judges improper.
- Failures resulting from attachments, accessory items and parts not sold or approved by Caterpillar.
- Failures resulting from abuse, neglect and/or improper repair.
- Failures resulting from user's delay in making the product available after being notified of a potential product problem.
- Failures resulting from unauthorized repair or adjustments, and unauthorized fuel setting changes.
- Damage to parts, fixtures, housings, attachments, and accessory items that are not part of the engine or electric power generation product (including any products of other manufacturers packaged and sold by Caterpillar).
- Repair of components sold by Caterpillar that is warranted directly to the user by their respective manufacturer. Depending on type of application, certain exclusions may apply. Consult your Caterpillar dealer for more information.

For products operating outside of Australia, Fiji, Nauru, New Caledonia, New Zealand, Papua New Guinea, the Solomon Islands and Tahiti, the following is applicable:

NEITHER THE FOREGOING EXPRESS WARRANTY NOR ANY OTHER WARRANTY BY CATERPILLAR, EXPRESS OR IMPLIED, IS APPLICABLE TO ANY ITEM CATERPILLAR SELLS WHICH IS WARRANTED DIRECTLY TO THE USER BY ITS MANUFACTURER.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, EXCEPT CATERPILLAR EMISSION-RELATED COMPONENTS WARRANTIES FOR NEW ENGINES, WHERE APPLICABLE. REMEDIES UNDER THIS WARRANTY ARE LIMITED TO THE PROVISION OF MATERIAL AND SERVICES, AS SPECIFIED HEREIN.

CATERPILLAR IS NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

CATERPILLAR EXCLUDES ALL LIABILITY FOR OR ARISING FROM ANY NEGLIGENCE ON ITS PART OR ON THE PART OF ANY OF ITS EMPLOYEES, AGENTS OR REPRESENTATIVES IN RESPECT OF THE MANUFACTURE OR SUPPLY OF GOODS OR THE PROVISION OF SERVICES RELATING TO THE GOODS.

IF OTHERWISE APPLICABLE, THE VIENNA CONVENTION (CONTRACTS FOR THE INTERNATIONAL SALE OF GOODS) IS EXCLUDED IN ITS ENTIRETY.

For personal or family use engines or electric power generation products, operating in the USA, its territories and possessions, some states do not allow limitations on how long an implied warranty may last nor allow the exclusion or limitation of incidental or consequential damages. Therefore, the previously expressed exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights, which vary by jurisdiction. To find the location of the nearest Caterpillar dealer or other authorized repair facility, call (800) 447-4986. If you have questions concerning this warranty or its applications, call or write:

In USA and Canada: Caterpillar Inc., Engine Division, P. O. Box 610, Mossville, IL 61552-0610, Attention: Customer Service Manager, Telephone (800) 447-4986. Outside the USA and Canada: Contact your Caterpillar dealer.

For products operating in Australia, Fiji, Nauru, New Caledonia, New Zealand, Papua New Guinea, the Solomon Islands and Tahiti, the following is applicable:

THIS WARRANTY IS IN ADDITION TO WARRANTIES AND CONDITIONS IMPLIED BY STATUTE AND OTHER STATUTORY RIGHTS AND OBLIGATIONS THAT BY ANY APPLICABLE LAW CANNOT BE EXCLUDED, RESTRICTED OR MODIFIED ("MANDATORY RIGHTS"). ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED (BY STATUTE OR OTHERWISE), ARE EXCLUDED.

NEITHER THIS WARRANTY NOR ANY OTHER CONDITION OR WARRANTY BY CATERPILLAR, EXPRESS OR IMPLIED (SUBJECT ONLY TO THE MANDATORY RIGHTS), IS APPLICABLE TO ANY ITEM CATERPILLAR SELLS WHICH IS WARRANTED DIRECTLY TO THE USER BY ITS MANUFACTURER.

TO THE EXTENT PERMITTED UNDER THE MANDATORY RIGHTS, IF CATERPILLAR IS THE SUPPLIER TO THE USER, CATERPILLAR'S LIABILITY SHALL BE LIMITED AT ITS OPTION TO (a) IN THE CASE OF SERVICES, THE SUPPLY OF THE SERVICES AGAIN OR THE PAYMENT OF THE COST OF HAVING THE SERVICES SUPPLIED AGAIN, AND (b) IN THE CASE OF GOODS, THE REPAIR OR REPLACEMENT OF THE GOODS, THE SUPPLY OF EQUIVALENT GOODS, THE PAYMENT OF THE COST OF SUCH REPAIR OR REPLACEMENT OR THE ACQUISITION OF EQUIVALENT GOODS.

CATERPILLAR EXCLUDES ALL LIABILITY FOR OR ARISING FROM ANY NEGLIGENCE ON ITS PART OR ON THE PART OF ANY OF ITS EMPLOYEES, AGENTS OR REPRESENTATIVES IN RESPECT OF THE MANUFACTURE OR SUPPLY OF GOODS OR THE PROVISION OF SERVICES RELATING TO THE GOODS.

CATERPILLAR IS NOT LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES UNLESS IMPOSED UNDER MANDATORY RIGHTS.

IF OTHERWISE APPLICABLE, THE VIENNA CONVENTION (CONTRACTS FOR THE INTERNATIONAL SALE OF GOODS) IS EXCLUDED IN ITS ENTIRETY.

This warranty covers every major component of the products. Claims under this warranty should be submitted to a place of business of a Caterpillar dealer or other source approved by Caterpillar. For further information concerning either the location to submit claims or Caterpillar as the issuer of this warranty, write Caterpillar Inc., 100 N. E. Adams St., Peoria, IL USA 61629.

MANUFACTURER'S CERTIFICATION OF PROPER INSTALLATION

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Chlorine Residual and pH Analyzer
PROJECT NO:	11339.05	SPEC. SECTION:	13322

I HEREBY CERTIFY THAT THE ABOVE-REFERENCED EQUIPMENT/SYSTEM HAS BEEN: (Check Applicable)

- ☐ Installed in accordance with manufacturer's recommendations.
- ☐ Inspected, checked and adjusted.
- ☐ Serviced with proper initial lubricants.
- ☐ Electrical and mechanical connections meet quality and safety standards.
- ☐ All applicable safety equipment has been properly installed.
- ☐ System has been performance tested, and meets or exceeds specified performance requirements (when complete system of one manufacturer).

COMMENTS: _____

I, the undersigned Manufacturer's Representative, hereby certify that I am (i) a duly authorized representative of the manufacturer, (ii) empowered by the manufacturer to inspect, approve, and operate his equipment and (iii) authorized to make recommendations required to assure that the equipment furnished by the manufacturer is complete and operational, except as may be otherwise indicated herein. I further certify that all information contained herein is true and accurate.

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
2-5-09	12-10-08	02-05-09
DATE	DATE	DATE

MANUFACTURER'S SERVICES

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Chlorine Residual and pH Analyzer
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	13322

The following is a list of manufacturers services required by the specifications:

A. TESTING

- Analyzer Units: The analyzer units shall be tested using appropriate standards to demonstrate the calibration of the units. The system shall be tested, as a whole, to demonstrate the operation of the wastewater reject valves, and the recorder.
- Piping Systems: Piping systems shall be tested for leakage as required.

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
2-5-09 DATE	12-10-00 DATE	02-05-09 DATE

SPARE PARTS

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Chlorine Residual and pH Analyzer
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	13322

The following list contains the spare parts turned over to the owner.

- The following shall constitute the minimum spare parts: one spare sensor and cable for each type provided. Preventative maintenance kits. PM kits are to include electrolyte and membranes for chlorine measurement.

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
2-10-09	12-10-08	02-18-09
DATE	DATE	DATE

TRAINING

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Chlorine Residual and pH Analyzer
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	13322

The following were in attendance at the training for the equipment listed above:

Date of Training: ______

Name	Signature
Sean McNeil	[signature]
Ignacio Gomez	[signature]
Tracy Cook	[signature]
James Stratton	[signature]
Steven Sierals	[signature]

[signature]	[signature]	Joseph W Coote
FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
2-5-09	12-10-08	02-05-09
DATE	DATE	DATE

MATERIAL TURNOVER

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Turbidity Analyzer
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	13322

The following list contains the materials turned over to the owner:

- 1 ea – Turbidity Analyzer

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
2-13-09 DATE	DATE	02-18-09 DATE

WARRANTY

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Chlorine Residual and pH Analyzer
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	13322

The warranty for the above referenced equipment/system is as follows:

- The work shall be guaranteed for a period of one full year from the date of final acceptance.

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
2-9-09 DATE	12-10-08 DATE	02-05-09 DATE

MATERIAL TURNOVER

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

EQPT TAG NO:		EQPT/SYSTEM:	Refrigerated Sampler
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	13323

The following list contains the equipment turned over to the Owner:

1 each – Isco Refrigerated Sampler

FOR OWNER	FOR ENGINEER	FOR WHARTON-SMITH, INC.
Jamie Gamiotea	N/A	C SCHNEIDER
PRINT	PRINT	PRINT
11-9-07	N/A	11/9/07
DATE	DATE	DATE

MANUFACTURER'S CERTIFICATION OF PROPER INSTALLATION

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:	PLC-100, PLC-200, PLC-300, PLC-400, PLC-500	EQPT/SYSTEM:	Programmable Logic Controller
PROJECT NO:	11340.05/ 11344.06	SPEC. SECTION	17010

I HEREBY CERTIFY THAT THE ABOVE-REFERENCED EQUIPMENT/SYSTEM HAS BEEN: (Check Applicable)

- ☐ Installed in accordance with manufacturer's recommendations.
- ☒ Inspected, checked and adjusted.
- ☐ Serviced with proper initial lubricants.
- ☐ Electrical and mechanical connections meet quality and safety standards.
- ☐ All applicable safety equipment has been properly installed.
- ☐ System has been performance tested and meets or exceeds specified performance requirements (when complete system of one manufacturer).

COMMENTS: _____

I, the undersigned Manufacturer's Representative, hereby certify (that I am (i) a duly authorized representative of the manufacturer, (ii) empowered by the manufacturer to inspect, approve, and operate his equipment and (iii) authorized to make recommendations required to assure that the equipment furnished by the manufacturer is complete and operational, except as may be otherwise indicated herein. I further certify that all information contained herein is true and accurate.

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
2-5-09	12-10-08	02-05-09
DATE	DATE	DATE

MANUFACTURER'S SERVICES

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:	PLC-100, PLC-200, PLC-300, PLC-400, PLC-500	EQPT/SYSTEM:	Programmable Logic Controller
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION	17010

The following is a list of manufacturers services required by the specifications:

A. INSTALLATION

- Certification: The CONTRACTOR shall furnish the Engineer with a written certification signed by the manufacturer's representative that the equipment has been properly installed, tested, calibrated and operated under full load conditions, and satisfactory operation has been obtained.

- Personnel: The services of a factory trained, qualified representative shall be provided to inspect the completed installation, make all adjustments necessary to place the system in trouble-free operation, and instruct the operating personnel in the proper care and operation of the equipment, prior to the final acceptance of the PLC system and its associated installation.

B. TESTING

- Testing Procedures and Documentation: All test activities shall follow detailed test procedures and check lists accepted by the Engineer. All test data shall be acquired using equipment as required and shall be recorded on test forms accepted by the Engineer. Completion of all system test activities shall be documented by a certified report, including all test forms with test data entered, delivered to the Engineer with a clear and unequivocal statement that all system test requirements have been satisfied.

- Field Test: Reference Field Test Form

C. TRAINING

- Training shall be provided for the OWNER's operators and maintenance personnel in PLC operation, maintenance and troubleshooting. Training shall also include a general overview of the PLC Program logic used to implement the control operational requirements.

- Training shall be provided in two levels:
  - Basic Operation for operators.
  - Programming and system maintenance and troubleshooting for maintenance personnel.
- On-Site Support: A factory representative who has complete knowledge of proper operation and maintenance of the PLC system shall be provided for one day on-site to instruct representatives of the Owner and the Engineer on proper operation and maintenance. With the permission of the Owner, this work may be conducted in conjunction with the inspection of the installation and testing as provided in this Section. If there are any difficulties in the operation of the equipment due to the manufacturer's design or fabrication, additional services shall be provided at no cost to the Owner.

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
2-5-09	2-5-09	02-05-09
DATE	DATE	DATE

FIELD TEST

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:	PLC-100, PLC-200, PLC-300, PLC-400, PLC-500	EQPT/SYSTEM:	Programmable Logic Controller
PROJECT NO:	11340005 / 11344.06	SPEC. SECTION:	17010

Field Test: When the facility is complete and ready for operation, the PLC system shall be inspected and tested for compliance with the Contract Documents. Test of the equipment shall be made by the Contractor, in the presence of the Owner's Engineer, the Electrical Subcontractor, the equipment manufacturer's representative and the Owner's representative. The equipment tests shall include, but not be limited to, the following:

1. Controls: Controls shall be tested to determine satisfactory performance for starting and stopping the pumps, motors, opening and closing the associated valves, emergency shut-down, alarm actuation, etc.

2. Control Valve Tests: All control valves, drives and connecting linkages shall be exercised from the Operator Workstation, as well as, local control devices and adjusted to verify proper control action, hand switch action, limit switch settings, torque settings, remote control actions and remote feedback of valve status and position.

3. Interlocks: All hardware and software interlocks between the instrumentation and the motor control circuits, control circuits of variable-speed controllers and packaged equipment controls shall be checked to verify and ensure proper operation.

4. Loop Validation: Controllers and electronic function modules shall be field tested and exercised to demonstrate correct operation. All control loops shall be checked under simulated operating conditions by impressing input signals at the primary control elements and observing appropriate responses of the respective control and monitoring elements, final control elements and the graphic displays associated with the HMI system. Actual signals shall be used wherever available. Following any necessary corrections, the loops shall be retested. Each analog loop shall be tested by applying simulated analog or discrete inputs to the element of an analog loop. Continuously variable analog inputs shall be applied to verify the proper operation and setting of discrete devices. Provisional settings shall be made on controllers and alarms during analog loop tests. All analog loop test data shall be recorded by the Contractor on test forms.

5. Controllers: The stable steady-state operation of final control elements running under the control of software-based controllers shall be ensured by adjusting the controllers as required to eliminate oscillatory final control element operation.

6. Inspection: A thorough inspection of all mechanical and electrical equipment and controls, fittings, brackets, mountings, seals, conduit, painting, components and features shall be made to determine performance and compliance with design requirements and specifications.

I/O TEST SHEET

Panel Number: PLC 100			Contract Drawing: I-1.12		Lead Tester:				Date: 12-03-08			
Point Information					PLC Expected Input Value			PLC Actual Input Value				HARDWARE
POINT DESCRIPTION	I/O TYPE	SHEET	PLC ADDRESS	PLC SOFTWARE ADDRESS	0%	50%	100%	0%	50%	100%	Initials	HARDWARE COMPONENTS CHECKED
INFLUENT FLOW RATE	AI	107	0/4/0	PLC_200_DATA[4]	0	~~3500~~ 5000	~~6000~~ 10000	0	3000	6000	JWP	PLC RACK AND POWER
TRANSFER SWITCH POSITION (UTILITY)	DI	106	0/6/0	DIGITAL_INPUTS_SLOT_6.0	OFF	N/A	ON	OFF	N/A	ON	JWP KR	PLC MODULES
GENERATOR STATUS (ON/OFF)	DI	106	0/6/1	DIGITAL_INPUTS_SLOT_6.1	OFF	N/A	ON	OFF	N/A	ON	JWP KR	GFI/SURGE PROTECTION
GENERATOR FAILURE (NORMAL)	DI	106	0/6/2	DIGITAL_INPUTS_SLOT_6.2	OFF	N/A	ON	OFF	N/A	ON	JWP KR	24 VDC POWER SUPPLY
FIRE ALARM (NORMAL)	DI	106	0/6/3	DIGITAL_INPUTS_SLOT_6.3	OFF	N/A	ON	OFF	N/A	ON	JWP KR	MEDIA CONVERTER
UPS FAILURE (NORMAL)	DI	101	0/6/4	DIGITAL_INPUTS_SLOT_6.4	OFF	N/A	ON	OFF	N/A	ON	JWP KR	UPS
ALARM STROBE	DO	107	0/9/0	DIGITAL_OUTPUTS_SLOT_9.0	OFF	N/A	ON	OFF	N/A	ON	JWP KR	ALARM STROBE
ALARM HORN	DO	107	0/9/1	DIGITAL_OUTPUTS_SLOT_9.1	OFF	N/A	ON	OFF	N/A	ON	JWP KR	ALARM HORN

I/O TEST SHEET

Panel Number: PLC 200				Contract Drawing: I-1.20	Lead Tester:				Date: 12-03-08			
Point Information					PLC Expected Input Value			PLC Actual Input Value				HARDWARE
POINT DESCRIPTION	I/O TYPE	SHEET	PLC ADDRESS	PLC SOFTWARE ADDRESS	0%	50%	100%	0%	50%	100%	Initials	HARDWARE COMPONENTS CHECKED
INFLUENT PUMP NO. 1 SPEED INDICATION	AI	106	0/2/0	ANALOG_INPUTS_SLOT_2[0]	0	50	100					PLC RACK AND POWER
INFLUENT PUMP NO. 2 SPEED INDICATION	AI	106	0/2/1	ANALOG_INPUTS_SLOT_2[1]	0	50	100	0	49.7	99.2	RK	PLC MODULES
INFLUENT PUMP NO. 3 SPEED INDICATION	AI	107	0/2/2	ANALOG_INPUTS_SLOT_2[2]	0	50	100	0	49.8	99.5	RK	GFI
INFLUENT PUMP NO. 4 SPEED INDICATION	AI	107	0/2/3	ANALOG_INPUTS_SLOT_2[3]	0	50	100				RK	DIGITAL INDICATORS
INFLUENT FLOW RATE	AI	113	0/2/4	PLC_200_DATA[4]	0	~~3000~~ ~~5000~~	~~6000~~ ~~10000~~	0	3000	6000	RK	INFLUENT MAGMETER
INFLUENT PRESSURE TRANSMITTER	AI	113	0/2/5	PLC_200_DATA[5]	0	50	100	0	50	100	RK	INFLUENT PRESSURE
UPS STATUS NORMAL	DI	101	0/5/0	DIGITAL_INPUTS_SLOT_5.0	OFF	N/A	ON	OFF	N/A	ON	RK	UPS
INFLUENT PUMP NO. 1 RUNNING	DI	106	0/5/1	DIGITAL_INPUTS_SLOT_5.1	OFF	N/A	ON	OFF	N/A	ON	RK	SIGNAL CONVERTERS
INFLUENT PUMP NO. 1 FAIL	DI	106	0/5/2	DIGITAL_INPUTS_SLOT_5.2	OFF	N/A	ON	OFF	N/A	ON	RK	RELAYS
INFLUENT PUMP NO. 2 RUNNING	DI	106	0/5/3	DIGITAL_INPUTS_SLOT_5.3	OFF	N/A	ON	OFF	N/A	ON	RK	DCC PUMP CONTROLLER
INFLUENT PUMP NO. 2 FAIL	DI	106	0/5/4	DIGITAL_INPUTS_SLOT_5.4	OFF	N/A	ON	OFF	N/A	ON	RK	BUBBLER SYSTEM
INFLUENT PUMP NO. 3 RUNNING	DI	107	0/5/5	DIGITAL_INPUTS_SLOT_5.5	OFF	N/A	ON	OFF	N/A	ON	RK	LEVEL SENSOR
INFLUENT PUMP NO. 3 FAIL	DI	107	0/5/6	DIGITAL_INPUTS_SLOT_5.6	OFF	N/A	ON	OFF	N/A	ON	RK	PUMP FAIL RELAYS
INFLUENT PUMP NO. 4 RUNNING	DI	107	0/5/7	DIGITAL_INPUTS_SLOT_5.7	OFF	N/A	ON	OFF	N/A	ON	RK	24 VDC POWER SUPPLY
INFLUENT PUMP NO. 4 FAIL	DI	107	0/5/8	DIGITAL_INPUTS_SLOT_5.8	OFF	N/A	ON	OFF	N/A	ON	RK	MANUAL SPEED CONTROL
PUMP CONTROLLER FAULT	DI	108	0/5/9	DIGITAL_INPUTS_SLOT_5.9	OFF	N/A	ON	OFF	N/A	ON	RK	PANEL LIGHTS
WETWELL LEVEL LOW	DI	108	0/5/10	DIGITAL_INPUTS_SLOT_5.10	OFF	N/A	ON	OFF	N/A	ON	RK	HI AND LOW FLOATS
WETWELL LEVEL HIGH	DI	108	0/5/11	DIGITAL_INPUTS_SLOT_5.11	OFF	N/A	ON	OFF	N/A	ON	RK	PUSH BUTTONS
SLURRY CUP IN AUTO	DI	109	0/5/12	DIGITAL_INPUTS_SLOT_5.12	OFF	N/A	ON	OFF	N/A	ON	RK	HOA SWITCHES
GRIT SNAIL IN AUTO	DI	109	0/5/13	DIGITAL_INPUTS_SLOT_5.13	OFF	N/A	ON	OFF	N/A	ON	RK	MEDIA CONVERTER
GRIT SNAIL FAIL	DI	109	0/5/14	DIGITAL_INPUTS_SLOT_5.14	OFF	N/A	ON	OFF	N/A	ON	RK	SURGE PROTECTION
BAR SCREEN RUN	DI	110	0/5/15	DIGITAL_INPUTS_SLOT_5.15	OFF	N/A	ON	OFF	N/A	ON	RK	HEADWORKS INTERFACE
BAR SCREEN OVERLOAD	DI	110	0/6/0	DIGITAL_INPUTS_SLOT_6.0	OFF	N/A	ON	OFF	N/A	ON	RK	VFD INTERFACE
INFLUENT CHANNEL LEVEL HIGH	DI	110	0/6/1	DIGITAL_INPUTS_SLOT_6.1	OFF	N/A	ON	OFF	N/A	ON	RK	MCC INTERFACE
SCREW WASH PRESS RUN	DI	111	0/6/2	DIGITAL_INPUTS_SLOT_6.2	OFF	N/A	ON	OFF	N/A	ON	RK	
SCREW WASH PRESS OVERLOAD	DI	111	0/6/3	DIGITAL_INPUTS_SLOT_6.3	OFF	N/A	ON	OFF	N/A	ON	RK	
INFLUENT FLOW TOTALIZED PULSE 100 GAL	DI	113	0/6/4	DIGITAL_INPUTS_SLOT_6.4	OFF	N/A	ON	OFF	N/A	ON	RK	
ODOR BLOWER MOTOR RUN	DI	112	0/6/5	DIGITAL_INPUTS_SLOT_6.5	OFF	N/A	ON	OFF	N/A	ON	RK	
ODOR BLOWER MOTOR FAIL	DI	112	0/6/6	DIGITAL_INPUTS_SLOT_6.6	OFF	N/A	ON	OFF	N/A	ON	RK	
GRIT REMOVAL / DEWATERING CP REQUIRED	DO	109	0/9/0	DIGITAL_OUTPUTS_SLOT_9.0	OFF	N/A	ON		N/A	NOT USING		
ODOR BLOWER MOTOR REQUIRED	DO	112	0/9/1	DIGITAL_OUTPUTS_SLOT_9.1	OFF	N/A	ON	OFF	N/A	ON	RK	

I/O TEST SHEET

Panel Number: PLC 300			Contract Drawing: I-1.30		Lead Tester:				Date: 12-03-08			
Point Information					PLC Expected Input Value			PLC Actual Input Value				HARDWARE
POINT DESCRIPTION	I/O TYPE	SHEET	PLC ADDRESS	PLC SOFTWARE ADDRESS	0%	50%	100%	0%	50%	100%	Initials	HARDWARE COMPONENTS CHECKED
PS3 WAS/RAS 4" VALVE POSITION - FUTURE	AI	109	0/2/0	ANALOG_INPUTS_SLOT_2[0]	0	50	100	0	50	100	JWK	PLC RACK AND POWER
PS3 WAS/RAS 4" FLOW RATE - FUTURE	AI	111	0/2/1	ANALOG_INPUTS_SLOT_2[1]	0	5000	10000	0	5000	10000	JWK	PLC MODULES
PS3 WAS/RAS 16" VALVE POSITION - FUTURE	AI	110	0/2/2	ANALOG_INPUTS_SLOT_2[2]	0	50	100	0	50	100	JWK	GFI
PS3 WAS/RAS 16" FLOW RATE - FUTURE	AI	112	0/2/3	ANALOG_INPUTS_SLOT_2[3]	0	5000	10000	0	4800	10000	JWK	24 VDC POWER SUPPLY
PS3 WAS/RAS 4" VALVE POSITION CONTROL - FUTURE	AO	109	0/4/0	ANALOG_OUTPUTS_SLOT_4[0]	0	50	100	0	50	100	JWK	MEDIA CONVERTER
PS3 WAS/RAS 16" VALVE POSITION CONTROL - FUTURE	AO	110	0/4/1	ANALOG_OUTPUTS_SLOT_4[1]	0	50	100	0	50	100	JWK	SURGE PROTECTION
UPS STATUS NORMAL	DI	101	0/6/0	DIGITAL_INPUTS_SLOT_6.0	OFF	N/A	ON	OFF	N/A	ON	JWK	UPS
WAS/RAS PUMP NO. 1 RUNNING - FUTURE	DI	106	0/6/1	DIGITAL_INPUTS_SLOT_6.1	OFF	N/A	ON	OFF	N/A	ON	JWK	RELAYS
WAS/RAS PUMP NO. 1 FAILED - FUTURE	DI	106	0/6/2	DIGITAL_INPUTS_SLOT_6.2	OFF	N/A	ON	OFF	N/A	ON	JWK	AERATION INTERFACE
WAS/RAS PUMP NO. 2 RUNNING - FUTURE	DI	107	0/6/3	DIGITAL_INPUTS_SLOT_6.3	OFF	N/A	ON	OFF	N/A	ON	JWK	VFD INTERFACE
WAS/RAS PUMP NO. 2 FAILED - FUTURE	DI	107	0/6/4	DIGITAL_INPUTS_SLOT_6.4	OFF	N/A	ON	OFF	N/A	ON	JWK	MCC INTERFACE
WAS/RAS PUMP NO. 3 RUNNING - FUTURE	DI	108	0/6/5	DIGITAL_INPUTS_SLOT_6.5	OFF	N/A	ON	OFF	N/A	ON	JWK	
WAS/RAS PUMP NO. 3 FAILED - FUTURE	DI	108	0/6/6	DIGITAL_INPUTS_SLOT_6.6	OFF	N/A	ON	OFF	N/A	ON	JWK	
WAS/RAS 4" VALVE OPEN - FUTURE	DI	109	0/6/7	DIGITAL_INPUTS_SLOT_6.7	OFF	N/A	ON	OFF	N/A	ON	JWK	
WAS/RAS 4" TOTALIZED FLOW METER - FUTURE	DI	111	0/6/9	DIGITAL_INPUTS_SLOT_6.9	OFF	N/A	ON		N/A	FUTURE		
WAS/RAS 16" TOTALIZED FLOW - FUTURE	DI	112	0/6/10	DIGITAL_INPUTS_SLOT_6.10	OFF	N/A	ON		N/A	FUTURE		
WAS/RAS 16" VALVE OPEN - - FUTURE	DI	110	0/6/11	DIGITAL_INPUTS_SLOT_6.11	OFF	N/A	ON	OFF	N/A	ON	JWK	
CLARIFIER 2A DRIVE RUNNING - FUTURE	DI	113	0/6/13	DIGITAL_INPUTS_SLOT_6.13	OFF	N/A	ON	OFF	N/A	ON	JWK	
CLARIFIER 2A DRIVE HIGH TORQUE - FUTURE	DI	113	0/6/14	DIGITAL_INPUTS_SLOT_6.14	OFF	N/A	ON	OFF	N/A	ON	JWK	
CLARIFIER 2A DRIVE HIGH HIGH TORQUE - FUTURE	DI	113	0/6/15	DIGITAL_INPUTS_SLOT_6.15	OFF	N/A	ON	OFF	N/A	ON	JWK	
PS3 WAS/RAS/ PUMP NO. 1 OFF/ON (ON) - FUTURE	DO	106	0/9/0	DIGITAL_OUTPUTS_SLOT_9.0	OFF	N/A	ON	OFF	N/A	ON	JWK	
PS3 WAS/RAS PUMP NO. 2 OFF/ON (ON) - FUTURE	DO	107	0/9/1	DIGITAL_OUTPUTS_SLOT_9.1	OFF	N/A	ON	OFF	N/A	ON	JWK	
PS3 WAS/RAS PUMP NO. 3 OFF/ON (ON) - FUTURE	DO	108	0/9/2	DIGITAL_OUTPUTS_SLOT_9.2	OFF	N/A	ON	OFF	N/A	ON	JWK	
PS3 WAS/RAS 4" MOV OPEN / CLOSE - FUTURE	DO	109	0/9/3	DIGITAL_OUTPUTS_SLOT_9.3	OFF	N/A	ON	OFF	N/A	ON	JWK	
PS3 WAS/RAS 16" MOV OPEN / CLOSE - FUTURE	DO	110	0/9/4	DIGITAL_OUTPUTS_SLOT_9.4	OFF	N/A	ON	OFF	N/A	ON	JWK	
CLARIFIER 2A DRIVE OFF/ON (ON) - FUTURE	DO	113	0/9/5	DIGITAL_OUTPUTS_SLOT_9.5	OFF	N/A	ON	OFF	N/A	ON	JWK	

Panel Number: PLC 400			Contract Drawing: I-1.40 and I-1.41		Lead Tester:			Date: 12-03-08				
Point Information					PLC Expected Input Value			PLC Actual Input Value				HARDWARE
POINT DESCRIPTION	I/O TYPE	SHEET	PLC ADDRESS	PLC SOFTWARE ADDRESS	0%	50%	100%	0%	50%	100%		HARDWARE COMPONENTS CHECKED
EFFLUENT PUMP NO.1 SPEED INDICATION	AI	108	0/2/0	ANALOG_INPUTS_SLOT_2[0]	0	50	100	0	50	100	JLC MK	PLC RACK AND POWER
EFFLUENT PUMP NO. 2 SPEED INDICATION	AI	106	0/2/1	ANALOG_INPUTS_SLOT_2[1]	0	50	100	0	50	100	JLC RK	PLC MODULES
EFFLUENT PUMP NO. 3 SPEED INDICATION	AI	107	0/2/2	ANALOG_INPUTS_SLOT_2[2]	0	50	100	0	50	100	JLC RK	WETWELL LEVEL SENSOR
EFFLUENT PUMP NO. 4 SPEED INDICATION	AI	107	0/2/3	ANALOG_INPUTS_SLOT_2[3]	0	50	100	0	50	100	JLC RK	DIGITAL INDICATORS
DISK FILTER NO. 1 TURBIDITY	AI	117	0/2/4	ANALOG_INPUTS_SLOT_2[4]	0	50	100	VALUE AT ANALYZER MATCHED SCADA				TURBIDITY ANALYZER
MONITORING WELL LEVEL NO. 1	AI	117	0/2/5	ANALOG_INPUTS_SLOT_2[5]	0	50	150	0	75	150	JLC RK	WELL NO. 1 LEVEL SENSOR
MONITORING WELL LEVEL NO. 2	AI	117	0/3/0	ANALOG_INPUTS_SLOT_3[0]	0	50	150	0	75	150	JLC RK	WELL NO. 2 LEVEL SENSOR
EFFLUENT CHLORINE	AI	118	0/3/1	ANALOG_INPUTS_SLOT_3[1]	0	2.5	5	VALUE AT ANALYZER MATCHED SCADA				CHLORINE ANALYZER
EFFLUENT pH	AI	118	0/3/2	ANALOG_INPUTS_SLOT_3[2]	-2.00	6.00	14.00	VALUE AT ANALYZER MATCHED SCADA				PH ANALYZER
EFFLUENT REJECT POND FLOW RATE	AI	116	0/3/3	ANALOG_INPUTS_SLOT_3[3]	0	2500	5000	0	2500	5000	JLC MK	POND FLOWMETER
EFFLUENT DEEP WELL FLOW RATE	AI	115	0/3/4	ANALOG_INPUTS_SLOT_3[4]	0	5000	10000	0	5000	10000	JLC MK	DEEP WELL FLOWMETER
EFFLUENT DEEP WELL PRESSURE	AI	115	0/3/5	ANALOG_INPUTS_SLOT_3[5]	0	50	100	0	75	150	JLC RK	DEEP WELL PRESS TRANS
UPS STATUS NORMAL	DI	101	0/5/0	DIGITAL_INPUTS_SLOT_5.0	OFF	N/A	ON	OFF	N/A	ON	JLC MK	UPS
EFFLUENT PUMP NO. 1 RUNNING	DI	106	0/5/1	DIGITAL_INPUTS_SLOT_5.1	OFF	N/A	ON	OFF	N/A	ON	JLC MK	PUMP FAIL RELAYS
EFFLUENT PUMP NO. 1 FAIL	DI	106	0/5/2	DIGITAL_INPUTS_SLOT_5.2	OFF	N/A	ON	OFF	N/A	ON	JLC MK	24 VDC POWER SUPPLY
EFFLUENT PUMP NO. 2 RUNNING	DI	106	0/5/3	DIGITAL_INPUTS_SLOT_5.3	OFF	N/A	ON	OFF	N/A	ON	JLC MK	MANUAL SPEED CONTROL
EFFLUENT PUMP NO. 2 FAIL	DI	106	0/5/4	DIGITAL_INPUTS_SLOT_5.4	OFF	N/A	ON	OFF	N/A	ON	JLC MK	PANEL LIGHTS
EFFLUENT PUMP NO. 3 RUNNING	DI	107	0/5/5	DIGITAL_INPUTS_SLOT_5.5	OFF	N/A	ON	OFF	N/A	ON	JLC MK	HOA SWITCHES
EFFLUENT PUMP NO. 3 FAIL	DI	107	0/5/6	DIGITAL_INPUTS_SLOT_5.6	OFF	N/A	ON	OFF	N/A	ON	JLC MK	PUSH BUTTONS
EFFLUENT PUMP NO. 4 RUNNING	DI	107	0/5/7	DIGITAL_INPUTS_SLOT_5.7	OFF	N/A	ON	OFF	N/A	ON	JLC MK	DEEP WELL MOV
EFFLUENT PUMP NO. 4 FAIL	DI	107	0/5/8	DIGITAL_INPUTS_SLOT_5.8	OFF	N/A	ON	OFF	N/A	ON	JLC MK	DISK FILTER MOV
PUMP CONTROLLER FAULT	DI	108	0/5/9	DIGITAL_INPUTS_SLOT_5.9	OFF	N/A	ON	OFF	N/A	ON	JLC MK	BUBBLER SYSTEM
WETWELL LEVEL LOW	DI	108	0/5/10	DIGITAL_INPUTS_SLOT_5.10	OFF	N/A	ON	OFF	N/A	ON	JLC MK	DCC PUMP CONTROLLER
WETWELL LEVEL HIGH	DI	108	0/5/11	DIGITAL_INPUTS_SLOT_5.11	OFF	N/A	ON	OFF	N/A	ON	JLC MK	HI AND LOW FLOATS
DISK FILTER NO. 1 MOV CLOSED	DI	109	0/5/12	DIGITAL_INPUTS_SLOT_5.12	OFF	N/A	ON	OFF	N/A	ON	JLC RK	POND MOV
DISK FILTER NO. 1 MOV OPEN	DI	109	0/5/13	DIGITAL_INPUTS_SLOT_5.13	OFF	N/A	ON	OFF	N/A	ON	JLC RK	MEDIA CONVERTER
DISK FILTER NO. 1 MOV FAIL	DI	109	0/5/14	DIGITAL_INPUTS_SLOT_5.14	OFF	N/A	ON	OFF	N/A	ON	JLC RK	SIGNAL CONVERTERS
DISK FILTER NO. 1 HIGH LEVEL BYPASS HIGH	DI	110	0/5/15	DIGITAL_INPUTS_SLOT_5.15	OFF	N/A	ON	OFF	N/A	ON	JLC MK	RELAYS
DISK FILTER NO. 1 BACKWASH PUMP RUNNING	DI	110	0/6/0	DIGITAL_INPUTS_SLOT_6.0	OFF	N/A	ON	OFF	N/A	ON	JLC MK	VFD INTERFACE
DISK FILTER NO. 1 DRUM AFD RUNNING	DI	110	0/6/1	DIGITAL_INPUTS_SLOT_6.1	OFF	N/A	ON	OFF	N/A	ON	JLC MK	MCC INTERFACE
DISK FILTER NO. 1 BACKWASH PUMP FAIL	DI	110	0/6/2	DIGITAL_INPUTS_SLOT_6.2	OFF	N/A	ON	OFF	N/A	ON	JLC MK	SURGE PROTECTION
DISK FILTER NO. 1 DRUM AFD FAIL	DI	110	0/6/3	DIGITAL_INPUTS_SLOT_6.3	OFF	N/A	ON	OFF	N/A	ON	JLC MK	GFI
DISK FILTER NO. 2 MOV CLOSED	DI	111	0/6/4	DIGITAL_INPUTS_SLOT_6.4	OFF	N/A	ON	OFF	N/A	ON	JLC RK	
DISK FILTER NO. 2 MOV OPEN	DI	111	0/6/5	DIGITAL_INPUTS_SLOT_6.5	OFF	N/A	ON	OFF	N/A	ON	JLC RK	
DISK FILTER NO. 2 MOV FAIL	DI	111	0/6/6	DIGITAL_INPUTS_SLOT_6.6	OFF	N/A	ON	OFF	N/A	ON	JLC RK	
DISK FILTER NO. 2 HIGH LEVEL	DI	112	0/6/7	DIGITAL_INPUTS_SLOT_6.7	OFF	N/A	ON	OFF	N/A	ON	JLC MK	
DISK FILTER NO. 2 BACKWASH PUMP RUNNING	DI	112	0/6/8	DIGITAL_INPUTS_SLOT_6.8	OFF	N/A	ON	OFF	N/A	ON	JLC MK	

DISK FILTER NO. 2 DRUM AFD RUNNING	DI	112	0/6/9	DIGITAL_INPUTS_SLOT_6.9	OFF	N/A	ON	OFF	N/A	ON	Jac RK	
DISK FILTER NO. 2 BACKWASH PUMP FAIL	DI	112	0/6/10	DIGITAL_INPUTS_SLOT_6.10	OFF	N/A	ON	OFF	N/A	ON	Jac RK	
DISK FILTER NO. 2 DRUM AFD FAIL	DI	112	0/6/11	DIGITAL_INPUTS_SLOT_6.11	OFF	N/A	ON	OFF	N/A	ON	Jac RK	
DISK FILTER NO. 3 MOV CLOSED - FUTURE	DI	113	0/6/12	DIGITAL_INPUTS_SLOT_6.12	OFF	N/A	ON		N/A	FUTURE		
DISK FILTER NO. 3 MOV OPEN - FUTURE	DI	113	0/6/13	DIGITAL_INPUTS_SLOT_6.13	OFF	N/A	ON		N/A	FUTURE		
DISK FILTER NO. 3 MOV FAIL - FUTURE	DI	113	0/6/14	DIGITAL_INPUTS_SLOT_6.14	OFF	N/A	ON		N/A	FUTURE		
DISK FILTER NO. 3 HIGH LEVEL - FUTURE	DI	113	0/6/15	DIGITAL_INPUTS_SLOT_6.15	OFF	N/A	ON		N/A	FUTURE		
DISK FILTER NO. 3 BACKWASH PUMP RUNNING - FUTURE	DI	113	0/7/0	DIGITAL_INPUTS_SLOT_7.0	OFF	N/A	ON		N/A	FUTURE		
DISK FILTER NO. 3 DRUM AFD RUNNING - FUTURE	DI	114	0/7/1	DIGITAL_INPUTS_SLOT_7.1	OFF	N/A	ON		N/A	FUTURE		
DISK FILTER NO. 3 BACKWASH PUMP FAIL - FUTURE	DI	114	0/7/2	DIGITAL_INPUTS_SLOT_7.2	OFF	N/A	ON		N/A	FUTURE		
DISK FILTER NO. 3 DRUM AFD FAIL - FUTURE	DI	114	0/7/3	DIGITAL_INPUTS_SLOT_7.3	OFF	N/A	ON		N/A	FUTURE		
EFFLUENT REJECT POND MOV CLOSED	DI	116	0/7/4	DIGITAL_INPUTS_SLOT_7.4	OFF	N/A	ON	OFF	N/A	ON	Jac RK	
EFFLUENT REJECT POND MOV OPEN	DI	116	0/7/5	DIGITAL_INPUTS_SLOT_7.5	OFF	N/A	ON	OFF	N/A	ON	Jac RK	
EFFLUENT REJECT POND MOV FAILED	DI	116	0/7/6	DIGITAL_INPUTS_SLOT_7.6	OFF	N/A	ON	OFF	N/A	ON	Jac RK	
EFFLUENT DEEP WELL MOV CLOSED	DI	115	0/7/7	DIGITAL_INPUTS_SLOT_7.7	OFF	N/A	ON	OFF	N/A	ON	Jac RK	
EFFLUENT DEEP WELL MOV OPEN	DI	115	0/7/8	DIGITAL_INPUTS_SLOT_7.8	OFF	N/A	ON	OFF	N/A	ON	Jac RK	
EFFLUENT DEEP WELL MOV FAILED	DI	115	0/7/9	DIGITAL_INPUTS_SLOT_7.9	OFF	N/A	ON	OFF	N/A	ON	Jac RK	
DISK FILTER NO. 1 MOV REQUIRED	DO	109	0/9/0	DIGITAL_OUTPUTS_SLOT_9.0	OFF	N/A	ON	OFF	N/A	ON	Jac RK	
DISK FILTER NO. 2 MOV REQUIRED	DO	111	0/9/1	DIGITAL_OUTPUTS_SLOT_9.1	OFF	N/A	ON	OFF	N/A	ON	Jac RK	
DISK FILTER NO. 3 MOV REQUIRED - FUTURE	DO	113	0/9/2	DIGITAL_OUTPUTS_SLOT_9.2	OFF	N/A	ON		N/A	FUTURE		
EFFLUENT REJECT POND MOV REQUIRED	DO	116	0/9/3	DIGITAL_OUTPUTS_SLOT_9.3	OFF	N/A	ON	OFF	N/A	ON	Jac RK	
EFFLUENT DEEP WELL MOV REQUIRED	DO	115	0/9/4	DIGITAL_OUTPUTS_SLOT_9.4	OFF	N/A	ON	OFF	N/A	ON	Jac RK	

I/O TEST SHEET

Panel Number: PLC 500			Contract Drawing: I-1.50		Lead Tester:				Date: 12-03-08				
Point Information					PLC Expected Input Value			PLC Actual Input Value				HARDWARE	
POINT DESCRIPTION	I/O TYPE	SHEET	PLC ADDRESS	PLC SOFTWARE ADDRESS	0%	50%	100%	0%	50%	100%	Initials	HARDWARE COMPONENTS CHECKED
PS2 WAS/RAS 6 VALVE POSITION	AI	109	0/2/0	ANALOG_INPUTS_SLOT_2[0]	0	50	100	VALVE	AT VALVE	MATCHED	SCADA	PLC RACK AND POWER
PS2 WAS/RAS 6 FLOW RATE	AI	112	0/2/1	ANALOG_INPUTS_SLOT_2[1]	0	300	600	0	300	600		6" MAGMETER
PS2 WAS/RAS 8 VALVE POSITION	AI	110	0/2/2	ANALOG_INPUTS_SLOT_2[2]	0	50	100	VALVE	AT VALVE	MATCHED	SCADA	RAS/WAS MOVS
PS2 WAS/RAS 8 FLOW RATE	AI	113	0/2/3	ANALOG_INPUTS_SLOT_2[3]	0	300	600	0	300	600		8" MAGMATER
PS2 WAS/RAS 16 VALVE POSITION	AI	111	0/2/4	ANALOG_INPUTS_SLOT_2[4]	0	50	100	VALVE	AT VALVE	MATCHED	SCADA	MEDIA CONVERTER
PS2 WAS/RAS 16 FLOW RATE	AI	114	0/2/5	ANALOG_INPUTS_SLOT_2[5]	0	3000	6000	0	3000	6000		16"MAGMETER
PS2 WAS/RAS 6VALVE POSITION CONTROL	AO	109	0/4/0	ANALOG_OUTPUTS_SLOT_4[0]	0	50	100	0	50	100		GFI
PS2 WAS/RAS 8VALVE POSITION CONTROL	AO	110	0/4/1	ANALOG_OUTPUTS_SLOT_4[1]	0	50	100	0	50	100		RELAYS
PS2 WAS/RAS 16VALVE POSITION CONTROL	AO	110	0/4/3	ANALOG_OUTPUTS_SLOT_4[3]	0	50	100	0	50	100		CENTRIFUGE INTERFACE
UPS STATUS NORMAL	DI	101	0/6/0	DIGITAL_INPUTS_SLOT_6.0	OFF	N/A	ON	OFF	N/A	ON		UPS
PS4 RESIDUAL PUMP NO. 1 RUNNING	DI	115	0/6/1	DIGITAL_INPUTS_SLOT_6.1	OFF	N/A	ON	OFF	N/A	ON		PLC MODULES
PS4 RESIDUAL PUMP NO. 1 FAULT	DI	115	0/6/2	DIGITAL_INPUTS_SLOT_6.2	OFF	N/A	ON	OFF	N/A	ON		24 VDC POWER SUPPLY
PS4 RESIDUAL PUMP NO. 2 RUNNING	DI	116	0/6/3	DIGITAL_INPUTS_SLOT_6.3	OFF	N/A	ON	OFF	N/A	ON		SURGE PROTECTION
PS4 RESIDUAL PUMP NO. 2 FAULT	DI	116	0/6/4	DIGITAL_INPUTS_SLOT_6.4	OFF	N/A	ON	OFF	N/A	ON		MCC INTERFACE
PS4 RESIDUAL PUMP NO. 3 RUNNING - FUTURE	DI	117	0/6/5	DIGITAL_INPUTS_SLOT_6.5	OFF	N/A	ON	OFF	N/A	ON		
PS4 RESIDUAL PUMP NO. 3 FAULT - FUTURE	DI	117	0/6/6	DIGITAL_INPUTS_SLOT_6.6	OFF	N/A	ON	OFF	N/A	ON		
PS2 WAS/RAS PUMP NO. 1 RUNNING	DI	109	0/6/7	DIGITAL_INPUTS_SLOT_6.7	OFF	N/A	ON	OFF	N/A	ON		
PS2 WAS/RAS PUMP NO. 1 FAULT	DI	111	0/6/8	DIGITAL_INPUTS_SLOT_6.8	OFF	N/A	ON	OFF	N/A	ON		
PS2 WAS/RAS PUMP NO. 2 RUNNING	DI	112	0/6/9	DIGITAL_INPUTS_SLOT_6.9	OFF	N/A	ON	OFF	N/A	ON		
PS2 WAS/RAS PUMP NO. 2 FAULT	DI	110	0/6/10	DIGITAL_INPUTS_SLOT_6.10	OFF	N/A	ON	OFF	N/A	ON		
PS2 WAS/RAS PUMP NO. 3 RUNNING	DI	113	0/6/11	DIGITAL_INPUTS_SLOT_6.11	OFF	N/A	ON	OFF	N/A	ON		
PS2 WAS/RAS PUMP NO. 3 FAULT	DI	113	0/6/12	DIGITAL_INPUTS_SLOT_6.12	OFF	N/A	ON	OFF	N/A	ON		
PS2 WAS/RAS 6 VALVE CLOSED	DI	109	0/6/13	DIGITAL_INPUTS_SLOT_6.13	OFF	N/A	ON	OFF	N/A	ON		
PS2 WAS/RAS 6 VALVE FAILED	DI	109	0/6/14	DIGITAL_INPUTS_SLOT_6.14	OFF	N/A	ON	OFF	N/A	ON		
PS2 WAS/RAS 6 TOTALIZED FLOW	DI	112	0/6/15	DIGITAL_INPUTS_SLOT_6.15	OFF	N/A	ON	OFF	N/A	ON		
PS2 WAS/RAS 8 VALVE CLOSED	DI	110	0/7/0	DIGITAL_INPUTS_SLOT_7.0	OFF	N/A	ON	OFF	N/A	ON		
PS2 WAS/RAS 8 VALVE FAILED	DI	110	0/7/1	DIGITAL_INPUTS_SLOT_7.1	OFF	N/A	ON	OFF	N/A	ON		
PS2 WAS/RAS 8 TOTALIZED FLOW	DI	113	0/7/2	DIGITAL_INPUTS_SLOT_7.2	OFF	N/A	ON	OFF	N/A	ON		
PS2 WAS/RAS 16 VALVE CLOSED	DI	111	0/7/3	DIGITAL_INPUTS_SLOT_7.3	OFF	N/A	ON	OFF	N/A	ON		
PS2 WAS/RAS 16 VALVE FAILED	DI	111	0/7/4	DIGITAL_INPUTS_SLOT_7.4	OFF	N/A	ON	OFF	N/A	ON		
PS2 WAS/RAS 16 TOTALIZED FLOW	DI	114	0/7/5	DIGITAL_INPUTS_SLOT_7.5	OFF	N/A	ON	OFF	N/A	ON		
PS4 RESIDUAL PUMP NO. 1 REQUIRED	DO	115	0/9/0	DIGITAL_OUTPUTS_SLOT_9.0	OFF	N/A	ON	OFF	N/A	ON		
PS4 RESIDUAL PUMP NO. 2 REQUIRED	DO	116	0/9/1	DIGITAL_OUTPUTS_SLOT_9.1	OFF	N/A	ON	OFF	N/A	ON		
PS4 RESIDUAL PUMP NO. 3 REQUIRED - FUTURE	DO	117	0/9/2	DIGITAL_OUTPUTS_SLOT_9.2	OFF	N/A	ON		N/A	FUTURE		
PS2 WAS/RAS PUMP NO. 1 REQUIRED	DO	109	0/9/3	DIGITAL_OUTPUTS_SLOT_9.3	OFF	N/A	ON	OFF	N/A	ON		
PS2 WAS/RAS PUMP NO. 2 REQUIRED	DO	110	0/9/4	DIGITAL_OUTPUTS_SLOT_9.4	OFF	N/A	ON	OFF	N/A	ON		

I/O TEST SHEET

PS2 WAS/RAS PUMP NO. 3 REQUIRED	DO	113	0/9/5	DIGITAL_OUTPUTS_SLOT_9.5	OFF	N/A	ON	OFF	N/A	ON	RR	
PS2 WAS/RAS 6 MOV REQUIRED	DO	109	0/9/6	DIGITAL_OUTPUTS_SLOT_9.6	OFF	N/A	ON	OFF	N/A	ON	RR	
PS2 WAS/RAS 8 MOV REQUIRED	DO	110	0/9/7	DIGITAL_OUTPUTS_SLOT_9.7	OFF	N/A	ON	OFF	N/A	ON	RR	
PS2 WAS/RAS 16 MOV REQUIRED	DO	111	0/9/8	DIGITAL_OUTPUTS_SLOT_9.8	OFF	N/A	ON	OFF	N/A	ON	RR	

SPARE PARTS

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:	PLC-100, PLC-200, PLC-300, PLC-400, PLC-500	EQPT/SYSTEM:	Programmable Logic Controller
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	17010

The following list contains the spare parts turned over to the owner.

- Spare components and devices shall be provided for the PLC system. All spare parts shall be delivered to the Owner in the original packaging. The outside of the packaging for spare parts shall include the model number or part number of the component or device within the package. Spare parts and quantities shall include:

Quantity	Spare Part
One (1)	PLC CPU Module
One (1)	PLC Communication Module
One (1)	PLC Analog Input Module
One (1)	PLC Analog Output Module
One (1)	PLC Discrete Input Module
One (1)	PLC Discrete Output Module
One (1)	PLC Power Supply
One (1)	Each Size DC Power Supply
One (1)	Each PLC or Data Communication Components Not Included Above

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
2-5-09	12-10-08	02-05-09
DATE	DATE	DATE

TRAINING

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:	PLC-100, PLC-200, PLC-300, PLC-400, PLC-500	EQPT/SYSTEM:	Programmable Logic Controller
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	17010

The following were in attendance at the training for the equipment listed above:

Date of Training:

Name	Signature
JOHN MITCHELL	
Ignacio Gomez	
TRACY COOK	
Steve Sierchio	
James Strathem	

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
DATE: 2-5-09	DATE: 12-10-08	DATE: 02-05-09

WARRANTY

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:	PLC-100, PLC-200, PLC-300, PLC-400, PLC-500	EQPT/SYSTEM:	Programmable Logic Controller
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	17010

The warranty for the above referenced equipment/system is as follows:

All equipment, components, materials and software shall be guaranteed against defects in material and workmanship for a minimum period of one year from the date of Owner's final inspection and acceptance. Any defective or faulty equipment, components, materials or software shall be repaired or replaced without cost or obligation to the Owner.

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
2-5-09	12-10-08	02-05-09
DATE	DATE	DATE

MANUFACTURER'S CERTIFICATION OF PROPER INSTALLATION

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER: Okeechobee Utility Authority

EQPT SERIAL NO:

EQPT TAG NO:

EQPT/SYSTEM: Human Machine Interface System

PROJECT NO: 11340.05 / 11344.06

SPEC. SECTION: 17510

I HEREBY CERTIFY THAT THE ABOVE REFERENCED EQUIPMENT/SYSTEM HAS BEEN: (Check Applicable)

- ☐ Installed in accordance with manufacturer's recommendations.
- ☐ Inspected, checked and adjusted.
- ☐ Serviced with proper initial lubricants.
- ☐ Electrical and mechanical connections meet quality and safety standards.
- ☐ All applicable safety equipment has been properly installed.
- ☐ System has been performance tested, and meets (or exceeds) specified performance requirements (when complete system of one manufacturer).

COMMENTS: _____

I, the undersigned Manufacturer's Representative, hereby certify that I am (i) a duly authorized representative of the manufacturer, (ii) empowered by the manufacturer to inspect, approve, and operate his equipment and (iii) authorized to make recommendations required to assure that the equipment furnished by the manufacturer is complete and operational, except as may be otherwise indicated herein. I further certify that all information contained herein is true and accurate.

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
2-5-09	12-10-08	02-05-09
DATE	DATE	DATE

MANUFACTURER'S SERVICES

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Human Machine Interface System
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	17510

The following is a list of manufacturers services required by the specifications:

A. INSTALLATION AND TESTING:

- After installation of the HMI is completed, the installation shall be inspected jointly by the CONTRACTOR and the equipment manufacturers representatives. Any problems shall be corrected, and when both are satisfied with the installation, a written certification of the installation shall be delivered to the Engineer. The certification shall state that all system grounds, communication networks, workstations and all other components of the HMI system have been inspected and are installed within the manufacturer's guidelines.

- All analog inputs and outputs of the PLC shall have their calibration checked at a minimum of 4 points to verify consistency with the balance of the analog loop. Workstation displays and PLC registers shall both be verified for correctness.

- After the PLC calibration has been certified and the analog points have been calibrated, the PLC shall be tested to verify that all discrete inputs and outputs of both the PLC system and each workstation system are correct. All points shall be checked "end to end". For example, valve status inputs shall be checked by stroking the valve and a pump start output shall be checked by using it to start the pump. Simulated testing shall be allowed only when no practical alternatives exists. Workstation displays shall be verified for correctness at the same time. An I/O checklist shall be used to record test results and a copy provided to the Engineer upon completion.

- When the PLC installation has been certified and analog loop calibration and discrete I/O testing have been completed, system testing shall be performed in accordance with the approved test procedures. System testing shall operate the various process systems to verify compliance with all functional requirements specified, including the automatic control modes and PLC interlocks. Tests which fail to demonstrate the required operation shall be repeated in their entirety or continued after corrective action has been completed at the discretion of the Engineer.

  1. Each workstation display, including trend screens, reports, control screens, and alarm summaries and logs shall be verified for correctness during the system testing phase of this project. During system tests, the CONTRACTOR shall have a representative on-site continuously who is capable of troubleshooting and modifying the configuration programming of the HMI system and the PLC system.

2. The CONTRACTOR shall submit to the Engineer a system testing completion report when each process system and all aspects of the configuration software have been successfully tested as described herin. The report shall note any problems encountered and what action was required to correct them. The CONTRACTOR shall certify that the process systems have been thoroughly tested and are complete and functional in accordance with all specification requirements.

- The CONTRACTOR shall provide start-up support to include the programming personnel, electrical personnel, and the PLC System manufacturer's representative as required during the testing period to produce a fully operational HMI/PLC System. This support shall be provided at no additional cost to the OWNER.

- Performance Test: Reference Performance Test Form

B. TRAINING

- The CONTRACTOR shall provide training for the purpose of familiarizing the OWNER's technical maintenance staff with the use, maintenance, calibration and repair of all components of the system.

- The training shall be scheduled concurrent with the calibration, equipment testing and process system testing phases of the project.

- The training shall be performed by qualified employees of the manufacturer and CONTRACTOR as noted in the table below at the job site. The CONTRACTOR shall conduct only the overview and operations training. Training shall be specifically tailored to this project and reflect the system as installed and configured. All training sessions shall be complete with training materials, system documentation and software. The table below summarizes training hours required, which shall be provided at no additional cost to the OWNER. All training shall be conducted at the job site unless another location is approved nu the Engineer and OWNER.

MAINTENANCE AND OPERATOR'S TRAINING CLASS REQUIRED	CONDUCTED CLASS (HRS)	TRAINING CONDUCTED BY
PLC System Hardware/Software	8 Hrs Total	CONTRACTOR/ PLC Manufacturer
Workstation Configuration Software Including Display, Reports, Alarm Handling, Logs	40 Hrs Total	CONTRACTOR/ HMI Software Representative

- Each training class shall be a minimum of eight (8) hours in duration.

- The training classes shall be scheduled a minimum of 3 weeks in advance of the date training is to commence. Proposed training material, including a resume for the proposes instructor(s) (indicating previous instructional experience) and a detailed outline of each lesson shall be submitted to the Engineer at least 30 days in advance of when the lessons to be given. The Engineer will review the submitted data for suitability and provide comments that shall be incorporated into the training classes. Final materials shall be provided at least two weeks in advance of the training sessions.

- Within 10 days after the completion of each class, the CONTRACTOR shall present to the Engineer the following:

1. A list of all OWNER personnel that attended the class.

2. A copy of the hard copy text utilized during the class with all notes, diagrams, and comments. This documentation shall be contained in the Training Manual.

- After completion of all training specified above, the CONTRACTOR shall provide a session of three (3) days duration of directed operations training for operations/maintenance personnel (to be selected by the OWNER). This training shall be conducted by the individual employed by the CONTRACTOR who is most familiar with the configuration of this project and who was significantly involved in performing this configuration. The training sessions shall be conducted during the hours designated by the OWNER.

- The purpose of these directed operations training sessions is to coach the OWNER's personnel through the use of all HMI control/monitoring screens, user authorization protocols and parameters, historical data collection and trending functions, and all report generation functions which are part of the permanent workstation configuration.

- This training shall be scheduled with the OWNER a minimum of three (3) weeks in advance.

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
2-9-05 DATE	2-5-09 DATE	02-05-09 DATE

PERFORMANCE TEST

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Human Machine Interface System
PROJECT NO:	11340105 / 11344.06	SPEC. SECTION:	17510

PERFORMANCE TEST

- Subsequent to the system start-up testing, the Contractor shall conduct a successful 90-day final acceptance test for the system furnished. In the test, the entire system shall be continuously operated and maintained (i.e. 7 days per week, 24 hours per day) during the test period with zero downtime resulting from system failures. If a system failure occurs, the 90-day test shall be considered a failure and is not acceptable. The Contractor shall repeat the 90-day test. The system shall be acceptable only after all equipment and software has satisfied the performance test requirements.

- Downtime resulting from, but not limited to, the following shall be considered system failures:

  a. Downtime of any component (exclusive of input/output devices) whose failure results in the inability of the operator to monitor and manipulate control loops from each workstation using standard workstation interface procedures.

  b. Downtime resulting from concurrent failure of any monitor, keyboard, or mouse which is associated with each workstation.

  c. Downtime of any component/ peripheral associated with the communication network if the failed component results in a disabling of the historical function.

- The Contractor shall submit a final performance test completion report which shall state that all contract requirements have been met and which shall include (1) a listing of all equipment maintenance/repair activities conducted during the testing and (2) a listing of all components which were unable to operate successfully. Final acceptance, in writing, of the system shall be provided by the Engineer if the results of all the performance tests are acceptable.

- After acceptance of all require performance test, the Contractor shall be responsible for furnishing the spare parts/tools on-site. All spare parts/tools stored in-site shall become the property of the Owner upon completion of the guarantee period. The Contractor shall guarantee that the completed system shall perform all of the data acquisition, control and reporting functions specified.

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
2-5-09 DATE	2-5-09 DATE	02-05-09 DATE

SPARE PARTS

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Human Machine Interface System
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	17510

The following list contains the spare parts turned over to the owner:

- None required

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
2-5-09	12-10-08	02-05-09
DATE	DATE	DATE

TRAINING

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Human Machine Interface System
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	17510

The following were in attendance at the training for the equipment listed above.

Date of Training:

Name	Signature
John M[illegible]	[signature]
Ignacio Gomez	[signature]
Tracy Cook	[signature]
Steven Sierack	[signature]
James Strathern	[signature]

[signature]	Rodney Rock / [signature]	[signature]
FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
2-5-09	12-10-08	02-05-09
DATE	DATE	DATE

WARRANTY

METZGER & WILLARD, INC.
Civil • Environmental Engineers

Okeechobee WWTP Expansion to 3.0 MGD – Contract No. 2

OWNER:	Okeechobee Utility Authority	EQPT SERIAL NO:	
EQPT TAG NO:		EQPT/SYSTEM:	Human Machine Interface System
PROJECT NO:	11340.05 / 11344.06	SPEC. SECTION:	17510

The warranty for the above referenced equipment/system is as follows:

- The complete HMI System and associated software included therein shall be guaranteed to meet or exceed the design requirements set forth in the Contract Documents.

- Equipment, software and materials which do not achieve design requirements after installation shall be replaced or modified by the CONTRACTOR to attain compliance, at no additional cost to the OWNER. Following replacement or modification, the CONTRACTOR shall re-test the system and perform any additional procedures needed to place the complete system in satisfactory operation and attain design compliance approval from the Engineer.

- The CONTRACTOR warrants the materials and workmanship used for the HMI system and further guarantees the materials and workmanship used for any equipment and materials produced and furnished herein as part of the work to be as herein specified and agreed upon, free from injurious defects, and in all respects satisfactory for the service required.

  The CONTRACTOR warrants/guarantees the satisfactory performance of the equipment and materials under operating conditions for a period on one (1) year after the date of final acceptance of the entire HMI System. Final acceptance will be contingent upon completion of all items required by the Contract Documents, including a successful system-wide 90 day performance test as specified in Section 3.0. In the event that tests and inspections disclose latent defects or failure to meet the specified requirements, the CONTRACTOR, upon notification by the Engineer, shall proceed at once to correct or repair any such defects or non-conformance or to furnish new equipment or parts as may be necessary for conformity to the specified requirements, and shall receive no additional compensation. In the case of any required repairs or other corrective or remedial work covered under warranty, the warranties on all such corrections, repairs, new equipment or parts shall be extended for an additional 12 months from the date of final acceptance or 12 months from the date of completion of any such corrections, repairs, new equipment or parts, whichever date is later. The CONTRACTOR shall reimburse the OWNER for all cost incurred in the removal of the defective materials and installation of the replacement.

FOR OWNER/ENGINEER (PRINT/SIGN)	FOR MANUFACTURER (PRINT/SIGN)	FOR WHARTON-SMITH, INC. (PRINT/SIGN)
2-5-09 DATE	2-5-09 DATE	02-05-09 DATE

ATTACHMENT H
CALIBRATION CERTIFICATES OF PRESSURE GAUGES AND FLOW METERS

CALIBRATION CERTIFICATE

Date:	- DEC-05-08
Transmitter type	- PTX 1230
Serial No.	- 2832784
Range/Pressure units	- 150 psi g
Supply Voltage	- 9 to 30 Vdc
Output Current	- 4 to 20 mA dc
Non-linearity and hysteresis	- <±0.25% FS BSL
Temperature Error Band	- ±1.5% FS TEB
Compensated temp. range	- 30° to 86°F

Supply connection
Cable color code:

Red - Supply Positive
Black - Supply Negative
Shield - To transmitter body

REMARKS: _____

APPLICATION NOTES

1. The power supply must be between 9 and 30 Vdc applied to the transmitter terminals as stated on the transmitter body. Care should be taken when selecting this voltage to ensure that, with the load resistance and cable resistance together, the transmitter is operating within the areas as indicated on the graph. The output signal appearing across the load resistor selected can therefore vary within the confines of the operating area.
Maximum load Ohms = 50X (V_{SUPPLY}-9)

2. Maintain electrical termination and breather tube in a clean, dry environment.

3. Depth Application Notes INS-A015 available on request from the factory.

CALIBRATION CERTIFICATE

Date:	- DEC-09-08
Transmitter type	- PTX 1230
Serial No.	- 2818767
Range/Pressure units	- 150 psi g
Supply Voltage	- 9 to 30 Vdc
Output Current	- 4 to 20 mA dc
Non-linearity and hysteresis	- ≤±0.25% FS BSL
Temperature Error Band	- 1.5% FS TEB
Compensated temp. range	- 30° to 86°F

Supply connection
Cable color code:

Red	- Supply Positive
Black	- Supply Negative
Shield	- To transmitter body

REMARKS: Ins.

4

GE Sensing

APPLICATION NOTES

1. The power supply must be between 9 and 30 Vdc applied to the transmitter terminals as stated on the transmitter body. Care should be taken when selecting this voltage to ensure that, with the load resistance and cable resistance together, the transmitter is operating within the areas as indicated on the graph. The output signal appearing across the load resistor selected can therefore vary within the confines of the operating area.
Maximum load Ohms = 50X (V_{SUPPLY}-9)

2. Maintain electrical termination and breather tube in a clean, dry environment.

3. Depth Application Notes INS-A015 available on request from the factory.

Pack

EMERSON.
Process Management

27 July, 2009

Emerson Process Management
Rosemount Inc.
8200 Market Blvd
Chanhassen, MN U.S. 55317-9786

Calibration Data Sheet Consistent with ISO 10474 3.1 or EN 10204 3.1

Customer Information	Manufacturer Information
Name: WUNDERLICH MALEC SYSTEMS INC **PO:** 157014060	**Sales Order:** 2248625 **Line:** 1
Device Information	**Calibration Information**
Device Type: Pressure Transmitter **Tag No:** **Serial No:** 1982685 **Model No:** 3051TG2A2B21AS5B4M5 **Module Serial No:** 12095192 **Output:** Linear	**Factory:** CHANHASSEN, MN, USA **Station Name:** XMTR_CAL_05 **Operator ID:** 36728 **Calibration Date:** 12/8/2008 5:59:21PM

Attached Models

0306RT22BA11

Equipment Used

EqNumber:	EqName:	CalDueDate:
E3-56230	Multimeter	12/20/2008 2:05:00PM
E3-52905	Load Box	2/20/2009 12:03:00PM
P3-53225	Pressure Controller	2/26/2009 6:54:00AM

Calibration Data

Range: 0.000 TO 150.000 PSI

% of Range	Applied Pressure	Requested Applied Pressure	Analog Output (mA)	% Span Error	Pass/Fail
100.000	150.000 PSI	150.0000 PSI	20.0002	0.0013	PASS
60.000	90.000 PSI	90.0000 PSI	13.5974	-0.0162	PASS
0.000	0.000 PSI	0.0000 PSI	4.0004	0.0025	PASS

This is to certify that the listed product meets the applicable Rosemount Specifications. Measuring and test equipment used in the manufacture and inspection of the listed product are traceable to the National Institute of Standards and Technology. The calibration system was designed to meet the intent of ANSI Z540-1-1994.

Tim Layer
Vice-President of Global Quality

ORDER DATA

ORDER DATA SHEET
MODEL 20181
UNIVERSAL VENTURI TUBE™

CREATE PART NUMBER USING TABLES A AND B BELOW

MODEL		TABLE A		TABLE B
20181	-	1	8	- 1 3

TABLE A

LINE SIZE (IN INCHES)					
03	04	06	08	10	12
14	16	**18**	20	24	30
36	42	48	54	60	72

TABLE B

125/150 LB FLANGE				250/300 LB FLANGE			
BRONZE THROAT				BRONZE THROAT			
A	B	C		A	B	C	
01	02	08	W/O INSPECTION HOLE	04	05	06	W/O INSPECTION HOLE
07	09	09	WITH INSPECTION HOLE	10	11	12	WITH INSPECTION HOLE
316 STAINLESS STEEL THROAT				316 STAINLESS STEEL THROAT			
A	B	C		A	B	C	
13	14	15	W/O INSPECTION HOLE	16	17	18	W/O INSPECTION HOLE
19	21	22	WITH INSPECTION HOLE	22	23	24	WITH INSPECTION HOLE

NOTE: SELECT A PAINT FINISH FROM THE CHART AT RIGHT

PAINT FINISH			
	INTERIOR	EXTERIOR	PART NUMBER
X	POTA POX PLUS EPOXY (Black)	POTA POX PLUS EPOXY (Black)	A27124-1

CUSTOMER INFORMATION

CUSTOMER: Wunderlich-Malec P.O. NO. 157014001 # SIMILAR VENTURIS: 1

LOCATION: Okeechobee WWTP BIF ORDER NO.: 51343-0000 WRITTEN BY: PCC

TAG NO. FET-5 SERVICE: Waste Water DATE: 5/6/08

SPECIFICATION: 11329.2.1.2 SERIAL NO. 08-51343-01-01

OPERATING FLOW CONDITIONS

NOMINAL PIPE ID: 18 " EXACT PIPE ID: _____ " MAX. FLOW RATE: 2,500 GPM

DP AT MAX FLOW RATE: 33.48 " WC HEAD LOSS AT MAX FLOW RATE: 4.2 " WC

LINE FLUID: [ ] COLD WATER (60°F) [X] WATER [ ] OTHER LIQUID-NAME: _____
[ ] STEAM [ ] AIR [ ] OTHER GAS-NAME: _____

LINE CONDITIONS: PRESSURE: _____ PSIG TEMPERATURE: 60 °F RELATIVE HUMIDITY: _____ %

BASE CONDITIONS: PRESSURE: _____ PSIG TEMPERATURE: _____ °F RELATIVE HUMIDITY: _____ %

SPECIFIC GRAVITY: _____ VISCOSITY: _____ Cp SPECIFIC HEAT RATIO: _____

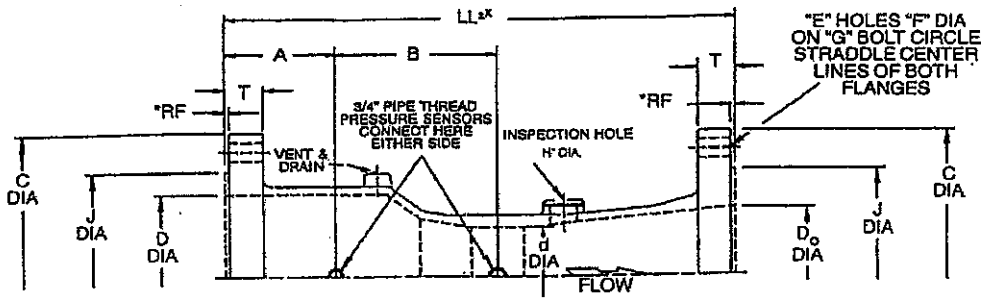
OPTIONS:

BIF®
1405 Home Avenue
Akron, Ohio 44310
330-564-0941
Fax 330-633-6362

ORDER DATA

Dimensional Drawing

MODEL 20181
UVT™ 125/250# FLANGE - 2" - 24"



ELEVATION VIEW

D	d	D_o	A	B	125# FLANGE C	T	E	F	G	250# FLANGE C	J	B	T	RF	E	F	G	LL	X	H
18	B 10.150	14.266	6	15.937	25	1 9/16	16	1 1/4	22 3/4	25	25 3/16	2 3/8	1/16	24	1 3/8	24 3/4	1 1/4	48	± 1/4	

- DIMENSIONS IN INCHES.
- FOR MATERIAL AND FINISH, REFER TO DATA DRAWING.
- NOTE: 125# FLANGES ARE FLAT FACED.
  250# FLANGES HAVE 1/16" RAISED FACE.

BIF®

1405 Home Avenue
Akron, Ohio 44310

330-564-0941
Fax 330-633-6362

CALCULATION DATA SHEET

Certified Performance Curve

MODEL 20181 CAST IRON UNIVERSAL VENTURI TUBE™

BIF

Differential Producer Calculation

Output Sheet

Date:- 9/17/2007

Pipe Diameter	18.000	Inches
Throat Diameter	8.700	Inches
Beta Ratio	0.4833	
Meter Type	Static Tap Universal Venturi Tube	
Throat Material	316 Series SS	
Line Fluid	Water	
Rate of Flow	2,500	Gallons per Minute
Differential Pressure	33.48	Inches of Water
Head Loss	4.2	Inches of Water
Line Temperature	60	Degrees F
Line Pressure		PSIG
Line Relative Humidity		Percent
Standard Temperature		Degrees F
Standard Pressure		PSIG
Standard Relative Humidity		Percent
Specific Gravity		
Viscosity	1.122	Centipoise
Specific Heat Ratio		

Calculated. by:- P Campbell

Okeechobee WWTP
Central Florida
Serial Numbers
08-51343-01-01
Tag Numbers
FET-5

Gallons per Minute	Inches of Water
500	1.34
750	3.01
1,000	5.36
1,250	8.37
1,500	12.05
1,750	16.41
2,000	21.43
2,250	27.12
2,500	33.48

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Akron, Ohio 44310
330-564-0941
Fax 330-633-6362

CALCULATION DATA SHEET

Certified Performance Curve

MODEL 20181 CAST IRON UNIVERSAL VENTURI TUBE™

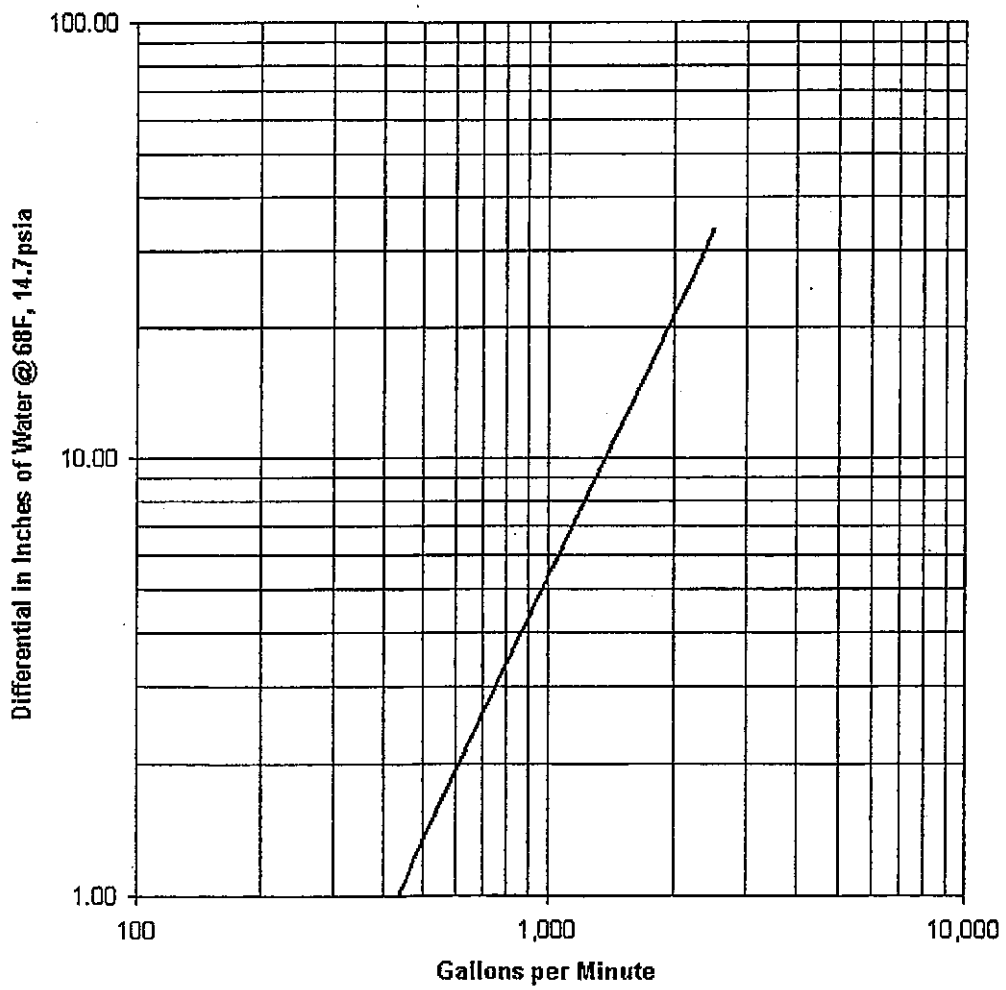
BIF

Differential Producer Calculation

Performance Curve

Static Tap Universal Venturi Tube	Line Fluid - Water
18.000 X 8.700	Line Temperature = 60 Degrees F
Beta = 0.4833	
Okeechobee WWTP	**08-51343-01-01**
Central Florida	**FET-5**

Flow vs. Differential



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Akron, Ohio 44310

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Fax 330-633-6362

ORDER DATA

ORDER DATA SHEET
MODEL 20181
UNIVERSAL VENTURI TUBE™

CREATE PART NUMBER USING TABLES A AND B BELOW

MODEL		TABLE A		TABLE B
20181	-	2	4	- 1 4

TABLE A

LINE SIZE (IN INCHES)					
03	04	06	08	10	12
14	16	18	20	24	30
36	42	48	54	60	72

TABLE B

125/150 LB FLANGE				250/300 LB FLANGE			
BRONZE THROAT				BRONZE THROAT			
A	B	C		A	B	C	
01	02	03	W/O INSPECTION HOLE	04	05	06	W/O INSPECTION HOLE
07	08	09	WITH INSPECTION HOLE	10	11	12	WITH INSPECTION HOLE
316 STAINLESS STEEL THROAT				316 STAINLESS STEEL THROAT			
A	B	C		A	B	C	
13	14	15	W/O INSPECTION HOLE	16	17	18	W/O INSPECTION HOLE
19	20	21	WITH INSPECTION HOLE	22	23	24	WITH INSPECTION HOLE

NOTE: SELECT A PAINT FINISH FROM THE CHART AT RIGHT

PAINT FINISH			
	INTERIOR	EXTERIOR	PART NUMBER
X	POTA POX PLUS EPOXY (Black)	POTA POX PLUS EPOXY (Black)	A27124-1

CUSTOMER INFORMATION

CUSTOMER: Wunderlich-Malec P.O. NO. 157014001 # SIMILAR VENTURIS: 1

LOCATION: Okeechobee WWTP BIF ORDER NO.: 51343-0000 WRITTEN BY: PCC

TAG NO. FET-6 SERVICE: Waste Water DATE: 5/6/08

SPECIFICATION: 11329.2.1.2 SERIAL NO. 08-51343-02-01

OPERATING FLOW CONDITIONS

NOMINAL PIPE ID: 24 " EXACT PIPE ID: _____ " MAX. FLOW RATE: 10,000 gpm

DP AT MAX FLOW RATE: 63.65 " WC HEAD LOSS AT MAX FLOW RATE: 5.4 " WC

LINE FLUID: [ ] COLD WATER (60°F) [ ] STEAM [x] WATER [ ] AIR [ ] OTHER LIQUID-NAME: _____ [ ] OTHER GAS-NAME: _____

LINE CONDITIONS: PRESSURE: _____ PSIG TEMPERATURE: 60 °F RELATIVE HUMIDITY: _____ %

BASE CONDITIONS: PRESSURE: _____ PSIG TEMPERATURE: _____ °F RELATIVE HUMIDITY: _____ %

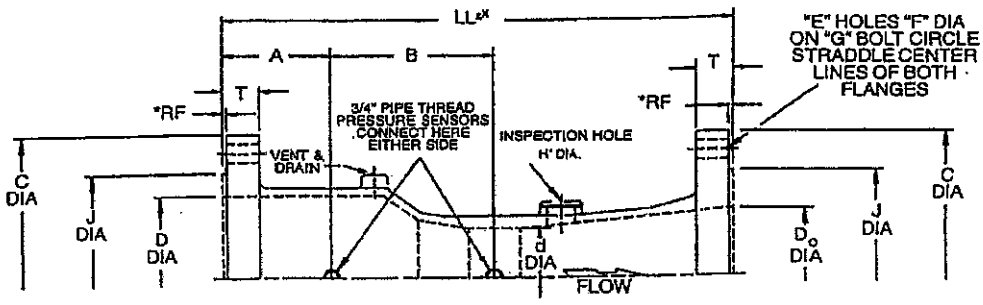
SPECIFIC GRAVITY: _____ VISCOSITY: _____ Cp SPECIFIC HEAT RATIO: _____

OPTIONS:

BIF®
1405 Home Avenue
Akron, Ohio 44310
330-564-0941
Fax 330-633-6362

ORDER DATA

Dimensional Drawing
MODEL 20181
UVT™ 125/250# FLANGE - 2" - 24"



ELEVATION VIEW

D	d	D_o	A	B	125# FLANGE C	T	E	F	G	250# FLANGE C	J	T	RF	E	F	G	LL	X	H
24	B - 14.500	19.854	6	21.775	32	1 7/8	20	1 3/8	29 1/2								62	± 1/4	

- DIMENSIONS IN INCHES.
- FOR MATERIAL AND FINISH, REFER TO DATA DRAWING.
- NOTE: 125# FLANGES ARE FLAT FACED.
  250# FLANGES HAVE 1/16" RAISED FACE.

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CALCULATION DATA SHEET

Certified Performance Curve

MODEL 20181 CAST IRON UNIVERSAL VENTURI TUBE™

BIF

Differential Producer Calculation

Output Sheet

Date:- 9/17/2007

Pipe Diameter	24.000	Inches
Throat Diameter	14.500	Inches
Beta Ratio	0.6042	
Meter Type	Static Tap Universal Venturi Tube	
Throat Material	316 Series SS	
Line Fluid	Water	
Rate of Flow	10,000	Gallons per Minute
Differential Pressure	63.65	Inches of Water
Head Loss	5.4	Inches of Water
Line Temperature	60	Degrees F
Line Pressure		PSIG
Line Relative Humidity		Percent
Standard Temperature		Degrees F
Standard Pressure		PSIG
Standard Relative Humidity		Percent
Specific Gravity		
Viscosity	1.122	Centipoise
Specific Heat Ratio		

Calculated. by:- P Campbell

Okeechobee WWTP
Central Florida
Serial Numbers
08-51343-02-01
Tag Numbers
FET-6

Gallons per Minute	Inches of Water
2,000	2.55
3,000	5.73
4,000	10.18
5,000	15.91
6,000	22.91
7,000	31.19
8,000	40.74
9,000	51.56
10,000	63.65

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CALCULATION DATA SHEET

Certified Performance Curve

MODEL 20181 CAST IRON UNIVERSAL VENTURI TUBE™

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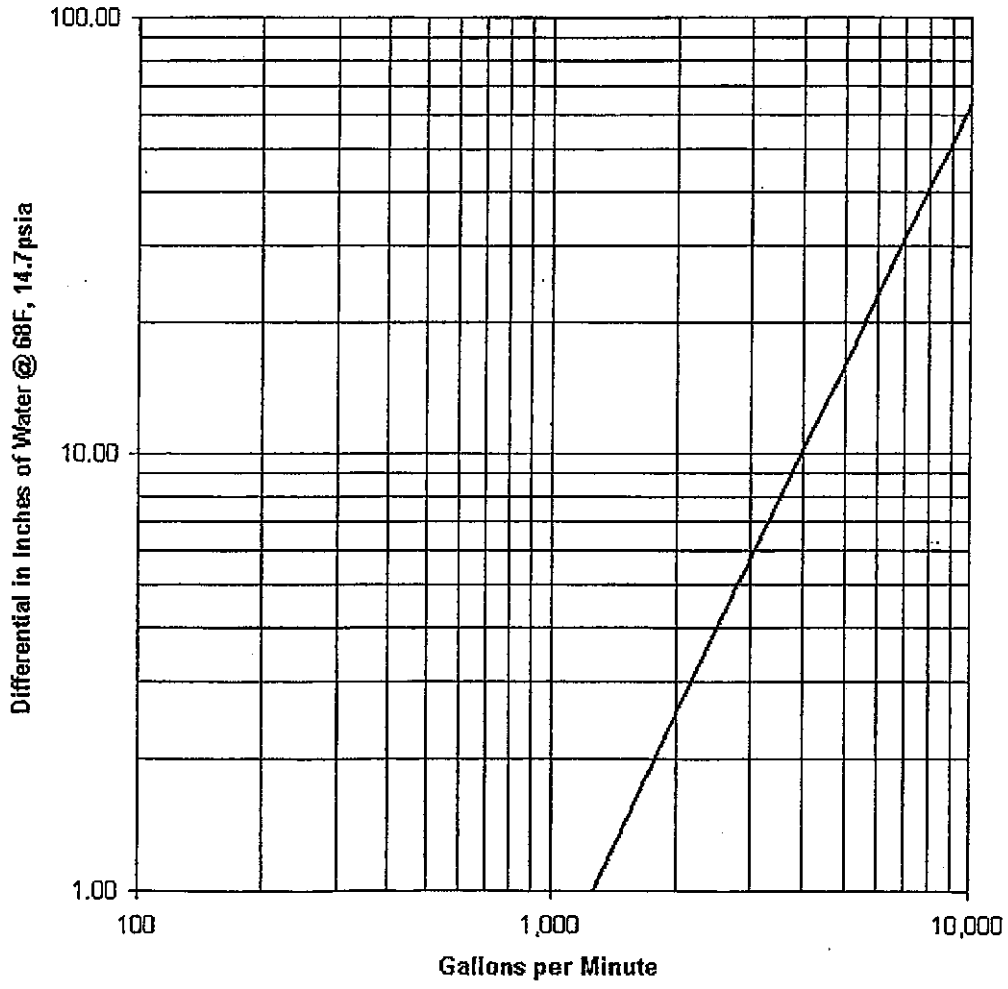
Differential Producer Calculation

Performance Curve

Static Tap Universal Venturi Tube	Line Fluid - Water
24.000 X 14.500	Line Temperature = 60 Degrees F
Beta = 0.6042	
Okeechobee WWTP	**08-51343-02-01**
Central Florida	FET-6

Flow vs. Differential



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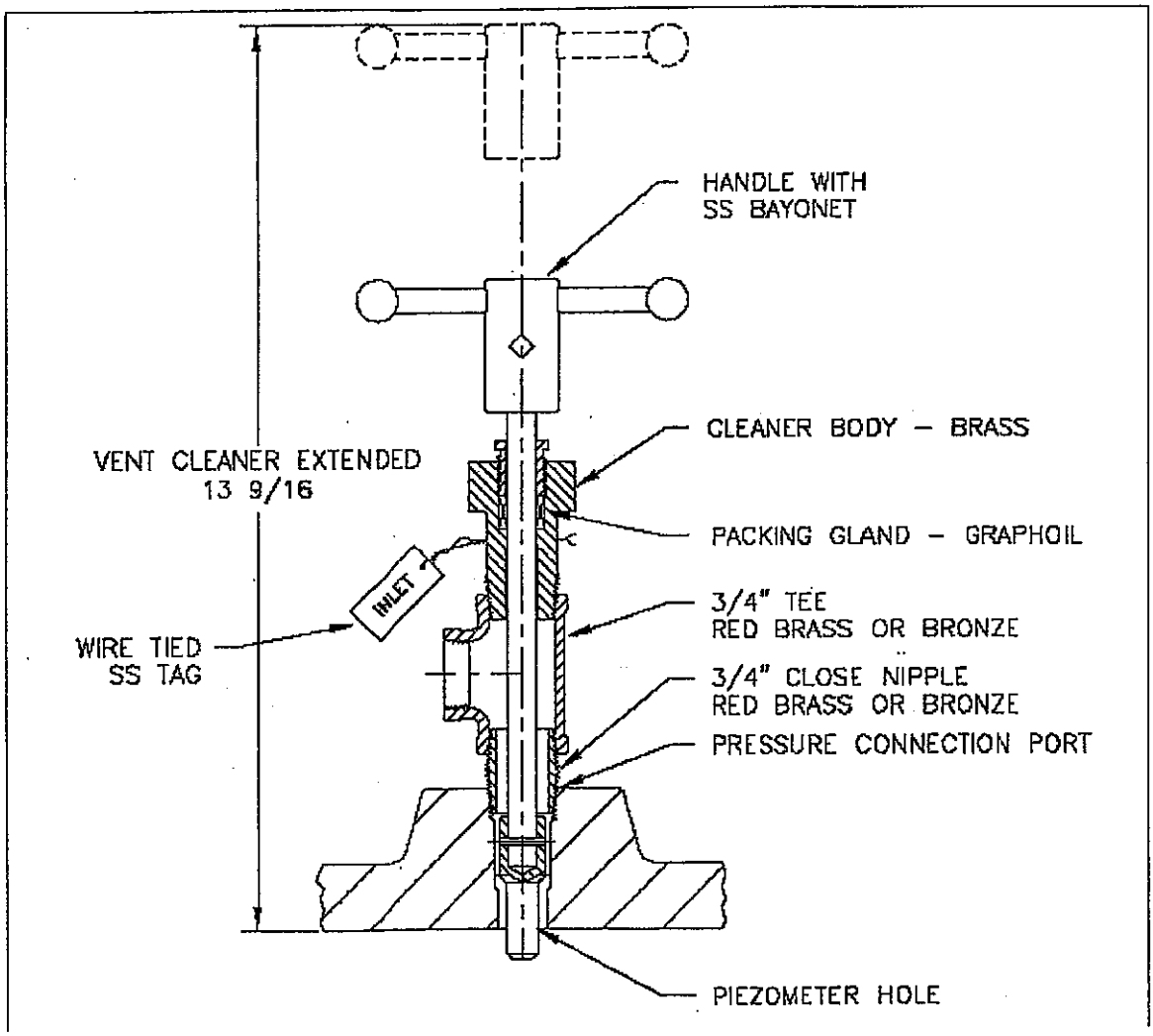
SPECIFICATION DATA

MODEL 20181
UNIVERSAL VENTURI TUBE™

Description

The Model 20100 manual vent cleaner is a plunger type device used in solids-bearing liquid service. It cleans interior piezometer openings while the venturi is in service, not requiring the flow to be stopped or line depressurized.

Manual vent cleaners are operated by thrusting the cleaner bayonet full stroke through to the piezometer hole, then withdrawing. Done on a regular maintenance schedule it helps assure accurate flow measurement.



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