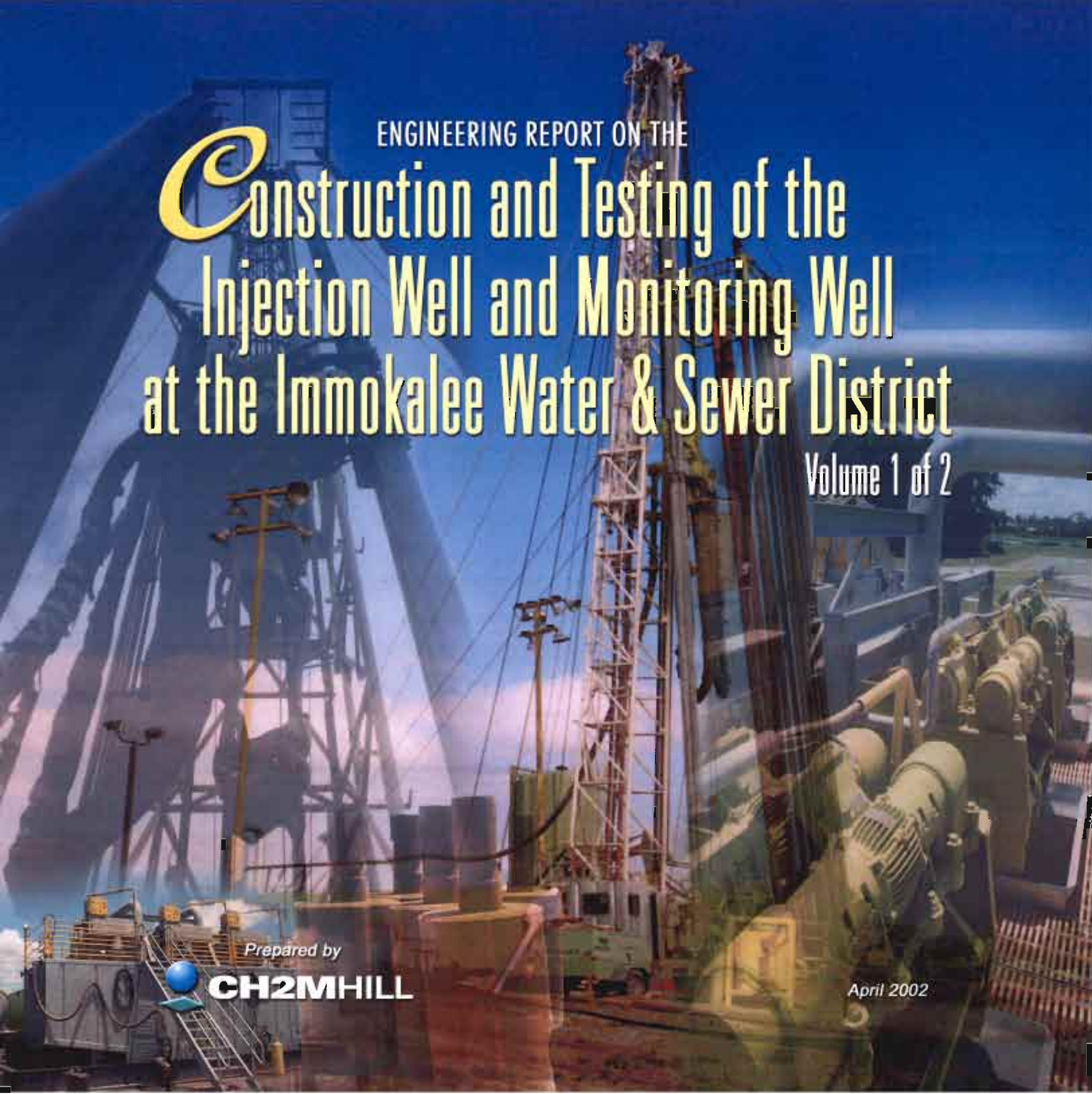

ENGINEERING REPORT ON THE

Construction and Testing of the Injection Well and Monitoring Well at the Immokalee Water & Sewer District

Volume 1 of 2

Prepared by

CH2MHILL

April 2002

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CH2MHILL

April 24, 2002

156772.DI.CS

Mr. Jack Myers, P.G.
UIC/Groundwater Program Manager
Florida Department of Environmental Protection
South District
2295 Victoria Avenue, Suite 364
Fort Myers, FL 33901

Dear Jack:

Subject: Immokalee IWSD Injection Well (IW-1)
FDEP Permit No. 50725-006-UC
Engineering Report on the Construction and Testing of the Injection Well System

Hereby submitted is one signed and sealed copy of the above-referenced Engineering Report (Volumes 1 and 2). This report includes the data collected during the construction and testing of injection well IW-1 and the Immokalee Water and Sewer District.(IWSD) Injection Well IW-1 is now complete and was constructed in accordance with the specific conditions of Construction Permit No. 50725-006-UC. With the submittal of this report the IWSD would like to request the well be placed into operational testing.

If you have any questions regarding the enclosed material, please call me at 954-426-4008.

Sincerely,

CH2M HILL

Sean Skehan, P.G.
Project Manager

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: Eva Deyo/IWSD
Dave Xavier/LBFH
Joe Haberfeld/FDEP-Tlh.
Ron Reese/USGS
Nancy Marsh/USEPA
Steve Anderson/SFWMD
Mark Schilling/CH2M HILL

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Acronyms and Abbreviations

µmhos	micromhos per centimeter
API	American Petroleum Institute
bpl	below pad level
bls	below land surface
btoc	below top of casing
CBL	cement bond log
CCL	casing collar locator
cm	centimeter
DI	dual induction
°F	degrees Fahrenheit
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
GRB	Bottom Gamma Radiation Detector
GRM	Middle Gamma Radiation Detector
GRT	Top Gamma Radiation Detector
IW-1	injection well
IWSD	Immokalee Water and Sewer District
K	hydraulic conductivity
L	liter
mCi	millicurie
mg	milligrams
mgd	million gallons per day
MIT	mechanical integrity
MRIL	Magnetic Resonance Imaging Log
NGR	natural gamma-ray
PMW	pad monitoring wells
psi	pounds per square inch
RTS	radioactive tracer surveys

SFWMD	South Florida Water Management District
SU	standard units
T	transmissivity
TAC	Technical Advisory Committee
TZMW-1	tri-zone monitoring well
UIC	Underground Injection Control
WTP	water treatment plant
WWTP	wastewater treatment plant

SECTION 1

Introduction

1.1 Background Information

The Immokalee Water and Sewer District (IWSD) owns and operates a water treatment plant (WTP) and a wastewater treatment plant (WWTP) located in Immokalee, Florida. Immokalee is situated in the north-central portion of Collier County, as shown on the site location map presented in Exhibit 1-1.

The IWSD WWTP is a secondary treatment facility with a permitted capacity of 2.5 million gallons per day (mgd). The WWTP currently disposes of treated effluent via an irrigation system on a 21-acre site at the plant and a 640-acre spray irrigation site southwest of the plant. However, the effluent disposal system is insufficient during wet weather conditions and discharges to surface waters have occurred, resulting in the IWSD entering into a Consent Agreement with the Florida Department of Environmental Protection (FDEP). One of the requirements of the Consent Agreement is that IWSD provide improvements to the effluent disposal system.

One of the improvements proposed by IWSD was to construct a 12-inch-diameter Class I injection well system to serve as a back-up means of effluent disposal. The injection well will be used during periods when the existing effluent disposal system is unable to meet the disposal needs of the WWTP. The irrigation system and spray irrigation site will be maintained as the primary disposal system during normal conditions.

A permit application for the construction of a Class I injection well was submitted to the FDEP in April 2000. An FDEP Underground Injection Control (UIC) permit (Construction Permit No. 50725-006-UC) was issued in June 2001. A copy of the construction permit is included in Appendix A. In general, a Class I injection well injects below the base of a formation containing potential future drinking water supplies (or Underground Source of Drinking Water [USDW [1]]). Issuance of the permit allowed the IWSD to proceed with construction and testing of the injection well system.

A preliminary hydrogeologic investigation was conducted to confirm groundwater discharge feasibility at the Immokalee facility. A tri-zone monitoring well constructed by the South Florida Water Management District (SFWMD) in 1996 is located near the injection well and was incorporated as part of the design for the effluent disposal system. Water quality data collected during the construction of the test well were analyzed as well.

[1] An USDW is defined as, among other criteria, aquifers capable of yielding a significant amount of drinking water containing less than 10,000 mg/L of total dissolved solids (TDS).

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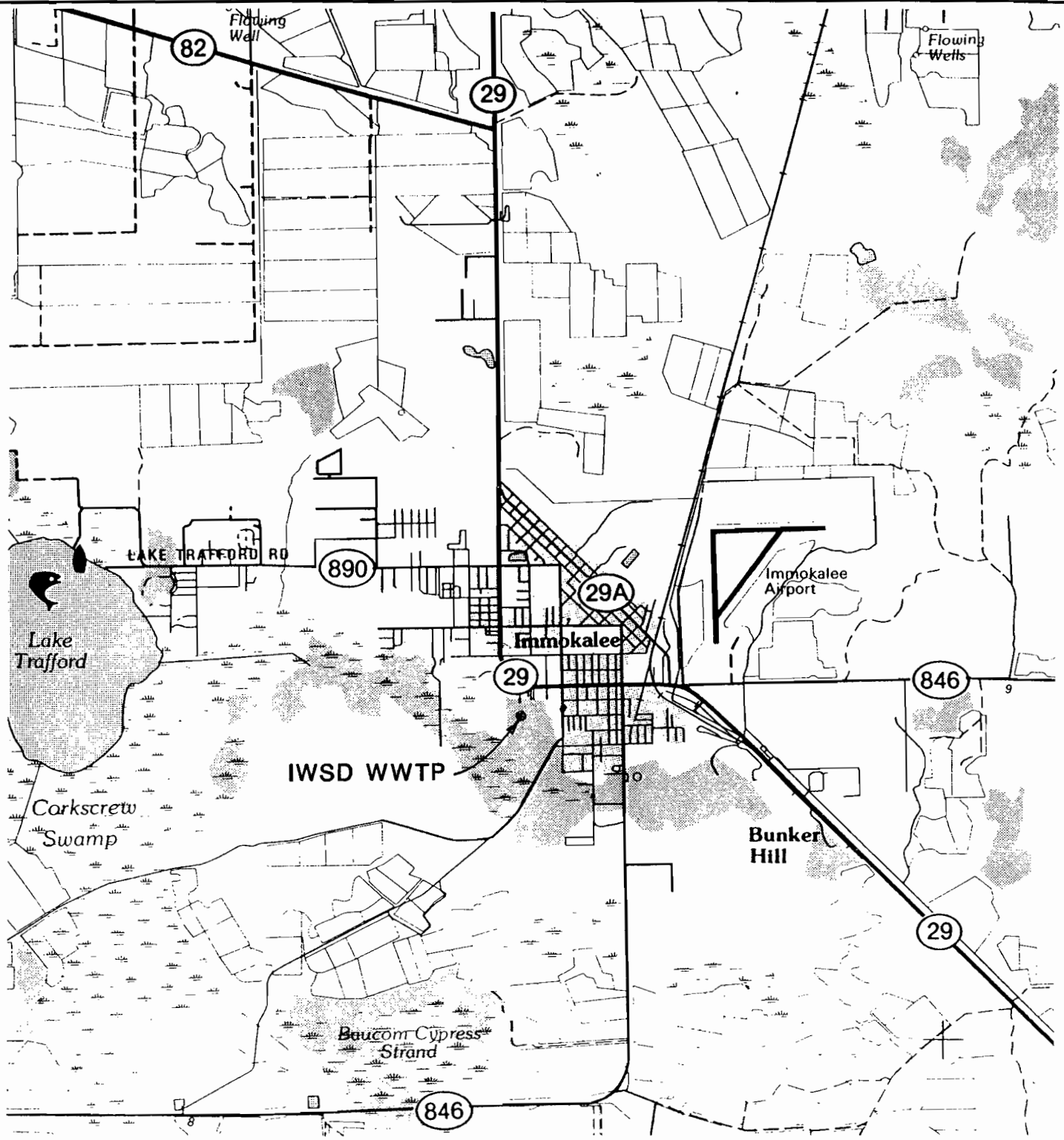

Exhibit 1-1
Immokalee WWTP
Location Map

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1.2 Project Description

This report summarizes the construction and testing of the injection well (IW-1) and modification of an existing tri-zone monitoring well (TZMW-1) at the IWSD WWTP. Exhibit 1-2 presents a site map of the WWTP that indicates the location of the injection well and monitoring well system. Construction and testing of the injection well system was performed in accordance with Chapter 62-528, Florida Administrative Code (FAC), recommendations from the Technical Advisory Committee (TAC), and the provisions of the FDEP Class I injection well construction permit No. 50725-006-UC.

CH2M HILL served as the engineer of record for the design, construction, and testing of the injection well system. Youngquist Brothers Inc. of Ft. Myers, Florida was selected as the prime subcontractor for construction of the injection well system.

CH2M HILL provided resident observation and technical support services during construction and testing of the injection well system. CH2M HILL and Youngquist prepared daily and weekly summary reports that were submitted to the TAC on a weekly basis as required by the well construction permit. Copies of the weekly summary reports and daily reports are provided in Appendix B.

A comprehensive testing plan was conducted during construction of the injection well and monitoring well system. The testing plan included formation sampling, geophysical logging, reverse-air pilot hole water quality, specific capacity testing, core sampling, packer testing, and variable-rate step-drawdown testing. The optimal injection zone identified during construction was located in the Oldsmar Formation. Testing conducted during construction of the injection well emphasized data collection that would identify the injection zone, identify the base of the USDW, and evaluate confining characteristics of the lithology between the injection interval and the base of the USDW from this potential injection zone formation and overlying strata.

A more detailed description of the testing activities conducted during well construction can be found in Section 4 of this report.

1.3 Permitting

Regulatory approval is required to install and operate a deep injection well. Because the IWSD injection well is a Class I injection well, injection well permitting involves close coordination with the FDEP. The well construction permit issued by the FDEP was obtained prior to construction and testing of the injection well system. A copy of the well construction permit is provided in Appendix A.

The FDEP UIC division regulates activities in Florida under Chapter 62-528, FAC. The FDEP TAC consists of representatives from FDEP Ft. Myers, FDEP Tallahassee, Region IV (Atlanta) of the U.S. Environmental Protection Agency (EPA), United States Geologic Survey (USGS), and SFWMD. A pre-application meeting was held with the TAC on May 14, 2000.

04-11-02

N

N.T.S.

16" DIP PIPING TO DEEP INJECTION WELL

FUTURE BLDG.

24" V.C. (NIC)

UTILITY BLDG

CCC

POLISHING POND #1

FL 24.5

AERATED GRIT CHAMBER

CLARIFIER

FL 24.5

6'x6'x4" CONCRETE SPLASH PAD

56 L.F. OF 12" D.I. PIPE LAID FLAT W/ 12" PLUG VALVE NORMALLY OPEN

28.0

662.43'

[64']

2-GOLF 36" RCP DRAINAGE PIPES 5' C/CW/HEADWALL

661.49'

CLARIFIER FL 28.1

DIGESTER

302 T.O.G.

SLUDGE DRYING BEDS

OXIDATION DITCH

POLISHING POND #2

14" PVC C-900

P5

SPRAY IRRIGATION PUMP STRUCTURE

FL 24.0

FL 24.0

FL 24.0

[216']

[18"-45°]

[12"-C-900 192.90']

[18" 120']

RETENTION POND #1

6" D.I. 301'

RETENTION POND #2

DEEP INJECTION WELL

EXIST. SFWMD IWSD-TW

TRI-ZONE MONITORING WELL (T2MW-1)

EARTHERN DIKE 12"± ABOVE NATURAL GROUND

ANT CONTRACT

Source:

Lindahl, Browning, Ferrari & Hellstrom, Inc.
CONSULTING ENGINEERS, PLANNERS & SURVEYORS
3550 SW CORPORATE PARKWAY
PALM CITY, FLORIDA 34990
(561) 286-3883 - FAX: (561) 288-3825

Exhibit 1-2
Immokalee WWTP
Site Plan

CH2MHILL

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An FDEP Certification of Class I Well Construction Completion form has been completed by CH2M HILL and is provided in Appendix C, per the requirement of the well construction permit No. 50725-006-UC, Specific Condition No. 6 (a).

SECTION 2

Lithostratigraphic and Hydrogeologic Framework

2.1 Geology and Hydrogeology

Collier County aquifer systems are developed within a thick carbonate platform which overlies the Early Jurassic (>200 million years old) basement rocks. Sediments within the carbonate platform range in age from Early Jurassic to Recent. The sediments consist primarily of carbonates and Miocene Age siliciclastics. The aquifer systems in Collier County are developed in sediments ranging in age from late Paleocene (55 million years old) to Pliocene (recent) and include the Floridan Aquifer System, the Intermediate Aquifer System, and the Surficial Aquifer System. In general, groundwaters within Collier County become more mineralized with depth. Potable groundwater is found only in limited quantities within the surficial aquifer and very upper portions of the intermediate aquifer.

Sediments encountered during the construction of the IW-1 ranged in age from Pliocene to Eocene. A brief discussion of Pliocene to Eocene Age sediments and their relationship to the hydrostratigraphy of the site follows. Exhibit 2-1 provides a stratigraphic and hydrostratigraphic column of the site. The hydrostratigraphic nomenclature utilized in Exhibit 2-1 and discussed below is based on SFWMD Technical Publication 84-10.

2.2 Undifferentiated Pliocene to Pleistocene Series

Unconsolidated shell fragments and fine grained limestone make up the undifferentiated Pliocene to Pleistocene sediments at the site. The undifferentiated Pliocene and Pleistocene Age deposits at the site are present from land surface to approximately 122 feet below pad level (bpl) and consists of unconsolidated sand (medium to coarse grained) and shell fragments. The undifferentiated Pliocene and Pleistocene deposits comprise the water table portion of the Surficial Aquifer at the site.

2.3 Miocene Series

Hawthorn Group. In Collier County, the Hawthorn Group is divided into two units. The upper unit is the Peace River Formation, which is made up primarily of greenish-gray, phosphatic clay with occasional interbedded fine-grained limestone at the site. The lower unit is a predominantly carbonate formation consisting of limestone and phosphatic limestone with interbedded phosphatic clay. The lower unit of the Hawthorn Group is the Arcadia Formation. Aquifers within the Hawthorn Group are collectively referred to as the Intermediate Aquifer System.

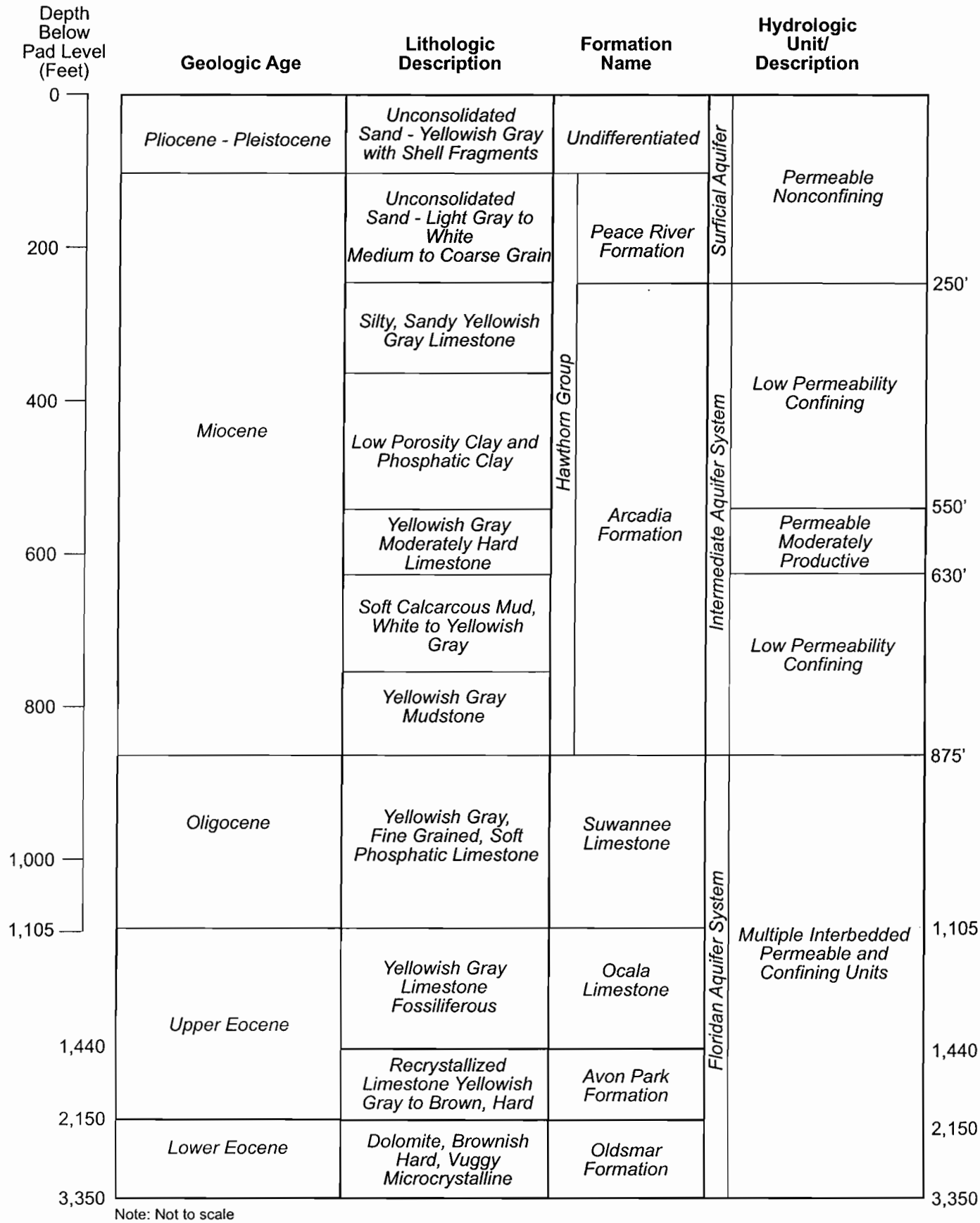

EXHIBIT 2-1
Stratigraphic and Hydrostratigraphic Column of the
Immokalee Water and Sewer District
Injection Well System Site

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Peace River Formation. The upper most portion of the Hawthorne Group is made up of the Peace River Formation, which was first encountered at a depth of approximately 120 feet and extends to a depth of approximately 250 feet bpl. This formation consists of unconsolidated, medium- to coarse-grained sand, light gray to white.

The top of the Peace River Formation is a low permeability unit that acts as a semi-confining interval (Upper Hawthorn Confining Zone) separating the Surficial Aquifer from the Intermediate Aquifer System (IAS). The IAS aquifer consists multiple productive intervals interbedded with low permeability inter-aquifer confining units.

Arcadia Formation. The top and base of the lower lithologic unit of the Hawthorn Group, the Arcadia Formation, were identified at depths of 250 feet bpl and approximately 875 feet bpl, respectively. The formation is generally made up as follows:

- 250 to 380 feet bpl, light to yellowish gray poorly consolidated silty, sandy limestone
- 380 to 550 feet bpl, olive gray silty phosphatic clay
- 550 to 630 feet bpl, white to yellowish gray, moderately hard limestone
- 630 to 780 feet bpl, soft poorly consolidated, calcareous mud, white to yellowish gray
- 780 to 875 feet bpl, light to yellowish gray calcareous mudstone, moderately hard

2.4 Oligocene Age

Suwannee Limestone. The Suwannee Limestone of the Oligocene Age occurs from a depth of approximately 875 to 1,105 feet bpl and is characterized by a yellowish-gray to light-gray, sandy, phosphatic limestone. The Suwannee Limestone is part of the upper Floridan Aquifer System, and characteristically exhibits high permeability and artesian pressure. The base of the formation is marked by a decrease in gamma ray activity.

2.5 Eocene Age

Ocala Formation. The Ocala Formation of the Upper Eocene Age occurs from a depth of 1,105 to 1,440 feet bpl and is marked by an attenuation of the natural gamma response. The formation is characterized by a yellowish gray to very light gray limestone that was moderately to well consolidated. The limestone contains intervals with some foraminifera (*lepidocyclina* sp.) and mollusks. The Ocala Formation is part of the upper Floridan Aquifer System, and characteristically exhibits high permeability and artesian pressure. The contact between the Suwannee Limestone and the Ocala Formation and the uppermost permeable section of the Ocala Formation were selected for the upper monitoring interval of the injection well system.

Avon Park Formation. The Avon Park Formation of the Mid-Eocene Age occurs from a depth of 1,440 to 2,150 feet bpl and is characterized by yellowish-gray to yellowish brown, recrystallized, well-consolidated, hard limestone with a small amount of dolomitic limestone and dolomite. The upper portion of the Avon Park Formation typically exhibits high permeability and artesian pressure. The lower portion of the formation is often finer grained, has a lower porosity than the upper portion, and is confining in nature.

Oldsmar Formation. The Oldsmar Formation of the Eocene Age occurs from a depth of 2,150 to below the total depth of the well at 3,350 feet bpl. The lithology of the Oldsmar

Formation at this site is predominantly dolomite and interbedded recrystallized limestone. Characteristics include yellowish gray to dark yellowish brown, microcrystalline, hard, with sucrosic to muggy texture. The Oldsmar Formation contains highly transmissive, fractured, and cavernous intervals known as the "Boulder Zone." Injected effluent exits the borehole in the "Boulder Zone."

SECTION 3

Construction Phase

This section describes the construction, drilling, and testing details associated with the construction of the deep IW-1 and TZMW-1. The IW-1 was completed with steel surface, intermediate, and final casing. The final casing for IW-1 was completed within the Oldsmar formation. TZMW-1 was modified from an existing onsite test well. As-built construction details for IW-1 are presented in Exhibit 3-1.

EXHIBIT 3-1
As-built Construction Details for IW-1

Well	Casing	Casing Material	Casing Thickness (inches)	Casing OD (inches)	Casing Depth (feet)	Open-Hole Interval (feet)
IW-1	Surface	Steel	0.375	36	275	--
	Intermediate	Steel	0.375	30	930	--
	Intermediate	Steel	0.375	22	2,000	--
	Final	Steel	0.50	12.75	2,983	2,983 to 3,350

Note:
OD=Outside Diameter

The drilling schedule and casing setting depths for IW-1 were designed to conform to the hydrogeological features observed at the site, as well as various regulatory agency requirements. Geological formation samples were collected and described at 10-foot intervals during drilling of the IW-1 pilot hole. Lithological descriptions of the formation samples collected during IW-1 well construction are presented in Appendix D. Data from the pilot hole (geophysical logs, formation samples, water quality, and packer tests) were evaluated for geologic and hydrogeologic information to assist in the selection of casing setting depths and open-hole intervals. The cementing program was specifically tailored for each casing installed. Copies of casing mill certificates for IW-1 surface, intermediate, and final casing are presented in Appendix E. The following section describes the construction, drilling, and testing details associated with the construction of IW-1 and modification of TZMW-1.

3.1 Surficial Monitoring Wells

As required by the construction permit, four surficial monitoring wells were installed and sampled prior to the start of construction at IW-1. A surficial well was installed at each corner of the drilling pad to monitor for groundwater contamination during construction. Following installation of the surficial monitoring wells, samples were collected from each well and analyzed to establish background water quality data. Weekly samples were collected and analyzed during construction. A typical surficial monitoring well diagram is presented in Exhibit 3-2. Water quality data from the surficial monitoring wells is discussed in Section 4 of this report.

3.2 Injection Well (IW-1)

A summary of well construction activity is presented in Appendix F. Drilling of IW-1 began on September 9, 2001, and was concluded on January 24, 2002, upon completion of the internal radioactive tracer survey (RTS). Mud rotary drilling techniques were used to drill through the surficial aquifer and the clay intervals which make up the Hawthorn Group. Additionally, mud rotary techniques were used while drilling through the upper portion of the Floridan Aquifer System to a depth of 2,010 feet bpl. Reverse air, closed circulation drilling techniques were used during subsequent drilling to a total depth of 3,350 feet bpl to remove drill cuttings from the borehole and to collect water samples at 30-foot intervals.

Data from the pilot hole interval (formation samples [cuttings], water samples, drill stem packer tests, pumping test, and geophysical logs) were evaluated to provide the basis for describing the geologic formations encountered, to assist in selection of the casing setting depths, and to interpret the site lithology and hydrogeology. The pilot hole was then reamed to the specified diameter to the selected casing setting depth as approved by FDEP.

Construction of IW-1 took place with four concentric steel casings (36-, 30-, 22-, and 12.75-inch outside diameters). A table summarizing the casing depths and the types and quantities of cement used is presented in Appendix G. Exhibit 3-3 depicts the completion diagram of IW-1.

Construction of IW-1 began with the drilling of a nominal 12.25-inch diameter pilot hole to a depth of 310 feet bpl using mud-rotary techniques. The pilot hole was then geophysically logged (caliper, gamma ray, and dual induction logs) and reamed to a nominal 42-inch diameter to a depth of 279 feet bpl. A caliper log was then performed on the reamed hole and a 36-inch diameter casing was installed and cemented through the surficial aquifer from a depth of 275 feet bpl.

Below the 36-inch casing, drilling of the 12.25-inch pilot hole continued to a depth of 1,010 feet bpl. The pilot hole was then geophysically logged (caliper, dual induction, sonic, and gamma ray logs) and reamed to a nominal 36-inch diameter to a depth of 935 feet bpl and followed by a caliper log. Installation of the 30-inch-diameter casing was completed through the confining units of the Hawthorn Group to a depth of 930 feet bpl.

The pilot hole was advanced to a depth of 2,010 feet bpl using a 9.875-inch bit size. Caliper, Natural Gamma Ray, and Dual Induction logs were performed by YBI. Additional logs were performed by Baker Atlas and included a Magnetic Resonance Imaging Log (MRIL), Spectral Gamma Ray, and the Full Wave Form Sonic log. The pilot hole was then drilled to a nominal diameter of 12 inches using reverse-air drilling to conduct packer testing.

Packer tests were conducted on the intervals from 1,950 to 2,000 and 1,970 to 2,000 feet bpl. The results of straddle packer testing are discussed in Section 4 of this report. The pilot hole was then backplugged with 12 percent bentonite cement to a depth of 960 feet bpl.

Reaming of the pilot hole to a nominal 30-inches in diameter then took place to a depth of 2,005 feet bpl followed by a caliper log. The 22-inch diameter casing was then installed and cemented through the Ocala Group and completed from a depth of 2,000 feet bpl.

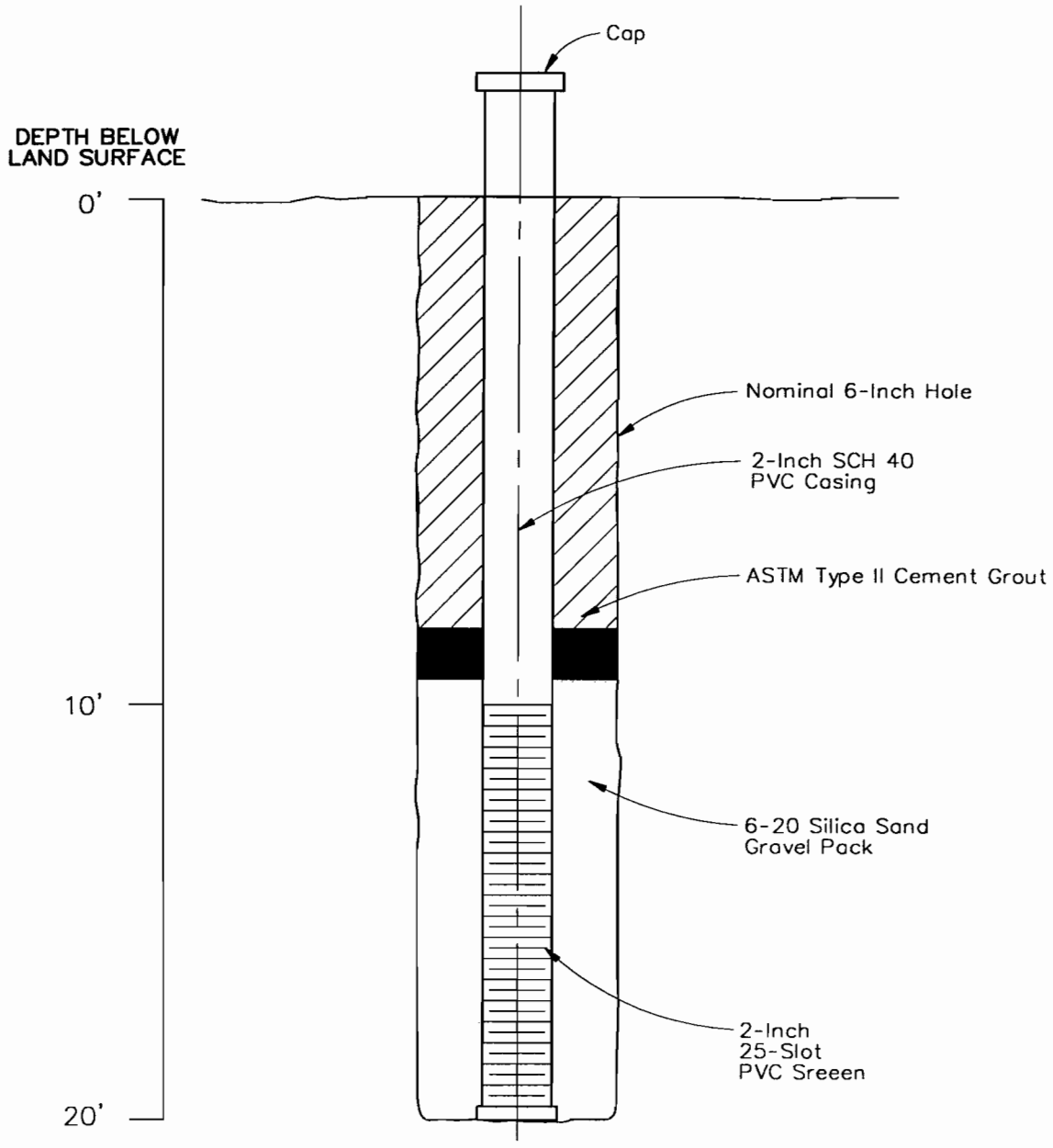

Exhibit 3-2

Surficial Monitoring Well
Completion Diagram

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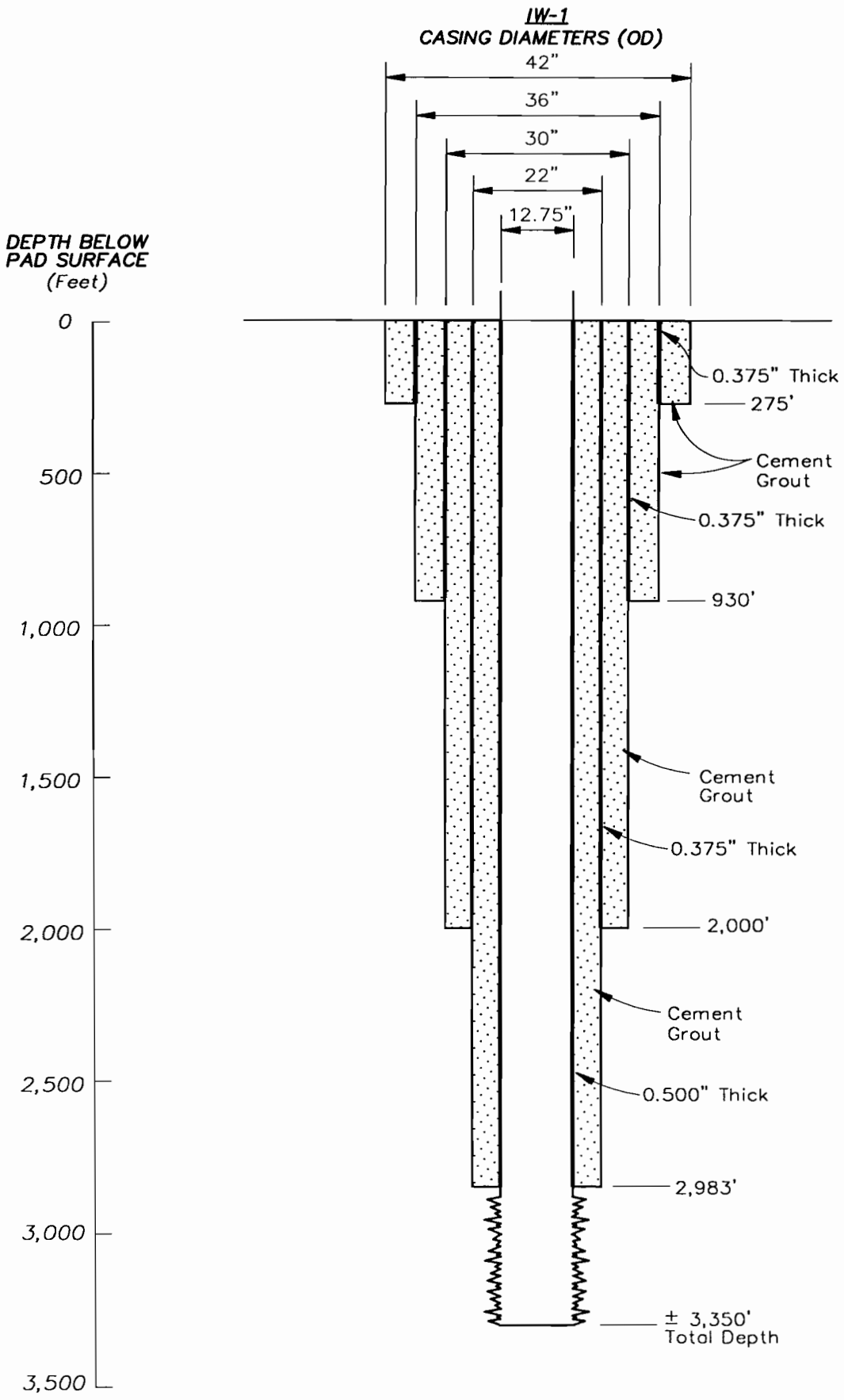

Exhibit 3-3
Injection Well IW-1 Completion Diagram

Note: Drawing is not to Scale

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After installing the 22-inch diameter casing, the pilot hole was advanced to a depth of 2,980 feet bpl using a 12.25-inch bit. During this phase of pilot hole drilling, five 4-inch diameter cores were collected from the interval of 2,054 to 2,771 feet bpl. Caliper, gamma ray, dual induction, and sonic logs were conducted after completion of the pilot hole drilling. Straddle packer tests were then conducted on the intervals of 2,200 to 2,251; 2,400 to 2,461; 2,720 to 2,755; and 2,800 to 2,901 feet. The results of the straddle packer testing are discussed in Section 4 of this report. The pilot hole was then backplugged with 12 percent bentonite cement to a depth of 2,007 feet bpl.

The pilot hole was reamed to a nominal 22-inch diameter to a depth of 2,915 feet bpl. The drilling of the pilot hole was then advanced from 2,915 feet bpl using a 12.25-inch bit to a total depth of 3,350 feet bpl. A full suite of geophysical logs were performed on the total depth of the borehole. The logs performed were caliper, gamma ray, sonic, spontaneous potential, dual induction, temperature, fluid resistivity, static flowmeter, dynamic flowmeter, and video survey logs. Based on the results of packer testing, coring, geophysical logging, and formation sample analyses, a 12.75-inch diameter casing setting depth of 2,983 feet bpl was recommended to and approved by the FDEP and TAC.

The pilot hole was further reamed using the nominal 22-inch diameter drill bit to a depth of 2,995 feet bpl after receiving approval of casing seat recommendation from FDEP. A caliper log was then performed and a drillable bridge plug was installed prior to installation and cementing of the 12.75-inch diameter casing. The 12.75-inch diameter casing was installed and cemented through the Avon Park Formation into the Oldsmar Formation.

After installation and cementing of the final casing was completed, the bridge plug was drilled out using an 11-inch drill bit followed by air development of the well. A final caliper log was performed over the entire depth of the completed well.

A casing pressure test was then conducted on the 12.75-inch diameter casing to evaluate casing integrity. The final casing maintained a pressure of 150 pounds per square inch (psi) ± 0.5 psi for 1 hour. A pressure differential of no more than 5 percent over 1 hour constitutes a successful pressure test.

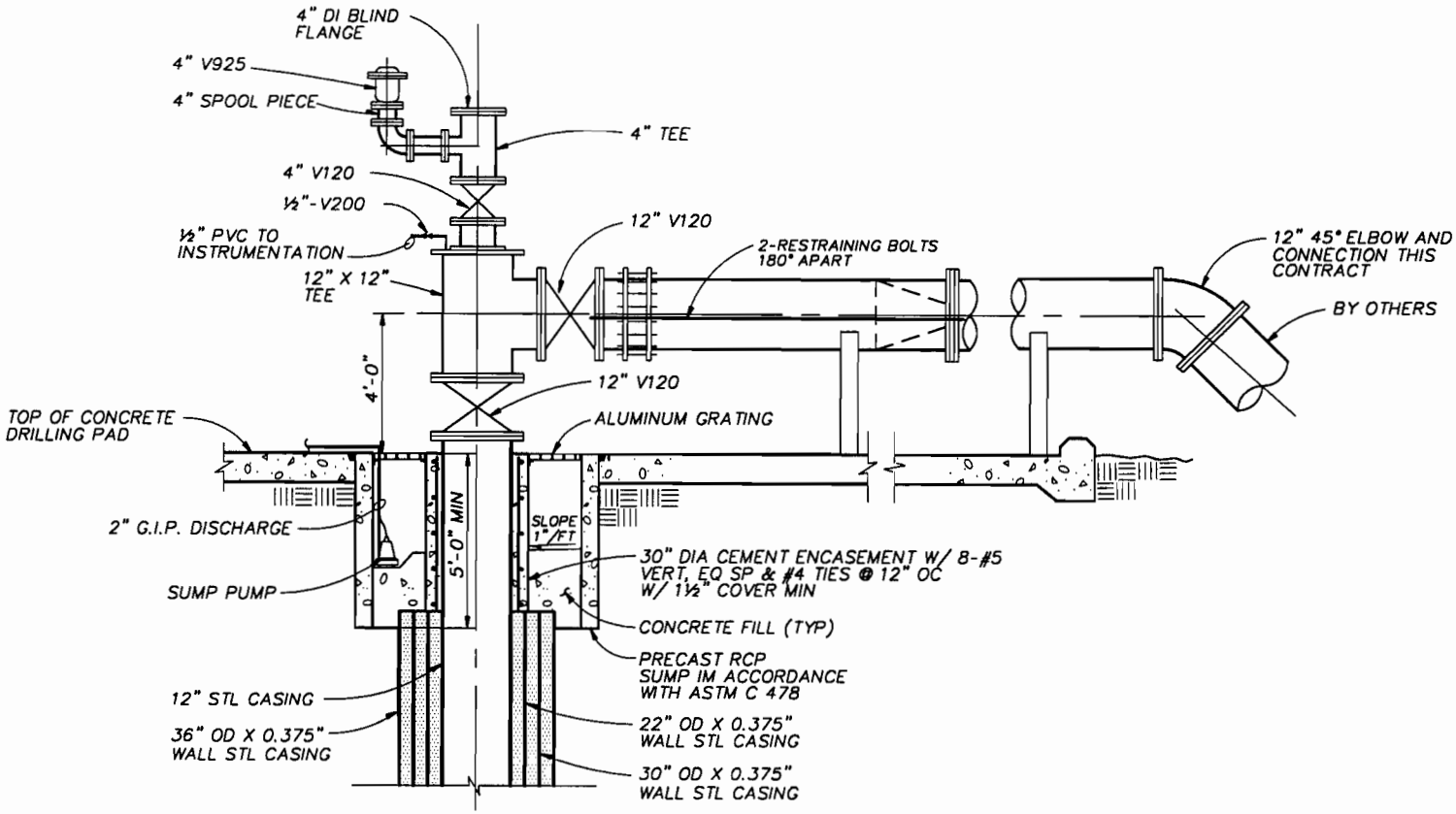
Three casing volumes of water were pumped from the well in preparation for water quality sampling. The water quality sampling included collection of samples for analysis of primary and secondary drinking water standards. After collection of the water samples, a video survey and cement bond log were performed. The final logs to be performed were the temperature log and a gamma ray log in preparation for internal and external RTSs.

The wellhead to injection well IW-1 was then installed and wellhead piping was connected to the WWTP effluent disposal piping. Pressure transducers and flowmeters at the wellhead were circuited from the injection well system to the WWTP control building. Exhibit 3-4 depicts the completion diagram for the IW-1 wellhead.

An injection test was then conducted on the completed well with the results discussed in Section 4.

3.3 Tri-Zone Monitoring Well (TZMW-1)

A TZMW-1 constructed by the SFWMD in 1996 is located near IW-1 as shown on Exhibit 1-2. The well was originally constructed to monitor the intervals from 1,060 to 1,160; 1,752 to 1,880; and 2,200 to 2,356 feet bpl and was used for collection of potentiometric head data. The modification of TZMW-1 that began on January 17, 2002, and involved backplugging of the lowest monitoring zone from 2,356 to 2,236 feet bpl. There were no modifications conducted on the upper and intermediate monitoring zones. A completion diagram of the modified well is provided in Exhibit 3-5.



DEEP INJECTION WELL WELLHEAD DETAILS

NTS

Exhibit 3-4
Injection Wellhead

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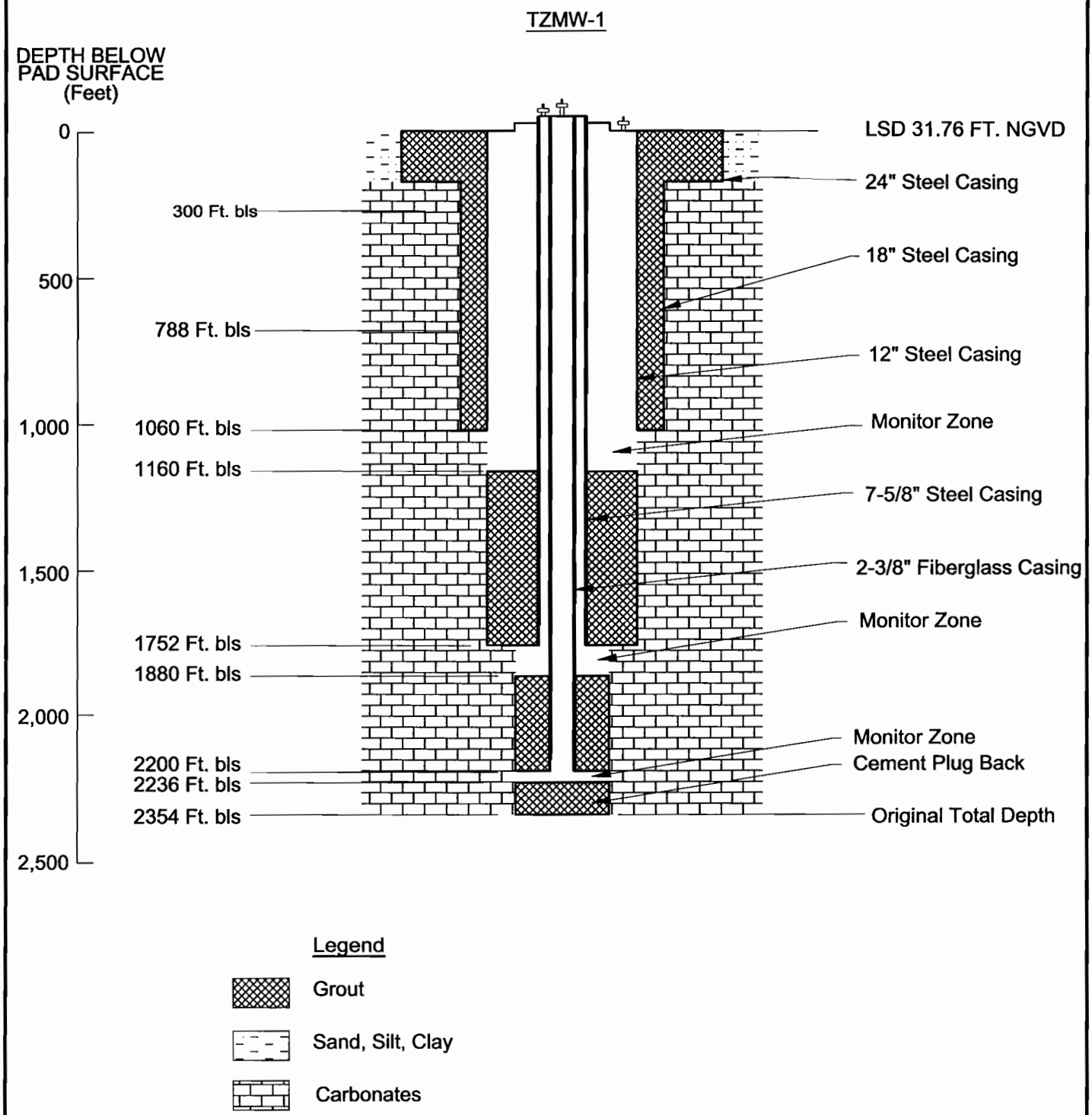

Exhibit 3-5
Tri-Zone Monitoring Well Completion Diagram

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SECTION 4

Testing During Well Construction

Testing during construction of the injection well and monitoring well system included pad monitor wells (PMWs) formation sampling, geophysical logging, reverse-air pilot hole water quality, core sampling, and packer testing. Results of the testing were used to determine the hydraulic characteristics of the strata intercepted by the borehole, which were then used to determine the design of the wells.

4.1 Water Table Monitoring Data

The four PMWs were sampled weekly during IW-1 and TZMW-1 well construction. The purpose of this sampling was to monitor potential water quality impacts to the surficial aquifer as a result of construction and testing activities at IW-1 and MZMW-1. The depth to water was measured at each well and then purged for a minimum of three casing volumes of water prior to sample collection. Water samples were field analyzed for pH, chlorides, and conductivity. Appendix H presents a summary of the PMWs water quality data for the duration of well construction.

A background water sample was collected on August 30, 2001 and September 6, 2001, prior to initiation of well construction on September 9, 2001. The background levels for conductivity ranged between 487 micromhos per centimeter (µmhos/cm) and 780 µmhos/cm with the low occurring at the Northwest PMW and the high occurring at the Northeast PMW. The background levels for chlorides ranged between 4 mg/L and 33 mg/L with the low occurring at the Northwest PMW and the high occurring at the Southeast PMW. The background levels for pH ranged between 6.26 Standard Units (SU) and 6.91 SU with the low occurring at the Southeast PMW and the high occurring at the Northwest PMW. No significant water quality changes within the surficial aquifer were observed during construction at the IWSD site. Anomalous conductivity and chlorides concentrations of 1,003 µmhos/cm and 103 mg/L, respectively were observed on September 26, 2001, at the Northwest PMW. These data points are several times greater than the remainder of the data at this monitoring well. The anomaly may be the result of analytical error. The Northeast PMW chloride concentrations have exhibited a slight increasing trend over the course of the construction. This trend is not evident at any of the other PMWs.

Overall, the PMWs water quality data indicate that the surficial aquifer was not impacted by well drilling or testing operations at the IWSD injection well site.

Water levels were monitored at the PMWs during the well construction period. Water levels were measured from the top of each of the well casings in units of feet below top of casing (btoc). Water levels gradually increased throughout the construction period. The initial water level at the Southeast PMW was 6.75 feet-btoc and the final water level was 10.1 feet-btoc. The initial water level at the Northeast PMW was 3.50 feet-btoc, and the final water level was 8.9 feet-btoc. The initial water level at the Southwest PMW was 6.67 feet-btoc, and the final water level was 10.6 feet-btoc. The initial water level at the Northwest PMW was 6.00 feet-btoc, and the final water level was 10.3 feet-btoc.

4.2 Pilot Hole Water Quality

Water samples were collected at approximately 30-foot intervals during reverse-air drilling of IW-1 to provide a generalized profile of water quality changes with respect to depth. The samples underwent analyses for conductivity, chlorides and pH. Closed circulation reverse-air drilling techniques were used during pilot hole drilling of the interval from the base of the 22-inch diameter casing at 2,000 feet bpl to the total depth of the well at 3,350 feet bpl. Pilot hole water quality reflects a mixture of formation fluids for the entire open hole interval and fresh water which was used to begin reverse air drilling. This results in muted changes in pilot hole water quality with depth. In general, analytical results from pilot hole drilling show a sharp increase in the analyzed parameters in early samples and then relatively steady levels as the depth of samples increased. Pilot hole water quality data for IW-1 is presented in Appendix H.

4.3 Formation Sampling

Duplicate formation samples were collected at 10-feet intervals during construction of IW-1. Each sample was described by a CH2M HILL geologist according to rock type, color, consolidation, porosity, and fossils that is presented as a lithologic table in Appendix D. A generalized summary of the geologic formations encountered during IW-1 well construction is presented in Exhibit 4-1.

EXHIBIT 4-1
Geological Formations Encountered

Depth Interval (ft bpl)	Description	Formation	Geologic Age
0–35	Sand, unconsolidated limestone and light olive brown clays	Peace River Formation	Miocene
35–70	Grayish yellow limestone, some clay and marl	Peace River Formation	Miocene
70–290	Yellowish gray to grayish olive clay, yellowish gray marl, varying amounts of limestone, phosphate present	Peace River Formation (from 70 to 185 ft bpl) Tampa Member of the Arcadia Formation (from 185 to 290 ft bpl)	Miocene
290–425	Yellowish gray limestone, interbedded layers of clay, phosphate present	Tampa Member of the Arcadia Formation	Miocene
425–625	Yellowish gray limestone, well consolidated, trace of shell fragments	Suwannee Limestone	Oligocene
625–655	Dark brown dolomite, microcrystalline, trace of limestone	Suwannee Limestone	Oligocene
655–880	Yellowish gray limestone, well consolidated, foraminifera, fossils present	Ocala Group	Eocene
880–1108	Dark brown dolomite, microcrystalline, interbedded layers of yellowish gray limestone, trace of foraminifera	Avon Park Formation	Eocene

4.4 Geophysical Logging

Geophysical logs were performed at IW-1 to correlate data and to provide additional geologic water quality information of the intercepted borehole. More specifically, the geophysical logs were compared to the formation samples collected during drilling and used to identify formation boundaries, as well as to obtain specific geologic and hydrogeologic data pertaining to the underground formations. These data were then utilized in the selection of casing setting depths and identification of water producing intervals. Temperature and cement bond logs were also performed to verify cement tag depths and evaluate cement integrity. A summary of geophysical logging activities during construction of IW-1 is presented in Appendix I (Volume 2) with geophysical logs for IW-1 and MZMW-1. Borehole video surveys for IW-1 will be provided to the TAC members under separate cover. A summary of the video survey is presented in Appendix J.

4.4.1 IW-1

The first suite of geophysical logs was performed at IW-1 in the mud-filled borehole to 310 feet bpl. Logs performed were caliper, natural gamma-ray (NGR), and dual induction (DI) logs. The purpose of this suite of logs was to evaluate the Hawthorn Group and to select a surface casing setting depth. Based on the information gathered from the logs and drill cuttings, a 36-inch casing setting depth of 275 feet bpl was selected.

On September 12, 2001, a caliper log was performed inside the IW-1 reamed pilot hole to 280 feet bpl. The purpose of this logging event was to determine the volume of cement needed for grouting of the casing.

The second suite of geophysical logs was performed at IW-1 in the mud-filled borehole to 1,010 feet bpl. Logs performed were caliper, NGR, DI, and sonic logs. The purpose of this suite of logs was to evaluate the Hawthorn Group and Suwannee Formation and to assist in the selection of the first of two intermediate casing setting depths.

With assistance from the information obtained from the logs, the intermediate casing setting depth was selected at 930 feet bpl.

On September 22, 2001, a caliper log was performed inside the IW-1 reamed pilot hole to 935 feet bpl. The purpose of this logging event was to determine the volume of cement needed to grout the casing. Temperature logs were also performed after each stage of cementing the casing.

The third suite of geophysical logs was performed after advancing the nominal 10-inch diameter pilot hole to a total depth of 2,010 feet bpl. Logs performed by the contractor were caliper, NGR, and DI logs. The purpose of this logging event was to evaluate the Ocala and Avon Park formations and to select the second of the two intermediate casing setting depths. Additional Logs performed by Baker Atlas, Inc. were Magnetic Resonance Imaging, Spectral Gamma Ray and Full Wave Form Sonic logs.

On October 11, 2001, a caliper log was performed inside the 12.25-inch diameter reamed pilot hole to 2,000 feet bpl to assist in selecting packer setting intervals.

On October 19, 2001, a caliper log was performed inside the 28.5-inch diameter reamed pilot hole to 2,005 feet bpl. On October 22, 2001, the caliper log was repeated after the installation

of the 22-inch casing was postponed due to inclement weather. The purpose of this logging event was to determine the volume of cement needed to grout the casing. Temperature logs were also performed after each stage of cementing the casing.

The fourth suite of geophysical logs was performed after advancing the pilot hole to a total depth of 2,980 feet bpl. Logs performed include caliper, NGR, sonic, and DI. The purpose of this logging event was to assist in determining the confining units of the formation and in the selection of packer setting depths. After reviewing the logs, packer setting intervals of 2,200 to 2,251 feet bpl; 2,400 to 2,461 feet bpl; 2,720 to 2,756 feet bpl; and 2,801 to 2,901 feet bpl were selected.

On November 29, 2001, caliper, NGR, DI, sonic, temperature (static and dynamic), fluid conductivity (static and dynamic), flowmeter (static and dynamic) logs and a video survey were performed on the reamed pilot hole to 2, 915 feet bpl, and on the pilot hole to 3,350 feet bpl. The purpose of this suite of logs was to evaluate Oldsmar Formation and to assist in the selection of a final casing setting depth. With assistance from the logs, the final casing depth was recommended and subsequently approved by FDEP to be 2,983 feet bpl.

On December 6, 2001, a caliper log was performed inside the IW-1 reamed pilot hole to 2,995 feet bpl. The purpose of this logging event was to evaluate the characteristics of the reamed hole prior to installation of the bridge plug.

On December 11, 2001, a caliper log was performed which determined that the bridge plug was at a depth of 2, 986 feet bpl.

Temperature logs were also performed after each stage of cementing the casing.

Upon completion of the well, a suite of logs was conducted to provide a record of the completed well and to evaluate the mechanical integrity of the well. The logs included a caliper log conducted on December 18, 2001, and a cement bond log (CBL) on January 9, 2002, as part of the mechanical integrity testing (MIT) to assess the quality of the cement-to-casing bond of the IW-1 final well casing. The log was performed before cementing the upper 216 feet of the 12-inch diameter final well casing to allow the tool to be calibrated to non-cemented casing (above 216 feet bpl) and cemented casing (below 216 feet bpl). The CBL demonstrated that a good cement bond exists around the final casing. A video survey was also conducted on January 9, 2001, to provide a final record of well condition during static flow conditions. Overall, the quality of the video survey in terms of visibility was excellent. The final casing setting depth was confirmed at 2,982.5 feet bpl. Several native fractures in the injection zone formation were evident from approximately 3,100 to 3,160 feet bpl and between 3,220 to 3,250 feet bpl. These fractures in the formation are indicative of the highly transmissive Oldsmar formation. A full summary of the video survey is provided in Appendix J.

4.5 Core Sampling

During drilling of the injection well pilot hole, core samples were recovered to correlate with drill cuttings and geophysical logs. Samples were recovered using a 4-inch diameter, 10-foot core barrel. A total of five core samples were recovered during pilot-hole drilling. The estimated coring intervals and respective geologic units for these samples are as follows:

- Core Sample No. 1: 2,054 to 2,066 feet bpl (Avon Park Formation)
- Core Sample No. 2: 2,230 to 2,242 feet bpl (Oldsmar Formation)
- Core Sample No. 3: 2,306 to 2,318 feet bpl (Oldsmar Formation)
- Core Sample No. 4: 2,402 to 2,414 feet bpl (Oldsmar Formation)
- Core Sample No. 5: 2,760 to 2,771 feet bpl (Oldsmar Formation)

After recovering the core sample from the coring barrel, samples were immediately wrapped with plastic liners to reduce evaporative water losses. A description of each core collected is presented in Appendix K.

4.6 Packer Testing

Six straddle packer tests were conducted during drilling and testing of the injection well pilot hole. These tests were conducted to establish the base of the USDW and to obtain water quality and hydraulic characteristics of the confining units above the injection zone. Each packer test consisted of pumping the test interval at a predetermined rate and recording water level drawdown with time. Preliminary pumping tests were conducted to determine the optimum pumping rate for each test interval.

Water level pumping and recovery measurements were collected to provide data for specific capacity calculations. Water levels were measured using a submersible pressure transducer and were recorded by an *in situ* Hermit data logger. Water samples were collected during each straddle packer test and were analyzed for chlorides, conductivity, and pH. Exhibit 4-2 presents a summary of packer testing data and water quality data.

EXHIBIT 4-2
IW-1 Packer Testing Summary

Date	Test Interval (bpl)	TDS (mg/L)	Chlorides (mg/L)	Conductivity (μmhos/cm)	Pumping Rate (gpm)	Drawdown (feet)	Specific Capacity (gpm/ft)
10/12/01	1,950–2,000	12,700	5,830	21,500	85	163	0.523
10/13/01	1,970–2,000	13,900	6,000	22,300	60	136	0.441
11/7/01	2,800–2,901	24,800	12,800	35,400	3.5	140	0.0250
11/8/01	2,720–2,755	22,900	10,500	34,200	0.75	104	0.0072
11/11/01	2,400–2,461	23,000	10,800	34,100	0.75	60	0.0125
11/12/01	2,200–2,251	20,200	9,250	30,500	5	12.44	0.4019

The first two straddle packer tests were conducted on October 12 and 13, 2001, to establish the base of the USDW. Water quality samples collected from these tests demonstrated values that were above the 10,000 mg/L TDS interface. The remaining four straddle packer tests were conducted between November 7, 2001, and November 13, 2001, to determine confinement. Specific capacity data from the three lower packer tests demonstrated very low values indicative of confinement. The six test intervals were as follows:

- 1,950 to 2,000 feet bpl
- 1,970 to 2,000 feet bpl
- 2,200 to 2,251 feet bpl
- 2,400 to 2,461 feet bpl

- 2,720 to 2,756 feet bpl
- 2,801 to 2,901 feet bpl

4.7 Injection Testing

A 12-hour step injection test was conducted on March 13, 2002 to evaluate the hydraulic characteristics of the injection well. The test was conducted after giving FDEP a demonstration of mechanical integrity and completion of wellhead piping to the injection system. The overflow ponds belonging to IWSD were the source of the water used for injection. A Hermit datalogger was used to monitor the wellhead pressures of the injection well and all three of the monitoring zones before, during, and after the test.

Prior to the start of the test, the background wellhead pressure of the injection well was 21 psi. Step 1 of the test was conducted for 1 hour at 2,500 gpm with an injection wellhead pressure of 34 psi. Step 2 was conducted for 1 hour at 3,000 gpm with an injection wellhead pressure of 42 psi. The third and final step was conducted for 8 hours at 3,500 gpm with an injection wellhead pressure of 47 psi. The wellhead pressures encountered are typical for injection wells in the State of Florida. After the injection of the fluid was stopped, the wellhead pressure returned to the background pressure of 21 psi within 3 minutes.

The three monitoring zones wellhead pressures did not show any influence from the injection of the fluid into the injection zone. A graph summarizing the data collected during the test is provided in Appendix L.

4.8 Background Water Quality

In order to provide background water quality prior to operational status, the injection well IW-1 and TZMW-1 were sampled for those parameters listed as Florida's state primary and secondary drinking water standards (Chapter 62-550, Florida Administrative Code).

The IW-1 suite of water samples was collected by the Sanders Laboratory on January 9, 2002, after the well was purged of five well volumes. TZMW-1 water samples were collected from all three monitoring zones on March 5, 2002. Each zone was purged of five well volumes prior to the collection of the samples.

Water quality data reports are presented in Appendix M. The samples were analyzed for primary and secondary drinking water standards and FDEP's minimum criteria. The background sample for the intermediate monitoring zone had a TDS concentration of 3,700 mg/L, further demonstrating that the monitoring zone is located above the base of the USDW. The TDS concentration of the lower monitoring zone sample was 34,600 mg/L, further demonstrating that the lower monitoring zone is located below the base of the USDW.

4.9 Groundwater Modeling

A well inventory conducted as part of the permitting process for IWSD's injection well IW-1 revealed the presence of a test oil well located just inside the 1-mile zone of review. This well was drilled in 1955, and subsequently plugged and abandoned that same year. As

required by the construction permit (Specific Condition 14.) groundwater flow simulations were conducted to assess the potential impact of wastewater movement with the operation of IW-1, upon the water level in the abandoned well for a 10-year period. Particle-tracking simulations were also run to estimate the horizontal movement of injected water over the simulation period.

4.10 Conceptual Model

4.10.1 Aquifer System

The top of the Floridan aquifer is located approximately 773 feet below land surface in the study area (Bennett, 2001). The Floridan aquifer is divided into the Upper Floridan and Lower Floridan units, which are separated by an intermediate low-permeability unit. Together, the two units of the Floridan aquifer are referred to as the Floridan Aquifer System (FAS). The highly transmissive zone of cavernous dolomite below the base of the Lower Floridan aquifer is referred to as the "Boulder Zone".

Exhibit 2-1 presents a simplified cross-section of the FAS across the southern portion of the state of Florida. Additional information on the FAS may be found in the following citations:

- CH2M HILL, 1996. Feasibility Study of a Lower East Coast Aquifer Storage and Recovery System. Phase III: Final Report (C-4103). Prepared for the South Florida Water Management District.
- Meyer, F.W., 1989. Hydrogeology, Groundwater Movement, and Subsurface Storage in Southern Florida. U.S. Geological Survey Professional Paper 1403-G. U.S.G.S., Washington, D.C.
- Miler, J.A., 1986. Hydrogeologic Framework of the Floridan Aquifer System in Florida and in Parts of Georgia, Alabama, and South Carolina. U.S. Geological Survey Professional Paper 1403-B. U.S.G.S., Washington, D.C.
- South Florida Water Management District, 1999. Documentation for the Lower East Coast Floridan Aquifer Model. SFWMD, West Palm Beach, FL.

4.10.2 Hydrologic Boundaries

In the study area, the FAS generally dips to the west. The FAS is exposed at land surface in the central portion of the state. Its lateral extent encompasses southern Alabama, Georgia, South Carolina, and most of Florida with the exception of the panhandle. Its terminal offshore boundaries are less well defined.

4.10.3 Hydraulic Properties

Data on the hydraulic properties of the Boulder Zone are not as plentiful when compared with other aquifers. The published documentation for the SFWMD LEC Floridan aquifer model lists hydraulic conductivity values for the Boulder Zone ranging from 607 ft/day to 58,565 ft/day, with a geometric mean value of 1,771 ft/day. A specific capacity test performed on an injection well in Fort Lauderdale, Florida, yielded a transmissivity of 22 mgd/ft, which corresponds to a hydraulic conductivity value of 4,456 ft/day over the 660-foot open interval tested (Geraghty & Meiller, 1981).

4.10.4 Sources and Sinks

No known sources or sinks penetrate the Boulder Zone of the Floridan aquifer near the IWSD plant. Well IW-1 is designed to dispose of excess treated wastewater that cannot be accommodated by the IWSD's surface pond system. Over the past 10 years (1991 to 2001), excess wastewater has averaged 1.9 mgd during the months of September through December. On an average day basis over the course of a year, this flow rate is approximately 640,000 gpd.

4.11 Computer Code Description

The computer code Aquifer Win32 (ESI, 2000) was selected to conduct the Floridan aquifer impact analysis. Aquifer Win32 contains a 2-D analytical modeling environment, and was selected to provide a simple, impact analysis of the effects of wastewater injection into the Boulder Zone. The model objectives and the lack of available data make this analytical approach preferable to the use of a numerical model.

4.11.1 Assumptions and Limitations

As an analytical model, Aquifer Win32 makes several simplifying assumptions:

1. Groundwater flow is horizontal.
2. The aquifer is infinite in areal extent.
3. Hydraulic conductivity is homogeneous and isotropic.

These assumptions do not significantly affect the application of the model to meet the modeling objectives. The size of the Floridan aquifer in relation to the area of interest makes the second assumption valid. Finally, the relatively limited amount of information on the hydraulic properties of the Floridan aquifer combined with the large scale over which flow occurs justify the third assumption.

4.11.2 Solution Techniques

The following sections present the equations used by Aquifer Win32. Equations for model features not included in this analysis are not presented in this memorandum, but may be found in the model documentation.

The head at any point in the model domain may be computed by equation (1) (Strack, 1989):

$$\phi(x, y, t) = C - G(x\cos\alpha + y\sin\alpha) - \sum_{j=1}^{n} s_j \qquad (1)$$

where:

	ϕ	= head
G		= regional gradient
	α	= angle between regional gradient and x-axis
t		= time to compute drawdown
s_j		= drawdown computed for well j

$C = \phi_r + G(x_0 \cos \alpha + y_0 \sin \alpha)$

The head resulting from the operation of IW-1 was simulated using Hantush and Jacob's (1955) equation (2) for a leaky aquifer, where:

$$h_0 - h = \frac{Q}{4\pi T} W(u, r/B) \quad (2)$$

where:

$h_0 - h$ = drawdown

Q = injection rate

T = aquifer transmissivity

W(u,r/B) = leaky well function

The method of Hantush and Jacob (1955) was chosen over other drawdown equations (Theis, 1935, ETC) because of its inclusion of leakage from the confining bed.

4.12 Model Construction

4.12.1 Model Domain

The model domain encompasses the area around the IWSD plant. Because the model is an analytical solution, there is no model grid or mesh. The area of interest was considered to be the same as the 1-mile area of review presented with the construction permit application.

4.12.2 Hydraulic Parameters

The Boulder Zone of the Floridan aquifer was simulated as a confined aquifer with a thickness of 367 ft, with the top located 2,983 ft below land surface. The aquifer was assigned a hydraulic conductivity of 1,771 ft/day, which is the geometric mean of reported hydraulic conductivity values for the Boulder Zone (SFWMD, 1999). Expressed as transmissivity, this value is 649,957 ft^2/d. This value is lower than the hydraulic conductivity value reported for the Boulder Zone in Fort Lauderdale. The lower value was chosen in order to provide a more conservative estimate of the potential impact.

A storage value of 0.010 was used by the SFWMD in their model the same value was used for this analysis. A 1/B value of 3.6×10^{-6} /ft was calculated based on the 200-foot thickness of the Middle Confining Unit (Bennet, 2001) and the 1.7×10^{-3} ft/day vertical hydraulic conductivity used for this unit in the SFWMD LEC Floridan Aquifer model (SFWMD, 1999).

4.12.3 Sources and Sinks

The only source included in the simulation was the IWSD well IW-1, which injected at a constant rate of 0.64 mgd. This is the average daily flow (over a 365-day period) resulting from an average daily flow of 1.9 mgd from September to December (1991 to 2001).

4.13 Predictive Simulation

4.13.1 Water Level Impact

Water level impacts after 10 years are shown in Exhibit 4-3. Note that the impact at a distance of 1 mile from the injection well is on the order of 0.085 feet, or less than 1/100th of an inch.

4.13.2 Particle Travel Time

Particle tracking was conducted by simulating the release of 100 particles from the injection well. Exhibit 4-4 shows the particle positions after 10 years. The simulated travel distance with a porosity of 0.20 is less than 0.25 miles. This porosity value is lower than expected for the cavernous Boulder Zone, and was selected to provide a conservative estimate. If the actual porosity is higher, the travel distance would be even less since particle velocity is inversely proportional to porosity.

4.14 Summary and Conclusions

Groundwater flow simulations conducted to simulate the operation of IWSD well IW-1 indicate that the water level impact after 10 years of operation at an average day injection rate of 640,000 gpd is less than 1/100th of an inch. Particle tracking simulations indicate movement of less than 0.25 miles after 10 years.

The impact upon the abandoned oil well located just within the 1-mile zone of review will be negligible, and no additional work will be required to re-abandon the oil well.

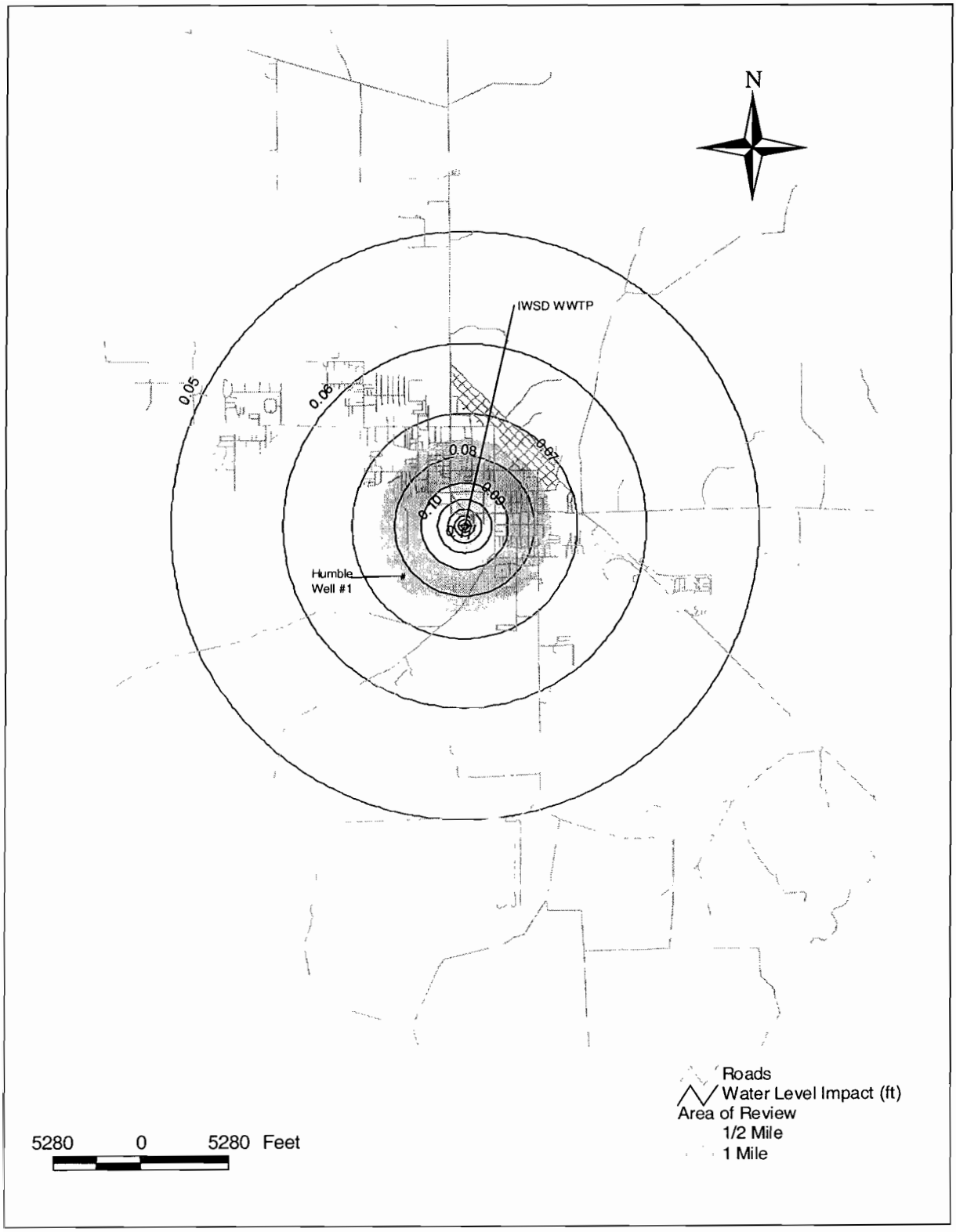

EXHIBIT 4-3
Water Table Impact After 10 Years

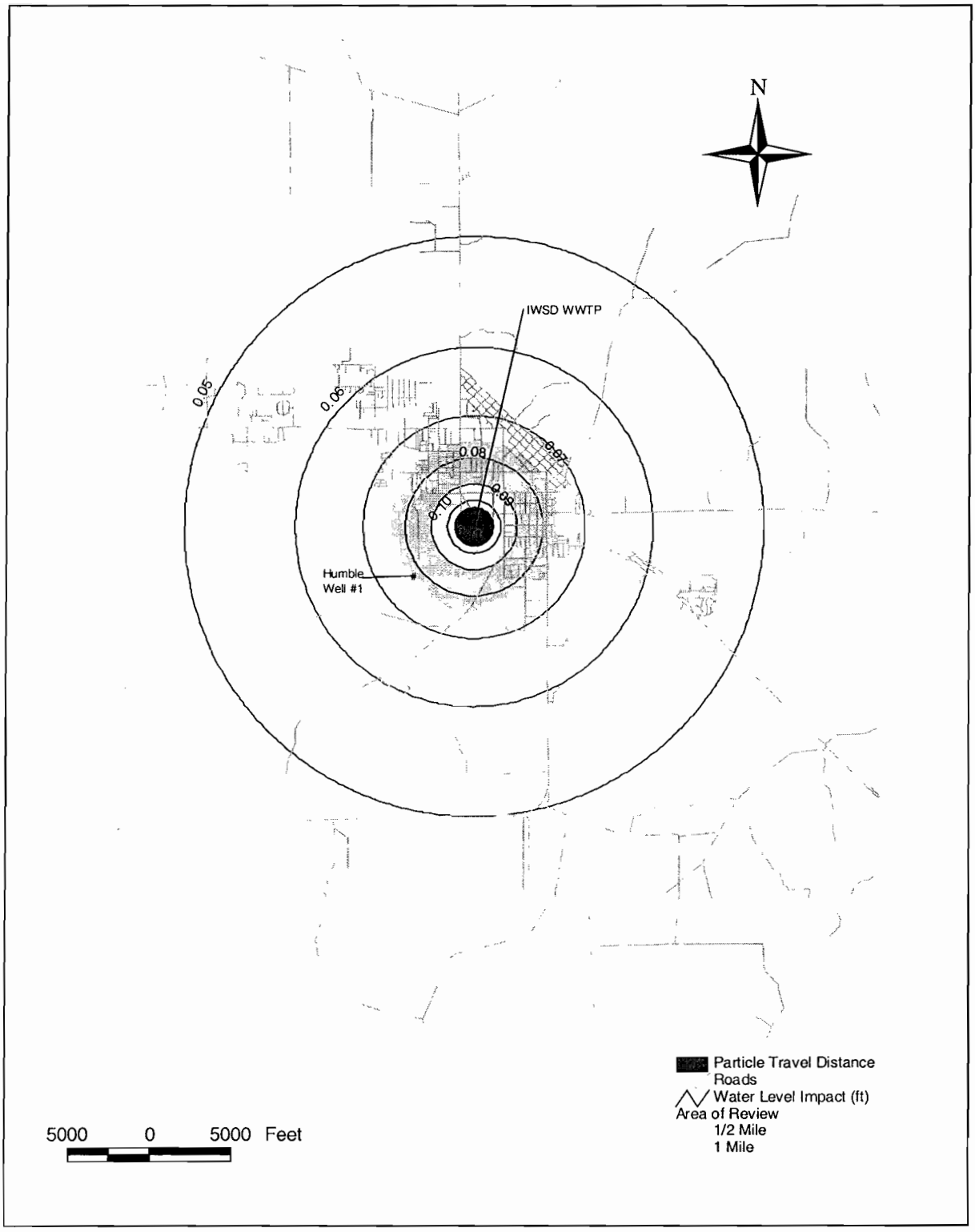

EXHIBIT 4-4
Simulated Particle Travel Distance After 10 Years

SECTION 5

Mechanical Integrity Testing

5.1 External Mechanical Integrity Testing

5.1.1 Controlling Regulations

FDEP is responsible for regulating injection wells in Florida. Chapter 62-528, FAC, contains regulations for constructing and operating an injection well system. These regulations require that injection wells undergo mechanical integrity (MI) testing every 5 years. Furthermore, Section 62-528.300(6), FAC, defines the MI of injection wells, while Section 62-528.425(1) lists the monitoring requirements for injection wells as related to MI. Exhibit 5-1 presents these sections of the FAC.

As noted above, MI testing has internal and external components. Demonstration of internal MI investigates the integrity of the well casing, while external MI investigates the integrity of the grout seal to restrict fluid movement adjacent to the casing. The approved method for external MI demonstration includes the RTS methodology, temperature logging, and review/interpretation of water quality data from monitoring wells. An additional item that was included as part of this project was the performance of an internal RTS. The internal RTS can be used to correlate to the casing pressure test and video survey, all part of establishing internal MI. The results of this testing are also presented to establish baseline conditions so that the use of this technology can be considered in the future for this site.

5.1.2 MI Demonstration Test Program

The test program includes temperature logging and RTS testing for the demonstration of external MI. The radioactive isotope Iodine-131 (^{131}I) was utilized as a tracer for the RTS because it has a short half-life of 8.05 days and is an excellent emitter of gamma radiation. ^{131}I is a manufactured isotope of the naturally occurring Iodine-126 that primarily emits beta particles but also emits gamma radiation. The end product of ^{131}I radioactive decay is Xenon-131, which is an inert noble gas. The tracer is contained within a solution of sodium iodide (NaI^{131}). The assay date of the tracer used during testing at the IWSD was less than its half-life, as required by FDEP. In addition, the tracer has a specific gravity of approximately 1.0, which is similar to that of the potable water injected at the site. Additional isotope information including assay dates and quantity is contained in Appendix N.

RTS testing was conducted by the Geophysical Logging Division of Youngquist Brothers, Inc. (YBI) of Fort Myers, Florida. YBI has completed similar MI work at many wastewater facilities. YBI is licensed in Florida to handle radioactive materials and has an ongoing health and safety program to provide for a safe working environment at the site.

A schematic diagram of the RTS tool configuration used during the external MI demonstration is shown on the RTS log in Appendix I. The tool has three gamma radiation detectors with the following designations:

- Top Gamma Radiation Detector (GRT)
- Middle Gamma Radiation Detector (GRM)
- Bottom Gamma Radiation Detector (GRB)

EXHIBIT 5-1
FAC Sections Pertaining to Mechanical Integrity

Mechanical Integrity Definition (Section 62-528.300(6))

(a)	An injection well has mechanical integrity if:
(1)	There is no leak in the casing, tubing or packer; and
(2)	There is no fluid movement into an underground source of drinking water through channels adjacent to the injection well bore.
(b)	One of the following tests shall be used to evaluate the absence of leaks under Subsection (a)1. of this subsection.
(1)	Monitoring of tubing-casing annulus pressure with sufficient frequency to be representative, as determined by the Department, while maintaining an annulus pressure different from atmospheric pressure measured at the surface, after an initial pressure test pursuant to subparagraph 2. And paragraph (e) of this subsection; or
(2)	Pressure test of inner casing or tubing.
(c) (a)2.	The following methods shall be used to determine the absence of fluid movement under Subparagraph A temperature or noise log, and a radioactive tracer survey.
(d)	The Department shall allow the use of a test to demonstrate mechanical integrity, other than those listed in paragraphs (b) and (c) above, with the written approval of the United States Environmental Protection Agency. If the Environmental Protection Agency has approved an alternative mechanical integrity test method, only written Department approval shall be required before conducting alternative mechanical integrity tests to those specified in (b) and (c) above.
(e)	A pressure test required under paragraph (b) above shall be conducted with a liquid at a minimum pressure of 1.5 times the maximum pressure at which the well is to be permitted, or 50 PSI, whichever is higher, for at least one hour. Internal mechanical integrity under subparagraph (a)1. above is demonstrated if there is no more than a five-percent pressure change over the one-hour test period. The pressure used to test wells constructed using tubing and packer shall not exceed the design specifications of the tubing or packer.
(f)	In conducting and evaluating the tests enumerated in this rule or others to be allowed by the Department, the permittee and the Department shall apply methods and standards generally accepted in the industry. When the permittee reports the results of mechanical integrity tests to the Department, a description of the test(s), method(s) used, and interpretation of the results shall be included. In making the evaluation, the Department shall review monitoring and other test data submitted since the previous evaluation.
(g)	The Department shall require additional or alternative mechanical integrity tests unless the results presented by the permittee under (b) and (c) above provide reasonable assurance that there is no fluid movement into or between underground sources of drinking water resulting from the injection activity.
(h)	A permit for any Class I or III well or injection project which lacks mechanical integrity shall include, and for ny Class V well may include, a condition prohibiting injection operations until the permittee affirmatively demonstrates under Rule 62-528.300(6)(a)-(c), F.A.C., that the well has mechanical integrity, unless the permittee affirmatively demonstrates that there is no movement of fluid into or between underground sources of drinking water.

Class I Injection Well Monitoring Requirements (Section 62-528.425(1), F.A.C.)

(d)	A demonstration of mechanical integrity pursuant to Rule 62-528.300(6), F.A.C., at least once every five years during the life of the well; and
(1)	As part of the baseline monitoring information, a video survey from the surface to the bottom of the injection zone shall be run prior to injection but after completion of testing, except for those wells that inject through tubing or where it is physically impossible to do so, and every five years thereafter, or more frequently if impairment of the integrity of the casing, tubing, or formation is suspected based on physical or geochemical data such as water quality, pressure changes, or mechanical integrity results.
(2)	The video survey may be either black and white or color.
(3)	Adequate provisions must be made to centralize the camera in the borehole.
(4)	Before running the survey, adequate provisions shall be made to assure that fluid in both the casing and open borehole is of sufficient clarity to provide a baseline survey of a quality acceptable to the Department.

The gamma radiation detectors are spaced at 1.20 feet (GRB), 10.50 feet (GRM), and 24.00 feet (GRT) from the bottom of the tool. The tool is equipped with one tracer ejector port, located 13.50 feet from the bottom of the tool, spaced between the GRT and GRM detectors. A casing collar locator (CCL) is located 9.60 feet from the tool bottom. The RTS tool was field-calibrated upon mobilization to the site.

The three detectors on the tool register gamma radiation in API units. The API unit is a standard industry measure of gamma radiation and relates to two test wells maintained by the University of Texas at Houston. One of the test wells is completed into a geologic formation with no sources of gamma radiation. The second well is completed into a formation that naturally emits a consistent level of gamma radiation arbitrarily set to 200 API units. To utilize a new tool for a RTS, the contractor must log both test wells with the new tool and calibrate to the 200 API units and 0 API units standards. Instead of measuring the radiation in units of energy, arbitrary API units are used to account for differences in electronics inherent in different logging tools. The logging tool used by YBI has been calibrated to these test wells. Field calibration is intended as a supplement to the baseline calibration.

A representative (Mr. John Powers) from CH2M HILL was onsite to observe all RTS testing activities. Although FDEP were unavailable to witness the testing, they did authorize that testing take place without their being present. A 2-inch-diameter flexible hose and a totaling flow meter were installed at the injection well to provide the accurate flow measurements necessary to complete the RTS work. The flow meter was used to measure the relatively low flows (approximately 20 to 170 gallons per minute [gpm]) utilized during the external MI demonstration. A copy of the flowmeter calibration certificate is included in Appendix N. Potable water from the WWTP was used to achieve the desired flow rate in the well. At no time was WWTP effluent used during the test. During flushing of the well between tests, the maximum flow rate was limited to 170 gpm. Typically, the injection well was flushed at this rate for approximately 30 minutes (approximately 5,000 gallons) to remove the tracer between tests. Much lower rates (20 to 25 gpm) were used during actual testing.

5.1.3 External RTS Test Methodology

Exhibit 5-2 summarizes the FDEP-approved external MI testing procedures. Background gamma radiation logs were conducted under static well conditions before releasing any radioactive material in each well. The background gamma radiation log provides a baseline of comparison for establishing MI. A static temperature log was also run to determine the static temperature gradient. The static temperature log is useful in identifying areas where internal or external MI may be suspect and is a standard procedure during external MI testing. A CCL log was also performed before the RTS testing to locate the bottom of the injection casing.

The external MI testing procedure consisted of two distinct phases: static testing and dynamic testing. The static RTS had two primary objectives:

1. To check for leaking valves on aboveground injection piping
2. To confirm the external MI of the injection well

During the static testing, a quantity of tracer with an activity of 1-millicurie (mCi) was ejected 1 foot below the bottom of the well casing. A millicurie is essentially a unit of energy is a measure of the rate at which a radioactive material emits particles. One millicurie

EXHIBIT 5-2
FDEP-Approved External Radioactive Tracer Survey Procedures

Static External RTS Procedures

Notify FDEP 72 hours in advance of testing.

Run static temperature, CCL, and background gamma radiation logs of the entire well.

Flush well with at least 3,000 gallons of potable water.

Position the RTS logging probe ejector port approximately 1 foot below the bottom of the casing, and eject a measured tracer volume (1 mCi ^{131}I).

With the tool stationary, monitor the tracer plume for at least 60 minutes under static conditions for upward fluid movement.

Log profile of tracer plume to verify positioning. Log up out of position to at least 100 feet above the top of the radioactive plume.

Flush tracer material down hole until tracer material is flushed sufficiently below the base of the casing to perform additional testing.

Log through area affected by static radioactive plume to verify that plume has been properly flushed and to identify areas that may have become stained by the ^{131}I.

Dynamic External RTS Procedures

Position RTS logging probe ejector port 5 feet above the base of the well casing, and eject 1 mCi of 131I while pumping into the well at a downhole velocity, not to exceed 5 feet per minute.

With the tool stationary, monitor for upward migration of the plume external to the well casing for at least 30 minutes under dynamic conditions.

Conduct steps 6 through 8 above.

Repeat dynamic external test by repeating steps 9 through 11 above.

Run a final gamma radiation log from approximately 100 feet below the base of the casing to land surface.

General Requirements

Calibrate all geophysical tools within 1 week of testing.

The tracer (131I) must be dated less than one-half-life at time of actual use during testing.

All mechanical and digital gauges used for flow and pressure measurements must be calibrated within 60 days of actual testing.

Gamma radiation detectors shall be field calibrated by the geophysical logging crew upon mob to injection well.

The RTS probe shall be emptied of all tracer material prior to removal from the well.

is equal to 3.7×10^7 disintegrations per second. The logging tool was held stationary in the well casing for 1 hour to confirm the presence of static conditions in the well (i.e., no fluid injection at the time of the test). Movement of the plume under static conditions is often variable depending upon the natural flow conditions present in the well.

The dynamic external RTS began with the geophysical logging probe held stationary. The travel time of the plume was monitored by the GRM and GRB detectors to confirm the flow velocity in the well. For a minimum of 1 hour, the gamma counts were monitored for arrival of the source at the GRT detector. Arrival of the plume at the GRT detector would indicate inadequate external MI at the base of the well as a result of vertically upward tracer movement outside the injection well casing.

After the 60-minute monitoring period, the contractor logged out of position up to at least 100 feet above the ejection point in the well. The injection well was then flushed at a high

rate, and logging through this interval was repeated. The absence of any elevated gamma counts near the base of the injection casing demonstrated that adequate external MI existed at the base of the injection well.

The testing procedure for the dynamic external RTS was repeated, ejecting the tracer at 5 feet above the base of the injection casing. However, for the second test, the monitoring period was reduced from 60 minutes to 30 minutes. After both tests were conclusive in demonstrating external MI, a final gamma-radiation log was completed to land surface and compared to the background log for further external MI verification. Appendix I contains copies of all geophysical logs. The format of each gamma radiation log is as follows:

1. The top detector (GRT) trace is on the far left of each log. The CCL, which provides depth control, is also shown on the left side.
2. The bottom detector (GRB) trace is located in the center.
3. The middle detector (GRM) trace is located on the far right.

The background temperature logs have been formatted at 20 degrees/inch with a scale ranging from 50°F to 150°F. The differential temperature is also shown on the log, with a range from -1.0 to 1.0 over 2.5 inches.

5.1.4 External MI Test Results

Exhibit 5-3 summarizes the geophysical logging conducted during the external MI testing of the City of Immokalee injection well. Each logging run completed is a separate electronic dataset. Except for the temperature log and initial background gamma radiation log, which were completed on January 22, 2002, all logs were completed on January 23, 2002. The background temperature log (dataset pass1) shows the water temperature in the casing gradually increasing from 76.2° F at approximately 200 feet bls to 88.2° F at 2,974 feet bls, just above the casing bottom at 2,983 feet bls. From 2,974 feet bls to 2,986 feet bls the temperature decreased, coinciding with the transition from casing to open borehole. Below 2,986 feet bls, the water temperature stabilized followed by a continuation of an increasing trend to the bottom of the well. At least two flow zones are indicated by the temperature log response within the open borehole. No anomalous intervals were observed on the temperature log within the casing. No anomalous intervals were indicated by the del-T log, which measures water temperature difference, not temperature value.

Except for the transition from casing to open borehole, temperature gradually increased with increasing depth, which is indicative of the prevailing geothermal gradient. The temperature log showed that the injection well has been left undisturbed (no flow condtions) long enough for a natural geothermal temperature gradient to develop.

5.1.5 Static Testing

The background gamma radiation log (dataset pass3) shows gamma radiation counts inside the 11.75-inch inside diameter casing generally less than 20 API units. Below the base of the injection casing at 2,983 feet, the radiation count was more variable with increased radiation up to a maximum of approximately 50 API at 3,266 feet bls.

Exhibit 5-3
Geophysical Logs Completed During the City of Immokalee Class I Injection Well (IW-1) Internal Mechanical Integrity Demonstration Utilizing the Radioactive Tracer Survey Method, January 24, 2002

Dataset	Start Time	Stop Time	Interval Logged (1)	Injection Rate in gpm (fpm)	Description
pass3	6:45 AM	8:01 AM	3,335-0	0	Background gamma radiation pass
pass1	7:37 AM	--	--	33 (5.9 fpm)	Eject 10 mCi @ 50 ft bls
pass2	8:45 AM	8:55 AM	39.5-410	35 (6.2 fpm)	Down Chase #1, 100 API @410 ft bls
pass3	8:57 AM	--	425-90	36 (6.4 fpm)	Log Out of Position (LOP)
pass4	9:09 AM	11:10 AM	90-390	165	Log After Flush (LAF) - 30 minutes
pass6	10:09 AM	--	--	39 (7.0 fpm)	Eject 10 mCi @ 400 ft bls
pass7	11:43 AM	12:00 PM	289.5-1,016	38 (6.8 fpm)	Down Chase #2, 100 API @1,010 ft bls
pass9	12:05 PM	--	1,020-590	36 (6.4 fpm)	LOP 2
pass10	12:34 PM	--	590-988	165	LAF 2
pass12	1:07 PM	--	--	39 (7.0 fpm)	Eject 10 mCi @ 1,000 ft bls
pass13	1:57 PM	2:36 PM	990-1,488	39 (7.0 fpm)	Down Chase #3, 100 API @1,485 ft bls
pass14	2:39 PM	--	1,490-1,100	41 (7.3 fpm)	LOP 3
pass15	2:46 PM	--	1,090-1,438	165	LAF 3
pass16	3:18 PM	--	--	41 (7.3 fpm)	Eject 10 mCi @ 1,450 ft bls
pass17	4:47 PM	5:03 PM	1,450-2,060	39 (7.0 fpm)	Down Chase #4, 100 API @2,058 ft bls
pass18	5:10 PM	--	2,062-1,600	39 (7.0 fpm)	LOP 4
pass19	5:29 PM	--	1,600-1,990	165	LAF 4
pass20	5:49 PM	--	--	39 (7.0 fpm)	Eject 10 mCi @ 2,000 ft bls
pass21	7:06 PM	7:18 PM	1,992-2,490	40 (7.1 fpm)	Down Chase #5, 100 API @2,490 ft bls
pass22	7:20 PM	--	2,495-2,100	39 (7.0 fpm)	LOP 5
pass23	7:31 PM	--	2,100-2,438	165	LAF 5
pass24	8:10 PM	--	--	39 (7.0 fpm)	Eject 10 mCi @ 2,450 ft bls
pass25	9:17 PM	9:39 PM	2,440-3,328	41 (7.3 fpm)	Down Chase #6, 100 API @2,980 ft bls

Notes:

Inner Casing Diameter (in.)	Casing Depth (ft bls)	Well Depth (ft bls)
11.75	2983	3,350

(1) Depths are referenced to land surface.
(2) RTS - Radioactive Tracer Survey
(3) ft bls - feet below land surface
(4) gpm - gallons per minute
(5) fpm - feet per minute
(6) LOP - Log Out of Position
(7) LAF - Log After Flush
(8) All logging was completed on January 24, 2002 except for the background gamma radiation survey (pass 3) which was completed on January 22, 2002.

The static testing, conducted to demonstrate external MI, consists of three datasets, pass6 through pass8. A tracer volume with a total radioactivity of 1 mCi was ejected at 2,984 feet bls, 1 foot below the base of the injection casing, and monitored for 1 hour. The tracer was observed at the GRM approximately 2 minutes after injection, increasing gradually to a maximum of approximately 1,450 API units 6 to 7 minutes after release of the tracer. The gamma radiation began to increase gradually after 14 minutes at the GRT detector to a maximum of approximately 260 API units after 58 minutes. At the GRB detector, elevated counts of radiation above background began to be registered approximately 15 minutes after tracer release.

Logging up out of position (pass7) identified a concentrated plume from approximately 3,000 to 2,960 feet bls. The peak of the plume was located at approximately 2,986 feet bls with the GRB. The GRT returned to background gamma radiation levels at approximately 2,952 feet bls, and correlated well with the background gamma radiation log to 2,676 feet in depth. After flushing the well with potable water for approximately 20 minutes, the interval logged (pass8: 2,998 feet to 2,790 feet in depth) showed a very good correlation with background gamma radiation (pass3). No external MI problems were noted at IW-1 during the static external MI testing.

5.1.6 Dynamic Testing

Dynamic testing logs (shown on Exhibit 5-3) consist of seven datasets: pass9 through pass15. The initial dynamic test began by ejecting 1 mCi of tracer at 2,978 feet bls (5 feet above bottom of casing) while monitoring in time-drive mode. A flow rate of approximately 20 to 21 gpm (3.57 to 3.74 feet/minute) was maintained at the wellhead during the logging event. The ^{131}I plume was observed in less than 20 seconds at the GRM detector and in approximately 2 minutes at the GRB detector. No increase was observed at the GRT during the entire monitoring time, with gamma radiation averaging approximately 10 API units.

The log up out of position (dataset pass10) showed no increased radioactivity inside the casing with any of the detectors, indicating that the plume was dispersed into the open borehole below the casing. A very good correlation (pass11) with background (pass3) was present above 2,982 feet bls after flushing the well for approximately 30 minutes. The dynamic test of IW-1 was repeated (pass12 through pass14) under similar conditions as the first test with the same results. The final background gamma radiation log (pass15) from 3,250 feet bls to land surface showed an excellent correlation with the initial background gamma radiation log (pass3).

5.2 Internal Mechanical Integrity Testing

5.2.1 Casing Pressure Test

On January 3, 2002, a casing pressure test was successfully conducted on the final 12-inch diameter well casing of IW-1. The pressure test was conducted after cementing the casing in place and after drilling out the cement plug at the base of the casing. The casing was pressurized with water to 150 psi. The wellhead pressure was monitored for 2 hours with a 200-psi calibrated pressure gauge. A copy of the calibration certificate for the pressure gauge is provided in Appendix N. Pressure readings were manually recorded every 10 minutes during the 2-hour test. Exhibit 5-4 summarizes the casing pressure test data. During the

test, the pressure decreased slightly from 150.0 psi to 149.5 psi. The 0.5 psi decrease was within the 5 percent pressure differential limit (7.5 psi) specified by the FDEP for a 2-hour pressure test. The casing pressure test was observed by Tracy Levi (CH2M HILL) and Jack Myers (FDEP).

EXHIBIT 5-4
Casing Pressure Test Data for IW-1

Elapsed Time (minutes)	Pressure (psi)	Elapsed Time (minutes)	Pressure (psi)
0	150.0	70	149.5
10	149.5	80	149.5
20	149.5	90	149.5
30	149.5	100	149.5
40	149.5	110	149.5
50	149.5	120	149.5
60	149.5		

5.2.2 Video Survey

A color camera video survey was conducted under static conditions at IW-1 on January 9, 2002, by Florida Geophysical, Inc., after injecting more than 50,000 gallons of potable water (three casing volumes) into the well. Overall, the quality of the video survey in terms of visibility was excellent. The final casing setting depth was confirmed at 2,982.5 feet bpl. Several native fractures in the injection zone formation were evident from approximately 3,100 to 3,160 feet bpl and between 3,220 to 3,250 feet bpl. These fractures in the formation are indicative of the highly transmissive Oldsmar formation. The video survey was terminated when the video became too cloudy to see clearly at a depth of 3,317 feet bpl.

The video survey also revealed that a piece of the bridge plug "basket" was stuck at the side wall of the well at approximately 2,988 feet bpl. It is anticipated that this "basket" will become dislodged with the first pumping of water into the well.

In summary, the geophysical logs of the completed well indicate no inconsistencies and that the casing is in good condition. Below the base of the casing, the most productive intervals of the open borehole exist between approximately 3,050 and 3,165 feet bpl and between approximately 3,220 and 3,260 feet bpl. A copy of the video survey report is provided in Appendix J.

5.2.3 Geophysical Logging

Cement bond and high resolution temperature logs were performed on injection well IW-1 by Florida Geophysical, Inc., on January 9, 2002, and January 22, 2002, respectively. Copies of the logs are provided in Appendix I.

The CBL was conducted to assess the quality of the cement-to-casing bond of the final casing of IW-1. The log was performed before cementing the upper 216 feet of the 12-inch diameter final well casing to allow the tool to be calibrated to non-cemented casing (above 216 feet bpl) and cemented casing (below 216 feet bpl). The CBL demonstrated that a good cement bond exists around the final casing from 2,983 feet bpl to 216 feet bpl. Above 216 feet bpl, the CBL confirms that the casing was non-cemented at the time of the logging event. The interval from land surface to 216 feet bpl was cemented after completion of the CBL.

The temperature log (run from land surface to a total depth of 3,350 feet bpl) indicated temperatures between 86.8 degrees Fahrenheit (°F) and 95.5°F from 100 to 2,440 feet bpl. Between 2,440 and 3,033°feet bpl, the temperature increased from 95.2°F to approximately 101.5°F. Results of temperature logging do not indicate leaks in the 12-inch diameter casing.

5.2.4 Internal Radioactive Tracer Survey

On January 23 and 24, 2002, an external and internal RTS was conducted on IW-1. The survey was conducted by YBI, in the presence of Mr. John Powers (CH2M HILL). FDEP was unavailable to witness the testing, but gave its authorization for the testing to take place.

5.2.4.1 Internal RTS Test Methodology

The RTS method is a an EPA- and FDEP-approved technology for demonstrating the internal MI of injection wells. The methodology originates from guidelines and procedures developed by the Louisiana Geological Survey for injection wells with and without tubing and packer, and numerous investigations performed for EPA (e.g., Nielson and Aller, 1984; Dewan, 1983). The approved internal RTS method is outlined in the December 10, 1987, *Federal Register*. One advantage that the internal RTS method offers over conventional pressure testing with a packer is that it can be used to locate a leak in the casing, versus simply determining whether a well has internal MI. In addition, the RTS method eliminates problems typically associated with inadequate seating of the packers. Significant cost and time-savings can also be realized by injection well owners using the RTS instead of the packer testing method for internal MI demonstrations.

Sensitivity testing using the internal RTS method was conducted in the 29-inch inside diameter injection wells at the City of St. Petersburg Northwest Water Reclamation Facility, (CH2M HILL, September 1989). The sensitivity testing determined that the internal RTS testing methodology was capable of detecting leaks as small as 0.1 gpm using a tracer (^{131}I) with a radioactivity of 4 mCi. Exhibit 5-5 outlines the current testing procedures used for the internal RTS work.

The radioactive tracer material was kept moving at a constant velocity during testing. This allowed for a uniform exposure of the injection casing to the radioactive material, thereby reducing the potential for variable staining to occur in the well as a result of starts and stops of the pumping rate during the tracer test. The upper gamma radiation detector was normally not immersed in the plume, and was stopped as the detector reached a count of 100 API units. This procedure was adopted to prevent excess staining of the tool. However, during the last down chase (No. 6), it was decided to move the tool completely through the plume instead of stopping when the upper detector registered 100 API. This was done to define the plume profile.

EXHIBIT 5-5
Internal Mechanical Integrity Radioactive Tracer Survey Procedures Utilized at the City of Immokalee Class I Injection Well

1. Place ejector port of RTS probe at approximately 50 feet below land surface (bls), and release 10 mCi of tracer slug ^{131}I under dynamic conditions at an injection velocity of 6 to 7 fpm. Note time and concentration of tracer release.
2. Monitor slug passing by lower two detectors and raise RTS probe above tracer slug to approximately 30 feet bls.
3. Continue pumping into well until travel time has elapsed to displace the tracer slug approximately 400 to 500 feet. Record volumetric rate and time of pumping.
4. Begin logging downward from approximately 30 feet bls; continue logging until the upper gamma radiation detector (GRT) reaches a value of approximately 100 API units. Compare depth to top of tracer slug with calculated depth based upon displacement volume pumped.
5. Log out of position upward, keeping the GRT detector below the stained interval at 50 feet bls.
6. Repeat above steps completing gamma radiation logs at intervals of approximately 400 to 500 feet until one of the following conditions are met (whichever occurs first):
7. The tracer slug has dispersed over a vertical distance of 500 feet or more, or the bottom of the casing is encountered
8. If the tracer slug is dispersed greater than 500 feet in the wellbore (i.e., top of slug to bottom of slug), perform the following:
9. The remaining tracer material shall be flushed out of the casing and a background gamma radiation survey completed from the base of the casing to a point 50 feet above the previous depth where correlation with background existed.
10. Eject a new tracer slug of 10 mCi. Note time and location of ejection.
11. Repeat Steps 2 through 5 until one of the conditions listed in Step 7 is satisfied.
12. Do the following once the bottom of casing is reached:
13. Lower the logging tool to total depth and run a gamma radiation survey from TD to land surface.
14. Run additional surveys as necessary to evaluate data in accordance with FDEP established Pass/Fail criteria for internal mechanical integrity testing using RTS methodology. Additional surveys may be necessary if a potential leak is identified for verification.

General Requirements

Calibrate geophysical tool within 1 week of testing.

The tracer (^{131}I) must be dated less than one-half-life at the time of actual use during testing.

All mechanical and digital gauges used for flow and pressure measurements must be calibrated within 60 days of actual testing.

5.2.4.2 Internal MI Demonstration Test Program

As discussed in Section 5.1.2, the radioactive isotope Iodine-131 (^{131}I) was used as a tracer for the RTS because it has a short half-life of 8.05 days and is an excellent emitter of gamma radiation. RTS testing was conducted by the Geophysical Logging Division of YBI.

A representative (Mr. John Powers) from CH2M HILL was onsite to observe all RTS testing activities (as described previously in Section 5.1.2). Although FDEP declined to witness the testing, they did authorize that testing take place without their being present. Notes taken by the CH2M HILL resident observer during testing are contained in Appendix B. A 2-inch-diameter flexible hose and a totaling flow meter were installed at the injection well to provide the accurate flow measurements necessary to complete the RTS work. The flow meter was used to measure the relatively low flows (approximately 33 to 165 gpm) utilized during the internal MI demonstration. A copy of the flowmeter calibration certificate is included in

Appendix N. Potable water from the WWTP was used to achieve the desired flow rate in the well. At no time was WWTP effluent used during the test. During flushing of the well between tests, the maximum flow rate was limited to approximately 165 gpm. Typically, the injection well was flushed at this rate for approximately 30 minutes (approximately 5,000 gallons) to remove the tracer between ejection events.

5.2.4.3 Internal MI Test Results

Exhibit 5-6 summarizes the geophysical logs conducted during the internal MI demonstration of the City of Immokalee Class I injection well. Background gamma radiation was logged on January 22, 2002, prior to completion of the external MI demonstration on January 23, 2002. Internal MI testing was completed on January 24, 2002. The internal MI RTS test at IW-1 consists of digital files pass1 through pass25.

Tracer Ejection No. 1

Testing began on January 24, 2002, by ejecting a quantity of sodium iodide solution at 50 feet bls with a radioactivity of 10 mCi ^{131}I. A flow rate of approximately 33 to 36 gpm (5.9 to 6.4 fpm) was maintained during and immediately after ejection. The plume arrived within 20 seconds at the GRM and within 1.5 minutes at the GRB detector after ejection (pass1). Once the plume passed these two detectors, the tool was pulled up approximately 30 feet and monitored in the time-drive mode for approximately 30 minutes. At no point during ejection or time-drive mode was the plume detected by the GRT.

During the initial down chase (pass2), the top of the plume (100 API with the GRT) was tagged at 410 feet bls approximately 78 minutes after ejecting the slug. The plume movement rate of 4.6 feet per minute (fpm) (410-50 feet/78 minutes) was less than the introduced flow rate of 5.9-6.4 fpm. Because of casing friction, the plume movement rate can be less than the flow rate into the well. The tracer material may slightly attenuate along the casing leaving a progressively longer "tail" as the tracer moves down the casing. The following up pass (pass3) or Log Out of Position (LOP) from 425 to 90 feet bls (measured at the GRT) showed a good correlation with background gamma radiation with the GRT detector. The LOP was offset from the background gamma radiation trace by a consistent 10 to 15 API units because of adhesion of the tracer to the casing. As long as the offset is consistent, then no leak is indicated. A leak in the casing would show as a sharp and narrow spike exceeding background gamma radiation levels. Correlation with background was poor by the GRB and GRM detectors because of immersion in the tracer plume. Upon completion of pass3, the injection well was flushed for 30 minutes with potable water at a rate of approximately 165 gpm to flush the tracer plume out of the well casing. Upon completion of flushing, the tool was advanced from 90 to 390 feet bls to measure residual gamma radiation in the well casing. This pass is designated on Table 3 as pass 4, and described as Log After Flush (LAF). The purpose of a LAF is to verify flushing of the tracer which is demonstrated by a good correlation of the GRT with background gamma radiation. As shown on pass4, good correlation is indicated between the GRT trace and background gamma radiation. The offset is consistent, averaging approximately 5 API units, with no spikes present, therefore demonstrating the absence of a leak.

Exhibit 5-6

Geophysical Logs Completed During the City of Immokalee Class I Injection Well External MIT Demonstration, January 22-23, 2002

	Dataset	Interval Logged (1)	Logging Performed (2)	Injection Rate (gpm)	Comments
Background	PASS1	0-3245	T, del-T	STATIC	Fluid temperature
Logs	PASS3	3335-0	GR	STATIC	Background Gamma Radiation
	PASS5	2888-3100	CCL	STATIC	Casing Tie In
Static	PASS6	Time Drive[4]	GR	STATIC	Eject 1 mCi @ 2984' (1' below casing bottom)[3]
Test	PASS7	2988-2686	GR	STATIC	Log out of position (LOP)
	PASS8	2889-2998	GR	STATIC	Log after flush (170 gpm)
	PASS9	Time Drive	GR	20 (3.57 fpm)	Eject 1 mCi @ 2978' (5' above casing bottom)
	PASS10	2992-2969	GR	21 (3.74 fpm)	LOP
Dynamic	PASS11	2770-2991	GR	STATIC	Log after flush (170 gpm)
Tests	PASS12	Time Drive	GR	25 (4.46 fpm)	Eject 1 mCi @ 2978'
	PASS13	2992-2768	GR	25 (4.46 fpm)	LOP
	PASS14	3350-2940	GR	STATIC	Log after flush (170 gpm)
	PASS15	3250-0	GR	STATIC	Final gamma radiation background

Injection Well Specifications

	Inner Casing Diameter (in.)	Casing Depth (ft bls)	Current Well Depth (ft bls)
IW-1	11.75	2983	3,350

Notes:

(1) Depths shown are referenced to land surface

(2) CCL: Casing Collar Locator; GR: Gamma Radiation; T: Temperature; del-T: Differential Temperature

(3) Casing depth was determined with the CCL

(4) Time Drive: stationary tool

Tracer Ejection No. 2

After completion of the first ejection test, the ejector was positioned at 400 feet bls. At 10:09 a.m. a solution of sodium iodide with a radioactivity of 10 mCi ^{131}I was ejected into the casing (pass6). A flow rate of approximately 36 to 39 gpm (6.4 to 7.0 fpm) was maintained during and immediately after ejection. The plume arrived within 20 seconds at the GRM and within 1.5 minutes at the GRB detector after ejection (pass6). Once the plume passed these two detectors, the tool was pulled up approximately 20 feet and monitored in the time-drive mode for approximately 30 minutes. At no point during ejection or time-drive mode was the plume detected by the GRT.

During the second down chase (pass7), the top of the plume (100 API with the GRT) was tagged at 1,010 feet bls approximately 91 minutes after ejecting the tracer. The plume movement rate of 6.7 to fpm (1,010-400 feet/91 minutes) was within the range of the introduced flow rate (6.4 to 7.0 fpm). The following LOP 2 (pass9) from 1,020 to 590 feet bls (measured at the GRT) showed a good correlation with background gamma radiation with the GRT detector. Upon completion of LOP 2, the injection well was flushed for 30 minutes with potable water at a rate of approximately 165 gpm to flush the tracer plume out of the well casing. Upon completion of flushing, the tool was advanced from 590 to 988 feet bls to measure residual gamma radiation in the well casing. This pass is designated on Table 3 as pass10 and described as LAF 2. The purpose of a LAF is to verify flushing of the tracer, which is demonstrated by a good correlation of the GRT with background gamma radiation. As shown on pass10, good to excellent correlation is indicated between the GRT trace and background gamma radiation. The offset is consistent with no spikes present.

Tracer Ejection No. 3

After completion of the second ejection test, the ejector was positioned at 1,000 feet bls. At 1:07 p.m., a solution of sodium iodide with a radioactivity of 10 mCi ^{131}I was ejected into the casing (pass12). A flow rate of approximately 39 to 41 gpm (7.0 to 7.3 fpm) was maintained during and immediately after ejection. The plume arrived in approximately 20 seconds at the GRM and within 1.5 minutes at the GRB detector (pass12). Once the plume passed these two detectors, the tool was pulled up approximately 20 feet and monitored in the time-drive mode for approximately 30 minutes. At no point during ejection or time-drive mode was the plume detected by the GRT.

During the third down chase (pass13), the top of the plume (100 API with the GRT) was tagged at 1,485 feet bls approximately 89 minutes after ejection. The plume movement rate of 5.4 fpm (1,485-1,000 feet/89 minutes) was less than the range of the introduced flow rate (7.0 to 7.3 fpm). The following LOP 3 (pass14) from 1,490 to 1,100 feet bls (measured at the GRT) showed a good correlation with background gamma radiation with the GRT detector from 1,250 to 1,100 feet bls. Upon completion of LOP 3, the injection well was flushed for approximately 30 minutes with potable water at a rate of approximately 165 gpm to flush the tracer plume out of the well casing. Upon completion of flushing, the tool was advanced from 1,090 to 1,438 feet bls (LAF 3) to measure residual gamma radiation in the well casing. As shown on pass15, good to excellent correlation is indicated between the GRT trace and background gamma radiation. The offset is consistent, and there are no spikes in residual gamma radiation present, therefore demonstrating the absence of a leak.

Tracer Ejection Nos. 4, 5, and 6

Three additional tracer ejection events at sequentially deeper depths were completed to successfully demonstrate internal MI. Sodium iodide solution with a radioactivity of 10 mCi was released at 1,450 feet bls (pass16), 2,000 feet bls (pass20), and 2,450 feet bls (pass24). The plume from tracer ejection no. 6 was tagged at 2,980 feet bls, 3 feet above the bottom of the casing at 2,983 feet bls. With that tag, the bottom of casing was reached, and the internal MI demonstration was completed.

5.2.4.4 Summary of Internal MI Test Results

The results of all six ejection events were the same in that no leaks in the casing were detected. Sixty (60) mCi of energy were released into the well casing during testing, which consisted of 10 mCi released per ejection event. This quantity of radiation used during each event exceeded the 4 to 6 mCi typically used in MI testing of the City of St. Petersburg injection wells where internal RTS testing using the RTS method was pioneered in Florida. If a leak had been present, a sharp deflection of the residual, gamma radiation trace from the background radiation trace would have resulted. No such trace was detected during any of the ejection events. Furthermore, water velocity during testing was successfully maintained in the low flow rate desired range of 6 to 7 fpm. Therefore, the radiation had opportunity to find a pinhole leak if one had been present. Accordingly, internal MI of the City of Immokalee's Class I injection well was successfully demonstrated utilizing the RTS method. Baseline testing of internal MI with the RTS method has now been established and according to FDEP practice, the next internal MI demonstration can be performed with the RTS technology in lieu of a casing pressure test. A requirement for completion of a video survey of the well casing during the internal MI demonstration remains unchanged.

5.3 MI Testing

MI testing of IW-1 was performed to evaluate the MI of the wells in accordance with standards set forth in FAC 62-528. Testing of the injection well included a video survey of the casing and wellbore, temperature and cement bond logs, a casing pressure test, and radioactive tracer testing (both internal and external). Results of testing demonstrated that the well meets the requirements for both internal and external mechanical integrity testing as set forth in FAC 62-528.300(6).

SECTION 6

Summary and Conclusions

A deep injection well system was constructed at the IWSD WWTP in Immokalee, Florida. Construction of the injection well system began on September 9, 2001, and was completed on March 13, 2002. IW-1 was constructed with the final 12-inch diameter casing string set to a depth of 2,983 feet bpl and an open hole interval to a total depth of 3,350 feet bpl. The lower zone of existing TZMW-1 was plugged back to monitor the intervals from 2,200 to 2,236 feet bpl. The upper interval (1,060 to 1,160 feet bpl) and lower intervals (1,752 to 1,880 feet bpl) were unchanged. Construction and testing were conducted in accordance with FDEP construction permit 128633-001-UC, the applicable sections of Chapter 62-528, FAC, and the construction contract documents prepared by CH2M HILL.

The testing program was approved by FDEP and TAC prior to the issuance of the construction permit. A comprehensive testing program was conducted during construction of the injection well system to evaluate the site hydrogeology and assist in selection of the casing setting depths. The testing program consisted of collecting formation samples, cores, pilot hole water samples, geophysical logging, air-lift specific capacity tests, packer tests, an injection test, and collection of background water quality samples.

Interpretation of the geophysical logs correlates with the data obtained during packer testing and suggests the base of the USDW is located at approximately 1,960 feet bpl. The testing program identified the top of the injection zone at approximately 3,100 feet bpl. The injection zone is characterized by extremely high transmissivity, highly fractured and cavernous dolomite with intervals of lower transmissivity limestone. Confining units were identified above the injection zone over the interval from 2,200 to 2,900 feet bpl.

Geophysical logging, pressure testing, a video survey, and a radioactive tracer survey were performed to demonstrate mechanical integrity of the final casing at the injection well. The tests confirmed that the final casing of the injection well demonstrated both internal and external mechanical integrity and met the standards established in Chapter 62.528, FAC.

SECTION 7

References

Bennett, M.W., 2001. Hydrogeolgic Investigation of the Floridan Aquifer System, Immokalee Water and Sewer District Wastewater Treatment Plant, Collier County, Florida. South Florida Water Management District, West Palm Beach, FL.

CH2M HILL, 1996. Feasibility Study of a Lower East Coast Aquifer Storage and Recovery System. Phase III: Final Report (C-4103). Prepared for the South Florida Water Management District.

Dewan, J.T., December 1983. Mechanical Integrity Tests – Class II Wells: Review and Recommendations: Final Report, USA.

Environmental Simulations, Inc., 2000. Guide to Using Win Flow. E.S.I., Oak Hill, VA.

Geraghty & Miller, 1981. Construction and Testing of the Test Injection Well, City of Fort Lauderdale, Florida. Final Report, EPA Project C-120474-220, City Project 7089.

Hantush, M.S. and C.E. Jacob, 1955. Nonsteady Radial Flow in an Infinite Leaky Aquifer. Transactions of the American Geophysical Union. Vol. 36. Pp. 95-100.

Louisiana Geological Survey, 1986. Radioactive Tracer Survey – Cement Bond Log Study as related to the Mechanical Integrity Testing of injection wells.

Meyer, F.W., 1989. Hydrogeology, Groundwater Movement, and Subsurface Storage in Southern Florida. U.S. Geological Survey Professional Paper 1403-G. U.S.G.S., Washington, D.C.

Miler, J.A., 1986. Hydrogeologic Framework of the Floridan Aquifer System in Florida and in Parts of Georgia, Alabama, and South Carolina. U.S. Geological Survey Professional Paper 1403-B. U.S.G.S., Washington, D.C.

Nielson and Aller, 1984. Methods for determining the Mechanical Integrity of Class II Injection Wells. NWWA. Prepared for the US Environmental Protection Agency.

Riley, T.E., O.L. Franke, G.D. Bennett, 1987. The Principle of Superposition and Its Application in Ground-Water Hydraulics. U.S.G.S. Techniques of Water Resource Investigations, Book 3, Chapter B6. U.S.G.S, Washington, D.C.

South Florida Water Management District, 1999. Documentation for the Lower East Coast Floridan Aquifer Model. SFWMD, West Palm Beach, FL.

Strack, O.D.L., 1989. Groundwater Mechanics. Prentice Hall, Englewood Cliffs, NJ.

Theis, C.V., 1935. The Relation Between the Lowering of the Piezometric Surface and the Rate and Duration of Discharge of a Well Using Groundwater Storage. Trans. American Geophysical Union, v. 16, pp. 519-524.

APPENDIX A

Construction Permit

Department of Environmental Protection

Jeb Bush
Governor

South District
P.O. Box 2549
Fort Myers, Florida 33902-2549

David B. Struhs
Secretary

CERTIFIED MAIL NO.: 7000 1670 0005 5300 1829
RETURN RECEIPT REQUESTED

In the Matter of an
Application for Permit by:

Ms. Eva J. Deyo, Executive Director
Immokalee Water and Sewer District
1020 Sanitation Road
Immokalee, Florida 34142

Collier County – UIC/DW
FDEP File No. 50725-006-UC
Immokalee Wastewater Treatment Plant IW-1
Class I Injection Well

NOTICE OF PERMIT ISSUANCE

Enclosed is Permit Number 50725-006-UC to construct one Class I Injection Well (IW-1) system, issued pursuant to Section(s) 403.087, Florida Statutes.

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, 3900 Commonwealth Boulevard, Mail Station 35, 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.

Executed in Fort Myers, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

Richard W. Cantrell

Richard W. Cantrell
Director of
District Management

Ms. Eva J. Doyo, Executive Director
Immokalee Water and Sewer District
June 12, 2001

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this PERMIT and all copies were mailed by certified mail before the close of business on June 12, 2001 to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to S.120.52(11), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Janice L. Ingram 6-12-01
Clerk Date

RWC/JBM/cap

Enclosures

Copies furnished to:

David Schuman, P.E. – CH2M Hill
TAC

Department of Environmental Protection

Jeb Bush
Governor

South District
P.O. Box 2549
Fort Myers, Florida 33902-2549

David B. Struhs
Secretary

PERMIT

PERMITTEE:

Ms. Eva J. Deyo, Executive Director
Immokalee Water and Sewer District
1020 Sanitation Road
Immokalee, Florida 34142

Permit/Certification
Number: S0725-006-UC
Date of Issue: June 12, 2001
Expiration Date: June 11, 2001
County: Collier
Latitude: 26° 24' 55" N
Longitude: 81° 25' 45" W
Section/Town/Range: 4/T47S/R29E
Project: Immokalee Wastewater Treatment Plant
IW-1 Class I Injection Well

This permit is issued under the provisions of Chapter 403, Florida Statutes (F.S.), and Florida Administrative Code (F.A.C.) Rules 62-4, 62-520, 62-528, 62-550, 62-600, and 62-601. The above named permittee is hereby authorized to perform the work or operate 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:

Construct a nominal 12 inch diameter Class I injection well (IW-1), with cemented 12" steel casing to approximately 2,850 feet below land surface (bls) and a total depth of approximately 3,300, feet bls. Injection is into the Oldsmar Formation within the Lower Floridan Aquifer for the backup method of disposal of secondary treated domestic effluent from the Immokalee WWTP, for a maximum disposal of 2.5 million gallons per day (MGD). The maximum injection rate shall not exceed 1,736 gpm. The IW-1 existing tri-zone monitoring well (TZMW-1) will be completed from approximately 1,060 to 1,160 feet bls, 1,752 to 1,880 feet bls and 2,200 to 2,230 feet bls.

The Application to Construct/Operate/Abandon Class I, III, or V Injection well System, DEP Form 62-528.900(1), was received on April 5, 2000, with supporting documents and additional information last received on January 9, 2001. The Certificate of Demonstration of Financial Responsibility was approved January 9, 2001. Project is located at the Immokalee Wastewater Treatment Plant at 140 White Way Immokalee, Florida.

Subject to Specific Conditions 1-15.

PERMITTEE:

Immokalee Water & Sewer District

Permit/Cert. No.: S0725-006-UC
Date of Issue: June 12, 2001
Expiration Date: June 11, 2006

SPECIFIC CONDITIONS:

1. GENERAL CRITERIA

a. 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.

b. 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.

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

d. 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.

e. This permit may be modified, revoked and reissued, or terminated for cause. 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.

f. When requested by the Department, the permittee shall furnish, within the time specified, any information needed to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit.

g. Signatories and Certification Requirements

1. 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.

2. 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 upon 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."

h. The permittee shall notify the Department and obtain approval or to any physical alterations or additions to the injection or monitor well, including removal of the well head.

i. 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.

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

1. Any monitoring or other information which indicates that any contaminant may cause an

PERMITTEE:

Immokalee Water & Sewer District

Permit/Cert. No.: 50725-006-UC
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Expiration Date: June 11, 2006

SPECIFIC CONDITIONS:

endangerment to an underground source of drinking water; or

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

Any 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 5 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.

k. No underground injection is allowed that causes or allows movement of fluid into an underground source of
drinking water.

l. The permittee shall retain all records concerning the nature and composition of injected fluid until five years after completion of any plugging and abandonment 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.

m. If injection is to continue beyond the expiration date of this permit the permittee shall apply for, and obtain an operation permit. If necessary to complete the two-year operational testing period, the permittee shall apply for renewal of the construction permit at least 60 days prior to the expiration date of this permit.

2. Site Requirements

a. A drilling pad shall be provided to collect spillage of contaminants and to support the heaviest load that will be encountered during drilling.

b. The disposal of drilling fluids, cuttings, formation water or waste shall be in a sound environmental manner that avoids violation of surface and ground water quality standards. The disposal method shall be approved by the Department prior to start of construction.

c. Specific drilling pad dimensions and design details shall be provided to and approved by the Department prior to commencing construction (and shortly after selection of drilling contractor).

d. The four water table monitoring wells surrounding the injection well pad shall be sampled and analyzed prior to drilling this injection well and then weekly thereafter. Sampling shall include specific conductance, pH, chloride, temperature and water level.

e. Pursuant to Rule 62-528.455(1)(c)6., F.A.C., a survey indicating the exact location in metes and bounds of all wells authorized by this permit shall be provided prior to issuance of an operating permit.

3. Construction and Testing Requirements

a. The permittee shall contact the Technical Advisory Committee (TAC) chairman so that he may schedule progress review meetings at appropriate times with the TAC, the U.S. Environmental Protection Agency (USEPA), and permittee for the purpose of reviewing the results of tests, geophysical logging, surveys, drilling records and construction problems.

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SPECIFIC CONDITIONS:

b. All drilling shall be inside a blow out preventer upon penetration of the Floridan Aquifer.

c. Mechanical integrity testing is a two part demonstration which includes a pressure test to demonstrate that no leaks are present in the casing, tubing or packer and a temperature or noise log and radioactive tracer survey to demonstrate the absence of leaks behind the casing. Verification of pressure gauge calibration must be provided at the scheduled tests.

d. Department approval and Technical Advisory Committee (TAC) and USEPA review pursuant to F.A.C. Rule 62-528 is required for the following stages of construction:

(1) Intermediate casing seat selection.
(2) Final casing seat selection.
(3) Prior to operational (long term) testing with effluent.

The permittee shall submit all necessary supporting documentation/data, with interpretation, to the TAC and USEPA for review.

e. The cementing program, as required in Section 62-528.410(5), Florida Administrative Code, shall be submitted to the Department, the USEPA, and the Technical Advisory Committee for review. Cementing shall not commence prior to approval being granted.

f. All temperature surveys (except for mechanical integrity demonstration) shall be run within 48 hours after cementing.

g. TAC meetings are scheduled on the first Tuesday of each month subject to a 5 working day prior notice and timely receipt of critical data by all TAC members and the USEPA. Emergency meetings may be arranged when justified to avoid undue construction delay.

h. The Permittee shall insure that safe internal pressures are maintained during the cementing of all casings.

i. The background water quality of the injection zone shall be established prior to commencement of any injection testing. Parameters to be measured are the primary and secondary drinking water standards and minimum criteria. The water level measurements from the tri-zone monitoring well will be required during all injection test.

Minimum Criteria for Sewage Effluent

Toluene
1,2 Dichlorobenzene
Chlorofor,
1.2 Dichloroethylene
Chloroethane
Aldrin
Dieldrin
Diethylphthalate
Dimethylphthalate
Butybenzylphthalate
Napthalene
Anathracene
Phenanthrene
Phenol
2,4,6-Trichlorophenol
2-Chlorophenol

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Immokalee Water & Sewer District

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SPECIFIC CONDITIONS:

Ammonia
Organic Nitrogen
Total Kjeldahl Nitrogen
Nitrite (as N)
Total Nitrogen
Soluble Orthophosphate
Total Phosphorus
Antimony

j. The injection and monitor well(s) at the site shall be abandoned when no longer usable for their intended purpose, or when posing potential threat to the quality of the waters of the State. Within 180 days of well abandonment, the permittee shall submit to the Department, the USEPA, and the TAC the proposed plugging method, pursuant to Rule 62-528.435, F.A.C.

k. All salt used in well drilling shall be stored in an environmentally sound manner. Accurate records shall be kept on the amount of salt used.

l. All dual induction, sonic and caliper geophysical logs run on the pilot holes of the injection well shall be submitted with scales of one inch equals one hundred feet (1"=100'), two inches equals one hundred feet (2"=100'), and five inches equals one hundred feet (5"=100').

4. Quality Assurance/Quality Control Requirements

a. This permit approval is based upon evaluation of the data contained in the application dated April 5, 2000, and the plans and/or specifications submitted in support of the application. Any proposed modifications to this permit shall be submitted in writing to the Underground Injection Control program manager, the TAC, and USEPA for review and clearance prior to implementation. Changes of negligible impact to the environment and staff time will be reviewed by the program manager, cleared when appropriate and incorporated into this permit. Changes or modifications other than those described above will require submission of a completed application and appropriate processing fee as per Rule 62-4.050, F.A.C.

b. A professional engineer registered pursuant to Chapter 471, Florida Statutes shall be retained throughout the construction period to be responsible for the construction operation and to certify the application, specifications,
completion report and other related documents. The Department shall be notified immediately of any change of engineer.

c. Where required by Chapter 471 (P.E.) or Chapter 492 (P.G.) F.S., applicable portions of permit applications and supporting documents which are submitted to the Department for public record shall be signed and sealed by the professional(s) who approved or prepared them.

d. The Department shall be notified immediately of any problems that may seriously hinder compliance with this permit, construction progress, or good construction practice. The Department may require a detailed written report describing the problem, remedial measures taken to assure compliance and measures taken to prevent recurrence of the problem.

e. Issuance of a Class I Test/Injection well construction and testing permit does not obligate the Department to authorize operation of the injection well system, unless the wells qualify for an operation permit applied for by the permittee and issued by the Department.

5. Reporting Requirements

PERMITTEE:

Immokalee Water & Sewer District

Permit/Cert. No.: 50725-006-UC
Date of Issue: June 12, 2001
Expiration Date: June 11, 2006

SPECIFIC CONDITIONS:

a. All reports and surveys required by this permit must be submitted concurrently to all the members of the TAC and the USEPA. The TAC and USEPA consists of representatives from these agencies:

Florida Department of Environmental Protection
South District
P.O. Box 2549
Fort Myers, FL 33902-2549

Florida Department of Environmental Protection
Bureau of Water Facilities Regulation
UIC Program, MS 3530
2600 Blair Stone Rd.
Tallahassee, FL 32399-2400

South Florida Water Management District
Post Office Box 24680
West Palm Beach, FL 33416-4680

United States Environmental Protection Agency, Region IV
UIC Section
61 Forsythe Street, SW
Atlanta, Georgia 30303-8909

United States Geological Survey
9100 NW 36th Street, Suite 107
Miami, FL 33178

b. Members of the TAC and the USEPA shall receive a weekly summary of the daily log kept by the contractor. The weekly reporting period shall run Friday through Thursday and reports shall be mailed each Friday. The report shall include but is not limited to the following:

(1) Description of daily footage drilled by diameter of bit or size of hole opener or reamer being used;
(2) Description of formation and depth encountered; and specific conductance of water samples collected during drilling. Description of work during installation and cementing of casings; include amounts of casing and actual cement used versus calculated volume required.
(3) Lithological description of drill cuttings collected every ten (10) feet or at every change in formation. Description of work and type of testing accomplished, geophysical logging, pumping tests, and coring results.
(4) Description of any construction problems that develop and their status to include a description of what is being done or has been done to correct the problem.
(5) Description of the amount of salt used.
(6) Results of any water quality analyses performed as required by this permit, including pad monitor wells
(7) Copies of the driller's log are to be submitted with the weekly summary.

c. The Department must be notified seventy-two (72) hours prior to all testing for mechanical integrity on the injection well. Testing should begin during daylight hours Monday through Friday.

d. Annotated copies of geophysical logs, lithologic descriptions and logs and water quality data (from drilling and packer tests) must be submitted to TAC and the USEPA, with interpretation, for intermediate and final casing seat selection approvals by the Department.

PERMITTEE:

Immokalee Water & Sewer District

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SPECIFIC CONDITIONS:

e. An interpretation of all test results must be submitted with all test data and geophysical logs.

f. After completion of construction and testing, a final report shall be submitted to the Department, the TAC, and the USEPA. The report shall include, but not be limited to, all information and data collected under Rule 62-528.450(2) and Rule 62-528.450(3), F.A.C., with appropriate interpretations. Mill certificates for the casing(s) shall be included in this report. To the extent possible, the transmissivity of the injection zone and maximum injection rate within safe pressure limits shall be estimated.

6. The construction permit includes a period of temporary injection operation for the purposes of long term testing. Prior to commencement of operational testing:
   a. Construction of the injection well shall be complete and the permittee shall submit a notice of completion of construction to the Department.
   b. Each well shall first be tested for integrity of construction, and shall be followed by a short-term injection test of such duration to allow for the prediction of the operating pressure.
   c. The permittee shall submit the following information to each member of the Technical Advisory Committee:
      1) A copy of the borehole television survey(s),
      2) Geophysical logs,
      3) Mechanical integrity test data,
      4) Data obtained during the short term injection testing conducted pursuant to Rules 62-528.405(3)(a) and 62-528.410(7)(c), and 62-528.450(3)(a)2., F.A.C., above,
      5) Confining zone data,
      6) Background water quality data for the injection and monitor zones,
      7) Wastestream analysis,
      8) As-built well construction specifications,
      9) Draft operation and maintenance manual with emergency procedures, and
      10) Other data obtained during well construction needed by the Department to evaluate whether the well will operate in compliance with Department rules.
   d. The emergency discharge method shall be fully operational and no emergency discharge shall occur until the permittee has obtained all necessary permits.
   e. Any corrective action required under Rule 62-528.300(5)(c)2., F.A.C., has been completed.
   f. Written authorization shall be obtained from the Department. Authorization shall be for up to two years or the expiration date of the construction permit, whichever is less, and is nonrenewable. The authorization shall specify the conditions under which operational testing is approved. The authorization shall include:
      1) Injection pressure limitation,
      2) Injection flow rate limitation,
      3) Monthly specific injectivity testing,
      4) Reporting requirements, and
      5) An expiration date for the operational testing period not to exceed two years.
   g. Before authorizing operational testing the Department shall conduct an inspection of the facility to determine if the conditions of the permit have been met.

7. Operational Testing Requirements

(a). Operational Testing Conditions - Injection Well System

The injection system shall be monitored in accordance with rule 62-528.425(1)(g) and 62-528.430(2), F.A.C.
The following injection well performance data shall be recorded and reported at the frequency indicated from
the injection well instrumentation in the Monthly Operating Report as indicated below. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

PERMITTEE:

Immokalee Water & Sewer District

Permit/Cert. No.: 50725-006-UC
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Expiration Date: June 11, 2006

SPECIFIC CONDITIONS:

The permittee shall use continuous indicating and recording devices to monitor injection flow rate and injection pressure. In the case of operational failure of any of these instruments for a period of more than 48 hours, the permittee shall report to the Department in writing the remedial action to be taken and the date when the failure will be corrected.

INJECTION WELL IW-1

The proposed specifications for the injection well are as follows:

Casing Diameter (OD)	Depth (bls) Cased	Open Hole (bls)
36" Steel	275'	
30" Steel	925'	
22" Steel	2,000'	
12" Steel	2,850'	2,850'-3,300'

Parameters	Reporting Frequency
Injection Pressure (p.s.i)	Daily/Monthly
Maximum Injection Pressure	Daily/Monthly
Minimum Injection Pressure	Daily/Monthly
Average Injection Pressure	Daily/Monthly
Flow Rate (g.p.m.)	Daily/Monthly
Maximum Flow Rate	Daily/Monthly
Average Flow Rate	Daily/Monthly
Minimum Flow Rate	Daily/Monthly
Total Volume WWTP Effluent Injected (gallons)	Daily
Total Volume WWTP Effluent Injected (gallons)	Monthly
WWTP Effluent Water Quality	
TKN (mg/L)	Monthly
Ammonia as N (mg/L)	Monthly
Nitrate and Nitrite as N (mg/l)	Monthly

(b). Operational Testing Conditions - Monitor Well System

The monitor well system will consist of one tri-zone monitor well as described below:

Well Number	Casing Dia. (OD)	Depth (bls) Cased/Total
TZMW-1	12" Steel	1,060' / 1,160'
	8" Steel	1,752' / 1,880'
	2" FRP	2,200' / 2,230'

All monitor wells shall be monitored in accordance with rule 62-528.615, F.A.C. The following monitor well performance data shall be recorded and reported at the frequency indicated from the monitor well instrumentation in the Monthly Operating Report as indicated below. Samples and measurements taken for

PERMITTEE:

Immokalee Water & Sewer District

Permit/Cert. No.: 50725-006-UC
Date of Issue: June 12, 2001
Expiration Date: June 11, 2006

SPECIFIC CONDITIONS:

the purpose of monitoring shall be representative of the monitored activity. The permittee shall use continuous indicating and recording devices to monitor the monitor zone pressures or water levels. In the case of operational failure of any of these instruments for a period of more than 48 hours, the permittee shall report to the Department in writing the remedial action to be taken and the date when the failure will be corrected.

Parameters	Reporting Frequency
Maximum Water Level/Pressure	Daily/Monthly
Minimum Water Level/Pressure	Daily/Monthly
Average Water Level/Pressure	Daily/Monthly
Water Quality (Middle and Lower Monitoring Zones)	
TKN (mg/L)	Weekly
Ammonia as N (mg/L)	Weekly
Specific Conductivity (μmhos/cm)	Weekly
Total Dissolved Solids (mg/L)	Weekly
pH (std. units)	Weekly
Chloride (mg/L)	Weekly
Sulfate (mg/L)	Weekly
Field Temperature (°C)	Weekly
Nitrate as N (mg/l)	Monthly
Total Phosphorous (mg/l)	Monthly
Sodium (mg/L)	Monthly
Calcium (mg/L)	Monthly
Potassium (mg/L)	Monthly
Magnesium (mg/L)	Monthly
Iron (mg/L)	Monthly
Carbonate (mg/L)	Monthly
Bicarbonate (mg/L)	Monthly
Water Quality (Upper Monitoring Zone)	
Specific Conductivity (μmhos/cm)	Monthly
Total Dissolved Solids (mg/L)	Monthly
pH (std. units)	Monthly
Chloride (mg/L)	Monthly
Field Temperature (°C)	Monthly

Water quality data may be reduced to monthly analyses after a minimum six months of data if the conditions of Rule 62-528.450(3)(d), F.A.C., have been met and with Department approval.

(c). The permittee shall calibrate all pressure gauge(s), flow meter(s), chart recorder(s), and other related equipment associated with the injection well system on a semi-annual basis. The permittee shall maintain all monitoring equipment and shall ensure that the monitoring equipment is calibrated and in proper operating condition at all times. Laboratory equipment, methods, and quality control will follow EPA guidelines as expressed in Standard Methods for the Examination of Water and Wastewater. The pressure gauge(s), flow meter(s), and chart recorder(s) shall be calibrated using standard engineering methods.

(d). The permittee shall submit monthly to the Department the results of all injection well and monitor well data required by this permit no later than the last day of the month immediately following the

PERMITTEE:

Immokalee Water & Sewer District

Permit/Cert. No.: 50725-006-UC
Date of Issue: June 12, 2001
Expiration Date: June 11, 2006

SPECIFIC CONDITIONS:

month of record. The results shall be sent to the Department of Environmental Protection, P.O. Box 2549, Fort Myers, Florida 33902-2549. A copy of this report shall also be sent to the Department of Environmental Protection, Underground Injection Control Program, MS 3530, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

(e). The Engineer of Record or designated qualified representative must be present for the start-up operations and the Department must be notified in writing of the date operational testing commenced for the well.

8. Abnormal Events

a. In the event the permittee is temporarily unable to comply with any conditions of this permit due to breakdown of equipment, power outages, destruction by hazard of fire, wind, or by other cause, the permittee shall notify the Department. Notification shall be made in person, by telephone or by telegraph within 24 hours of breakdown or malfunction to the UIC Program staff, South District office.

b. A written report of any noncompliance referenced in 1) above shall be submitted to the South District office within five days after its occurrence. The report shall describe the nature and cause of the breakdown or malfunction, the steps being taken or planned to be taken to correct the problem and prevent its reoccurrence, emergency procedures in use pending correction of the problem, and the time when the facility will again be operating in accordance with permit conditions.

9. Emergency Disposal

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

b. Any changes in emergency disposal methods must be submitted for Technical Advisory Committee (TAC) and USEPA review and Department approval.

c. The permittee shall notify the Department within 24 hours whenever an emergency discharge has occurred (Rule 62-528.415(4)(c)1., F.A.C.). Written notification shall be provided to the Department within 5 days after each occurrence. The Permittee shall indicate the location and duration of the discharge and the volume of fluid discharged.

10. Financial Responsibility

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

b. The permittee shall review annually the plugging and abandonment cost estimates. The permittee shall resubmit documentation necessary to demonstrate financial responsibility using the revised cost estimates on or before March 31 of each year.

c. In the event that 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, 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.

PERMITTEE:

Immokalee Water & Sewer District

Permit/Cert. No.: 50725-006-UC
Date of Issue: June 12, 2001
Expiration Date: June 11, 2006

SPECIFIC CONDITIONS:

11. Mechanical Integrity

a. Injection is prohibited until the permittee affirmatively demonstrates that the well has mechanical integrity. Prior to operational testing the permittee shall establish, and thereafter maintain, mechanical integrity of the well at all times.

b. If the Department determines that the injection well lacks mechanical integrity, written notice shall be given to the permittee.

c. Unless the Department requires the immediate cessation of injection, within 48 hours of receiving written notice from the department that the well lacks mechanical integrity the permittee shall cease injection into the well unless the Department allows continued injection pursuant to (d) below.

d. The Department may allow the permittee to continue operation of a well that lacks mechanical integrity if the permittee demonstrates that fluid movement into or between underground sources of drinking water is not occurring.

12. The permittee is reminded of the necessity to comply with the pertinent regulations of any other regulatory agency, as well as any county, municipal, and federal regulations applicable to the project. These regulations may include, but not limited to, those of the Federal Emergency Management Agency in implementing flood control measures. This permit should not be construed to imply compliance with the rules and regulations of other regulatory agencies.

13. Department review and approval must be obtained before the lower zone of the tri-zone monitor well is partially plugged back with cement as outlined in the September 25, 2000 design changes to the proposed deep tri-zone monitoring well system.

14. The permittee is to conduct groundwater modeling as outlined in the October 24, 2000 corrective action plan to evaluate the probability that injected effluent will not impact the Underground Source of Drinking Water (USDW) via the Humble well. Site specific hydrogeologic parameters obtained or determined from the construction and testing of the IW-1 injection well shall be used in the development of the model. If the model is not accepted by the Department, as demonstrating the effluent will not impact the underground source of drinking water, further corrective action will be required prior to operational testing.

15. The permittee shall be aware of and operate under the general conditions in Rule 62-528.307(1)(a) through (x) and Rule 62-528.307(2)(a) through (f), F.A.C. These general conditions are binding upon the permittee and enforceable pursuant to Chapter 403 of the Florida Statutes.

Note: In the event of an emergency the permittee shall contact the Department by calling (850) 413-9911. During normal business hours, the permittee shall call (941) 332-6975.

Issued this 12th day of June, 2001.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

Richard W. Cantrell

Richard W. Cantrell
Director of
District Management

RWC/JBM/cap

APPENDIX B

Weekly and Daily Summary Reports

Weekly Summary Reports

MEMORANDUM

CH2MHILL

TO: Eva Deyo/IWSD
Jack Myers/FDEP
Joe Haberfeld/FDEP
Nancy Marsh/USEPA
Tracy Levi/CH2M HILL
Dave Xavier/LBFH
Steve Anderson/SFWMD
Ron Reese/USGS
Sean Skehan/CH2M HILL

FROM: Mark Schilling/CH2M HILL

DATE: September 14, 2001

SUBJECT: Weekly Summary No. 1
September 10 thru September 13, 2001

PROJECT: ***Immokalee Water & Sewer District Deep Injection System***
FDEP UIC Permit Number 50725-006-UC

Summary of Engineer's/Driller's Log

The start-up of the drilling of the pilot hole for the Deep Injection Well (IW-1) began on Tuesday, September 11 and was completed to a depth of 310 feet below pad level (bpl) on the same date. Geophysical logging was conducted and the reaming of the pilot hole was begun, also on September 11. The reaming was completed on September 12, and the installation of the 36-inch steel casing was started. The installation, to a depth of 275 feet bpl, was completed on September 13 with both stages of the grouting of the casing to pad level also completed on the same date.

During the next reporting period, it is anticipated that the pilot hole drilling will resume and be completed to the next staging depth of 1,050 feet bpl. The installation of the 30-inch steel casing should also be completed.

Attachments:
Engineer's Daily Reports
Driller's Daily Reports
Geophysical Logs

a

MEMORANDUM

CH2MHILL

TO: Eva Deyo/IWSD
Jack Myers/FDEP
Joe Haberfeld/FDEP
Nancy Marsh/USEPA
Dave Xavier/LBFH
Steve Anderson/SFWMD
Ron Reese/USGS
Tracy Levi/CH2M HILL

FROM: Mark Schilling & Sean Skehan/CH2M HILL STS

DATE: September 14, 2001

SUBJECT: Weekly Summary No. 2
September 14 thru September 20, 2001

PROJECT: ***Immokalee Water & Sewer District Deep Injection System***
FDEP UIC Permit Number 50725-006-UC

Summary of Engineer's/Driller's Log

The resumption of the pilot hole drilling, from the base of the 36-inch casing at 275 feet below pad level (bpl), was resumed on Monday, September 17th and completed to a depth of 1,010 feet bpl during the night shift of the same date. On Tuesday, September 18th, the geophysical logging of the pilot hole was conducted followed by the start of the reaming to a nominal 35-inches diameter. The reaming had reached a depth of 810 feet bpl at the completion of the day shift on Thursday, September 20th.

During the next reporting period, it is anticipated that the reaming and the installation and grouting of the 30-inch steel casing will be completed. It is also anticipated that resumption of pilot hole drilling from the base of the 30-inch casing will resume. Packer testing of the pilot hole should also occur.

Attachments:
Engineer's Daily Reports
Driller's Daily Reports
Geophysical Logs

a

MEMORANDUM

CH2MHILL

TO: Eva Deyo/IWSD
Steve Anderson/SFWMD
Ron Reese/USGS
Dave Xavier/LBFH
Jack Myers/FDEP
Joe Haberfeld/FDEP
Nancy Marsh/USEPA
Tracy Levi/CH2M HILL

FROM: Mark Schilling & Sean Skehan/CH2M HILL STS

DATE: October 1, 2001

SUBJECT: Weekly Summary No. 3
September 21 through September 27, 2001

PROJECT: ***Immokalee Water & Sewer District Deep Injection System***
FDEP UIC Permit Number 50725-006-UC

Summary of Engineer's/Driller's Log

The reaming of the pilot hole was completed to a depth of 935 feet bpl (below pad level) on Friday, September 21st. On Saturday, September 22nd, the 30-inch casing was installed to a depth of 930 feet bpl and was pressure grouted to land surface on the same day. A temperature geophysical log, for the cement stage, was conducted on Sunday, September 23rd. The drilling of the pilot hole, using a 9-7/8 inch drill bit, resumed on Tuesday, September 25th, from the base of the 30-inch casing. The drilling reached a depth of 1,107 feet bpl on the same day before it was suspended for the remainder of the week for equipment repairs.

During the next reporting period, it is anticipated that the equipment repairs will be completed and pilot hole drilling will resume and reach the next staging depth of 2,050 feet bpl. Geophysical logging of the borehole is also anticipated to be completed.

Attachments:
Engineer's Daily Reports
Driller's Daily Reports
Geophysical Logs

a

MEMORANDUM

CH2MHILL

TO: Eva Deyo/IWSD
Jack Myers/FDEP
Joe Haberfeld/FDEP
Nancy Marsh/USEPA
Jimmy Brantley/YBI
Dave Xavier/LBFH
Steve Anderson/SFWMD
Ron Reese/USGS
Tracy Levi/CH2M HILL

FROM: Mark Schilling & Sean Skehan/CH2M HILL STS

DATE: October 8, 2001

SUBJECT: Weekly Summary No. 4
September 28 thru October 4, 2001

PROJECT: ***Immokalee Water & Sewer District Deep Injection System***
FDEP UIC Permit Number 50725-006-UC

Summary of Engineer's/Driller's Log

Pilot hole drilling was suspended due to rig repairs until the night shift of Sunday, September 30th. Drilling resumed from 1,107 feet below pad level (bpl), and was completed to a depth of 2,010 feet bpl during the night shift on Tuesday, October 2nd. The remainder of the reporting period was spent waiting on availability of an out-of-state geophysical logging company to mobilize to the site to conduct specialty geophysical logs.

During the next reporting period, it is anticipated that geophysical logging will be completed and packer testing of the pilot hole will be underway.

Attachments: Engineer's Daily Reports
Driller's Daily Reports

a

MEMORANDUM

CH2MHILL

TO: Eva Deyo/IWSD
Jack Myers/FDEP
Joe Haberfeld/FDEP
Nancy Marsh/USEPA
Jimmy Brantley/YBI
Dave Xavier/LBFH
Steve Anderson/SFWMD
Ron Reese/USGS
Tracy Levi/CH2M HILL

FROM: Mark Schilling & Sean Skehan/CH2M HILL

DATE: October 8, 2001

SUBJECT: Weekly Summary No. 5
October 5 thru October 11, 2001

PROJECT: ***Immokalee Water & Sewer District Deep Injection System***
FDEP UIC Permit Number 50725-006-UC

Summary of Engineer's/Driller's Log

On Sunday, October 7th, the Contractor conditioned the borehole in preparation of conducting geophysical logging. The logging was conducted on Monday, October 8th, and on Tuesday, October 9th, reaming of the pilot hole began, using a 12.25-inch bit and reverse-air drilling techniques. Reaming was completed to a depth of 2,000 feet below pad level (bpl) on Wednesday, October 10th. A caliper geophysical log was conducted on Thursday, October 11th, followed immediately by the installation of the packer assembly to a depth of 1,950 feet bpl.

During the next reporting period, it is anticipated that the packer testing will be completed and the reaming of the pilot hole to a nominal 30-inches in diameter will begin.

Attachments:
Engineer's Daily Reports
Driller's Daily Reports
Geophysical Logs

a

MEMORANDUM

CH2MHILL

TO: Eva Deyo/IWSD
Jack Myers/FDEP
Joe Haberfeld/FDEP
Nancy Marsh/USEPA
Jimmy Brantley/YBI
Dave Xavier/LBFH
Steve Anderson/SFWMD
Ron Reese/USGS
Tracy Levi/CH2M HILL

FROM: Mark Schilling & Sean Skehan/CH2M HILL SS

DATE: October 8, 2001

SUBJECT: Weekly Summary No. 6
October 12 thru October 18, 2001

PROJECT: ***Immokalee Water & Sewer District Deep Injection System***
FDEP UIC Permit Number 50725-006-UC

Summary of Engineer's/Driller's Log

A packer test of the interval from 1,950 to 2,000 feet below pad level (bpl) was started and completed on Friday, October 12th. A second packer test on the interval of 1,970 to 2,000 feet was also started on Friday and completed on Saturday, Oct 13th. On Monday, October 15th, the pilot hole was backplugged with 12% bentonite cement from a depth of 2,000 feet bpl to 960 feet bpl. Reaming to a nominal 30-inches in diameter was started on Tuesday, October 14th and had reached a depth of 1,901 feet bpl by the end of the reporting period.

During the next reporting period, it is anticipated that the reaming of the pilot to a nominal 30-inches in diameter will be completed and the 22-inch casing installed and grouted to pad level.

Attachments: Engineer's Daily Reports
Driller's Daily Reports

a

MEMORANDUM

CH2MHILL

TO: Eva Deyo/IWSD
Jack Myers/FDEP
Joe Haberfeld/FDEP
Nancy Marsh/USEPA
Jimmy Brantley/YBI
Dave Xavier/LBFH
Steve Anderson/SFWMD
Ron Reese/USGS
Tracy Levi/CH2M HILL

FROM: Mark Schilling & Sean Skehan/CH2M HILL STS

DATE: October 26, 2001

SUBJECT: Weekly Summary No. 7
October 19 thru October 25, 2001

PROJECT: ***Immokalee Water & Sewer District Deep Injection System***
FDEP UIC Permit Number 50725-006-UC

Summary of Engineer's/Driller's Log

The reaming of the pilot hole, to a nominal 30-inches in diameter, was completed on Friday, October 19th. There was no activity on Saturday, October 20th and the reamed pilot hole was re-conditioned on Sunday, October 21st. The installation of the 22-inch steel casing was started on Monday, October 22nd and completed to a depth of 2,000 feet below pad level (bpl), on Tuesday, October 23rd. A total of 4 stages of cementing the casing were conducted – 2 on Tuesday and 2 on Wednesday, October 24th. No construction work was conducted during the remainder of the reporting period to allow the cement to cure.

During the next reporting period, it is anticipated that the resumption of the pilot hole drilling, from the base of the 22-inch casing, will resume. Coring is also anticipated to be conducted during the pilot hole drilling.

Attachments:
Engineer's Daily Reports
Driller's Daily Reports
Geophysical Logs

a

MEMORANDUM

CH2MHILL

TO: Eva Deyo/IWSD
Jack Myers/FDEP
Joe Haberfeld/FDEP
Nancy Marsh/USEPA
Jimmy Brantley/YBI
Dave Xavier/LBFH
Steve Anderson/SFWMD
Ron Reese/USGS
Tracy Levi/CH2M HILL

FROM: Mark Schilling & Sean Skehan/CH2M HILL STS

DATE: November 5, 2001

SUBJECT: Weekly Summary No. 8
October 26 thru November 1, 2001

PROJECT: ***Immokalee Water & Sewer District Deep Injection System***
FDEP UIC Permit Number 50725-006-UC

Summary of Engineer's/Driller's Log

The drilling of the pilot hole resumed, from the base of the 22-inch casing at 2,000 feet below pad level (bpl), on Friday, October 26th. While drilling the pilot hole, cores were collected at depths of 2,054 feet, 2,230 feet, 2,306 feet, and 2,402 feet bpl on October 26th, 30th, 31st and November 1st, respectively. Pilot hole drilling had reached a depth of 2,566 feet bpl at the end of the reporting period.

During the next reporting period, it is anticipated that the fifth and final core sample will be collected and that the pilot hole drilling will be completed to a total depth of 3,300 feet bpl.

Attachments: Engineer's Daily Reports
Driller's Daily Reports

MEMORANDUM

CH2MHILL

TO: Eva Deyo/IWSD
Jack Myers/FDEP
Joe Haberfeld/FDEP
Nancy Marsh/USEPA
Jimmy Brantley/YBI
Dave Xavier/LBFH
Steve Anderson/SFWMD
Ron Reese/USGS
Tracy Levi/CH2M HILL

FROM: Mark Schilling & Sean Skehan/CH2M HILL STS

DATE: November 14, 2001

SUBJECT: Weekly Summary No. 9
November 2 thru November 8, 2001

PROJECT: ***Immokalee Water & Sewer District Deep Injection System***
FDEP UIC Permit Number 50725-006-UC

Summary of Engineer's/Driller's Log

On Friday, November 2nd, the pilot hole drilling continued from 2,566 feet below pad level (bpl), using a 12.25-inch drill bit. While drilling, the final core was collected at 2,760 feet bpl on November 2nd with completion of the pilot hole and geophysical logging taking place on Monday, November 5th, to a depth of 2,980 feet bpl. Based on the geophysical logs, core samples and the cuttings, the following packer testing intervals were selected: 2.800 to 2,901, 2,720 to 2,755, 2,400 to 2,461 and 2,200 to 2,251.f On Tuesday, November 6th, the straddle packer test on the interval of 2,800 to 2,901 feet bpl, was started and then completed on Wednesday, November 7th. The second straddle packer test, on the interval of 2,720 to 2,755 feet bpl, was started on Thursday, November 8th and was still being conducted at the end of the reporting period.

During the next reporting period, it is anticipated that all packer testing will be completed and the backplugging of the pilot should be accomplished.

Attachments:
Engineer's Daily Reports
Driller's Daily Reports
Geophysical Logs

a

MEMORANDUM

CH2MHILL

TO: Eva Deyo/IWSD
Jack Myers/FDEP
Joe Haberfeld/FDEP
Nancy Marsh/USEPA
Jimmy Brantley/YBI
Dave Xavier/LBFH
Steve Anderson/SFWMD
Ron Reese/USGS
Tracy Levi/CH2M HILL

FROM: Mark Schilling & Sean Skehan/CH2M HILL STS

DATE: November 19, 2001

SUBJECT: Weekly Summary No. 10
November 9 thru November 15, 2001

PROJECT: ***Immokalee Water & Sewer District Deep Injection System***
FDEP UIC Permit Number 50725-006-UC

Summary of Engineer's/Driller's Log

The second packer test, on the interval of 2,720 to 2,756 feet below pad level (bpl), was completed on Friday, November 9th. On Sunday, November 11th, the third straddle packer test, on the interval of 2,800 to 2,901 feet bpl, was started and completed on Monday, November 12th. The fourth and final packer test, on the interval of 2,200 to 2,251 feet bpl was completed on Tuesday, November 13th. Pilot hole backplugging, to the base of the 22-inch casing at 2,000 feet bpl, was conducted on Tuesday and Wednesday, November 14th. Reaming of the pilot hole, using a nominal 22-inch bit, was started on Wednesday and had reached a depth of 2,264 feet bpl at the end of the reporting period.

During the next reporting period, it is anticipated that the reaming of the pilot hole will be completed to a depth of 2,910. No work is anticipated to be conducted during the Thanksgiving holiday weekend.

Attachments: Engineer's Daily Reports
Driller's Daily Reports

MEMORANDUM

CH2MHILL

TO: Eva Deyo/IWSD
Jack Myers/FDEP
Joe Haberfeld/FDEP
Nancy Marsh/USEPA
Jimmy Brantley/YBI
Dave Xavier/LBFH
Steve Anderson/SFWMD
Ron Reese/USGS
Tracy Levi/CH2M HILL

FROM: Mark Schilling & Sean Skehan/CH2M HILL SCS

DATE: November 27, 2001

SUBJECT: Weekly Summary No. 11
November 16 thru November 21, 2001

PROJECT: ***Immokalee Water & Sewer District Deep Injection System***
FDEP UIC Permit Number 50725-006-UC

Summary of Engineer's/Driller's Log

The reaming of the pilot hole, to a nominal 22-inch diameter, continued from a depth of 2,264 feet below pad level (bpl), on Friday, November 16th. The reaming continued through Wednesday, November 21st, reaching the desired depth of 2,915 feet bpl.

During the next reporting period, it is anticipated that the pilot hole drilling will resume from 2,915 feet bpl and reach a total depth of 3,300 feet bpl. Upon completion of the pilot hole, geophysical and video logging will be conducted.

Attachments: Engineer's Daily Reports
Driller's Daily Reports

a

MEMORANDUM

CH2MHILL

TO: Eva Deyo/IWSD
Jack Myers/FDEP
Joe Haberfeld/FDEP
Nancy Marsh/USEPA
Jimmy Brantley/YBI
Dave Xavier/LBFH
Steve Anderson/SFWMD
Ron Reese/USGS
Tracy Levi/CH2M HILL

FROM: Mark Schilling & Sean Skehan/CH2M HILL STS

DATE: December 3, 2001

SUBJECT: Weekly Summary No. 12
November 23 thru November 29, 2001

PROJECT: ***Immokalee Water & Sewer District Deep Injection System***
FDEP UIC Permit Number 50725-006-UC

Summary of Engineer's/Driller's Log

There was no work conducted on Friday, November 23rd and Saturday, November 24th due to the Thanksgiving holiday. The Contractor started preparations to resume pilot hole drilling on Sunday, November 25th. The drilling of the pilot hole resumed, from 2,980 on Monday, November 26th. The drilling continued through Wednesday, November 28th, where the desired depth of 3,350 feet bpl was reached. Geophysical logging was conducted on Thursday, November 29th.

During the next reporting period, it is anticipated that the geophysical/video logging will be completed and installation of the 12-inch diameter casing will begin.

Attachments:
Engineer's Daily Reports
Driller's Daily Reports
Geophysical Logs

a

MEMORANDUM

CH2MHILL

TO: Eva Deyo/IWSD
Jack Myers/FDEP
Joe Haberfeld/FDEP
Nancy Marsh/USEPA
Jimmy Brantley/YBI
Dave Xavier/LBFH
Steve Anderson/SFWMD
Ron Reese/USGS
Tracy Levi/CH2M HILL

FROM: Mark Schilling & Sean Skehan/CH2M HILL STS

DATE: December 6, 2001

SUBJECT: Weekly Summary No. 13
November 30 thru December 6, 2001

PROJECT: ***Immokalee Water & Sewer District Deep Injection System***
FDEP UIC Permit Number 50725-006-UC

Summary of Engineer's/Driller's Log

The geophysical/video logging continued on Friday, November 30th and was completed on Saturday, December 1st. The was no activity at the site, except for rig maintenace, from Sunday, December 2nd through Tuesday, December 4th while approval of the casing setting depth was obtained. On Wednesday, December 5th, the approval was granted and reaming of the pilot hole to a nominal 22-inch diameter was started and completed from a depth of 2,915 feet bpl to 2,995 feet bpl. On Thursday, December 6th, caliper geophysical logging of the reamed borehole was conducted and a drillable bridge plug was set from 2,998 to 3,002 feet bpl.

During the next reporting period, it is anticipated that the installation and cementing of the 12-inch diameter casing will be started and completed.

Attachments:
Engineer's Daily Reports
Driller's Daily Reports
Geophysical Logs

a

MEMORANDUM

CH2MHILL

TO: Eva Deyo/IWSD
Jack Myers/FDEP
Joe Haberfeld/FDEP
Nancy Marsh/USEPA
Jimmy Brantley/YBI
Dave Xavier/LBFH
Steve Anderson/SFWMD
Ron Reese/USGS
Tracy Levi/CH2M HILL

FROM: Mark Schilling & Sean Skehan/CH2M HILL SJS

DATE: December 17, 2001

SUBJECT: Weekly Summary No. 14
December 7 thru December 13, 2001

PROJECT: ***Immokalee Water & Sewer District Deep Injection System***
FDEP UIC Permit Number 50725-006-UC

Summary of Engineer's/Driller's Log

There was no activity at the site on Friday, December 7th. The installation of the 12-inch diameter casing began on Saturday, December 8th and was completed to a depth of 2,983 feet below pad level (bpl) on Tuesday, December 11th. The cementing of the casing was started on Tuesday and reached a depth of 2,090 feet bpl by the end of the reporting period.

During the next reporting period, it is anticipated that the cementing of the 12-inch casing will be completed to a depth of 200 feet bpl. Drilling out of the bridge plug and well development are also anticipated to be completed.

Attachments: Engineer's Daily Reports
Driller's Daily Reports

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MEMORANDUM

CH2MHILL

TO: Eva Deyo/IWSD
Jack Myers/FDEP
Joe Haberfeld/FDEP
Nancy Marsh/USEPA
Jimmy Brantley/YBI
Dave Xavier/LBFH
Steve Anderson/SFWMD
Ron Reese/USGS
Tracy Levi/CH2M HILL

FROM: Mark Schilling & Sean Skehan/CH2M HILL STS

DATE: January 2, 2002

SUBJECT: Weekly Summary No. 15
December 14 thru December 20, 2001

PROJECT: ***Immokalee Water & Sewer District Deep Injection System***
FDEP UIC Permit Number 50725-006-UC

Summary of Engineer's/Driller's Log

The cementing of the 12-inch casing continued on Friday, December 14th and was completed to a depth of 216 feet below pad level (bpl) on Saturday, December 15th. On Sunday December 16th, the Contractor installed the drill bit in preparation of drilling out the bridge plug. The drilling was started and completed on Monday, December 17th. Air development of the well also began on Monday and was completed on Tuesday, December 18th, and a caliper log was conducted. For the remainder of the reporting period, demobilization of the drill rig was conducted.

During the next reporting period, it is anticipated that the demobilization will be completed and a casing pressure test will be conducted.

Attachments: Engineer's Daily Reports
Driller's Daily Reports

a

MEMORANDUM

CH2MHILL

TO: Eva Deyo/IWSD
Jack Myers/FDEP
Joe Haberfeld/FDEP
Nancy Marsh/USEPA
Jimmy Brantley/YBI
Dave Xavier/LBFH
Steve Anderson/SFWMD
Ron Reese/USGS
Tracy Levi/CH2M HILL

FROM: Mark Schilling & Sean Skehan/CH2M HILL STS

DATE: January 3, 2002

SUBJECT: Weekly Summary No. 16
December 21 thru December 27, 2001

PROJECT: ***Immokalee Water & Sewer District Deep Injection System***
FDEP UIC Permit Number 50725-006-UC

Summary of Engineer's/Driller's Log

No activity took place at the site due to the holidays.

During the next reporting period, it is anticipated that the casing pressure test on the 12-inch casing will be conducted.

MEMORANDUM

CH2MHILL

TO: Eva Deyo/IWSD
Jack Myers/FDEP
Joe Haberfeld/FDEP
Nancy Marsh/USEPA
Jimmy Brantley/YBI
Dave Xavier/LBFH
Steve Anderson/SFWMD
Ron Reese/USGS
Tracy Levi/CH2M HILL

FROM: Mark Schilling & Sean Skehan/CH2M HILL STS

DATE: January 4, 2002

SUBJECT: Weekly Summary No. 17
December 28, 2001 through January 3, 2002

PROJECT: ***Immokalee Water & Sewer District Deep Injection System***
FDEP UIC Permit Number 50725-006-UC

Summary of Engineer's/Driller's Log

From December 28th through January 1st, there was no activity at the site due to the holidays. On Wednesday, January 2nd, preparations, including installation of packer assembly, for the casing pressure test were conducted. The casing pressure test was conducted on Thursday, January 3rd.

During the next reporting period, it is anticipated that geophysical logging, cement bond and video logs, and the completion of the cementing of the 12-inch casing will be conducted.

Attachments: Engineer's Daily Reports
Driller's Daily Reports

a

MEMORANDUM

CH2MHILL

TO:	Eva Deyo/IWSD	Dave Xavier/LBFH
	Jack Myers/FDEP	Steve Anderson/SFWMD
	Joe Haberfeld/FDEP	Ron Reese/USGS
	Nancy Marsh/USEPA	Tracy Levi/CH2M HILL
	Jimmy Brantley/YBI	

FROM: Mark Schilling & Sean Skehan/CH2M HILL STS

DATE: January 22, 2002

SUBJECT: Weekly Summary No. 18
January 4, 2002 through January 10, 2002

PROJECT: ***Immokalee Water & Sewer District Deep Injection System***
FDEP UIC Permit Number 50725-006-UC

Summary of Engineer's/Driller's Log

No work was conducted at the site until Tuesday, January 8th when a pump was installed and the well was pumped in preparation of collecting water quality samples and video logging. On Wednesday, January 9th, water quality samples for primary and secondary drinking water standards were collected from the well. The video and cement bond logging was also conducted on Wednesday. No further work was conducted during this reporting period.

It is anticipated that during the next reporting period, work on the modification to the monitor well will begin.

Attachments: Engineer's Daily Reports
Geophysical Logs

a

MEMORANDUM

CH2MHILL

TO: Eva Deyo/IWSD
Jack Myers/FDEP
Joe Haberfeld/FDEP
Nancy Marsh/USEPA
Jimmy Brantley/YBI
Dave Xavier/LBFH
Steve Anderson/SFWMD
Ron Reese/USGS
Tracy Levi/CH2M HILL

FROM: Mark Schilling & Sean Skehan/CH2M HILL STS

DATE: January 25, 2002

SUBJECT: Weekly Summary No. 19
January 11, 2002 through January 17, 2002

PROJECT: ***Immokalee Water & Sewer District Deep Injection System***
FDEP UIC Permit Number 50725-006-UC

Summary of Engineer's/Driller's Log

No work was conducted at the site until Wednesday, January 16th, when preparations for the backplugging of the lower monitor zone of the Tri-Zone Monitor Well were started. The 1st stage of the backplugging was conducted on Thursday, January 17th.

It is anticipated that during the next reporting period, the backplugging of the lower monitor zone in the monitor well will be completed and the Radioactive Tracer Survey logging will be completed on the injection well.

Attachments: Engineer's Daily Reports

a

Daily Summary Reports

CH2M HILL DAILY SUMMARY

Day/Date:	**Monday/9-17-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well (IW-1)**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, Humid, ~ 87 degrees F**

Activity: Pilot Hole Drilling
Starting Depth: 275 feet bpl

Bit Size: 12.25-inches
Ending Depth: 1,010 feet bpl

Time	Description
1030	Arrive at site. The Contractor is currently pilot hole drilling and is at a depth of 443 feet below pad level (bpl).
1100	30-inch steel casing arrives at site.
1515	Pilot hole drilling reaches a depth of 600 feet bpl.
1530	Leave site. The Contractor will continue pilot hole drilling to a total depth of 1010 feet bpl.

Recorded By: Tracy Levi

Date: 9/17/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Tuesday/9-18-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, Humid, ~ 87 degrees F**

Activity: Geophysical Logging & Reaming
Bit Size: 34.5-inches
Starting Depth: 275 feet bpl
Ending Depth: 381 feet bpl

Time	Description
0745	Arrive at site. The Contractor is preparing to conduct geophysical logging of the pilot hole with their logging equipment. The logging truck is on site.
0800	Start conducting geophysical logging. Logs to be conducted are caliper, dual induction, sonic, temperature, gamma ray, fluid resistivity and SP logs.
0900	Sean Skehan of CH2M HILL arrives at the site.
1100	Logging completed. The Contractor starts preparations for reaming the pilot hole to a nominal 35-inch diameter.
1615	S. Skehan leaves site for the day.
1715	The Contractor starts installing the reaming assembly into the well.
1815	Leave site for the day. The top of the cement plug inside of the 36-inch casing is tagged at 272 feet bpl.

Recorded By: Tracy Levi
Date: 9/18/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Wednesday/9-19-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, Humid, ~ 87 degrees**

Activity: Reaming Pilot Hole
Bit Size: 34.5-inches
Starting Depth: 381 feet bpl
Ending Depth: 585 feet bpl

Time	Description
1200	Arrive at site. The Contractor is currently reaming the pilot hole and is at a depth of 440 feet below pad level (bpl).
1215	Scott Eckler of LBFH arrives at site.
1240	S. Eckler leaves the site after receiving a tour of the site.
1540	Reaming is at a depth of 464 feet bpl.
1650	S. Eckler and IWSD Board members arrive at site.
1710	Board Members leave site.
1720	S. Eckler leaves site.
1730	Reaming is at a depth of 492 feet bpl.
1745	Leave site for the day. The Contractor will continue reaming.

Recorded By: Tracy Levi
Date: 9/19/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Thursday/9-20-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, Humid, Hot, ~ 92 degrees F**

Activity: Reaming Pilot Hole
Bit Size: 34.5-inches
Starting Depth: 585 feet bpl
Ending Depth: 810 feet bpl

Time	Description
1215	Arrive at site. The Contractor is currently reaming the pilot hole and is at a depth of 675 feet below pad level (bpl).
1600	Reaming is at a depth of 755 feet bpl.
1830	Reaming is at a depth of 802 feet bpl. The Contractor is informed by CH2M HILL not to exceed a reaming depth of 850 feet bpl, until a casing setting depth is determined in the morning. The Contractor will conduct wiper passes to condition the borehole after reaching a depth of 850 feet bpl if this depth is reached before the casing setting depth is determined.
1915	Leave the site for the day.

Recorded By: Tracy Levi
Date: 9/20/01

Daily Operations Report Form

Rig Number: 411

Superintendent: Jimmy B

Date: 8-17-01

Job Number: _____ Well Number: IM-1 Lead Driller: Dixon M

Shift: Day

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00			set rig / start drill at 220 cement 280 work make up stab #3
			Drill To 360 dev sur / make stab #4 Drill To 440' dev sur
			make #5 drill To 520 dev sur / make #6 drill To 600 dev sur
			make #7 drill to 650

Production Recap

Beginning Borehole Footage: 310 Ending Borehole Footage: 712 Reamed Size: 12 1/4 Footage: 402' Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Emp Initials	Time From	Time To	Total Hours	Employee Name	Emp Initials
07:00	19:00	12	Dixon McMellon	DM					
1500	1900	4	Ted Sullivan	TS					
07:00	19:00	12	Jason Thomas	JT					
07:00	19:00	12	Curt Carlson	CC					
07:00	19:00	12	JARLOT AMADOR	JL					

Cement Stage Records

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Daily Operations Report Form

Job Number: _____ Well Number: IW #1 Superintendent: J. Bruntley Lead Driller: W. Fargo Rig Number: 411 Mov Date: 9-17-01 Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Drill f 717' to 760'. Dev surv @ 720 Drill to 840' surv @ 810' Drill to 920' surv @ 900' cont Drill to 1000' Comp surv @ 990' cont to drill to 1010. Circ hole clean make 2-wiper trips & P.O.O.H lay down D.C.

Production Recap

Beginning Borehole Footage: 717 Ending Borehole Footage: 1010' Reamed Size: 12¼ Footage: _____ Casing Size: _____ Footage: 275'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	W. Fargo						
		12	S. Cerecerez						
		12	E. Rivas						
		12	R. McGinnis						

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Daily Oper **Report Form**

Rig Number: 411

Superintendent: Jimmy

Date: 8-18-01

Job Number: _____ Well Number: IMI-1 Lead Driller: Dixon

Shift: DOYS

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00			SER Rig / Logging / make up stabilizer & Trip 3 std's
	19:00		Headder up

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: 11,5 Footage: _____ Casing Size: 36" Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Emp Initials	Time From	Time To	Total Hours	Employee Name	Emp Initials
07:00	19:00	12	Dixon McClellan	D.M					
07:00	19:00	12	Ted Sullivan	TS					
07:00	19:00	12	JORGE L. AMADOR	JLA					
07:00	19:00	12	Jason Thomas	JT					

Cement Stage Collars

Stage Number: _____ Tag: _____ Feet

Stage Number: _____ Tag: _____ Feet

Notes

Daily Operations Report Form

Job Number: _____ Well Number: IW #1 Superintendent: Jim Brantley Rig Number: 411
Lead Driller: W. Fargo Date: 8-18-01 Tue Shift: Night

Time From:	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Service Rig c/o Pipe rubbers & Drill F/272' to 381'

Production Recap
Beginning Borehole Footage: 272 Ending Borehole Footage: 381 Reamed Size: 34½ Footage: _____ Casing Size: 36" Footage: 275

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	W. FArgo						
"	"	12	S. Cervecerez						
"	"	12	R. McClinnis	BMC					
1900	0700	12	E. Rivas						

Current Stage Records
Stage Number: _____ Tag: _____ Feet

Bottom Plug Set	Stage Type

Type	Fluid Lost	Slurry	Water

Top	Bottom	Slurry	Water

Notes

Stage Number: _____ Tag: _____ Feet

Bottom Plug Set	Stage Type

Type	Fluid Lost	Slurry	Water

Top	Bottom	Slurry	Water

Notes

Daily Operati[illegible] Report Form

Rig Number: 411

Superintendent: Jimmy

Date: 8-15-01

Job Number: _____ Well Number: _____ Lead Driller: Dixon

Shift: DOY

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00			SDI-Rig Drill From 381 To 504 / DEV SUR 370

Production Recap

Beginning Borehole Footage: 381 Ending Borehole Footage: 504 Reamed Size: 34.5 Footage: 123' Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours
				1							/				

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Emp Initials
07:00	19:00	12	Dixon Mcclellan	DM					
1	1	12	Jason Wells	JW					
1	1	12	TROY AMASON	TA					
1	1	12	Curt Carlson	CC					

Stage Number: _____ Tag: _____ Feet

Stage Number: _____ Tag: _____ Feet

Daily Operations Report Form

Job Number: _____ Well Number: IW#1 Superintendent: Jim Brantley Lead Driller: W. Fargo Rig Number: 411 Date: 8-19-01 WED Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700		Drill to 505' clean hole & survey, Rig service & Conn.
			Cont. to drill to 585'

Production Recap

Beginning Borehole Footage: 504' Ending Borehole Footage: 585' Reamed Size: 34.5 Footage: 81' Casing Size: 36" Footage: 275'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0900	13	W. Fargo	WF					
		13	S. Cerecerez						
		13	E. Rivas						
		13	R. McGinnis	RMC					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Daily Operations Report Form

Rig Number: 411

Superintendent: Jimmy B

Date: 9-20-01

Job Number: _____ Well Number: IW-1

Lead Driller: Dixon, M

Shift: Day

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00			ser Rig + Equipment / circ Hole clean / make up std # 8 KD mill
			Be 665.5 Dev surv 540' make up std #9 KD 745' Dev-surv 630'
			make up std #10 cont To

Production Recap

Beginning Borehole Footage: 585' Ending Borehole Footage: 810' Reamed Size: 34.5 Footage: 225' Casing Size: 36" Footage: 225'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Init's	Time From	Time To	Total Hours	Employee Name	Empl Init's
07:00	15:00	12	Dixon Mcclellan						
/	/	/	Jason Wells	JW					
			Curt Carlson	CC					

Cement Stage Record

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0930	N/A	599	30	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	780	13	N/A	6.72		YBI/Sanders

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Water Quality Data
Northwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1030	N/A	487	5	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	470	4	N/A	6.91		YBI/Sanders

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0900	N/A	512	13	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	550	33	N/A	6.26		YBI/Sanders

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1100	N/A	685	9	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	490	16	N/A	6.59		YBI/Sanders

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

CH2M HILL DAILY SUMMARY

Day/Date:	**Friday/9-21-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, Humid, ~ 93 degrees F**

Activity: Reaming Pilot Hole
Bit Size: 34.5-inches
Starting Depth: 810 feet bpl
Ending Depth: 935 feet bpl

Time	Description
1330	Arrive at site. The Contractor is currently reaming the pilot hole and is at a depth of 910 feet below pad level (bpl). During the night shift of 9-20, the depth of 850 feet bpl was reached and two wiper passes were conducted. The Contractor was informed, earlier this morning, that the 30-inch casing setting depth is to be 930 feet bpl, and reaming was resumed at that time.
1715	Reaming has reached a total depth of 935 feet bpl. The Contractor is will circulate and condition the borehole for the remainder of the shift. Installation of 30-inch casing is scheduled for tomorrow morning.
1730	Leave site for the day.

Recorded By: Tracy Levi
Date: 9/21/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Saturday/9-22-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, Humid, ~ 93 degrees F**

Activity: Installation of 30-inch Casing
Bit Size: 34.5-inches
Starting Depth: 0 feet bpl
Ending Depth: 930 feet bpl

Time	Description
0600	Arrive at site. The Contractor has conditioned the reamed borehole and removed the reaming bit. The Contractor starts conducting caliper logging, using their own geophysical logging equipment.
0710	Caliper logging complete. Begin installation of 30-inch steel casing.
1325	Chris Peters of CH2M HILL arrive at site.
1400	T. Levi leaves site for the day.
1700	Casing installed to a depth of 930 feet below pad level (bpl). The Contractor starts preparations to pressure grout the casing.
1830	Begin to circulate annular space.
2020	Begin installing tremie pipe into casing for grouting.
2105	Tremie pipe installed to a depth of 920 feet bpl.
2130	Start pressure grouting of the casing.
2245	Pressure grouting completed and cement returns noted at surface. A total of 295 barrels of 4% bentonite cement and 134 barrels of neat cement was pumped followed by 10 barrels of fresh water as chase. Wellhead pressure is 299 psi at shut-in. Temperature log is scheduled for 0830 tomorrow, 9-23.
2255	C. Peters leaves site for the day.

Recorded By: Tracy Levi/Chris Peters
Date: 9/22/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Sunday/9-23-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Sunny, Warm, ~ 88 degrees F**

Activity: Geophysical Logging and Tagging of Cement **Bit Size:** 34.5-inches
Starting Depth: 0 feet bpl **Ending Depth:** 927 feet bpl

Time	Description
0805	Arrive at site. The tremie pipe has been removed from the casing in preparation of conducting a temperature geophysical log after cementing stage.
0810	Begin temperature log. Jimmy Brantley of YBI reports that the casing pressure had dropped to a low of 19 psi during the night, but was approximately 40 psi this morning when they set up for logging.
0825	Cement plug in bottom of casing 927 ft bpl.
0830	Logging tool out of hole. Based on a visual of the top of the cement at land surface and the temperature log, the top of the cement is verified at land surface. J. Brantley states that no further work will be conducted today or during the day shift on Monday, 9-24. On Monday, the night shift will come in and prepare to resume pilot hole drilling on Tuesday, 25 Sept.
0850	Leave site for the day.

Recorded By: Chris Peters Date: 9/23/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Tuesday/9-25-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 93 degrees F**

Activity: Pilot Hole Drilling
Bit Size: 9.875-inches
Starting Depth: 930 feet bpl
Ending Depth: 1,107 feet bpl

Time	Description
1230	Arrive at site. The Contractor has resumed pilot hole drilling from the base of the 30-inch casing at 930 feet below pad level (bpl), using a 9.875-inch drill bit and mud rotary drilling techniques.
1450	Pilot hole drilling reaches a depth of 1,107 feet bpl and is stopped due to equipment problems.
1630	It is determined that the equipment repairs will require a new hydraulic pump and shaft. The Contractor informs CH2M HILL that due to the bit size the only one drill collar will be used when drilling resumes. The remaining collars are to be removed from the hole.
1800	Leave site for the day. The Contractor will continue with the equipment repairs.

Recorded By: Tracy Levi
Date: 9/25/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Wednesday/9-26-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 90 degrees F**

Activity: Equipment Repairs **Bit Size:**
Starting Depth: **Ending Depth:**

Time	Description
1230	Arrive at site. The drilling is still stopped for equipment repairs.
1300	Water quality samples collected at NW, SW, NE and SE monitor wells.
1800	Leave site for the day as the Contractor informs CH2M HILL that the equipment repairs will continue for the remainder of the day.

Recorded By: Tracy Levi Date: 9/26/01

Daily Operations Report Form

Rig Number: 411
Superintendent: Jim Brantley
Date: 9-20-01
Job Number: _____ Well Number: IW #1 Lead Driller: W. Forge Tour Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Drill f/810 to 825 survey @ [redacted] Cont. drilling to 850'
			circ. f/cond mud for wiper Trip, Make wiper Trip No drag No fill
			Service Rig circ condition hole

47" Fuel

Production Recap

Beginning Borehole Footage: 810' Ending Borehole Footage: 850' Reamed Size: 34.5 Footage: 40' Casing Size: 36' Footage: 275'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	W. Forge						
		12	S. Cerecerez						
		12	R. McInnis	RMC					
		12	E. Rivas	ER					

Daily Operations Report Form

Rig Number: 411

Superintendent: Jimmy B

Date: 9-21-11

Job Number: _____ Well Number: TW-1 Lead Driller: Dixon M

Shift: Day

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00			cond mud / work on 3" PVC Line To Pre Hy Tank / ser - Rig
			Drill cont #11 down ISD 905' make up 8+0 12 Drill To
			935' T.D.

Production Recap

Beginning Borehole Footage: 850 Ending Borehole Footage: 935 Reamed Size: 36.5 Footage: _____ Casing Size: 36" Footage: 935'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Employee's Initials	Time From	Time To	Total Hours	Employee Name	Employee Initials
07:00	19:00	12	Dixon Mclellan						
/	/	/	Jason Webb	JW					
/	/	/	Curt Carlson	CC					
/	/	/	Jorge L. Amador						

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Time	Event Description	Pressure	Volume

Notes

Stage Number: _____ Tag: _____ Feet

Time	Event Description	Pressure	Volume

Notes

Daily Operations Report Form

Job Number: ImoKolee Well Number: IW# 1 Superintendent: Jim Brantle Lead Driller: W. Fargo Rig Number: 411 Date: 9-21-01 Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0800	13	Wiper Trip service Rig & Circ & Cond mud & P.O.O.H. lay Down BHA. Run caliper log's Rig up & Run casing

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0800	13	W. Fargo	WF					
		13	S. Cerecerez						
		13	E. Rivas						
		13	R. McClunis	RMC					

Cement Stage Records

Stage Number: 1 Tag: _____ Feet

Stage Number: _____ Tag: _____ Feet

Notes

Daily Operations Report Form

Job Number: _____ Well Number: IW-1 Superintendent: Jimmy Big Lead Driller: Dixon M Rig Number: 411 Date: 9-22-01 Shift: Day's

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00			Ser Rig / Run casing

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: 30" Footage: 430'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Emp Initials	Time From	Time To	Total Hours	Employee Name	Emp Initials
07:00	19:00	12 1/2	Dixon McClellan	D.M					
1	19:00	12	Jason Webb	JW					
1	"	12	Jorge L. Amador	JLA.					
11	1	12	Curt Cayler	CC					

Cement Stage Records

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Daily Operations Report Form

Rig Number: 411

Superintendent: Brantley

Date: 9-22-01

Job Number: _____ Well Number: IN#1 Lead Driller: W. Fargo SAT Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0900		RUN 2 3/8 & Rig up & pump cement
			W.O.C. & clean up pad & Tah site - P.O.O.H & Rig up for Temp log

Cement Stage Report

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0400	13	W. Fargo		0700	0800		Jason Webb	JW
		13	S. Cerecerez						
		13	E. Revis						
		13	R. McGinnis	RMC					

Notes

Daily Operations Report Form

Job Number: Immaktok Well Number: IW-1 Superintendent: Jimmy B Lead Driller: Dixon Rig Number: 411 Date: 9-24-01 Shift: Day

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07.00	19.00	12	clean up location, headers up. make up 11 stands drill pipe

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Emp Initials	Time From	Time To	Total Hours	Employee Name	Emp Initials
07.00	19.00	12	Dixon McClellan						
0700	1900	12	Jason Webb						
0700	1900	12	Curt Carlson						
0700	1400	12	Jorge Amador	JLA					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Daily Opera **Report Form**

Rig Number: 411

Superintendent: Jimmy B

Date: 9-25-01

Job Number: Immokalee Well Number: IW-1 Lead Driller: Dixon M

Shift: Day's

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
06:30			ser-Rig / make up 5 collar Trip To Bottom 930'
			Drill / Drill From 930 cement To 1107' Hyd unit went down
			work on Hyd unit

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
06:30	19:00	12½	Dixon mcclellan						
07:00	1908	12	Jason Webb	JW					
1	1	12	Curt Carlin	CC					
			IGNACIO L. AMADOR	ILA.					

Cement Stage Records

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Daily Operations Report Form

Job Number: McKalee Well Number: IW#1 Superintendent: Jim Brantley Lead Driller: W. Fargo Rig Number: 411 Date: 9-25-01 Shift: Night

Time From	Time To	Total Hours	Details of Operations in Secuense and Remarks
1900	0700	12	Work on Hydraulic unit & clean on Job site, Rig up aircomp to rig system, Service Rig & equipment

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

BR #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	BR #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	W. Fargo						
		12	S. Cerezo Cerez						
		12	E. Rivas	ER					
		12	R. McClinahis	RMC					

Cement Stage Records

Stage Number: _____ Tag: _____ Feet

Slurry Weight	Yield

Sacks	Excess (%)	Mix H2O	Pump Time

Type	Slurry Vol	Top	Bottom

Notes

Stage Number: _____ Tag: _____ Feet

Slurry Weight	Yield

Sacks	Excess (%)	Mix H2O	Pump Time

Type	Slurry Vol	Top	Bottom

Notes

Daily Operation Report Form

Rig Number: 411

Superintendent: Jimmy B

Date: 9-26-01

Job Number: Immokalee Well Number: IW-1

Lead Driller: Dixon M

Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00			ser-Rig

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
07:00	19:00	12	Dixon McClellan						
07:00	11:00	4	Jason Wells	JW					
07:00	19:00	12	Jorge L. Amador	JLA					
07:00	19:00	12	Curt Carlson	CC					

Cement Stage Report

Stage Number: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Daily Operations Report Form

Job Number: Immokalee Well Number: I(1)#1 Superintendent: Jim Brantley Lead Driller: W. Fargo Rig Number: 411 Date: 9-26-01 Shift: Nights WED

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Service Rig & clean Rig & location

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	W. Farg						
		12	S. Cerecerez						
		12	R. McClinnis	RMC					
		12	S Rivas						

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Bottom Plug | Baffle

Time | Barrels Lost | Rate | Pressure

Type | Barrels | Type | Pressure

Notes

Stage Number: _____ Tag: _____ Feet

Bottom Plug | Baffle

Time | Barrels Lost | Rate | Pressure

Type | Barrels | Type | Pressure

Notes

Daily Operations Report Form

Job Number: Innokelee Well Number: IW-1 Superintendent: Jimmy Lead Driller: Dixon Rig Number: _____ Date: 9-27-07 Shift: _____

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
			clean up Job site & Rig

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
07:00	17:00	10	Dixon McClellan	DM					
07:00	14:30	7½	Jorge L. Amador	JLA					
			[illegible]						
07:00	14:30		[illegible]						

Cement Stage Record

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0900	N/A	512	13	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	550	33	N/A	6.26		YBI/Sanders
09/13/2001	0830	N/A	540	9	N/A	6.82		YBI/Sanders
09/19/2001	1230	N/A	396	15	N/A	6.41		YBI/Sanders
09/26/2001	1340	6.75	420	9	N/A	6.40		T. Levi

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0930	N/A	599	30	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	780	13	N/A	6.72		YBI/Sanders
09/13/2001	0830	N/A	490	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	415	22	N/A	6.22		YBI/Sanders
09/26/2001	1310	3.50	440	26	N/A	6.40		T. Levi

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1100	N/A	685	9	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	490	16	N/A	6.59		YBI/Sanders
09/13/2001	0830	N/A	550	10	N/A	6.74		YBI/Sanders
09/19/2001	1230	N/A	646	15	N/A	6.22		YBI/Sanders
09/26/2001	1330	6.67	720	8	N/A	6.20		T. Levi

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1030	N/A	487	5	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	470	4	N/A	6.91		YBI/Sanders
09/13/2001	0830	N/A	760	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	331	11	N/A	6.05		YBI/Sanders
09/26/2001	1320	6.00	1,003	103	N/A	6.10		T. Levi

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

CH2M HILL DAILY SUMMARY

Day/Date:	**Monday/10-01-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Sunny, ~ 87 degrees F**

Activity: Pilot Hole Drilling
Bit Size: 9.875-inches
Starting Depth: 1,107 feet bpl
Ending Depth: 1,794 feet bpl

Time	Description
0915	Arrive at site. Contractor resumed pilot hole drilling during the night shift on 9-30-01, from 1,107 feet below pad level (bpl), after rig repairs were completed.
1000	Pilot hole drilling reaches a depth of 1,385 feet bpl.
1450	Pilot hole drilling reaches a depth of 1,510 feet bpl.
1630	Pilot hole drilling reaches a depth of 1,547 feet bpl.
1700	Leave site for the day. Contractor continues the pilot hole drilling.

Recorded By: Tracy Levi
Date: 10/01/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Tuesday/10-02-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Sunny, ~ 87 degrees F**

Activity: Pilot Hole Drilling
Bit Size: 9.875-inches
Starting Depth: 1,794 feet bpl
Ending Depth: 2,005 feet bpl

Time	Description
0830	Arrive at site. Pilot hole drilling is continuing.
0920	Pilot hole drilling reaches a depth of 1,840 feet bpl.
1100	Pilot hole drilling reaches a depth of 1,868 feet bpl.
1250	Pilot hole drilling reaches a depth of 1,909 feet bpl.
1430	Pilot hole drilling reaches a depth of 1,954 feet bpl.
1445	Leave site for the day. The Contractor will continue drilling until a depth of 2,000 feet bpl is reached.

Recorded By: Tracy Levi
Date: 10/02/01

Daily Operations Report Form

Rig Number: 411

Superintendent: Jim Brantley

Date: 10-3-01

Job Number: Imokalee Well Number: IW #1

Lead Driller: Carlson

Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700			service equipment, keep borehole full of fluid

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	15:30	~~15:30~~ 8½	Curt Carlson	CC					
		8½	Jason Webb	JW					
		8½	Dennis Pendley	DP					
		8½	Jorge L. Amador	JLA					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush		
Type	**Barrels Lead**	**CuFt**	**Sacks**
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush		
Type	**Barrels Lead**	**CuFt**	**Sacks**
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Daily Operations Report Form

Job Number: _____ Well Number: IW #1 Superintendent: Jim Brantley Lead Driller: [redacted] FARGO Thurs

Rig Number: 411 Date: 9-27-07 Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900			work on desander & Rig Equipment

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0100	6	W. Fargo	WF					
		6	S. Cerecerez	SC					
		6	R. McInnis	RMc					
		6	E. Rivas	ER					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush		
Type	**Barrels Lead**	**CuFt**	**Sacks**
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush		
Type	**Barrels Lead**	**CuFt**	**Sacks**
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

aily Operations ort Form

Rig Number: 411
Superintendent: Jimmy
Date: 9-28-0
Job Number: _____ Well Number: _____ Lead Driller: Dixon
Shift: DAYS

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
			work on Hyd Pumps

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
7:00	19:00	12	Dixon McLellan	D.M					
/	/	/	JORGE L. AMADOR-TLA.						
/	/	/	Jason Webb	J.W					
/	/	/	Curt Carter	C.C					

Cement Stage rts

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Daily Operations Report Form

Job Number: _____ Well Number: IW #1

Superintendent: Jim Brantley

Lead Driller: W. Fargo

Rig Number: 411

Date: 9-28-00 Fri

Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900			clean up Job site

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush		Barrel Flush	

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush		Barrel Flush	

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	2300	4	W. FARGO	~~WF~~					
		4	S. Ceresperez	SC					
		4	R. McClinnis	RMC					
		4	E. Rivas	ER					

Notes

Daily Operation Report Form

Rig Number: 411
Superintendent: Jim Brantley
Date: 9-30-01
Job Number: _____ Well Number: IW#1
Lead Driller: W. Fargo
SUN Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
900			P.O.O.H. lay down 4-DC, RIH. cond mud & drill f/1107 To 1304
			RAN Survey's @ conn's @ 990', 1080' 1170', 1260'

Production Recap

Beginning Borehole Footage: 1107' Ending Borehole Footage: _____ Reamed Size: 9 7/8 Footage: _____ Casing Size: 30" Footage: 930'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours
1	7/8	Mill Tooth													

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
900	1900	12½	W. Fargo	WF					
	1900	12½	S. Cerecerez	SC					
		12	E. Rivas	ER					
		12	R. Mcclinnis	~~RMC~~					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

60" Fuel

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Daily Operation **port Form**

Job Number: _____ Well Number: IW#1 Superintendent: J. Brantley Lead Driller: W. Fargo Rig Number: 411 Date: 10-1-01 Mon Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Serv Rig & W.L.S. & con @ 1627, cont to drill to. 1708 survey & conn @ 1708 cont Drlg. to 1794

Production Recap

Beginning Borehole Footage: 1627 Ending Borehole Footage: 1794 Reamed Size: 9 7/8" Footage: _____ Casing Size: 30" Footage: 930'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	W. Fargo						
		12	S. Corecpreo	SC					
		12	R. McClinnis						
		12	E. Rivas						

Cement Stage Ports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush		Barrel Flush	
Type	Barrels Lead	CuFt	Sacks
Type	Barrels Tail	CuFt	Sacks

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush		Barrel Flush	
Type	Barrels Lead	CuFt	Sacks
Type	Barrels Tail	CuFt	Sacks

Notes

Daily Operations Report Form

Rig Number: 411

Superintendent: Jimmy / KB

Date: 10-1-01

Job Number: Immokolee Well Number: IW-2 Lead Driller: Dixon . M

Shift: Day's

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00			Finish Drill std #16 Down circ H/C make up std #17 Drill To 1388' POH survey @ at 1350' / make up std #18 Drill To 1468' survey at 1440' make up std #19 Drill To 1548 / Pick up std #20 Drill To 1627'

Production Recap

Beginning Borehole Footage: 1307' Ending Borehole Footage: 1627' Reamed Size: _____ Footage: 320' Casing Size: 30" Footage: 930'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
07:00	19:00	12	Dixon McClellan	D.M					
			JASON LOVELL	JL					
			Curt Calvin	CC					
			JORGE C. AMADOR	JCA					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Daily Operation port Form

Rig Number: 411

Job Number: Imokalee Well Number: IW#1 Superintendent: Jim Brantley Lead Driller: W. Fargo Date: 10-2-01 Tue Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Wiper Trip to casing, Service Rig & Run Back to Btm. No fill CIRC & cond. mud pull Back To Csg.
			Change oil, oil & fuel filters #1, 2, 3 G.I.W. pump's Motor's
			installed New wiper rubber's on well head

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	W. Fargo	WF					
"	"	12	S. Cerecerez	SC					
"	"	12	R. McClinnis	RMC					
1900	0700	12	E. Rivas	ER					

Cement Stage Ports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Daily Operations Report Form

Rig Number: 411

Superintendent: Jimmy . B

Date: 10-2-01

Job Number: Immokalee Well Number: _____ Lead Driller: Dixon . M

Shift: Day's

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00			cont Drlg To 1868' TD survey 1800' / Pick up std #24 cont Drlg To 1948' & survey 1890' / Pick up std #25 cont Drlg To 2005' TD. Circ Hole clean /

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
07:00	19:00	12	Dixon MCClellan						
			Jason Webb	JW					
			Curt Carlson	CC					
			Angel Amador	JCA					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1100	N/A	685	9	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	490	16	N/A	6.59		YBI/Sanders
09/13/2001	0830	N/A	550	10	N/A	6.74		YBI/Sanders
09/19/2001	1230	N/A	646	15	N/A	6.22		YBI/Sanders
09/26/2001	1330	6.67	720	8	N/A	6.20		T. Levi
10/02/2001	1155	6.59	747	9	N/A	6.20		T. Levi

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1030	N/A	487	5	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	470	4	N/A	6.91		YBI/Sanders
09/13/2001	0830	N/A	760	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	331	11	N/A	6.05		YBI/Sanders
09/26/2001	1320	6.00	1,003	103	N/A	6.10		T. Levi
10/02/2001	1225	5.88	406	9	N/A	6.10		T. Levi

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1030	N/A	487	5	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	470	4	N/A	6.91		YBI/Sanders
09/13/2001	0830	N/A	760	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	331	11	N/A	6.05		YBI/Sanders
09/26/2001	1320	6.00	1,003	103	N/A	6.10		T. Levi

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

CH2M HILL DAILY SUMMARY

Day/Date:	**Monday/10-8-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 90 degrees F**

Activity: Geophysical Logging
Bit Size: 9.875-inches
Starting Depth: 1,000 feet bpl
Ending Depth: 2,010 feet bpl

Time	Description
0600	Arrive at site. The Contractor's geophysical logging equipment is already at the site and ready to start the logging. Start logging. Logs to be conducted are the Caliper, Natural Gamma Ray, and Dual Induction logs. The Contractor previously conditioned the borehole for the logging earlier in the shift.
0755	Baker Atlas arrives at the site to conduct geophysical logging.
0830	The Contractor completes their geophysical logging phase and Baker Atlas starts setting up to conduct their phase. The logs to be conducted by Baker Atlas are the Magnetic Resonance Imaging Log (MRIL), Spectral Gamma Ray, and the Full Wave Form Sonic logs.
1045	Start Sonic logging.
1130	The Contractor's geophysical logging truck leaves the site.
1205	Sonic logging completed. Jamie Luft of CH2M HILL arrives at site to assist in describing the drill cutting samples. Baker Atlas starts setting up to conduct the MRIL log.
1415	Start MRIL logging.
1820	MRIL logging completed.
1900	While removing the MRIL logging tool, it would not come fully into the 30-inch casing. Numerous attempts have been made to have the tool bottom reach a depth higher than 942 feet below pad level (bpl). The tool string length is 85 feet. The Contractor and Baker Atlas are conferring as to how to remove the tool from the borehole.
2030	The Contractor and Baker Atlas agree to build an overshot tool to assist in removing the logging tool. The Contractor starts building the tool.
2245	Contractor starts installing the overshot tool into the borehole.
2400	Installation of overshot tools continues.

Recorded By: Mark Schilling
Date: 10/8/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Tuesday/10-9-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 90 degrees F**

Activity: Reaming Pilot Hole
Starting Depth: 930 feet bpl

Bit Size: 12.25-inches
Ending Depth: 2,010 feet bpl

Time	Description
0000	Contractor is still installing overshot tool that was started previous day.
0210	The MRIL logging tool is removed from the well after overshot tool is installed and successful in freeing tool. The Contractor starts removing the overshot told from the borehole.
0230	M. Schilling leaves the site for the day. The Contractor is removing the overshot tool from the well and then will complete the switchover from mud rotary to reverse-air rotary drilling method. Baker Atlas is demobilizing their equipment and will leave the site shortly.

Recorded By: Mark Schilling

Date: 10/9/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Thursday/10-11-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 87 degrees F**

Activity: Packer Testing **Bit Size:** 12.25-inches
Starting Depth: 1,950 feet bpl **Ending Depth:** 2,000 feet bpl

Time	Description
0545	Arrive at the site. The Contractor has completed reaming the pilot hole to a nominal diameter of 12-inches and is currently preparing to conduct a caliper geophysical log, using their own logging equipment.
0600	Start caliper logging.
0745	Caliper logging complete. The Contractor starts preparing to install the packer assembly for installation.
0850	Start installing packer assembly.
1200	Equipment representatives arrive at the site to inspect the drill rig. Contractor stops work to consult with representatives.
1235	Leave the site for lunch.
1300	Return to site. Contractor is resuming installation of the packer assembly.
1435	Packer assembly installed to 1,950 feet below pad level (bpl). Start inflating packer. Contractor also starts installing 420 feet of 2.875-inch tremie pipe into the packer stem to air develop the zone between 1,950 and 2,000 feet bpl.
1415	Packer assembly inflated to 410 psi and squared off.
1520	Start air development
1550	Stop air development as very little (less than 2 gpm) water being produced. Contractor starts to add 120 feet of tremie pipe.
1610	Resume air development with 2.875-inch tremie pipe at 540 feet bpl. Development rate estimated at 60 gpm.
1845	Air development is complete. Contractor starts removing the tremie pipe and preparing to install the submersible test pump into the packer stem.
1930	Leave site for dinner.
2030	Return to site. Contractor is installing the test pump.
2200	Test pump installed. Start preliminary packer pump test.
2310	Preliminary test stopped. Final pumping rate was 83 gpm. Start recovery/background data collection.
2400	Collection of background data continues

Recorded By: Mark Schilling Date: 10/11/01

Daily Operations Report Form

Job Number: Immokalee Well Number: IW#1 Superintendent: Jim Brantley Lead Driller: W. Fargo Rig Number: 411 Date: 10-7-01 SUN Shift: Nights

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	RIH To Btm x/o full circ & cond mud, Wiper trip & circ-cond. P.O.O.H & Rig up & log

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	W. Fargo						
		12	S. Cerecerez						
		12	E. Rivas	ER					
1900		12	R. McClinic	RMC					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Daily Operatic Report Form

Rig Number: 411

Superintendent: J. Brantley

Date: 10-8-01

Job Number: Imalcolee Well Number: IW #1 Lead Driller: Dixon McClellan

Shift: Day

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00			Logging

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: 30" Footage: 930'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
07:00	19:00	12	Dixon McClellan	DM					
"	"	"	Curt Carlson	CC					
"	"	"	JORGE L AMADOR	JLA					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush		Barrel Flush	
Type	**Barrels Lead**	**CuFt**	**Sacks**
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush		Barrel Flush	
Type	**Barrels Lead**	**CuFt**	**Sacks**
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Daily Operations Report Form

Job Number: _____ Well Number: IW# 1 Superintendent: Jim Brantley Lead Driller: W. Fargo Rig Number: 411 Date: 10-8-01 Shift: Night MON

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Build guide tool to pull logging tools out of hole, Pull out and Rig down loggers, Pick up B.H.A & RIH, start run left hand airline

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0730	12½	W. Fargo	~~EF~~					
"		12½	S. Cerecerez	SC					
"		12½	R. McInnis	RMC					
"		12½	E. Rivas	~~ER~~					
"	02:30	7½	Dixon McClellan	DM					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Daily Operations Report Form

Job Number: Implcolee Well Number: IW # 1 Superintendent: J. Brantley Lead Driller: Dixon McClellan Rig Number: 411 Date: 10-9-01 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700	17.00	10	Repair HYD coupeling.
17.00	19.00	2	Drlg and Reaming 883 to 963

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
07.00	19.00	12	Dixon McClellan						
			Curt Carlson	CC					
			Michael Dennis	MD					
			Randall Scott Townley	RST					
			JORGE L. AMADOR	JLA.					
			Larry R Hascock	LH					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Daily Operations Report Form

Job Number: Immokalee Well Number: IW #1 Superintendent: Jim Brantley Lead Driller: W. Fargo Rig Number: 411 Date: 10-9-01 Tue Shift: Day T

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Drill f/963' to 1330

Production Recap

Beginning Borehole Footage: 963 Ending Borehole Footage: 1330 Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	W. Fargo						
		12	S. Cardenez						
		12	E. Rivas						

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush		
Type	**Barrels Lead**	**CuFt**	**Sacks**
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

45" Fuel left

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush		
Type	**Barrels Lead**	**CuFt**	**Sacks**
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Daily Operati Report Form

Rig Number: 411

Superintendent: Jimmy B

Date: 10-10-01

Job Number: Immokalee Well Number: IW-1 Lead Driller: Dixon M

Shift: Day's

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
7:00	9:30	2½	Reaming 1338 - 1444
9:30	11:30	2	Packing Swivel
11:30	7:00	7½	Reaming 1444 - 1820

Cement Stage Reports

Stage Number: ____ Tag: ____ Feet

Barrel Pre Flush		Barrel Flush	
Type	Barrels Lead	CuFt	Sacks
Type	Barrels Tail	CuFt	Sacks

Notes

Stage Number: ____ Tag: ____ Feet

Barrel Pre Flush		Barrel Flush	
Type	Barrels Lead	CuFt	Sacks
Type	Barrels Tail	CuFt	Sacks

Production Recap

Beginning Borehole Footage: ____ Ending Borehole Footage: ____ Reamed Size: ____ Footage: ____ Casing Size: 30" Footage: -930'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

N/A

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
07:00	19:00	12	Larry Hancock	LH			12		
			Dixon McClellan				12		
			Michael Dennis	MD			12		
			Jorge L. Amador	J.L.A.			12		
			Curt Carlson	CC			12		
			Randall Scott Townley	RST			12		
			Jason M Racine	JR			12		

Notes

Daily Operations Report Form

Job Number: _____ Well Number: IW#1 Superintendent: Jim Brantley Lead Driller: W. Fargo Rig Number: 411 Date: 10-10-01 Wed Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
19:00			Drill f/ 1820 to 1843' service rig & make conn, cont. to drill 2000'
			circ hole clean & P.O.O.H
			Rig up & Run Caliper log

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Production Recap

Beginning Borehole Footage: 1820 Ending Borehole Footage: 2000 Reamed Size: 12¼ Footage: 180' Casing Size: 30" Footage: 930'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours
	12¼	Mill Tooth	384	930	2000	1070'									

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
@ 1900	0700	12	W. Fargo	WF					
"	"	12	S. Cereceres	SC					
"	"	12	E. Rivas	ER					
19:00	"	12	R. McGinnis	RMC					

Daily Operatio[n] Report Form

Rig Number: 411

Superintendent: Jim Boardley

Date: 10-11-01

Job Number: _____ Well Number: IW #1

Lead Driller: W Fargo Hasecock

Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700	8:00	1	Weld plate on packer
8:00	2:00	6	Trip in 12¼" Packer - Set packer @ 450 ft
2:00	3:00	1	Pick up 18 Jts 2" Tubing 555' ft
3:00	7:00	4	Floor test Well

Cement Stag[e] Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush		Barrel Flush	
Type	**Barrels Lead**	**CuFt**	**Sacks**
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush		Barrel Flush	
Type	**Barrels Lead**	**CuFt**	**Sacks**
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0760	1700	12	Larry Hasecock				12		
		12	Jason Racine				12		
		12	Randall Scott Townley	RST					
		12	Michael Dennis	MD					
		12	JORGE L. Amador	JLA					
		12	Curt Cain	CC					
		12	Dixon McClellan						

Daily Operations Report Form

Job Number: _____ Well Number: IW #1 Superintendent: Jim Brantley Lead Driller: W. Fargo Rig Number: 411 Thur Date: 10-11-01 Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900			Rig up submersable pump, pull airline and run purge, do pre-limenary test For packer test

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	5700	12	W. Fargo						
		12	Shawn Covecore-z						
		12	E. Rivas						
		12	Robert McGinnis	RMC					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Beginning Meter Reading
012456.00

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Daily Operatio' eport Form

Rig Number: 411

Superintendent: Jim Boothe

Date: 10-12-01

Job Number: _____ Well Number: IW #1 Lead Driller: TR Blascock

Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
7:00	12:00	5	flow testing
12:00	3:00	3	Pull Tubing and pumps From well Pick up DP Lay Down 2 - 10 FT PJ
3:00	4:00	1	Pumps And Tubing back in Well
			move Packer Down 20 To 1970' 24 std 1 40 single 3' PUP

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
07:00	19:00	12	Dixon McClellan						
/		12	Larry Hascock	LH			12		
/	10:30	3 1/2	Jorge L. Amador	JLA			3 1/2		
/	10:30	3 1/2	Randall Scott Young	RSY			3 1/2		
/	10:30	3 1/2	Jon Rockwell	JR			3 1/2		
/		12	Michael Dennis	MD			12		

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush		Barrel Flush	

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

flow Meter Reading
START 17940

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush		Barrel Flush	

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Daily Operations Report Form

Job Number: _____ Well Number: IW #1

Superintendent: Jimmy Brantley
Lead Driller: Wayne Fargo

Rig Number: 411
Date: 10-12-01
Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Packers Test #1

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	Wayne Fargo						
		12	Shawn Crefcrez	SC.					
		12	Ed Rivas	ER					
		12	Robert McClintic	RMC					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush		Barrel Flush	
Type	**Barrels Lead**	**CuFt**	**Sacks**
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush		Barrel Flush	
Type	**Barrels Lead**	**CuFt**	**Sacks**
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0900	N/A	512	13	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	550	33	N/A	6.26		YBI/Sanders
09/13/2001	0830	N/A	540	9	N/A	6.82		YBI/Sanders
09/19/2001	1230	N/A	396	15	N/A	6.41		YBI/Sanders
09/26/2001	1340	6.75	420	9	N/A	6.40		T. Levi
10/02/2001	1215	6.68	509	19	N/A	6.40		T. Levi
10/11/2001	1500	7.40	493	20	N/A	6.50		M. Schilling

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0930	N/A	599	30	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	780	13	N/A	6.72		YBI/Sanders
09/13/2001	0830	N/A	490	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	415	22	N/A	6.22		YBI/Sanders
09/26/2001	1310	3.50	440	26	N/A	6.40		T. Levi
10/02/2001	1205	3.62	524	39	N/A	6.40		T. Levi
10/11/2001	1515	3.20	536	26	N/A	6.40		M. Schilling

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1100	N/A	685	9	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	490	16	N/A	6.59		YBI/Sanders
09/13/2001	0830	N/A	550	10	N/A	6.74		YBI/Sanders
09/19/2001	1230	N/A	646	15	N/A	6.22		YBI/Sanders
09/26/2001	1330	6.67	720	8	N/A	6.20		T. Levi
10/02/2001	1155	6.59	747	9	N/A	6.20		T. Levi
10/11/2001	1530	6.70	704	7	N/A	6.10		M. Schilling

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1030	N/A	487	5	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	470	4	N/A	6.91		YBI/Sanders
09/13/2001	0830	N/A	760	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	331	11	N/A	6.05		YBI/Sanders
09/26/2001	1320	6.00	1,003	103	N/A	6.10		T. Levi
10/02/2001	1225	5.88	406	9	N/A	6.10		T. Levi
10/11/2001	1545	6.00	430	10	N/A	6.00		M. Schilling

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

CH2M HILL DAILY SUMMARY

Day/Date:	**Friday/10-12-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 87 degrees F**

Activity: Packer Testing **Bit Size:** 12.25-inches
Starting Depth: 1,970 feet bpl **Ending Depth:** 2,000 feet bpl

Time	Description
0000	Collection of background data in preparation of the packer pump test on the interval of 1,950 to 2,000 feet below pad level (bpl) continues.
0320	Stop collecting background data and start packer pump test at a pumping rate of 85 gpm. Initial flowmeter totalizer reading is 1,215,400 gallons.
0500	Leave the site. The Contractor will continue to monitor the packer pump test.
1045	Return to site. Analyze water samples collected by the Contractor. Based on analysis, decision is made to stop test and move packer assembly to 1,970 feet bpl.
1130	Test stopped and the Contractor starts bleeding off the packer inflation pressure.
1215	Test pump is removed and Contractor starts preparing to move packer assembly.
1300	Contractor has added 20 feet to the packer stem, bringing the depth of the centerline of the packer element to 1,970 feet bpl. Start installing the test pump into the packer stem.
1430	Test pump installed to a depth of 247 feet below the top of the packer stem. The packer is inflated to 415 psi. The Contractor is in the process of removing water produced during the earlier packer pump test from the pits and the drill pad in order to start the next test.
1640	Start developing test zone.
1830	Stop developing and start preliminary packer pump test.
1920	Stop pumping. Final pump rate was 65 gpm. Water sample collected at end of test and field analyzed for conductivity – Conductivity = 16,200 *u*mhos. Well being allowed to recover before the start of the background data collection. Contractor is setting up a pipeline to the lined pond at the site for the water produced during the packer pump test.
1930	Leave site for dinner.
2000	Return to site. Start collecting background data.
2200	Stop collecting background and start packer pump test. Pumping rate is 60 gpm.
2330	Leave the site for the day. The Contractor will continue to monitor the pump test.

Recorded By: Mark Schilling Date: 10/12/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Saturday/10-13-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 87 degrees F**

Activity: Packer Testing
Bit Size: 12.25-inches
Starting Depth: 1,970 feet bpl
Ending Depth: 2,000 feet bpl

Time	Description
1120	Arrive at site. The packer pump test is still continuing. Pumping rate is steady at 60 gpm. Field analysis of samples collected after 6 hours and 12 hours pumping time = 6-hour pump time has a conductivity of 16,190 *u*mhos and 12-hour pump time has a conductivity of 16,080 *u*mhos.
1345	Leave site. Contractor will continue to monitor packer pump test.
2100	Return to site. Pump test is continuing. Field analysis of samples collected after 18 hours pumping time = 16,090 *u*mhos.
2200	Stop pump test after collecting water quality samples for laboratory analysis. Start 2-hour recovery data collection.
2230	Leave site for the day. The Contractor will monitor the recovery period and then remove test pump and packer assembly from the well.

Recorded By: Mark Schilling
Date: 10/13/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Sunday/10-14-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 87 degrees F**

Activity: No Activity
Starting Depth: N/A

Bit Size: N/A
Ending Depth: N/A

Time	Description
	No activity at the site

Recorded By: Mark Schilling

Date: 10/14/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Monday/10-15-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 87 degrees F**

Activity: Backplugging Pilot Hole
Bit Size: 12.25-inches
Starting Depth: 1,970 feet bpl
Ending Depth: 2,000 feet bpl

Time	Description
0830	Arrive at site. The Contractor is preparing for the backplugging of the pilot hole prior to reaming. A total of 1,980 of 2.875-inch tremie pipe has been installed with the bottom of the tremie string at 1,973 ft below pad level (bpl).
0935	Start backplugging the pilot hole, using 12% bentonite cement with calcium chloride additive.
1050	Stop backplugging. A total of 292 barrels of 12% bentonite cement was pumped, followed by 4 barrels of fresh water as chase. Contractor starts removing tremie pipe to bring the bottom of the string into the casing.
1215	Leave site for lunch.
1315	Return to site.
1350	Top of cement tagged at 1,150 feet bpl. Contractor starts preparing for 2nd stage of backplugging pilot hole.
1430	Start 2nd stage, using 12% bentonite cement with calcium chloride additive.
1450	Stop the 2nd stage. A total of 77 barrels of 12% bentonite cement was pumped, followed by 4 barrels of fresh water as chase. Contractor starts removing tremie pipe to bring the bottom of the string into the casing.
1810	Top of cement tagged at 960 feet bpl. Contractor starts removing the tremie string from the well.
1830	Leave site for the day.

Recorded By: Mark Schilling
Date: 10/15/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Tuesday/10-16-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 87 degrees F**

Activity: Reaming
Starting Depth: 930 feet bpl

Bit Size: 28.5-inches
Ending Depth: 1,457 feet bpl

Time	Description
	The Contractor is reaming to a nominal 30-inches in diameter. Starting depth is 930 feet below pad level (bpl) and by the end of the day, a depth of 1,457 feet bpl was reached.

Recorded By: Mark Schilling

Date: 10/16/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Wednesday/10-17-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 87 degrees F**

Activity: Reaming
Bit Size: 28.5-inches
Starting Depth: 1,457 feet bpl
Ending Depth: 1,729 feet bpl

Time	Description
	The Contractor is reaming to a nominal 30-inches in diameter. Starting depth is 1,457 feet below pad level (bpl) and by the end of the day, a depth of 1,729 feet bpl was reached.

Recorded By: Mark Schilling
Date: 10/17/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Thursday/10-18-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Mostly Cloudy, ~ 83 degrees F**

Activity: Reaming
Bit Size: 28.5-inches
Starting Depth: 1,729 feet bpl
Ending Depth: 1,901 feet bpl

Time	Description
1030	Arrive at site for monthly progress meeting. The Contractor is reaming the pilot hole to a nominal 30-inch diameter. The reaming is currently at a depth of 1,800 feet below pad level (bpl).
1100	Progress meeting begins.
1215	Progress meeting ends.
1315	David Xavier of LBFH leaves the site after conducting a site inspection.
1430	Leave the site for the day after the collection of the shallow pad monitor well water quality samples.

Recorded By: Mark Schilling
Date: 10/18/01

Daily Operations Report Form

Job Number: _____ Well Number: IW #1 Lead Driller: W. Fargo Shift: Nights

Superintendent: Jim Brantley Thur Date: 10-11-01 Rig Number: 411

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900			Rig up submersible pump, pull airline and run pump, do pre-limenary test For packer test

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Bore Fluid Type	Bore Fluid

Type	Bottom Depth	Diameter	Slots
Type	Bottom To	Diameter	Slots

Notes

Beginning Meter Reading
012456.00

Stage Number: _____ Tag: _____ Feet

Bore Fluid Type	Bore Fluid

Type	Bottom Depth	Diameter	Slots
Type	Bottom To	Diameter	Slots

Notes

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl initials
1900	5700	12	W. Fargo						
		12	Shawn Perez						
		12	E. Rivas	E					
		12	Robert McGinnis	RMC					

Daily Operations Report Form

Job Number: _____ Well Number: IW #1 Superintendent: Jim Beattie Lead Driller: Ty Blascock Rig Number: 41 Date: 10-11-01 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
7:00	12:00	5	flow testing
12:00	5:00	3	Pull Tubing and pump From well Pick up DP Lay Down 1-10FT PJ
7:00	4:00	1	Pump And Tubing back in Well
			move Parker Down 20 To 1970 24 std 140 sig/c 3 AP

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
07:00	19:00	12	Dixon mcclellan						
/		12	Larry Blascock	LB			12		
/	10:30	3½	Jake L. Amador	JLA			3½		
/	10:30	3½	Randall Scott Young	RSY			3½		
/	10:30	3½	Dan Kosel	DK			3½		
/		12	Michael Dennis	MD			12		

Cement Stage Data

Stage Number: _____ Tag: _____ Feet

Bottom Plug Float	Top Plug Float

Type	Sacks/Yield	Slurry	Slurry

Type	Sacks/Yield	Slurry	Slurry

Notes

flow Meter Reading
Start 11940

Stage Number: _____ Tag: _____ Feet

Bottom Plug Float	Top Plug Float

Type	Sacks/Yield	Slurry	Slurry

Type	Sacks/Yield	Slurry	Slurry

Notes

Daily Operations Report Form

Rig Number: 411

Superintendent: Jimmy Brantley Date: 12-13-0

Job Number: _____ Well Number: IW #1 Lead Driller: Wayne Fargo Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Packer Test #1

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	WAYNE FARGO						
		12	SHAWN CERECERES	SC.					
		12	Ed Rivas	ER					
		12	Robert Mcclintic	BMC					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Bottom Stage Depth	Stage Depth

Type	Bottom Top	Cmt Vol	Sacks

Type	Bottom Top	Cmt Vol	Sacks

Notes

Stage Number: _____ Tag: _____ Feet

Bottom Stage Depth	Stage Depth

Type	Bottom Top	Cmt Vol	Sacks

Type	Bottom Top	Cmt Vol	Sacks

Notes

Daily Operations Report Form

Rig Number: 41

Superintendent: Jimmy Brantley

Date: 10-13-01

Job Number: _____ Well Number: IW #1 Lead Driller: Larry Blocker

Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
7:00	19:00	12	Packer Test #1

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
07:00	19:00	12	Dixon McClellan	D.M					
		12	Larry Blocker						
		12	Michael Dennis						
		4	Joel McRacine						
		4	Target Anadrill						

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Bump Plug Psig | Bump Psig

Time | Barrels Away | Shift | Rocks

Rate | Barrels To | Shift | Sacks

Notes

Stage Number: _____ Tag: _____ Feet

Bump Plug Psig | Bump Psig

Time | Barrels Away | Shift | Sacks

Rate | Barrels To | Shift | Sacks

Notes

Daily Operations Report Form

Job Number: Immokalee Well Number: IW #1 Superintendent: Jim Brantley Lead Driller: W. FARGO Rig Number: 411 SAT Date: 10-13-11 Shift: Night's

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	00:00	5	Packer test & Recovery
00:00	07:00	7	POOH. W/Packer & RIH W/ 32 Stands 2 3/8 TBG.

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	W. Fargo						
	700	12	S. Cerecerez						
	700	12	G. Rivas	GR					
	700	12	B. McClinnis	BMC					
	800	13	R. S. Townley	RST					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Bottom Plug Depth | Bottom Plug Depth

Type | Sacks Used | Slurry Wt. | Slurry Yield

Type | Sacks Used | Slurry Wt. | Slurry Yield

Notes

Stage Number: _____ Tag: _____ Feet

Bottom Plug Depth | Bottom Plug Depth

Type | Sacks Used | Slurry Wt. | Slurry Yield

Type | Sacks Used | Slurry Wt. | Slurry Yield

Notes

Daily Ope is Report Form

Rig Number: 411

Job Number: Imperial Valley Well Number: IW #1 Superintendent: Jim Brantley Lead Driller: LB Hancock Date: 10-15-01 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
7:00	9:00	2	Pick up Cement Truck
9:00	9:30	½	Safety Meeting
9:30	11:00	1½	cement pallet hole 1st Stage
11:00	2:00	3	WOC
2:00	3:00	1	Cement pallet hole 1st Stage
3:00	6:30	3½	WOC
6:30	7:00	½	Tag Cement Lay Down Tubing

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
7:00	7:00	12	Dixon McClellan	D.M					
/	/	12	Jason M Racine	JR					
/	/	12	Michael Dennis	MD					
/	/	12	LA Hancock	LH					
/	/	12	JORGE C. AMADOR	JA					
/	/	12	Chuck Cuba	CC					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Stage Number: _____ Tag: _____ Feet

Notes

Daily Operations Report Form

Job Number: Juunkeler Well Number: Ind #1 Superintendent: J. Brantley Rig Number: 411
Lead Driller: J. Fargo Mon Date: 10-15-01 Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Rig down tbg tools and well head down pick up Bit & stabilizer
			sand seal well head change rubber & KTH
			Drill cement f/923' to990' circ hole clean sand sweep & take core @ 990'

Production Recap
Beginning Borehole Footage: 923' Ending Borehole Footage: 991 Reamed Size: 28" Footage: Casing Size: Footage:

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Emp Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	W 12	W. Fargo	WF					
		12	S Covarrubias						
		12	E. Rivas	ER					
		12	R Mcclanic	RMC					
		12	R.C. Trumley	RCT					

Cement Stage Records

Stage Number: Tag: Feet

Bring Pit Fluid | Bring Mud | Type | Excess Lost | Wash | Swivel | Type | Excess | Wash | Swivel

Notes

Stage Number: Tag: Feet

Bring Pit Fluid | Bring Mud | Type | Excess Lost | Wash | Swivel | Type | Excess | Wash | Swivel

Notes

993

Daily Opera **Report Form**

Rig Number: 411

Superintendent: Jimmy. B

Job Number: Immokalee Well Number: IW #1 Lead Driller: Dixon. M

Date: 10-16-01 Shift: Day/S

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00	1900	12	Drlg Cement @ 990 -
			Fuel 38"

Production Recap

Beginning Borehole Footage: 991 Ending Borehole Footage: 1230 Reamed Size: _____ Footage: 239 Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
07:00	1900	12	Dixon McClellan						
		12	LR Glascock						
		12	Michael Dennis	MD					
		12	JORGE L. AMADOR	JCA					

Cement Stage Records

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Daily Operations Report Form

Job Number: Immokalee Well Number: IW#1 Superintendent: Jimmy Brantley Lead Driller: W. Fargo Rig Number: 411 Date: 12-16-01 Tue Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Drill F/1230'

Production Recap

Beginning Borehole Footage: 1230' Ending Borehole Footage: 1451' Reamed Size: 28" Footage: 220 Casing Size: 30" Footage: 930'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	W. Fargo						
		12	S. Cerecerez						
		12	R McInnis	BMC					
		12	E Rivas	ER					
19:00		12	R S Townley	RST					

Cement Stage Records

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Daily Op ons Report Form

Rig Number: _____ Cement Stag orts

Superintendent: _____ Date: 10-17-01 Stage Number: _____ Tag: _____ Feet

Job Number: Immokalee Well Number: IWI Lead Driller: Tribble Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700	1900	12	Drl 1450' 1578' ser Rig + Equipment

Stage Number: _____ Tag: _____ Feet

Production Recap

Beginning Borehole Footage: 1450 Ending Borehole Footage: 1578 Reamed Size: _____ Footage: _____ Casing Size: 30" Footage: 930'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours
	28½														

Time From	Time To	Total Hours	Employee Name	Emp Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	1900	12	Dixon McClellan	D.M					
		12	LR Glascock	LG					
		12	Michael Dennis	MD					
		12	Jorge C. Amador	JCA.					

Notes

Daily Operations Report Form

Job Number: Immokalee Well Number: IW#1 Superintendent: Jim Brantley Lead Driller: W. Fargo Rig Number: 411 WED Date: 10-17-21 Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Drlg f/1578' to 1729

Production Recap

Beginning Borehole Footage: 1578 Ending Borehole Footage: 1729 Reamed Size: 28 Footage: _____ Casing Size: 30" Footage: 930'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	W. Fargo						
"		12	S. Cerecerez						
"		12	E Rums	ER					
		12	R McClung	RMc					
1900	0700	12	R. S. Townley	RST					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Bulk Mix Start | Bulk Mix Finish | Cmt | Bbls Lost | Cmt | Bbls

Stage Number: _____ Tag: _____ Feet

Bulk Mix Start | Bulk Mix Finish | Cmt | Bbls Lost | Cmt | Bbls

Notes

Serviced Rig & Conn.

Notes

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0900	N/A	512	13	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	550	33	N/A	6.26		YBI/Sanders
09/13/2001	0830	N/A	540	9	N/A	6.82		YBI/Sanders
09/19/2001	1230	N/A	396	15	N/A	6.41		YBI/Sanders
09/26/2001	1340	6.75	420	9	N/A	6.40		T. Levi
10/02/2001	1215	6.68	509	19	N/A	6.40		T. Levi
10/11/2001	1500	7.40	493	20	N/A	6.50		M. Schilling
10/18/2001	1345	7.10	517	23	N/A	6.80		M. Schilling

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0930	N/A	599	30	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	780	13	N/A	6.72		YBI/Sanders
09/13/2001	0830	N/A	490	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	415	22	N/A	6.22		YBI/Sanders
09/26/2001	1310	3.50	440	26	N/A	6.40		T. Levi
10/02/2001	1205	3.62	524	39	N/A	6.40		T. Levi
10/11/2001	1515	3.20	536	26	N/A	6.40		M. Schilling
10/18/2001	1330	3.50	542	22	N/A	6.80		M. Schilling

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1100	N/A	685	9	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	490	16	N/A	6.59		YBI/Sanders
09/13/2001	0830	N/A	550	10	N/A	6.74		YBI/Sanders
09/19/2001	1230	N/A	646	15	N/A	6.22		YBI/Sanders
09/26/2001	1330	6.67	720	8	N/A	6.20		T. Levi
10/02/2001	1155	6.59	747	9	N/A	6.20		T. Levi
10/11/2001	1530	6.70	704	7	N/A	6.10		M. Schilling
10/18/2001	1400	6.90	665	9	N/A	6.40		M. Schilling

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1030	N/A	487	5	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	470	4	N/A	6.91		YBI/Sanders
09/13/2001	0830	N/A	760	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	331	11	N/A	6.05		YBI/Sanders
09/26/2001	1320	6.00	1,003	103	N/A	6.10		T. Levi
10/02/2001	1225	5.88	406	9	N/A	6.10		T. Levi
10/11/2001	1545	6.00	430	10	N/A	6.00		M. Schilling
10/18/2001	1415	6.20	445	10	N/A	6.10		M. Schilling

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

CH2M HILL DAILY SUMMARY

Day/Date:	**Friday/10-19-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Cloudy w/Occasional Heavy Rain, ~ 80 degrees F**

Activity: Preparations to Install 22-inch Casing
Bit Size: 28.5-inches
Starting Depth: N/A
Ending Depth: N/A

Time	Description
1230	Arrive at site. Contractor is in the process of removing the drill bit and string from the reamed borehole. The borehole was reamed to a depth of 2,005 feet below pad level.
1330	Leave site for lunch.
1415	Return to site.
1530	Bit removed from borehole. Contractor starts setting up to conduct a caliper log using their own logging equipment.
1630	Decision made by Contractor to postpone the installation of the 22-inch casing until Monday, 10-22, morning due to inclement weather. The Contractor will finish conducting the caliper geophysical log, however will conduct another one prior to the start of the casing installation.
1645	Leave the site for the day.

Recorded By: Mark Schilling
Date: 10/19/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Saturday/10-20-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Mostly Cloudy, ~ 85 degrees F**

Activity: No Activity
Starting Depth: N/A

Bit Size: N/A
Ending Depth: N/A

Time	Description
	There was no activity at the site.

Recorded By: Mark Schilling

Date: 10/20/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Sunday/10-21-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Mostly Cloudy, ~ 85 degrees F**

Activity: Conditioning Reamed Pilot Hole
Bit Size: 28.5-inches
Starting Depth: 0 feet bpl
Ending Depth: 2,005 feet bpl

Time	Description
	The Contractor conducted wiper passed on the reamed pilot hole in preparation of the installation of the 22-inch casing.

Recorded By: Mark Schilling

Date: 10/21/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Monday/10-22-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Cloudy, ~ 85 degrees F**

Activity: Installation of 22-inch Casing
Bit Size: 28.5-inches
Starting Depth: 0 feet bpl
Ending Depth: 1,563 feet bpl

Time	Description
0545	Arrive at site. Contractor starts conducting a caliper geophysical log on the reamed borehole, using their own equipment.
0645	Caliper logging completed. Contractor starts preparing to install the 22-inch steel casing.
0715	Casing installation starts.
1215	Tracy Levi of CH2M HILL arrives at site.
1230	Leave site for lunch.
1325	Return to site.
1345	M. Schilling leaves the site.
2330	M. Schilling returns to site.
2400	T. Levi leaves the site for the day. Casing installation continues. A total of 1,563 feet of casing has been installed.

Recorded By: Mark Schilling
Date: 10/22/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Tuesday/10-23-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Cloudy, ~ 85 degrees F**

Activity: Installation of 22-inch Casing
Bit Size: 28.5-inches
Starting Depth: 1,563 feet bpl
Ending Depth: 2,000 feet bpl

Time	Description
0000	Casing installation continues.
0450	22-inch steel casing installed to a depth of 2,000 feet below pad level. The Contractor starts preparing for the pressure grouting of the casing.
0625	Leave site for breakfast.
0645	Return to site.
0930	Start pressure grouting of casing.
1045	1st stage of cementing casing completed. A total of 239 barrels of 4% bentonite cement and 92 barrels of neat cement was pumped, followed by 9 barrels of fresh water as chase. The well is sealed in to allow the cement to cure.
1130	Leave site for lunch.
1700	Return to site.
1800	Contractor's geophysical logging equipment arrives at the site to conduct a temperature log for the 1st stage of cementing the casing.
1810	Tracy Levi arrive at site.
1830	Contractor starts removing the tremie pipe from inside the casing, after completing rig repairs.
1945	Tremie pipe removed. Start temperature logging.
2100	Temperature logging completed. Contractor starts installing 2.875-inch tremie pipe into the annular space.
2250	Top of cement pumped during 1st stage is tagged at 1,445 feet bpl.
2305	Start 2nd stage of cementing casing.
2345	2nd stage completed. A total of 203 barrels of 4% bentonite cement was pumped followed by 4.5 barrels of fresh water as chase.
2400	Tracy Levi and M. Schilling leave the site for the day.

Recorded By: Mark Schilling
Date: 10/23/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Wednesday/10-24-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 88 degrees F**

Activity: Cementing of 22-inch Casing
Bit Size: 28.5-inches
Starting Depth: 1,445 feet bpl
Ending Depth: 0 feet bpl

Time	Description
0715	Arrive at site.
0725	Contractor's geophysical logging equipment arrives at the site to conduct a temperature log for the 2nd stage of cementing the casing.
0800	Start temperature logging.
0815	Tracy Levi of CH2M HILL arrives at site.
0835	Temperature logging completed. Contractor starts installing 2.875-inch tremie pipe into the annular space.
0905	Top of cement pumped during 2nd stage is tagged at 1,118 feet bpl. Decision made to pump 12% bentonite cement due to losses in formation.
0950	Start 3rd stage of cementing casing.
1030	3rd stage completed. A total of 260 barrels of 12% bentonite cement was pumped followed by 3 barrels of fresh water as chase.
1115	T. Levi and M. Schilling leave the site.
1630	Return to site.
1710	The Contractor starts setting up to conduct a temperature geophysical log for the 3rd stage of cementing the casing, using their own equipment.
1720	Start temperature logging.
1730	T. Levi returns to site.
1805	Temperature logging completed. Contractor starts installing 2.875-inch tremie pipe into the annular space.
1840	Top of cement pumped during 3rd stage is tagged at 830 feet bpl. Contractor starts preparing for 4th stage.
1905	Start 4th stage.
1945	4th stage completed. A total of 287 barrels of 12% bentonite cement was pumped. Cement returns were noted at surface. The Contractor starts removing the tremie pipe from the annulus.
1950	T. Levi leaves the site for the day.
2030	M. Schilling leaves the site for the day.

Recorded By: Mark Schilling
Date: 10/24/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Thursday/10-25-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Mostly Cloudy w/Occasional Rain, ~ 84 degrees F**

Activity: Pilot Hole Drilling
Bit Size: 12.25-inches
Starting Depth: 2,000 feet bpl
Ending Depth: 2,010 feet bpl

Time	Description
2030	Arrive at site. Contractor is in the process of installing the 12.25-inch drill bit to resume pilot hole drilling from the base of the 22-inch casing at 2,000 feet below pad level.
2230	Pilot hole drilling resumes.
2400	Pilot hole drilling continues

Recorded By: Mark Schilling
Date: 10/25/01

Daily Operations Report Form

Job Number: Immokalee Well Number: IW #1 Superintendent: Jimmy Brantley Lead Driller: Wayne Fargo Rig Number: 411 Date: 10-15-01 Thurs Shift: NIGHT

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Drill f/1901' to 2,005' clean up hole make wiper trip to casing & Back to Btm

Production Recap

Beginning Borehole Footage: 1901 Ending Borehole Footage: 2005 Reamed Size: 28" Footage: 104' Casing Size: 7" Footage: 930'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	W. FARGO	WF					
		12	S. CERFCERFZ	SC					
		12	R. McCLINNIS	RMc					
		12	F. RIVAS	FR					
		12	R.S TOWNLEY	RST					

Cement Stage Reports

Stage Number: ____ Tag: ____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

1

Stage Number: ____ Tag: ____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

1511' Ridge Middle of std # 19

Daily Operatio[n] Report Form

Rig Number: 411

Job Number: Immanuley Well Number: IW #1 Superintendent: Jimmy Brantley Lead Driller: LP Blanch Date: 10-18-01 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700	10:00	~~3~~ 3:00	Finish picking Hwdpe, circ + cond
10:00	11:30	1½	Mix up 10 bbls Kill mud
11:30	12:30	1	Kill DP
12:30	13:30	1	Pull air Tubing
13:30	1430	1	Kill annular
14:30	~~1700~~	~~2½~~	Pull out hole
17:00	~~17:00~~	4	Rig up Losing truck Calb Log
~~1730~~	19:00	3	Rig Down truck Trip in BHA

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	~~1900~~	12	Dixon McClellan	~~DM~~					
		12	LP Blanch	LPB					
		12	Michael Dennis	MD					
		12	Curt Cash	CC					
		12	JORGE L. AMADOR	~~JLA~~					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

-1 = 17

Daily Operations Report Form

Rig Number: 411

Superintendent: _____ Date: 1020.01

Job Number: _____ Well Number: _____ Lead Driller: _____ Shift: _____

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
7:01	7:00	12	Cleaning Mud TAnK

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
7:11	7:00	12	Michael Dennis	MD					
7:00	19:00	12	Rob Bertnicc Linnis	RMC					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Daily Operation Report Form

Job Number: Emmakalee Well Number: IW#1 Superintendent: Brantley Lead Driller: W. Fargo Rig Number: 411 Date: 10-21-01 Shift: Night Sun

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900			RTH To Btm, Circ hole clean p.o.o.h.
			Brk Bit & Stab lay down same, monitar well & Rig up to log & Run casing

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0600	14	W. Fargo						
"	"	14	S. Corecerez						
"	"	14	R. McClinic	RM					
"	"	14	E. Rivas						
1900		14	R. S. Townley	RST					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush		
Type	**Barrels Lead**	**CuFt**	**Sacks**
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush		
Type	**Barrels Lead**	**CuFt**	**Sacks**
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Daily Operations Report Form

Job Number: Immokalee Well Number: IOU #1 Superintendent: Jimmy Brown Lead Driller: LR Glascock Rig Number: 411 Date: 10.22.01 Shift: DAY

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00	17:00	12	Running 22" Casing 28 Jts, 1114 ft.

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
08:00	17:00	13							
		13	LR Glascock	LG					
		13	Michael Dennis	MD					
		13	~~JORGE L. AMADOR~~	~~JLA~~					
			Curt Carlson	CC					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Daily Operations Report Form

Job Number: Iowaoklee Well Number: IW #1 Superintendent: J. Brantley Rig Number: 411

Lead Driller: Wayne Fargo Date: 10-28-01 Mon Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0		Run 22' casing, seal header & Run 2 3/8 TBG

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	W. Fargo	WF					
	0730	12½	S. Cerecerez						
	0730	12½	E. Rivas	ER					
	0830	13½	R. McClinnis	RMC					
	0730	12½	R.S. Townley						

Cement Stage Reports

Stage Number: _____ _____ Feet

Type	Barrels Used	Cuft	Sacks

Type	Barrels Used	Cuft	Sacks

Notes

Stage Number: _____ Tag: _____ Feet

Slurry Wgt. Ppg	Slurry Yield

Type	Barrels Used	Cuft	Sacks

Type	Barrels Used	Cuft	Sacks

Notes

Daily Operations Report Form

Job Number: Immokalee Well Number: IW #1 Superintendent: Jim Brantley Lead Driller: Larry Glascock Rig Number: 411 Date: 10-23-01 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00	08:00	1	WOC Run in 45# 1 Singal
08:00	09:00	1	Rig up Logging truck run temp Log
09:00	11:00	2	Pickup Tubing Tag cement @ Rig up to Cement Pull 10 Std
11:00	15:00	4	WOC
15:00	16:00	1	Rig up Logging truck run temp Log
16:00	17:00	1	pick up tubing to Tag cement

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush		Barrel Flush	

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush		Barrel Flush	

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
07:00	20:00	13	Dixon McClellon	DM					
07:00	19:00	12	LR Glascock						
1	1	12	Michael Dennis						
		12	~~JORGE L. AMADO~~	JA					
07:00	20:00	13	Curt Carter	CC					

Daily Operati Report Form

Job Number: Immokalee Well Number: IW#1 Lead Driller: Wayne Fargo Shift: Night

Superintendent: JIM Brantley Rig Number: 411

Date: 10-23-0 Tue

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
19:00			P.O.O.H. w/ 2 7/8 Tubing, Rig up & Run Temp Survey, Run TBg down Anulus
			make tag & pump 200 BBL's cement, Pull 9-DP's flush & pull TBg Hig
	0700	12	W.O.C.

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: 22" Footage: 2000'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
19:00	07:00	12	W. Fargo	WF					
		12	S. Cererecerez	SC					
		12	R. McGinnis	RMC					
		12	E. Rivas	ER					
		12	R. S. Townley	RST					

Cement Stage Re

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Daily Operations Report Form

Job Number: Immokalee Well Number: IW #1

Superintendent: Jim Brantley Lead Driller: LR Blaycock

Rig Number: 411 Date: 10-24-01 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
7:00	9:00	2	Logging (Temp)
9:00	10:00	1	TAgging Cement AT 1,118 Feet - Pumping Cement
10:00	1:00	3	Logging (Temp
1:00	7:00	6	Tagging Cement AT 830 Feet

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	19:00	12	LR Blaycock	LB	12				
			Michael Dennis	MD	12				
			Curt Carlson	CC	12				
			Jorge L Aurrot	JA	12				

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush		Barrel Flush	

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush		Barrel Flush	

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Daily Operations Report Form

Job Number: Immokalee Well Number: IW#1 Superintendent: Jim Brantley Lead Driller: W. Fargo Rig Number: 411 Date: 10-24-01 WED Shift: Nights

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Rig up & pump cement, P.n.n.H W/TBG & W.O.C. clean pad & down load core pump

Cement Stage Re

Stage Number: Tag: Feet

Notes

Stage Number: Tag: Feet

Production Recap

Beginning Borehole Footage: Ending Borehole Footage: Reamed Size: Footage: Casing Size: Footage:

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1000	0700	12	WAYNE FARGO	WF					
		12	S. Cerecerez						
		12	R. McClinnis	RMC					
		12	E. Rivas	ER					
		12	R.S. Townley						

Notes

Daily Operations Report Form

Job Number: Immokalee Well Number: TW #1 Superintendent: Jim Beantley Lead Driller: Larry Glascock Rig Number: 411 Date: 10-25-01 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00	1500	4	WOC
15:00	17:00	2	Cut off 22' in stall Rig Water
17:00	19:00	2	Start in hole w/ 12¼ Bit

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Emp Initials	Time From	Time To	Total Hours	Employee Name	Emp Initials
19:00	19:00	12	LR Glascock	LG					
		12	Michael Dennis	MD					
		12	Jorge L Arroyo	JA					
		12	Curt Carlson	CC					

Current Stage Reports

Stage Number: _____ Tag: _____ Feet

Bore Dia Begin | Bore Dia End | Start | Finish | Cut | Ream | Start | Finish

Notes

Stage Number: _____ Tag: _____ Feet

Bore Dia Begin | Bore Dia End | Start | Finish | Cut | Ream | Start | Finish

Notes

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0900	N/A	512	13	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	550	33	N/A	6.26		YBI/Sanders
09/13/2001	0830	N/A	540	9	N/A	6.82		YBI/Sanders
09/19/2001	1230	N/A	396	15	N/A	6.41		YBI/Sanders
09/26/2001	1340	6.75	420	9	N/A	6.40		T. Levi
10/02/2001	1215	6.68	509	19	N/A	6.40		T. Levi
10/11/2001	1500	7.40	493	20	N/A	6.50		M. Schilling
10/18/2001	1345	7.10	517	23	N/A	6.80		M. Schilling
10/25/2001	1610	7.20	502	21	N/A	6.81		M. Schilling

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0930	N/A	599	30	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	780	13	N/A	6.72		YBI/Sanders
09/13/2001	0830	N/A	490	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	415	22	N/A	6.22		YBI/Sanders
09/26/2001	1310	3.50	440	26	N/A	6.40		T. Levi
10/02/2001	1205	3.62	524	39	N/A	6.40		T. Levi
10/11/2001	1515	3.20	536	26	N/A	6.40		M. Schilling
10/18/2001	1330	3.50	542	22	N/A	6.80		M. Schilling
10/25/2001	1630	4.30	500	25	N/A	6.60		M. Schilling

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1100	N/A	685	9	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	490	16	N/A	6.59		YBI/Sanders
09/13/2001	0830	N/A	550	10	N/A	6.74		YBI/Sanders
09/19/2001	1230	N/A	646	15	N/A	6.22		YBI/Sanders
09/26/2001	1330	6.67	720	8	N/A	6.20		T. Levi
10/02/2001	1155	6.59	747	9	N/A	6.20		T. Levi
10/11/2001	1530	6.70	704	7	N/A	6.10		M. Schilling
10/18/2001	1400	6.90	665	9	N/A	6.40		M. Schilling
10/25/2001	1550	7.10	698	8	N/A	6.23		M. Schilling

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1030	N/A	487	5	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	470	4	N/A	6.91		YBI/Sanders
09/13/2001	0830	N/A	760	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	331	11	N/A	6.05		YBI/Sanders
09/26/2001	1320	6.00	1,003	103	N/A	6.10		T. Levi
10/02/2001	1225	5.88	406	9	N/A	6.10		T. Levi
10/11/2001	1545	6.00	430	10	N/A	6.00		M. Schilling
10/18/2001	1415	6.20	445	10	N/A	6.10		M. Schilling
10/25/2001	1640	6.40	428	9	N/A	6.10		M. Schilling

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

CH2M HILL DAILY SUMMARY

Day/Date:	**Friday/10-26-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Mostly Cloudy w/Occasional Rain, ~ 84 degrees F**

Activity: Pilot Hole Drilling & Coring
Bit Size: 12.25-inches
Starting Depth: 2,010 feet bpl
Ending Depth: 2,066 feet bpl

Time	Description
0000	Pilot hole drilling continues.
0300	Pilot hole drilling reaches a depth of 2,054 feet bpl start tripping out drill bit to collect a core sample.
0830	Drill bit removed from well.
0930	Start installing 4-inch core barrel.
1305	Start coring from 2,054 feet bpl.
1355	Stop coring at 2,066 feet bpl. Start removing core barrel.
1400	Leave site for lunch.
1430	Return to site.
1610	Core barrel is removed from well. A total of 4 feet of core was retrieved with the largest piece of material being approximately 18 inches in length.
1700	Leave the site for the day.

Recorded By: Mark Schilling
Date: 10/26/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Saturday/10-27-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Mostly Cloudy w/Occasional Rain, ~ 84 degrees F**

Activity: No Activity
Bit Size: N/A
Starting Depth: N/A
Ending Depth: N/A

Time	Description
	No activity at the site

Recorded By: Mark Schilling

Date: 10/27/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Sunday/10-28-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Mostly Cloudy w/Occasional Rain, ~ 84 degrees F**

Activity: Pilot Hole Drilling
Starting Depth: 2,054 feet bpl

Bit Size: 12.25-inches
Ending Depth: 2,208 feet bpl

Time	Description
	The Contractor resumed pilot hole drilling from 2,054 feet below pad level (bpl).

Recorded By: Mark Schilling

Date: 10/28/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Monday/10-29-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 85 degrees F**

Activity: Pilot Hole Drilling and Coring
Bit Size: 12.25-inches
Starting Depth: 2,208 feet bpl
Ending Depth: 2,304 feet bpl

Time	Description
1140	Arrive at site. Contractor is in the process of removing the drill bit from the well in preparation of collecting a core sample. Current depth is 2,230 feet below pad level (bpl).
1145	Tracy Levi of CH2M HILL arrives at site.
1225	Start installing 4-inch core barrel.
1335	M. Schilling and T. Levi leave site for lunch.
1345	Return to site. Contractor still installing core barrel.
1510	Start coring from 2,230 feet bpl.
1625	Stop coring at 2,242 feet bpl. Start removing core barrel.
1850	Core barrel is removed from well. A total of 5 feet of core was retrieved with the largest piece of material being approximately 6 inches in length.
1900	M. Schilling and T. Levi leave site for the day. The Contractor will resume pilot hole drilling.

Recorded By: Mark Schilling
Date: 10/29/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Tuesday/10-30-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 80 degrees F**

Activity: Pilot Hole Drilling and Coring
Bit Size: 12.25-inches
Starting Depth: 2,304 feet bpl
Ending Depth: 2,380 feet bpl

Time	Description
0750	Arrive at site. Contractor is in the process of removing the drill bit from the well in preparation of collecting a core sample. Current depth is 2,306 feet below pad level (bpl).
1010	Start installing 4-inch core barrel.
1045	Leave site for lunch.
1145	Return to site. Contractor still installing core barrel.
1232	Start coring from 2,306 feet bpl.
1436	Stop coring at 2,318 feet bpl. Start removing core barrel.
1620	Core barrel is removed from well. A total of 10.5 feet of core was retrieved with the largest piece of material being approximately 1.5 feet in length.
1700	Leave site for the day. The Contractor will resume pilot hole drilling.

Recorded By: Tracy Levi
Date: 10/30/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Wednesday/10-31-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 80 degrees F**

Activity: Pilot Hole Drilling and Coring
Bit Size: 12.25-inches
Starting Depth: 2,380 feet bpl
Ending Depth: 2,467 feet bpl

Time	Description
1730	Arrive at site. Contractor has already installed 4-inch core barrel and is ready to collect core sample. Current depth of pilot hole drilling is 2,402 feet below pad level (bpl).
1800	Start coring from 2,402 feet bpl.
2030	Stop coring at 2,414 feet bpl. Start removing core barrel.
2210	Core barrel is removed from well. A total of 11 feet of core was retrieved with the largest piece of material being approximately 2.5 feet in length.
2245	T. Levi leaves site for the day. The Contractor will resume pilot hole drilling.

Recorded By: Tracy Levi
Date: 10/31/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Thursday/11-01-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 83 degrees F**

Activity: Pilot Hole Drilling and Coring
Bit Size: 12.25-inches
Starting Depth: 2,467 feet bpl
Ending Depth: 2,566 feet bpl

Time	Description
1155	Arrive at site. Contractor is continuing to drill pilot hole and the current depth is 2,505 feet below pad level (bpl).
1700	T. Levi leaves site for the day. Pilot hole drilling is currently at a depth of 2,545 feet bpl and will continue.

Recorded By: Tracy Levi
Date: 11/01/01

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0900	N/A	512	13	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	550	33	N/A	6.26		YBI/Sanders
09/13/2001	0830	N/A	540	9	N/A	6.82		YBI/Sanders
09/19/2001	1230	N/A	396	15	N/A	6.41		YBI/Sanders
09/26/2001	1340	6.75	420	9	N/A	6.40		T. Levi
10/02/2001	1215	6.68	509	19	N/A	6.40		T. Levi
10/11/2001	1500	7.40	493	20	N/A	6.50		M. Schilling
10/18/2001	1345	7.10	517	23	N/A	6.80		M. Schilling
10/25/2001	1610	7.20	502	21	N/A	6.81		M. Schilling
11/01/2001	1430	7.33	542	20	N/A	6.40		T. Levi

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0930	N/A	599	30	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	780	13	N/A	6.72		YBI/Sanders
09/13/2001	0830	N/A	490	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	415	22	N/A	6.22		YBI/Sanders
09/26/2001	1310	3.50	440	26	N/A	6.40		T. Levi
10/02/2001	1205	3.62	524	39	N/A	6.40		T. Levi
10/11/2001	1515	3.20	536	26	N/A	6.40		M. Schilling
10/18/2001	1330	3.50	542	22	N/A	6.80		M. Schilling
10/25/2001	1630	4.30	500	25	N/A	6.60		M. Schilling
11/01/2001	1410	3.50	564	53	N/A	6.50		T. Levi

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1100	N/A	685	9	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	490	16	N/A	6.59		YBI/Sanders
09/13/2001	0830	N/A	550	10	N/A	6.74		YBI/Sanders
09/19/2001	1230	N/A	646	15	N/A	6.22		YBI/Sanders
09/26/2001	1330	6.67	720	8	N/A	6.20		T. Levi
10/02/2001	1155	6.59	747	9	N/A	6.20		T. Levi
10/11/2001	1530	6.70	704	7	N/A	6.10		M. Schilling
10/18/2001	1400	6.90	665	9	N/A	6.40		M. Schilling
10/25/2001	1550	7.10	698	8	N/A	6.23		M. Schilling
11/01/2001	1420	7.25	700	8	N/A	7.00		T. Levi

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1030	N/A	487	5	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	470	4	N/A	6.91		YBI/Sanders
09/13/2001	0830	N/A	760	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	331	11	N/A	6.05		YBI/Sanders
09/26/2001	1320	6.00	1,003	103	N/A	6.10		T. Levi
10/02/2001	1225	5.88	406	9	N/A	6.10		T. Levi
10/11/2001	1545	6.00	430	10	N/A	6.00		M. Schilling
10/18/2001	1415	6.20	445	10	N/A	6.10		M. Schilling
10/25/2001	1640	6.40	428	9	N/A	6.10		M. Schilling
11/01/2001	1400	6.33	476	10	N/A	6.20		T. Levi

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

Daily Operations Report Form

Job Number: Immokalee Well Number: IW#1 Superintendent: Jim Brantley/Ronnie Lead Driller: W. FARGO Rig Number: 411 Thurs Date: 10-25-01 Thur Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	change rubbers & RIH Tag cement @ 1994'
			Drlg out cement and cont. to drill to 2054
			T.O.O.H to D.C. mix & K.H well

Production Recap

Beginning Borehole Footage: 2000' Ending Borehole Footage: Reamed Size: 12¼ Footage: Casing Size: 22" Footage: 2000'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Emp Initials	Time From	Time To	Total Hours	Employee Name	Emp Initials
1900	0800	13	W. FARGO						
	730	12½	S. Cerecerez						
	730	12½	E. Rivas						
	730	12½	R. McClinnin						
1900	730	12½	R.S. Townley						

Cement Stage Reports

Stage Number: Tag:

Stage Number: Tag: Feet

Daily Operatir Report Form

Job Number: Jamokee Well Number: IW #1 Superintendent: Jim Brantley Perris Lead Driller: LR Hancock Rig Number: 411 Date: 10-26-01 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
01:00	09:30	2½	Kill Well Pull out hole
09:30	12:30	3	Pick up core bbl check over bbl Trip in hole
12:30	11:00	½	circ Drop ball
11:00	14:00		Core #1 @ 2078 to 2083
14:00	16:00	2	Pull out hole Rec 4' of core
16:00			Pick up Bit BHA in hole Put Kelly hose on
			Trip in hole

Cement Stage Reports

Stage Number: Tag: Feet

Stage Number: Tag: Feet

Production Recap

Beginning Borehole Footage: Ending Borehole Footage: Reamed Size: Footage: Casing Size: Footage:

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	1900	12	LR Hancock	LRH	12				
		12	Michael Dennis	MD	12				
		12	Curt Carlson	CC	12				
		12	Tommy RANELLS	TR	12				
		12	ALLEN W. KELLEY	AWK	12				
		12	David Mickin	DM	12				
		12	Robert MAUPIN	RM	12				

Daily Operations Report Form

Job Number: Immokalee Well Number: IW #1 Superintendent: Jim, Brantley & Rocco Thomas Rig Number: 411
Lead Driller: W. Fargo Date: 10-28-01
Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700		RIH W/ D.E. & Airline service Rig & Drill f/ 2054' To 2162' survey @ 2101'
			cont. drlg To 2208'

Production Recap

Beginning Borehole Footage: 2054' Ending Borehole Footage: 2208' Reamed Size: 12¼ Footage: 146' Casing Size: 22 Footage: 2000'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	W. Fargo	WF					
1900	0700	12	S. Cerecerez	SC					
1900	0700	12	R. McGinnis	RMC					
1900	0700	12	E. Rivas	ER					
1900	0700	12	R.S. Townley	RST					

Cement Stage Reports

Stage Number: Tag:

Notes

Stage Number: Tag: Feet

Notes

Daily Oper[illegible]s Report Form

Rig Number: 411

Superintendent: Jim Brantly Ronnie Thomas Date: 10-29-01

Job Number: Immokalee Well Number: TW #1 Lead Driller: LA Hascock Shift: Day

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700	0830	1½	Drlg 2208 - 2230
08:30	09:00	½	Circ
09:00	11:30	2½	Lay Down Tubing Pull out hole
11:30	12:00	½	Take off Kelly, Hose
12:00	3:00	3	Trip in hole Break Bell Circ
3:00	4:30	1½	Core #2 2230 - 2242 12 ft.
4:30	6:30	2	Trip out
6:30	7:00	½	Lay Down core # rec 5ft of core

Production Recap

Beginning Borehole Footage: 2205 Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours
												#1			

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	19:00	12	LA Hascock	LH					
		12	Michael Dennis	MD					
		12	Robert Maupin	RM					
		12	ALLEN W. KELLEY	AWK.					
			[illegible]						

Cement Stag[illegible]orts

Stage Number: _____ Tag: _____ Feet

Stage Number: _____ Tag: _____ Feet

Daily Operations Report Form

Job Number: IMMOKALEE Well Number: IW # 1 Superintendent: Jim Brantley/Public Lead Driller: WAYNE TORGO Rig Number: 411 Date: 10/29-01 Mon. Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Lay down core BARREL, R.I.H w/ drill pipe + Air line
			cont. to drill from 2230' to 2242' survey & coon.
			Cont. to drill to 2304'

Production Recap

Beginning Borehole Footage: 2230' Ending Borehole Footage: 2304 Reamed Size: 12¼" Footage: _____ Casing Size: 22" Footage: 2000'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Emp Initials	Time From	Time To	Total Hours	Employee Name	Emp Initials
1900	0700	12	W. FARGO						
	0700	12	S. CERECERES	SC					
	0700	12	E. Rivas	ER					
	0700	12	R. McClendon	RMC					
	0700	12	RS. Townley	RT					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Stage Number: _____ Tag: _____ Feet

Notes

Hole starting dredging at 2293'

Daily Opera' Report Form

Job Number: Immokalee Well Number: IW # 1 Superintendent: Jim Brantley Ranair Lead Driller: LR Holcomb Rig Number: 4 11 Date: 10.30.01 Shift: DAY

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700	0800	1	Cont. drilling to 2306 and circ cutting
8:00	10:00	2	Lay Down Tubing Pull out hole take off Kelly hose
10:00	12:00	2	Pick up core BBL and trip trip Hole circ Drop ball
12:00	2:30	2½	core #3 2306 to 2318 12 ft
2:30	4:30	2	Pull out hole
4:30	5:00	½	Lay Down core #3 Rec 11 ft
5:00	7:00	2	Put Kelly hose on and Trip in hole

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: 6" Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	1900	12	LR Holcomb	LRH					
		12	Michael Dennis	MD					
		12	ALLEN W. KELLEY	AWK					
		12	Robert Mawyin	RM					
		12	Curt Carlson	CC					
		12	JORGE L. AMADOR	JLA					

Cement Stage Reports

Stage Number: _____ Tag: _____ Fee

Notes

Stage Number: _____ Tag: _____ Fee

Notes

Daily Operations Report Form

Job Number: 218017 Well Number: IW#1 Superintendent: Ronnie Thames Lead Driller: W. Fargo

Rig Number: 411 Tue Date: 10-30-01 Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	~~Delay~~ RIH P/up Airline, Service Rig & drill f/2306 to 2372
			Survey and conn.
			cont to drill to 2380'

Production Recap

Beginning Borehole Footage: 2306 Ending Borehole Footage: 2380 Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Emp Initials	Time From	Time To	Total Hours	Employee Name	Emp Initials
1900	0700	12	W Fargo						
		12	S. Corecerez						
		12	R. McClinnis						
		12	E Rivas						
		12	R.S. Townley	RSP					

Cement Stage Results

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Daily Operations Report Form

Rig Number: 411

Superintendent: Jim Brantley, Dennis and Date: 10-30-01

Job Number: 218017 Well Number: IW #1 Lead Driller: LR Hancock Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00	09:30	2½	Drl 2380 - 2402
09:30	10:00	½	Circ clean up hole
10:00	12:00	2	Lay Down Tubing Trip out hole
12:00	17:00	5	Trip in hole
17:00	17:30	½	Circ drop ball
17:30	19:00	1½	Core #4 2402 - 2408
			Pull 44"

Production Recap 0

Beginning Borehole Footage: _____ Ending Borehole Footage: 2408 Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
07:00	19:00	12	LR Hancock	LH					
"	"	12	Robert Maupin	RM					
"	"	12	Michael Dennis	MD					
"	"	12	Jorge L Amador	Jesh.					
"	"	12	ALLEN W. KELLEY	AWK					
		12	Curt Cabra	CC					

Cement Stages

Stage Number: _____ Tag: _____ Feet

Stage Number: _____ Tag: _____ Feet

Daily Operations Report Form

Job Number: 71807 Well Number: IW#1 Superintendent: Roque Thomas Lead Driller: W. Fargo Rig Number: 411 Date: 10-31-21 Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1500	0700	12	core f/2405 to 2412, Pull out and Recover 11' core. Pick up 12¼ Button Bit make up kelly hose, service rig & R.I.H. ~~to~~ Run Survey @ 2360' and make conn D'lg to

Production Recap

Beginning Borehole Footage: 2402 Ending Borehole Footage: 2467 Reamed Size: 12¼ Footage: Casing Size: 22" Footage: 2000'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours
	12¼	Button	473	2402											

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	7:00	12	W. Fargo						
		12	S. Cervantes						
		12	R. McInnis						
		12	R.S. Townley	RST					

Cement Stage Reports

Stage Number: Tag: Feet

Notes

Stage Number: Tag: Feet

Notes

Daily Operations Report Form

Job Number: 718017 Well Number: IM #1 Superintendent: Jessie Thomas Lead Driller: JR Hancock

Rig Number: 411 Date: 11.1.01 Shift: DAY

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700	19:00	12	Continue Drlg From 2467 - 2566

Production Recap

Beginning Borehole Footage: 2467 Ending Borehole Footage: 2566 Reamed Size: _____ Footage: 164 Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours
	12 1/4	BUTTON	473	2402											

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
07:00	19:00	12	LA Hancock	LH					
		12	Michael Dennis	MD					
"	"	12	Robert Maupin	RM					
"	"	12	ALLEN W. KELLEY	AWK					
"	"	12	Curt Carlson	CC					
"	"	12	JORGE L. AMADOR	JLA					

Cement Stage Reports

Stage Number: 1 Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

CH2M HILL DAILY SUMMARY

Day/Date:	**Friday/11-02-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Mostly Cloudy/Light Rain, ~ 80 degrees F**

Activity: Pilot Hole Drilling and Coring
Bit Size: 12.25-inches
Starting Depth: 2,566 feet bpl
Ending Depth: 2,771 feet bpl

Time	Description
0940	Arrive at site. Contractor is continuing to drill pilot hole and the current depth is 2,755 feet below pad level (bpl).
1040	Pilot hole drilling reaches a depth of 2,760 feet bpl. Start removing the drill bit to install the 4-inch core barrel.
1320	Start installing the core barrel.
1600	Start coring from 2,760 feet bpl.
1818	Stop coring at 2,771 feet bpl. Start removing core barrel.
2015	Core barrel is removed from well. A total of 9 feet of core was retrieved with the largest piece of material being approximately 2.3 feet in length.
2030	Leave site for the day.

Recorded By: Tracy Levi
Date: 11/02/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Saturday/11-3-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Mostly Cloudy w/Occasional Rain, ~ 84 degrees F**

Activity: No Activity
Starting Depth: N/A

Bit Size: N/A
Ending Depth: N/A

Time	Description
	No activity at the site

Recorded By: Mark Schilling

Date: 11/3/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Sunday/11-4-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Mostly Cloudy w/Occasional Rain, ~ 84 degrees F**

Activity: Pilot Hole Drilling
Bit Size: 12.25-inches
Starting Depth: 2,760 feet bpl
Ending Depth: 2,870 feet bpl

Time	Description
	The Contractor resumed pilot hole drilling from 2,760 feet below pad level (bpl).

Recorded By: Mark Schilling

Date: 11/4/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Monday/11-05-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy/Rain, ~ 74 degrees F**

Activity: Pilot Hole Drilling & Geophysical Logging
Bit Size: 12.25-inches
Starting Depth: 2,870 feet bpl
Ending Depth: 2,980 feet bpl

Time	Description
1230	Arrive at site. Contractor resumed drilling the pilot hole during the night shift of Sunday, November 4th and reached the depth of 2,980 feet below pad level (bpl) this morning. The Contractor starts removing the drill bit and string from the well in preparation for geophysical logging.
1500	The Contractor's geophysical logging equipment arrives on-site.
1600	Start geophysical logging. Logs to be conducted are the caliper, gamma ray, dual-induction and sonic logs.
2030	The logging is completed.
2045	Leave site for the day.

Recorded By: Tracy Levi
Date: 11/05/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Tuesday/11-06-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 80 degrees F**

Activity: Packer Testing
Bit Size: 12.25-inches
Starting Depth: 2,800 feet bpl
Ending Depth: 2,901 feet bpl

Time	Description
0700	Arrive at site. Contractor is waiting for packer setting depth before installing the packer assembly.
0755	Tracy Levi of CH2M HILL arrives at site.
0930	After discussions with the Deerfield Beach office and analysis of the geophysical logs, CH2M HILL informs the Contractor of the packer setting depths. The Contractor starts preparing to install the straddle packer assembly.
1100	Start installing packer assembly.
1700	Straddle packer assembly installed to a depth of 2,901 feet below pad level (bpl) at the top of the bottom packer element and at 2,800 feet bpl at the bottom of the top packer element. Start inflating elements.
1735	Packers inflated to 520 psi. Start installing 5 hp submersible test pump.
1900	Test pump installed a total of 180 feet inside of packer stem. A 250 psi pressure transducer is installed a total of 175 feet inside of packer stem and a 30 psi pressure transducer is installed inside the annulus to a depth of 48 feet bpl.
1905	Start pumping to develop test zone. Initial pumping rate is 60 gpm.
1908	Pump starts cavitating and pumping rate is reduced to 5 gpm.
2010	Stop development/preliminary pump test. Allow well to recover.
2315	T. Levi leaves the site for the day.
2400	Well still recovering.

Recorded By: Mark Schilling
Date: 11/06/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Wednesday/11-07-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 80 degrees F**

Activity: Packer Testing
Bit Size: 12.25-inches
Starting Depth: 2,800 feet bpl
Ending Depth: 2,901 feet bpl

Time	Description
0000	Well is still in recovery phase from the development/preliminary pump test conducted on 11-6-01.
0705	Well has recovered to within 10 feet of original head. Start packer pump test at 5 gpm. The flowmeter totalizer reading is 1,387,343 gallons.
0800	Leave site for breakfast.
0815	Return to site.
1100	Packer pump test still in progress.
1115	Tracy Levi of CH2M HILL arrives at the site.
1230	Leave site for lunch and pick up distilled water for water quality analysis.
1300	Return to site.
1330	Flow rate bumped back up to 5 gpm from 3 gpm.
1415	Flow rate lowered to 2.5 gpm due to only 3 feet of head on 250 psi pressure transducer.
1505	Pumping rate increased from 2.5 gpm to 4 gpm. Drawdown is being closely monitored.
1610	Stop pumping and start recovery phase. The flowmeter totalizer reading is 1,389,302 gallons.
1820	M. Schilling leaves site.
1845	T. Levi leaves site.
2010	End recovery phase. Contractor begins removing Packer Assembly from well.

Recorded By: Mark Schilling
Date: 11/07/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Thursday/11-08-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Sunny ~ 80 degrees F**

Activity: Packer Testing
Bit Size: 12.25-inches
Starting Depth: 2,720 feet bpl
Ending Depth: 2,756 feet bpl

Time	Description
0000	Arrive at site. The Contractor has removed the straddle packer assembly from the well and changed the straddle interval for the next packer test.
0010	Start installing packer assembly.
0300	Straddle packer assembly installed to a depth of 2,756 feet below pad level (bpl) at the top of the bottom packer element and at 2,720 feet bpl at the bottom of the top packer element. Start inflating elements.
0325	Packers inflated to 545 psi. Start installing 5 hp submersible test pump.
0400	Test pump installed a total of 180 feet inside of packer stem. A 250 psi pressure transducer is installed a total of 175 feet inside of packer stem and a 30 psi pressure transducer is installed inside the annulus to a depth of 48 feet bpl.
0435	Start pumping to develop test zone. Initial pumping rate is 7 gpm. Pumping rate gradually slows to 5 gpm. Static head, above the 250 psi transducer, is 171 feet.
0535	Stop pumping as pump is cavitating. Allow well to recover.
0610	Resume pumping. Pumping rate is adjusted until water level stabilizes. Final pumping rate achieved is 0.75 gpm.
0820	Stop pumping and start well recovery period.
1030	Leave site.
1700	Return to site.
1715	The head is currently at 134 feet above the 250 psi transducer. Stop recovery and start packer pump test at 0.75 gpm. The flowmeter totalizer reading is 1,389,680 gallons.
1820	Leave site for dinner.
1845	Return to site.
2215	Pumping rate has dropped to 0.5 gpm.
2400	Packer pump test still in progress.

Recorded By: Tracy Levi
Date: 11/08/01

...y Operations Report Form

Rig Number: 411

Superintendent: Ronald Thames

Date: 11-1-01

Job Number: 118017 Well Number: IW #2 Lead Driller: Wayne DARGO

TK Shift: NIGHT

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	cont. to drill from 2516' to 2725

Production Recap

Beginning Borehole Footage: 2516' Ending Borehole Footage: 2725 Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours
	12¼	Button	473	2402											

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	W. FARGO						
		12	S. CERECERES	SC.					
		12	R. McCLINNIS	RMC					
		12	R.S. Towalley	RST					

Cement Stage Records

Stage Number: _____ Tag: _____ Feet

Stage Number: _____ Tag: _____ Feet

Job Number: 718019 Well Number: IW#1 Superintendent: Dennis Thomas Lead Driller: LR Hancock Rig Number: 411 Date: 11-2-01 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00	10:30	3½	Drlg 2725 - 2760
10:30	11:00	½	circ clean up hole
11:00			Lay Down Tubing And Trip out
	16:00	5	Pick up core bbl Trip in hole
16:00	18:00	2	core #5 2760 - 2771 11 ft
18:00			Trip out W/ core Lay Down 10 ft of core
	23:00	5	Trip in hole

Production Recap

Beginning Borehole Footage: 2725 Ending Borehole Footage: 2760 Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours
	12¼														

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
07:00	23:00	16	LR Hancock	LR					
		16	Michael Dennis	MD					
		16	Robert Maupin						
		16	ALLEN W. KELLEY	A.W.K.					
		16	Chuck Cantrell	CC					
		16	TOMMY L. ARMOUR	TLA.					

Cement Stage Records

Stage Number: _____ Tag: _____ Feet

Bottom Plug Depth | Bottom Plug Depth

Type | Bottom Plug Set | Quantity | Yield

Type | Bottom Plug Set | Quantity | Yield

Notes

Stage Number: _____ Tag: _____ Feet

Bottom Plug Depth | Bottom Plug Depth

Type | Bottom Plug Set | Quantity | Yield

Type | Bottom Plug Set | Quantity | Yield

Notes

Daily Operation Report Form

Job Number: 71809 Well Number: IW#1 Superintendent: Ronnie Thomas Lead Driller: W. Fargo Rig Number: 411 Date: 11-4-09 Shift: Nights

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
7:00			Service Rig, Run Additional Tools & Tag Bottom Survey @ 2720'
			Drlg f/ 2760'

Production Recap

Beginning Borehole Footage: 2760 Ending Borehole Footage: 2870 Reamed Size: 12¼ Footage: 110 Casing Size: 22" Footage: 2000'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours
	12¼	Bit	473												

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	W. Fargo	WF					
		12	S. Carrasco	SC					
		12	R. Mackins	RM					
		12	K.S. Tumley	KT					

Cement Stage Record

Stage Number: _____ Tag: _____ Feet

Stage Number: _____ Tag: _____ Feet

Notes

Notes

Daily Operations Report Form

Job Number: 71917 Well Number: IW # 1 Superintendent: Ronnie Thomas Lead Driller: [illegible] Rig Number: 411 Date: 11-5-01 Shift: Day

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700	1200	5	Drlg. F 2870 – 2980
1200	12:30	½	Cir & clean up Lole @ 2980
12:30	13:00	½	Lay Down Tubing
13:00	15:00	2	Trip out hole
15:00	15:30	½	Install Pack and Rig up Logging Truck
15:30	17:30	2	Run Gamma Neutron Log
17:30	19:00	1	Rig up RL

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	19:00	12	UK Hancock	UH					
		12	Michael Dennis	MD					
		12	ALLEN W. KELLEY	A.W.K					
		12	Robert T Maupin	RTM					
		12	[illegible]	[illegible]					
			Curt Cook	C.					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Stage Pump	Slurry Pump

Type	Amount Used	Left	Sacks

Slurry	Water Req	Left	Gals

Notes

Stage Number: _____ Tag: _____ Feet

Spacer Pump	Slurry Pump

Type	Amount Used	Left	Sacks

Slurry	Water Req	Left	Gals

Notes

Daily Operations Report Form

Job Number: 218017 Well Number: IW #1 Superintendent: Ron Thames Lead Driller: W. Fargo Rig Number: 411 Date: 11-05-01 MSW Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700		Logging, Rig Maintainence, & clean up

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	W. Fargo						
1	/	12	S. Cerecerez						
1	/	12	R. McClinnis						
1900	/	12	R.S. Tawney						

Cement Stage Reports

Stage Number: _____ _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Daily Operations Report Form

Job Number: 21017 Well Number: IM # 1 Superintendent: Ronnie Thomas Rig Number: 4.11
Lead Driller: J R [illegible] Date: 11.6.01 Shift: DAY

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700	[illegible]	5	[illegible]
[illegible]	[illegible]	5	Trip in hole w/ packer. set @ 2800 TO 2901'
[illegible]	[illegible]	1	Install 3" pump

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	[illegible]	12	J.R. [illegible]	JR					
		12	Michael Dennis	MD					
		12	Robert Thomas	RT					
		12	Jesse L. Dewar	JLD					
		12	Allen W. Kelley	AWK					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Bottom of Pipe	Top of Cement

Sax	Cement Type	Yield	Slurry

Volume

Stage Number: _____ Tag: _____ Feet

Bottom of Pipe	Top of Cement

Sax	Cement Type	Yield	Slurry

Notes

Daily Operatio eport Form

Job Number: 718017 Well Number: IW #1 Superintendent: Ronnie Thomas Lead Driller: W Fargo Rig Number: 411 Date: 11-6-01 Tour Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	straddle packer Test #1 2800' To 2901'

Cement Stage Ra

Stage Number: Tag: Feet

Notes

Stage Number: Tag: Feet

Production Recap

Beginning Borehole Footage: Ending Borehole Footage: Reamed Size: Footage: Casing Size: Footage:

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	W. Fargo	WF					
1	1	12	S. Cardenas	CC					
1	1	12	R. Hinojosa	RH					
1	1	12	R. Rodriguez	RR					
1	1	12	R. Gutierrez	RG					

Notes

Daily Operations Report Form

Job Number: 219017 Well Number: TW #1 Superintendent: Bennie Thomas Lead Driller: LR Hancock Rig Number: 411 Date: 11-7-01 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00	19:00	12	Straddle packer Test #1, 2800 - 2900'

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
7:00	5:00	12	LR Hancock	LRH					
		12	Robert Maupin	R.M.					
			Curt Carlson	CC					
		12	ALLEN W. KELLEY	AWK					
		12	Michael Dennis	MD					

Stage Number: _____ Tag: _____ Feet

Stage Number: _____ Tag: _____ Feet

Daily Operation Report Form

Job Number: 218017 Well Number: IW#1 Superintendent: Ron Thomas Lead Driller: W. Fargo Rig Number: 411 Date: 11-7-01 WE Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Finish Recovery on #1 Static pkr test. P.O.O.H & change packer configuration & RIH to set pkr @ 2742 to 2755'

Cement Stage Records

Stage Number: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: 12¼ Footage: _____ Casing Size: 22" Footage: 2000'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Init's	Time From	Time To	Total Hours	Employee Name	Empl Init's
1900	0700	12	W Fargo						
1		1	S. Cerecerez						
1	1	1	R McClinnis						
		1	D. McClain						
1900	0700	12	R S. Tumley	DST					

Notes

Daily Operations Report Form

Job Number: 218.077 Well Number: IW #1 Superintendent: Ronnie Thomas Lead Driller: L.R. Glasscock Rig Number: 411 Date: 11-8-01 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700	19:00	12	Recovery

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Emp Initials	Time From	Time To	Total Hours	Employee Name	Emp Initials
07:00	19:00	12	L R Glascock	LG					
		12	Robert Maupin	RM					
		12	JORGE G. AMADOR	JGA					
		12	Michael Dennis	MD					
		12	Kenneth D. Cargal	KC					
		12	TROY A Payne	TAP					
		12	ALLEN W. KELLEY	AWK					

Current Stage Reports

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0900	N/A	512	13	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	550	33	N/A	6.26		YBI/Sanders
09/13/2001	0830	N/A	540	9	N/A	6.82		YBI/Sanders
09/19/2001	1230	N/A	396	15	N/A	6.41		YBI/Sanders
09/26/2001	1340	6.75	420	9	N/A	6.40		T. Levi
10/02/2001	1215	6.68	509	19	N/A	6.40		T. Levi
10/11/2001	1500	7.40	493	20	N/A	6.50		M. Schilling
10/18/2001	1345	7.10	517	23	N/A	6.80		M. Schilling
10/25/2001	1610	7.20	502	21	N/A	6.81		M. Schilling
11/01/2001	1430	7.33	542	20	N/A	6.40		T. Levi
11/08/2001	2000	9.50	535	17	N/A	7.30		T. Levi

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0930	N/A	599	30	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	780	13	N/A	6.72		YBI/Sanders
09/13/2001	0830	N/A	490	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	415	22	N/A	6.22		YBI/Sanders
09/26/2001	1310	3.50	440	26	N/A	6.40		T. Levi
10/02/2001	1205	3.62	524	39	N/A	6.40		T. Levi
10/11/2001	1515	3.20	536	26	N/A	6.40		M. Schilling
10/18/2001	1330	3.50	542	22	N/A	6.80		M. Schilling
10/25/2001	1630	4.30	500	25	N/A	6.60		M. Schilling
11/01/2001	1410	3.50	564	53	N/A	6.50		T. Levi
11/08/2001	2010	7.00	551	53	N/A	6.40		T. Levi

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1100	N/A	685	9	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	490	16	N/A	6.59		YBI/Sanders
09/13/2001	0830	N/A	550	10	N/A	6.74		YBI/Sanders
09/19/2001	1230	N/A	646	15	N/A	6.22		YBI/Sanders
09/26/2001	1330	6.67	720	8	N/A	6.20		T. Levi
10/02/2001	1155	6.59	747	9	N/A	6.20		T. Levi
10/11/2001	1530	6.70	704	7	N/A	6.10		M. Schilling
10/18/2001	1400	6.90	665	9	N/A	6.40		M. Schilling
10/25/2001	1550	7.10	698	8	N/A	6.23		M. Schilling
11/01/2001	1420	7.25	700	8	N/A	7.00		T. Levi
11/08/2001	2020	8.80	734	11	N/A	6.50		T. Levi

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1030	N/A	487	5	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	470	4	N/A	6.91		YBI/Sanders
09/13/2001	0830	N/A	760	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	331	11	N/A	6.05		YBI/Sanders
09/26/2001	1320	6.00	1,003	103	N/A	6.10		T. Levi
10/02/2001	1225	5.88	406	9	N/A	6.10		T. Levi
10/11/2001	1545	6.00	430	10	N/A	6.00		M. Schilling
10/18/2001	1415	6.20	445	10	N/A	6.10		M. Schilling
10/25/2001	1640	6.40	428	9	N/A	6.10		M. Schilling
11/01/2001	1400	6.33	476	10	N/A	6.20		T. Levi
11/08/2001	2030	8.50	490	8	N/A	6.50		T. Levi

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

CH2M HILL DAILY SUMMARY

Day/Date:	**Friday/11-09-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Sunny, ~ 75 degrees F**

Activity: Packer Testing
Bit Size: 12.25-inches
Starting Depth: 2,720 feet bpl
Ending Depth: 2,756 feet bpl

Time	Description
0000	Packer pump test still in progress.
0115	Stop pumping and start recovery phase. The flowmeter totalizer reading is 1,389,680 gallons.
0715	End recovery phase.
0915	Contractor begins removing packer assembly from well.
1215	The straddle packer assembly is removed from the well. The Contractor adjusts the straddle interval and starts re-installing the packer assembly for Packer Test #3.
1300	Leave site for the day.

Recorded By: Tracy Levi
Date: 11/09/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Saturday/11-10-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Sunny, ~ 75 degrees F**

Activity: No Activity
Starting Depth: N/A

Bit Size: N/A
Ending Depth: N/A

Time	Description
	No activity at the site

Recorded By: Mark Schilling

Date: 11/10/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Sunday/11-11-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Sunny, ~ 75 degrees F**

Activity: Packer Testing
Bit Size: 12.25-inches
Starting Depth: 2,400 feet bpl
Ending Depth: 2,461 feet bpl

Time	Description
1900	Arrive at site. The straddle packer assembly was installed on Friday, November 11th and background data has been collected since the elements were pressurized. The packer pressure has bled down to 240 psi, from 500 psi, and is repressurized back to 500 psi.
1915	Start packer pump test at 1 gpm. The flowmeter totalizer reading is 1,389,680 gallons.
1930	Pumping rate stabilized at ¾ gpm.
2305	Pumping rate adjusted back to ¾ gpm.
0000	Packer pump test continues.

Recorded By: Mark Schilling
Date: 11/11/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Monday/11-12-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Sunny, ~ 79 degrees F**

Activity: Packer Testing
Bit Size: 12.25-inches
Starting Depth: 2,200 feet bpl
Ending Depth: 2,251 feet bpl

Time	Description
0000	Packer pump test continues.
0330	Stop pumping and start recovery phase.
0930	Stop recovery phase and start removing the packer assembly.
1100	M. Schilling leaves site for the day.
1300	Tracy Levi arrives at the site.
1500	Contractor begins installation of packer assembly.
1815	The packer has been pressurized to 500 psi. Start installing 5 hp submersible test pump.
1900	Test pump installed a total of 180 feet inside of packer stem. A 250 psi pressure transducer is installed a total of 175 feet inside of packer stem and a 30 psi pressure transducer is installed inside the annulus to a depth of 48 feet bpl.
1915	Collect background data under static conditions. Static head is 156.22 feet of water.
2315	Final reading of static head is 155.55 feet of water.
2340	Start packer pump test. Initial pumping rate is 1 gpm. . Static head is 155.55 feet of water. The flowmeter totalizer reading is 1,389,680 gallons. Pumping rate is adjusted to 5 gpm.
2400	Packer pump test continues.

Recorded By: Mark Schilling/Tracy Levi
Date: 11/12/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Tuesday/11-13-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Sunny, ~ 79 degrees F**

Activity: Packer Testing & Backplugging Pilot Hole
Bit Size: 12.25-inches
Packer Test: Starting Depth: 2,200 feet bpl
Ending Depth: 2,251 feet bpl
Backplugging: Starting Depth: 2,980 feet bpl
Ending Depth: 2,282 feet bpl

Time	Description
0000	Packer pump test continues.
0800	Stop pumping and start recovery phase. The flowmeter totalizer reading is 1,392,670 gallons. Final head reading is 143.113 feet of water.
0830	Leave site.
1600	Stop recovery phase and start removing the packer assembly.
1900	The Contractor begins installing the tremie pipe in preparation of the backplugging of the pilot hole prior to reaming.
2250	A total of 2,995 of 2.875-inch tremie pipe has been installed with the bottom of the tremie string at 2,975 ft below pad level (bpl).
2200	Start backplugging the pilot hole, using 12% bentonite cement with calcium chloride additive.
2305	Stop backplugging. A total of 234 barrels of 12% bentonite cement was pumped, followed by 8 barrels of fresh water as chase. Contractor starts removing tremie pipe to bring the bottom of the string into the casing.
2400	Waiting on cement to cure.

Recorded By: Tracy Levi
Date: 11/13/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Wednesday/11-14-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Cloudy, ~ 70 degrees F**

Activity: Backplugging Pilot Hole & Reaming **Bit Size:** 20.5-inches
Starting Depth: 2,000 feet bpl **Ending Depth:** 2,159 feet bpl

Time	Description
0000	Waiting on cement pumped during 1st stage of backplugging pilot hole to cure.
0415	Top of cement tagged at 2,282 feet bpl. Contractor starts preparing for 2nd stage of backplugging pilot hole.
0450	Start 2nd stage, using 12% bentonite cement with calcium chloride additive.
0515	Stop the 2nd stage. A total of 94 barrels of 12% bentonite cement was pumped, followed by 4 barrels of fresh water as chase. Contractor starts removing tremie pipe.
0900	Top of cement tagged at 2,007 feet bpl. Contractors begin removing tremie pipe from well.
1000	Leave site for the day. Contractor will start reaming, using a 20.5-inch diameter bit.

Recorded By: Tracy Levi Date: 11/14/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Thursday/11-15-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Cloudy, ~ 70 degrees F**

Activity: Reaming
Bit Size: 20.5-inches
Starting Depth: 2,159 feet bpl
Ending Depth: 2,264 feet bpl

Time	Description
0930	Arrive at site. The Contractor has started reaming and the current reaming depth is 2,182 feet below pad level (bpl).
1030	Water quality samples are collected from the pad monitor wells.
1700	Leave site. The current reaming depth is 2,250 feet bpl. Contractor will continue to ream.

Recorded By: Tracy Levi
Date: 11/15/01

Daily Operations Report Form

Job Number: 219017 Well Number: IW#1 Superintendent: Ronnie Thames Rig Number: 411
Lead Driller: W. Fargo Date: 11-8-01 Thur Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900			Packer test #2 straddle 7720'-7755'

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	7:00	12	W. Fargo						
"	"	12	S. Cerecerez						
"	"	12	R. Mcclinnis						
"	"	12	D. McClain	DM					
"	"	12	K. S. Townley	RST					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Daily Operations Report Form

Rig Number: 411

Superintendent: Ronnie Thames

Date: 11-9-01

Job Number: 218017 Well Number: IW#1 Lead Driller: _____

Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
7:00	11:00	4	Packer test #2
11:00			Trip out reset packer
	7:00	8	Trip in hole pickup water pump

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
7:00	19:00	12	LR Blasingame	LB					
		12	Robert Maupin	RM					
		12	ALLEN W. KELLEY	AWK					
		12	Michael Dennis	M.D.					
		12	FARRELL AMMAR	FA					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Stage Number: _____ Tag: _____ Feet

Daily Operations Report Form

Job Number: 719017 Well Number: TW#1 Superintendent: Ronnie Thames Rig Number: 411
Lead Driller: W. Fargo SUN Date: 11-11-01 Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900			Packer test

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Emp Initials	Time From	Time To	Total Hours	Employee Name	Emp Initials
1900	0700	12	W. Fargo						
"	"	12	S. Cereceres						
"	"	12	R. McGinnis						
"	"	12	E. Ricks						
1900	"	12	Joel Harrison						

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Stage Number: _____ Tag: _____ Feet

Daily Operations Report Form

Job Number: 21021 Well Number: IW#1 Superintendent: Rosie Thames Lead Driller: LR Hancock

Rig Number: 401 Date: 11-12-01 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
01:00	10:30	3½	Recovery
10:30			Pull 2" pump Start out hole Finish Trip out
			Lay Down 40' pick up 30 in packer
			Check packers Trip in hole Set packers 2200 - 2250
	7:00	8½	Install 2" pump

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
01:00	19:00	12	LR Hancock	LRH					
		12	Michael Dennis	MD					
		12	JORGE L. AMADOR	JLA					
		4½	ALLEN W. KELLEY	A.W.K					
		4½	Robert Maupin	RM					

Current Stage Reports

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Daily Operations Report Form

Job Number: 710817 Well Number: IW #1 Superintendent: Ronnie Thames Lead Driller: Wayne Sargo Rig Number: 411 Date: 11-12-01 Mor Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900			Packer Test #4

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900		12	W. SARGO						
		12	S. CERECERES	SC					
		12	R. M'CLAINS						
		12	E. RIVAS						
		12	Joel HARRISON						
		12	David M'Clain						

Cement Stage Record

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Daily Operation Report Form

Job Number: 710817 Well Number: FW #1 Superintendent: Ronnie Thomas Lead Driller: LR GLASCOCK Rig Number: 411 Date: 11.17.01 Shift: DAY

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
7:00	4:00	9	PACKER TEST # 4
4:00			Pull 2" pump retrieve packer
	7:00	3	Trip out Lob Lay Down Packers

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
7:00	7:00	12	LR Glascock	LG	7:00	7:00	12	Brian Crizer	BC
		3	Michael Dennis	MD					
		12	Robert Maupin	RM					
		12	JORGE L. AMPUDIA	JLA					
		12	Michael Ashley	MA					
		12	ALLEN W. KELLY	AWK					

Current Stage Recap

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Daily Operations Report Form

Job Number: 716817 Well Number: IW #1 Superintendent: Reggie Thames Rig Number: 411
Lead Driller: W. Fargo Date: 11-13-01 Tues Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	RIH W/ 2 3/8 TBG. & cement 12 1/4 pilot hole
			W.O.C. RIH & Tag cement @ 2082'
			Rig up & pump cement & pull Back to 1790' & WOC
			29 SBL's 1-sing & mule shoe in hole
			21 BBL's on the ground

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	W. Fargo						
		12	S. Corecorez.	SDC					
		12	D McClain						
		12	R. Mcllinia	RMC					
		12	E. Rivas	ER					
		12	J. Harrison						

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Daily Operatio sport Form

Rig Number: 481

Superintendent: Ronnie Thomas

Date: 11-14-08

Job Number: 71081 Well Number: IW #1 Lead Driller: LR Blaycock

Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
7:00	9:00	2	WOC
9:00	10:30	1½	Tag cement @ 2007 Lay Down Tubing
10:30	3:00	4½	Move tubing out Rig up floor pick up std. Trip in hole
3:00	7:00	4	Drlg cement @ 2007 – 2068

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours
496	20½														

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
7:00	7:00	12	LR Blaycock	LB					
7:00	7:00	12	Michael Ashley	MA					
7:00	7:00	12	Jacob L. Amador	JLA.					
7:00	7:00	12	Bryan Crizer	BC					
11	11	12	Robert Maupin	RM					
7:00	7:00	12	Allen Kelley	AK					

Daily Operations Report Form

Job Number: 210817 Well Number: IW #1 Superintendent: Ronnie Thames Lead Driller: Wayne Fargo Rig Number: 511 Date: 11-14-08 Wel Shift: Days Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	cont. to drill from 2069' to 2159' surv @ 2070'

Production Recap

Beginning Borehole Footage: 2069' Ending Borehole Footage: 2159 Reamed Size: 20" Footage: 90' Casing Size: 22" Footage: 2000'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	W. FARGO						
			S. CERECERES	SC.					
			D. McClain						
			E. Rivas	ER					
			R. McClintic	RMC					
			J. Harrison	JH					

Cement Stage Records

Stage Number: Tag: Feet

Stage Number: Tag: Feet

Rig Number: 411

Job Number: 710917 Well Number: IW #1 Superintendent: Donnie Thomas Lead Driller: LR Glascock Date: 11-15-01 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700			Drlg 2159 - 2264

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours
							30								

Time From	Time To	Total Hours	Employee Name	Emp Initials	Time From	Time To	Total Hours	Employee Name	Emp Initials
		12	LR Glascock	LR					
7:00	7:00	12	Bryan Crizer	B.C.					
7:00	7:00	12	ALLEN W. KELLEY	A.W.K.					—
7:00	7:00	12	Robert Maupin	R M					—
7:00	7:00	12	~~JOHN~~ ANDREW	J.A.					

Cement Stage Record

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0900	N/A	512	13	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	550	33	N/A	6.26		YBI/Sanders
09/13/2001	0830	N/A	540	9	N/A	6.82		YBI/Sanders
09/19/2001	1230	N/A	396	15	N/A	6.41		YBI/Sanders
09/26/2001	1340	6.75	420	9	N/A	6.40		T. Levi
10/02/2001	1215	6.68	509	19	N/A	6.40		T. Levi
10/11/2001	1500	7.40	493	20	N/A	6.50		M. Schilling
10/18/2001	1345	7.10	517	23	N/A	6.80		M. Schilling
10/25/2001	1610	7.20	502	21	N/A	6.81		M. Schilling
11/01/2001	1430	7.33	542	20	N/A	6.40		T. Levi
11/08/2001	2000	9.50	535	17	N/A	7.30		T. Levi
11/15/2001	1230	9.50	717	36	N/A	7.00		T. Levi

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0930	N/A	599	30	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	780	13	N/A	6.72		YBI/Sanders
09/13/2001	0830	N/A	490	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	415	22	N/A	6.22		YBI/Sanders
09/26/2001	1310	3.50	440	26	N/A	6.40		T. Levi
10/02/2001	1205	3.62	524	39	N/A	6.40		T. Levi
10/11/2001	1515	3.20	536	26	N/A	6.40		M. Schilling
10/18/2001	1330	3.50	542	22	N/A	6.80		M. Schilling
10/25/2001	1630	4.30	500	25	N/A	6.60		M. Schilling
11/01/2001	1410	3.50	564	53	N/A	6.50		T. Levi
11/08/2001	2010	7.00	551	53	N/A	6.40		T. Levi
11/15/2001	1240	7.09	626	53	N/A	6.70		T. Levi

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1100	N/A	685	9	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	490	16	N/A	6.59		YBI/Sanders
09/13/2001	0830	N/A	550	10	N/A	6.74		YBI/Sanders
09/19/2001	1230	N/A	646	15	N/A	6.22		YBI/Sanders
09/26/2001	1330	6.67	720	8	N/A	6.20		T. Levi
10/02/2001	1155	6.59	747	9	N/A	6.20		T. Levi
10/11/2001	1530	6.70	704	7	N/A	6.10		M. Schilling
10/18/2001	1400	6.90	665	9	N/A	6.40		M. Schilling
10/25/2001	1550	7.10	698	8	N/A	6.23		M. Schilling
11/01/2001	1420	7.25	700	8	N/A	7.00		T. Levi
11/08/2001	2020	8.80	734	11	N/A	6.50		T. Levi
11/15/2001	1250	9.17	837	10	N/A	6.60		T. Levi

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1030	N/A	487	5	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	470	4	N/A	6.91		YBI/Sanders
09/13/2001	0830	N/A	760	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	331	11	N/A	6.05		YBI/Sanders
09/26/2001	1320	6.00	1,003	103	N/A	6.10		T. Levi
10/02/2001	1225	5.88	406	9	N/A	6.10		T. Levi
10/11/2001	1545	6.00	430	10	N/A	6.00		M. Schilling
10/18/2001	1415	6.20	445	10	N/A	6.10		M. Schilling
10/25/2001	1640	6.40	428	9	N/A	6.10		M. Schilling
11/01/2001	1400	6.33	476	10	N/A	6.20		T. Levi
11/08/2001	2030	8.50	490	8	N/A	6.50		T. Levi
11/15/2001	1300	8.75	592	8	N/A	6.60		T. Levi

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

CH2M HILL DAILY SUMMARY

Day/Date:	**Friday/11-16-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Cloudy, ~ 70 degrees F**

Activity: Reaming
Bit Size: 20.5-inches
Starting Depth: 2,264 feet bpl
Ending Depth: 2,400 feet bpl

Time	Description
1030	Arrive at site. Contractor continues to ream the pilot hole using a 20.5-inch-diameter bit. Reaming is currently at a depth of 2,355 feet below pad level (bpl).
1340	Reaming reaches a depth of 2,383 feet bpl.
1400	Leave site for the day. The Contractor will continue to ream until 1900 hours tonight.

Recorded By: Tracy Levi
Date: 11/16/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Saturday/11-17-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Sunny, ~ 75 degrees F**

Activity: No Activity
Starting Depth: N/A

Bit Size: N/A
Ending Depth: N/A

Time	Description
	No activity at the site

Recorded By: Mark Schilling

Date: 11/17/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Sunday/11-18-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 75 degrees F**

Activity: Reaming
Starting Depth: 2,400 feet bpl

Bit Size: 20.5-inches
Ending Depth: 2,445 feet bpl

Time	Description
	Contractor resumed reaming the pilot hole, using a 20.5-inch-diameter bit, from 2,400 feet below pad level.

Recorded By: Mark Schilling

Date: 11/18/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Monday/11-19-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 74 degrees F**

Activity: Reaming
Bit Size: 20.5-inches
Starting Depth: 2,445 feet bpl
Ending Depth: 2,580 feet bpl

Time	Description
1015	Arrive at site. Contractor is reaming the pilot hole, using a 20.5-inch diameter bit and is currently at a depth of 2,462 feet below pad level (bpl).
1720	Reaming reaches a depth of 2,503 feet bpl.
1745	Leave site for the day. Contractor will continue to ream.

Recorded By: Tracy Levi
Date: 11/19/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Tuesday/11-20-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 74 degrees F**

Activity: Reaming
Bit Size: 20.5-inches
Starting Depth: 2,580 feet bpl
Ending Depth: 2,777 feet bpl

Time	Description
0945	Arrive at site. Contractor is reaming the pilot hole, using a 20.5-inch diameter bit and is currently at a depth of 2,600 feet below pad level (bpl)
1115	Reaming reaches a depth of 2,620 feet bpl.
1745	Leave site for the day. Reaming is currently at a depth of 2,680 feet bpl. Contractor will continue reaming.

Recorded By: Tracy Levi
Date: 11/20/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Wednesday/11-21-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Sunny, ~ 70 degrees F**

Activity: Reaming
Bit Size: 20.5-inches
Starting Depth: 2,777 feet bpl
Ending Depth: 2,915 feet bpl

Time	Description
1015	Arrive at site. Contractor had reamed to a depth of 2,800 fee below pad level (bpl) at 0930 hours and stopped per engineer's request. Waiting on further instructions.
1115	Water quality samples collected from pad monitor wells.
1300	Contractor informed to resume reaming to a depth of 2,915 feet bpl.
1305	Leave site for the day. The Contractor will continue reaming through the night shift and then shut down for the Thanksgiving holiday weekend.

Recorded By: Tracy Levi
Date: 11/21/01

...Report Form

Job Number: 110817 Well Number: IW-1 Superintendent: Rayllie Thames Rig Number: 411
Lead Driller: J Davis Date: 11-15-01 Thu. Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Cont. to drill from 2264' to 2338

Production Recap

Beginning Borehole Footage: 2264 Ending Borehole Footage: _____ Reamed Size: 20" Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	J. Davis	JD					
		12	S. Cereceres	SC.					
		12	D McClain	DM.					
		12	E. Rivas	ER					
		12	R. McClinnis	RMc					
		12	J. Harrison	JH					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Bore Pro Fluid | Bore Fluid

Type | Bentonite | Qty | Water

Type | Bentonite | Qty | Water

Notes

Stage Number: _____ Tag: _____ Feet

Bore Pro Fluid | Bore Fluid

Type | Bentonite | Qty | Water

Type | Bentonite | Qty | Water

Notes

Daily Operatio[illegible] Report Form

Job Number: 710817 Well Number: LW-1 Superintendent: Ronnie Thames Lead Driller: L.R. Glascock Rig Number: 411 Date: 11-16-01 Shift: Days

Time From:	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700			Drilling 2338 - 2400

Cement Stage Record

Stage Number: _____ Tag: _____ Feet

Stage Number: _____ Tag: _____ Feet

Notes

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours
4RR	20½						54								

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	1900	12	L.R. Glascock	LR					
		12	Robert Maupin	RM					
		12	Bryan Crizer	BC					
		12	ALLEN W. KELLEY	AWK					
		11	JORGE L. AMADOR	JLA					

Notes

...y Operations Report Form

Job Number: 710817 Well Number: IW-1 Superintendent: Ronnie Thames Rig Number: 411
Lead Driller: J Davis Date: 11-19-01 Shift: Nights

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Drilling 2400 - 2445

Production Recap

Beginning Borehole Footage: 2400 Ending Borehole Footage: 2445 Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours
494	9 0'6						Calc								

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	J. Davis	JD					
		12	R. McClimmis	RMC					
		12	D. McClain	DMC					
		12	E. Rivas	ER					
		12	T. CRAIG	JC					

Current Stage Reports

Stage Number: _____ Tag: _____ Feet

Bore Fluid Type | Bore Fluid Vol | Cmt Type | Cmt Vol

Bore Fluid Type | Bore Fluid Vol | Cmt Type | Cmt Vol

Notes

Stage Number: _____ Tag: _____ Feet

Bore Fluid Type | Bore Fluid Vol | Cmt Type | Cmt Vol

Bore Fluid Type | Bore Fluid Vol | Cmt Type | Cmt Vol

Notes

Daily Operations Report Form

Job Number: 710817 Well Number: IW-1 Superintendent: Ronnie Thanies Lead Driller: L.R. Glascock Rig Number: 4-11- Date: 11-19-01 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00	19:00	12	Drlg 2445 - 2511

Cement Stage Re

Stage Number: Tag: Feet

Slurry Pit Fluid | Slurry Fluid

Type | Slurry Density | Slurry | Slurry

Type | Slurry Density | Slurry | Slurry

Notes

Stage Number: Tag: Feet

Slurry Pit Fluid | Slurry Fluid

Type | Slurry Density | Slurry | Slurry

Type | Slurry Density | Slurry | Slurry

Notes

Production Recap

Beginning Borehole Footage: Ending Borehole Footage: Reamed Size: Footage: Casing Size: Footage:

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours
494	20½						78								

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
07:00	19:00	12	LR Glascock	LRG					
		12	Robert Maupin	RM					
		12	Bryan Crizer	BC					
		12	Joel HARRISON	JH					
		12	ALLEN W. KELLEY	AWK					

Daily Operations Report Form

Job Number: 710817 Well Number: IW-1 Superintendent: Bonnie Thomas Lead Driller: J Davis Rig Number: 411 Date: 11-17-01 Shift: Nights

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1400	0200	12	Drlg F/2511 T/2580

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours
499	20.5	TCI					90								

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
19:00	0700	12	J. Davis	JD					
			B. McClimis	BMC					
			D. McClain	DMC					
			E. Rivas	ER					
			J. Grais	JG					

Cement Stage Records

Stage Number: _____ Tag: _____ Feet

Stage Number: _____ Tag: _____ Feet

Notes

Notes

Daily Operatic eport Form

Job Number: 710817 Well Number: JW-1 Superintendent: Ronnie Thames Lead Driller: LR Glascock Rig Number: 411 Date: 11-20-0 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00	19:00	12	Drl. 2580 - 2695
			fuel 30"

Current Stage F... Stage Number: ____ Tag: ____ Feet

Bore Rig Floor | Bore Pump | Pump | Bore Pit | Pump | Bore | Pump | Bore

Notes

Stage Number: ____ Tag: ____ Feet

Bore Rig Floor | Bore Pump | Pump | Bore Pit | Pump | Bore | Pump | Bore

Notes

Production Recap

Beginning Borehole Footage: ____ Ending Borehole Footage: ____ Reamed Size: ____ Footage: ____ Casing Size: ____ Footage: ____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours
494	20½														

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
07:00	19:00	12	LR Glascock	LG					
		12	Robert Maupin	RM					
		12	Bryan Critzer	BC					
		12	Joel HARRISON	J.H.					
		12	ALLEN W. KELLEY	AWK					

Daily Operations Report Form

Job Number: 710817 Well Number: IW-1 Superintendent: Bonnie Thames Lead Driller: J Davis Rig Number: 411 Date: 11-20 Shift: 1900-0700

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Drlg F/2695 -T/2777

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
19:00	0700	12	J. Davis	JD					
"	"	"	B. McClimis	BMC					
"	"	"	D. McClain	DMC					
"	"	"	E. Rivas	ER					
"	"	"	J. Craig	J.C					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Slurry Pit Fluid | Slurry Fluid

Type | Slurry Vol | Slurry Wt | Slurry

Type | Slurry Vol | Slurry Wt | Slurry

Notes

Stage Number: _____ Tag: _____ Feet

Slurry Pit Fluid | Slurry Fluid

Type | Slurry Vol | Slurry Wt | Slurry

Type | Slurry Vol | Slurry Wt | Slurry

Notes

Daily Operatio[n] Report Form

Rig Number: 411

Superintendent: Ronnie Thames

Date: 11-21-01

Job Number: 710817 Well Number: IW-1 Lead Driller: L.R. Glascock

Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00	09:30	2½	Drlg 2777 - 2900
09:30	10:00	½	circ. bottoms up
10:00	13:00	3	Stand by Time
13:00	19:00	6	Drlg 2800 - 2955

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
07:00	19:00	12	L R Glascock	LG					
07:00		12	Robert Maupin	RM					
07:00	2:00	7	Bryan Ecizar	BC					
		12	Allen W Kelley						
		12	Joel Harrison						

Cement Stage Record

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Daily Operations Report Form

Job Number: 710817 Well Number: IW-2 Superintendent: Bonnie Thames Lead Driller: J Davis Rig Number: 41 Date: 11-21 Shift: MIDNIGHT

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	DRLG F/ 2855 - 2915

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl initials	Time From	Time To	Total Hours	Employee Name	Empl initials
19:00	0700	12	J. DAVIS	JD					
			B. McCLINNIS	BMC					
			D. McClain	DMC					
			E RIVAS	ER					
			~~[illegible]~~						

Current Stage Reports

Stage Number: _____ Tag: _____ Feet

Bore Pressure | Bore Flow

Time | Bore Loss | Cuttings | Slough

Flow | Bore Loss | Cuttings | Slough

Notes

Stage Number: _____ Tag: _____ Feet

Bore Pressure | Bore Flow

Time | Bore Loss | Cuttings | Slough

Flow | Bore Loss | Cuttings | Slough

Notes

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0900	N/A	512	13	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	550	33	N/A	6.26		YBI/Sanders
09/13/2001	0830	N/A	540	9	N/A	6.82		YBI/Sanders
09/19/2001	1230	N/A	396	15	N/A	6.41		YBI/Sanders
09/26/2001	1340	6.75	420	9	N/A	6.40		T. Levi
10/02/2001	1215	6.68	509	19	N/A	6.40		T. Levi
10/11/2001	1500	7.40	493	20	N/A	6.50		M. Schilling
10/18/2001	1345	7.10	517	23	N/A	6.80		M. Schilling
10/25/2001	1610	7.20	502	21	N/A	6.81		M. Schilling
11/01/2001	1430	7.33	542	20	N/A	6.40		T. Levi
11/08/2001	2000	9.50	535	17	N/A	7.30		T. Levi
11/15/2001	1230	9.50	717	36	N/A	7.00		T. Levi
11/21/2001	1120	9.67	509	28	N/A	7.00		T. Levi

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0930	N/A	599	30	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	780	13	N/A	6.72		YBI/Sanders
09/13/2001	0830	N/A	490	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	415	22	N/A	6.22		YBI/Sanders
09/26/2001	1310	3.50	440	26	N/A	6.40		T. Levi
10/02/2001	1205	3.62	524	39	N/A	6.40		T. Levi
10/11/2001	1515	3.20	536	26	N/A	6.40		M. Schilling
10/18/2001	1330	3.50	542	22	N/A	6.80		M. Schilling
10/25/2001	1630	4.30	500	25	N/A	6.60		M. Schilling
11/01/2001	1410	3.50	564	53	N/A	6.50		T. Levi
11/08/2001	2010	7.00	551	53	N/A	6.40		T. Levi
11/15/2001	1240	7.09	626	53	N/A	6.70		T. Levi
11/21/2001	1140	7.63	526	35	N/A	6.60		T. Levi

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1100	N/A	685	9	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	490	16	N/A	6.59		YBI/Sanders
09/13/2001	0830	N/A	550	10	N/A	6.74		YBI/Sanders
09/19/2001	1230	N/A	646	15	N/A	6.22		YBI/Sanders
09/26/2001	1330	6.67	720	8	N/A	6.20		T. Levi
10/02/2001	1155	6.59	747	9	N/A	6.20		T. Levi
10/11/2001	1530	6.70	704	7	N/A	6.10		M. Schilling
10/18/2001	1400	6.90	665	9	N/A	6.40		M. Schilling
10/25/2001	1550	7.10	698	8	N/A	6.23		M. Schilling
11/01/2001	1420	7.25	700	8	N/A	7.00		T. Levi
11/08/2001	2020	8.80	734	11	N/A	6.50		T. Levi
11/15/2001	1250	9.17	837	10	N/A	6.60		T. Levi
11/21/2001	1130	9.42	716	6	N/A	6.50		T. Levi

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1030	N/A	487	5	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	470	4	N/A	6.91		YBI/Sanders
09/13/2001	0830	N/A	760	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	331	11	N/A	6.05		YBI/Sanders
09/26/2001	1320	6.00	1,003	103	N/A	6.10		T. Levi
10/02/2001	1225	5.88	406	9	N/A	6.10		T. Levi
10/11/2001	1545	6.00	430	10	N/A	6.00		M. Schilling
10/18/2001	1415	6.20	445	10	N/A	6.10		M. Schilling
10/25/2001	1640	6.40	428	9	N/A	6.10		M. Schilling
11/01/2001	1400	6.33	476	10	N/A	6.20		T. Levi
11/08/2001	2030	8.50	490	8	N/A	6.50		T. Levi
11/15/2001	1300	8.75	592	8	N/A	6.60		T. Levi
11/21/2001	1150	9.13	491	9	N/A	6.70		T. Levi

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

CH2M HILL DAILY SUMMARY

Day/Date:	**Friday/11-23-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Sunny, ~ 75 degrees F**

Activity: No Activity
Starting Depth: N/A

Bit Size: N/A
Ending Depth: N/A

Time	Description
	No activity at the site due to Thanksgiving holiday

Recorded By: Mark Schilling

Date: 11/23/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Saturday/11-24-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Sunny, ~ 75 degrees F**

Activity: No Activity
Starting Depth: N/A

Bit Size: N/A
Ending Depth: N/A

Time	Description
	No activity at the site

Recorded By: Mark Schilling

Date: 11/24/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Sunday/11-25-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 75 degrees F**

Activity: Preparating for Pilot Hole Drilling
Bit Size: 12.25-inches
Starting Depth: N/A
Ending Depth: N/A

Time	Description
	Contractor removed the 20.5-inch diameter reaming bit and reinstalled the 12.25-inch diameter bit in preparation of resuming pilot hole drilling from 2,980 feet below pad level.

Recorded By: Mark Schilling Date: 11/25/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Monday/11-26-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 70 degrees F**

Activity: Pilot Hole Drilling
Bit Size: 12.25-inches
Starting Depth: 2,915 feet bpl
Ending Depth: 3,175 feet bpl

Time	Description
0900	Arrive at site. The Contractor has removed the 20.5 inch bit from the hole and installed the 12.25 inch bit to resume with pilot hole drilling below 2,980 feet below pad level (bpl). Due to the backplugging of the pilot hole before reaming, the drilling will start at 2,915 feet bpl.
0930	Pilot hole drilling resumes.
1030	Greg Caruthers and Theresa Newton with the USDA arrive at the site for Progress Meeting # 4
1100	Evo Deyo and John Short with IWSD arrive at the site
1105	Dave Xavier with LBFH arrives at the site
1110	Sean Skehan with CH2M Hill arrives at the site
1125	Ed McCullers with YBI arrives at the site
1225	Progress Meeting ends. G. Caruthers, T. Newton and E. Deyo leave the site.
1300	D. Xavier, E. McCullers and J. Short leave the site.
1345	S. Skehan leaves the site.
1400	Pilot hole drilling reaches a depth of 2,965 feet bpl.
1700	T. Levi leaves site. Pilot hole drilling is currently at a depth of 3,007 feet bpl. Contractor will continue pilot hole drilling throughout the night.

Recorded By: Tracy Levi
Date: 11/26/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Tuesday/11-27-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 75 degrees F**

Activity: Pilot Hole Drilling
Bit Size: 12.25-inches
Starting Depth: 3,175 feet bpl
Ending Depth: 3,300 feet bpl

Time	Description
0930	Arrive at site. The Contractor is continuing with the drilling of the pilot hole and has reached a depth of 3,190 feet below pad level (bpl).
1200	Pilot hole drilling reaches a depth of 3,220 feet bpl.
1730	Leave site for the day. Pilot hole drilling is currently at a depth of 3,250 feet bpl and is continuing.

Recorded By: Tracy Levi
Date: 11/27/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Wednesday/11-28-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 80 degrees F**

Activity: Pilot Hole Drilling
Bit Size: 12.25-inches
Starting Depth: 3,300 feet bpl
Ending Depth: 3,350 feet bpl

Time	Description
1045	Arrive at site. The Contractor is continuing with the drilling of the pilot hole to 3,350 feet below pad level (bpl).
1230	The drilling reaches the desired depth of 3,350 feet bpl. Contractor begins removing pipe from the hole.
1500	The Contractor's geophysical logging equipment arrives at the site.
1545	The drill bit is removed from the borehole. Start preparations for geophysical logging.
1615	Begin logging. The logs to be conducted are the Caliper, Natural Gamma Ray, Dual Induction, Sonic, Static and Dynamic Fluid Resistivity, Dynamic and Static Fluid Temperature, and Dynamic Flowmeter logs.
1650	Due to an obstruction at 3,240 feet bpl, the logging is stopped without any logs being conducted.
1745	The Contractor's geophysical logging equipment leaves the site. The Contractor will clean is reinstalling the drill bit to remove the obstruction. The logging will be conducted in the morning. Leave the site for the day.

Recorded By: Tracy Levi
Date: 11/28/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Thursday/11-29-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 80 degrees F**

Activity: Geophysical Logging
Starting Depth: 2,000 feet bpl

Bit Size: 12.25-inches
Ending Depth: 3,350 feet bpl

Time	Description
0700	Arrive at site. The Contractor's geophysical logging equipment is also arriving. Cable to be repaired on rig before logging can begin.
0845	Begin caliper/gamma ray log.
1010	Complete caliper/gamma ray log.
1025	Begin Sonic log.
1130	Complete Sonic log.
1140	Begin SP/Dual Induction log.
1320	Complete SP/Dual Induction log.
1335	Begin Static/Dynamic Temperature/Fluid Resistivity log.
1400	Stop log due to leakage of instrument. Remove instrument from hole.
1430	Restart Temperature/Fluid Conductivity log.
1515	End Temperature/Fluid Conductivity log due to instrument malfunction.
1540	Begin Static Flowmeter log.
1650	Complete Static Flowmeter log. Start Dynamic Flowmeter log. Contractor is having difficulties with the pump.
2100	Pump problems corrected. Flow rate is 440 gpm.
2200	A 5 hp pump is added to the assembly to increase the flow rate. Flow rate is increased an additional 94 gpm to 534 gpm. Start Dynamic Flowmeter log.
2330	Complete Dynamic Flowmeter log.
2345	Begin Fluid Resistivity/Temperature log that was suspended earlier.
2400	Geophysical logging continues.

Recorded By: Tracy Levi

Date: 11/29/01

Daily Operations Report Form

Job Number: 110817 Well Number: IW-1 Superintendent: Ronnie Thares Lead Driller: J. Davis Rig Number: 411 Date: 11-25-01 Shift: night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Trip out 4th stabilizer & L/D the 12¼ Bit trip in

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
19:00	0700	12	J. DAVIS	JD					
			S. CERECERES	SC.					
			E. RIVAS	ER					
			T.A. Pagan	TAP					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Daily Operator Report Form

Rig Number: 411

Superintendent: Barnie Thacker Mon Date: 11-26-01

Job Number: 71081 Well Number: IW #1 Lead Driller: LR Hancock Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
01:00	09:00	2	finish Trip in hole 2900 pick up tubing
09:00	09:30	½	circ bottoms up
09:30	19:00	9½	Drlg @ 2915 3027

Production Recap

Beginning Borehole Footage: 2,915' Ending Borehole Footage: 3,029' Reamed Size: 12.25" Footage: 114' Casing Size: 22" Footage: 2000'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
7:00	7:00	12	LR Hancock	LH					
		12	Robert Maupin	R.M.					
		12	Joel HARRISON	JH					
		12	ALLEN W. KELLEY	A.W.K.					

Cement Stage Records

Stage Number: Tag: Feet

Stage Number: Tag: Feet

Notes

...Report Form

Job Number: 710817 Well Number: IW-1 Superintendent: Ronnie Thakes Lead Driller: J. Davis Rig Number: 411 Date: 11-26-01 Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700		Dilg F/3085 - T/3175
	1900	12	3259

Production Recap

Beginning Borehole Footage: 3,029' Ending Borehole Footage: 3,175' Reamed Size: 12.25" Footage: 146' Casing Size: 22" Footage: 2000'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employees Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
19:00	0700	12	J. Davis	JD					
"	"	12	E. Rivas	ER					
"	"	12	JORGE L. AMADOR	JLA.					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Daily Operat' Report Form

Job Number: 710817 Well Number: IW-1 Superintendent: Rickie Thames Lead Driller: L.R. Glascock Rig Number: 4-11 Tue Date: 11-27-01 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700	19:00	12	Drlg f/3175 - 3259

Production Recap

Beginning Borehole Footage: 3,175' Ending Borehole Footage: 3,259' Reamed Size: 1225" Footage: 84' Casing Size: 22" Footage: 2000'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
07:00	19:00	12	LR Glascock	LRG					
		12	Robert Mampin	R.M.					
		12	Joel HARRISON	J.H.					
		12	ALLEN W. KELLEY	A.W.K					

Cement Stage Records

Stage Number: Tag: Feet

Notes

Stage Number: Tag: Feet

Notes

Daily Operations Report Form

Job Number: 710817 Well Number: IW-1 Superintendent: Ronnie Thares Lead Driller: J. Davis Rig Number: 411 Date: 11-28-10 Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700		Drlg F/3259 - T/3300
			Diesel 285 11

Production Recap

Beginning Borehole Footage: 3,259' Ending Borehole Footage: 3,300' Reamed Size: 12.25" Footage: 41' Casing Size: 22" Footage: 2000'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Emp Initials
19:00	0700	12	J. Davis	JD					
		↓	E. Rivas	ER					
		↓	J. L. Amador	JLA					
		12	Larry Haynes	LH					

Cement Stage Reports

Stage Number: Tag: Feet

Notes

Stage Number: Tag: Feet

Notes

Daily Operat Report Form

Job Number: 210817 Well Number: IW-1 Superintendent: Ronnie Thames Lead Driller: L.R Glascock Rig Number: 411 WCD Date: 11-28-01 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00	09:30	2½	W.O.O. @ 3300
09:30	12:00	1½	Drlg 3300 to 3350
12:00	13:00	1	circ bottoms up
13:00	16:00	3	Trip out hole
16:00			Rig up Logging Truck

Cement Stage Records

Stage Number: ____ Tag: ____ Feet

Notes

Stage Number: ____ Tag: ____ Feet

Notes

Production Recap

Beginning Borehole Footage: 3,300' Ending Borehole Footage: 3,350' Reamed Size: 12.25" Footage: 50' Casing Size: 22" Footage: 2000'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Emp Initials
07:00	19:00	12	LA Glascock	LG					
		12	Robert Maupin	RM.					
		12	Joel Harrison	J.H.					
		12	ALLEN W. KELLEY	A.W.K.					

Daily Operations Report Form

Job Number: 710817 Well Number: IW-1 Superintendent: Ronnie Thares Lead Driller: J. Davis Rig Number: 411 Date: 11-28-01 Shift: night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	2200	3	Trip in hole
2200	0200	4	Air Tubing & wash to Bottom
0200	0330	1½	Circulate to clean hole out
0330	0700	3½	L/D sinline & DP & Trip out of hole

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	J. Davis						
"	"	"	E. RIVAS	ER					
"	"	"	J.L. Amador						
"	"	"	Larry Hayres	LH					

Cement Stage Records

Stage Number: _____ Tag: _____ Feet

Bump Pressure | Bump Plug

Type | Bbls Slurry | Sx | Slurry Wt

Type | Bbls Water | Sx | Slurry Wt

Notes

Stage Number: _____ Tag: _____ Feet

Bump Pressure | Bump Plug

Type | Bbls Slurry | Sx | Slurry Wt

Type | Bbls Water | Sx | Slurry Wt

Notes

Daily Operations Report Form

Job Number: 710817 Well Number: IW #1 Superintendent: Kenny Thayer Lead Driller: LR Glascock Rig Number: 411 Date: 11-29-01 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00	08:30	1½	finish Trip out
08:30	19:00	10½	Rig up Logging Truck and Logging

Cement Stage Record

Stage Number: _____ Tag: _____ Feet

Bore Angle | Bore Azimuth

Type | Barrels Used | Slurry Weight | Slurry Yield

Type | Barrels Used | Slurry Weight | Slurry Yield

Notes

Stage Number: _____ Tag: _____ Feet

Bore Angle | Bore Azimuth

Type | Barrels Used | Slurry Weight | Slurry Yield

Type | Barrels Used | Slurry Weight | Slurry Yield

Notes

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
07:00	19:00	12	LR Glascock	LR					
07:00	19:00	12	Robert Maupin	RM					

Notes

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0900	N/A	512	13	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	550	33	N/A	6.26		YBI/Sanders
09/13/2001	0830	N/A	540	9	N/A	6.82		YBI/Sanders
09/19/2001	1230	N/A	396	15	N/A	6.41		YBI/Sanders
09/26/2001	1340	6.75	420	9	N/A	6.40		T. Levi
10/02/2001	1215	6.68	509	19	N/A	6.40		T. Levi
10/11/2001	1500	7.40	493	20	N/A	6.50		M. Schilling
10/18/2001	1345	7.10	517	23	N/A	6.80		M. Schilling
10/25/2001	1610	7.20	502	21	N/A	6.81		M. Schilling
11/01/2001	1430	7.33	542	20	N/A	6.40		T. Levi
11/08/2001	2000	9.50	535	17	N/A	7.30		T. Levi
11/15/2001	1230	9.50	717	36	N/A	7.00		T. Levi
11/21/2001	1120	9.67	509	28	N/A	7.00		T. Levi
11/29/2001	1630	10.0	596	25	N/A	6.80		T. Levi

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0930	N/A	599	30	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	780	13	N/A	6.72		YBI/Sanders
09/13/2001	0830	N/A	490	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	415	22	N/A	6.22		YBI/Sanders
09/26/2001	1310	3.50	440	26	N/A	6.40		T. Levi
10/02/2001	1205	3.62	524	39	N/A	6.40		T. Levi
10/11/2001	1515	3.20	536	26	N/A	6.40		M. Schilling
10/18/2001	1330	3.50	542	22	N/A	6.80		M. Schilling
10/25/2001	1630	4.30	500	25	N/A	6.60		M. Schilling
11/01/2001	1410	3.50	564	53	N/A	6.50		T. Levi
11/08/2001	2010	7.00	551	53	N/A	6.40		T. Levi
11/15/2001	1240	7.09	626	53	N/A	6.70		T. Levi
11/21/2001	1140	7.63	526	35	N/A	6.60		T. Levi
11/29/2001	1650	7.50	506	59	N/A	7.00		T. Levi

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1100	N/A	685	9	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	490	16	N/A	6.59		YBI/Sanders
09/13/2001	0830	N/A	550	10	N/A	6.74		YBI/Sanders
09/19/2001	1230	N/A	646	15	N/A	6.22		YBI/Sanders
09/26/2001	1330	6.67	720	8	N/A	6.20		T. Levi
10/02/2001	1155	6.59	747	9	N/A	6.20		T. Levi
10/11/2001	1530	6.70	704	7	N/A	6.10		M. Schilling
10/18/2001	1400	6.90	665	9	N/A	6.40		M. Schilling
10/25/2001	1550	7.10	698	8	N/A	6.23		M. Schilling
11/01/2001	1420	7.25	700	8	N/A	7.00		T. Levi
11/08/2001	2020	8.80	734	11	N/A	6.50		T. Levi
11/15/2001	1250	9.17	837	10	N/A	6.60		T. Levi
11/21/2001	1130	9.42	716	6	N/A	6.50		T. Levi
11/29/2001	1640	9.67	717	11	N/A	6.80		T. Levi

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1030	N/A	487	5	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	470	4	N/A	6.91		YBI/Sanders
09/13/2001	0830	N/A	760	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	331	11	N/A	6.05		YBI/Sanders
09/26/2001	1320	6.00	1,003	103	N/A	6.10		T. Levi
10/02/2001	1225	5.88	406	9	N/A	6.10		T. Levi
10/11/2001	1545	6.00	430	10	N/A	6.00		M. Schilling
10/18/2001	1415	6.20	445	10	N/A	6.10		M. Schilling
10/25/2001	1640	6.40	428	9	N/A	6.10		M. Schilling
11/01/2001	1400	6.33	476	10	N/A	6.20		T. Levi
11/08/2001	2030	8.50	490	8	N/A	6.50		T. Levi
11/15/2001	1300	8.75	592	8	N/A	6.60		T. Levi
11/21/2001	1150	9.13	491	9	N/A	6.70		T. Levi
11/29/2001	1700	9.50	460	8	N/A	6.70		T. Levi

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

CH2M HILL DAILY SUMMARY

Day/Date:	**Friday/11-30-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 80 degrees F**

Activity: Geophysical Logging
Bit Size: 12.25-inches
Starting Depth: 0 feet bpl
Ending Depth: 2,290 feet bpl

Time	Description
0000	Continue with Fluid Resistivity/Temperature geophysical logging.
0100	Complete Fluid Resistivity/Temperature logging. Leave site. Contractor will start flushing the well with fresh water in preparation of conducting the video survey.
0700	Return to site. The Contractor has flushed the well with fresh water for 4 hours and is ready to begin the video survey.
0710	Begin Video Survey.
0820	Halt Video Survey at 2,290 feet below pad level (bpl), due to cloudiness of water in formation. A large fracture is noted at this depth. Continue to flush with fresh water.
1015	Leave site for the day as the Contractor will continue to flush with fresh water to remove the cloudiness from the formation water.
1235	Steve Hillberg of CH2M HILL arrives at site. Contractor has continued to flush since 0820 hours.
1245	Contractor checks the water quality at 2,291 feet bpl by viewing through camera. The water is still full of suspended solids. The camera is lowered to a depth of 2,303 feet bpl with no change in water quality.
1250	S. Hillberg leaves site for lunch. Contractor continues to flush with fresh water.
1340	Return to site. The water is still cloudy. Flush estimated to be 90 to 100 gpm.
1420	After discussions with Mark Schilling of CH2M HILL, the Contractor makes decision to remove the camera from the well and install a packer assembly below the fracture as the flow from below it appears to be flowing out into the formation at the fracture and the fresh water is also flowing out into the formation at that point.
1435	Camera removed from the well. It is anticipated that the video logging will resume at 0700 hours tomorrow, December 1st.
1450	S. Hillberg leaves the site for the day.

Recorded By: Tracy Levi/Steve Hillberg
Date: 11/30/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Saturday/12-1-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 80 degrees F**

Activity: Video Survey
Starting Depth: 2,290 feet bpl

Bit Size: 20.5/12.25-inches
Ending Depth: 3,350 feet bpl

Time	Description
0300	Arrive at site. Contractor has installed drill pipe to a depth of 3,275 feet below pad level (bpl) and has flushed with fresh water. The plan is to video the flushed zone, move the drill pipe up the well, flush, then video. This process will be repeated until the entire borehole below 2,290 feet bpl is video surveyed.
0310	Start video survey from 3,350 feet bpl.
1200	Video survey completed and camera removed from well.
1400	Leave site for the day.

Recorded By: Steve Hillberg Date: 12/1/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Sunday/12-2-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 80 degrees F**

Activity: N/A
Bit Size: N/A
Starting Depth: N/A
Ending Depth: N/A

Time	Description
	No activity at the site.

Recorded By: Tracy Levi

Date: 12/2/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Monday/12-3-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**N/A**

Activity: N/A
Bit Size: N/A
Starting Depth: N/A
Ending Depth: N/A

Time	Description
	Contractor conducts equipment maintenance and trips out drill pipe used in flushing for video survey leaving 400 feet in the well.

Recorded By: Tracy Levi

Date: 12/3/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Tuesday/12-4-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**N/A**

Activity: N/A
Bit Size: N/A
Starting Depth: N/A
Ending Depth: N/A

Time	Description
	No activity at the site while awaiting approval of casing seat recommendation.

Recorded By: Tracy Levi

Date: 12/4/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Wednesday/12-5-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 80 degrees F**

Activity: Reaming
Starting Depth: 2,917 feet bpl

Bit Size: 20.5-inches
Ending Depth: 2,995 feet bpl

Time	Description
	The Contractor reamed the pilot hole, using a 20.5-inch diameter bit, from a depth of 2,917 feet bpl to a depth of 2,995 feet bpl after receiving approval of casing seat recommendation.

Recorded By: Tracy Levi

Date: 12/5/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Thursday/12-6-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Cloudy/Light Rain, ~ 81 degrees F**

Activity: Geophysical Logging/SettingBridge Plug
Bit Size: 20.5-inches
Starting Depth: 2,000 feet bpl
Ending Depth: 2,295 feet bpl

Time	Description
0730	Arrive at site.
0750	The Contractor's geophysical logging equipment arrives at the site.
0830	Begin Caliper logging.
0915	Collect pad monitor well water quality samples.
0950	Caliper logging completed.
1010	Begin installing drillable bridge plug into the well.
1500	Bridge plug installed to 3,002 feet bpl. Begin pumping cement to set plug.
1555	Stop cementing. A total of two 55-gallon drums of neat cement with calcium chloride additive was pumped followed by 508 gallons of fresh water as chase.
1855	Top of cement tagged at 2,998 feet bpl. Disconnect tremie pipe from bridge plug and start removing from well.
2030	Tremie pipe removed from well.
2035	Leave site for the day. There will be no further activity at the site until the start of the casing installation at 0700 hours on Saturday, December 8th.

Recorded By: Tracy Levi
Date: 12/6/01

Daily Operations Report Form

Job Number 710817 Well Number IW-1 Superintendent: Ronnie Thares Lead Driller: J. Davis Rig Number: 411 Date: 11-29-01 Shift: night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Log Flow w/ + pump fresh water Down hole

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
19:00	0700	12	J. Davis	JD					
/	/	/	E. Rivas	ER					
			J.L. Amador	JLA					
			Larry Haynes	LH					
			Mrs. DeSoto!!	MD					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Stage Number: _____ Tag: _____ Feet

Daily Operations Report Form

Job Number: 710817 Well Number: IW 1 Superintendent: R. Thames Rig Number: 411
Lead Driller: LR Glascock Date: 11-30-09 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700	15:00	8	Logging, pump fresh water down hole
15:00	15:30	½	Rig Down Logging Truck
15:30	18:00	2½	Kill Well
18:00	19:00	1	Trip in hole

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl initial's	Time From	Time To	Total Hours	Employee Name	Empl initials
0700			LR Glascock	LG					
		12	Robert Mayzin	RM					
		12	Joel Harrison	JH					
		12	Larry Glascock Jr.	LG					
		12	Joshua Cain	JC					
		12	Allen W. Kelley	AWK					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Stage Number: _____ Tag: _____ Feet

Notes

Diesel 26"

Daily Operations Report Form

Job Number: 71817 Well Number: IW #1 Superintendent: D. Thames Lead Driller: J. Davis Rig Number: 411 Date: 11-30-07 Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	TIH in hole open ended to log w/csng

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Emp Initials	Time From	Time To	Total Hours	Employee Name	Emp Initials
1900	0700	12	J. Davis	JA					
			E. Rivas	ER					
			J.L. Amador	JLA					
			Larry Haynes	LH					
			M.S. Degotell	MSD					
			Keith McGovern	KMC					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Daily Operations Report Form

Job Number: 71817 Well Number: IW #1 Superintendent: R. Thames Lead Driller: L.R Glascock Rig Number: 411 S+T. Date: 12-1-01 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700	19:00		Logging W/ Wire line comp. Rig Down Logging Truck

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Bottom	Bottom	Top	Top

Sacks	Type	Sacks	Type

Notes

Stage Number: _____ Tag: _____ Feet

Bottom	Bottom	Top	Top

Sacks	Type	Sacks	Type

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
07:00	19:00	12	LR Glascock	LRG					
		12	Robert Mcupin	RM					
		12	Joel Harrison	JH					
		12	Josh Cain	JC					
		12	Larry Glascock Jr	LRG					

Notes

Diesel - 26"

Daily Operations Report Form

Job Number: 210817 Well Number: TW#1 Superintendent: Nonnie Thomas Lead Driller: LR Glascock

Rig Number: 411 Date: 8-30-01 Shift: Day

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00	13:00	4	change oil and filters

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Init's	Time From	Time To	Total Hours	Employee Name	Empl Init's
07:00	13:00	4	LR Glascock	LG					
		8	Larry Glascock IV	LG					
		8	Joel HARRISON	JH					
		4	Joshua Cain	JC					
		4	ALLEN W. KELLEY	AWK					

Cement Stage Records

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Daily Operations Report Form

Job Number: 710817 Well Number: IW #1 Superintendent: R. Thames Lead Driller: T. Davis Rig Number: 411 Date: 12-3-10 Shift: night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0300	8:00	- TRIPPED OUT OF HOLE LEAVING 5 STANDS IN. AND 32 STANDING
			- CLEAN CEMENT TUBING
			- GENERAL CLEAN-UP.
			- ORGANIZED AND PRESSURE WASHED PARTS HOUSE -

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Emp. Initials	Time From	Time To	Total Hours	Employee Name	Emp. Initials
1900	0300	8	J. Davis	JD					
		13	E. Rivas	ER					
		8	JL. Amador	JLA					
		12	L. Haynes	LH					
			/						

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Bottom Plug Set	Top Plug Set

Type	Density (ppg)	Slurry	Yield

Type	Density (ppg)	Slurry	Yield

Notes

Stage Number: _____ Tag: _____ Feet

Bottom Plug Set	Top Plug Set

Type	Density (ppg)	Slurry	Yield

Type	Density (ppg)	Slurry	Yield

Notes

Daily Operations Report Form

Job Number: 710817 Well Number: IW #1 Superintendent: R. Thames Lead Driller: L.R Glascock Rig Number: 411 Date: 12-4-01 Shift: DAY'S

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1400	1400	12	

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1400	14:00	12	LARRY R. GLASCOCK						
			LARRY GLASCOCK JR						
			Joel Harrison						
			Joshua Cain						
			Robert Maupin						
			Allen W. Kelley						

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Stage Number: _____ Tag: _____ Feet

Daily Operations Report Form

Job Number: 710817 Well Number: IW #1 Superintendent: R. Thomas Rig Number: 411
Lead Driller: L R Glascock Tue. Date: 12-4-01 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700	1500		

Cement Stage Records

Stage Number: _____ Top: _____ Feet

Stage Number: _____ Top: _____ Feet

Notes

26" Fuel

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
		12	L.R Glascock	LRG					
		12	Larry Glascock JR	LG-J.					
		8	Joel Harrison	JH.					
		12	Joshua Cain	JC.					
		8	ALLEN W. KELLY	A.W.K.					
		8	Robert Mangin	RM					

Daily Oper ▼ Report Form

Rig Number: 411

Job Number: 710817 Well Number: I W# 1 Superintendent: N. Thames Lead Driller: J. Davis Date: 12-4-01 Shift: night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0300	8	CREW U/L Rig & LOCATION

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Emp Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0300	8	J. Davis						
			E. RIVAS	ER					
			J.L. Amador						
			L. Haynes						
			K. McGovern						

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Daily Operations Report Form

Job Number: 70817 Well Number: IWI Superintendent: R Thames Lead Driller: J Davis Rig Number: 411 Date: 12-5-01 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00	14:00	7	
14:00	19:00	5	Picking up std and B.H. Tools in hole 2917

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
07:00	19:00	12	LR Glascock	LG					
		12	Larry Glascock Sr	LG					
		12	Jon L Harrison	JH					
		12	Joshua Cain	JC					
		12	Robert Maupin	RM					
		12	Allen W Kelley	AK					

Cement Stage Records

Stage Number: _____ Tag: _____ Feet

Stage Number: _____ Tag: _____ Feet

Daily Operations Report Form

Job Number: 71017 Well Number: IW #1 Superintendent: H. Thames Lead Driller: J. Davis

Rig Number: 411 Date: 12-5-01 Shift: night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Ream Hole, to 2995 Trip out of hole, LD DC & Stabilizers & Bit Clean up Floor

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Emp Initials	Time From	Time To	Total Hours	Employee Name	Emp Initials
1900	0700	12	J. Davis	JD					
"	"	"	E. Rivas	ER					
"	"	"	J.L. Amador	JLA					
"	"	"	L. Haynes	[illegible]					
"	"	"	K. McGatlin	KMc					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Bottom Hole Temp | Bottom Hole Pressure

Pump | Pump Rate | Mud | Density

Pump | Pump Rate | Mud | Density

Notes

Stage Number: _____ Tag: _____ Feet

Bottom Hole Temp | Bottom Hole Pressure

Pump | Pump Rate | Mud | Density

Pump | Pump Rate | Mud | Density

Notes

Daily Operations Report Form

Job Number: 710817 Well Number: IW#1 Superintendent: R. Thames Rig Number: 411
Lead Driller: J. Davis Date: 12-6-01 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700	0915	1	Safety Meeting, Travel
0915	10:30	2½	Logging
10:30	11:00	½	Rig Down Logging Truck
11:00	14:00	3	Pick up 2⅜" tubing
14:00	16:00	2	Running tubing
16:00			WOC

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	19:00	12	L.R. Glascock	LRG					
		12	Larry Glascock Jr.	LG					
		12	Joel R. Harrison	JRH					
		12	Joshua Cain	JC					
		12	Robert Maupin	RM					
		12	Allen W. Kelley	AWK					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Stage Number: _____ Tag: _____ Feet

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0900	N/A	512	13	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	550	33	N/A	6.26		YBI/Sanders
09/13/2001	0830	N/A	540	9	N/A	6.82		YBI/Sanders
09/19/2001	1230	N/A	396	15	N/A	6.41		YBI/Sanders
09/26/2001	1340	6.75	420	9	N/A	6.40		T. Levi
10/02/2001	1215	6.68	509	19	N/A	6.40		T. Levi
10/11/2001	1500	7.40	493	20	N/A	6.50		M. Schilling
10/18/2001	1345	7.10	517	23	N/A	6.80		M. Schilling
10/25/2001	1610	7.20	502	21	N/A	6.81		M. Schilling
11/01/2001	1430	7.33	542	20	N/A	6.40		T. Levi
11/08/2001	2000	9.50	535	17	N/A	7.30		T. Levi
11/15/2001	1230	9.50	717	36	N/A	7.00		T. Levi
11/21/2001	1120	9.67	509	28	N/A	7.00		T. Levi
11/29/2001	1630	10.0	596	25	N/A	6.80		T. Levi
12/06/2001	1200	10.2	635	26	N/A	6.90		T. Levi

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0930	N/A	599	30	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	780	13	N/A	6.72		YBI/Sanders
09/13/2001	0830	N/A	490	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	415	22	N/A	6.22		YBI/Sanders
09/26/2001	1310	3.50	440	26	N/A	6.40		T. Levi
10/02/2001	1205	3.62	524	39	N/A	6.40		T. Levi
10/11/2001	1515	3.20	536	26	N/A	6.40		M. Schilling
10/18/2001	1330	3.50	542	22	N/A	6.80		M. Schilling
10/25/2001	1630	4.30	500	25	N/A	6.60		M. Schilling
11/01/2001	1410	3.50	564	53	N/A	6.50		T. Levi
11/08/2001	2010	7.00	551	53	N/A	6.40		T. Levi
11/15/2001	1240	7.09	626	53	N/A	6.70		T. Levi
11/21/2001	1140	7.63	526	35	N/A	6.60		T. Levi
11/29/2001	1650	7.50	506	59	N/A	7.00		T. Levi
12/06/2001	1200	7.75	600	70	N/A	6.90		T. Levi

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1100	N/A	685	9	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	490	16	N/A	6.59		YBI/Sanders
09/13/2001	0830	N/A	550	10	N/A	6.74		YBI/Sanders
09/19/2001	1230	N/A	646	15	N/A	6.22		YBI/Sanders
09/26/2001	1330	6.67	720	8	N/A	6.20		T. Levi
10/02/2001	1155	6.59	747	9	N/A	6.20		T. Levi
10/11/2001	1530	6.70	704	7	N/A	6.10		M. Schilling
10/18/2001	1400	6.90	665	9	N/A	6.40		M. Schilling
10/25/2001	1550	7.10	698	8	N/A	6.23		M. Schilling
11/01/2001	1420	7.25	700	8	N/A	7.00		T. Levi
11/08/2001	2020	8.80	734	11	N/A	6.50		T. Levi
11/15/2001	1250	9.17	837	10	N/A	6.60		T. Levi
11/21/2001	1130	9.42	716	6	N/A	6.50		T. Levi
11/29/2001	1640	9.67	717	11	N/A	6.80		T. Levi
12/06/2001	1200	10.00	714	10	N/A	6.70		T. Levi

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1030	N/A	487	5	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	470	4	N/A	6.91		YBI/Sanders
09/13/2001	0830	N/A	760	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	331	11	N/A	6.05		YBI/Sanders
09/26/2001	1320	6.00	1,003	103	N/A	6.10		T. Levi
10/02/2001	1225	5.88	406	9	N/A	6.10		T. Levi
10/11/2001	1545	6.00	430	10	N/A	6.00		M. Schilling
10/18/2001	1415	6.20	445	10	N/A	6.10		M. Schilling
10/25/2001	1640	6.40	428	9	N/A	6.10		M. Schilling
11/01/2001	1400	6.33	476	10	N/A	6.20		T. Levi
11/08/2001	2030	8.50	490	8	N/A	6.50		T. Levi
11/15/2001	1300	8.75	592	8	N/A	6.60		T. Levi
11/21/2001	1150	9.13	491	9	N/A	6.70		T. Levi
11/29/2001	1700	9.50	460	8	N/A	6.70		T. Levi
12/06/2001	1200	9.55	440	11	N/A	6.70		T. Levi

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

CH2M HILL DAILY SUMMARY

Day/Date:	**Friday/12-7-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 81 degrees F**

Activity: No Activity
Starting Depth: N/A

Bit Size: N/A
Ending Depth: N/A

Time	Description
	There was no activity at the site.

Recorded By: Mark Schilling

Date: 12/7/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Saturday/12-8-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 81 degrees F**

Activity: Casing Installation
Starting Depth: 0 feet bpl

Bit Size: 20.5-inches
Ending Depth: 402 feet bpl

Time	Description
0700	Arrive at site. The Contractor is preparing for the installation of the 12-inch casing.
0715	N.D.T. and Inspections, Inc. (NDT) arrives at site to conduct x-ray testing of the welds between each 40-foot casing section. The welders also arrive at site.
0850	Start casing installation.
1535	Casing installation continues. A total of 196 feet of casing has been installed.
2135	Casing installation continues. A total of 361 feet of casing has been installed. Changeover in welding crew takes place.
2400	Casing installation continues. A total of 402 feet of casing has been installed.

Recorded By: Mark Schilling

Date: 12/8/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Sunday/12-9-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 81 degrees F**

Activity: Casing Installation
Bit Size: 20.5-inches
Starting Depth: 402 feet bpl
Ending Depth: 888 feet bpl

Time	Description
0000	Installation of the 12-inch steel casing continues. A total of 402 feet of casing has been installed.
0235	A piece of the casing (Joint #11) is discovered to be 0.375-inch wall thickness instead of 0.5-inch thickness. The discovery was made after the piece had been welded to casing string. The piece is being cut out and removed from the string. An extra piece of casing will be used to replace it.
0605	Contractor stops welding until changeover of welding crew takes place. A total of 442 feet of casing has been installed.
0810	New welding crew arrives at site and casing installation resumes.
0945	Leave site for breakfast.
1000	Return to site.
1220	Steve Hillberg of CH2M HILL arrives at site.
1300	Mark Schilling leaves site. A total of 566 feet of casing has been installed.
1500	S. Hillberg leaves site.
1530	S. Hillberg returns to site.
1910	A total of 767 feet of casing has been installed.
2400	Casing installation continues. A total of 888 feet of casing has been installed.

Recorded By: Mark Schilling/Steve Hillberg
Date: 12/9/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Monday/12-10-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 80 degrees F**

Activity: Casing Installation
Bit Size: 20.5-inches
Starting Depth: 888 feet bpl
Ending Depth: 2,261 feet bpl

Time	Description
0000	Installation of the 12-inch steel casing continues. A total of 888 feet of casing has been installed.
0440	N.D.T. and Inspections, Inc. (NDT), the x-ray welding inspectors, are released as a total of 1,012 feet of casing has been installed and the remaining casing will inside the 22-inch casing.
0715	Tracy Levi of CH2M Hill arrives at site.
0730	S. Hillberg leaves site. A total of 1,217 feet of casing has been installed.
1050	Casing installation has reached a depth of 1,454 feet bpl.
1625	Casing installation has reached a depth of 1,855 feet bpl.
1830	Mark Schilling of CH2M HILL arrives at site.
1845	T. Levi leaves the site.
1930	Contractor releases 2 of the 3 welders at the site for sleep. One welder remains. A total of 2,018 feet of casing has been installed.
2400	Casing installation continues. A total of 2,261 feet of casing has been installed.

Recorded By: Steve Hillberg/Tracy Levi/Mark Schilling
Date: 12/10/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Tuesday/12-11-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 80 degrees F**

Activity: Casing Installation
Bit Size: 20.5-inches
Starting Depth: 2,261 feet bpl
Ending Depth: 2,983 feet bpl

Time	Description
0000	Installation of the 12-inch steel casing continues. A total of 2,261 feet of casing has been installed.
0330	A total 2,461 feet of casing has been installed.
0535	The remaining welder leaves the site to get sleep. Installation temporarily stopped until the second welding crew returns to site.
0630	Welding resumes.
0915	A total of 2,790 feet of casing has been installed.
1220	A total of 2,985 feet is installed and the installation is stopped due to an obstruction in the borehole. The target depth is 2,990 feet below pad level (bpl). Sean Skehan of CH2M HILL is contacted and he will contact Jack Myers of FDEP to inform him of the situation and recommend that the casing setting depth be moved up to approximately 2,984 feet bpl.
1300	Contractor informs CH2M HILL that their geophysical logging equipment is enroute to conduct a caliper log through the casing.
1345	S. Skehan informs the CH2M HILL on-site representative that FDEP approved setting the base of the casing at approximately 2,984 feet bpl. Contractor is informed by on-site representative.
1355	The Contractor's geophysical logging equipment arrives at the site and starts preparing to conduct the caliper log.
1415	Contractor informs CH2M HILL that after completing a verification of the bridge plug calculations, it is determined that the bridge plug is the obstruction at 2,986 feet bpl. The caliper log will be conducted as extra verification.
1445	Start caliper logging.
1515	Caliper logging completed and verified that bridge plug is at 2,985 feet bpl. It is determined that the Contractor will proceed from the caliper logging into the pressure grouting of the casing. The casing will be lowered to a tag of the bridge plug and then raised 2 feet to create space for the pressure grouting. This will set the bottom of the casing at 2,983 feet bpl. A total of 100 feet of theoretical fill of

	neat cement will be pumped. The Contractor starts preparations for the pressure grout.
1555	M. Schilling leaves the site.
1730	Tracy Levi of CH2M HILL arrives at the site.
2005	Installation of 2.375-inch tremie pipe, for the pressure grouting, is completed to 2,968 feet bpl.
2023	Begin first cementing stage.
2041	End first cementing stage. A total of 30 barrels of neat cement was pumped.
2100	T. Levi leaves site.

Recorded By: Mark Schilling/Tracy Levi Date: 12/11/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Wednesday/12-12-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 80 degrees F**

Activity: Cementing of 12-inch Casing
Bit Size: 20.5-inches
Starting Depth: 2,900 feet bpl
Ending Depth: 2,384 feet bpl

Time	Description
0330	Arrive at site. The Contractor's geophysical logging equipment is also arriving at the site.
0345	Begin temperature logging for the 1st stage of cementing the 12-inch casing.
0500	Temperature logging completed. Estimated top of cement at 2,880 feet below pad level (bpl).
0520	Start installing tremie pipe into the annulus between the 12-inch and the 22-inch for the 2nd stage of cementing.
0725	The top of the cement pumped during the 1st stage is tagged at 2,900 feet bpl.
0745	Start 2nd stage of cementing.
0810	2nd stage of cementing completed. A total of 50 barrels of neat cement was pumped.
0845	Leave site while cement cures.
1515	Return to site.
1530	The Contractor's geophysical logging equipment arrives at the site.
1600	Begin temperature logging for the 2nd stage.
1645	Temperature logging completed. Estimated top of cement at 2,746 feet bpl.
1705	The top of the cement pumped during the 2nd stage is tagged with the tremie pipe at 2,776 feet bpl.
1740	Start 3rd stage of cementing.
1840	3rd stage of cementing completed. A total of 150 barrels of 4% bentonite cement was pumped.
1845	Leave site while cement cures.
2330	Return to site.
2400	Waiting on the start of the temperature logging for the 3rd stage.

Recorded By: Tracy Levi
Date: 12/12/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Thursday/12-13-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 80 degrees F**

Activity: Cementing the 12-inch Casing
Bit Size: 20.5-inches
Starting Depth: 2,384 feet bpl
Ending Depth: 2,090 feet bpl

Time	Description
0000	Awaiting start of temperature logging for the 3rd stage of cementing the 12-inch casing.
0215	Start temperature logging.
0240	Temperature logging completed. Estimated top of cement at 2,375 feet below pad level (bpl).
0430	The top of the cement pumped during the 3rd stage is tagged with the tremie pipe at 2,384 feet bpl.
0525	Start 4th stage of cementing.
0620	4th stage of cementing completed. A total of 152 barrels of 4% bentonite cement was pumped.
0645	Leave site while cement cures.
1330	Return to site. Start temperature logging for the 4th stage.
1410	Temperature logging completed. Estimated top of cement at 2,260 feet bpl.
1425	The top of the cement pumped during the 4th stage is tagged with the tremie pipe at 2,279 feet bpl.
1510	Start 5th stage of cementing.
1550	5th stage of cementing completed. A total of 115 barrels of 4% bentonite cement was pumped.
1700	Leave site while cement cures.
2200	Return to site.
2315	Start temperature logging for the 5th stage.
2345	Temperature logging completed. Estimated top of cement at 2,076 feet bpl.
2400	Installation of tremie pipe to tag the top of the cement pumped during the 5th stage is in progress.

Recorded By: Tracy Levi
Date: 12/13/01

Daily Operations Report Form

Job Number: 710817 Well Number: I.W #1 Superintendent: R. THAMES Lead Driller: J. DAVIS Rig Number: 411 7 Date: 12-6-01 Shift: NIGHTS

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
19:00	21:30	2.5	TRIP OUT CEMENT TUBING -
21:30	0:700	9.5	CLEAN UP —

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
19:00	0:00	12	J. DAVIS	J.D.					
"	"	"	E. RIVAS	E.R.					
"	"	"	J.L. AMADOR	JLA					
"	"	"	L. HAYNES	L.H.					
"	"	"	K McGOVERN	K.M.					
"									
"									

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Stage Number: _____ Tag: _____ Feet

Daily Operations Report

Job Number: 20817 Well Number: IW#1 Superintendent: R. Thames Lead Driller: J. Davis Rig Number: 711 Date: 12-8-01 Shift: Day

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700	1900	12	Running 12" Casing

Stage Number: Tag: Feet

Stage Number: Tag: Feet

Production Recap

Beginning Borehole Footage: Ending Borehole Footage: Reamed Size: Footage: Casing Size: Footage:

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	1900	12	L.R. Glascock	LG					
		12	Larry Glascock Jr.	LG					
		12	Noel R. Harrison	N.H.					
		12	Joshua Cain	JC					
		12	ALLEN W. KELLEY	A.W.K					

Daily Operat' `s Report Form

Job Number: 71817 Well Number: IW #1 Superintendent: R. Thames Lead Driller: J. Davis Rig Number: 411 Date: 12-8-01 Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
19:00	07:00	12	Run Casing & Rig

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
19:00	07:00	12	J. Davis	JD					
			E. Rivas	ER					
			J.L. Amador	JLA					
			L. Haynes	LA					
			K. McGovern	KMC					
			S. Perez	SC					

Cement Stage Records

Stage Number: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Daily Operations Report Form

Job Number: 71817 Well Number: IW#1 Superintendent: R. Thames Lead Driller: J. Davis Rig Number: 411 Date: 12-9-01 Shift: DAY

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700	1900		Run Casing X Ray

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	1900	12	Larry Glascock	LG					
		12	Larry Glascock JR	LG					
		12	Joel R. Harrison	JH.					
		12	Joshua Cain	JC					
		12	ALLEN W. KELLEY	A.W.K					

Cement Stage Records

Stage Number: _____ Tag: _____ Feet

Stage Number: _____ Tag: _____ Feet

Notes

Fuel - 25"

Daily Operations Report Form

Job Number: 71817 Well Number: IW#1 Superintendent: L. Thames Lead Driller: J. DAVIS Rig Number: 411 Date: 12-9-01 Shift: nights

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
19:00	0700	12	RUN Casing and X Rays

Cement Stage Records

Stage Number: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
19:00	0700	12	J. DAVIS	JD					
〃	〃	〃	E. RIVAS	ER					
〃	〃	〃	J.L. AMADOR	JLA					
〃	〃	〃	L. HAYNES	LH					
〃	〃	〃	K. McGOVERN	KMc					

Daily Operations Report Form

Job Number: 710817 Well Number: TW #1 Superintendent: Bennie Thames Lead Driller: LR Hancock Rig Number: 411 Date: 12-10-01 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00	19:00	12	Running Casing

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
07:00	19:00	12	L R Hancock	LR					
		12	Larry Hancock	LH					
		12	Joshua Cain	JC					
		12	Josh HARRISON	JH					
		12	ALLEN W. KELLEY	AWK					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Diesel - 25"

Daily Operat' s Report Form

Job Number: 71817 Well Number: IW #1 Superintendent: T. Thames Lead Driller: J. Davis Rig Number: 411 Date: 12-[illegible]-01 Shift: nights

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Run Casing W/1 welder

Cement Stage Records

Stage Number: _____ _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	J. Davis	JD					
			E. Rivas	ER					
			J.L. Amador	JLA					
			L. Haynes	LA					
			K. McQueen	KMC					

Daily Operations Report Form

Job Number: 71817 Well Number: IW #1 Superintendent: R Thomas Rig Number: 411
Lead Driller: L.R. Glascock Tue, Date: 13-11-D Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700	1800	5	Running Casing
1200	1430	2½	Rigging up wire line + cement
1430	1600		Logging + rigging down truck
1600	19:00		welding base plate on 10"
19:00	19:00	1	Picking up 2⅞ tubing

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	1900	12	L.R. Glascock	LG					
		12	Larry Glascock Jr.	LG					
		12	Joel R. HARRISON	J.H.					
		12	Robert Menpin	R.M.					
		12	Joshua Cain	JC					
		12	Joshua Brown						
		14½	ALLEN W. KELLEY	AW.K.					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Bottom Plug	Top Plug

Time	Event Code	PSI	Comments

Stage Number: _____ Tag: _____ Feet

Bottom Plug	Top Plug

Time	Event Code	PSI	Comments

Daily Oper ...s Report Form

Job Number: 71817 Well Number: IW # 1 Superintendent: H. Thames Lead Driller: J. DAVIS Rig Number: 411 Date: 12-11-0 Shift: nights

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	0700	12	Run 2 3/8 Tubing in hole to cement finish cementing @ 6205 set set & watch pressure guage 1000 psi
			W/A cement tubing & PU tubing go back in backside

Cement Stage Report

Stage Number: ____ @: ____ Feet

Notes

Stage Number: ____ Tag: ____ Feet

Notes

Production Recap

Beginning Borehole Footage: ____ Ending Borehole Footage: ____ Reamed Size: ____ Footage: ____ Casing Size: ____ Footage: ____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Emp Initials	Time From	Time To	Total Hours	Employee Name	Emp Initials
1900	0700	12	J. DAVIS	JA					
			E. RIVAS	ER					
			J.L. AMADOR	JLA					
			L. HAYNES	LH					
			K. McGOVERN	KMC					

Notes

Daily Operations Report Form

Job Number: 70817 Well Number: IW #1 Superintendent: R. Thames Lead Driller: J. Davis Rig Number: 411 Date: 12-12-0 Shift: Day

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700	0730	1/2	Running tubing
0730	0830	1	Pumping cement
09:30	0850	2	WOC.
13:30	15:30		Rig up Wire line Truck and run temp Log
15:30	17:30		CEMENTED
17:30	19:00		LAYED DOWN CEMENT TUBING

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	19:00	12	L.R. Glasscock	LG	0700			Allen Kelley	
"	"	"	Larry Glasscock Jr	LG	0700			Robert Mangin	
"	"	"			0700			Joel Harrison	
"	"	"	Joshua Cain	JC					
"	"	"							
0700			Joshua Brown						

Cement Stage Records

Stage Number: 2 Tag: 2900 Feet

N	50 bbls		

Notes

Stage Number: 3 Tag: 2776 Feet

10	9.5		
4½	150		

Notes

Pump Cement w/ 3 Doubles: Out / 4.5 DP's in Hole 15' above Floor; Lay Down 12 Doubles & Re Flush

JFS

Daily Operations Report Form

Job Number: 71817 Well Number: IW*1 Superintendent: L. Thames Lead Driller: J. DAVIS Rig Number: 411 Date: 12-12-01 Shift: nights

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
19:00	0230	7½	WOC
0230	0300	½	Temp Surve Logs
0300	0400	1	TIH in hole w/ 2⅞ Tubing to tag cement tag @ 2385
0400	0500	1	Pressure Accsing to 150 psi & observe gauge
0500	0700	2	CEMENT

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
19:00	0700	12	J. DAVIS	JD					
			E. RIVAS	ER					
			J.L. AMADOR	JLA					
			L. HAYNES	LH					
			~~K. McGEHEE~~ N.	KMC					
		12	[illegible]						

Cement Stage Notes

Stage Number: 4 @ 2385 Feet

4%	150		

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Daily Operations Report Form

Job Number: 71817 Well Number: IW #1 Superintendent: R THAMES Rig Number: 411
Lead Driller: J. DAVIS Date: 12-13-0 Shift: DAY

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
07:00	13:30	6½	WOC
13:30	15:00	1½	Rig up Logging Truck Temp Log Pick up Tubing Tag cement
15:00	16:00	1	cement Lay Down 8 stds Tubing
16:00	19:00	3	WOC Monitor casing pressure

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	19:00	12	L.R. Glascock	LG			12		
		12	Larry Glascock Jr.	LG			12		
		12	Joshua Cain	JC			12		
		12	Robert Mayoi-	RM					
		12	Joel R. HARRISON	J.H.					
		12	ALLEN W. KELLEY	A.W.K					

Cement Stage Records

Stage Number: 5 Tag: _____ Feet

Top	Bottom	Cmt	Yield

Top	Bottom	Cmt	Yield

Notes

Stage Number: _____ Tag: _____ Feet

Top	Bottom	Cmt	Yield

Top	Bottom	Cmt	Yield

Comments

Fuel - 22"

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0900	N/A	512	13	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	550	33	N/A	6.26		YBI/Sanders
09/13/2001	0830	N/A	540	9	N/A	6.82		YBI/Sanders
09/19/2001	1230	N/A	396	15	N/A	6.41		YBI/Sanders
09/26/2001	1340	6.75	420	9	N/A	6.40		T. Levi
10/02/2001	1215	6.68	509	19	N/A	6.40		T. Levi
10/11/2001	1500	7.40	493	20	N/A	6.50		M. Schilling
10/18/2001	1345	7.10	517	23	N/A	6.80		M. Schilling
10/25/2001	1610	7.20	502	21	N/A	6.81		M. Schilling
11/01/2001	1430	7.33	542	20	N/A	6.40		T. Levi
11/08/2001	2000	9.50	535	17	N/A	7.30		T. Levi
11/15/2001	1230	9.50	717	36	N/A	7.00		T. Levi
11/21/2001	1120	9.67	509	28	N/A	7.00		T. Levi
11/29/2001	1630	10.0	596	25	N/A	6.80		T. Levi
12/06/2001	1200	10.2	635	26	N/A	6.90		T. Levi
12/13/2001	2200	10.3	514	22	N/A	7.10		T. Levi

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0930	N/A	599	30	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	780	13	N/A	6.72		YBI/Sanders
09/13/2001	0830	N/A	490	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	415	22	N/A	6.22		YBI/Sanders
09/26/2001	1310	3.50	440	26	N/A	6.40		T. Levi
10/02/2001	1205	3.62	524	39	N/A	6.40		T. Levi
10/11/2001	1515	3.20	536	26	N/A	6.40		M. Schilling
10/18/2001	1330	3.50	542	22	N/A	6.80		M. Schilling
10/25/2001	1630	4.30	500	25	N/A	6.60		M. Schilling
11/01/2001	1410	3.50	564	53	N/A	6.50		T. Levi
11/08/2001	2010	7.00	551	53	N/A	6.40		T. Levi
11/15/2001	1240	7.09	626	53	N/A	6.70		T. Levi
11/21/2001	1140	7.63	526	35	N/A	6.60		T. Levi
11/29/2001	1650	7.50	506	59	N/A	7.00		T. Levi
12/06/2001	1200	7.75	600	70	N/A	6.90		T. Levi
12/13/2001	2220	8.08	558	80	N/A	7.30		T. Levi

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1100	N/A	685	9	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	490	16	N/A	6.59		YBI/Sanders
09/13/2001	0830	N/A	550	10	N/A	6.74		YBI/Sanders
09/19/2001	1230	N/A	646	15	N/A	6.22		YBI/Sanders
09/26/2001	1330	6.67	720	8	N/A	6.20		T. Levi
10/02/2001	1155	6.59	747	9	N/A	6.20		T. Levi
10/11/2001	1530	6.70	704	7	N/A	6.10		M. Schilling
10/18/2001	1400	6.90	665	9	N/A	6.40		M. Schilling
10/25/2001	1550	7.10	698	8	N/A	6.23		M. Schilling
11/01/2001	1420	7.25	700	8	N/A	7.00		T. Levi
11/08/2001	2020	8.80	734	11	N/A	6.50		T. Levi
11/15/2001	1250	9.17	837	10	N/A	6.60		T. Levi
11/21/2001	1130	9.42	716	6	N/A	6.50		T. Levi
11/29/2001	1640	9.67	717	11	N/A	6.80		T. Levi
12/06/2001	1200	10.00	714	10	N/A	6.70		T. Levi
12/13/2001	2210	10.08	655	24	N/A	6.90		T. Levi

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1030	N/A	487	5	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	470	4	N/A	6.91		YBI/Sanders
09/13/2001	0830	N/A	760	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	331	11	N/A	6.05		YBI/Sanders
09/26/2001	1320	6.00	1,003	103	N/A	6.10		T. Levi
10/02/2001	1225	5.88	406	9	N/A	6.10		T. Levi
10/11/2001	1545	6.00	430	10	N/A	6.00		M. Schilling
10/18/2001	1415	6.20	445	10	N/A	6.10		M. Schilling
10/25/2001	1640	6.40	428	9	N/A	6.10		M. Schilling
11/01/2001	1400	6.33	476	10	N/A	6.20		T. Levi
11/08/2001	2030	8.50	490	8	N/A	6.50		T. Levi
11/15/2001	1300	8.75	592	8	N/A	6.60		T. Levi
11/21/2001	1150	9.13	491	9	N/A	6.70		T. Levi
11/29/2001	1700	9.50	460	8	N/A	6.70		T. Levi
12/06/2001	1200	9.55	440	11	N/A	6.70		T. Levi
12/13/2001	2230	9.58	369	10	N/A	7.20		T. Levi

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

CH2M HILL DAILY SUMMARY

Day/Date:	**Friday/12-14-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 80 degrees F**

Activity: Cementing the 12-inch Casing
Bit Size: 20.5-inches
Starting Depth: 2,090 feet bpl
Ending Depth: 216 feet bpl

Time	Description
0000	The installation of tremie pipe continues.
0030	The top of the cement pumped during the 5th stage of cementing the 12-inch casing is tagged with tremie pipe at 2,090 feet below pad level (bpl).
0545	Start 6th stage of cementing.
0600	6th stage of cementing completd. A total of 52 barrels of 4% bentonite cement was pumped.
0700	Leave site while cement cures.
1245	Return to site.
1300	Start temperature logging for the 6th stage.
1315	Temperature logging completed.
1335	Start 7th stage of cementing after tagging, with tremie pipe, the top of the cement pumped during the 6th stage at 1,987 feet bpl.
1425	7th stage of cementing completed. A total of 251 barrels of 12% bentonite cement was pumped.
1445	Leave site.
	A temperature log was performed on the 7th stage cementing after curing and the cement was tagged,with tremie pipe, at 1,115 feet bpl. The 8th stage of cementing was conducted by pumping 251 barrels of 12% bentonite cement.

Recorded By: Tracy Levi
Date: 12/14/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Saturday/12-15-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 80 degrees F**

Activity: Cementing the 12-inch Casing
Bit Size: 20.5-inches
Starting Depth: N/A
Ending Depth: N/A

Time	Description
	The Contractor conducted a temperature log on the 8th stage of cementing and tagged, with tremie pipe, the top of the cement at 216 feet below pad level. The remainder of the casing will remain uncemented until the completion of a cement bond geophysical log.

Recorded By: Mark Schilling
Date: 12/15/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Sunday/12-16-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 80 degrees F**

Activity: Preparations for Drilling Out Bridge Plug **Bit Size:** 11-inches
Starting Depth: N/A **Ending Depth:** N/A

Time	Description
	The Contractor tripped into well with drill pipe and an 11-inch drill bit in preparation to drill out the bridge plug.

Recorded By: Tracy Levi Date: 12/16/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Monday/12-17-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 80 degrees F**

Activity: Drill Out Bridge Plug/Well Development
Bit Size: 11-inches
Starting Depth: 2,983 feet bpl
Ending Depth: 3,350 feet bpl

Time	Description
1515	Arrive at site. The Contractor started and completed drilling out the bridge plug earlier today. The Contractor is currently conducting air development of the well with the 11-inch bit at 3,350 feet below pad level (bpl). The Contractor states that the development started at 1430 hours. The development will consist of a combination of continuos development and surging of the well.
1730	The Contractor stops air development and starts removing drill pipe to resume at 3,150 feet bpl.
1800	Resume air development at 3,150 feet bpl.
2055	Stop air development to resume at 3,250 feet bpl.
2105	Resume air development at 3,250 feet bpl.
2400	Stop air development to resume at 3,350 feet bpl.

Recorded By: Tracy Levi
Date: 12/17/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Tuesday/12-18-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Cloudy, ~ 80 degrees F**

Activity: Well Development
Bit Size: 11-inches
Starting Depth: 3,150 feet bpl
Ending Depth: 3,350 feet bpl

Time	Description
0000	The Contractor is in the process of installing drill pipe to resume air development at 3,350 feet below pad level (bpl).
0020	Resume air development at 3,350 feet bpl. Early sample collected is mostly clear with a very small amount of small particulates at the bottom.
0200	The well development is declared completed. The Contractor starts conducting a wiper pass of the open borehole.
0300	Begin removing pipe from well.
0400	Leave site.
0800	Return to site.
1145	The Contractor's geophysical logging equipment arrives at the site.
1210	Start conducting a caliper log.
1300	Collect pad monitor wells water quality samples.
1315	Caliper log completed.
1415	Leave site for the day.

Recorded By: Tracy Levi
Date: 12/18/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Wednesday/12-19-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**N/A**

Activity: Demobilization
Bit Size: N/A
Starting Depth: N/A
Ending Depth: N/A

Time	Description
	The Contractor starts demobilizing the drill rig.

Recorded By: Tracy Levi

Date: 12/19/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Thursday/12-20-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**N/A**

Activity: Demobilization
Bit Size: N/A
Starting Depth: N/A
Ending Depth: N/A

Time	Description
	Demobilization of the drill rig continues

Recorded By: Tracy Levi

Date: 12/20/01

Daily Operations Report Form

Job Number: 71817 Well Number: IW #1 Superintendent: R. Thames Lead Driller: James Davis

Rig Number: 411 Date: 12/13 Shift: Nights

Cement Stage Results

Stage Number: 6 Tag: 2090 Feet

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900	2230	3½	WOC. Watch Casing gauge 150 psi
2230	2330	1	Bleed off pressure & Rig up Logger & temperature log
2330	0530	6	PU Tubing & Tag Pressure up on Casing 150 psi
0530	0700	1½	Rig up cementer & cement
			tag cement @ 2090

Stage Number: 2 Tag: Feet

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Numbers	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Numbers	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Emp Initials	Time From	Time To	Total Hours	Employee Name	Emp Initials
1900	0700	12	J Davis	JD					
"	"	"	E. Rivas	ER					
"	"	"	T. Amador	TA					
"	"	"	L. Haynes	LH					
"	"	"	K. McCallon	KM					

Daily Operations Report Form

Job Number: _____ Well Number: _____ Superintendent: _____ Lead Driller: _____ Rig Number: _____ Date: _____ Shift: _____

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Emp #	Time On	Time Off	Total Hours	Employee Name	Emp # Initials

Cement Stage

Stage Number: _____ Tag: _____ Feet

Bottom Plug Set	Bottom Plug

Type	Bottom Plug Set	Cut	Backs
Type	Bottom Plug Set	Cut	Backs

Notes

Stage Number: _____ Tag: _____ Feet

Bottom Plug Set	Bottom Plug

Type	Bottom Plug Set	Cut	Backs
Type	Bottom Plug Set	Cut	Backs

Daily Operations Report Form

Job Number: 71097 Well Number: I.W. #4 Superintendent: R. THAMES Rig Number: 411
Lead Driller: J. DAVIS Date: 12-14-07 Shift: NIGHT

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
19:00	0200	7.0	PREP FOR CEMENTING ; CEMENTED ; ALLIED ALL TUBING
02:00	0700	5.0	CLEANED TUBING ; FLOOR AND LOCATION monitor CASING 200 PSI
07:00			TAG CEMENT @ 206 — 215

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Emp #	Time From	Time To	Total Hours	Employee Name	Emp #
							12	ALLEN - KELLEY	AWK
								Robert Maupin	RM
0500	0700	2	J. HARRISON				2	Joel N. HARRISON	JH
0400		14	K. McGOVERN	K.M					

Cement Stage Reports

Stage Number: 8 Tag: 115 Feet

Type	Sacks Used	Slurry	Density
	250		

Notes

Stage Number: _____ Tag: _____ Feet

Type	Sacks Used	Slurry	Density

Daily Oper ns Report Form

Job Number: 7087 Well Number: D.W. #1 Superintendent: K. THAMES Lead Driller: J. DAVIS Rig Number: 4 Date: 12-10-21 Shift: DAY

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
19:3			CUT CASING ; TRIP ALL DRILL PIPE IN HOLE

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Stage Number: _____ Tag: _____ Feet

Notes

Daily Operations Report Form

Rig Number: _____

Superintendent: _____ Date: _____

Job Number: _____ Well Number: _____ Lead Driller: _____ Shift: _____

Time Each To	Time To	Total Hours	Details of Operations in Sequence and Remarks

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Notes

Daily Oper[illegible] Report Form

Rig Number: _____ Superintendent: _____ Date: _____

Job Number: _____ Well Number: _____ Lead Driller: _____ Shift: _____

Time From	Time To	Total Hours	Details, Operations in Sequence and Remarks
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]		[illegible]
[illegible]	[illegible]		[illegible]
[illegible]	[illegible]		[illegible]
[illegible]	[illegible]		[illegible]

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

[illegible]	[illegible]	[illegible]	[illegible]								

Cement Stage [illegible]

Stage Number: _____ Tag: _____ Feet

Bore Hole Size | Bore Hole Depth

Pipe | Barrels Gel | Cuft | Sacks

Notes

Stage Number: _____ Tag: _____ Feet

Bore Hole Size | Bore Hole Depth

Pipe | Barrels Gel | Cuft | Sacks

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0900	N/A	512	13	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	550	33	N/A	6.26		YBI/Sanders
09/13/2001	0830	N/A	540	9	N/A	6.82		YBI/Sanders
09/19/2001	1230	N/A	396	15	N/A	6.41		YBI/Sanders
09/26/2001	1340	6.75	420	9	N/A	6.40		T. Levi
10/02/2001	1215	6.68	509	19	N/A	6.40		T. Levi
10/11/2001	1500	7.40	493	20	N/A	6.50		M. Schilling
10/18/2001	1345	7.10	517	23	N/A	6.80		M. Schilling
10/25/2001	1610	7.20	502	21	N/A	6.81		M. Schilling
11/01/2001	1430	7.33	542	20	N/A	6.40		T. Levi
11/08/2001	2000	9.50	535	17	N/A	7.30		T. Levi
11/15/2001	1230	9.50	717	36	N/A	7.00		T. Levi
11/21/2001	1120	9.67	509	28	N/A	7.00		T. Levi
11/29/2001	1630	10.0	596	25	N/A	6.80		T. Levi
12/06/2001	1200	10.2	635	26	N/A	6.90		T. Levi
12/13/2001	2200	10.3	514	22	N/A	7.10		T. Levi
12/18/2001	1340	10.4	568	18	N/A	7.00		T. Levi

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0930	N/A	599	30	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	780	13	N/A	6.72		YBI/Sanders
09/13/2001	0830	N/A	490	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	415	22	N/A	6.22		YBI/Sanders
09/26/2001	1310	3.50	440	26	N/A	6.40		T. Levi
10/02/2001	1205	3.62	524	39	N/A	6.40		T. Levi
10/11/2001	1515	3.20	536	26	N/A	6.40		M. Schilling
10/18/2001	1330	3.50	542	22	N/A	6.80		M. Schilling
10/25/2001	1630	4.30	500	25	N/A	6.60		M. Schilling
11/01/2001	1410	3.50	564	53	N/A	6.50		T. Levi
11/08/2001	2010	7.00	551	53	N/A	6.40		T. Levi
11/15/2001	1240	7.09	626	53	N/A	6.70		T. Levi
11/21/2001	1140	7.63	526	35	N/A	6.60		T. Levi
11/29/2001	1650	7.50	506	59	N/A	7.00		T. Levi
12/06/2001	1200	7.75	600	70	N/A	6.90		T. Levi
12/13/2001	2220	8.08	558	80	N/A	7.30		T. Levi
12/18/2001	1330	7.55	520	69	N/A	7.30		T. Levi

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1100	N/A	685	9	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	490	16	N/A	6.59		YBI/Sanders
09/13/2001	0830	N/A	550	10	N/A	6.74		YBI/Sanders
09/19/2001	1230	N/A	646	15	N/A	6.22		YBI/Sanders
09/26/2001	1330	6.67	720	8	N/A	6.20		T. Levi
10/02/2001	1155	6.59	747	9	N/A	6.20		T. Levi
10/11/2001	1530	6.70	704	7	N/A	6.10		M. Schilling
10/18/2001	1400	6.90	665	9	N/A	6.40		M. Schilling
10/25/2001	1550	7.10	698	8	N/A	6.23		M. Schilling
11/01/2001	1420	7.25	700	8	N/A	7.00		T. Levi
11/08/2001	2020	8.80	734	11	N/A	6.50		T. Levi
11/15/2001	1250	9.17	837	10	N/A	6.60		T. Levi
11/21/2001	1130	9.42	716	6	N/A	6.50		T. Levi
11/29/2001	1640	9.67	717	11	N/A	6.80		T. Levi
12/06/2001	1200	10.00	714	10	N/A	6.70		T. Levi
12/13/2001	2210	10.08	655	24	N/A	6.90		T. Levi
12/18/2001	1350	10.16	688	10	N/A	6.70		T. Levi

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1030	N/A	487	5	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	470	4	N/A	6.91		YBI/Sanders
09/13/2001	0830	N/A	760	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	331	11	N/A	6.05		YBI/Sanders
09/26/2001	1320	6.00	1,003	103	N/A	6.10		T. Levi
10/02/2001	1225	5.88	406	9	N/A	6.10		T. Levi
10/11/2001	1545	6.00	430	10	N/A	6.00		M. Schilling
10/18/2001	1415	6.20	445	10	N/A	6.10		M. Schilling
10/25/2001	1640	6.40	428	9	N/A	6.10		M. Schilling
11/01/2001	1400	6.33	476	10	N/A	6.20		T. Levi
11/08/2001	2030	8.50	490	8	N/A	6.50		T. Levi
11/15/2001	1300	8.75	592	8	N/A	6.60		T. Levi
11/21/2001	1150	9.13	491	9	N/A	6.70		T. Levi
11/29/2001	1700	9.50	460	8	N/A	6.70		T. Levi
12/06/2001	1200	9.55	440	11	N/A	6.70		T. Levi
12/13/2001	2230	9.58	369	10	N/A	7.20		T. Levi
12/18/2001	1320	9.71	489	29	N/A	6.70		T. Levi

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

MEMORANDUM

CH2MHILL

TO: Eva Deyo/IWSD
Jack Myers/FDEP
Joe Haberfeld/FDEP
Nancy Marsh/USEPA
Jimmy Brantley/YBI
Dave Xavier/LBFH
Steve Anderson/SFWMD
Ron Reese/USGS
Tracy Levi/CH2M HILL

FROM: Mark Schilling & Sean Skehan/CH2M HILL

DATE: January 2, 2002

SUBJECT: Weekly Summary No. 16
December 21 thru December 27, 2001

PROJECT: ***Immokalee Water & Sewer District Deep Injection System***
FDEP UIC Permit Number 50725-006-UC

Summary of Engineer's/Driller's Log

No activity took place at the site due to the holidays.

During the next reporting period, no work is anticipated.

MEMORANDUM

CH2MHILL

TO: Eva Deyo/IWSD
Jack Myers/FDEP
Joe Haberfeld/FDEP
Nancy Marsh/USEPA
Jimmy Brantley/YBI
Dave Xavier/LBFH
Steve Anderson/SFWMD
Ron Reese/USGS
Tracy Levi/CH2M HILL

FROM: Mark Schilling & Sean Skehan/CH2M HILL

DATE: January 3, 2002

SUBJECT: Weekly Summary No. 16
December 21 thru December 27, 2001

PROJECT: ***Immokalee Water & Sewer District Deep Injection System***
FDEP UIC Permit Number 50725-006-UC

Summary of Engineer's/Driller's Log

No activity took place at the site due to the holidays.

During the next reporting period, no work is anticipated.

a

CH2M HILL DAILY SUMMARY

Day/Date:	**Friday/12-28-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**N/A**

Activity: N/A
Starting Depth: N/A

Bit Size: N/A
Ending Depth: N/A

Time	Description
	There was no activity at the site.

Recorded By: Tracy Levi

Date: 12/28/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Saturday/12-29-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**N/A**

Activity: N/A
Bit Size: N/A
Starting Depth: N/A
Ending Depth: N/A

Time	Description
	There was no activity at the site.

Recorded By: Tracy Levi

Date: 12/29/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Sunday/12-30-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**N/A**

Activity: N/A
Bit Size: N/A
Starting Depth: N/A
Ending Depth: N/A

Time	Description
	There was no activity at the site.

Recorded By: Tracy Levi Date: 12/30/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Monday/12-31-01**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**N/A**

Activity: N/A
Bit Size: N/A
Starting Depth: N/A
Ending Depth: N/A

Time	Description
	There was no activity at the site.

Recorded By: Tracy Levi Date: 12/31/01

CH2M HILL DAILY SUMMARY

Day/Date:	**Tuesday/1-1-02**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**N/A**

Activity: N/A
Bit Size: N/A
Starting Depth: N/A
Ending Depth: N/A

Time	Description
	There was no activity at the site.

Recorded By: Tracy Levi Date: 1/1/02

CH2M HILL DAILY SUMMARY

Day/Date:	**Wednesday/1-2-02**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Cold/Rainy, ~ 65 degrees F**

Activity: Preliminary Casing Pressure Test on 12-inch Casing **Bit Size:** N/A
Starting Depth: 0 feet bpl **Ending Depth:** 2,969 feet bpl

Time	Description
0920	Arrive at the site. Contractor is already at site and preparing to install the packer assembly to conduct a casing pressure test on the 12-inch casing.
1000	Begin installing packer assembly.
1730	Packer assembly installed to a depth of 2968.50 feet below pad level (bpl).
1800	Pressurize packer to 300 psi.
1845	Pressurize casing to 150 psi to test for leaks. A 200 psi calibrated gauge is installed.
1915	All leaks discovered and stopped. Casing will remain pressurized overnight and the preliminary test will be conducted in the morning.
1930	Leave site for the day.

Recorded By: Tracy Levi Date: 1/2/02

CH2M HILL DAILY SUMMARY

Day/Date:	**Thursday/1-3-02**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Cold/Rainy, ~ 58 degrees F**

Activity: Casing Pressure Test on 12-inch Casing
Bit Size: N/A
Starting Depth: 0 feet bpl
Ending Depth: 2,969 feet bpl

Time	Description
0800	Arrive at the site.
0820	Begin preliminary casing pressure test on the 12-inch casing. A calibrated/certified 200 psi gauge is being used to monitor the pressure. Casing pressurized to 150 psi.
0920	Preliminary test concluded with no loss of pressure noted.
0930	Leave site.
1200	Return to site.
1330	Jack Myers with FDEP arrives at the site to monitor the official pressure test of the casing.
1334	Begin pressure test. Casing pressurized to 150 psi.
1435	J. Myers leaves the site for the day.
1534	End pressure test. Casing pressure reading is 149.5 psi.
1600	Leave site for the day.

Recorded By: Tracy Levi
Date: 1/3/02

Daily Operations Report Form

Job Number: 710817 Well Number: IW-1 Superintendent: Jimmy Lead Driller: Floyd Benson

Rig Number: 204 Wed Date: 01-02-02 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700			Service rig. Start tripping in hole @ 10:30
			in bottom @ 5:30 inflate packer, + casing holding
	1930	12½	good ready for test ●

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	1930	12½	Floyd Benson	FB					
0700	1930	12½	Richard Fosshaug	RF					
0700	1900	12	Keith McGovern	KM					
0700	1900	12	Jorge L. Amador	JA					
0700	1900	12	Vernon W. Martin	VM					
0700	1900	12	Edward M. Rivas	ER					

Cement Stage Reports

Stage Number: _____ _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Daily Operations Report Form

Job Number: 710817 Well Number: Iw-1 Superintendent: Jimmy Lead Driller: Floyd Benson Rig Number: 204 -HV Date: 01-03-02 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700			service Rig, set up for Pre-Lim, every thing fine no-
			loss in packer or tbg, clean up, oil & location, wait on
	1540	3¾	Dep for test
			go to vanderbuilt to dominate well
			H4

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700			FLOYD BENSON	FB					
0700			Richard Freshour	RF					
0700	0900	2	Keith McGovern	KM					
0700	0900	2	Jose L. Amador	JA					
0700	0900	2	Vernon M. Morton	VM					
0700	0900	2	EDUARD M. Rivas	ER					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Notes

Stage Number: _____ Tag: _____ Feet

Notes

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0900	N/A	512	13	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	550	33	N/A	6.26		YBI/Sanders
09/13/2001	0830	N/A	540	9	N/A	6.82		YBI/Sanders
09/19/2001	1230	N/A	396	15	N/A	6.41		YBI/Sanders
09/26/2001	1340	6.75	420	9	N/A	6.40		T. Levi
10/02/2001	1215	6.68	509	19	N/A	6.40		T. Levi
10/11/2001	1500	7.40	493	20	N/A	6.50		M. Schilling
10/18/2001	1345	7.10	517	23	N/A	6.80		M. Schilling
10/25/2001	1610	7.20	502	21	N/A	6.81		M. Schilling
11/01/2001	1430	7.33	542	20	N/A	6.40		T. Levi
11/08/2001	2000	9.50	535	17	N/A	7.30		T. Levi
11/15/2001	1230	9.50	717	36	N/A	7.00		T. Levi
11/21/2001	1120	9.67	509	28	N/A	7.00		T. Levi
11/29/2001	1630	10.0	596	25	N/A	6.80		T. Levi
12/06/2001	1200	10.2	635	26	N/A	6.90		T. Levi
12/13/2001	2200	10.3	514	22	N/A	7.10		T. Levi
12/18/2001	1340	10.4	568	18	N/A	7.00		T. Levi
01/03/2002	1540	10.70	583	15	N/A	7.00		T. Levi

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0930	N/A	599	30	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	780	13	N/A	6.72		YBI/Sanders
09/13/2001	0830	N/A	490	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	415	22	N/A	6.22		YBI/Sanders
09/26/2001	1310	3.50	440	26	N/A	6.40		T. Levi
10/02/2001	1205	3.62	524	39	N/A	6.40		T. Levi
10/11/2001	1515	3.20	536	26	N/A	6.40		M. Schilling
10/18/2001	1330	3.50	542	22	N/A	6.80		M. Schilling
10/25/2001	1630	4.30	500	25	N/A	6.60		M. Schilling
11/01/2001	1410	3.50	564	53	N/A	6.50		T. Levi
11/08/2001	2010	7.00	551	53	N/A	6.40		T. Levi
11/15/2001	1240	7.09	626	53	N/A	6.70		T. Levi
11/21/2001	1140	7.63	526	35	N/A	6.60		T. Levi
11/29/2001	1650	7.50	506	59	N/A	7.00		T. Levi
12/06/2001	1200	7.75	600	70	N/A	6.90		T. Levi
12/13/2001	2220	8.08	558	80	N/A	7.30		T. Levi
12/18/2001	1330	7.55	520	69	N/A	7.30		T. Levi
01/03/2002	1525	8.50	549	62	N/A	6.90		T. Levi

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1100	N/A	685	9	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	490	16	N/A	6.59		YBI/Sanders
09/13/2001	0830	N/A	550	10	N/A	6.74		YBI/Sanders
09/19/2001	1230	N/A	646	15	N/A	6.22		YBI/Sanders
09/26/2001	1330	6.67	720	8	N/A	6.20		T. Levi
10/02/2001	1155	6.59	747	9	N/A	6.20		T. Levi
10/11/2001	1530	6.70	704	7	N/A	6.10		M. Schilling
10/18/2001	1400	6.90	665	9	N/A	6.40		M. Schilling
10/25/2001	1550	7.10	698	8	N/A	6.23		M. Schilling
11/01/2001	1420	7.25	700	8	N/A	7.00		T. Levi
11/08/2001	2020	8.80	734	11	N/A	6.50		T. Levi
11/15/2001	1250	9.17	837	10	N/A	6.60		T. Levi
11/21/2001	1130	9.42	716	6	N/A	6.50		T. Levi
11/29/2001	1640	9.67	717	11	N/A	6.80		T. Levi
12/06/2001	1200	10.00	714	10	N/A	6.70		T. Levi
12/13/2001	2210	10.08	655	24	N/A	6.90		T. Levi
12/18/2001	1350	10.16	688	10	N/A	6.70		T. Levi
01/03/2002	1450	10.30	854	95	N/A	6.90		T. Levi

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1030	N/A	487	5	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	470	4	N/A	6.91		YBI/Sanders
09/13/2001	0830	N/A	760	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	331	11	N/A	6.05		YBI/Sanders
09/26/2001	1320	6.00	1,003	103	N/A	6.10		T. Levi
10/02/2001	1225	5.88	406	9	N/A	6.10		T. Levi
10/11/2001	1545	6.00	430	10	N/A	6.00		M. Schilling
10/18/2001	1415	6.20	445	10	N/A	6.10		M. Schilling
10/25/2001	1640	6.40	428	9	N/A	6.10		M. Schilling
11/01/2001	1400	6.33	476	10	N/A	6.20		T. Levi
11/08/2001	2030	8.50	490	8	N/A	6.50		T. Levi
11/15/2001	1300	8.75	592	8	N/A	6.60		T. Levi
11/21/2001	1150	9.13	491	9	N/A	6.70		T. Levi
11/29/2001	1700	9.50	460	8	N/A	6.70		T. Levi
12/06/2001	1200	9.55	440	11	N/A	6.70		T. Levi
12/13/2001	2230	9.58	369	10	N/A	7.20		T. Levi
12/18/2001	1320	9.71	489	29	N/A	6.70		T. Levi
01/03/2002	1510	8.50	385	11	N/A	7.10		T. Levi

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

CH2M HILL DAILY SUMMARY

Day/Date:	**Friday/1-4-02**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**N/A**

Activity: N/A
Starting Depth: N/A

Bit Size: N/A
Ending Depth: N/A

Time	Description
	There was no activity at the site.

Recorded By: Mark Schilling

Date: 1/4/02

CH2M HILL DAILY SUMMARY

Day/Date:	**Saturday/1-5-02**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**N/A**

Activity: N/A
Bit Size: N/A
Starting Depth: N/A
Ending Depth: N/A

Time	Description
	There was no activity at the site.

Recorded By: Mark Schilling Date: 1/5/02

CH2M HILL DAILY SUMMARY

Day/Date:	**Sunday/1-6-02**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**N/A**

Activity: N/A
Bit Size: N/A
Starting Depth: N/A
Ending Depth: N/A

Time	Description
	There was no activity at the site.

Recorded By: Mark Schilling Date: 1/6/02

CH2M HILL DAILY SUMMARY

Day/Date:	**Monday/1-7-02**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**N/A**

Activity: N/A
Starting Depth: N/A

Bit Size: N/A
Ending Depth: N/A

Time	Description
	There was no activity at the site.

Recorded By: Mark Schilling

Date: 1/7/02

CH2M HILL DAILY SUMMARY

Day/Date:	**Tuesday/1-8-02**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**N/A**

Activity: Preparations for Water Quality Sampling/Geophysical Logging **Bit Size:** N/A
Starting Depth: N/A **Ending Depth:** N/A

Time	Description
	The Contractor installed a pump into the well and started pumping in preparation of the water quality sampling. A total of 2 casing volumes were pumped.

Recorded By: Mark Schilling Date: 1/8/02

CH2M HILL DAILY SUMMARY

Day/Date:	**Wednesday/1-9-02**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Cold/Sunny, ~ 60 degrees F**

Activity: Water Quality Sampling/Geophysical Logging **Bit Size:** N/A
Starting Depth: N/A **Ending Depth:** N/A

Time	Description
0900	Arrive at site. The Contractor is already at the site and pumped a total of 3 casing volumes of water from the well yesterday, 1-10, afternoon. South Florida Water Management District (SFWMD) personnel are also at the site to collect specialty samples for their information. The Contractor began pumping the well at 0850 hours this morning with an initial flowmeter totalizer reading of 110,700 gallons.
0940	Flowmeter totalizer reading is 140,400 gallons.
1000	Flowmeter totalizer reading is 149,400 gallons.
1005	SFWMD collects isotope/noble gas samples.
1015	SFWMD collects metals, nutrients and in-situ samples. Sanders Laboratory arrives on site to collect water quality samples for primary/secondary drinking water samples.
1020	Flowmeter totalizer reading is 158,600 gallons.
1030	The Contractor's geophysical logging equipment arrives at the site. SFWMD completes their sampling.
1032	Flowmeter totalizer reading is 164,100 gallons. Sanders Lab collects sample.
1035	Stop pumping. Final flowmeter totalizer reading is 166,050 gallons. Total volume pumped is 55,350 gallons.
1115	SFWMD and Sanders Lab leave site.
1315	The Contractor starts removing the pump assembly from well.
1418	Begin video survey.
1645	Video survey completed.
1515	Start cement bond logging.
1915	Cement bond logging completed.
1930	Leave site for the day.

Recorded By: Tracy Levi Date: 1/9/02

CH2M HILL DAILY SUMMARY

Day/Date:	**Thursday/1-10-02**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**N/A**

Activity: N/A
Bit Size: N/A
Starting Depth: N/A
Ending Depth: N/A

Time	Description
	There was no activity at the site.

Recorded By: Mark Schilling

Date: 1/10/02

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0900	N/A	512	13	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	550	33	N/A	6.26		YBI/Sanders
09/13/2001	0830	N/A	540	9	N/A	6.82		YBI/Sanders
09/19/2001	1230	N/A	396	15	N/A	6.41		YBI/Sanders
09/26/2001	1340	6.75	420	9	N/A	6.40		T. Levi
10/02/2001	1215	6.68	509	19	N/A	6.40		T. Levi
10/11/2001	1500	7.40	493	20	N/A	6.50		M. Schilling
10/18/2001	1345	7.10	517	23	N/A	6.80		M. Schilling
10/25/2001	1610	7.20	502	21	N/A	6.81		M. Schilling
11/01/2001	1430	7.33	542	20	N/A	6.40		T. Levi
11/08/2001	2000	9.50	535	17	N/A	7.30		T. Levi
11/15/2001	1230	9.50	717	36	N/A	7.00		T. Levi
11/21/2001	1120	9.67	509	28	N/A	7.00		T. Levi
11/29/2001	1630	10.0	596	25	N/A	6.80		T. Levi
12/06/2001	1200	10.2	635	26	N/A	6.90		T. Levi
12/13/2001	2200	10.3	514	22	N/A	7.10		T. Levi
12/18/2001	1340	10.4	568	18	N/A	7.00		T. Levi
01/03/2002	1540	10.70	583	15	N/A	7.00		T. Levi
01/09/2002	0830	10.20	572	16	N/A	7.00		YBI/Sanders

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0930	N/A	599	30	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	780	13	N/A	6.72		YBI/Sanders
09/13/2001	0830	N/A	490	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	415	22	N/A	6.22		YBI/Sanders
09/26/2001	1310	3.50	440	26	N/A	6.40		T. Levi
10/02/2001	1205	3.62	524	39	N/A	6.40		T. Levi
10/11/2001	1515	3.20	536	26	N/A	6.40		M. Schilling
10/18/2001	1330	3.50	542	22	N/A	6.80		M. Schilling
10/25/2001	1630	4.30	500	25	N/A	6.60		M. Schilling
11/01/2001	1410	3.50	564	53	N/A	6.50		T. Levi
11/08/2001	2010	7.00	551	53	N/A	6.40		T. Levi
11/15/2001	1240	7.09	626	53	N/A	6.70		T. Levi
11/21/2001	1140	7.63	526	35	N/A	6.60		T. Levi
11/29/2001	1650	7.50	506	59	N/A	7.00		T. Levi
12/06/2001	1200	7.75	600	70	N/A	6.90		T. Levi
12/13/2001	2220	8.08	558	80	N/A	7.30		T. Levi
12/18/2001	1330	7.55	520	69	N/A	7.30		T. Levi
01/03/2002	1525	8.50	549	62	N/A	6.90		T. Levi
01/09/2002	0820	8.24	537	65	N/A	7.10		YBI/Sanders

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1100	N/A	685	9	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	490	16	N/A	6.59		YBI/Sanders
09/13/2001	0830	N/A	550	10	N/A	6.74		YBI/Sanders
09/19/2001	1230	N/A	646	15	N/A	6.22		YBI/Sanders
09/26/2001	1330	6.67	720	8	N/A	6.20		T. Levi
10/02/2001	1155	6.59	747	9	N/A	6.20		T. Levi
10/11/2001	1530	6.70	704	7	N/A	6.10		M. Schilling
10/18/2001	1400	6.90	665	9	N/A	6.40		M. Schilling
10/25/2001	1550	7.10	698	8	N/A	6.23		M. Schilling
11/01/2001	1420	7.25	700	8	N/A	7.00		T. Levi
11/08/2001	2020	8.80	734	11	N/A	6.50		T. Levi
11/15/2001	1250	9.17	837	10	N/A	6.60		T. Levi
11/21/2001	1130	9.42	716	6	N/A	6.50		T. Levi
11/29/2001	1640	9.67	717	11	N/A	6.80		T. Levi
12/06/2001	1200	10.00	714	10	N/A	6.70		T. Levi
12/13/2001	2210	10.08	655	24	N/A	6.90		T. Levi
12/18/2001	1350	10.16	688	10	N/A	6.70		T. Levi
01/03/2002	1450	10.30	854	95	N/A	6.90		T. Levi
01/09/2002	0810	10.24	726	12	N/A	6.80		YBI/Sanders

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1030	N/A	487	5	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	470	4	N/A	6.91		YBI/Sanders
09/13/2001	0830	N/A	760	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	331	11	N/A	6.05		YBI/Sanders
09/26/2001	1320	6.00	1,003	103	N/A	6.10		T. Levi
10/02/2001	1225	5.88	406	9	N/A	6.10		T. Levi
10/11/2001	1545	6.00	430	10	N/A	6.00		M. Schilling
10/18/2001	1415	6.20	445	10	N/A	6.10		M. Schilling
10/25/2001	1640	6.40	428	9	N/A	6.10		M. Schilling
11/01/2001	1400	6.33	476	10	N/A	6.20		T. Levi
11/08/2001	2030	8.50	490	8	N/A	6.50		T. Levi
11/15/2001	1300	8.75	592	8	N/A	6.60		T. Levi
11/21/2001	1150	9.13	491	9	N/A	6.70		T. Levi
11/29/2001	1700	9.50	460	8	N/A	6.70		T. Levi
12/06/2001	1200	9.55	440	11	N/A	6.70		T. Levi
12/13/2001	2230	9.58	369	10	N/A	7.20		T. Levi
12/18/2001	1320	9.71	489	29	N/A	6.70		T. Levi
01/03/2002	1510	8.50	385	11	N/A	7.10		T. Levi
01/09/2002	0800	9.14	392	14	N/A	6.90		YBI/Sanders

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

CH2M HILL DAILY SUMMARY

Day/Date: **Friday/1-11-02**
Project No.: **156772.DI.CS**
Client: **Immokalee Water & Sewer District/LBFH**
Contractor: **Youngquist Brothers, Inc. (YBI)**
Well No.: **Deep Injection Well**
FDEP Permit #: **50725-006-UC**
Weather: **N/A**

Activity: N/A
Bit Size: N/A
Starting Depth: N/A
Ending Depth: N/A

Time	Description
	There was no activity at the site.

Recorded By: Mark Schilling Date: 1/11/02

CH2M HILL DAILY SUMMARY

Day/Date:	**Saturday/1-12-02**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**N/A**

Activity: N/A
Bit Size: N/A
Starting Depth: N/A
Ending Depth: N/A

Time	Description
	There was no activity at the site.

Recorded By: Mark Schilling Date: 1/12/02

CH2M HILL DAILY SUMMARY

Day/Date:	**Sunday/1-13-02**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**N/A**

Activity: N/A
Bit Size: N/A
Starting Depth: N/A
Ending Depth: N/A

Time	Description
	There was no activity at the site.

Recorded By: Mark Schilling Date: 1/13/02

CH2M HILL DAILY SUMMARY

Day/Date:	**Monday/1-14-02**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**N/A**

Activity: N/A
Bit Size: N/A
Starting Depth: N/A
Ending Depth: N/A

Time	Description
	There was no activity at the site.

Recorded By: Mark Schilling Date: 1/14/02

CH2M HILL DAILY SUMMARY

Day/Date:	**Tuesday/1-15-02**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**N/A**

Activity: No Activity
Starting Depth: N/A

Bit Size: N/A
Ending Depth: N/A

Time	Description
	There was no activity at the site.

Recorded By: Mark Schilling

Date: 1/15/02

CH2M HILL DAILY SUMMARY

Day/Date:	**Wednesday/1-16-02**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Tri-Zone Monitor Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Sunny, ~ 78 degrees F**

Activity: Backplugging Lower Monitor Zone **Bit Size:**
Starting Depth: **Ending Depth:**

Time	Description
0945	Arrive at site. Contractor is preparing to install 1-inch tremie pipe to backplug the lower monitor zone to 2,230 feet below pad level (bpl).
1245	Contractor's cementing equipment arrives at site. The Contractor is unable to start installation of tremie pipe until part arrives via delivery service.
1600	Contractor informs CH2M HILL that backplugging will not be conducted today due to delay in delivery of needed part. It is being rescheduled for tomorrow, 1-17. Leave site for the day.

Recorded By: Tracy Levi Date: 1/16/02

CH2M HILL DAILY SUMMARY

Day/Date:	**Thursday/1-17-02**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Tri-Zone Monitor Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Hazy, ~ 80 degrees F**

Activity: Backplugging Lower Monitor Zone **Bit Size:** N/A
Starting Depth: 2,353 feet bpl **Ending Depth:** 2,329 feet bpl

Time	Description
0940	Arrive at site. Contractor is already at site and installing 1-inch tremie pipe into the 2 3/8-inch tubing for the lower monitor zone in preparation of backplugging the zone from 2,354 to 2,230 feet below pad level (bpl).
1010	Unable to install the tremie pipe past 2,335 feet bpl. Start preparing to jet tremie pipe in an effort to reach total depth of zone.
1015	3 barrels of fresh water is pumped to flush. No returns noted.
1100	20 barrels of fresh water is pumped to flush. No returns noted.
1110	Tremie lowered to depth of 2,253 feet bpl after flushing/jetting.
1155	Begin pumping neat cement.
1205	Cement pumping completed. A total of 3.25 barrels of neat cement was pumped. No returns noted during pumping.
1230	Leave site for the day. Contractor is removing 4 stands of tremie pipe from the well.

Recorded By: Tracy Levi Date: 1/17/02

CH2M HILL DAILY SUMMARY

Day/Date:	**Friday/1-18-02**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Tri-Zone Monitor Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Fog/Cloudy, ~ 82 degrees F**

Activity: Backplugging Lower Monitor Zone **Bit Size:** N/A
Starting Depth: 2,329 feet bpl **Ending Depth:** 2,318 feet bpl

Time	Description
0730	Arrive at the site. Contractor is already at site.
0745	The top of the cement pumped during the 1st stage of backplugging is tagged, with the 1-inch tremie pipe, at 2,328.5 feet below pad level (bpl). Start pre-flush with fresh water. Returns are noted.
0820	Stop flushing. A total of 30 barrels was pumped.
0940	Decision made to conduct a mini-pump test to determine the specific capacity of the modified lower zone. The Contractor starts removing the tremie pipe.
1245	Tremie pipe removed from well. Begin installing pump assembly and take static water level reading. Static reading is 0 feet bpl.
1254	Begin mini-pump test.
1322	End mini-pump test. The well came alive and began artesian flow during the test. The pump's maximum pumping rate of 15 gpm was not sufficient to drawdown the head. Continue pumping/flowing to circulate and clean out the bottom.
1400	Begin installing i-inch tremie pipe in preparation for 2nd stage of backplugging.
1645	Tremie installed to 2328.5 feet bpl.
1658	Begin 2nd stage of backplugging.
1710	2nd stage of backplugging completed. A total of 3 barrels of neat cement was pumped.
1730	Leave site for the day.

Recorded By: Tracy Levi Date: 1/18/02

CH2M HILL DAILY SUMMARY

Day/Date:	**Saturday/1-19-02**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Tri-Zone Monitor Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 82 degrees F**

Activity: Backplugging Lower Monitor Zone **Bit Size:** N/A
Starting Depth: 2,318 feet bpl **Ending Depth:** 2,236 feet bpl

Time	Description
	The Contractor tagged the top of the cement pumped during the 2nd stage of backplugging at 2,318 feet below pad level (bpl). A total of 3 barrels of neat cement was pumped during the 3rd stage of backplugging. The top of the cement pumped during that stage was tagged at 2,275 feet bpl. A 4th stage of backplugging was then conducted, pumping 2 barrels of neat cement.

Recorded By: Mark Schilling Date: 1/19/02

CH2M HILL DAILY SUMMARY

Day/Date: **Sunday/1-20-02**
Project No.: **156772.DI.CS**
Client: **Immokalee Water & Sewer District/LBFH**
Contractor: **Youngquist Brothers, Inc. (YBI)**
Well No.: **Tri-Zone Monitor Well**
FDEP Permit #: **50725-006-UC**
Weather: **Partly Cloudy, ~ 82 degrees F**

Activity: N/A
Bit Size: N/A
Starting Depth: N/A
Ending Depth: N/A

Time	Description
	There was no activity at the site.

Recorded By: Mark Schilling
Date: 1/20/02

CH2M HILL DAILY SUMMARY

Day/Date:	**Monday/1-21-02**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Tri-Zone Monitor Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Cloudy, ~ 80 degrees F**

Activity: Backplugging Lower Monitor Zone **Bit Size:** N/A
Starting Depth: N/A **Ending Depth:** N/A

Time	Description
1530	Arrive at site. The Contractor is already at the site and has tagged the top of cement pumped during the 4th stage of backplugging at 2,236 feet below pad level (bpl). The 1-inch tremie pipe is in the process of being removed from the well. The Contractor has also started injecting fresh water into the injection well (IW-1) in preparation of the RTS geophysical logging. The injection began at 1515 hours and the initial flowmeter totalizer reading was 138,350 gallons.
1745	The tremie pipe is removed from the monitor well..
1800	Leave site for the day. The Contractor will continue to inject the fresh water into the injection well until 3 casing volumes have been injected.

Recorded By: Tracy Levi Date: 1/21/02

CH2M HILL DAILY SUMMARY

Day/Date:	**Tuesday/1-22-02**
Project No.:	**156772.DI.CS**
Client:	**Immokalee Water & Sewer District/LBFH**
Contractor:	**Youngquist Brothers, Inc. (YBI)**
Well No.:	**Deep Injection Well**
FDEP Permit #:	**50725-006-UC**
Weather:	**Partly Sunny, ~ 80 degrees F**

Activity: Background RTS Geophysical Logging
Bit Size: N/A
Starting Depth: N/A
Ending Depth: N/A

Time	Description
1245	Arrive at the site. The injection of fresh water into the well has been halted. The final flowmeter totalizer reading is 217,960 gallons. The modified lower monitor zone (2,200 to 2,236 feet below pad level) is currently being developed by pumping the zone at 3 gpm.
1250	The Contractor's geophysical logging equipment arrives at the site.
1400	Begin conducting the temperature log.
1520	Temperature log completed. Begin conducting the background gamma ray log.
1640	Background gamma ray logging completed.
1645	Leave site for the day.

Recorded By: Tracy Levi
Date: 1/22/02

CH2M HILL

MECHANICAL INTEGRITY DEMONSTRATIONS OF THE CITY OF IMMOKALEE
CLASS I INJECTION WELL

Client Name: *City of Immokalee* ***Date:*** *January 23, 2002*
Location: *City of Immokalee WWTP*
Well #: *IW-1*

Applicable Information	*Time*	*Discussion/Description of Activities*
Contractor:		
Youngquist Brothers, Inc.	9:10 AM	J.Powers onsite. YBI onsite also. Begin static external
Tel #: (941) 241-4653		MI demo.
Contractor's Representative	9:23 AM	Position ejector port at 2,984 feet bls, 1 foot below the
Timothy Denison		bottom of the casing. Eject 1 mCi of tracer.
	10:26 AM	Complete static external MI demonstration.
		Possible release of a small amount of tracer when
Emerg. Tel #: (813)		tool was pulled up.
	10:33 AM	Begin flush @135 gpm. Potable water.
Subcontractor Location:		one well volume - 17,361 gallons
15465 Pine Ridge Road	11:17 AM	Position ejector port at 2,978 feet bls, 5 foot above the
Fort Myers, FL 33908		bottom of the casing. Eject 1 mCi of tracer.
	11:17 AM	First dynamic ext. test. Q=20 gpm.
Regulatory Representatives	11:51 AM	Q=21gpm
On-site:	12:18 PM	Begin log out of position (LOP)
FDEP: None	12:25 PM	Begin flush @135 gpm. Potable water.
	12:34 PM	Begin logging down to repeat dynamic external test.
	12:51 PM	Eject 1 mCi - second dynamic ext. test. Q=25 gpm.
Visitors On-site:	1:25 PM	Second dynamic ext. test is complete. Begin LOP.
None	2:03 PM	Eject remaining tracer at bottom of borehole.
	2:27 PM	Log after flush shows good correlation with bac. rad.
	2:30 PM	Begin to remove tool from well.
	3:00 PM	J.Powers leaves site. YBI cleaning up.
City of Immokalee		
Representatives On-site:		
None		
CH2M Hill Consulting		
Engineer:		
John A. Powers		
Mark Schilling		

CH2M HILL Engineer	
Client Representative	
Regulatory Representative	

CH2M HILL

MECHANICAL INTEGRITY DEMONSTRATIONS OF THE CITY OF IMMOKALEE
CLASS I INJECTION WELL

Client Name: *City of Immokalee* ***Date:*** *January 24, 2002*
Location: *City of Immokalee WWTP*
Well #: *IW-1*

Applicable Information	*Time*	*Discussion/Description of Activities*
Contractor:		
Youngquist Brothers, Inc.	7:18 AM	J.Powers onsite. YBI onsite also.
Tel #: (941) 241-4653		Q=30 to 33 gpm.
Contractor's Representative	9:23 AM	Position ejector port at 50 feet bls.
Timothy Denison	7:37 AM	Eject 10 mCi from ejector.
	8:45 AM	Begin downchase no. 1
	8:55 AM	Tag 100 API with GRT at 410 ft bls
Emerg. Tel #: (813)	9:09 AM	Begin flush @165 gpm. Potable water. 30 minutes.
	9:43 AM	Begin tripping down.
Subcontractor Location:	9:51 AM	Position ejector @ 400 ft bls.
15465 Pine Ridge Road		Adjust flowrate to 39 gpm.
Fort Myers, FL 33908	10:09 AM	Eject 10 mCi from ejector.
	11:03 AM	Q=38gpm
Regulatory Representatives	11:43 AM	Begin downchase no. 2
On-site:	12:00 PM	Tag 100 API with GRT at 1,010 ft bls
FDEP: None	12:34 PM	Begin flush @165 gpm. Potable water.
	1:02 PM	Position ejector @ 1,000 ft bls. Q=39gpm
	1:07 PM	Eject 10 mCi
Visitors On-site:	1:47 PM	Q=39gpm
None	1:58 PM	Begin downchase no. 3
	2:36 PM	Tag 100 API with GRT at 1,486 ft bls
	2:39 PM	Log out of position to 1,100 ft bls
	2:46 PM	Begin flush
	3:18 PM	Eject 10 mCi @1,450, Q=41 gpm
	4:47 PM	Begin downchase no. 4
City of Immokalee	5:03 PM	Tag 100 API with GRT at 2,058 ft bls
Representatives On-site:		Log out of position, Q=39 gpm
None	5:10 PM	Begin flushing
	5:39 PM	Finish flushing
		Q=39 gpm
	5:49 PM	Eject 10 mCi @2,000, Q=41 gpm
CH2M Hill Consulting	7:06 PM	Begin downchase no. 5
Engineer:	7:18 PM	Tag 100 API with GRT at 2,489 ft bls
John A. Powers	7:20 PM	Log out of position
	7:31 PM	Begin flushing
	8:10 PM	Eject 10 mCi @2,450, Q=39 gpm
	9:17 PM	Begin downchase no. 6
CH2M HILL Engineer		John Powers
Client Representative		
Regulatory Representative		

CH2M HILL

MECHANICAL INTEGRITY DEMONSTRATIONS OF THE CITY OF IMMOKALEE
CLASS I INJECTION WELL

Client Name: City of Immokalee ***Date: January 24, 2002***
Location: City of Immokalee WWTP
Well #: IW-1

Applicable Information	***Time***	***Discussion/Description of Activities***
Contractor:	9:23 PM	Q=41 gpm
Youngquist Brothers, Inc.	9:39 PM	Tag 100 API with GRT at 2,978 ft bls, advance tool
Tel #: (941) 241-4653		through plume to the bottom of the well and hold position.
Contractor's Representative	9:54 PM	Begin flushing, dump remaining tracer from the tool
Timothy Denison		and complete background gamma radiation survey
		while pulling the tool out of the well
	10:30 PM	J.Powers leaves site. YBI cleaning up.
Emerg. Tel #: (813)		
Subcontractor Location:		
15465 Pine Ridge Road		
Fort Myers, FL 33908		
Regulatory Representatives		
On-site:		
FDEP: None		
Visitors On-site:		
None		
City of Immokalee		
Representatives On-site:		
None		
CH2M Hill Consulting		
Engineer:		
John A. Powers		
Mark Schilling		

CH2M HILL Engineer	
Client Representative	
Regulatory Representative	

APPENDIX C

FDEP Construction Certification Form

Certification of Injection Well Completion

Facility Name: Immokalee Water and Sewer District Wastewater Treatment Plant (IWSD WWTP)
Owners Name: City of Immokalee
Address: 1020 Sanitation Road
City: Immokalee State: Florida Zip: 34142-0000

Well Contractor's Name: Youngquist Brothers Inc.
Address: 15465 Pine Ridge Road
City: Ft. Myers State: Florida Zip: 33908

UIC Construction Permit Number: 50725-006-UC Date Issued: June 12, 2001

Injection Well Purpose: Used when on site pond levels are exceeded for the disposal of secondary effluent.

Well Location: WWTP
Latitude/Longitude: Latitude: 26 24' 55" N Longitude: 81 25' 45" W, Section/Township/Range: 4/T47S/R29E

Casing Dimensions:

Casing Diameter (inches):	36"	Casing Depth (feet):	275'
	30"		930'
	22"		2,000'
	12.75"		2,983'
Total Depth (feet):	3,350	Open Interval (feet):	2,983' – 3,350'

Certification by Professional Engineer

I certify that the monitor well has been completed substantially in accordance with the approved plans and specifications, or that deviations will not prevent the monitor well from functioning in compliance with the requirements of Chapter 62-528, F.A.C., when properly operated and maintained. These determinations have been based upon on-site observation of well construction, scheduled or conducted by me or by a project representative under my direct supervision, for the purpose of determining if work proceeded in compliance with plans and specifications and application materials.

(Affix Seal)

David Alan Schuman P.E.
Name
52092
Florida Registration Number
CH2M Hill
Company Name
800 Fairway Drive, Suite 350
Company Address
Deerfield Bch. Florida 33441
City **State** **Zip**
Telephone No. 954-426-4008

FORMPECERT043002.DOC/021190012

APPENDIX D

Lithological Descriptions

Lithologic Description for Injection Well IW-1

Depth Logged (ft-bpl) From	To	Observer's Description
0	10	SILTY CLAY, olive gray (5Y4/1)
10	20	Same as above
20	30	SAND, yellowish gray (5Y8/1), fine grained, well sorted, subrounded
30	40	Same as above
40	50	Same as above
50	60	Same as above
60	70	SAND, yellowish gray (5Y8/1), medium grained, well sorted, subrounded
70	80	Same as above
80	90	SAND, white (N9) to very light gray (N8) to black (N1), medium to very coarse grained sand, rounded to sub-rounded grains, poorly sorted
90	100	Same as above
100	110	Same as above
110	120	Same as above
120	130	Same as above
130	140	Same as above
140	150	Same as above
150	160	Same as above
160	170	SAND, light olive gray (5Y6/1) to white (N9), medium grained sand, moderately sorted
170	180	Same as above
180	190	Same as above
190	200	SAND, very light gray (N8) to white (N9), medium grained sand, moderately sorted
200	210	SAND, very light gray (N8) to white (N9), medium to coarse grained sand, poorly sorted
210	220	Same as above
220	230	SAND with LIMESTONE, sand very light gray (N8) to white (N9), medium to coarse grained, poorly sorted, limestone yellowish gray (5Y7/2) to light olive gray (5Y/6/1), poorly consolidated
230	240	Same as above
240	250	MISSING
250	260	SILTY SAND, light olive gray (5Y6/1), 75% sample fine grained silt, 25% medium to coarse grained sand
260	270	Same as above
270	280	LIMESTONE with SAND, limestone yellowish gray (5Y8/1) to very light gray (N8), poorly consolidated, sand very light gray (N8) to white (N9), coarse grained
280	290	LIMESTONE with SAND, limestone yellowish gray (5Y8/1) to very light gray (N9), moderately consolidated, sand very light gray (N8) to white (N9), coarse grained
290	300	Same as above
300	310	Same as above

Lithologic Description for Injection Well IW-1

Depth Logged (ft-bpl) From	To	Observer's Description
310	320	LIMESTONE with SILT, limestone (80%) yellowish gray (5Y8/1) and medium gray (N5), moderately consolidated, phosphatic, silt (20%) yellowish gray (5Y8/1), some quartz grains present
320	330	Same as above
330	340	LIMESTONE with SILT, limestone (60%) very light gray (N8) and yellowish gray (5Y8/1), poorly consolidated, silt (40%) yellowish gray (5Y8/1)
340	350	Same as above
350	360	Same as above
360	370	LIMESTONE with SILT, limestone (80%) very light gray (N8) and yellowish gray (5Y8/1), silt (20%) yellowish gray (5Y8/1)
370	380	LIMESTONE with SILT, limestone (80%) very light gray (N8) and medium gray (N6), phosphatic, silt (20%) yellowish gray (5Y8/1)
380	390	SILTY CLAY, light olive gray (5Y5/2) to olive gray (5Y4/1), phosphatic, 10% yellowish gray limestone fragments present
390	400	Same as above
400	410	SILTY CLAY, olive gray (5Y4/1), phosphatic, limestone fragments (10%), yellowish gray (5Y7/2)
410	420	Same as above
420	430	Same as above
430	440	Same as above
440	450	Same as above
450	460	CLAY, (90%) grayish olive (10Y4/2), trace phosphates, limestone fragments (10%), yellowish gray (5Y7/2)
460	470	Same as above
470	480	Same as above
480	490	Same as above
490	500	Same as above
500	510	Same as above
510	520	MISSING
520	530	CLAY, (90%) grayish olive (10Y4/2), phosphatic, limestone fragments (10%), yellowish gray (5Y7/2)
530	540	Same as above
540	550	Same as above
550	560	LIMESTONE, (85%) white (N9) to yellowish gray (5Y7/2), clay (15%) grayish olive (10Y4/2)
560	570	Same as above
570	580	LIMESTONE, white (N9) to yellowish gray (5Y7/2)
580	590	LIMESTONE, (85%) white (N9) to yellowish gray (5Y7/2), clay (15%) grayish olive (10Y4/2)
590	600	Same as above
600	610	LIMESTONE, (85%) white (N9) to yellowish gray (5Y7/2), phosphatic, clay (15%) grayish olive (10Y4/2)
610	620	LIMESTONE, (95%) yellowish gray (5Y7/2), phosphatic, clay (5%) grayish olive (10Y4/2)

Lithologic Description for Injection Well IW-1

Depth Logged (ft-bpl) From	To	Observer's Description
620	630	LIMESTONE, (95%) yellowish gray (5Y7/2), phosphatic, clay (5%) grayish olive (10Y4/2)
630	640	CLAY, (60%) white (N9) to light olive gray (5Y6/1) phosphatic, LIMESTONE (40%), very light gray (N8) to yellowish gray (5Y7/2)
640	650	CLAY, (95%) grayish olive (10Y4/2), phosphatic, limestone fragments (5%), yellowish gray (5Y7/2)
650	660	CLAY, (85%) white (N9) to yellowish gray (5Y8/1) to grayish olive (10Y4/2) phosphatic, limestone (15%) yellowish gray (5Y7/2)
660	670	Same as above
670	680	CLAY, (85%) white (N9) to yellowish gray (5Y8/1) and trace amounts of grayish olive (10Y4/2), phosphatic, limestone (15%) yellowish gray (5Y7/2) to light gray (N7)
680	690	Same as above, increased amount of grayish olive clay
690	700	CLAY, (95%) white (N9) to yellowish gray (5Y8/1) and trace amounts of grayish olive (10Y4/2), phosphatic, limestone (5%) yellowish gray (5Y7/2) to light gray (N7)
700	710	CLAY, (90%) white (N9) to yellowish gray (5Y8/1) and grayish olive (10Y4/2), phosphatic, limestone (10%) medium light gray (N6)
710	720	Same as above, increased amount of grayish olive clay
720	730	CLAY, (95%) yellowish gray (5Y7/2), phosphatic, limestone (5%) yellowish gray (5Y7/2)
730	740	CLAY, (90%) yellowish gray (5Y7/2), phosphatic, limestone (10%) yellowish gray (5Y7/2)
740	750	CLAY, (80%) yellowish gray (5Y7/2), phosphatic, limestone (20%) yellowish gray (5Y7/2)
750	760	CLAY, (60%) yellowish gray (5Y7/2), phosphatic, limestone (40%) yellowish gray (5Y7/2)
760	770	LIMESTONE, (75%) yellowish gray (5Y8/1), trace phosphates, CLAY (25%) white (N9) to yellowish gray (5Y8/1)
770	780	Same as above, includes trace amounts of grayish olive clay (10Y4/2)
780	790	LIMESTONE, (75%) yellowish gray (5Y8/1), trace phosphates, CLAY (25%) white (N9) to yellowish gray (5Y8/1)
790	800	Same as above
800	810	LIMESTONE (50%), very light gray (N7), sparry cement, phosphatic, CLAY (50%), yellowish gray (5Y7/2)
810	820	LIMESTONE (60%), very light gray (N7), sparry cement, phosphatic, CLAY (40%), yellowish gray (5Y7/2)
820	830	Same as above
830	840	LIMESTONE (60%), yellowish gray (5Y8/1), phosphatic, CLAY (40%), yellowish gray (5Y7/2)
840	850	LIMESTONE (60%), yellowish gray (5Y8/1), sparry cement, CLAY (40%), yellowish gray (5Y7/2), phosphatic

Lithologic Description for Injection Well IW-1

Depth Logged (ft-bpl) From	To	Observer's Description
850	860	LIMESTONE (80%), yellowish gray (5Y8/1), CLAY (20%), yellowish gray (5Y7/2) and trace amounts of medium gray (N5) clay
860	870	LIMESTONE (60%), yellowish gray (5Y8/1), CLAY (40%), yellowish gray (5Y7/2)
870	880	Same as above
880	890	Same as above
890	900	LIMESTONE (60%) yellowish gray (5Y8/1), CLAY (40%) yellowish gray and light olive gray (5Y6/1), trace phosphates
900	910	Same as above
910	920	Same as above
920	930	LIMESTONE (60%) yellowish gray (5Y8/1), CLAY (40%) yellowish gray and light olive gray (5Y6/1) to olive gray (5Y4/1), trace phosphates
930	940	LIMESTONE, (75%) yellowish gray (5Y8/1) to light gray (N7), clay (25%) yellowish gray (5Y8/1) and trace amounts of medium gray (N6)
940	950	Same as above
950	960	LIMESTONE, yellowish gray (5Y8/1), moderately consolidated
960	970	LIMESTONE (90%), yellowish gray (5Y8/1), moderately consolidated, clay (10%) olive gray
970	980	Same as above
980	990	Same as above
990	1000	Same as above, poorly consolidated
1000	1010	Same as above, moderate consolidation
1010	1020	MISSING
1020	1030	MISSING
1030	1040	LIMESTONE, very light gray (N8), poorly consolidated, traces amounts of clay, light gray (N8)
1040	1050	Same as above, no clay
1050	1060	Same as above
1060	1070	LIMESTONE, yellowish gray (5Y8/1) to light gray (N7), fine sand grained, moderately consolidated
1070	1080	Same as above
1080	1090	Same as above, phosphatic
1090	1100	LIMESTONE, yellowish gray (5Y8/1) to light gray (N7), fine sand grained, moderately consolidated, traces amounts of clay, medium light gray (N6), phosphatic
1100	1110	Same as above, traces amounts of clay, light gray (N7)
1110	1120	Same as above, no phosphates
1120	1130	LIMESTONE, yellowish gray (5Y8/1) to light gray (N7), fine sand grained, moderately consolidated,
1130	1140	Same as above
1140	1150	Same as above
1150	1160	MISSING

Lithologic Description for Injection Well IW-1

Depth Logged (ft-bpl) From	To	Observer's Description
1160	1170	LIMESTONE, yellowish gray (5Y8/1) to light gray (N7), fine sand grained, moderately consolidated,
1170	1180	Same as above, traces amounts of clay, light gray (N7)
1180	1190	Same as above
1190	1200	Same as above, moderate to well consolidation
1200	1210	LIMESTONE, yellowish gray (5Y8/1) to very light gray (N8), fine sand grained, moderately to well consolidated
1210	1220	Same as above
1220	1230	Same as above
1230	1240	Same as above
1240	1250	Same as above, poor to moderate consolidation
1250	1260	Same as above
1260	1270	Same as above, moderately to well consolidated
1270	1280	Same as above
1280	1290	Same as above
1290	1300	Same as above
1300	1310	Same as above, poorly consolidated
1310	1320	Same as above
1320	1330	LIMESTONE, yellowish gray (5Y8/1) to very light gray (N8), fine sand grained, moderately to well consolidated
1330	1340	Same as above
1340	1350	Same as above
1350	1360	Same as above
1360	1370	Same as above
1370	1380	Same as above
1380	1390	Same as above, moderate consolidation
1390	1400	LIMESTONE, yellowish gray (5Y8/1) to very light gray (N8), fine sand grained, moderately to well consolidated
1400	1410	Same as above
1410	1420	Same as above
1420	1430	LIMESTONE, yellowish gray (5Y8/1) to white (N9), fine sand grained, moderate consolidation
1430	1440	Same as above
1440	1450	Same as above
1450	1460	LIMESTONE, yellowish gray (5Y8/1) to white (N9), fine sand grained, poor to moderate consolidation
1460	1470	Same as above, well consolidated
1470	1480	LIMESTONE, yellowish gray (5Y8/1) to white (N9), fine sand grained, poor to moderate consolidation
1480	1490	LIMESTONE, yellowish gray (5Y8/1) to white (N9), fine sand grained, moderate consolidation, trace amounts of clay, light gray (N7)
1490	1500	LIMESTONE, yellowish gray (5Y8/1) to white (N9), fine sand grained, moderate consolidation, traces amounts of dolomite, pale yellowish brown (10YR6/2)

Lithologic Description for Injection Well IW-1

Depth Logged (ft-bpl) From	To	Observer's Description
1500	1510	LIMESTONE (90%) yellowish gray (5Y8/1) to white (N9), fine sand grained, moderate consolidation, dolomite (5%), pale yellowish brown (10YR6/2)
1510	1520	Same as above
1520	1530	LIMESTONE (60%) yellowish gray (5Y8/1) to white (N9), fine sand grained, well consolidation, dolomite (40%), pale yellowish brown (10YR6/2)
1530	1540	LIMESTONE (90%) yellowish gray (5Y8/1) to white (N9), fine sand grained, moderate consolidation, dolomite (10%), pale yellowish brown (10YR6/2)
1540	1550	Same as above
1550	1560	Same as above
1560	1570	LIMESTONE, yellowish gray (5Y8/1) to white (N9), fine sand grained, poorly consolidation, trace amounts of dolomite, pale yellowish brown (10YR6/2)
1570	1580	Same as above
1580	1590	LIMESTONE, yellowish gray (5Y8/1) to white (N9), fine sand grained, well consolidation, trace amounts of dolomite, pale yellowish brown (10YR6/2)
1590	1600	Same as above
1600	1610	LIMESTONE (90%), yellowish gray (5Y8/1), fine to medium sand grained, recrystallized, poor consolidation, dolomite (10%), pale yellowish brown (10YR6/2)
1610	1620	Same as above
1620	1630	Same as above, moderately consolidated
1630	1640	LIMESTONE, yellowish gray (5Y8/1), fine to medium sand grained, recrystallized, poor consolidation, trace amounts of dolomite, pale yellowish brown (10YR6/2)
1640	1650	Same as above, moderate consolidation
1650	1660	Same as above
1660	1670	Same as above, well consolidated
1670	1680	Same as above
1680	1690	Same as above, moderately consolidated, trace amounts of clay, light olive gray ((5Y6/1)
1690	1700	Same as above, no clay
1700	1710	Same as above
1710	1720	Same as above
1720	1730	LIMESTONE, yellowish gray (5Y8/1), fine to medium sand grained, recrystallized, vuggy, moderate to well consolidation
1730	1740	Same as above
1740	1750	LIMESTONE, yellowish gray (5Y8/1), medium sand grained, vuggy, moderate to well consolidation
1750	1760	LIMESTONE, yellowish gray (5Y8/1), fine to medium sand grained, vuggy, moderate to well consolidation
1760	1770	Same as above, moderate to poor consolidation

Lithologic Description for Injection Well IW-1

Depth Logged (ft-bpl) From	To	Observer's Description
1770	1780	Same as above
1780	1790	Same as above, poor consolidation
1790	1800	Same as above
1800	1810	Same as above
1810	1820	Same as above, moderate consolidation
1820	1830	LIMESTONE, yellowish gray (5Y8/1), fine to medium sand grained, moderate to well consolidation
1830	1840	Same as above, poorly consolidated, vuggy
1840	1850	Same as above
1850	1860	LIMESTONE, yellowish gray (5Y8/1), fine to medium sand grained, poorly consolidated
1860	1870	Same as above
1870	1880	LIMESTONE, yellowish gray (5Y8/1), fine to medium sand grained, recrystallized, moderately consolidated
1880	1890	LIMESTONE, yellowish gray (5Y8/1), fine to medium sand grained, sparry cement, moderately consolidated
1890	1900	Same as above
1900	1910	LIMESTONE, yellowish gray (5Y8/1), fine to medium sand grained, moderately consolidated, trace phosphates
1910	1920	Same as above
1920	1930	LIMESTONE, yellowish gray (5Y8/1), fine to medium sand grained, moderately consolidated, vuggy
1930	1940	Same as above
1940	1950	Same as above
1950	1960	Same as above
1960	1970	LIMESTONE, yellowish gray (5Y8/1), fine to medium sand grained, moderately consolidated
1970	1980	Same as above
1980	1990	Same as above
1990	2000	Same as above
2000	2010	LIMESTONE, white (N9) to very pale orange (10YR8/2), fine to medium sand grained, moderately consolidated
2010	2020	Same as above
2020	2030	Same as above
2030	2040	LIMESTONE, white (N9) to yellowish gray (5Y7/2), fine to medium sand grained, moderately consolidated, recrystallization .
2040	2050	Same as above
2050	2060	LIMESTONE, white (N9) to very pale orange (10YR8/2), medium sand grained, moderately consolidated, vuggy, recrystallization
2060	2070	LIMESTONE, white (N9), fine to medium sand grained, moderate to poor consolidation , recrystallization
2070	2080	Same as above
2080	2090	Same as above

Lithologic Description for Injection Well IW-1

Depth Logged (ft-bpl) From	To	Observer's Description
2090	2100	LIMESTONE (90%), white (N9), fine to medium sand grained, moderate consolidation , recrystallization, DOLOMITE (10%), light brownish gray (5YR6/1) to light olive gray (5Y6/1), microcrystalline, well consolidated
2100	2110	Same as above, no dolomite
2110	2120	LIMESTONE (25%), white (N9), fine to medium sand grained, moderate consolidation , recrystallization, DOLOMITE (75%), light brownish gray (5YR6/1) to light olive gray (5Y6/1), microcrystalline, well consolidated
2120	2130	Same as above, LIMESTONE (80%) and DOLOMITE (20%)
2130	2140	Same as above
2140	2150	LIMESTONE (30%), white (N9), fine to medium sand grained, moderate consolidation, DOLOMITE (70%), moderate yellowish brown (10YR5/4) to pale yellowish brown (10YR6/2), well consolidated, microcrystalline
2150	2160	DOLOMITE, moderate yellowish brown (10YR5/4) to pale yellowish brown (10YR6/2), well consolidated, microcrystalline, small vugs present
2160	2170	Same as above
2170	2180	Same as above
2180	2190	Same as above
2190	2200	Same as above
2200	2210	Same as above
2210	2220	DOLOMITIC LIMESTONE (80%), yellowish gray (5Y7/2) to pale yellowish brown (10YR6/2), fine grained, well consolidated, LIMESTONE (20%), white (N9), well consolidated
2220	2230	Same as above, some anhydrite found
2230	2240	LIMESTONE, yellowish gray (5Y8/1), fine to medium sand grained, well consolidated
2240	2250	DOLOMITE, moderate yellowish brown (10YR5/4) to pale yellowish brown (10YR6/2), well consolidated, microcrystalline
2250	2260	DOLOMITIC LIMESTONE (80%), yellowish gray (5Y7/2) to pale yellowish brown (10YR6/2), fine grained, well consolidated, LIMESTONE (20%), white (N9), well consolidated
2260	2270	DOLOMITIC LIMESTONE (60%), yellowish gray (5Y7/2) to medium light brown (N6), fine grained, well consolidated, LIMESTONE (40%), white (N9), well consolidated
2270	2280	Same as above
2280	2290	Same as above, Limestone 10%
2290	2300	DOLOMITE, pale yellowish brown (10YR6/2) to pale brown (5YR5/2), well consolidated, microcrystalline
2300	2310	DOLOMITE (30%), medium dark gray (N4) to brownish gray (5YR4/1), microcrystalline, well consolidated, LIMESTONE (70%), yellowish gray (5Y8/1), fine sand grained, well consolidated

Lithologic Description for Injection Well IW-1

Depth Logged (ft-bpl) From	To	Observer's Description
2310	2320	LIMESTONE, yellowish gray (5Y8/1), fine sand grained, well consolidated, sparry cement
2320	2330	DOLOMITE, light olive gray (5Y6/1), microcrystalline, well consolidated
2330	2340	DOLOMITE, moderate yellowish brown (10YR5/4) to pale yellowish brown (10YR6/2), well consolidated, microcrystalline,
2340	2350	Same as above, some anhydrite found
2350	2360	DOLOMITE, moderate yellowish brown (10YR5/4) to pale yellowish brown (10YR6/2), well consolidated, microcrystalline,
2360	2370	Same as above
2370	2380	Same as above
2380	2390	MISSING
2390	2400	LIMESTONE, yellowish gray (5Y8/1), fine sand grained, moderately consolidated, micritic cement
2400	2410	Same as above
2410	2420	Same as above
2420	2430	Same as above
2430	2440	Same as above
2440	2450	Same as above
2450	2460	Same as above
2460	2470	DOLOMITE, light olive gray (5Y6/1) to dark yellowish brown (10YR 4/2), microcrystalline, well consolidated
2470	2480	Same as above
2480	2490	DOLOMITE (80%), light olive gray (5Y6/1) to dark yellowish brown (10YR 4/2), microcrystalline, well consolidated, LIMESTONE (20%) yellowish gray (5Y8/1), moderate consolidation, sparry cement,
2490	2500	Same as above, some anhydrite found on dolomite
2500	2510	DOLOMITE, light olive gray (5Y6/1) to dark yellowish brown (10YR 4/2), microcrystalline, well consolidated, some anhydrite found on dolomite
2510	2520	Same as above
2520	2530	Same as above
2530	2540	Same as above
2540	2550	DOLOMITIC LIMESTONE, light gray (N7) to light olive gray (5Y6/1), fine sand grained, well consolidated, some anhydrite found
2550	2560	Same as above, no anhydrite
2560	2570	DOLOMITIC LIMESTONE, grayish black (N2) to light olive gray (5Y6/1), fine to medium sand grained, moderately consolidated,
2570	2580	Same as above
2580	2590	LIMESTONE, yellowish gray (5Y8/1), well consolidated, medium sand grained, sparry cement

Lithologic Description for Injection Well IW-1

Depth Logged (ft-bpl) From	To	Observer's Description
2590	2600	LIMESTONE (60%), yellowish gray (5Y8/1), well consolidated, medium sand grained, sparry cement, DOLOMITE (40%), brownish gray (5YR4/1), microcrystalline, well consolidated
2600	2610	DOLOMITIC LIMESTONE, light olive gray (5Y6/1), microcrystalline, fine sand grained, well consolidated
2610	2620	Same as above
2620	2630	Same as above, moderate consolidation, organic debris present
2630	2640	DOLOMITE, light olive gray (5Y6/1) to pale yellowish brown (10YR 6/2), microcrystalline, fine sand grained, well consolidated, organic debris present
2640	2650	DOLOMITE, light olive gray (5Y6/1) to pale yellowish brown (10YR 6/2), fine sand grained, sucrosic, organic debris present
2650	2660	Same as above
2660	2670	Same as above
2670	2680	DOLOMITE, light olive gray (5Y6/1) to dark yellowish brown (10YR 4/2), microcrystalline, well consolidated, organic debris present
2680	2690	DOLOMITE, light olive gray (5Y6/1) to medium gray (N5), microcrystalline, well consolidated
2690	2700	DOLOMITE, light olive gray (5Y6/1) to dark yellowish brown (10YR 4/2), microcrystalline, well consolidated
2700	2710	Same as above
2710	2720	Same as above
2720	2730	DOLOMITE, light olive gray (5Y6/1) to pale yellowish brown (10YR 6/2), fine sand grained, sucrosic, organic debris present
2730	2740	DOLOMITE, dark yellowish brown (10YR4/2), microcyrstalline, well consolidated, organic debris present
2740	2750	Same as above
2750	2760	Same as above
2760	2770	DOLOMITE, light olive gray (5Y6/1) to medium gray (N5), microcrystalline, well consolidated
2770	2780	DOLOMITIC LIMESTONE, light olive gray (5Y6/1) to pale yellowish brown (10YR 6/2), fine to sand grained, well consolidated
2780	2790	Same as above
2790	2800	Same as above
2800	2810	Same as above
2810	2820	Same as above
2820	2830	Same as above
2830	2840	Same as above
2840	2850	DOLOMITIC LIMESTONE, light olive gray (5Y6/1) to yellowish gray (5Y8/1), fine sand grained, well consolidated
2850	2860	Same as above

Lithologic Description for Injection Well IW-1

Depth Logged (ft-bpl) From	To	Observer's Description
2860	2870	DOLOMITIC LIMESTONE (60%), light olive gray (5Y6/1) to yellowish gray (5Y8/1), fine sand grained, well consolidated, DOLOMITE (40%), dusky yellowish brown (10YR4/2) to pale yellowish brown (10YR 6/2), microcrystalline, well consolidated
2870	2880	Same as above, dolomitic limestone (80%), dolomite (20%)
2880	2890	Same as above
2890	2900	Same as above
2900	2910	DOLOMITE, white (N9), microcrystalline, well consolidated
2910	2920	DOLOMITE, dark yellowish brown (10YR4/2), microcyrstalline, well consolidated
2920	2930	LIMESTONE, yellowish gray (5Y8/1) to white (N9), fine to medium sand grained, well consolidated
2930	2940	Same as above
2940	2950	LIMESTONE, yellowish gray (5Y8/1) to white (N9), fine to medium sand grained, well consolidated, some small vugs
2950	2960	Same as above, no vugs
2960	2970	Same as above
2970	2980	Same as above
2980	2990	Same as above
2990	3000	DOLOMITE (80%), pale yellowish brown (10YR6/2) to medium dark gray (N4), microcrystalline, well consolidated, LIMESTONE (20%), very pale orange (10YR 8/2), fine sand grained, well consolidated
3000	3010	LIMESTONE, yellowish gray (5Y8/1) to white (N9), fine to medium sand grained, well consolidated
3010	3020	DOLOMITE, pale yellowish brown (10YR6/2), microcrystalline, well consolidated
3020	3030	DOLOMITE (60%), pale yellowish brown (10YR6/2), microcrystalline, well consolidated, LIMESTONE (40%), very pale orange (10YR 8/2), fine sand grained, moderate to poorly consolidated
3030	3040	DOLOMITE (20%), pale yellowish brown (10YR6/2), microcrystalline, moderate to well consolidated, LIMESTONE (80%), very pale orange (10YR 8/2), fine sand grained, poorly consolidated
3040	3050	DOLOMITE, pale yellowish brown (10YR6/2) to moderate brown (5YR3/4), microcrystalline, well consolidated, small vugs not interconnected
3050	3060	Same as above
3060	3070	Same as above
3070	3080	DOLOMITE, very pale orange (10YR8/2) to pale yellowish brown (10YR6/2) to moderate brown (5YR3/4), microcrystalline, well consolidated, small vugs not interconnected

Lithologic Description for Injection Well IW-1

Depth Logged (ft-bpl) From	To	Observer's Description
		DOLOMITE, pale yellowish brown (10YR6/2) to dusky yellowish brown (10YR2/2), microcrystalline, well consolidated, small vugs
3080	3090	not interconnected
3090	3100	Same as above
3100	3110	Same as above
		DOLOMITE, pale yellowish brown (10YR6/2), microcrystalline, well
3110	3120	consolidated, small vugs not interconnected
3120	3130	Same as above
3130	3140	Same as above
3140	3150	Same as above
		DOLOMITE, pale yellowish brown (10YR6/2), microcrystalline, well
3150	3160	consolidated
3160	3170	Same as above
3170	3180	Same as above
		DOLOMITE (60%), pale yellowish brown (10YR6/2) to dusky yellowish brown (10YR2/2), microcrystalline, moderate to well consolidated, LIMESTONE (40%), very pale orange (10YR 8/2),
3180	3190	fine sand grained, poorly consolidated
3190	3200	Same as above
		DOLOMITE (80%), pale yellowish brown (10YR6/2) to dusky yellowish brown (10YR2/2), microcrystalline, moderate to well consolidated, LIMESTONE (20%), very pale orange (10YR 8/2) to
3200	3210	yellowish gray (5Y7/2), fine sand grained, poorly consolidated
		DOLOMITE (90%), olive gray (5Y4/1), microcrystalline, well consolidated, LIMESTONE (10%), yellowish gray (5Y7/2), fine
3210	3220	sand grained, poorly consolidated
3220	3230	DOLOMITE, olive gray (5Y4/1), microcrystalline, well consolidated
3230	3240	Same as above
3240	3250	Same as above
		DOLOMITE, light gray (N7) to olive gray (5Y4/1), microcrystalline,
3250	3260	well consolidated
		DOLOMITE (50%), olive gray (5Y4/1), microcrystalline, well consolidated, LIMESTONE (50%), yellowish gray (5Y7/2), fine
3260	3270	sand grained, poorly consolidated
3270	3280	Same as above
		LIMESTONE, yellowish gray (5Y7/2), fine sand grained, well
3280	3290	consolidated
		LIMESTONE (80%), yellowish gray (5Y7/2), fine sand grained, moderately consolidated, DOLOMITE (20%) light olive gray
3290	3300	(5Y6/1), microcrystalline, well consolidated
		LIMESTONE, yellowish gray (5Y7/2) to light olive gray (5Y6/1),
3300	3310	fine sand grained, moderately consolidated
3310	3320	Same as above
3320	3330	Same as above, moderate to poor consolidation

Lithologic Description for Injection Well IW-1

Depth Logged (ft-bpl) From	To	Observer's Description
3330	3340	Same as above
3340	3350	LIMESTONE (90%), yellowish gray (5Y7/2) to light olive gray (5Y6/1), fine sand grained, well consolidated, DOLOMITE (10%), medium gray (N5), well consolidated, vuggy

APPENDIX E

Casing Mill Certificates

검 사 증 명 서

MILL INSPECTION CERTIFICATE

현 대 강 관 주 식 회 사
HYUNDAI PIPE CO., LTD.
•본사·공장 울산광역시 북구 염포동 265번지 (우)683-070
ULSAN PLANT : #265, YEMPO-DONG, BUK-GU, ULSAN, KOREA
TEL : (052) 280-0114
FAX : (052) 287-8916
•서울 사무소 서울특별시 중구 무교동 77번지 (우)100-070
CENTRAL OFFICE : #77, MUKYO-DONG, CHUNG-GU, SEOUL, KOREA
TEL : (02) 3455-0500
FAX : (02) 775-7096

검사증명서 번호 CERTIFICATE NO. : 2-1-07-004 페이지 PAGE : 2 of 4
발행일자 DATE OF ISSUE : JUL. 11. 2001. 84128500
계약번호 CONTRACT NO./O.NO. :
품명 COMMODITY : S.A.W. STEEL PIPE
제품규격 SPECIFICATION : API 5L X42 PSL2
수요가 CUSTOMER :

검증 TYPE OF TEST DOC.	치수 DIMENSION 외경 × 두께 × 길이 (OUTDIA. × THICK. × LENGTH)	수량 QUANTITY (PCS)	중량 WEIGHT (KG)	수압시험 HYDRO-STATIC TEST kgf/cm²	수압시험 HYDRO-STATIC TEST MPa	제강번호 HEAT NO.	인장시험 TENSILE TEST 항복강도 YIELD STRENGTH	인장강도 TENSILE STRENGTH	연신율 (EL.)	화학성분(%) CHEMICAL COMPOSITION C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V	Nb	Ti	CEQ	경도 HARDNESS	충격시험 IMPACT TEST (0℃) 흡수에너지 ENTROY	전단면적율 SHEAR-VALUE	비고 REMARK
#1	#2 #7 #4						kgf/mm²		%	#8	×100		×1000									×1000	HV	JOULE	%	
						Y13168	39.9	54.0	35	H	16	27	117	19	8								179	67		
							37.2	52.1	37.4	P	17	28	118	20	10								162	66		
						✓				P	17	28	118	19	9								155	69		
SVBE	NB	30" × .375" × 40.000'	140	300.888	64	10	X12612	47.7	58.3	34	H	16	30	119	16	6							168	60		
							45.5	56.4	39.3	36.3	P	18	32	120	18	8							182	63		
										P	18	31	120	18	7							184	60		
						X12614	47.2	58.6	34	H	16	32	122	14	7							178	60		
							45.4	56.3	36.8	P	17	30	124	15	8							167	61		
						✓				P	17	32	123	15	8							183	59		
						X12617	48.4	58.1	34	H	16	30	117	15	10							185	68		
										P	18	31	118	17	11							180	50		
										P	17	31	118	16	11							183	67		

#9 HEAT TREATMENT (WELD SEAM)	#10 VISUAL & DIMENSION TEST	#11 FLATTENING (B) TEST	#12 WELD DUCTILITY TEST	#13 NONDESTRUCTIVE TEST (U.T)	#14 ETT	#15 FLARING TEST	#16 CRUSH TEST	#17 REVERSE FLATTENING TEST
	GOOD	GOOD		GOOD	GOOD			

NOTE 1 #1 Type of pipe End 관말

B:Black	V:Varnish	PE:Plain End	VJ:Victaulic Joint
G:Galvanized	R:Removal Varnish	BE:Bevel End	
E:Enamled	O:Oiling Coating	TH:Thread End	
	F:FE Coating	CP:Thread Coupling	
	A:Asphalt Coating	SE:Swaging End	

#2 NB:Nominal Bore 호칭경, OD:Outside Diameter
#3 Holding Time:sec
#4 M:Heat (Ladle) Analysis 얼레분석, P:Product Analysis 제품분석
#5 Unit 단위(M:mm, I:Inch)
#6 B:Base Metal 모재부
#7 W : Weld Part 용접부
#8 Unit 단위(M:Meter, F:Feet, I:Inch)
#9 Heat Treatment 열처리
#10 Visual & Dimension Test 육안 및 치수검사
#11 Flattening or Bending Test 편평 또는 굽힘시험
#12 Weld Ductility Test 용접부 연성시험
#13 Nondestructive Test 비파괴검사
#14 Residual Magnetism Test 잔류자장
#15 Flaring Test 입구시험
#16 Crush Test 통압시험
#17 Reverse Flattening Test 역편시험

NOTE 2

ORIGINAL

본 제품은 검증규격에 합격 되었음을 보증합니다.
WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN ACCEPTED IN ACCORDANCE WITH THE PRESCRIBED SPECIFICATION AND ORDER

H. G. Lee

SUPERVISOR INSPECTION MANAGER

KTS - K301 - 022 - 01T HYUNDAI PIPE CO., LTD. (350×280)

TELEPHONE: (416) 259-1113
FAX: (416) 259-6851

CANADIAN PHOENIX STEEL PRODUCTS

DIVISION OF 1045781 ONTARIO LIMITED
289 HORNER AVENUE
ETOBICOKE, ONTARIO.
CANADA
M8Z 4Y4

LABORATORY REPORT AND MILL TEST CERTIFICATE

DATE Sept.14/01

CUSTOMER

SPECIFICATION A139B

CUSTOMER'S P.O 6709

DIA. & WALL 30" O.D. X .375 WT

PHOENIX REF.# 01-3731

HYDROTEST 700 PSI FOR 1 Min.

PHYSICAL PROPERTIES

HEAT NO.	PIPE NO.	LONGITUDINAL TEST YIELD	TENSILE	% ELONGATION	TRANSVERSE WELD TENSILE	BREAK LOCATION
2841T	2	57100	80400	37.5	83600	PM
2605T	9	58300	78400	37.5	81900	PM
2842T	14	54700	80200	37.5	83400	PM

LADLE ANALYSIS **CHEMICAL COMPOSITION**

HEAT NO	C	MN	S	P	SI	CR	NI	CU	MO	AL
2841T	.18	.82	.004	.008	.23	.02	.01	.01	.01	.034
2605T	.17	.86	.005	.011	.23	.01	.01	.01	.01	.035
2842T	.18	.86	.004	.006	.23	.02	.01	.01	.01	.035

The material listed on this report has been tested in accordance with the specification shown above.

Authorized Approval

검 사 증 명 서 (A)

MILL INSPECTION CERTIFICATE

현 대 강 관 주 식 회 사
HYUNDAI PIPE CO.,LTD.

• 본 사 · 공 장 : 울산광역시 북구 염포동 285번지 (우)683-800
HEAD OFFICE : # 285, YUMPO-DONG, BUK-KU, ULSAN, KOREA
(ULSAN PLANT) TEL:289-0114 FAX:(052)287-8918
TLX:HDPIPE K 53776

• 서울사무소:서울특별시 중구 무교동 77번지 (우)100-070
SEOUL OFFICE : # 77, MUGYO-DONG, JOONG-KU, SEOUL, KOREA
TEL:3455-0500 FAX:775-7045

심 사 시 번 호 CERTIFICATE NO : E-0-09-107 페이지 PAGE : 1
발 행 일 자 DATE OF ISSUE : SEP. 17. 1999. B4932506
계 약 번 호 CONTRACT (P/O) NO :
품 명 COMMODITY : E.R.W. STEEL PIPE
제 품 규 격 SPECIFICATION : API 5L X42/API 5LD/ASTM A53B/ASME SA53B
수 요 가 CUSTOMER :

0.6000

관 종 TYPE OF PIPE END	치 수 DIMENSION 외 경 × 두 께 × 길 이 (OUTDIA. × THICK. × LENGTH)	수 량 QUANTITY	중 량 WEIGHT	수압시험 HYDRO-STATIC TEST	6	7	8	9	10	11	12	13	14	도막시험 COATING TEST 아연부착량 WEIGHT OF ZINC COAT	도막성	경 도 HARD-NESS	제 강 번 호 HEAT NO.	인 장 시 험 TENSILE TEST 항복강도 YIELD STRENGTH	인장강도 TENSILE STRENGTH		신 율 ELONGATION	화 학 성 분 (%) CHEMICAL COMPOSITION											충격시험 IMPACT	
					VISUAL & DIMENSION TEST	FLATTENING TEST	WELD DUCTILITY TEST	水	DRIFT TEST	FLARING TEST	CRUSH TEST	FLATTENING TEST	HEAT TREATMENT					B 본체	W 용접부		C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V	Nb	Al	Ceq	흡수에너지 Absorbed ENGY.	전단파면율 SHEAR AREA
※1	※2 ※3 ※4	(PCS)	(KG)	MPa kg/mm² PSI	※5									g/m² OZ/FT²	균일성 DIP TEST	HRB HV		PSI	kg/mm²	%	※17	× 100			× 1000			× 100				× 1000	JOULE	%
DVBE	00 10-3/4" x .365" x 12.000'	22	17.039	170	G	G	G	G	G				G				993055	31.3	49.2	52.0	38	18	2	82	13	8	3	1	2	1	Tr			
	(273.1mm x 9.27mm x 12.002M)			2420														44500	70000	74000													
SVBE	00 22" x .375" x 12.000'	18	29.665	98	G	G	G	G	G				G				966665	32.3	52.0	55.0	34	18	1	75	12	8	1	1	1	1	Tr			
	(559.0mm x 9.53mm x 12.002M)			1290														45800	74000	78200													
	TOTAL →	40	46.704																														

비고 REMARK

주의 NOTES

※1 Type of pipe End 관종
- X: B : Black, G : Galvanized, E : Enameled
- X: V : Varnish, R : Removal Varnish, O : Oiling Coating, F : PE Coating, C : Coaltar Coating, A : Asphalt Coating
- XX: PE : Plain End, BE : Bevel End, TE : Thread End, TC : Thread Coupling, BL : Ball End, SE : Swaging End, VJ : Victaulic Joint

※2 NB : Nominal Bore 호칭경, OD: Outside Diameter
※3 G : Good
※4 Weld Ductility Test 용접부 연성시험
※13 Flaring Test 확관시험
※14 Heat Treatment 열처리
※17 H : Heat(Ladle)Analysis 열변분석, P: Product Analysis 제품분석
※5 Unit 단위 (M : mm, I : Inch)
※6 Visual & Dimension Test 육안 및 치수검사
※8 Nondestructive Test 비파괴검사 ( )
※12 Crush Test 압착시험
※15 B : Base Metal 모재부
※4 Unit 단위 (M : Meter, F : Feet, I : Inch)
※7 Flattening or Bending Test 편평 또는 굽힘시험
※10 Drift Test 관통 시험
※13 Reverse Flattening Test 전개시험
※16 W : Weld Part 용접부

SURVEYOR

본 제품은 관련규격에 합격되었음을 보증합니다.
WE CERTIFY THAT THE DESCRIBED MATERIAL HAS HEREIN BEEN ACCEPTED IN ACCORDANCE WITH THE PRESCRIBED SPECIFICATION AND ORDER.

H. G. Lee
QUALITY ASSURANCE TEAM GENERAL MGR.

HPS - B 301 - 631 - 0 - OLT

HYUNDAI PIPE CO., LTD.

(350 × 280)

INSPECTION CERTIFICATE

(주) 신 호 스 틸

SHINHO STEEL CO., LTD.

HEAD OFFICE : DONGWON BLDG. 275, YANGJAE DONG, SEOCHO-KU, SEOUL, KOREA
INCHON PLANT: 488, NAMIK-DONG, NAM-KU, INCHON, KOREA
DAEBUL PLANT: 11 BLOCK, DAEBUL NATIONAL INDUSTRIAL COMPLEX, NASUL-RI, SAMHO-MYEON, YOUNGAM-KUN, CHULLANAM-DO, KOREA

수입서번호
S No. : 171-4 CI-700318
금 일 자
SUED DATE : 2001. 02. 13
품 명
MMODITY : E.R.W. ~~STEEL~~ PIPE
품 규 격
SSIFICATION : API 5L X-42/API 5LB PSL1/ASTM A53B /ASME SA 53B

수입서번호
CERTIFICATE No. : E010213 - 17
제 조 번 호
MANUFACTURES No. : 01-01-201
주 문 자
SUPPLIER : * SHINHO STEEL CO., LTD.
수 요 가
CUSTOMER : ITOCHU PROJECT MANAGEMENT

HEAT NO. (LOT)	관종 TYPE	수 량 QUANTITY (PIECES)	호칭경 NOMINAL SIZE (in)	주문치수 ORDER SIZE 바깥지름 O.D. (mm)	두께 W.T. (in)	길이 LENGTH (ft)	중 량 WEIGHT (kg/pc)	인장시험 TENSILE TEST 인장강도 TENSILE STRENGTH (psi)	항복강도 YIELD STRENGTH (psi)	연신율 ELONG-ATION (%)	화학성분 CHEMICAL COMPOSITION(%) C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V
	①			②	③							2			3		④		2		3
32597	BPEB	50	20	508.0	0.375	40'	35.68	76803	48357	36	17	2	79	16	8	4	3	2	TR	2
32600	BPEB	91	20	508.0	0.375	40'	35.68	73958	49780	37	15	1	76	17	9	2	2	2	TR	3
32598	BPEB	19	20	508.0	0.375	40'	35.68	73958	48357	36	16	1	77	15	9	2	2	2	1	2
32599	BPEB	53	20	508.0	0.375	40'	35.68	75380	51202	37	18	1	78	18	8	2	3	2	TR	2
32602	BPEB	57	20	508.0	0.375	40'	35.68	76803	46935	35	17	2	79	16	9	2	2	2	TR	2
32599	BPEB	83	20	508.0	0.500	40'	47.28	73958	48357	36	16	3	80	20	10	3	2	3	TR	3
32598	BPEB	144	20	508.0	0.500	40'	47.28	75380	48357	36	15	1	76	19	10	3	2	3	TR	2
A00309	BPEB	65	22	559.0	0.375	40'	39.29	73958	48357	37	15	2	78	16	9	3	2	3	TR	3
A00309	BPEB	36	22	559.0	0.500	40'	52.08	75380	46935	35	16	2	77	18	9	3	2	2	TR	3
A99600	BPEB	1	24	610.0	0.250	40'	28.76	72536	49780	37	17	3	77	15	10	2	3	2	TR	2

수압시험 HYDROSTATIC TEST TP (PSI)	RE-SULT	열처리온도 HEAT TREATMENT (℃)	비파괴시험 NDT (U.T)	경도시험 HARDNESS TEST (HrB)	외주장 CIRCUMFERENCE (mm) END	BODY	용접부인장강도 TENSILE STRENGTH OF WELDS (psi)	아연도금시험 ZINC COATING TEST WZC (g/m²)	CST (TIMES)	VISUAL & DIMEN-SION	FLATT-ENING (BEND) TEST	WELD TEST					충격시험 IMPACT TEST ENE-RGY (J)	SHEAR AREA (%)	비 고 REMARKS
⑤			⑥					⑦				⑥				S.T (%)	( )℃		
1420	GOOD	920	ACCEPT				78261			ACCEPT	GOOD	GOOD	GOOD			0.1			
1420	GOOD	920	ACCEPT				75196			ACCEPT	GOOD	GOOD	GOOD			0.1			
1420	GOOD	920	ACCEPT				75315			ACCEPT	GOOD	GOOD	GOOD			0.1			
1420	GOOD	920	ACCEPT				77194			ACCEPT	GOOD	GOOD	GOOD			0.1			
1420	GOOD	920	ACCEPT				78126			ACCEPT	GOOD	GOOD	GOOD			0.1			
1890	GOOD	950	ACCEPT				75194			ACCEPT	GOOD	GOOD	GOOD			0.1			
1890	GOOD	950	ACCEPT				77616			ACCEPT	GOOD	GOOD	GOOD			0.1			
1290	GOOD	920	ACCEPT				75262			ACCEPT	GOOD	GOOD	GOOD			0.1			
1720	GOOD	950	ACCEPT				77912			ACCEPT	GOOD	GOOD	GOOD			0.1			
790	GOOD	850	ACCEPT				74132			ACCEPT	GOOD	GOOD	GOOD			0.1			

①TYPE BPE BLACK PLAIN ENDS BPEB BPE BEVELLED BTE BLACK THREADED ENDS BTC BLACK THREADED & COUPLED GPE GALVANIZED PLAIN ENDS GTE GALVANIZED THREADED ENDS GTC GALVANIZED THREAD & COUPLED
②O.D. OUTSIDE DIAMETER ③W.T. WALL THICKNESS ④CHEMICAL COMPOSITION CHECK ANALYSIS 2:×100 3:×1000 TR TRACE ⑤TP TESTING PRESSURE ⑥NDT NONDESTRUCTIVE TEST
E.T EDDY CURRENT TEST U.T ULTRASONIC TEST ⑦WZC WEIGHT OF ZINC COATING CST COPPER SULPHATE TEST ⑧WELD DUCTILITY TEST RGT RING GAGE TEST FRT FLANGE TEST
CRT CRUSH-TEST RFT REVERSE FLATTENING TEST S.T STRAIGHTNESS

\TURE

EIVOR TO:

본 제품은 관련 규격의 검한 시험 및 검사에 합격하였음을 증명합니다.
WE HEREBY CERTIFY THAT THE PRODUCTS HEREIN HAVE BEEN MADE AND TESTED IN ACCORDANCE WITH THE ABOVE SPECIFICATION AND ALSO WITH THE REQUIREMENTS CALLED FOR THE ORDER.

SIGNATURE T. J.
MANAGER OF QUALITY ASSURANCE DEPT.

C-30-05-(21)

INSPECTION CERTIFICATE

(주) 신 호 스 틸

SHINHO STEEL CO., LTD.

HEAD OFFICE : DONGWON BLDG. 275, YANGJAE DONG, SEOCHO-KU, SEOUL, KOREA
INCHUN PLANT: 487, MAGIK-DONG, NAM-KU, INCHON, KOREA
DAEBUL PLANT: 11 BLOCK, DAEBUL NATIONAL INDUSTRIAL COMPLEX, NAGUL-RI, SAMHO-MYEON, YOUNGAM-KUN, CHULLANAM-DO, KOREA

L/C No. : 171-LCI-700302
ISSUED DATE : 2000. 8. 14
COMMODITY : ERW L.N.G PIPE C.O.W. STEEL PIPE
SPECIFICATION : API 5L X-42/API 5LB/ASTM A538 /ASME SA 538

CERTIFICATE No. : 0000814 - 111
MANUFACTURED No. : 00-07-209
SUPPLIER :
CUSTOMER :

NO.	HEAT NO. (LOT)	TYPE ①	QUANTITY (PIECES)	NOMINAL SIZE (in)	ORDER SIZE O.D. (mm) ②	ORDER SIZE W.T. (in) ③	ORDER SIZE LENGTH (ft)	WEIGHT (kg/ft)	TENSILE TEST TENSILE STRENGTH (psi)	TENSILE TEST YIELD STRENGTH (psi)	ELONGATION (%)	CHEMICAL COMPOSITION (%) C	Si ②	Mn	P ③	S	Cu ④	Ni	Cr	Mo	V
1	A86409	BPEB	33	22	559.0	0.250	40'	26.34	72536	52624	37	18	14	80	15	9	4	2	3	1	4
2	A89179	BPEB	18	22	559.0	0.250	40'	26.34	75380	52624	37	18	14	80	15	9	4	2	3	1	4
3	A89177	BPEB	11	22	559.0	0.250	40'	26.34	73958	51202	35	15	11	75	15	8	4	2	3	TR	2
4	A88395	BPEB	52	22	559.0	0.375	40'	39.29	75380	54046	36	16	13	77	15	10	2	4	2	TR	4

LAST ITEM

NO.	HYDROSTATIC TEST TP (PSI) ⑤	HYDROSTATIC TEST KE-SULT	HEAT TREATMENT (℃)	NDT (U.T) ⑥	HARDNESS TEST (Hrb)	CIRCUMFERENCE (mm) END	CIRCUMFERENCE (mm) BODY	TENSILE STRENGTH OF WELD (psi)	ZINC COATING WEIGHT TEST (WZC g/m²) ⑦	ZINC COATING CST (TIMES) ⑦	VISUAL & DIMENSION	FLATTENING (BEND) TEST	WQT	RQT	FRT	GRT	RFT	S.T (%)	IMPACT TEST ENERGY (J)	IMPACT TEST SHEAR AREA (%)	REMARKS
1	860	GOOD	850	ACCEPT				74538			ACCEPT	GOOD	GOOD	GOOD				0.1			
2	860	GOOD	850	ACCEPT				77380			ACCEPT	GOOD	GOOD	GOOD				0.1			
3	860	GOOD	850	ACCEPT				75958			ACCEPT	GOOD	GOOD	GOOD				0.1			
4	1280	GOOD	920	ACCEPT				77380			ACCEPT	GOOD	GOOD	GOOD				0.1			

LAST ITEM

①TYPE BPE BLACK PLAIN ENDS BPEB BPE BEVELLED BTE BLACK THREADED ENDS BTC BLACK THREADED & COUPLED GPE GALVANIZED PLAIN ENDS GTE GALVANIZED THREADED ENDS GTC GALVANIZED THREAD & COUPLED
②O.D. OUTSIDE DIAMETER ③W.T WALL THICKNESS ④CHEMICAL COMPOSITION CHECK ANALYSIS 2:×100 3:×1000 TR TRACE ⑤TP TESTING PRESSURE ⑥NDT NONDESTRUCTIVE TEST
E.T EDDY CURRENT TEST U.T ULTRASONIC TEST ⑦WZC WEIGHT OF ZINC COATING CST COPPER SULPHATE TEST ⑧WDT WELD DUCTILITY TEST RGT RING GAGE TEST FRT FLARING TEST
CRT CRUSH TEST RFT REVERSE FLATTENING TEST S.T STRAIGHTNESS

SIGNATURE

SURVEYOR TO:

S C-30-05

본 제품은 정한 규격이 정한 시험 및 검사에 합격하였음을 증명합니다.
WE HEREBY CERTIFY THAT THE PRODUCTS HEREIN HAVE BEEN MADE AND TESTED IN ACCORDANCE WITH THE ABOVE SPECIFICATION AND ALSO WITH THE REQUIREMENTS CALLED FOR THE ORDER.

SIGNATURE T. Y.
MANAGER OF QUALITY ASSURANCE TEAM

INSPECTION CERTIFICATE

JC-04 1

KAWASAKI STEEL CORPORAT
CHITA WORKS
1, Kawasaki-cho 1-chome, Handa-City, Aichi Pref. Japan

CERTIFICATE NO.: ELY403
PURCHASE ORDER NO.: P/O NO. 61976
CONTRACT NO.: 6192-E0603-13 (FF6 FF614689)
SHIPPER:
CUSTOMER:
COMMODITY: ERW STEEL PIPE, API5LB/X42 (41ST EDITION), BPE-BVL
SPECIFICATION: API5LB/API5LX42 (BPE-BVL)
SIZE: OD22" X 0.375" X 42'
TOTAL LENGTH:
NO. OF PCS: 20 NO. OF BDL: MASS(NET): 33,000 kg
DATE: JUNE 30, 2000

MFG.NO	HEAT NO		C	Si	Mn	P	S	Cu	Ni	Cr	Mo	Al	Ti	V	Nb	B	N			Ceq		
			×1000	×100		×1000			×100			×1000				×10000				×100		
		max. H	260		115	30	30		100													
		min. max. P	260		115	30	30		100											43		
N0570-01 (3)	4-60558	H	80	21	65	18	4		2													
		P	80	21	65	19	4	2	2	3	<1	25	<3	<5	10					20		
		P	70	20	64	19	4	2	2	3	<1	24	<3	<5	10					19		
N1355-01 (17)	6-42445	H	160	21	78	17	4		2													
		P	160	21	78	17	3	1	2	3	<1	34	15	<5	13					30		
		P	150	19	77	15	3	<1	2	3	<1	35	16	<5	15					29		

VISUAL & DIMENSION: GOOD
HYDROSTATIC TEST: 1290PSI GOOD
DRIFT TEST:
N. D. E.: UT: GOOD
FLATTENING TEST:
BEND TEST:
FLARING TEST:

(NOTES)
H···Heat analysis P···Product analysis

TENSILE TEST — PARENT (A370) WELD (A370)
DIRECTION (T) GL (2")

	Y.P. or Y.S.	T.S.	EL.	Y.R.	T.S. (INCL WELD)
	KSI		(%)		
max.					
min.	420	600	28		600
N0570-01 (3) 4-60558	551	711	40		766
N1355-01 (17) 6-42445	612	774	37		819

CHARPY IMPACT TEST
DIRECTION ( )

	I.V. or A.E.		SHEAR AREA (%)	
	EACH	AVE.	EACH	AVE.
min.				

HARDNESS TEST — SPEC. HV
max. 248
min.

TENSILE TEST — STRIP SPECIMEN ASTM 1-1/2" | ROUND | FULL SEC

(REMARKS)
WELD DUCTILITY TEST : GOOD
SPECIFICATION AS PER API5L (41ST).
WE CONFIRM TO COMPLY WITH HARDNESS REQUIREMENT (MAX.HV 248) AND NI CONTENT REQUIREMENT (MAX. 1%) WHICH ARE REQUIRE NACE MR0175.
CEQ=C+MN/6+(CR+MO+V)/5+(NI+CU)/15

WE HEREBY CERTIFY THAT THE MATERIALS DESCRIBED HEREIN HAVE BEEN MANUFACTURED, INSPECTED AND TESTED IN ACCORDANCE WITH THE CUSTOMER'S SPECIFICATION(S), AND THAT THEY SATISFY THE REQUIREMENTS.

河手崇男
CHIEF INSPECTOR

EC04 2E

YOUNGQUIST BROTHERS, INC.
Has Reviewed this Shop Drawing/Submittal
YBI/Section No. # 02674-05-A
Transmittal No. # 880 Date: 11/19/07
Signature MF

V00155

6

VALLOUREC & MANNESMANN TUBES
V & M do BRASIL
BARREIRO PLANT - Belo Horizonte - MG - Brazil
CEP: 30161-970 - P.O BOX: 2153/2154

ISO 9002

INSPECTION CERTIFICATE

(According to EN 10204 / DIN 50049 3.1.B)

N°.: 90148947

Sheet: 1 / 2

Customer: VALLOUREC & MANNESMANN TUBES CORPORATION
Customer Order: EDT010149
Inspection: VALLOUREC & MANNESMANN TUBES - V&M do BRASIL S.A.

Country: EUA
Work Order: 68610
Material Number: 306772
Customer Material Number:

DIMENSION: 12.3/4" X 0.500" GRADE: GR X42 /GR C /GR B
METALLURGICAL STANDARD: API SPEC 5L 01.01.2000 # PSL 2 # DIMENSIONAL STANDARD: API SPEC 5L 01.01.2000
IN ACCORDANCE ALSO TO THE STANDARDS: A 53 / 1999 # A 106 / 1999 # ASME SA-53 / 1998 # ASME SA-106 / 1998 #
PRODUCT: SEAMLESS STEEL PIPE, HOT FINISHED , BEVELED ENDS 30 DEG. # NORMALIZED # SUPERFICIAL PROTECTION: LACQUER #
TOLERANCES: OUTSIDE DIAMETER: - 0.0311 " / + 0.0937 " WALL THICKNESS: - 0.0625 " / + 0.0750 "
CUT LENGTH: RANDOM 36.00 FT - 42.00 FT #
STANDARD MARKING: V & M DO BRASIL - 5L-0150.4 - MONOGRAMA API - "MM/AA" - 12.3/4 x 0.500 - X42 -B - PSL2 - S - HN - SR4 - ...FT - ASTM A/ASME SA 106-B/C - 02800 PSI - XS - ...LB - ASTM A/ASME SA-53 - HEAT -
SHIPPING MARKING: MADE IN BRAZIL - P.O 45021824 - VMT 40-034455 * HOUSTON * VAN LEEUWEN

A1923000

Batch	Heat N.	Inspection Lot	Pieces	Bundle Lengths	Weight(kgf)
0001696426	95799 ✓	030000342725	16	639.28 FT	19441 KG
TOTAL			16	639.28 FT	19441 KG

THE PRODUCT IS SATISFACTORY IN THE FOLLOWING TESTS / INSPECTIONS: DIMENSIONAL # VISUAL # FLATTENING TEST # Hydrostatic Test: 2.800,0 PSI 5 s #
ELECTROMAGNETIC TEST SR 4.3 #

CHEMICAL COMPOSITION(%): CEq according: 04 DI according: Unit:

		C	Mn	P	S	Si	Ni	Cr	Mo	Al	Cu	Sn	V	Nb	B	Ti	Pb	As	Zr	Co	W	O	N	H	Ca	Zn	Sb	CEq	FB	DI	Pcm
Required:	Min		0.29			0.10																									
	Max	0.22	1.20	0.025	0.015		0.40	0.40	0.15		0.400		0.080															0.400			
Batch:																															
0001696426		0.19	1.04	0.010	0.003	0.20	0.00	0.02	0.02	0.022	0.000		0.000	0.000	0.0000	0.002								0.0017			0.371			
	Check1	0.20	1.04	0.009	0.004	0.20	0.00	0.02	0.02	0.022	0.000		0.000	0.000	0.0000	0.001								0.0017						
	Check2	0.20	1.04	0.010	0.004	0.20	0.00	0.02	0.02	0.021	0.000		0.000	0.000	0.0000	0.001								0.0017						

MECHANICAL TESTS S.Direction: Longitudinal Temperature: Room Temperature Gage Length: L0=2"

Tensile		Area(Sq.in)	Ys(PSI)	Ts(PSI)	E(%)	R.A.()	Ys/Ts
Required:	Min.:		39915	70396	26		
	Max.:						
Batch							
0001696426		0.5	51381	75185	44		

V00155

V&M VALLOUREC & MANNESMANN TUBES

ISO 9002

INSPECTION CERTIFICATE (According to EN 10204 / DIN 50049 3.1.B)	N°.: 90148947	Sheet: 2 / 2

MECHANICAL TESTS — S.Direction: Transversal — Temperature: Room Temperature — Gage Length: L0=2"

Tensile		Area(Sq.in)	Ys(PSI)	Ts(PSI)	E(%)	R.A.()	Ys/Ts
Required:	Min.:		42092	60090	30		
	Max.:		65025	110020			
Batch							
0001696426		0.7	54720	75621	44		

Hardness		HRC
Required:	Min.:	
	Max.:	22
Batch		
0001696426		1

Impact — According: CHARPY 10X55X10 V NOTCH — Direction: Transversal — Temperature: 32 ° F

Batch	Absorbed Energy Required Min: 15 Ft.lb Average Min: 27				Shear Area Required Min: % Average Min:				Lateral Expansion Required Min: mils Average Min:			
	1	2	3	Average	1	2	3	Average	1	2	3	Average
0001696426	115	128	149	131	67	82	100	83				

Remarks:

MATERIAL IN ACCORDANCE TO ITEM 3.2 OF NACE MR 0175/2000.

ASME PRESSURE VESSEL CODE SECTION II.

We hereby certify that this product has been manufactured and examined in accordance with all requirements of the standards and specifications and all the results are found to be satisfactory This testimonial and certificate respectively is recorded by a computer system and is valid without signature. Alteration or use for others products are regarded as falsification of documents and will be subject to criminal jurisdiction.

QUALITY CONTROL DEPARTMENT

FAX:(55-31) 3328-2587

e-mail:cont.qualidade@vmtubes.com.br

DATE

TECHNICAL RESPONSIBLE 22.08.2001

DR JÚLIO MÁRCIO SILVEIRA E SILVA - CREA/MG 35820

VALLOUREC & MANNESMANN TUBES

V & M do BRASIL
BARREIRO PLANT - Belo Horizonte - MG - Brazil
CEP: 30161-970 - P.O BOX: 2153/2154

ISO 9002

INSPECTION CERTIFICATE (According to EN 10204 / DIN 50049 3.1.B)	N°.:	Sheet:
	90142814	1 / 3

Customer: VALLOUREC & MANNESMANN TUBES CORPORATION
Customer Order: EDT010085
Inspection: VALLOUREC & MANNESMANN TUBES - V&M do BRASIL S.A.

Country: EUA
Work Order: 65391
Material Number: 306772
Customer Material Number:

DIMENSION: 12.7520 " X 0.5000 " GRADE: GR X42 /GR C /GR B
METALURGICAL STANDARD: API SPEC 5L 01.01.2000 # PSL 2 # DIMENSIONAL STANDARD: API SPEC 5L 01.01.2000
IN ACCORDANCE ALSO TO THE STANDARDS: A 53 / 1999 # A 106 / 1999 # ASME SA-53 / 1998 # ASME SA-106 / 1998 #
PRODUCT: SEAMLESS STEEL PIPE, HOT FINISHED , BEVELED ENDS 30 DEG. # NORMALIZED # SUPERFICIAL PROTECTION: LACQUER #
TOLERANCES: OUTSIDE DIAMETER: - 0.0311 " / + 0.0937 " WALL THICKNESS: - 0.0625 " / + 0.0750 "
CUT LENGTH: RANDOM 36.00 FT - 42.00 FT #
STANDARD MARKING: V & M DO BRASIL - 5L-0150.4 - MONOGRAMA API - "MM/AA" - 12.3/4 x 0.500 - X42 -/B - PSL2 - S - HN - SR4 - ...FT - ASTM A/ASME SA 106-B/C - 02800 PSI - XS - ...LB - ASTM A/ASME SA-53 - HEAT -
SHIPPING MARKING: MADE IN BRAZIL - P.O 45021100 - VMT 40-034103 * HOUSTON * VAN LEEUWEN

Batch	Heat N.	Inspection Lot	Pieces	Bundle Lengths	Weight(kgf)
0001492685	93736	030000294335	3	123.89 FT	3690 KG
0001582190	94978	030000315740	17	688.22 FT	20947 KG
0001586237	94978	030000316647	15	603.18 FT	18431 KG
TOTAL			35	1415.29 FT	43068 KG

THE PRODUCT IS SATISFACTORY IN THE FOLLOWING TESTS / INSPECTIONS: DIMENSIONAL # VISUAL # FLATTENING TEST # Hydrostatic Test: 2.800,0 PSI 5 s #
ELECTROMAGNETIC TEST SR 4.3 #

CHEMICAL COMPOSITION(%): CEq according: 04 DI according: Unit:

		C	Mn	P	S	Si	Ni	Cr	Mo	Al	Cu	Sn	V	Nb	B	Ti	Pb	As	Zr	Co	W	O	N	H	Ca	Zn	Sb	CEq	FB	DI	Pcm
Required:	Min		0.29			0.10																									
	Max	0.22	1.20	0.025	0.015		0.40	0.40	0.15		0.400		0.080																		
Batch:																															
0001492685		0.18	1.05	0.020	0.004	0.30	0.00	0.08	0.02	0.020	0.000		0.000	0.000	0.0000	0.002									0.0025			0.375			
	Check1	0.18	1.05	0.020	0.004	0.29	0.00	0.08	0.02	0.021	0.000		0.000	0.000	0.0000	0.003									0.0025						
	Check2	0.18	1.05	0.020	0.005	0.30	0.00	0.08	0.02	0.021	0.000		0.000	0.000	0.0000	0.003									0.0025						
0001582190		0.17	1.05	0.012	0.004	0.26	0.01	0.02	0.02	0.022	0.000		0.000	0.000	0.0000	0.003									0.0014			0.354			
	Check1	0.17	1.04	0.013	0.004	0.27	0.01	0.02	0.02	0.022	0.000		0.000	0.000	0.0000	0.002									0.0014						
	Check2	0.17	1.04	0.010	0.004	0.26	0.01	0.02	0.02	0.022	0.000		0.000	0.000	0.0000	0.002									0.0014						
0001586237		0.17	1.05	0.012	0.004	0.26	0.01	0.02	0.02	0.022	0.000		0.000	0.000	0.0000	0.003									0.0014			0.354			

V&M VALLOUREC & MANNESMANN TUBES

INSPECTION CERTIFICATE (According to EN 10204 / DIN 50049 3.1.B)	N°.: 90142814	Sheet: 2 / 3

Check1	0.17	1.04	0.013	0.004	0.27	0.01	0.02	0.02	0.022	0.030	0.030	0.030	0.0000	0.002		0.0014
Check2	0.17	1.04	0.010	0.004	0.26	0.01	0.02	0.02	0.022	0.030	0.030	0.030	0.0000	0.002		0.0014

MECHANICAL TESTS — S.Direction: Longitudinal — Temperature: Room Temperature — Gage Length: L0=2"

Tensile		Area(Sq.in)	Ys(PSI)	Ts(PSI)	E(%)	R.A.()	Ys/Ts
Required:	Min.:		39915	70396	26		
	Max.:						
Batch							
0001492685		0.5	53414	74605	43		
0001582190		0.5	51817	74605	39		
0001586237		0.5	51817	74605	39		

MECHANICAL TESTS — S.Direction: Transversal — Temperature: Room Temperature — Gage Length: L0=2"

Tensile		Area(Sq.in)	Ys(PSI)	Ts(PSI)	E(%)	R.A.()	Ys/Ts
Required:	Min.:		42092	60090	30		
	Max.:		65025	110020			
Batch							
0001492685		0.8	52688	75766	46		
0001582190		0.8	52252	71992	42		
0001586237		0.8	52252	71992	42		

Hardness		HRC
Required:	Min.:	
	Max.:	22
Batch		
0001492685		1
0001582190		1
0001586237		1

Impact — According: CHARPY 10X55X10 V NOTCH — Direction: Transversal — Temperature: 32 °F

Batch	Absorbed Energy — Required Min: 15 Ft.lb Average Min: 27				Shear Area — Required Min: % Average Min:				Lateral Expansion — Required Min: mils Average Min:			
	1	2	3	Average	1	2	3	Average	1	2	3	Average
0001492685	122	125	116	121	100	100	100	100				
0001582190	146	149	158	151	100	100	100	100				
0001586237	146	149	158	151	100	100	100	100				

VALLOUREC & MANNESMANN TUBES

ISO 9002

INSPECTION CERTIFICATE	N°.:	Sheet:
(According to EN 10204 / DIN 50049 3.1.B)	90142814	3 / 3

Remarks:
MATERIAL IN ACCORDANCE TO ITEM 3.2 OF NACE MR 0175/2000.
ASME PRESSURE VESSEL CODE SECTION II.

We hereby certify that this product has been manufactured and examined in accordance with all requirements of the standards and specifications and all the results are found to be satisfactory
This testimonial and certificate respectively is recorded by a computer system and is valid without signature. Alteration or use for others products are regarded as falsification of documents and will be subject to criminal jurisdiction

QUALITY CONTROL DEPARTMENT

FAX:(55-31) 3328-2587

e-mail:cont.qualidade@vmtubes.com.br

DATE

TECHNICAL RESPONSIBLE 19.07.2001

DR JÚLIO MÁRCIO SILVEIRA E SILVA - CREA/MG 34582/D

VALLOUREC & MANNESMANN TUBES

V & M do Brasil
BARREIRO PLANT - Belo Horizonte - MG - Brazil
CEP: 30161-970 - P.O. BOX: 2153/2154

Inspection Certificate
(According to EN 10204 / DIN 50049 3.1.B)

N°.: 90117913

Sheet: 1

Customer: VALLOUREC & MANNESMANN TUBES CORPORATION
Customer Order: EDT000279
Inspection: VALLOUREC & MANNESMANN TUBES - V&M do BRASIL S.A.

Country: EUA

Work Order: 0000056396
Material Number: 306772

Customer Material Number:

DIMENSION: 12.7520 " X 0.5000 " INSIDE DIAMETER: SCHEDULE: SHAPE: GRADE: GR.X42 /GR.C /GR.B
METALURGICAL STANDARD: API SPEC 5L 01.01.2000 # PSL 2 DIMENSIONAL STANDARD: API SPEC 5L 01.01.2000
METALURGICAL SPECIFICATION: DIMENSIONAL SPECIFICATION:
IN ACCORDANCE ALSO TO THE STANDARDS: ASTM A 106 / 1997 # ASME SA 106 / 1998 # ASTM A 53 / 1998 # ASME SA 53 / 1998 # / # / / #
PRODUCT: SEAMLESS STEEL PIPE, HOT FINISHED # BEVELED ENDS 30 DEG. # NORMALIZED
DRAWING: DATE: # SUPERFICIAL PROTECTION: LACQUER SUPERFICIAL FINISHING:
TOLERANCES: OUTSIDE DIAMETER: -0.0311 " / +0.0937 " INSIDE DIAMETER: / WALL THICKNESS: -0.0625 " / +0.0750 "
CUT LENGTH: RANDOM 36.00 FT - 42.00 FT SHORT LENGTH I: - - SHORT LENGTH II: - -
STANDARD MARKING: V & M DO BRASIL - 5L-0150.4 - MONOGRAMA API - "MM/AA" - 12.3/4 x 0.500 - X42 -/B - PSL2 - S - HN - SR4 - ...FT - ASTM A/ASME SA 106-B/C - 02800
PSI - XS - ...LB - ASTM A/ASME SA-53 - HEAT -
SHIPPING MARKING: MADE IN BRAZIL - P.O 45018628 - VMT 40-033219 * HOUSTON * VAN LEEUWEN

Heat N.	Batch	Inspection Lot	Pieces	Bundle Lengths	Weight (kgf)
92380	0001303381	030000249217	9	361.82 FT	11058 KG
92380	0001325915	030000254409	4	159.32 FT	4890 KG
92380	0001325916	030000254410	10	398.43 FT	12201 KG
92380	0001355229	030000261264	3	121.36 FT	3696 KG
	TOTAL		26	1040.93 FT	31845 KG

THE PRODUCT IS SATISFACTORY IN THE FOLLOWING TESTS / INSPECTIONS:

DIMENSIONAL # VISUAL # FLATTENING TEST # Hydrostatic Test: 2.800,0 PSI # ELECTROMAGNETIC TEST #

CHEMICAL COMPOSITION (%): DI according: Unit:

		C	Mn	P	S	Si	Ni	Cr	Mo	Al	Cu	Sn	V	Nb	B	Ti	Pb	As	Zr	Co	W	O	N	H	Ca	Zn	Sb	CEq	FB	DI	Pcm
Required:	Min		0.29			0.10																									
	Max	0.22	1.20	0.025	0.015		0.40	0.40	0.15		0.400		0.080															0.400			

APPROVED

VALLOUREC & MANNESMANN TUBES

Inspection Certificate
(According to EN 10204 / DIN 50049 3.1.B)

N°.: 90117913

Sheet: 2

Batch:

0001303381		0.19	1.05	0.010	0.002	0.28	0.01	0.03	0.02	0.020	0.000	0.000	0.000	0.0000	0.001	0.0018	0.377	
	Check1	0.19	1.07	0.010	0.002	0.29	0.01	0.03	0.02	0.020	0.000	0.000	0.000	0.0000	0.002	0.0018		
	Check2	0.19	1.06	0.010	0.002	0.29	0.01	0.03	0.03	0.020	0.000	0.000	0.000	0.0000	0.002	0.0018		
0001325915		0.19	1.06	0.010	0.002	0.28	0.01	0.03	0.02	0.020	0.000	0.000	0.000	0.0000	0.001	0.0018	0.377	
	Check1	0.19	1.07	0.010	0.002	0.29	0.01	0.03	0.02	0.020	0.000	0.000	0.000	0.0000	0.002	0.0018		
	Check2	0.19	1.06	0.010	0.002	0.29	0.01	0.03	0.03	0.020	0.000	0.000	0.000	0.0000	0.002	0.0018		
0001325916		0.19	1.06	0.010	0.002	0.28	0.01	0.03	0.02	0.020	0.000	0.000	0.000	0.0000	0.001	0.0018	0.377	
	Check1	0.19	1.07	0.010	0.002	0.29	0.01	0.03	0.02	0.020	0.000	0.000	0.000	0.0000	0.002	0.0018		
	Check2	0.19	1.06	0.010	0.002	0.29	0.01	0.03	0.03	0.020	0.000	0.000	0.000	0.0000	0.002	0.0018		
0001355229		0.19	1.06	0.010	0.002	0.28	0.01	0.03	0.02	0.020	0.000	0.000	0.000	0.0000	0.001	0.0018	0.377	
	Check1	0.19	1.07	0.010	0.002	0.29	0.01	0.03	0.02	0.020	0.000	0.000	0.000	0.0000	0.002	0.0018		
	Check2	0.19	1.06	0.010	0.002	0.29	0.01	0.03	0.03	0.020	0.000	0.000	0.000	0.0000	0.002	0.0018		

MECHANICAL TESTS — S. Direction: Longitudinal — Temperature: Room Temperature — Gage Length: L0=2"

Tensile		Area (Sq.in)	Ys (PSI)	Ts (PSI)	E (%)	R.A. ( )	Ys / Ts
Required:	Min		39915	70396	26		
	Max						
Batch							
0001303381		0.5	51817	78814	42		
0001325915		0.5	51817	78814	42		
0001325916		0.5	51817	78814	42		
0001355229		0.5	51817	78814	42		

MECHANICAL TESTS — S. Direction: Transversal — Temperature: Room Temperature — Gage Length: L0=2"

Tensile		Area (Sq.in)	Ys (PSI)	Ts (PSI)	E (%)	R.A. ( )	Ys / Ts
Required:	Min		42092	60090	30		
	Max		65025	110920			
Batch							
0001303381		0.7	59945	80265	41		
0001325915		0.7	59945	80265	41		
0001325916		0.7	59945	80265	41		
0001355229		0.7	59945	80265	41		

V&M VALLOUREC & MANNESMANN TUBES

Inspection Certificate
(According to EN 10204 / DIN 50049 3.1.B)

N°.: 90117913

Sheet: 3

Hardness		HRC
Required:	Min	
	Max	22
Batch		
0001303381		1
0001325915		1
0001325916		1
0001355229		1

Impact According: CHARPY 10X55X10 V NOTCH Direction: Transversal Temperature: 32 °F

	Absorbed Energy				Shear Area				Lateral Expansion			
	Required Min: 11 FLlb		AVG Min: 20		Required Min: 10		AVG Min:	%	Required Min:		AVG Min:	mils
Batch	1	2	3	Average	1	2	3	Average	1	2	3	Average
0001303381	96	101	100	99	100	100	100					
0001325915	96	101	100	99	100	100	100					
0001325916	96	101	100	99	100	100	100					
0001355229	96	101	100	99	100	100	100					

Remarks:

MATERIAL IN ACCORDANCE TO ITEM 3.2 OF NACE MR 0175/2000.

ASME PRESSURE VESSEL CODE SECTION II.

We hereby certify that this product has been manufactured and examined in accordance with all requirements of the standards and specifications and all the results are found to be satisfactory. This testimonial and certificate respectively is recorded by a computer system and is valid without signature. Alteration or use for others products are regarded as falsification of documents and will be subject to criminal jurisdiction.

QUALITY CONTROL DEPARTMENT

FAX: (51-31)328-2632

e-mail: vmlat@vmbrasil.com.br

TECHNICAL RESPONSIBLE

Alcides de Castro Teodoro - CREA/MG 20.866/D

DATE

03/02/2001

VALLOUREC & MANNESMANN TUBES
V & M do BRASIL
BARREIRO PLANT - Belo Horizonte - MG - Brazil
CEP: 30161-970 - P.O BOX: 2153/2154

ISO 9002

INSPECTION CERTIFICATE

(According to EN 10204 / DIN 50049 3.1.B)

N°.: 90142829

Sheet: 1 / 3

Customer: VALLOUREC & MANNESMANN TUBES CORPORATION
Customer Order: EDT010106
Inspection: VALLOUREC & MANNESMANN TUBES - V&M do BRASIL S.A.

Country: EUA

Work Order: 66657
Material Number: 306772
Customer Material Number:

DIMENSION: 12.7520 " X 0.5000 " GRADE: GR X42 /GR C /GR B
METALURGICAL STANDARD: API SPEC 5L 01.01.2000 # PSL 2 # DIMENSIONAL STANDARD: API SPEC 5L 01.01.2000
IN ACCORDANCE ALSO TO THE STANDARDS: A 53 / 1999 # A 106 / 1999 # ASME SA-53 / 1998 # ASME SA-106 / 1998 #
PRODUCT: SEAMLESS STEEL PIPE, HOT FINISHED , BEVELED ENDS 30 DEG. # NORMALIZED # SUPERFICIAL PROTECTION: LACQUER #
TOLERANCES: OUTSIDE DIAMETER: - 0.0311 " / + 0.0937 " WALL THICKNESS: - 0.0625 " / + 0.0750 "
CUT LENGTH: RANDOM 36.00 FT - 42.00 FT #
STANDARD MARKING: V & M DO BRASIL - 5L-0150.4 - MONOGRAMA API - 'MM/AA' - 12.3/4 x 0.500 - X42 -/B - PSL2 - S - HN - SR4 - ...FT - ASTM A/ASME SA 106-B/C - 02800 PSI - XS - ...LB - ASTM A/ASME SA-53 - HEAT -
SHIPPING MARKING: MADE IN BRAZIL - P.O 45021485 - VMT 40-034217 * HOUSTON * VAN LEEUWEN

Batch	Heat N.	Inspection Lot	Pieces	Bundle Lengths	Weight(kgf)
0001617996	95155	030000324235	7	289.96 FT	8798 KG
0001618034	95155	030000324240	9	372.73 FT	11273 KG
0001621505	95155	030000325046	2	78.15 FT	2367 KG
TOTAL			18	740.84 FT	22438 KG

THE PRODUCT IS SATISFACTORY IN THE FOLLOWING TESTS / INSPECTIONS: DIMENSIONAL # VISUAL # FLATTENING TEST # Hydrostatic Test: 2.800,0 PSI 5 s #
ELECTROMAGNETIC TEST SR 4.3 #

CHEMICAL COMPOSITION(%): CEq according: 04 DI according: Unit:

		C	Mn	P	S	Si	Ni	Cr	Mo	Al	Cu	Sn	V	Nb	B	Ti	Pb	As	Zr	Co	W	O	N	H	Ca	Zn	Sb	CEq	FB	DI	Pcm
Required:	Min		0.29			0.10																									
	Max	0.22	1.20	0.025	0.015		0.40	0.40	0.15		0.400		0.090															0.400			
Batch:																															
0001617996		0.20	1.03	0.017	0.003	0.27	0.00	0.05	0.02	0.020	0.000		0.000	0.000	0.0000	0.002									0.0017			0.386			
	Check1	0.20	1.02	0.017	0.003	0.26	0.01	0.05	0.02	0.022	0.000		0.000	0.000	0.0000	0.002									0.0017						
	Check2	0.20	1.03	0.018	0.003	0.27	0.01	0.06	0.02	0.021	0.000		0.000	0.000	0.0000	0.002									0.0017						
0001618034		0.20	1.03	0.017	0.003	0.27	0.00	0.05	0.02	0.020	0.000		0.000	0.000	0.0000	0.002									0.0017			0.386			
	Check1	0.20	1.02	0.017	0.003	0.26	0.01	0.05	0.02	0.022	0.000		0.000	0.000	0.0000	0.002									0.0017						
	Check2	0.20	1.03	0.018	0.003	0.27	0.01	0.06	0.02	0.021	0.000		0.000	0.000	0.0000	0.002									0.0017						
0001621505		0.20	1.03	0.017	0.003	0.27	0.00	0.05	0.02	0.020	0.000		0.000	0.000	0.0000	0.002									0.0017			0.386			

VALLOUREC & MANNESMANN TUBES

ISO 9002

INSPECTION CERTIFICATE (According to EN 10204 / DIN 50049 3.1.B)	N°.: 90142829	Sheet: 2 / 3

Check1	0.20	1.02	0.017	0.003	0.26	0.01	0.05	0.02	0.022	0.000	0.000	0.000	0.0000	0.002		0.0017
Check2	0.20	1.03	0.018	0.003	0.27	0.01	0.06	0.02	0.021	0.000	0.000	0.000	0.0000	0.002		0.0017

MECHANICAL TESTS — S.Direction: Longitudinal — Temperature: Room Temperature — Gage Length: L0=2"

Tensile		Area(Sq.In)	Ys(PSI)	Ts(PSI)	E(%)	R.A.()	Ys/Ts
Required:	Min.:		39915	70396	26		
	Max.:						
Batch							
0001617996		0.5	52398	78669	37		
0001618034		0.5	52398	78669	37		
0001621505		0.5	52398	78669	37		

MECHANICAL TESTS — S.Direction: Transversal — Temperature: Room Temperature — Gage Length: L0=2"

Tensile		Area(Sq.In)	Ys(PSI)	Ts(PSI)	E(%)	R.A.()	Ys/Ts
Required:	Min.:		42092	60090	30		
	Max.:		65025	110020			
Batch							
0001617996		0.8	55300	76637	44		
0001618034		0.8	55300	76637	44		
0001621505		0.8	55300	76637	44		

Hardness		HRC
Required:	Min.:	
	Max.:	22
Batch		
0001617996		1
0001618034		1
0001621505		1

Impact — According: CHARPY 10X55X10 V NOTCH — Direction: Transversal — Temperature: 32 °F

Batch	Absorbed Energy Required Min: 15 Ft.lb Average Min: 27				Shear Area Required Min: % Average Min:				Lateral Expansion Required Min: mils Average Min:			
	1	2	3	Average	1	2	3	Average	1	2	3	Average
0001617996	194	183	188	188	100	100	100	100				
0001618034	194	183	188	188	100	100	100	100				
0001621505	194	183	188	188	100	100	100	100				

VALLOUREC & MANNESMANN TUBES

ISO 9002

INSPECTION CERTIFICATE (According to EN 10204 / DIN 50049 3.1.B)	N°.: 90142829	Sheet: 3 / 3

Remarks:
MATERIAL IN ACCORDANCE TO ITEM 3.2 OF NACE MR 0175/2000.
ASME PRESSURE VESSEL CODE SECTION II.

We hereby certify that this product has been manufactured and examined in accordance with all requirements of the standards and specifications and all the results are found to be satisfactory
This testimonial and certificate respectively is recorded by a computer system and is valid without signature. Alteration or use for others products are regarded as falsification of documents and will be subject to criminal Jurisdiction

QUALITY CONTROL DEPARTMENT

FAX:(55-31) 3328-2587

e-mail:cont.qualidade@vmtubes.com.br

TECHNICAL RESPONSIBLE
DR JÚLIO MÁRCIO SILVEIRA E SILVA - CREA/MG 34582/D

DATE
19.07.2001

APPENDIX F

Well Construction Summary

APPENDIX F

Well Construction Summary

IW-1 Well Construction and Testing Summary

Date	Activity
8/20/01	Pad monitor wells were constructed to a depth of 22 feet bls (screened interval from 12-22 feet bls).
8/20/01	Youngquist Brothers Inc. mobilized drilling equipment to IW-1 location.
9/11/01	Started and complete nominal 12-inch diameter pilot hole to 310 feet bpl using mud-rotary drilling methods. Conducted geophysical logging of the pilot hole. Logs conducted were Dual Induction, Caliper, and Gamma Ray logs. Started reaming of pilot hole to a nominal 42-inch diameter.
9/12/01	Completed reaming to a depth of 280 feet bpl. Conducted Caliper log. Started installation of the 36-inch diameter casing.
9/13/01	Completed installation of the 36-inch diameter steel casing to a depth of 275 feet bpl and cemented to pad level.
9/17/01	Started and completed nominal 12-inch diameter pilot hole drilling from 275 feet bpl to 1,010 feet bpl.
9/18/01	Conducted geophysical logging of the pilot hole. Logs conducted were Caliper, Dual Induction, Sonic, and Gamma Ray logs. Started reaming of pilot hole to a nominal 36-inch diameter.
9/21/01	Completed reaming to a depth of 935 feet bpl.
9/22/01	Conducted Caliper log. Installed and the 30-inch diameter steel casing to a depth of 930 feet bpl and cemented to pad level.
9/25/01	Started nominal 10-inch diameter pilot hole drilling from 930 feet bpl.
10/2/01	Completed pilot hole drilling to a depth of 2,010 feet bpl.
10/8/01	Conducted geophysical logging of the pilot hole. Logs conducted were Caliper, Dual Induction, Natural Gamma Ray, Magnetic Resonance Imaging, Spectral Gamma Ray, and Full Wave Form Sonic logs.
10/9/01	Started reaming the pilot hole to a nominal 12-inch diamter, using reverse air drilling techniques.
10/10/01	Completed reaming to a depth of 2,000 feet bpl.
10/11/01	Conducted Caliper geophysical log.
10/12/01	Conducted a straddle packer test on the interval from 1,950 to 2,000 feet bpl.
10/13/01	Conducted a straddle packer test on the interval from 1,970 to 2,000 feet bpl.
10/15/01	Pilot hole backplugged to a depth of 960 feet bpl prior to reaming.

Date	Activity
10/16/01	Started reaming pilot hole to a nominal 30-inches in diameter.
10/19/01	Completed reaming to a depth of 2,005 feet bpl.
10/22/01	Conducted Caliper geophysical logging of the reamed borehole. Started installation of the 22-inch diameter steel casing.
10/23/01	Completed installation of the 22-inch diameter steel casing to a depth of 2,000 feet bpl. Started cementing of casing.
10/24/01	Completed cementing of the casing to pad level.
10/25/01	Started nominal 12-inch diameter pilot hole drilling from the base of the 22-inch casing at 2,000 feet bpl.
10/26/01	Cored the interval from 2,054 to 2,066 feet bpl using a 4-inch core barrel, recovered 4 feet of core.
10/29/01	Cored the interval from 2,230 to 2,242 feet bpl using a 4-inch core barrel, recovered 5 feet of core.
10/30/01	Cored the interval from 2,306 to 2,318 feet bpl using a 4-inch core barrel, recovered 10.5 feet of core.
10/31/01	Cored the interval from 2,402 to 2,414 feet bpl using a 4-inch core barrel, recovered 11 feet of core.
11/2/01	Cored the interval from 2,760 to 2,771 feet bpl using a 4-inch core barrel, recovered 9 feet of core.
11/5/01	Completed pilot hole drilling to a depth of 2,980 feet bpl. Conducted geophysical logging. Logs conducted were Caliper, Gamma Ray, Dual Induction and Sonic logs.
11/7/01	Conducted a straddle packer test on the interval from 2,801 to 2,901 feet bpl.
11/8/01	Conducted a straddle packer test on the interval from 2,720 to 2,756 feet bpl.
11/11/01	Conducted a straddle packer test on the interval from 2,400 to 2,461 feet bpl.
11/12/01	Conducted a straddle packer test on the interval from 2,200 to 2,251 feet bpl.
11/13/01	Started backplugging pilot hole.
11/14/01	Completed backplugging of pilot hole to a depth of 2,007 feet bpl prior to reaming. Started reaming of pilot hole to a nominal 22-inch diameter.
11/21/01	Completed reaming to a depth of 2,915 feet bpl.
11/26/01	Started nominal 12-inch diameter pilot hole drilling from 2,915 feet bpl.
11/28/01	Completed pilot hole drilling to a total depth of 3,350 feet bpl.
11/29/01	Conducted geophysical logging of the pilot hole. Logs conducted were Dual Induction, Static and Dynamic Fluid Conductivity, Caliper, Gamma Ray, Sonic, Static and Dynamic Flowmeter, Static and Dynamic Temperature logs.
12/1/01	Conducted video survey of pilot hole.
12/5/01	Started and completed reaming of pilot hole to a nominal 22-inch diameter from a depth of 2,915 to 2,995 feet bpl.
12/6/01	Conducted Caliper logging. Installed drillable bridge plug at 2,986 feet bpl.
12/8/01	Started installation of 12-inch diameter steel casing.

TABLE 3-4
SMW-1 Well Construction and Testing Summary
Tropicana Deep Injection Well Project

Date	Activity
12/11/01	Completed installation of 12-inch casing to a depth of 2,983 feet bpl. Started cementing of casing.
12/15/01	Completed cementing to 216 feet bpl.
12/17/01	Bridge plug drilled out. Well is air developed.
12/18/01	Final Caliper geophysical log is conducted on completed well.
12/19/01	Drill rig is demobilized.
1/3/02	Casing pressure test on 12-inch casing is conducted.
1/9/02	Primary and secondary drinking water standard samples are collected. Video survey and cement bond log are conducted.
1/22/02	Conducted background Gamma Ray and Temperature logs prior to RTS.
1/23/02	External RTS is conducted.
1/24/02	Internal RTS is conducted.
3/13/02	Step injection test conducted.

TZMW-1 Well Modification and Testing Summary

Date	Activity
1/17/02	Started backplugging of lower monitor zone in TZMW-1.
1/21/02	Completed backplugging of lower monitor zone to 2,236 feet bpl.
1/28/02	Completed cementing of annual space between 12-inch and 18-inch diameter casings from 314 feet bls to land surface.
3/5/02	Primary and secondary drinking water standard samples are collected.

APPENDIX G

Casing Depths and Cement Quantities

Immokalee Water and Sewer District
Injection Well IW-1
Summary of Casing Setting Depths and Cement Quantities

Casing	Casing Material	Outside Diameter (inches)	Inside Diameter (inches)	Casing Thickness (inches)	Casing Depth (feet bpl)	Date	Cement Stage	Type of Cement	Quantity of Cement (barrels)	Comments
Surface	Steel	36	35.25	0.375	275	9/13/01	1	neat	358	Pressure grout from 273 feet bpl
							2	neat	56	Tremied into annulus from 57 feet bpl
Intermediate	Steel	30	29.25	0.375	930	9/22/01	1	4% bentonite	295	Pressure grout
								neat	134	Pressure grout
Intermediate	Steel	22	21.25	0.375	2000	10/23/01	1	4% bentonite	239	Pressure grout
								neat	92	Pressure grout
						10/23/01	2	4% bentonite	203	Tremied into annulus from 1,443 feet bpl
						10/24/01	3	12% bentonite	260	Tremied into annulus from 1,119 feet bpl
						10/24/01	4	12% bentonite	287	Tremied into annulus from 827 feet bpl
Final	Steel	12.75	11.75	0.5	2983	12/11/2001	1	neat	30	Pressure grout
						12/12/2001	2	neat	50	Tremied into annulus from 2,900 feet bpl
						12/12/2001	3	4% bentonite	150	Tremied into annulus from 2,776 feet bpl
						12/13/2001	4	4% bentonite	152	Tremied into annulus from 2,384 feet bpl
						12/13/2001	5	4% bentonite	115	Tremied into annulus from 2,279 feet bpl
						12/14/2001	6	4% bentonite	52	Tremied into annulus from 2,090 feet bpl
						12/14/2001	7	12% bentonite	251	Tremied into annulus from 1,987 feet bpl
						12/14/2001	8	12% bentonite	251	Tremied into annulus from 1,115 feet bpl
								Total Neat:	**720**	
								Total 4%:	**1206**	
								Total 12%:	**1049**	

APPENDIX H

Pad Monitor Well Water Quality

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0900	N/A	512	13	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	550	33	N/A	6.26		YBI/Sanders
09/13/2001	0830	N/A	540	9	N/A	6.82		YBI/Sanders
09/19/2001	1230	N/A	396	15	N/A	6.41		YBI/Sanders
09/26/2001	1340	6.75	420	9	N/A	6.40		T. Levi
10/02/2001	1215	6.68	509	19	N/A	6.40		T. Levi
10/11/2001	1500	7.40	493	20	N/A	6.50		M. Schilling
10/18/2001	1345	7.10	517	23	N/A	6.80		M. Schilling
10/25/2001	1610	7.20	502	21	N/A	6.81		M. Schilling
11/01/2001	1430	7.33	542	20	N/A	6.40		T. Levi
11/08/2001	2000	9.50	535	17	N/A	7.30		T. Levi
11/15/2001	1230	9.50	717	36	N/A	7.00		T. Levi
11/21/2001	1120	9.67	509	28	N/A	7.00		T. Levi
11/29/2001	1630	10.0	596	25	N/A	6.80		T. Levi
12/06/2001	1200	10.2	635	26	N/A	6.90		T. Levi
12/13/2001	2200	10.3	514	22	N/A	7.10		T. Levi
12/18/2001	1340	10.4	568	18	N/A	7.00		T. Levi
01/03/2002	1540	10.70	583	15	N/A	7.00		T. Levi
01/09/2002	0830	10.20	572	16	N/A	7.00		YBI/Sanders

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northeast Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	0930	N/A	599	30	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	780	13	N/A	6.72		YBI/Sanders
09/13/2001	0830	N/A	490	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	415	22	N/A	6.22		YBI/Sanders
09/26/2001	1310	3.50	440	26	N/A	6.40		T. Levi
10/02/2001	1205	3.62	524	39	N/A	6.40		T. Levi
10/11/2001	1515	3.20	536	26	N/A	6.40		M. Schilling
10/18/2001	1330	3.50	542	22	N/A	6.80		M. Schilling
10/25/2001	1630	4.30	500	25	N/A	6.60		M. Schilling
11/01/2001	1410	3.50	564	53	N/A	6.50		T. Levi
11/08/2001	2010	7.00	551	53	N/A	6.40		T. Levi
11/15/2001	1240	7.09	626	53	N/A	6.70		T. Levi
11/21/2001	1140	7.63	526	35	N/A	6.60		T. Levi
11/29/2001	1650	7.50	506	59	N/A	7.00		T. Levi
12/06/2001	1200	7.75	600	70	N/A	6.90		T. Levi
12/13/2001	2220	8.08	558	80	N/A	7.30		T. Levi
12/18/2001	1330	7.55	520	69	N/A	7.30		T. Levi
01/03/2002	1525	8.50	549	62	N/A	6.90		T. Levi
01/09/2002	0820	8.24	537	65	N/A	7.10		YBI/Sanders

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Southwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1100	N/A	685	9	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	490	16	N/A	6.59		YBI/Sanders
09/13/2001	0830	N/A	550	10	N/A	6.74		YBI/Sanders
09/19/2001	1230	N/A	646	15	N/A	6.22		YBI/Sanders
09/26/2001	1330	6.67	720	8	N/A	6.20		T. Levi
10/02/2001	1155	6.59	747	9	N/A	6.20		T. Levi
10/11/2001	1530	6.70	704	7	N/A	6.10		M. Schilling
10/18/2001	1400	6.90	665	9	N/A	6.40		M. Schilling
10/25/2001	1550	7.10	698	8	N/A	6.23		M. Schilling
11/01/2001	1420	7.25	700	8	N/A	7.00		T. Levi
11/08/2001	2020	8.80	734	11	N/A	6.50		T. Levi
11/15/2001	1250	9.17	837	10	N/A	6.60		T. Levi
11/21/2001	1130	9.42	716	6	N/A	6.50		T. Levi
11/29/2001	1640	9.67	717	11	N/A	6.80		T. Levi
12/06/2001	1200	10.00	714	10	N/A	6.70		T. Levi
12/13/2001	2210	10.08	655	24	N/A	6.90		T. Levi
12/18/2001	1350	10.16	688	10	N/A	6.70		T. Levi
01/03/2002	1450	10.30	854	95	N/A	6.90		T. Levi
01/09/2002	0810	10.24	726	12	N/A	6.80		YBI/Sanders

ft-btoc: feet below top of casing
umhos/cm: micromhos per centimeter
mg/L: milligrams per liter
C: Celsius
S.U.: standard units
TOC: Top of Casing

Project: Immokalee Water & Sewer District Deep Injection (IW-1) Well Project

Surficial Monitor Well Water Quality Data
Northwest Pad Monitor Well

Date	Time (hours)	Depth to Water (ft-btoc)	Conductivity (umhos/cm)	Chloride (mg/L)	Temperature (degrees C)	pH (S.U.)	Remarks	Sampled By
08/30/2001	1030	N/A	487	5	N/A	N/A	Initial sampling before drilling begins.	YBI/Sanders
09/06/2001	1400	N/A	470	4	N/A	6.91		YBI/Sanders
09/13/2001	0830	N/A	760	7	N/A	6.87		YBI/Sanders
09/19/2001	1230	N/A	331	11	N/A	6.05		YBI/Sanders
09/26/2001	1320	6.00	1,003	103	N/A	6.10		T. Levi
10/02/2001	1225	5.88	406	9	N/A	6.10		T. Levi
10/11/2001	1545	6.00	430	10	N/A	6.00		M. Schilling
10/18/2001	1415	6.20	445	10	N/A	6.10		M. Schilling
10/25/2001	1640	6.40	428	9	N/A	6.10		M. Schilling
11/01/2001	1400	6.33	476	10	N/A	6.20		T. Levi
11/08/2001	2030	8.50	490	8	N/A	6.50		T. Levi
11/15/2001	1300	8.75	592	8	N/A	6.60		T. Levi
11/21/2001	1150	9.13	491	9	N/A	6.70		T. Levi
11/29/2001	1700	9.50	460	8	N/A	6.70		T. Levi
12/06/2001	1200	9.55	440	11	N/A	6.70		T. Levi
12/13/2001	2230	9.58	369	10	N/A	7.20		T. Levi
12/18/2001	1320	9.71	489	29	N/A	6.70		T. Levi
01/03/2002	1510	8.50	385	11	N/A	7.10		T. Levi
01/09/2002	0800	9.14	392	14	N/A	6.90		YBI/Sanders

ft-btoc:	feet below top of casing
umhos/cm:	micromhos per centimeter
mg/L:	milligrams per liter
C:	Celsius
S.U.:	standard units
TOC:	Top of Casing

EXHIBIT H-1
Pilot Hole Water Quality Data for IW-1

Date	Time	Depth	pH	Chlorides	Conductivity
10/26/2001	1:10 AM	2,030	12.4	410	6,320
10/28/2001	8:47 PM	2,060	12.4	575	5,530
10/28/2001	10:25 PM	2,090	12.3	750	5,250
10/28/2001	11:44 PM	2,120	12.1	1,100	6,360
10/29/2001	1:10 AM	2,150	11.6	1,825	7,690
10/29/2001	4:10 AM	2,180	10.4	6,250	26,600
10/29/2001	7:00 AM	2,210	9.1	10,250	44,900
10/30/2001	12:35 AM	2,240	8.6	11,850	44,500
10/30/2001	1:50 AM	2,270	8.4	7,575	47,000
10/30/2001	6:05 AM	2,300	8.6	8,100	49,700
10/30/2001	10:45 PM	2,330	8.4	7,875	46,800
10/31/2001	3:10 AM	2,360	8.4	8,800	50,400
10/31/2001	8:05 AM	2,390	8.4	8,475	50,600
10/31/2001	4:13 PM	2,420	8.9	10,225	38,800
11/01/2001	5:59 AM	2,450	8.8	7,050	39,000
11/01/2001	8:25 AM	2,480	8.6	5,000	30,800
11/01/2001	12:00 PM	2,510	8.4	5,550	37,400
11/01/2001	N/A	2,540	9.5	6,400	33,800
11/01/2001	8:25 PM	2,570	9.2	5,950	33,200
11/01/2001	10:00 PM	2,600	8.8	7,250	34,600
11/01/2001	11:45 PM	2,630	8.7	9,500	36,900
11/02/2001	2:00 AM	2,660	10.7	6,100	33,800
11/02/2001	4:20 AM	2,690	9.0	8,125	33,600
11/02/2001	7:00 AM	2,720	8.7	9,875	34,700
11/02/2001	9:00 AM	2,750	8.8	7,850	35,600
11/05/2001	12:00 AM	2,780	8.7	4,500	31,500
11/05/2001	2:50 AM	2,810	8.5	7,200	34,800
11/05/2001	5:15 AM	2,840	8.4	9,000	33,200
11/05/2001	7:00 AM	2,870	8.3	6,275	35,800
11/05/2001	8:30 AM	2,900	8.4	6,325	33,600
11/05/2001	10:30 AM	2,930	8.4	6,800	35,800

EXHIBIT H-1
Pilot Hole Water Quality Data for IW-1

Date	Time	Depth	pH	Chlorides	Conductivity
11/05/2001	11:15 AM	2,960	8.4	6,500	34,100
11/05/2001	12:00 PM	2,980	8.6	6,125	35,500
11/26/2001	5:15 PM	3,010	8.0	6,100	27,600
11/26/2001	7:35 PM	3,040	7.9	6,425	30,300
11/26/2001	10:20 PM	3,070	8.0	10,550	32,500
11/27/2001	1:00 AM	3,100	8.3	10,225	30,000
11/27/2001	4:00 AM	3,130	8.1	6,875	30,000
11/27/2001	5:30 AM	3,160	7.9	8,600	37,700
11/27/2001	7:20 AM	3,190	7.8	8,250	39,800
11/27/2001	12:30 PM	3,220	7.9	9,750	41,300
11/27/2001	5:45 PM	3,250	7.8	9,475	40,400
11/28/2001	1:15 AM	3,280	8.1	9,675	40,600
11/28/2001	5:40 AM	3,300	7.8	9,550	40,900
11/28/2001	11:00 AM	3,330	8.0	9,900	40,500
11/28/2001	11:45 AM	3,350	8.0	9,850	41,000

APPENDIX I

Geophysical Logs

PROVIDED IN VOLUME 2

APPENDIX J

Video Survey

PROVIDED IN VOLUME 2

Immokalee Water & Sewer District IW-1
Video Survey Summary
12/8-9/2001

Depth in Feet below pad level		Comments
From	To	
0	100	Cloudy water within this interval. Casing joint at 31, 72 feet bpl.
100	200	Casing joint at 111, 152, 193 feet bpl.
200	300	Casing joint at 233, 275 feet bpl.
300	400	Casing joint at 317, 358, 399 feet bpl.
400	500	Casing joint at 440, 482 feet bpl.
500	600	Casing joint at 522, 561, feet bpl.
600	700	Casing joint at 602, 614, 681 feet bpl.
700	800	Casing joint at 722, 763 feet bpl.
800	900	Casing joint at 803, 843, 884 feet bpl.
900	1000	Casing joint at 925, 965 feet bpl.
1000	1100	Casing joint at 1,006, 1,046, 1,087 feet bpl.
1100	1200	Casing joint at 1,128, 1,169 feet bpl.
1200	1300	Casing joint at 1,210, 1,251, 1,290 feet bpl.
1300	1400	Casing joint at 1,330, 1,368 feet bpl.
1400	1500	Casing joint at 1,408, 1,450, 1,488 feet bpl.
1500	1600	Casing joint at 1,529, 1,568 feet bpl.
1600	1700	Casing joint at 1,609, 1,648, 1,686 feet bpl.
1700	1800	Casing joint at 1,725, 1,766 feet bpl.
1800	1900	Casing joint at 1,807, 1,847, 1,888 feet bpl.
1900	2000	Casing joint at 1,930, 1,971 feet bpl.
2000	2100	Casing joint at 2,012, 2,054, 2,095 feet bpl.
2100	2200	Casing joint at 2,136, 2,175 feet bpl.
2200	2300	Casing joint at 2,216, 2,255, 2,295 feet bpl.
2300	2400	Casing joint at 2,336, 2,376 feet bpl.
2400	2500	Casing joint at 2,417, 2,458, 2,500 feet bpl.
2500	2600	Casing joint at 2,541, 2,581 feet bpl.
2600	2700	Casing joint at 2,622, 2,663 feet bpl.
2700	2800	Casing joint at 2,704, 2,745, 2,787 feet bpl.
2800	2900	Casing joint at 2,828, 2,869 feet bpl.
2900	2983	Casing joint at 2,910, 2,950 feet bpl. Casing bottom at 2,983 feet bpl
2983	2991	Cement from casing bottom to 2,991 feet bpl.
2991	3350	Porous limestone. Total depth at 3,350 feet bpl.

APPENDIX K

Coring Descriptions

Immokalee Waste Water Treatment Plant
Immokalee Water and Sewer District
Deep Injection Well (IW-1)
Lithologic Description

Core #:	1
Date Recovered:	01/26/2001
Interval Cored:	2,054 to 2,066 feet bpl
Amount Recovered:	4 feet
Recovery Percentage:	33%

Depth Interval (feet bpl)		
From	To	Observer's Description
2,054.0	2,055.8	
2,055.8	2,058.0	

feet bpl = feet below pad level

Immokalee Waste Water Treatment Plant
Immokalee Water and Sewer District
Deep Injection Well (IW-1)
Lithologic Description

Core #:	2
Date Recovered:	10/30/2001
Interval Cored:	2,230 to 2,422 feet bpl
Amount Recovered:	4.85
Recovery Percentage:	40%

Depth Interval (feet bpl)		
From	To	Observer's Description
2,230.0	2,232.3	
2,232.3	2,234.9	

feet bpl = feet below pad level

Immokalee Waste Water Treatment Plant
Immokalee Water and Sewer District
Deep Injection Well (IW-1)
Lithologic Description

Core #: 3

Date Recovered: 10/31/2001

Interval Cored: 2,306 to 2,318 feet bpl

Amount Recovered: 10.4 feet

Recovery Percentage: 87%

Depth Interval (feet bpl) From	To	Observer's Description
2,306.0	2,310.2	Limestone, very pale orange (10 YR 8/2), fine to medium sand grained, high interparticle and vuggy porosity, poor to moderately consolidated
2,310.2	2,312.3	Micritic Limestone, yellowish gray (5 Y 7/2), low vuggy porosity, well consolidated
2,312.3	2,315.0	Limestone, very pale orange (10 YR 8/2), fine sand grained, moderate interparticle porosity, poorly consolidated
2,315.0	2,316.4	Limestone, grayish orange (5 Y 8/4), medium sand grained with shell gragments up to 5 millimeters in diameter, high interparticle and vuggy porosity, poorly consolidated

feet bpl = feet below pad level

Immokalee Waste Water Treatment Plant
Immokalee Water and Sewer District
Deep Injection Well (IW-1)
Lithologic Description

Core #: 4

Date Recovered: 11/01/2001

Interval Cored: 2,402 to 2,414 feet bpl

Amount Recovered: 10.5 feet

Recovery Percentage: 88%

Depth Interval (feet bpl) From	To	Observer's Description
2,402.0	2,407.5	Limestone, very pale orange (10 YR 8/2), fine sand grained with stringers up to 5 millimeters thick of medium sand, moderate interparticle porosity, poor to moderately consolidated
2,407.5	2,407.7	
2,407.7	2,408.2	
2,408.2	2,409.2	
2,409.2	2,409.7	
2,409.7	2,411.0	
2,411.0	2,412.5	Limestone, pinkish gray (5 YR 8/1), fine to medium sand grained, moderate interparticle porosity, well consolidated

feet bpl = feet below pad level

Immokalee Waste Water Treatment Plant
Immokalee Water and Sewer District
Deep Injection Well (IW-1)
Lithologic Description

Core #: 5

Date Recovered: 11/02/2001

Interval Cored: 2,760 to 2,772 feet bpl

Amount Recovered: 9.3 feet

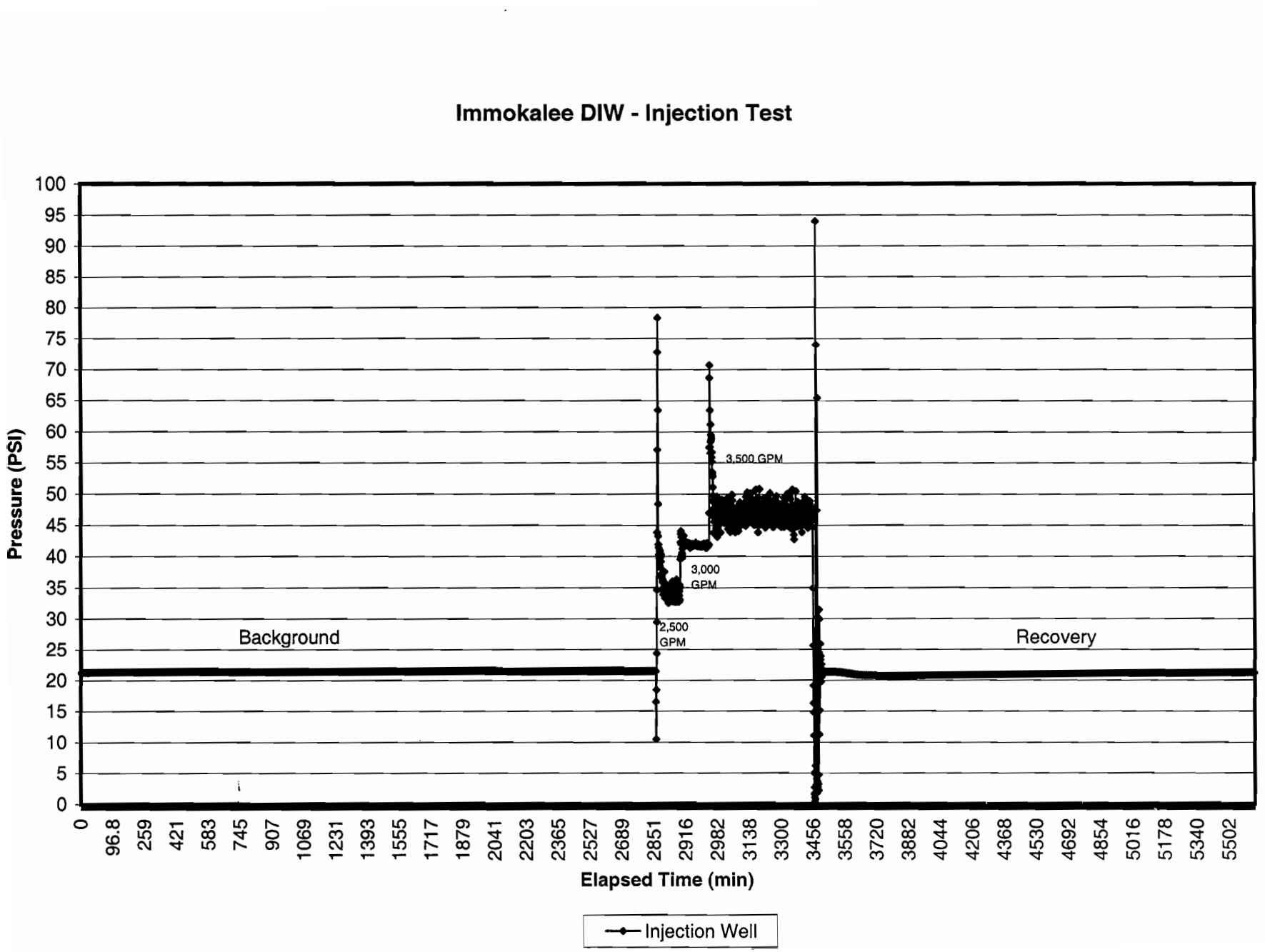
Recovery Percentage: 78%

Depth Interval (feet bpl) From	To	Observer's Description
2,760.0	2,760.5	Limestone, grayish orange (10 YR 7/4), fine to medium sand grained, moderate to high interparticle porosity, well consolidated
2,760.5	2,767.0	Limestone, olive gray (5 Y 4/1) with 1 millimeter wide black stringers containing what appears to be organic material, fine sand grained with abundant 2 millimeter diameter foraminifera, low interparticle and intraparticle porosity, well consolidated
2,767.0	2,769.3	Limestone, grayish orange (10 YR 7/4), fine to medium sand grained, low to moderate interparticle porosity, well consolidated

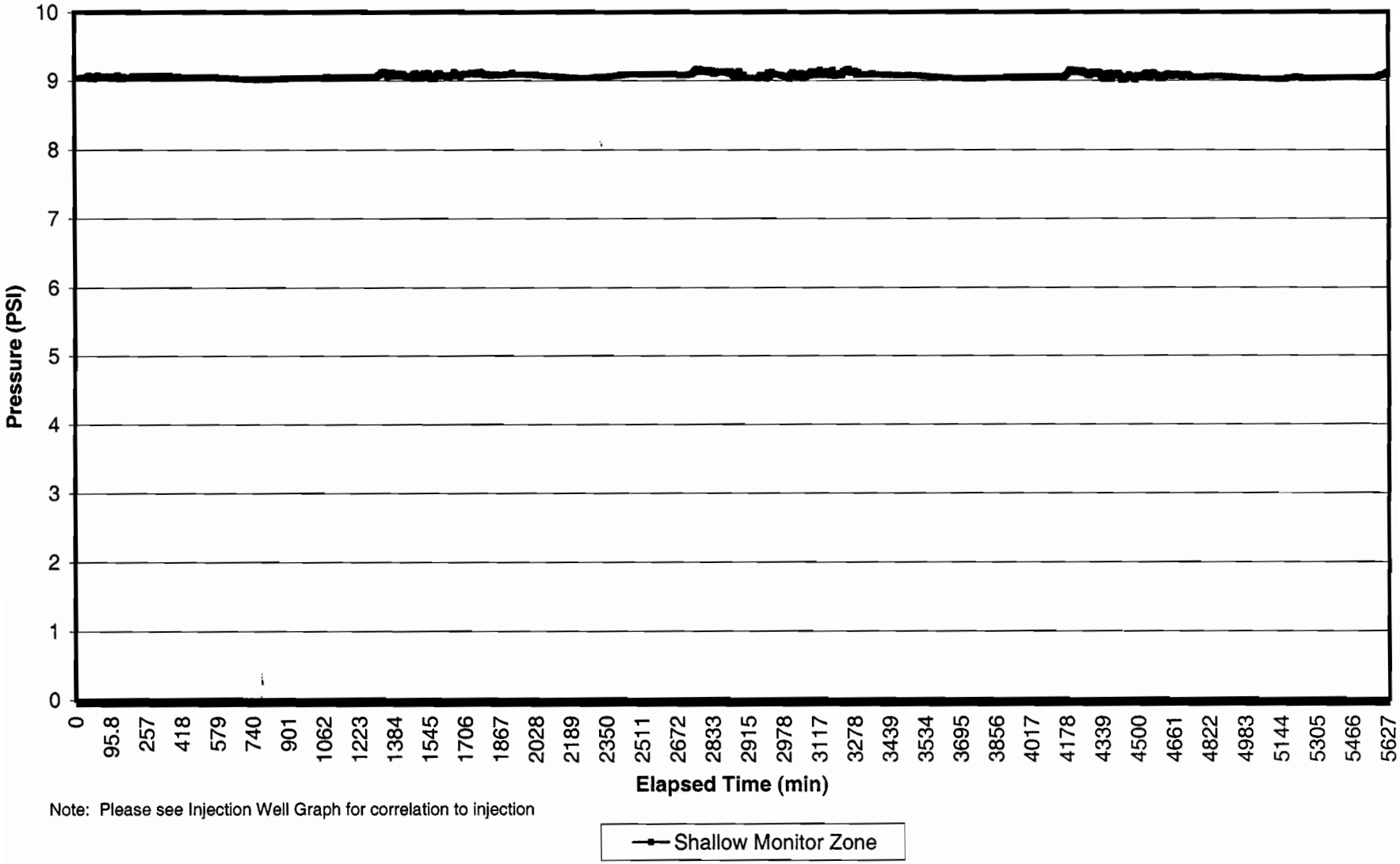
feet bpl = feet below pad level

APPENDIX L

Injection Test Graphs


Immokalee DIW - Injection Test
Pressure (PSI)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
0
96.8
259
421
583
745
907
1069
1231
1393
1555
1717
1879
2041
2203
2365
2527
2689
2851
2916
2982
3138
3300
3456
3558
3720
3882
4044
4206
4368
4530
4692
4854
5016
5178
5340
5502
Elapsed Time (min)
3,500 GPM
3,000 GPM
2,500 GPM
Background
Recovery
Injection Well

Immokalee DIW - Injection Test

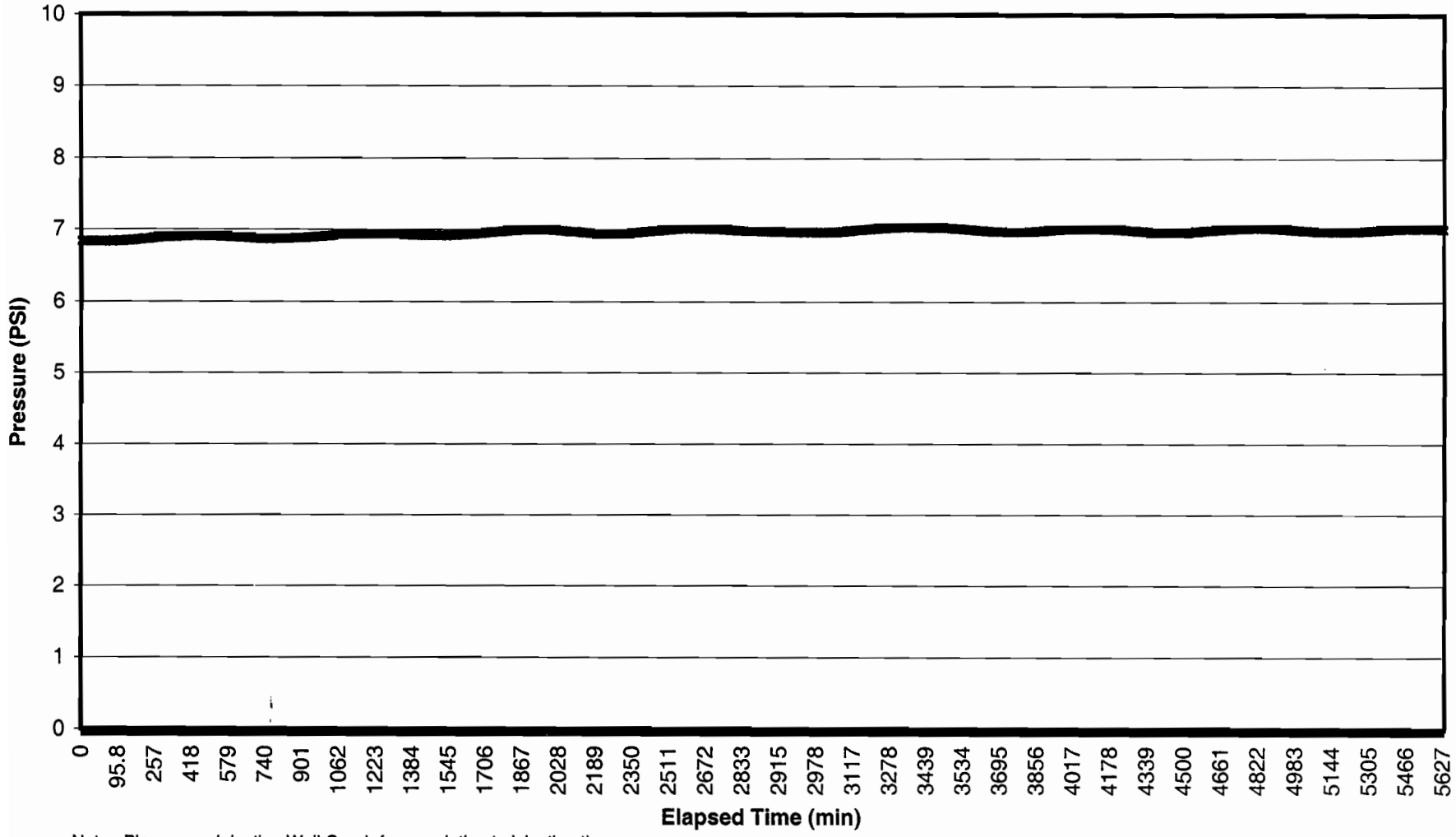


Note: Please see Injection Well Graph for correlation to injection

Immokalee DIW - Injection Test

Note: Please see Injection Well Graph for correlation to injection times

Immokalee DIW - Injection Test



Note: Please see Injection Well Graph for correlation to injection times

APPENDIX M

Primary and Secondary Drinking Water Standards

Youngquist Brothers, Inc.

TRANSMITTAL
No. 00158

15465 Pine Ridge Road
Fort Myers, Fl 33908

Phone: 941-489-4444
Fax: 941-489-4545

PROJECT: Immokalee Water & Sewer

DATE: 2/27/02

TO: CH2M Hill
Hillsbroro Executive Center North
800 Fairway Drive,
Deerfield Beach, Fl 33441

REF: Submittals

ATTN: Sean Skehan 954-426-4008

WE ARE SENDING:	SUBMITTED FOR:	ACTION TAKEN:
☑ Shop Drawings	☐ Approval	☐ Approved as Submitted
☐ Letter	☐ Your Use	☐ Approved as Noted
☐ Prints	☐ As Requested	☐ Returned After Loan
☐ Change Order	☐ Review and Comment	☐ Resubmit
☐ Plans		☑ Submit
☐ Samples	**SENT VIA:**	☐ Returned
☐ Specifications	☑ Attached	☐ Returned for Corrections
☑ Other: Made from Distributions	☐ Separate Cover Via: Mail	☐ Due Date:

ITEM	PACKAGE	SUBMITTAL	DRAWING	REV.	ITEM NO.	COPIES	DATE	DESCRIPTION	STATUS
SUB	02678	02678-01-A	02678/3.1			1	2/27/02	Dwg: 02678/3.1 Title: Water Quality Analizise I/W (P/S)	NEW

Remarks:

URGENT

CC: DAVE XANIER (8)

Signed:
Mark Forish

Expedition®

Submittal Data
FROM

Youngquist Brothers, Inc.

15465 Pine Ridge Rd.
Ft. Myers, FL. 33908
941-489-4444 Fax: 941-489-4545

Project

Immokalee Water Sewer District
Deep Injection Well WWTP Improvements

I have reviewed this submittal for general conformance with the design concepts and contract documents. Generally no conflict with materials or dimensions will arise from the approval of this shop drawing submittal.

Number of Copies: 1

Submittal Number: 02678-01-A

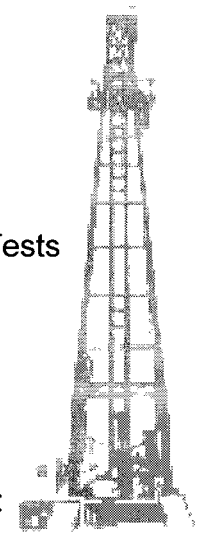
Specification Section Number: 02678

Item Submitted: I/W Primary/Secondary Tests

New Submittal: ☒ Resubmitted: ☐

Subcontractor:

Youngquist Brothers, Inc. Representative:



Mark Forish

Transmittal Date: February 27, 2002

Approved
Approved with changes
Rejected, Revise & Resubmit
Not Reviewed

By: _____

Firm: _____

Date: _____

Client Project: Immokalee
Lab Project: N0201208
Report Date: 02/13/02

Sanders Laboratories
Environmental Testing Services

YOUNGQUIST BROTHERS, INC.
Has Reviewed this Shop Drawing/Submittal
YBI/Section No. # 02678-01-A
Transmittal No. # 159 Date: 2/27/02
Signature

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

Lab ID	Sample Description	Sample Source	Sample Date/Time
N0201208-01	primary inorganics-iw-1 grab	Ground Water	1/9/02 10:20

Analysis	Method	Results	Qual	Detection Limit	Units	AnalysisDate/Time	Analyst	Cert ID
Antimony	200.7	< 0.0022		0.0022	mg/L	2/8/02 12:31	JW	E84380
Arsenic	200.7	0.0036		0.0028	mg/L	2/8/02 12:31	JW	E84380
Barium	200.7	< 0.0001		0.0001	mg/L	2/8/02 12:31	JW	E84380
Beryllium	200.7	0.0021		0.0008	mg/L	2/8/02 12:31	JW	E84380
Cadmium	200.7	< 0.0002		0.0002	mg/L	2/8/02 12:31	JW	E84380
Chromium	200.7	< 0.001		0.001	mg/L	2/8/02 12:31	JW	E84380
Cyanide, Total	4500CNE	< 0.005		0.005	mg/L	1/15/02 17:30	SA	E84129
Fluoride	340.2	0.8		0.1	mg/L	1/14/02 15:15	EC	E84380
Lead	200.7	< 0.001		0.001	mg/L	2/8/02 12:31	JW	E84380
Mercury	245.1	0.012		0.001	mg/L	1/22/02 10:42	DW	E84380
Nickel	200.7	< 0.001		0.001	mg/L	2/8/02 12:31	JW	E84380
Nitrate-N	353.2	< 0.05		0.05	mg/L	1/10/02 19:10	CC	E84380
Nitrite-N	353.2	< 0.05		0.05	mg/L	1/10/02 15:36	CC	E84380
Selenium	200.7	< 0.0016		0.0016	mg/L	2/8/02 12:31	JW	E84380
Sodium	200.7	12000		70.0	mg/L	2/13/02 15:00	LH	E84380
Thallium	200.7	0.0039		0.0035	mg/L	2/8/02 12:31	JW	E84380

Lab ID	Sample Description	Sample Source	Sample Date/Time

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Client Project: Immokalee
Lab Project: N0201208
Report Date: 02/13/02

Lab ID	Sample Description	Sample Source	Sample Date/Time
N0201208-02	secondary inorganics-iw-1 grab	Ground Water	1/9/02 10:20

Analysis	Method	Results	Qual	Detection Limit	Units	AnalysisDate/Time	Analyst	Cert ID
Aluminum	200.7	< 0.020		0.020	mg/L	1/22/02 14:11	DW	E84380
Chloride	4500Cl-B	20000		1000	mg/L	1/11/02 12:20	EC	E84380
Color	2120B	90		2	PtCo units	1/10/02 15:00	DA	E84380
Copper	200.7	< 0.0012		0.0012	mg/L	1/22/02 14:11	DW	E84380
Fluoride	340.2	0.8		0.1	mg/L	1/14/02 15:15	EC	E84380
Foaming Agents (MBAS)	5540C	< 0.05		0.05	mg/L	1/10/02 15:20	SA	E84129
Iron	200.7	1.76		0.030	mg/L	1/20/02 12:35	DW	E84380
Manganese	200.7	0.0240		0.0001	mg/L	1/22/02 14:11	DW	E84380
Odor	140.1	< 1		1	TON	1/9/02 15:30	EW	E84380
pH	150.1	7.44		0.01	pH units	1/9/02 15:00	DA	E84380
Silver	200.7	< 0.001		0.001	mg/L	1/22/02 14:11	DW	E84380
Sulfate	375.4	3010		100	mg/L	1/15/02 9:25	EC	E84380
Total Dissolved Solids	160.1	36400	Q	5	mg/L	1/16/02 19:35	DW	E84380
Zinc	200.7	0.002		0.002	mg/L	1/22/02 14:11	DW	E84380

Lab ID	Sample Description	Sample Source	Sample Date/Time
N0201208-03	trihalomethanes-iw-1 grab	Ground Water	1/9/02 10:20

Analysis	Method	Results	Qual	Detection Limit	Units	AnalysisDate/Time	Analyst	Cert ID
Bromodichloromethane	524.2	< 0.36000		0.36000	ug/L	1/14/02 14:27	TA	E83012
Bromoform	524.2	< 0.31000		0.31000	ug/L	1/14/02 14:27	TA	E83012
Chloroform	524.2	< 0.16000		0.16000	ug/L	1/14/02 14:27	TA	E83012
Dibromochloromethane	524.2	< 0.27000		0.27000	ug/L	1/14/02 14:27	TA	E83012

Client Project: Immokalee
Lab Project: N0201208
Report Date: 02/13/02

Lab ID	Sample Description	Sample Source	Sample Date/Time
N0201208-03	trihalomethanes-iw-1 grab	Ground Water	1/9/02 10:20

Analysis	Method	Results	Qual	Detection Limit	Units	AnalysisDate/Time	Analyst	Cert ID
Total THM	524.2	< 0.00036		0.36000	mg/L	1/14/02 14:27	TA	E83012

Lab ID	Sample Description	Sample Source	Sample Date/Time
N0201208-04	radiochemicals-iw-1 grab	Ground Water	1/9/02 10:20

Analysis	Method	Results	Qual	Detection Limit	Units	AnalysisDate/Time	Analyst	Cert ID
Gross Alpha	900.0	30.4*		+/-44.9	pCi/L	1/15/02 0:00	FRC	E83033
Radium 226	903.1	17.2		+/- 0.6	pCi/L	1/21/02 0:00	FRC	E83033
Radium 228	Ra-05	1.9		+/- 0.8	pCi/L	1/21/02 0:00	FRC	E83033

Lab ID	Sample Description	Sample Source	Sample Date/Time
N0201208-05	volatile organics iw-1 grab	Ground Water	1/9/02 10:20

Analysis	Method	Results	Qual	Detection Limit	Units	AnalysisDate/Time	Analyst	Cert ID
1,1,1-Trichloroethane	524.2	< 0.21000		0.21000	ug/L	1/14/02 14:27	TA	E83012
1,1,2-Trichloroethane	524.2	< 0.23000		0.23000	ug/L	1/14/02 14:27	TA	E83012
1,1-Dichloroethene	524.2	< 0.02000		0.02000	ug/L	1/14/02 14:27	TA	E83012
1,2,4-Trichlorobenzene	524.2	< 0.22000		0.22000	ug/L	1/14/02 14:27	TA	E83012
1,2-Dichlorobenzene	524.2	< 0.05000		0.05000	ug/L	1/14/02 14:27	TA	E83012
1,2-Dichloroethane	524.2	< 0.02000		0.02000	ug/L	1/14/02 14:27	TA	E83012
1,2-Dichloropropane	524.2	< 0.33000		0.33000	ug/L	1/14/02 14:27	TA	E83012
1,4-Dichlorobenzene	524.2	< 0.02000		0.02000	ug/L	1/14/02 14:27	TA	E83012
zene	524.2	< 0.05000		0.05000	ug/L	1/14/02 14:27	TA	E83012
Carbon Tetrachloride	524.2	< 0.29000		0.29000	ug/L	1/14/02 14:27	TA	E83012
Chlorobenzene	524.2	< 0.23000		0.23000	ug/L	1/14/02 14:27	TA	E83012

Client Project: Immokalee
Lab Project: N0201208
Report Date: 02/13/02

Lab ID	Sample Description	Sample Source	Sample Date/Time
N0201208-05	volatile organics iw-1 grab	Ground Water	1/9/02 10:20

Analysis	Method	Results	Qual	Detection Limit	Units	AnalysisDate/Time	Analyst	Cert ID
Cis-1,2-Dichloroethene	524.2	< 0.03000		0.03000	ug/L	1/14/02 14:27	TA	E83012
Ethylbenzene	524.2	< 0.47000		0.47000	ug/L	1/14/02 14:27	TA	E83012
Methylene Chloride	524.2	< 0.31000		0.31000	ug/L	1/14/02 14:27	TA	E83012
Styrene	524.2	< 0.47000		0.47000	ug/L	1/14/02 14:27	TA	E83012
Tetrachloroethene	524.2	< 0.21000		0.21000	ug/L	1/14/02 14:27	TA	E83012
Toluene	524.2	< 0.41000		0.41000	ug/L	1/14/02 14:27	TA	E83012
..ns-1,2-Dichloroethene	524.2	< 0.12000		0.12000	ug/L	1/14/02 14:27	TA	E83012
Trichloroethene	524.2	< 0.02000		0.02000	ug/L	1/14/02 14:27	TA	E83012
Vinyl Chloride	524.2	< 0.29000		0.29000	ug/L	1/14/02 14:27	TA	E83012
Xylenes	524.2	< 0.24000		0.24000	ug/L	1/14/02 14:27	TA	E83012

Lab ID	Sample Description	Sample Source	Sample Date/Time
N0201208-06	pesticides and pcbs iw-1 grab	Ground Water	1/9/02 10:20

Analysis	Method	Results	Qual	Detection Limit	Units	AnalysisDate/Time	Analyst	Cert ID
1,2-Dibromo-3-chloropropane	504.1	< 0.02000		0.02000	ug/L	1/24/02 14:20	MO	E83012
2,4,5-TP (Silvex)	515.1	< 0.200		0.200	ug/L	1/18/02 18:52	TA	E83012
2,4-D	515.1	< 0.100		0.100	ug/L	1/18/02 18:52	TA	E83012
Alachlor	507	< 0.0625		0.0625	ug/L	1/15/02 20:53	TA	E83012
Benzo(a)pyrene	525.2	< 0.0400		0.0400	ug/L	1/18/02 0:28	TA	E83012
..tachlor	507	< 0.500		0.500	ug/L	1/15/02 20:53	TA	E83012
Carbofuran	531.1	< 0.900		0.900	ug/L	1/16/02 10:59	TA	E83012
Chlordane	508	< 0.500		0.500	ug/L	1/15/02 20:53	TA	E83012

Client Project: Immokalee
Lab Project: N0201208
Report Date: 02/13/02

Lab ID	Sample Description	Sample Source	Sample Date/Time
N0201208-06	pesticides and pcbs iw-1 grab	Ground Water	1/9/02 10:20

Analysis	Method	Results	Qual	Detection Limit	Units	AnalysisDate/Time	Analyst	Cert ID
Dalapon	515.1	< 1.00		1.00	ug/L	1/18/02 18:52	TA	E83012
Di(2-ethylhexyl)adipate	525.2	< 0.600		0.600	ug/L	1/18/02 0:28	TA	E83012
Di(2-ethylhexyl)phthalate	525.2	< 1.32		1.32	ug/L	1/18/02 0:28	TA	E83012
Dinoseb	515.1	< 0.125		0.125	ug/L	1/18/02 18:52	TA	E83012
Diquat	549.1	< 0.960		0.960	ug/L	1/18/02 4:26	TA	E83012
Endothall	548.1	< 4.17		4.17	ug/L	1/16/02 8:33	TA	E83012
drin	508	< 0.0100		0.0100	ug/L	1/15/02 20:53	TA	E83012
Ethylene Dibromide	504.1	< 0.01000		0.01000	ug/L	1/24/02 14:20	MO	E83012
Glyphosate	547	< 2.40		2.40	ug/L	1/22/02 13:26	TA	E83012
Heptachlor	508	< 0.0540		0.0540	ug/L	1/15/02 20:53	TA	E83012
Heptachlor Epoxide	508	< 0.0245		0.0245	ug/L	1/15/02 20:53	TA	E83012
Hexachlorobenzene	508	< 0.100		0.100	ug/L	1/15/02 20:53	TA	E83012
Hexachlorocyclopentadiene	508	< 0.100		0.100	ug/L	1/15/02 20:53	TA	E83012
Lindane	508	< 0.0240		0.0240	ug/L	1/15/02 20:53	TA	E83012
Methoxychlor	508	< 0.250		0.250	ug/L	1/15/02 20:53	TA	E83012
Metolachlor	507	< 0.500		0.500	ug/L	1/15/02 20:53	TA	E83012
Metribuzin	507	< 0.120		0.120	ug/L	1/15/02 20:53	TA	E83012
Oxamyl (Vydate)	531.1	< 1.13		1.13	ug/L	1/16/02 10:59	TA	E83012
PCB	508	< 0.250		0.250	ug/L	1/15/02 20:53	TA	E83012
tachlorophenol	515.1	< 0.0400		0.0400	ug/L	1/18/02 18:52	TA	E83012
Picloram	515.1	< 0.250		0.250	ug/L	1/18/02 18:52	TA	E83012

Client Project: Immokalee
Lab Project: N0201208
Report Date: 02/13/02

Lab ID	Sample Description	Sample Source	Sample Date/Time
N0201208-06	pesticides and pcbs iw-1 grab	Ground Water	1/9/02 10:20

Analysis	Method	Results	Qual	Detection Limit	Units	AnalysisDate/Time	Analyst	Cert ID
Toxaphene	508	< 0.500		0.500	ug/L	1/15/02 20:53	TA	E83012

Lab ID	Sample Description	Sample Source	Sample Date/Time
N0201208-07	unregulated group I-iw-1 grab	Ground Water	1/9/02 10:20

Analysis	Method	Results	Qual	Detection Limit	Units	AnalysisDate/Time	Analyst	Cert ID
3-Hydroxycarbofuran	531.1	< 1.13		1.13	ug/L	1/16/02 10:59	TA	E83012
Aldicarb	531.1	< 1.04		1.04	ug/L	1/16/02 10:59	TA	E83012
Aldicarb Sulfone	531.1	< 0.647		0.647	ug/L	1/16/02 10:59	TA	E83012
Aldicarb Sulfoxide	531.1	< 0.850		0.850	ug/L	1/16/02 10:59	TA	E83012
Aldrin	508	< 0.0525		0.0525	ug/L	1/15/02 20:53	TA	E83012
Atrazine	507	< 0.625		0.625	ug/L	1/15/02 20:53	TA	E83012
Carbaryl	531.1	< 0.599		0.599	ug/L	1/16/02 10:59	TA	E83012
Dicamba	515.1	< 0.0250		0.0250	ug/L	1/18/02 18:52	TA	E83012
Dieldrin	508	< 0.02700		0.02700	ug/L	1/15/02 20:53	TA	E83012
Methomyl	531.1	< 0.254		0.254	ug/L	1/16/02 10:59	TA	E83012
Propachlor	508	< 0.380		0.380	ug/L	1/15/02 20:53	TA	E83012
Simazine	507	< 0.176		0.176	ug/L	1/15/02 20:53	TA	E83012

Lab ID	Sample Description	Sample Source	Sample Date/Time
N0201208-08	unregulated group II-iw-1 grab	Ground Water	1/9/02 10:20

Analysis	Method	Results	Qual	Detection Limit	Units	AnalysisDate/Time	Analyst	Cert ID
1,1,1,2-Tetrachloroethane	524.2	< 0.13000		0.13000	ug/L	1/14/02 14:27	TA	E83012
1,1,2,2-Tetrachloroethane	524.2	< 0.33000		0.33000	ug/L	1/14/02 14:27	TA	E83012

Client Project: Immokalee
Lab Project: N0201208
Report Date: 02/13/02

Lab ID	Sample Description	Sample Source	Sample Date/Time
N0201208-08	unregulated group II-iw-1 grab	Ground Water	1/9/02 10:20

Analysis	Method	Results	Qual	Detection Limit	Units	AnalysisDate/Time	Analyst	Cert ID
1,1-Dichloroethane	524.2	< 0.10000		0.10000	ug/L	1/14/02 14:27	TA	E83012
1,1-Dichloropropene	524.2	< 0.06000		0.06000	ug/L	1/14/02 14:27	TA	E83012
1,2,3-Trichloropropane	524.2	< 0.39000		0.39000	ug/L	1/14/02 14:27	TA	E83012
1,3-Dichlorobenzene	524.2	< 0.20000		0.20000	ug/L	1/14/02 14:27	TA	E83012
1,3-Dichloropropane	524.2	< 0.05000		0.05000	ug/L	1/14/02 14:27	TA	E83012
2,2-Dichloropropane	524.2	< 0.38000		0.38000	ug/L	1/14/02 14:27	TA	E83012
Chlorotoluene	524.2	< 0.33000		0.33000	ug/L	1/14/02 14:27	TA	E83012
4-Chlorotoluene	524.2	< 0.29000		0.29000	ug/L	1/14/02 14:27	TA	E83012
Bromobenzene	524.2	< 0.05000		0.05000	ug/L	1/14/02 14:27	TA	E83012
Bromomethane	524.2	< 0.29000		0.29000	ug/L	1/14/02 14:27	TA	E83012
Chloroethane	524.2	< 0.29000		0.29000	ug/L	1/14/02 14:27	TA	E83012
Chloromethane	524.2	< 0.35000		0.35000	ug/L	1/14/02 14:27	TA	E83012
cis-1,3-Dichloropropene	524.2	< 0.21000		0.21000	ug/L	1/14/02 14:27	TA	E83012
Dibromomethane	524.2	< 0.03000		0.03000	ug/L	1/14/02 14:27	TA	E83012
Dichlorodiflouromethane	524.2	< 0.50000		0.50000	ug/L	1/14/02 14:27	TA	E83012
Methyl-Tert-Butyl -Ether	524.2	< 1.0000		1.0000	ug/L	1/14/02 14:27	TA	E83012
trans-1,3-Dichloropropene	524.2	< 0.50000		0.50000	ug/L	1/14/02 14:27	TA	E83012
Trichloroflouromethane	524.2	< 0.28000		0.28000	ug/L	1/14/02 14:27	TA	E83012

Lab ID	Sample Description	Sample Source	Sample Date/Time
N0201208-09	unregulated group III-iw-1 grab	Ground Water	1/9/02 10:20

Analysis	Method	Results	Qual	Detection Limit	Units	AnalysisDate/Time	Analyst	Cert ID

Client Project: Immokalee
Lab Project: N0201208
Report Date: 02/13/02

Lab ID	Sample Description	Sample Source	Sample Date/Time
N0201208-09	unregulated group III-iw-1 grab	Ground Water	1/9/02 10:20

Analysis	Method	Results	Qual	Detection Limit	Units	AnalysisDate/Time	Analyst	Cert ID
2,4,6-Trichlorophenol	625	< 4.46		4.46	ug/L	1/17/02 15:41	TA	E83012
2,4-Dinitrotoluene	625	< 4.78		4.78	ug/L	1/17/02 15:41	TA	E83012
2-Chlorophenol	625	< 4.10		4.10	ug/L	1/17/02 15:41	TA	E83012
2-Methyl-4,6-Dinitrophenol	625	< 4.00		4.00	ug/L	1/17/02 15:41	TA	E83012
Anthracene	625	< 5.00		5.00	ug/L	1/17/02 15:41	TA	E83012
Butylbenzylphthalate	625	< 2.55		2.55	ug/L	1/17/02 15:41	TA	E83012
thylphthalate	625	< 4.96		4.96	ug/L	1/17/02 15:41	TA	E83012
Dimethylphthalate	625	< 5.00		5.00	ug/L	1/17/02 15:41	TA	E83012
Di-n-butylphthalate	625	< 4.01		4.01	ug/L	1/17/02 15:41	TA	E83012
Di-n-octylphthalate	625	< 2.43		2.43	ug/L	1/17/02 15:41	TA	E83012
Isophorone	625	< 7.26		7.26	ug/L	1/17/02 15:41	TA	E83012
Naphthalene	625	< 5.00		5.00	ug/L	1/17/02 15:41	TA	E83012
Phenol	625	< 3.01		3.01	ug/L	1/17/02 15:41	TA	E83012

Lab ID	Sample Description	Sample Source	Sample Date/Time
N0201208-10	iw-1 grab	Ground Water	1/9/02 10:20

Analysis	Method	Results	Qual	Detection Limit	Units	AnalysisDate/Time	Analyst	Cert ID
Phenanthrene	625	< 3.85		3.85	ug/L	1/17/02 15:41	TA	E83012

Lab ID	Sample Description	Sample Source	Sample Date/Time
N0201208-11	iw-1 grab	Ground Water	1/9/02 10:20

Analysis	Method	Results	Qual	Detection Limit	Units	AnalysisDate/Time	Analyst	Cert ID
Ammonia-N	350.3	< 0.05		0.05	mg/L	1/11/02 10:10	MA	E84380

Client Project: Immokalee
Lab Project: N0201208
Report Date: 02/13/02

Lab ID	Sample Description	Sample Source	Sample Date/Time
N0201208-11	iw-1 grab	Drinking Water	1/9/02 10:20

Analysis	Method	Results	Qual	Detection Limit	Units	AnalysisDate/Time	Analyst	Cert ID
Biochemical Oxygen Demand (5)	405.1	< 2		2	mg/L	1/11/02 8:45	DA	E84380
Chemical Oxygen Demand	410.4	2680		250	mg/L	1/16/02 12:00	DA	E84380
Nitrate+Nitrite-N	353.2	< 0.05		0.05	mg/L	1/10/02 19:10	CC	E84380
Nitrogen, Organic	calc.	0.20		0.05	mg/L	1/11/02 11:29	CC	E84380
Nitrogen, Total Kjeldahl	351.2	0.20		0.05	mg/L	1/11/02 11:29	CC	E84380
Phosphorus, Total	365.2	0.016		0.010	mg/L	1/15/02 12:00	MA	E84380
cific Conductance	DEPSOP	68300		0.1	umhos/cm	1/9/02 10:20	JC	E84380
Total Coliform	9222B	< 1		1	col/100ml	1/9/02 13:50	CR	E85457
Water Temperature	DEPSOP	33.4		0.1	C	1/9/02 10:20	JC	E84380

Approved by:

Craig Toler/Lab Director
Laura Sullivan/QA Officer
Kathrine Bartkiewicz/Lab Supervisor

Comments:

Data Qualifier Code: Q- sample held beyond acceptable holding time.
* Sample had an elevated detection limit and/or counting error due to low volume of sample used. The sample had a high TDS, which increased counting time to help reduce the detection

TABLE
PRIMARY DRINKING WATER STANDARDS
Analytical Results for Immokalee- IW1

Parameter	Units	Maximum Contaminant Level	Results	D.L.	Method	Cert ID
Inorganic Compounds						
Antimony	mg/L	0.006	<0.0022	0.0022	200.7	E84380
Arsenic	mg/L	0.05	0.0036	0.0028	200.7	E84380
Asbestos	MFL	7	n/a	n/a	n/a	E84380
Barium	mg/L	2	<0.0001	0.000	200.7	E84380
Beryllium	mg/L	0.004	0.0021	0.0008	200.7	E84380
Cadmium	mg/L	0.005	<0.0002	0.0002	200.7	E84380
Chromium	mg/L	0.1	<0.001	0.001	200.7	E84380
Cyanide	mg/L	0.2	<0.005	0.005	4500CNE	E84129
Fluoride	mg/L	4.0	0.8	0.1	340.2	E84380
Lead	mg/L	0.015	<0.001	0.001	200.7	E84380
Mercury	mg/L	0.002	0.012	0.001	245.1	E84380
Nickel	mg/L	0.1	<0.001	0.001	200.7	E84380
Nitrate	mg/L as N	10	<0.05	0.05	353.2	E84380
Nitrite	mg/L as N	1	<0.05	0.05	353.2	E84380
Total Nitrate & Nitrite	mg/L as N	10	<0.05	0.05	353.2	E84380
Selenium	mg/L	0.05	<0.0016	0.0016	200.7	E84380
Sodium	mg/L	160	12000	70	200.7	E84380
Thallium	mg/L	0.002	0.0039	0.0035	200.7	E84380
Pesticides & Polychlorinated Compounds						
2,4,5-TP (Silvex)	ug/L	0.05	<0.200	0.2	515.1	E83012
2,4-D	ug/L	0.07	<0.100	0.1	515.1	E83012
Alachlor	ug/L	0.002	<0.0625	0.1	525.2	E83012
Atrazine	ug/L	0.003	<0.625	0.6	525.2	E83012
Benzo (a) pyrene	ug/L	0.0002	<0.0400	0.04	525.2	E83012
Carbofuran	ug/L	0.04	<0.900	0.9	531.1	E83012
Chlordane	ug/L	0.002	<0.500	0.5	508	E83012
Dalapon	ug/L	0.2	<1.00	1	515.1	E83012
Di (2-ethylhexyl) adipate	ug/L	0.4	<0.600	0.6	525.2	E83012
Di (2-ethylhexyl) phthalate	ug/L	0.006	<1.32	1.3	525.2	E83012
Dibromochloropropane (DBCP)	ug/L	0.0002	<0.0200	0.02	504.1	E83012
Dinoseb	ug/L	0.007	<0.125	0.125	515.1	E83012
Dioxin (2, 3 ,7, 8, -TCDD)	ug/L	0.00000003	n/a	n/a	n/a	n/a
Diquat	ug/L	0.02	<0.960	0.96	549.1	E83012
Endothall	ug/L	0.1	<4.17	4.17	548.1	E83012
Endrin	ug/L	0.002	<0.01	0.01	508	E83012
Ethylene dibromide (EDB)	ug/L	0.00002	<0.01	0.01	504.1	E83012
Glyphosate	ug/L	0.7	<2.40	2.4	547	E83012
Heptachlor	ug/L	0.0004	<0.0540	0.054	508	E83012
Heptachlor epoxide	ug/L	0.0002	<0.0245	0.0245	508	E83012
Hexachlorobenzene	ug/L	0.001	<0.100	0.100	508	E83012
Hexcachlorocyclopentadiene	ug/L	0.05	<0.100	0.1	525.2	E83012
Lindane	ug/L	0.0002	<0.0240	0.024	508	E83012
Methoxychlor	ug/L	0.04	<0.250	0.25	508	E83012
Oxamyl (vydate)	ug/L	0.2	<1.13	1.13	531.1	E83012
Pentachlorophenol	ug/L	0.001	<0.04	0.0	525.2	E83012
Picloram	ug/L	0.5	<0.250	0.250	515.1	E83012
Polychlorinated biphenyl (PCB)	ug/L	0.0005	<0.250	0.250	508	E83012
Simazine	ug/L	0.004	<0.176	0.2	525.2	E83012
Toxaphene	ug/L	0.003	<0.500	<0.500	508	E83012

mg/L - milligrams per liter

MFL- million fibers per liter greater than 10 microns

TABLE (Continued)
PRIMARY DRINKING WATER STANDARDS
Analytical Results for Immokalee- IW1

Parameter	Units	Maximum Contaminant Level	Results	D.L.	Method	Cert ID
Volatile Organic Compounds						
1,1,1-Trichloroethane	ug/L	0.2	<0.21000	0.21	524.2	E83012
1,1,2-Trichloroethane	ug/L	0.005	<0.23000	0.23	524.2	E83012
1,1-Dichloroethylene	ug/L	0.007	<0.02000	0.02	524.2	E83012
1,2,4-Trichlorobenzene	ug/L	0.07	<0.22000	0.22	524.2	E83012
1,2-Dichlorethane	ug/L	0.003	<0.02000	0.02	524.2	E83012
1,2-Dichloropropane	ug/L	0.005	<0.33000	0.33	524.2	E83012
Benzene	ug/L	0.001	<0.05000	0.05	524.2	E83012
Carbon tetrachloride	ug/L	0.003	<0.29000	0.29	524.2	E83012
cis-1,2,-Dichloroethylene	ug/L	0.07	<0.03000	0.03	524.2	E83012
Dichloromethane	ug/L	0.005	<0.31000	0.31	524.2	E83012
Ethylbenzene	ug/L	0.7	<0.47000	0.47	524.2	E83012
Monochlorobenzene	ug/L	0.1	<0.23000	0.23	524.2	E83012
o-Dichlorobenzene	ug/L	0.6	<0.05000	0.05	524.2	E83012
para-Dichlorobenzene	ug/L	0.075	<0.02000	0.02	524.2	E83012
Styrene	ug/L	0.1	<0.47000	0.47	524.2	E83012
Tetrachloroethylene	ug/L	0.003	<0.21000	0.21	524.2	E83012
Toluene	ug/L	1	<0.41000	0.41	524.2	E83012
Total trihalomethanes (TTHM)	mg/L	0.10	<0.00036	0.00036	524.2	E83012
trans-1,2-Dichlorethylene	ug/L	0.1	<0.12000	0.12	524.2	E83012
Trichloroethylene	ug/L	0.003	<0.02000	0.02	524.2	E83012
Vinyl chloride	ug/L	0.001	<0.29000	0.29	524.2	E83012
Xylenes (total)	ug/L	10	<0.24000	0.24	524.2	E83012
Physical Characteristics						
Turbidity	NTU	1	n/a	n/a	n/a	n/a
Microbiological Characteristics						
Total Coliform	col/100mL	<5% positive	<1	1	9222B	E84380
Fecal Coliform		<1				
Radionuclides						
Combined Radium 226 & 228	pCi/L	5	19.1	1.2	903.1	E83033
Gross Alpha	pCi/L	15	30.4	71.9	900	E83033
Man-made beta & photon emitters	mRem/yr	4				
Treatment Chemicals						
Acrylamide		0.05% @1				
Epichlorohydrin		0.01% @20				

mg/L - milligrams per liter

pCi/L - picocurie per liter

m/Rem/yr - millirem per year

NTU - nephelometric turbidity unit

TABLE (Continued)
SECONDARY DRINKING WATER STANDARDS
Analytical Results for Immokalee- IW1

Parameter	Units	Maximum Contaminant Level	Results	D.L.	Method	Cert ID
Aluminum	mg/L	0.2	<0.020	0.020	200.7	E84380
Chloride	mg/L	250	20000	1000	4500Cl-B	E84380
Color	color units	15	90	2	2120B	E84380
Copper	mg/L	1	<0.0012	0.0012	200.7	E84380
Fluoride	mg/L	2	0.8	0.100	340.2	E84380
Foaming Agents	mg/L	0.5	<0.05	0.05	5540C	E84129
Iron	mg/L	0.3	1.76	0.03	200.7	E84380
Manganese	mg/L	0.05	0.024	0.0001	200.7	E84380
Odor	TON	3	<1	1	140.1	E84380
pH	---	6.5-8.5	7.44	0.01	150.1	E84380
Silver	mg/L	0.1	<0.001	0.001	200.7	E84380
Sulfate	mg/L	250	3010	100	375.4	E84380
Total Dissolved Solids (TDS)	mg/L	500	36400	5	160.1	E84380
Zinc	mg/L	5	0.002	0.002	<0.01	E84380

mg/L - milligrams per liter
TON - threshold odor number

Sanders Laboratories
Environmental Testing Services

CHAIN-OF-CUS DY RECORD

PROJECT # A020126

Page 1 of 3

Client Youngquist
Address
Phone Fax

Report To: Ed McCullers
Bill To:
P.O. #
Project Name IW-1
Project Location: Immokolee

Sample Supply: GW (DW standards)
Customer Type:
Field Report #:
Kit #
REQUESTED DUE DATE: 1/23/02

Sampled By (PRINT) Joshua Cooney
Sampler Signature

Bottle #	SAMPLE DESCRIPTION	Sample DATE	TIME	TYPE	PRESERVATIVES 4°C	UNPRESERVED	H_2SO_4	HNO_3	HCL	No chl	ANALYSES REQUEST Sb, Pb, Se	Hg, As, Be	Cd, Cr, Ni, Tl	Fe, Mn, Co, V	Cu	Al, Cu, Fe, Mn	Ag, Zn	Cl, Color, F	pH, SO4, TDS	ODOR	MBAS	THMs	Sample ID #
	Primary Inorganics - IW-1	1/9/02	1020	G	1			1			1	1	1										1A
	↓				1	1								1									1B
	↓				1					1					1								1C
	Secondary Inorganics - IW-1				1			1								1	1						2A
	↓				1	1												1	1				2B
	↓				1	1													1				2C
	↓				1	1														1			2D
	Trihalomethanes - IW-1	↓	↓	↓	1	1																1	3A

Bottle Lot #	OUT / DATE	SHIPMENT METHOD RETURNED / DATE	VIA	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
					1/9/02	1245		1/9	1245
	COMMENTS:		COOLER #		1/9/02	1245		1/9/02	1245
					1/9/02	1800		1/9/02	1800
			COOLER SEAL INTACT Yes No						

Sanders Laboratories, Inc.
Endeavor Ct., Nokomis, FL 34275-3623 • (941)488-8103 • FAX 484-6774 • 16880 Gator Road, Fort Myers, FL 33912 • (941) 590-0337 • FAX (941) 590-0536

Sanders Laboratories
Environmental Testing Services

CHAIN-OF-CUS DY RECORD

PROJECT # N020126

Client Youngquist
Address
Phone Fax

Report To: Ed McCullers
Bill To:
P.O. #
Project Name IW-1
Project Location: Immokolee

Sample Supply: ow (Dw Standards)
Customer Type:
Field Report #:
Kit #
REQUESTED DUE DATE: 1/23/02

Sampled By (PRINT) Joshua Cooney
Sampler Signature

Bottle #	SAMPLE DESCRIPTION	Sample DATE	Sample TIME	Sample TYPE	PRESERVATIVES 4°C	UNPRESERVED	H_2SO_4	HNO_3	HCL	Methanol	ANALYSES REQUEST Gross α	Gross β Radium 226 & 228	VOC's	Pesticides PCB's	Unregs Group I	Unregs Group II	Unregs Group III	U25	524	Sample ID #
	Radiochemicals IW-1	1/9/02	1020	G	2	1		1			2	2								4A
	Volatile Organics IW-1				2	2							2							5A
	Pesticides and PCBs IW-1				13	11				2				13						10A
	Unregulated Group I				4	2				2					4					7A
	Unregulated Group II				2	2										2				8A
	Unregulated Group III				1	1											1			9A
	IW-1				1	1												1		10A
	"				2	2													1	10B

Bottle Lot #	OUT / DATE	SHIPMENT METHOD RETURNED / DATE	VIA	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
					1/9/02	1245		1/9	1245
	COMMENTS:		COOLER #		1/9/02	1245		1/9/02	1245
					1/9/02	1500	RBUEad with	1/9/02	1500
			COOLER SEAL INTACT Yes No						

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Sanders Laboratories
Environmental Testing Services

CHAIN-OF-CUSTODY RECORD

PROJECT # NW2-0116, C2

Client Youngquist
Address
Phone Fax

Report To: Ed McCullers
Bill To:
P.O. #
Project Name IW-1
Project Location: Immokolee

Sample Supply: Our (Dw standards)
Customer Type:
Field Report #:
Kit #
REQUESTED DUE DATE: 1/23/02

Sampled By (PRINT) Joshua Cooney
Sampler Signature

Bottle #	SAMPLE DESCRIPTION	Sample DATE	Sample TIME	Sample TYPE	PRESERVATIVES 4°C	UNPRESERVED	H_2SO_4	HNO_3	HCL	ANALYSES REQUEST NH3+TKN	TP	NO3+NO2	O-Nitrogen	BOD	COD	Total Col	Fecal Col	Field pH, Cond, Temp	Sample ID #
	IW-1	1/9/02	1020	G	1		1			1	1								ΦIA
					1	1						1							ΦIB
					1	1							1						ΦIC
					1		1							1					ΦID
					1	1									1				ΦIE
																1			ΦIF

Bottle Lot #	OUT / DATE	SHIPMENT METHOD RETURNED / DATE	VIA	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
					1/9/02	1245		1/9	1245
	COMMENTS: pH - 7.70 Cond - 66,300		COOLER #		1/9/02	1245		1/9	1245
					1/9/02	1600		1/9/02	1600
			COOLER SEAL INTACT Yes No						

APPENDIX N

MIT Certification Data

Kimball Electronic Laboratory, Inc.

Precision Measurement Equipment Specialists

Certificate of Calibration

Customer:	YOUNGQUIST BROTHERS, INC.
Certificate #	097545
Manufacturer:	MCDANIEL
Model Number:	200 PSI
Nomenclature:	TEST GAUGE
Serial/I.D. #	IC120
Specifications:	0-200 PSI +/-.25%
Cal. Procedure:	MP16/C1-NAV
KELI Control #	YOU-86816

The accuracy and calibration of this instrument is traceable to the National Institute of Standards and Technology through certified standards maintained in the laboratories of KELI Inc. or derived by the ratio type of self-calibration techniques and is guaranteed to meet published specifications. The metrology procedures utilized satisfy the requirements set forth in ANSI/NCSL Z540-1.

In Tolerance When Received? Y Cal. Tech:065 Relative Humidity: 50% Temperature: 70 Deg. F

In-House [Y] Cal. Cycle: 12 Mos. Calibration Date: 10/02/2001 Calibration Due: 10/02/2002

Remarks: PERFORMED ROUTINE CALIBRATION/CERTIFICATION

Standards Used

I.D. #		Cal. Date	Cal. Due
391	EATON UPS 3000BAA PRESSURE INDICATOR	11/09/1999	11/09/2001

Quality Assurance

Kimball Electronic Laboratory, Inc.

8081 West 21st Lane Hialeah, Florida 33016
ph:(305)822-5792 fax:(305)362-3125

Certificate of Test # 097545

Customer: YOUNGQUIST BROTHERS, INC. KELI # YOU-86816 P.O.# UNK
Manufacturer: MCDANIEL Model: 200 PSI
Nomenclature: TEST GAUGE S.N./I.D. IC120

Range	Nominal	Pre-Cal	Post-Cal	Low Limit	High Limit
0-200 PSI	40	39.9	39.9	37.5	42.5
	80	79.9	79.9	77.5	82.5
	120	119.9	119.9	117.5	122.5
	160	159.9	159.9	157.5	162.5
	200	199.9	199.9	197.5	202.5

The accuracy and calibration of this instrument is traceable to the National Institute of Standards and Technology through certified standards maintained in the laboratories of KELI Labs., Inc. or derived by the ratio of self-calibration techniques and is guaranteed to meet published specifications. The metrology procedures utilized satisfy the requirements set forth in ANSI/NCSL 540-1.

Cal. Procedure: MP16/C1-NAV Specifications: 0-200 PSI +/-.25% Rcvd. in tol.? Y Temp. (F): 70.0 R.H.% 50.0
Cal. Cycle: 365 days Calibration Date: 10/02/2001 Calibration Due: 10/02/2002 Cal. Tech: 065 In-House: Y
Remarks: PERFORMED ROUTINE CALIBRATION/CERTIFICATION

I.D. #	Standards Used	Cal. Date	Cal. Due
391	EATON UPS 3000BAA PRESSURE INDICATOR	11/09/1999	11/09/2001

Quality Assurance

MANUFACTURER
SPECTRATEK SERVICES
2726 AZTEC N.E. BUILDING B
ALBUQUERQUE, NM 87107
PHONE : (505)888-0144
24 HOUR EMERGENCY RESPONSE:
(Within US) 1 800 535 5053 (Outside US) 1 352 323 3500 Collect

12/31/96

MATERIAL SAFETY DATA SHEET

	IDENTIFICATION
PRODUCT NAME	IODINE-131 WATER TRACER
RADIONUCLIDE	IODINE-131 (I-131)
CHEMICAL FORM	SODIUM IODIDE
PHYSICAL FORM	LIQUID

TOXICITY HAZARDS

Iodine-131 has severe long-term toxicity hazards if ingested. Data on lethal concentrations and doses are not presently available. IODIDE-131 WILL CONCENTRATE IN THE THYROID AND REDUCE THYROID FUNCTION.

HEALTH HAZARD DATA

ACUTE EFFECTS

May cause skin irritation.
May cause Eye and Mucous membrane irritation.
Should not be inhaled or allowed to absorb through the skin.

PREGNANT WOMEN SHOULD NOT BE ALLOWED TO WORK WITH THIS MATERIAL OR BE IN THE EXPOSURE AREA.

FIRST AID

IF SWALLOWED, OBTAIN COMPETENT MEDICAL ATTENTION IMMEDIATELY. The physician should be qualified in Nuclear Medicine and/or Health Physics.

In case of skin contact wash area vigorously with detergent (or RADCON, CONTRAD ETC.) SURVEY contaminated area with a Geiger-Muller meter with end window or pancake G-M probe to determine cleaning efficiency. Use of an abrasive cleaner such as Lava, Comet, or Ajax with a brush may be required. Remove all contaminated clothing and hold for decay or treat as RAD WASTE. SURVEY THE AREA near the spill and the areas the contaminated worker has been transferred to for RADIOACTIVE CONTAMINATION. Survey all personnel who had contact with the contaminated worker for RADIOACTIVE CONTAMINATION.

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure that adequate flushing occurs by separating eyelids with fingers. Obtain services of a qualified physician.

PHYSICAL DATA

SPECIFIC GRAVITY	1.0 Grams/ml
SOLUBILITY	>20 Grams/100 ml for the salt
APPEARANCE AND ODOR	Clear liquid & No Odor
HALF LIFE	8.05 Days

FIRE AND EXPLOSION HAZARD DATA

Fire and Explosion Hazard is Negligible
Autoignition Temperature not Applicable
EXTINGUISHING MEDIA - Carbon Dioxide or Halon (This reduces spread of radioactive contamination).

SPECIAL FIRE FIGHTING PROCEDURES
Wear Self Contained Breathing Apparatus and Protective Clothing To Prevent Inhalation and Contact With Skin and Eyes.

UNUSUAL FIRE AND EXPLOSION HAZARDS
NONE

REACTIVITY DATA

STABILITY - UNSEALED MATERIAL WILL VOLATIZE AND PRESENT INHALATION HAZARDS
CONDITION TO AVOID - USE OF IODIDE I-131 IN UNVENTED AREAS
INCOMPATIBILITIES - OXIDIZERS AND ACIDS

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS - OXIDEZED FORMS OF IODINE (THEY ARE VOLATILE AND POSE INHALATION HAZARDS)
HAZARDOUS POLYMERIZATIONS - NONE

SPILL AND LEAK PROCEDURES

SPILL PROCEDURES
CONTROL THE AREA. Do Not Move Personnel from the area until they have been surveyed using a G-M meter. The personnel may survey themselves and if not contaminated leave the area. This will help eliminate spread or radioactive contamination. **WEAR RESPIRATORY PROTECTION (ORGANIC VAPOR RESPIRATOR) PROTECTIVE CLOTHING, CHEMICAL SAFETY GOGGLES, IMPERVIOUS BOOTS, AND RUBBER GLOVES.** Clean up spill area by scooping up spilled material and transfer to a lined drum. It may be necessary to remove earth or other contaminated material. Remove all contaminated clothing and hold for decay or treat as RAD WASTE. Contain all spilled material and treat as radioactive waster as per N.R.C. OR Agreement State Regulations. Contact Health Physics prior to release of area following spill cleanup.

Location of iodine

Select any element

Se	Br	Kr
Te	I	Xe
Po	At	Rn
Select adjacent element		

WebElements

Restart WebElements

iodine (I)

menu: iodine

Background

- Key data and description
- History

iodine: the atom

- Electronic configuration
- Ionization enthalpies
- Electron affinities
- Effective nuclear charges
- Electron binding energies
- Valence shell radii
- NMR
- Naturally occurring isotopes
- Radioisotopes

iodine: the element

- Atom radii
- Crystal structure
  - [see with VR viewer]
  - [see with pdb viewer]
- Bulk properties
- Thermal properties
- Thermodynamic properties
- Mass absorption coefficients

iodine compounds

- Compounds
- Bond Enthalpies

Atomic number: 53
Atomic weight: 126.90447(3)
Group number: 17
CAS Registry number: 7553-56-2

French: iode
German: Iod
Italian: iodio
Spanish: yodo

Radioisotopes

Further data for naturally isotopes of iodine are listed separately.

Isotope	Mass	Half-life	Mode of decay	Nuclear spin	Nuclear magnetic moment
^{120}I	119.91005	1.35 h	EC to ^{120}Te	2	1.23
^{121}I	120.90737	2.12 h	EC to ^{121}Te	$^5/_2$	2.3
^{122}I	121.90760	3.6 m	EC to ^{122}Te	1	0.94
^{123}I	122.905605	13.2 h	EC to ^{123}Te	$^5/_2$	2.82
^{124}I	123.906211	4.18 d	EC to ^{124}Te	2	1.44
^{125}I	124.904624	59.4 d	EC to ^{125}Te	$^5/_2$	2.82
^{126}I	125.905619	13.0 d	EC to ^{126}Te; β^- to ^{126}Xe	2	1.44
^{128}I	127.905805	25.0 m	EC to ^{128}Te; β^- to ^{128}Xe	1	
^{129}I	128.904988	1.7×10^7 y	β^- to ^{129}Xe	$^7/_2$	2.621
^{130}I	129.906674	12.36 h	β^- to ^{130}Xe	5	3.35
^{131}I	130.906125	8.040 d	β^- to ^{131}Xe	$^7/_2$	2.742
^{132}I	131.90800	2.28 h	β^- to ^{132}Xe	4	
^{133}I	132.90781	20.8 h	β^- to ^{133}Xe	$^7/_2$	2.86
^{134}I	133.9099	52.6 m	β^- to ^{134}Xe	4	
^{135}I	134.91005	6.57 h	β^- to ^{135}Xe	$^7/_2$	

- Electronegativities
- Radii in compounds
- Lattice energies
- Reduction potentials

iodine around us

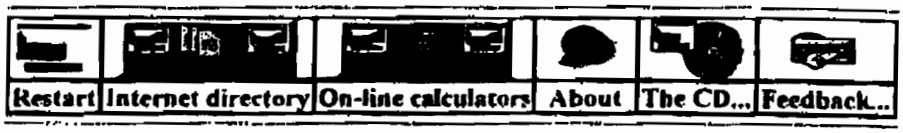
- Uses
- Geology
- Biology

General index

- WebElements on CD
- Welcome page
- Notes and help
- Provide feedback
- Awards for WebElements

For further information about isotopes (outside WebElements) see Jonghwa Chang's (Korea Atomic Energy Research Institute) Table of the Nuclides. That package is for advanced users and is cloned at a number of sites:

- KAERI, Korea
- Brookhaven, USA
- Rutherford Appleton Laboratory, UK



Additional information

- document URL: http://www.shef.ac.uk/chemistry/web-elements/nofr-radio/I.h
- WebElements 2.0 URL: http://www.shef.ac.uk/chemistry/web-elements/
- How to provide comments and feedback.

Syncor Int'l Corporation
Pharmacy Service Center - 10251 Metro Park Ste. 117
Ft. Myers FL 33912 941/275-1012
FLORIDA GEOPHYSICAL LOG Dr.

I-131 NaI Diagnostic Soln CS 21 JAN 02 #558527
Lot 113129-02101 Expires 02/20/02 24:00
Qty. Ordered ~~10.00 mCi~~
Assay 1.000 mCi/ml As Of 12:00
Volume ~~10.00 Ml~~
Qty. Dispensed mCi
Qty. Admin. mCi As Of By

Pt. GEOLOGICAL SRVY GEOLOGICAL SURVEY

CUSTOMER COPY

Syncor Int'l Corporation
Pharmacy Service Center - 10251 Metro Park Ste. 117
Ft. Myers FL 33912 941/275-1012
FLORIDA GEOPHYSICAL LOG Dr.

I-131 NaI Diagnostic Soln CS 21 JAN 02 #558526
Lot 113129-01903 Expires 02/20/02 24:00
Qty. Ordered ~~26.66 mCi~~
Assay 8.000 mCi/ml As Of 12:00
Volume ~~3.33 Ml~~
Qty. Dispensed mCi
Qty. Admin. mCi As Of By

CUSTOMER COPY

Syncor Int'l Corporation
Pharmacy Service Center - 10251 Metro Park Ste. 117
Ft. Myers FL 33912 941/275-1012
FLORIDA GEOPHYSICAL LOG Dr.

I-131 NaI Diagnostic Soln CS 21 JAN 02 #558525
Lot 113129-01903 Expires 02/20/02 24:00
Qty. Ordered ~~26.66 mCi~~
Assay 8.000 mCi/ml As Of 12:00
Volume ~~3.33 Ml~~
Qty. Dispensed mCi
Qty. Admin. mCi As Of By

Pt. GEOLOGICAL SRVY GEOLOGICAL SRUVEY

CUSTOMER COPY

WATER METER
ACCURACY TEST REPORT

9/24/01

#	MAKE	SERIAL NUMBER	LOW FLOW	INT. FLOW	HIGH FLOW
1	2"	USAGES			
2	USG	BEFORE			
3	MTRS	TEST			
4					
5		***SR# 2849837***	101.0	101.1	100.7
6	USAGES	1088700			
7					
8		***SR # 2738503***	99.1	99.8	99.5
9	USAGES	259200			
10					
11	USAGES	***SR # 2363373***	100.0	105.5	107.0
12		956000			
13			***5 GPM***	***8 GPM***	***65 GPM***
14					
15		USAGES			
16		AFTER			
17		TESTED			
18					
19		***SR# 2849837***			
20		1089100			
21					
22		***SR #2738503***			
23		260100			
		SR # 2363373	100.7	100.6	99.6
26		957500			
27			***5 GPM***	***8 GPM***	***65 GPM***
28					
29					
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48					

MASTER METER

1001 McKesson Dr.
Longview, TX 75604
(903) 297-0635
(800) 765-6518
FAX (903) 297-5963

RMA # 5007

CUSTOMER: YOUNGQUIST BROS INC.

TEST DATE: 9/24/01

TESTER: STEVE WHITE

NOTE:
Accuracy limits according to AWWA C708-96

*** 97% - 103% for Low Flows**

*** 98.5% - 101.5% for Intermediate and High Flows**

***Accuracy limits for meters removed from service according to M-6 Manual Table 5-1**

***80% - 104.0% for Low Flows**

***96% - 102.0% for Intermediate and High Flows**