

**Monitoring Well Abandonment Report
Stump Dump, Parcel 82(7)**

**Fort McClellan
Calhoun County, Alabama**

Prepared for:

**U.S. Army Corps of Engineers, Mobile District
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Mobile, Alabama 36602**

Prepared by:

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Knoxville, Tennessee 37923**

**Task Order CK10
Contract No. DACA21-96-D-0018
Shaw Project No. 796887**

October 2006

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List of Acronyms

ADEM	Alabama Department of Environmental Management
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
FTMC	Fort McClellan
Shaw	Shaw Environmental, Inc.
SI	site investigation

1.0 Introduction

Shaw Environmental, Inc. (Shaw) completed well abandonment activities at the Stump Dump, Parcel 82(7), located within the former Fort McClellan (FTMC) in Anniston, Alabama. These activities were in support of environmental investigations conducted by Shaw under contract with the U.S. Army Corps of Engineers, Mobile District. A total of 8 monitoring wells were abandoned at the Stump Dump (Figure 1). The well designations of the abandoned wells are listed in Table 1. The monitoring wells were abandoned in accordance with Alabama Department of Environmental Management (ADEM) Groundwater Branch guidelines (IT Corporation, 2000).

2.0 Site Description

The Stump Dump is an approximately 10-acre fill area located in the central part of the FTMC Main Post (Figure 1). The Stump Dump was used as a disposal site between 1985 and 1988. The site is currently inactive. The site primarily received storm debris (e.g., tree limbs, branches, stumps, yard waste and flood-washed soil). Some unauthorized dumping of items such as construction debris (e.g., sheet rock and concrete), batteries, tires, paint cans, refrigerators, landscaping trash, and other materials occurred (Environmental Science and Engineering, Inc., 1998). After its closure, the fill area surface was covered with soil and engineered with terrace decks. Several detention ponds were constructed around the fill area to control the rate of surface water runoff.

Shaw conducted a site investigation (SI) at the Stump Dump including fill area definition activities, installation of soil borings in the fill material, a wetland study, landfill gas monitoring and environmental sampling (Shaw, 2006). As part of the SI, eight groundwater monitoring wells were installed at the site. The report concluded that no additional investigations or remedial actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) were required but that certain non-CERCLA actions be conducted to promote reuse of the property and minimize safety concerns as well as decommissioning all existing monitoring wells. ADEM and the U.S. Environmental Protection Agency, Region 4, concurred with the SI report.

Based on the results of the SI and previous investigation activities, the U.S. Army implemented no further action with regard to CERCLA-related hazardous substances at the Stump Dump in 2006.

3.0 Field Activities

This section describes the well abandonment field activities conducted by Shaw on September 12 and 13, 2006.

3.1 Well Abandonment Activities

The 8 monitoring wells were abandoned in place according to ADEM guidelines. These wells are listed in Table 1. Well abandonments consisted of filling and isolating the screened interval and cementing the casing with a bentonite-cement grout. The grout was pumped through a tremie pipe inside the well. The goals of monitoring well abandonment were to:

- Prevent vertical migration of fluids within the monitoring well being abandoned
- Prevent intermixing of waters from different water-bearing zones
- Eliminate physical hazards (e.g., open boreholes)
- Preserve aquifer properties.

ADEM guidance states that in-place abandonment is complete when cross contamination cannot occur between various zones and contamination cannot enter from the surface.

Shaw contracted Boart Longyear to perform the well abandonment activities. A Shaw geologist supervised Boart Longyear personnel to ensure that all wells were the correct recorded depth (i.e., no foreign objects or obstructions present). Grout was mixed to appropriate ADEM standards, and sufficient decontaminated tremie pipe was placed to the bottom of the well. The field geologist completed a well abandonment form for each of the wells. The well abandonment forms are included as Attachment 1.

In-Place Abandonment Procedures. In-place abandonment leaves the well intact and is used when the construction details are known. The ADEM procedures for in-place abandonments are as follows:

1. Upon initiation of abandonment activities, the well was checked for obstruction (e.g., dedicated purge pumps, sample pumps, monitoring equipment), and any obstructions were removed from the well.
2. Using a weighted tape, the total depth of the well was measured (Table 1).
3. The wells were determined to be void of granular material (e.g., sand pack, formation sediment).

4. A neat grout mixture was prepared consisting of American Society for Testing and Materials Type I portland cement, water, and bentonite. The organic-free bentonite was added at a ratio of 5 pounds of bentonite per 94-pound bag of cement to produce a grout of 5-percent bentonite by weight. The grout was mixed with 6.5 to 7 gallons of water to create a pumpable slurry. The amount of neat grout needed to abandon each well was determined by calculating the volume of each well and is shown in Table 1. The well volume was calculated using the following formula:

$$V = \frac{\pi D^2 h}{4}$$

Where: V = Well volume in cubic feet
 D = Diameter of well in feet
 h = Depth of well, from top of casing, in feet
 $\pi = 3.14$

5. A decontaminated tremie pipe with a side-discharge tip was assembled and extended to the bottom of the well.
6. Once thoroughly mixed, the grout was pumped through the tremie pipe to the bottom of the well. The grout was forced through the well screen, into the filter pack (sand pack), and up the inside of the well casing to seal any holes and cracks that were present. The tremie pipe was slowly raised as the grout was tremied in place.
7. The grout was allowed to settle for 2 to 4 hours. Shaw personnel conducted a second visit to ensure that the well was grouted to ground surface.
8. After the second visit, the grout was allowed to cure for a minimum of 24 hours to ensure that it did not settle below ground surface.
9. Once the grout hardened, all surface completion materials (i.e., well stickup, protective steel casing, well pad, and protective posts) were removed to approximately 2 feet below ground surface. The 2-foot annulus was then filled with concrete to ground surface and a 2-foot by 2-foot by 1-foot-thick concrete surface pad was placed over the abandoned well. The concrete pad was completed flush with the ground surface.

3.2 Equipment Cleaning

All equipment used in the abandonment process (i.e., tremie pipe, weighted tape, and tools) was thoroughly cleaned using a high-pressure steam cleaner supplied by Boart Longyear. Potable water was obtained at the Shaw field office on the Main Post and transported to the site in clean poly tanks.

3.3 Disposal of Spent Well Materials

Spent well materials (i.e., steel bumper posts, polyvinyl chloride well casings, concrete, steel manhole covers, well locks, etc) and any other solid waste generated during well abandonment activities were placed in a construction debris roll-off container provided by Boart Longyear. The roll-off container was then transported to the Tri-Corners Landfill for disposal as nonhazardous waste.

4.0 Summary

Shaw abandoned 8 wells at the Stump Dump, Parcel 82(7), at FTMC in accordance with ADEM guidelines. Well abandonment activities began on September 12, 2006, and were completed on September 13, 2006. All known groundwater monitoring wells at the site were abandoned in place. A concrete surface pad was constructed on top of each abandoned well. All spent well materials were removed and properly disposed.

5.0 References

Environmental Science and Engineering (ESE), 1998, *Final Environmental Baseline Survey, Fort McClellan, Alabama*, January.

IT Corporation, 2000, *Final Installation-Wide Sampling and Analysis Plan, Fort McClellan, Calhoun County, Alabama*, March.

Shaw Environmental, Inc. (Shaw), 2006, *Site Investigation Report, Stump Dump, Parcel 82(7), Fort McClellan, Calhoun County, Alabama*, Final, October.

Table 1

Monitoring Well Abandonment Summary
 Stump Dump, Parcel 82(7)
 Fort McClellan, Calhoun County, Alabama

Well Designation	Well Type	Northing	Easting	Ground Elevation (ft amsl)	Total Depth Measured (ft btoc)	Screen Length (ft)	Well Material	Date Grouted	Volume of Grout Used (ft3)	Surface Completion Date
FTA-82-MW01	Residuum	1170705.27	677170.47	907.26	56.6	10	4" ID Sch. 80 PVC	9-13-06	4.94	9-13-06
FTA-82-MW02	Residuum	1170193.68	677552.22	932.10	68.85	10	4" ID Sch. 80 PVC	9-13-06	6.01	9-13-06
FTA-82-MW03	Residuum	1170575.25	678209.94	973.66	53	15	4" ID Sch. 80 PVC	9-12-06	4.63	9-13-06
FTA-82-MW04	Residuum	1171081.08	678253.19	1012.80	129	20	4" ID Sch. 80 PVC	9-12-06	11.26	9-13-06
FTA-82-MW05	Residuum	1171236.49	677806.44	1049.14	81.7	10	4" ID Sch. 80 PVC	9-12-06	7.13	9-13-06
FTA-82-MW06	Residuum	1171087.91	677795.62	1064.19	165	20	4" ID Sch. 80 PVC	9-12-06	14.4	9-13-06
FTA-82-MW07	Residuum	1170850.95	677755.89	1035.73	112	15	4" ID Sch. 80 PVC	9-12-06	9.78	9-13-06
FTA-82-MW08	Residuum	1170891.42	677221.99	914.48	47	10	4" ID Sch. 80 PVC	9-13-06	4.1	9-13-06

4" ID Sch. 40 PVC - 4-inch inside diameter, Schedule 40 polyvinyl chloride.

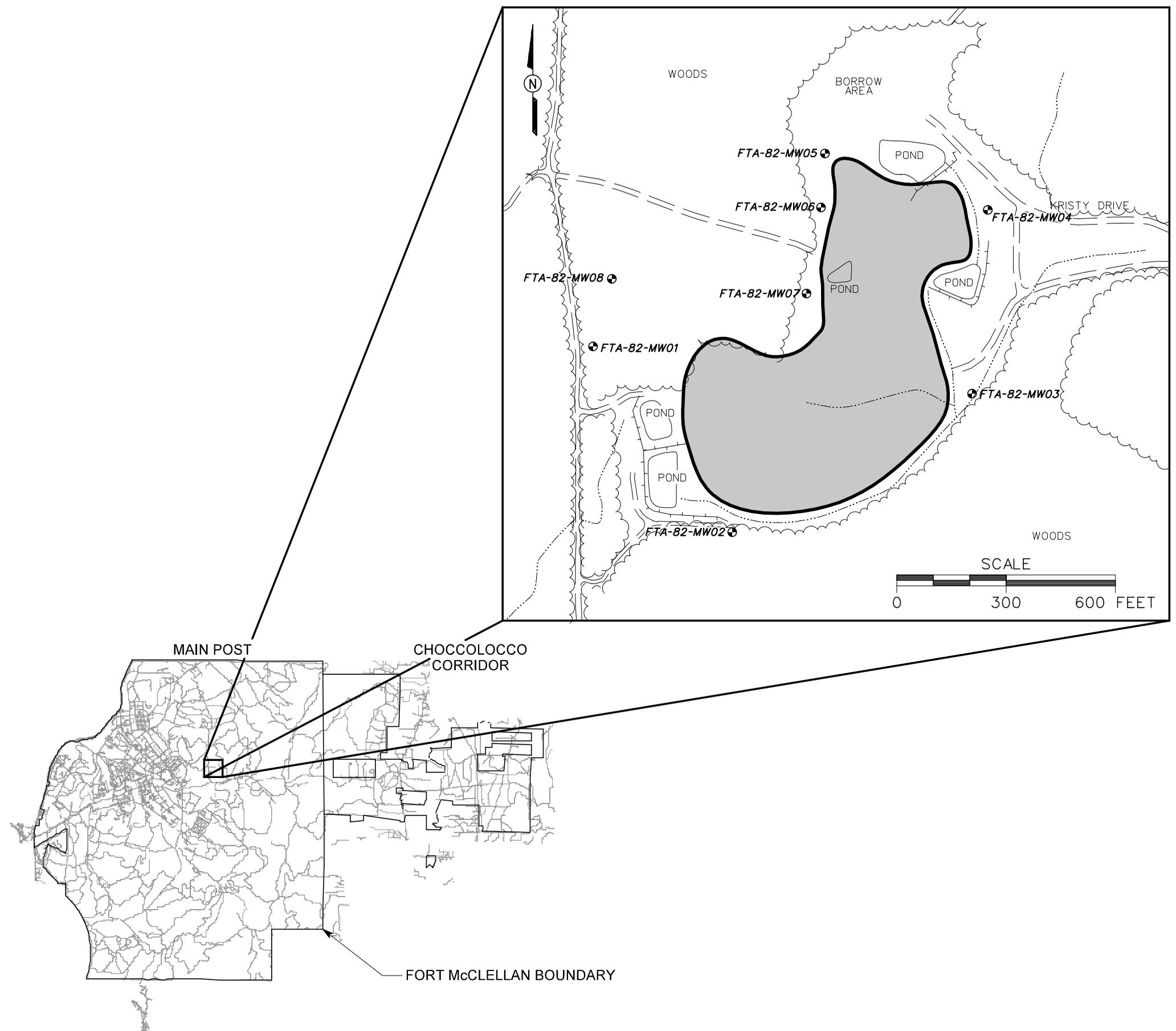
amsl - Above mean sea level.

btoc - Below top of casing.

ft - Feet.

ft3 - Cubic feet.

10/3/2006 11:36:22 AM
 K:\MCLELLAN\796887\796887es.926
 dbomar
 STARTING DATE: 08/22/06
 DRAWN BY: D. BOMAR
 DATE LAST REV.:
 DRAWN BY:
 ENGR. CHK. BY: S. MORAN
 ENGR. CHK. BY: S. MORAN
 DRAFT. CHK. BY:
 DRAFT. CHK. BY:
 INITIATOR: J. TARR
 PROJ. MGR.: S. MORAN
 DWG. NO.: 796887es.926
 PROJ. NO.: 796887



LEGEND

-  UNIMPROVED ROAD AND PARKING
-  TREES / TREELINE
-  PARCEL BOUNDARY
-  SURFACE DRAINAGE / CREEK
-  BERM
-  ABANDONED MONITORING WELL LOCATION

FIGURE 1
 SITE LOCATION MAP
 STUMP DUMP, PARCEL 82(7)

U. S. ARMY CORPS OF ENGINEERS
 MOBILE DISTRICT
 FORT McCLELLAN
 CALHOUN COUNTY, ALABAMA
 Contract No. DACA21-96-D-0018

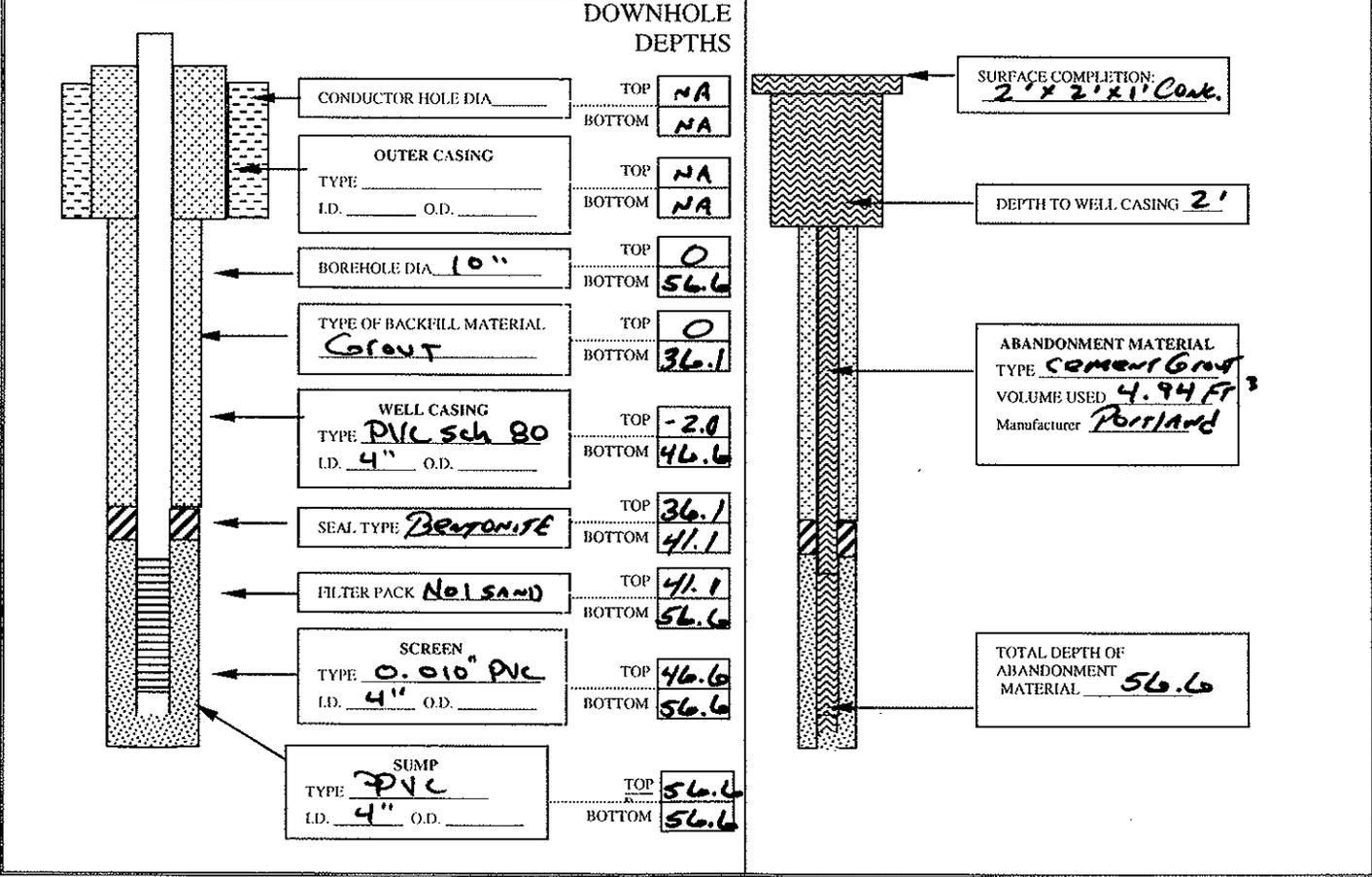
ATTACHMENT 1
WELL ABANDONMENT FORMS



Well Abandonment Form

Project: FTMC South Atlantic Division TERC		Well Number: FTA-82-MW01	
Client: USACE Mobile District		Well Coordinates:	
Project No. 796887.17050500		Northing: 1170705.27 Easting: 677170.47	
Start Date: 9-13-06	Completion Date: 9-13-06	Prepared By: <i>Kyle Kirshenman</i>	Reference Point for Measurements: TOP of CASING
Well Type: (circle one) Residuum Bedrock		NOTES:	
Other _____ Temporary			

BEFORE ABANDONMENT		AFTER ABANDONMENT:		
WELL CONSTRUCTION SUMMARY		NO YES N/A		
Well No. FTA-82-MW01	Well Location/ Parcel: STUMP Dump / Parcel 82	Concrete Pad Removed	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Total Depth (feet): 9-13-06 56.6 TOC	Drilled By: Miller Drilling Co.	Protective Posts Removed	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Date Completed: November 11, 1998	Ground Elevation: 907.26	Outer Casing Removed	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	TOC Elevation: 909.26	Flush Mount Removed	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		Disposition of Well Materials: _____		





Well Abandonment Form

Project: FTMC South Atlantic Division TERC

Well Number: **FTA-82-MW02**

Client: USACE Mobile District

Well Coordinates:

Project No. **796887.17050500**

Northing: **1170193.68** Easting: **677552.22**

Start Date: **9-13-06**

Completion Date: **9-13-06**

Prepared By: **Kyle Kirshenmann**

Reference Point for Measurements: **TOP OF CASING**

Well Type: (circle one) **Residuum** Bedrock
 Temporary
 Other _____

NOTES:

BEFORE ABANDONMENT

AFTER ABANDONMENT:

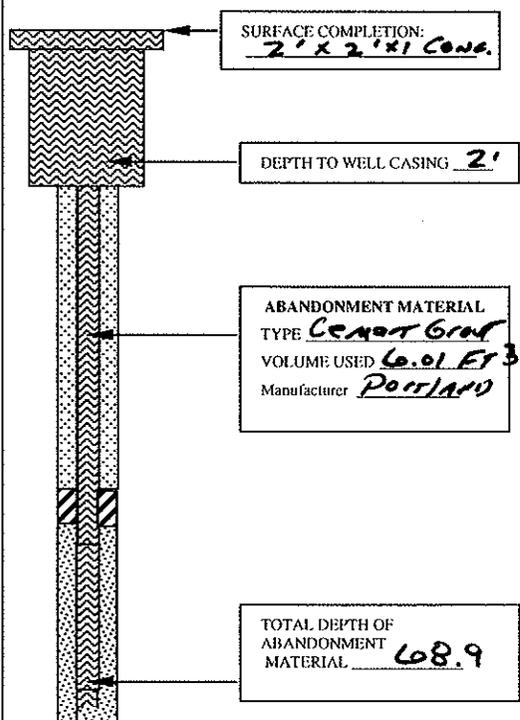
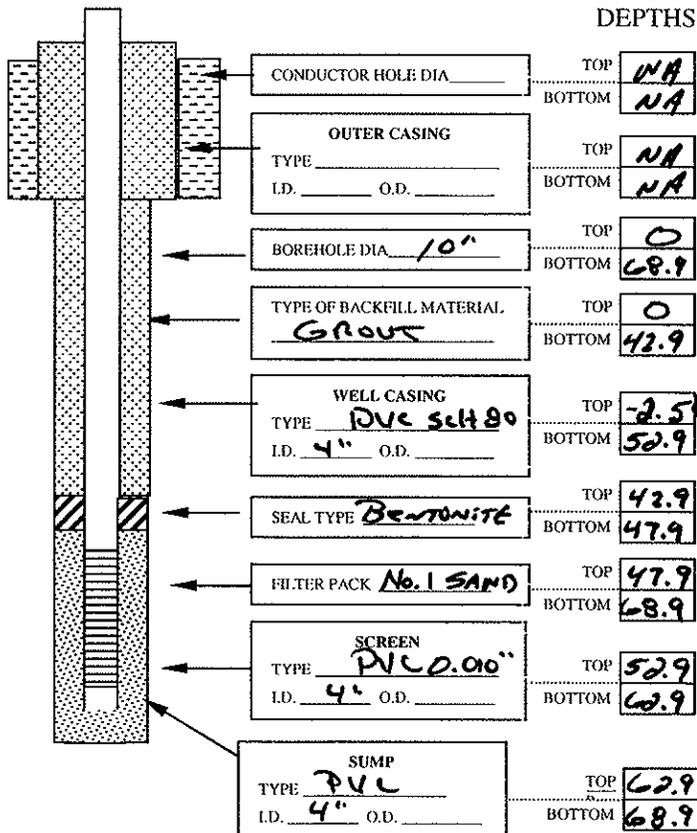
WELL CONSTRUCTION SUMMARY

Well No. FTA-82-MW02	Well Location/ Parcel: STUMP DUMP
Total Depth (feet): 9-13-06 68.9 TOC	Drilled By: Miller Drilling Co.
Date Completed: November 13, 1998	Ground Elevation: 932.1
	TOC Elevation: 934.6

	NO	YES	N/A
Concrete Pad Removed		<input checked="" type="checkbox"/>	
Protective Posts Removed		<input checked="" type="checkbox"/>	
Outer Casing Removed		<input checked="" type="checkbox"/>	
Flush Mount Removed			<input checked="" type="checkbox"/>

Disposition of Well Materials: _____

DOWNHOLE DEPTHS





Well Abandonment Form

Project: FTMC South Atlantic Division TERC

Well Number: *FTA-B2-MW03*

Client: USACE Mobile District

Well Coordinates:

Project No. *796887.17050500*

Northing: *1170575.25* Easting: *678209.94*

Start Date: *9-12-06*

Completion Date: *9-13-06*

Prepared By: *Kyle Kirschmann*

Reference Point for Measurements: *TOP OF CASING*

Well Type: (circle one) **Residuum** Bedrock
 Temporary
 Other _____

NOTES:

BEFORE ABANDONMENT

AFTER ABANDONMENT:

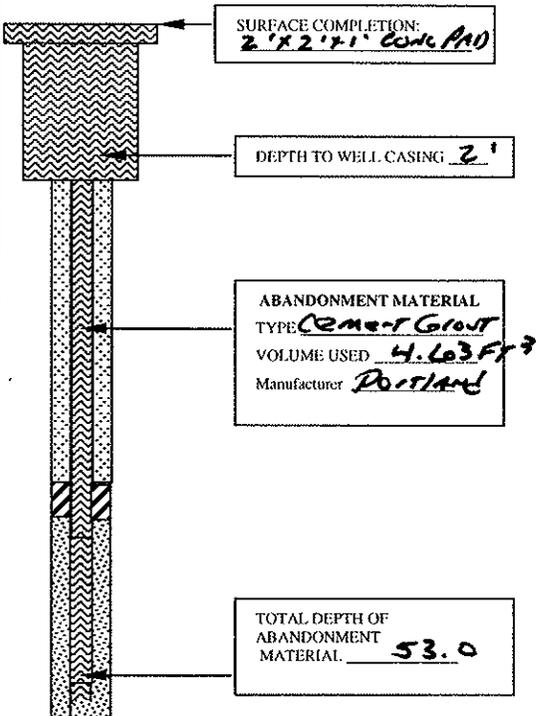
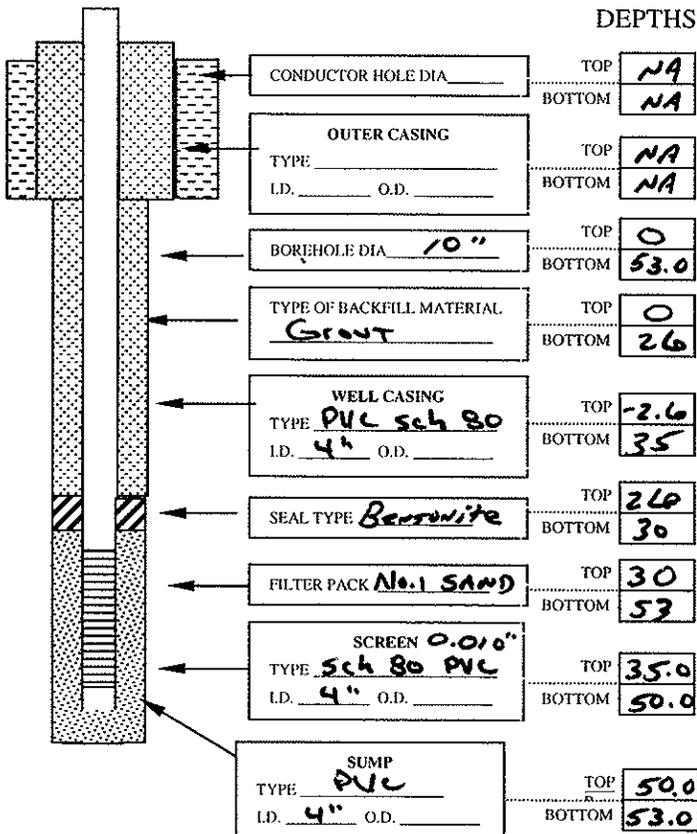
WELL CONSTRUCTION SUMMARY

Well No. *FTA-B2-MW03* Well Location/ Parcel: *STUMP DUMP Parcel 82*
 Total Depth (feet): *9-12-06 53.0 TOC* Drilled By: *Miller Drilling Co.*
 Date Completed: *December 11, 1998* Ground Elevation: *973.46*
 TOC Elevation: *976.23*

	NO	YES	N/A
Concrete Pad Removed		<input checked="" type="checkbox"/>	
Protective Posts Removed		<input checked="" type="checkbox"/>	
Outer Casing Removed		<input checked="" type="checkbox"/>	
Flush Mount Removed			<input checked="" type="checkbox"/>

Disposition of Well Materials: _____

DOWNHOLE DEPTHS





Well Abandonment Form

Project: FTMC South Atlantic Division TERC

Well Number: **FTA-82-MW04**

Client: USACE Mobile District

Well Coordinates:

Project No. **796887.17050500**

Northing: **1171081.08** Easting: **678253.19**

Start Date: **9-12-06**

Completion Date: **9-13-06**

Prepared By: **Kyle Kirshenmann**

Reference Point for Measurements: **TOP OF CASING**

Well Type: (circle one) **Residuum** Bedrock
 Temporary
 Other _____

NOTES:

BEFORE ABANDONMENT

AFTER ABANDONMENT:

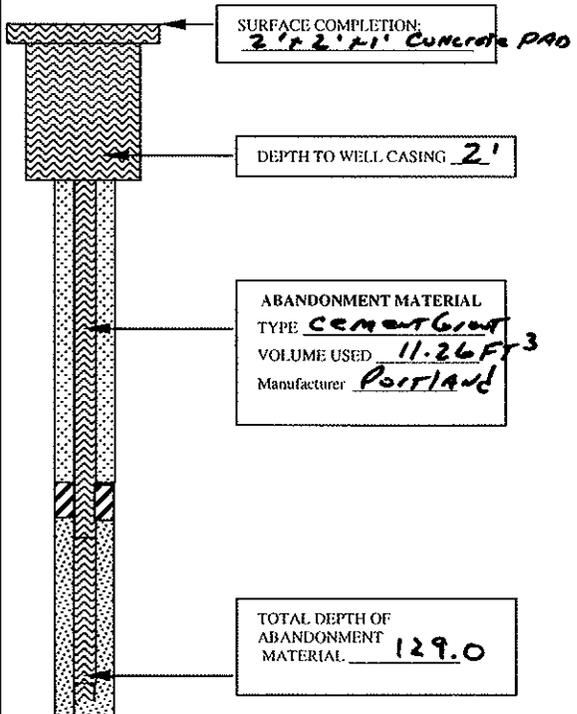
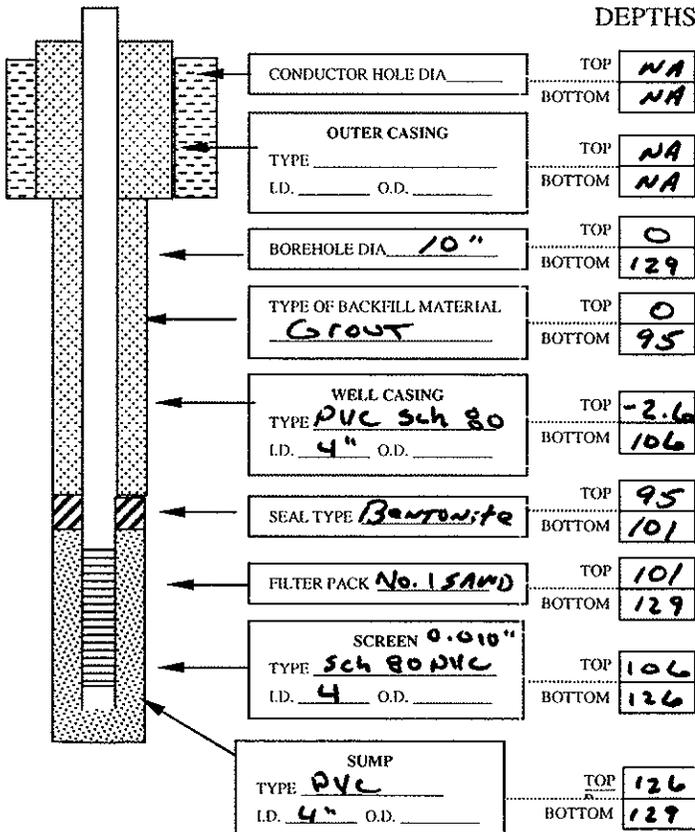
WELL CONSTRUCTION SUMMARY

Well No. **FTA-82-MW04** Well Location/ Parcel: **STUMP DUMP Parcel 82**
 Total Depth (feet): **9-12-06** Drilled By: **Miller Drilling Co.**
129.0 TOC
 Date Completed: **December 8, 1998** Ground Elevation: **1012.8**
 TOC Elevation: **1015.4**

	NO	YES	N/A
Concrete Pad Removed		<input checked="" type="checkbox"/>	
Protective Posts Removed		<input checked="" type="checkbox"/>	
Outer Casing Removed		<input checked="" type="checkbox"/>	
Flush Mount Removed			<input checked="" type="checkbox"/>

Disposition of Well Materials: _____

DOWNHOLE DEPTHS





Well Abandonment Form

Project: FTMC South Atlantic Division TERC
 Client: USACE Mobile District
 Project No. 796887.17050500
 Start Date: 9-12-06
 Completion Date: 9-13-06
 Well Type: (circle one) **Residuum** Bedrock
 Temporary
 Other _____

Well Number: **FTA-82-MW05**
 Well Coordinates:
 Northing: 1171236.49 Easting: 677806.44
 Prepared By: **Kyle Kirschenmann**
 Reference Point for Measurements: **TOP OF CASING**

NOTES:

BEFORE ABANDONMENT

WELL CONSTRUCTION SUMMARY

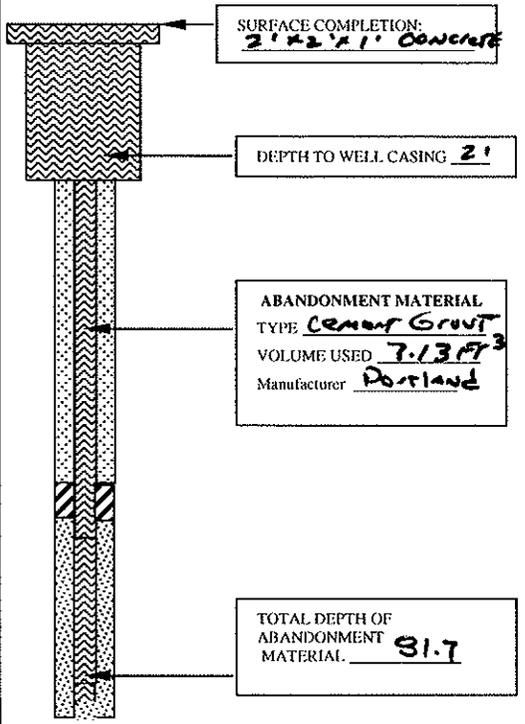
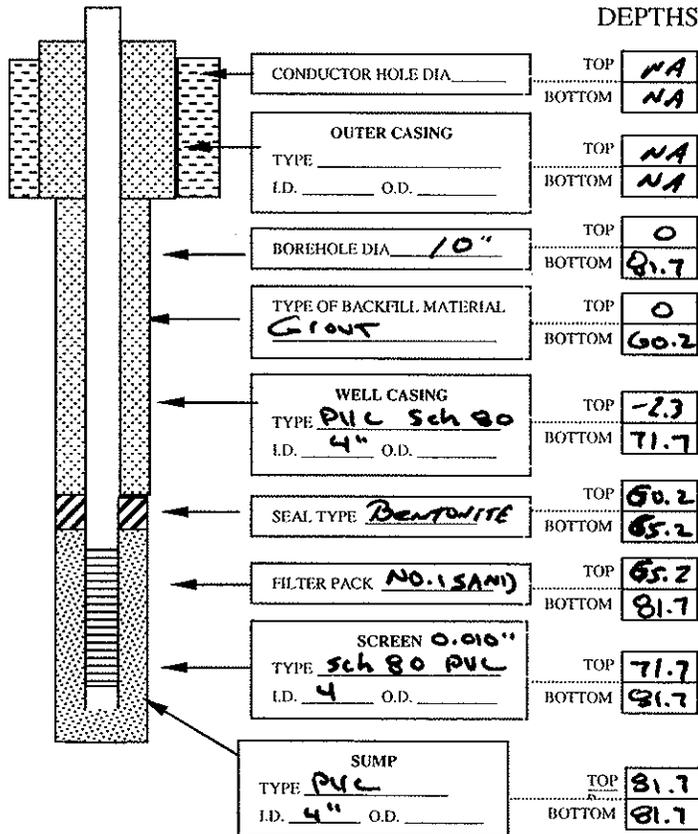
Well No. **FTA-82-MW05** Well Location/ Parcel: **STUMP DUMP / Parcel 82**
 Total Depth (feet): **9-12-06 81.7 TOC** Drilled By: **Miller Drilling Co.**
 Date Completed: **November 19, 1998** Ground Elevation: **1049.14**
 TOC Elevation: **1051.46**

AFTER ABANDONMENT:

	NO	YES	N/A
Concrete Pad Removed		✓	
Protective Posts Removed		✓	
Outer Casing Removed		✓	
Flush Mount Removed			✓

Disposition of Well Materials: _____

DOWNHOLE DEPTHS





Well Abandonment Form

Project: FTMC South Atlantic Division TERC
 Client: USACE Mobile District
 Project No. 796887.17050500
 Start Date: 9-12-06
 Completion Date: 9-13-06
 Well Type: (circle one) **Residuum** Bedrock
 Temporary
 Other _____

Well Number: FTA-82-MW06
 Well Coordinates:
 Northing: 1171087.91 Easting: 677795.62
 Prepared By: Kyle Kirschenmann
 Reference Point for Measurements: TOP OF CASING

NOTES:

BEFORE ABANDONMENT

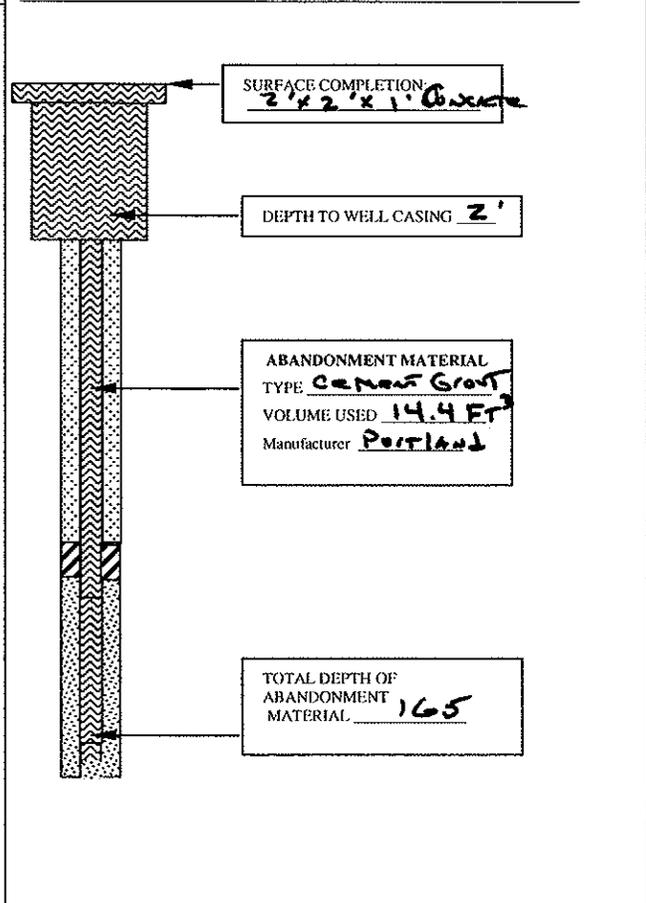
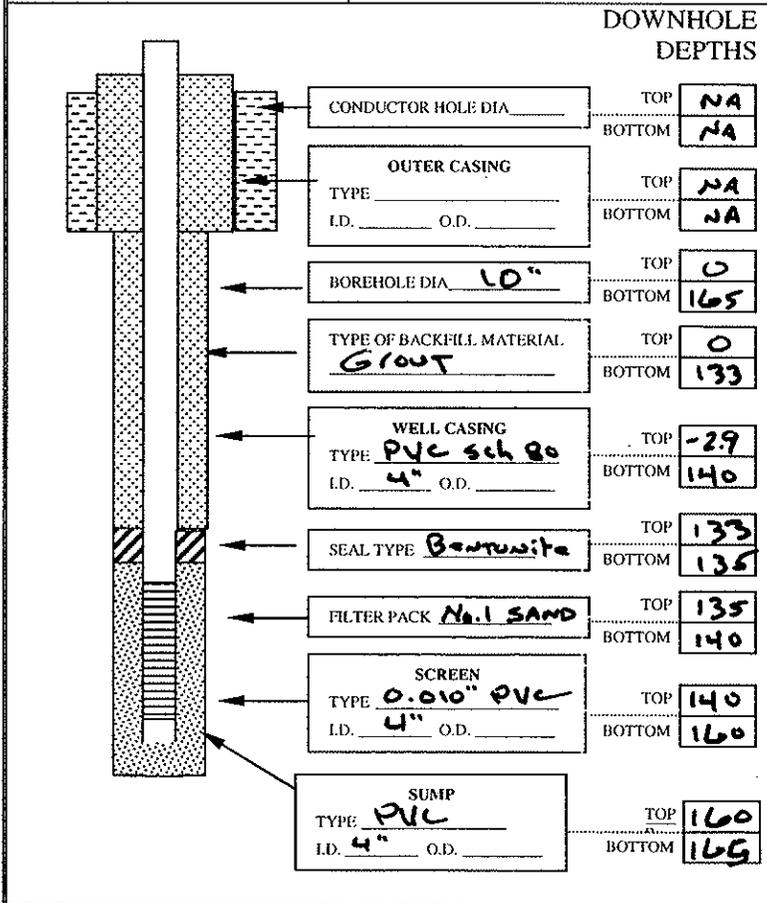
WELL CONSTRUCTION SUMMARY

Well No. FTA-82-MW06	Well Location/ Parcel: STUMP Dump Parcel 82
Total Depth (feet): 9-12-06 165.0 TOC	Drilled By: Miller Drilling Co.
Date Completed: December 10, 1998	Ground Elevation: 1064.19 TOC Elevation: 1067.13

AFTER ABANDONMENT:

	NO	YES	N/A
Concrete Pad Removed		✓	
Protective Posts Removed		✓	
Outer Casing Removed		✓	
Flush Mount Removed			✓

Disposition of Well Materials: _____





Well Abandonment Form

Project: FTMC South Atlantic Division TERC
 Client: USACE Mobile District
 Project No. 796887.17050500
 Start Date: 9-18-06
 Completion Date: 9-13-06
 Well Type: (circle one) **Residuum** Bedrock
 Temporary
 Other _____

Well Number: FTA-82-MW07
 Well Coordinates:
 Northing: 1170850.95 Easting: 677755.89
 Prepared By: Kyle Kirchenmann
 Reference Point for Measurements: TOP OF CASING

NOTES:

BEFORE ABANDONMENT

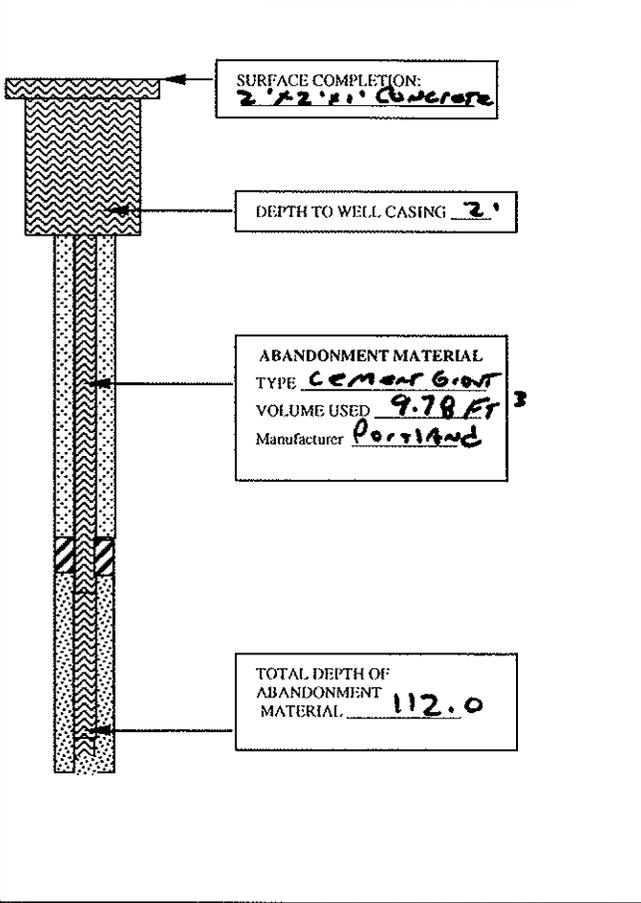
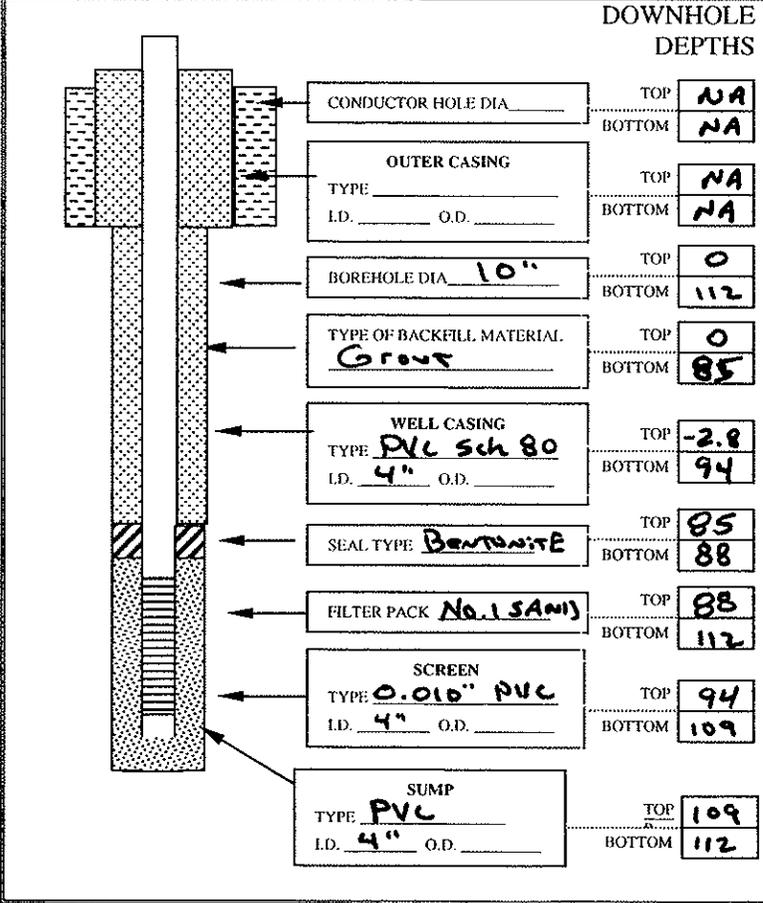
WELL CONSTRUCTION SUMMARY

Well No. FTA-82-MW07	Well Location/ Parcel: STUMP Dump Parcel 82
Total Depth (feet): 112.0 TOC	Drilled By: Miller Drilling Co.
Date Completed: December 10, 1998	Ground Elevation: 1035.7
	TOC Elevation: 1038.5

AFTER ABANDONMENT:

	NO	YES	N/A
Concrete Pad Removed		✓	
Protective Posts Removed		✓	
Outer Casing Removed		✓	
Flush Mount Removed			✓

Disposition of Well Materials: _____





Well Abandonment Form

Project: FTMC South Atlantic Division TERC

Well Number: **FTA-82-MW08**

Client: USACE Mobile District

Well Coordinates:

Project No. **796887. 17050500**

Northing: **1170891.42** Easting: **677221.99**

Start Date: **9-13-06**

Completion Date: **9-13-06**

Prepared By: **Kyle Kirschenmann**

Reference Point for Measurements: **TOP OF CASING**

Well Type: (circle one) **Residuum** Bedrock
 Temporary
 Other _____

NOTES:

BEFORE ABANDONMENT

AFTER ABANDONMENT:

WELL CONSTRUCTION SUMMARY

Well No. **FTA-82-MW08** Well Location/ Parcel: **STUMP DUMP / Parcel 82**
 Total Depth (feet): **9-13-06 47.0 TOC** Drilled By: **Miller Drilling Co.**
 Date Completed: **December 2, 1998** Ground Elevation: **914.5**
 TOC Elevation: **915.9**

	NO	YES	N/A
Concrete Pad Removed		<input checked="" type="checkbox"/>	
Protective Posts Removed		<input checked="" type="checkbox"/>	
Outer Casing Removed		<input checked="" type="checkbox"/>	
Flush Mount Removed			<input checked="" type="checkbox"/>

Disposition of Well Materials: _____

DOWNHOLE DEPTHS

