DOE–LM/1562–2007

Pinellas Environmental Restoration Project

Sitewide Environmental Monitoring Semiannual Progress Report for the Young - Rainey STAR Center June 2007 Through November 2007

December 2007

U.S. Department of Energy

Office of Legacy Management

Work Performed Under DOE Contract No. DE–AC01–02GJ79491
for the U.S. Department of Energy Office of Legacy Management.
Approved for public release; distribution is unlimited.

DOE−LM/1562−2007

Pinellas Environmental Restoration Project
Sitewide Environmental Monitoring
Semiannual Progress Report
for the
Young - Rainey STAR Center

June 2007 Through November 2007

December 2007

Work Performed by S.M. Stoller Corporation under DOE Contract No. DE–AC01–02GJ79491
for the U.S. Department of Energy Office of Legacy Management, Grand Junction, Colorado

Contents

Acronyms and Abbreviations iv
1.0 Introduction 1
1.1 Building 100 Area 2
1.2 Northeast Site 3
1.3 WWNA/Building 200 Area 5
1.4 Site Update 6
1.5 Site Activities 7
2.0 Water-Level Elevations 7
2.1 Work Conducted and Methods 7
2.2 Groundwater Flow 7
3.0 Groundwater Sampling and Analytical Results 9
3.1 Work Performed 9
3.2 Analytical Results 9
3.2.1 Northeast Site (PIN15) 9
3.2.2 Building 100 Area (PIN06, PIN09, PIN10, PIN12, and PIN21) 9
3.3 Quality Assurance/Quality Control 10
4.0 Data Interpretation 10
4.1 Contaminant Concentration Trends 11
4.2 Geochemical Parameters 11
5.0 Tasks to be Performed Semiannually 11
6.0 References 12

Figures

Figure 1. Young - Rainey STAR Center Location 14
Figure 2. Location of STAR Center Solid Waste Management Units (SWMUs) 15
Figure 3. Groundwater Elevations and Shallow Surficial Aquifer Flow, Northeast Site, June 2007 16
Figure 4. Groundwater Elevations and Deep Surficial Aquifer Flow, Northeast Site, June 2007 17
Figure 5. Groundwater Elevations and Shallow Surficial Aquifer Flow, Northeast Site, September 2007 18
Figure 6. Groundwater Elevations and Deep Surficial Aquifer Flow, Northeast Site, September 2007 19
Figure 7. Groundwater Elevations and Shallow Surficial Aquifer Flow, Building 100 Area, June 2007 20
Figure 8. Groundwater Elevations and Deep Surficial Aquifer Flow, Building 100 Area, June 2007 21
Figure 9. Groundwater Elevations and Shallow Surficial Aquifer Flow, Building 100 Area, September 2007 22
Figure 10. Groundwater Elevations and Deep Surficial Aquifer Flow, Building 100 Area, September 2007 23
Figure 11. Northeast Site Total COPC Concentrations September 2007 Sampling Event 24
Figure 12. Building 100 Area Total COPC Concentrations September 2007 Sampling Event ... 25

Figure 13. VC in PIN15−0569, Northeast Site 26
Figure 14. VC in PIN21−0512, Perimeter Well 27
Figure 15. VC in PIN12−S73C, Building 100 Area 28
Figure 16. VC Plume, Building 100 Area 29
Figure 17. TCE, cDCE, tDCE, VC in PIN12−0524, Building 100 Area 30

Tables

Table 1. Water-Level Data at the STAR Center 31
Table 2. Floridan Aquifer Monitoring Well Water Elevations 37
Table 3. Surface Water Elevations 37
Table 4. Dehalococcoides ethenogenes 38
Table 5. Field Measurements of Samples Collected at the STAR Center 39
Table 6. COPC Concentrations at the Northeast Site 42
Table 7. Sitewide Arsenic Measurements 46
Table 8. Aluminum, Iron, and Manganese Concentrations Measured at the Northeast Site (reported in µg/L) 47
Table 9. COPC Concentrations at the Building 100 Area 49
Table 10. Relative Percent Difference (RPD) for Duplicate Samples 53

Plates

Plate 1 Sitewide Shallow Surficial Aquifer Contours, June 2007
Plate 2 Sitewide Deep Surficial Aquifer Contours, June 2007
Plate 3 Sitewide Shallow Surficial Aquifer Contours, September 2007
Plate 4 Sitewide Deep Surficial Aquifer Contours, September 2007

Appendix

Appendix A Laboratory Reports—September 2007 Semiannual Results

Acronyms and Abbreviations

bls	below land surface
°C	degrees Celsius
CMS	Corrective Measures Study
CMIP	Corrective Measures Implementation Plan
COPC	contaminants of potential concern
CTL	Cleanup Target Level
DCE	dichloroethene
DOE	U.S. Department of Energy
EA	environmental assessment
EPA	U.S. Environmental Protection Agency
F.A.C.	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FONSI	Finding of No Significant Impacts
ft	feet
ft/ft	feet per foot
gpm	gallons per minute
HSWA	Hazardous and Solid Waste Amendments
HRC	Hydrogen Release Compound®
ICM	interim corrective measure
IDL	instrument detection limit
IWNF	Industrial Wastewater Neutralization Facility
MCL	maximum contaminant level
MSL	mean sea level
µmhos/cm	micromhos per centimeter
µg/L	micrograms per liter
mg/L	milligrams per liter
mV	millivolt
NAPL	non-aqueous phase liquid
NEPA	National Environmental Policy Act
NGVD	national geodetic vertical datum
NTU	Nephelometric Turbidity Units
PCIC	Pinellas County Industrial Council
QA/QC	quality assurance/quality control
RBCA	Risk-Based Corrective Action
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RPD	relative percent difference
STAR Center	Young - Rainey Science, Technology, and Research Center
SWMU	solid-waste management unit
TCE	trichloroethene
TCOPC	total contaminants of potential concern
VC	vinyl chloride
VOCs	volatile organic compounds
WWNA	Wastewater Neutralization Area

1.0 Introduction

The Young - Rainey Science, Technology, and Research Center (STAR Center) is a former U.S. Department of Energy (DOE) facility constructed in the mid-1950s in Pinellas County, Florida. The 99-acre STAR Center is located in Largo, Florida, and lies in the northeast quarter of Section 13, Township 30 South, Range 15 East (Figure 1). While it was owned by DOE, the facility primarily manufactured neutron generators for nuclear weapons. Other products manufactured at the STAR Center have included radioisotopically powered thermoelectric generators, thermal batteries, specialty capacitors, crystal resonators, neutron detectors, lightning-arrestor connectors, and vacuum-switch tubes. In 1987, the U.S. Environmental Protection Agency (EPA) performed a Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) (EPA 1988) at the site to gather information on potential releases of hazardous materials. In February of 1990, EPA issued a Hazardous and Solid Waste Amendments (HSWA) permit to DOE, enabling DOE to investigate and perform remediation activities in those areas designated as solid-waste management units (SWMUs), contaminated by hazardous materials resulting from DOE operations. On March 17, 1995, DOE sold the facility to the Pinellas County Industrial Council (PCIC). The sales contract included clauses to ensure continued compliance with federal, state, and local regulations while DOE remediates the site. On July 1, 1999, the PCIC was disestablished, and ownership of the STAR Center changed to the Pinellas County government. In November 2000, the State of Florida received HSWA authorization from EPA. The Florida Department of Environmental Protection (FDEP) issued a new HSWA permit to DOE in January 2002.

The administration of DOE activities at the facility is the responsibility of the DOE Office of Legacy Management in Grand Junction, Colorado. S.M. Stoller Corporation (Stoller), a prime contractor to DOE's Office of Legacy Management, provides technical support to DOE for remediation and closure of all active SWMUs on site.

The EPA RFA Report and the HSWA permit identified 15 sites at the former DOE facility that may have experienced environmental contamination as a result of past activities. Upon completion of the RCRA Facility Investigation (DOE 1991), 11 of the 15 SWMUs were recommended by DOE and approved by EPA Region IV and FDEP for no further action (DOE 1994b). A twelfth site, the Former Pistol Range Site, was remediated in 1993; it was recommended by DOE, and approved by EPA Region IV and FDEP, for no further action.

Two additional SWMUs, the West Fenceline Site and the Wastewater Neutralization Area/ Building 200 (WWNA/Building 200), were identified after the HSWA permit was issued, bringing the total to 17 SWMUs that have been identified and investigated at the STAR Center. The remediation of the West Fenceline Site was completed in 1997, and DOE recommended—and EPA Region IV and FDEP approved—no further action, for a total of 13 SWMUs remediated. A Corrective Measures Study (CMS)/Corrective Measures Implementation Plan (CMIP) was prepared and submitted in 1997 to EPA Region IV and FDEP to address the contamination at the WWNA/Building 200 Area.

Therefore, there are currently four SWMUs that have contamination in the surficial aquifer groundwater at levels in excess of protective standards. These four SWMUs are the Old Drum Storage Site (PIN06), the Industrial Drain Leaks-Building 100 Area (PIN12), the Northeast Site

(PIN15), and the WWNA/Building 200 Area (PIN18). Two SWMUs, PIN06 and PIN12, are collectively known as the Building 100 Area. Figure 2 depicts the location of the four SWMUs. Additional background information relative to each SWMU is briefly described below.

This document also serves as the semiannual progress report for each of these four SWMUs. The results of monitoring activities and a summary of ongoing and projected work are provided in this report.

1.1 Building 100 Area

The Building 100 Area (PIN06 and PIN12) is located in the southeast portion of the STAR Center. The Old Drum Storage Site is the former location of a concrete storage pad equipped with a drain and containment system used to store hazardous waste including methylene chloride, ignitable liquids, arsenic, and calcium chromate solids (DOE 1987a). Empty drums containing residual waste solvents were also stored in this area (DOE 1987b). The concrete pad was located near the northwest corner of Building 100. The pad was removed in October 1983 in accordance with an FDEP closure permit (DOE 1987a), and a closure report was submitted to FDEP in August 1986 (DOE 1986). The decommissioning of the pad and the cessation of drum storage effectively removed the potential for a future contaminant source at PIN06.

Building 100 is the largest building at the STAR Center and covers approximately 11 acres. In the past, offices, laboratories, and production facilities for DOE were housed in the building. SWMU PIN12 consists of the liquid waste drainage system that formerly served Building 100. Four individual drainage systems (sanitary, chemical, health physics, and storm water) were present within the building. In 1989, all four drainage systems were investigated, including verifying the system routing and the condition of underground and aboveground piping and ancillary equipment (EMC 1989). As a result of this investigation, the health physics and chemical drainage systems were flushed, grouted, and abandoned (DOE 1997). Some of the chemical drain lines were replaced by an aboveground system currently used by tenants of the building.

A CMS and CMIP were completed and approved for the Building 100 Area because volatile organic compounds (VOCs) concentrations measured in groundwater at the Old Drum Storage Site (PIN06) and one monitoring well located at the northwest corner of Building 100 (PIN12) exceeded the Safe Drinking Water Act and FDEP maximum contaminant levels (MCLs). Subsequent investigations revealed elevated VOCs concentrations under Building 100 and downgradient to the southeast as well. On August 15, 2000, EPA approved the Building 100 CMIP Addendum; FDEP approved the document on November 15, 1999.

In May 2001, DOE began an analysis of the potential remediation strategies for the three Building 100 Area tasks: plume control, source treatment, and dissolved phase treatment. The *Building 100 Area Remediation Technology Screening Report* (DOE 2001) assembled a list of remediation technologies, categorized them into the remediation tasks, and conducted an initial screening of the technologies. This initial screening eliminated the technologies that obviously would not work and recommended technologies that should be retained for detailed evaluation at a later time.

The *Building 100 Area Plume Control Technology Selection Report*, prepared in February 2002, conducted a detailed evaluation of five plume control technologies and recommended that enhanced bioremediation should be implemented for plume control at the Building 100 Area.

In-situ enhanced bioremediation to control the plume of dissolved contaminants at the Building 100 Area began as a pilot study on March 11, 2003. Hydrogen Release Compound® (HRC) was injected through nine injection points surrounding each of three monitoring wells. Groundwater samples were collected from each of the three monitoring wells at approximately 2-month intervals through May 2004 to track the progress of HRC at remediating site contaminants. HRC was selected because it is a proven technology for optimizing degradation rates of chlorinated hydrocarbons dissolved in groundwater. The continuous hydrogen source provided by the HRC can reduce the concentration of dissolved phase chlorinated hydrocarbons by greatly enhancing the reductive dechlorination process that occurs naturally at the Building 100 Area. The *In-Situ Enhanced Bioremediation Technology to Control the Plume of Dissolved Contaminants at the Building 100 Area of the Young - Rainey STAR Center Pilot Test* final report was received from the subcontractor on April 5, 2004. The results of the pilot test indicate that the injection of HRC had a limited influence in the pilot test area. This conclusion is based on increasing concentrations of the metabolic acids (as produced from HRC) and the decreasing concentrations of sulfate and iron and the observation of ethene at one location. A supplemental sampling event was conducted in May 2004, after which the pilot test was considered complete.

Several years have passed since the Building 100 Area CMS Report (DOE 1994a), the CMIP (DOE 1996a), and the CMIP Addendum (DOE 1998) were written. Therefore, in July 2006, the Building 100 Area CMS Report Addendum was prepared to update site conditions, discuss the regulatory framework, and re-evaluate active remediation alternatives for this SWMU. Based on the recommendations included in this report, FDEP and DOE continue to discuss the closure strategy for this SWMU. One recommendation that FDEP agreed on has already been implemented, with the shutdown of the two recovery wells at Building 100 on August 21, 2006.

1.2 Northeast Site

In the late 1960s, before the construction of the East Pond, drums of waste and construction debris were disposed of in the swampy area of the Northeast Site. The East Pond was excavated in 1968 as a borrow pit. In 1986, an expansion of the East Pond was initiated to create additional storm-water retention capacity. Excavation activities ceased when contamination was detected directly west of the East Pond. EPA identified the Northeast Site as a SWMU (EPA 1992). An Interim Corrective Measures (ICM) Study was developed and submitted to EPA, and approval of this document was received in October 1991. An interim groundwater recovery system for the Northeast Site was installed, and operation commenced in January 1992.

The groundwater treatment system, as initially installed, consisted of four recovery wells equipped with pneumatic recovery pumps, a holding tank, centrifugal transfer pumps, and approximately 2,500 feet (ft) of transfer and secondary containment piping. During 1993, DOE proposed a reconfigured system for the site, consisting of four shallow and three deep recovery wells. After EPA approved the upgrade, the system was reconfigured and became operational on March 1, 1994.

Between August and October 1995, after EPA and FDEP granted their approval, a portion of the Northeast Site was excavated to remove debris and other materials that could inhibit future corrective measures. The location of the areas of excavation was based primarily on the results of a geophysical survey and knowledge of existing utility locations. Detailed descriptions of the debris-removal activities were submitted to EPA and FDEP as part of the *Northeast Site Interim Measures Quarterly Progress Report* (DOE 1996b).

In 1996, DOE submitted a CMIP to EPA Region IV and FDEP. This plan was approved by both regulatory agencies in 1997. As part of the Northeast Site CMS and CMIP, a pump-and-treat system, in conjunction with a subsurface hydrogeologic barrier wall to prevent the migration of the contaminant plume, was identified as the best available technology. A pretreatment system for iron removal, an air-stripper unit, and a tank for holding treated groundwater before discharge to the Pinellas County Publicly Owned Treatment Works were recommended. The treatment system was constructed in early 1997 and became operational by July 1997, with seven Northeast Site recovery wells and two Building 100 recovery wells pumping to the system influent tank. Subsequently several additional recovery wells were installed, and some of the old recovery wells were abandoned.

During 1997, anaerobic bioremediation and rotary steam stripping pilot tests were conducted in the northern and southern portions of the Northeast Site, respectively. These tests were designed by an Innovative Treatment Remediation Demonstration group of regulatory and industry members to provide remedial options at the STAR Center. At the conclusion of the field tests in July 1997, pump-and-treat technology resumed at the Northeast Site.

An *Interim Measures Work Plan for Remediation of Non-Aqueous Phase Liquids* (NAPLs) *at the Northeast Site* was submitted to FDEP in late November 2001. The purpose of this document was to present the plan for the ICM to remediate NAPLs at the Northeast Site. An ICM was considered to be warranted because it supported the long-term corrective action to remediate the dissolved phase contamination in the surficial aquifer to FDEP drinking water MCLs. Without this measure, NAPLs would continue to act as a source of dissolved contamination, resulting in contaminant concentrations in groundwater well above the MCLs. FDEP approved this document on January 10, 2002.

Concurrent with the preparation of the ICM Plan, a National Environmental Policy Act (NEPA) Environmental Checklist recommending a Categorical Exclusion was approved by DOE on December 19, 2001. The categorical exclusion of the Area A pilot test activity was approved based on the fact that the NAPL remediation of Area A was a small-scale, short-term cleanup action and the siting, construction, and operation of treatment facilities were temporary and pilot-scale in size. Additionally, activities of this nature were evaluated in the 1995 *Environmental Assessment* (EA) *of Corrective Action at the Northeast Site* (DOE 1995).

A NEPA Action Review was conducted for the interim measure source removal action at Area B in October of 2002. A summary of the review concluded that Area B remediation would impact an area of approximately 38,000 square ft. The footprint of the above-ground treatment system would be about 80 ft by 80 ft, and an estimated 84,000 gallons per day of groundwater would be processed over a 24-week period of operation. The proposed interim measure, although not specifically identified in the 1995 EA, was determined to be within the scope of the proposed actions. The remedial activity would occur within the same physical boundaries and address the

same contaminants identified in the EA, but in a more concentrated form. Because the EA provided for "design modifications to reflect technological advances or site-specific conditions," it was determined that the NAPL remediation of Area B was within the scope of the existing EA. However, this flexibility was not mentioned in the Finding of No Significant Impacts (FONSI) document signed in May 1995 (Glass 1995). Therefore, it was determined that the appropriate action under NEPA would require an amendment to the FONSI to include the broader scope of activities from the EA and any additional impacts from the NAPL removal action. The FONSI was amended, reviewed by the DOE-Idaho NEPA Planning Board, and approved by the DOE Grand Junction Office NEPA Compliance Officer on February 24, 2003.

Construction of the NAPL Area A treatment system began in late May 2002, and system startup occurred on September 26, 2002. NAPL treatment was completed on February 28, 2003. Three post-treatment sampling events occurred in March, May, and August 2003. Demobilization activities began in early March and were completed in September 2003. The *Northeast Site Area A NAPL Remediation Final Report* (DOE 2003b), describing thermal remediation of Area A, was sent to stakeholders on September 25, 2003.

At the end of February 2004, a contract was awarded for the remediation of NAPL Area B using the electro-thermal dynamic stripping process. Construction of the NAPL Area B treatment system began in July 2004 and was completed in early August 2005. Operations began on August 16, 2005, and were completed on June 12, 2006. Heating resumed in a focused area from July 19, 2006, until August 25, 2006, to address groundwater concentrations that exceeded remediation goals at two locations. The treatment system was permanently shut down on August 29, 2006. Approximately 18,000 pounds of contaminants were removed during operations. Confirmatory sampling activities were completed by the end of September 2006. The *Final Report Northeast Site Area B NAPL Remediation Project at the Young - Rainey STAR Center Largo, Pinellas County, Florida* (DOE 2007) describes Area B remediation.

Currently there is no ongoing remedial action at the Northeast Site. Monitoring wells have been installed at the former NAPL areas to monitor the remaining dissolved phase plumes.

1.3 WWNA/Building 200 Area

The WWNA/Building 200 Area includes the active Industrial Wastewater Neutralization Facility (IWNF), the area around Building 200, and the area south of the neutralization facility. The IWNF refers to the physical treatment facility that currently receives sanitary and industrial wastewater and has been in operation since 1957.

A CMS Report and CMIP were completed in 1997 for this SWMU because vinyl chloride (VC), trichloroethene (TCE), and arsenic were detected in surficial aquifer groundwater at concentrations above federal and state MCLs. The recommended remediation alternative for the WWNA/Building 200 Area was groundwater recovery with the Building 100 Area wells and an additional recovery well located in the WWNA. The CMIP recommended that recovered water from the additional well be discharged directly to the IWNF. This well was designed to withdraw surficial aquifer groundwater directly from the arsenic plume and thereby reduce the contaminant mass and prevent contaminant migration.

FDEP's response to the CMS/CMIP, concerning arsenic contamination in the upper 2 ft of soil, suggested that a treatment technology, air sparging, was eliminated too early. DOE then proposed a multi-phased Interim Action that included operating the recovery well for 6 months, then pulsing the system, as well as performing geochemical analyses and leaching studies of the site. On January 21, 1999, FDEP approved the proposed interim remedial action.

Additionally, EPA Region IV also approved the interim remedial action and concurred with FDEP's position regarding the arsenic contamination. EPA also requested an addendum or modification to the CMIP that would address DOE's final selection of the remediation technology and include a timeline for the completion of these activities.

In early June 1999, the WWNA recovery well commenced operation. All arsenic concentrations in water from the WWNA recovery well, PIN18−RW01, were below the STAR Center's daily maximum discharge standard for arsenic in wastewater of 0.20 milligrams per liter (mg/L) until shutdown.

Additional details concerning the impacts of groundwater extraction are reported in the WWNA/Building 200 Area CMIP Addendum (DOE 2000b). Modifications to the recovery of groundwater were proposed based on data collected through November 1999 and consisted of the installation of two new recovery wells screened at shallow intervals and the abandonment of RW01. The CMIP Addendum was submitted to the regulators and approved by FDEP and EPA in 2000. A Statement of Basis (DOE 2000a) was issued by DOE in late September 2000. This document provides a summary of environmental investigations and proposed cleanup alternatives for the WWNA/Building 200 Area. Part of DOE's proposed final action for the WWNA was to shut down the three extraction wells and begin a 1-year monitoring period. Verbal approval for this action was received from FDEP on December 20, 2005, and the wells were shut down that day. A No Further Action With Controls Proposal for the WWNA/ Building 200 Area was submitted to FDEP on March 14, 2007.

1.4 Site Update

Risk-Based Corrective Action (RBCA) rules are currently being evaluated for applicability to assist in expediting closure at some or all of the SWMUs at the STAR Center. Technical discussions regarding RBCA as the proposed final action continued between FDEP and DOE. Additionally, DOE is currently evaluating remediation alternatives for the Building 100 Area in light of the RBCA rules.

Part of the evaluation of remediation alternatives for the Building 100 Area involves the development and application of three numerical models that were used to project the spatial extent and potential future disposition of VOCs in groundwater beneath and near the Building 100 Area. This evaluation is ongoing and should be completed in early 2008.

Pinellas County is planning a major road construction effort along Bryan Dairy and Belcher Roads that will begin in late 2008. DOE is evaluating the effect, if any, that the Building 100 Area groundwater plume might have upon road construction activities along the east and south sides of the STAR Center. Seven small-diameter monitoring well pairs were installed in October along the southeast part of the STAR Center. Four well pairs were placed along Bryan Dairy Road and three well pairs were placed along Belcher Road. These well pairs consist of small-

diameter wells with one well screened from 10−20 ft and another well screened from 20 to 30 ft below land surface (bls). In December, a third small-diameter well will be added at each location and will be screened from 30 to 40 ft bls or to top of the Hawthorn, which ever comes first. Additional soil borings and groundwater monitoring wells are being installed in December 2007 and January 2008 to further assess the composition of the sediments and the quality of the groundwater in those areas.

Groundwater samples from a few wells in a recently remediated area at the Northeast Site continue to show high concentrations of NAPL compounds. Soil borings are being planned for early 2008 to delineate the area around each hot spot that may still contain NAPL at high concentrations. Once the areas have been delineated, treatment technologies will be evaluated and one chosen that will be implemented to treat the hot spot area.

1.5 Site Activities

- Water-level measurements were obtained from all accessible monitoring wells, recovery wells, and ponds on September 11, 2007.
- The semiannual sampling event was conducted in September 2007. The sampling event included collecting water samples from 105 monitoring and former recovery wells.
- The results of the semiannual sampling event were reported (this document).

2.0 Water-Level Elevations

2.1 Work Conducted and Methods

On June 8, 2007, and September 11, 2007, depth-to-water measurements were taken at all accessible monitoring wells, former extraction wells, and ponds at the STAR Center and two offsite ponds. The water levels were measured with an electronic water-level indicator or directly from a staff gauge. Groundwater elevations are listed in Table 1.

2.2 Groundwater Flow

Groundwater and surface-water elevations were used to construct sitewide groundwater contour maps of the shallow and deep surficial aquifers for the June data (Plates 1 and 2, respectively) and the September data (Plates 3 and 4, respectively). Individual contour maps were also constructed for the shallow and deep surficial aquifers at the Northeast Site and the Building 100 Area (Figure 3 through Figure 10).

Previously, water levels throughout the STAR Center indicated that the water table was highest in the general area around the West Pond. As groundwater flowed from this discharge area, it dispersed to the west, south, and east. A new pattern was observed in the shallow surficial aquifer around the West Pond and Pond 5 in September 2006, and this new pattern was observed again in both June and September 2007. As shown on Plates 1 and 2, the West Pond and Pond 5 now act as recharge points for the surficial aquifer. During recent construction activities at the site, the West Pond was cleaned out, Pond 5 was excavated, and the two ponds were connected by an underground pipe. This construction work seems to have changed the flow pattern in this

area of the site to what we observe now. The flow pattern in the deep surficial aquifer is consistent with previously observed flow patterns.

At the Northeast Site, a return to the natural flow pattern of flow generally to the east was again observed in June and September 2007 following the completion of NAPL remediation in August 2006. Along the northern boundary of the Northeast Site, the contours near the slurry wall for the past several years have indicated that the wall has been a significant barrier to groundwater flow. This pattern was observed again in June and September 2007. As shown in Figure 4 and Figure 6, in June there was a differential of 0.60 ft, and in September there was a differential of 0.57 ft, between the downgradient and upgradient sides of the wall as measured in monitoring wells PIN15−M24D and −M33D, respectively. This differential is less than the historical range of about 2 to 5 ft, but it is consistent with the differentials observed during the past 2 years. Water-table elevations indicate that the East Pond acted as a discharge point for the shallow surficial aquifer in June and September 2007 (Figure 3 and Figure 5).

In the shallow surficial aquifer at the Northeast Site, the hydraulic gradient was about 0.003 feet per foot (ft/ft), with flow toward the east (Plates 1 and 3). Calculations using Darcy's Law, along with approximations of 1 ft/day for hydraulic conductivity and 0.3 for effective porosity, indicate that groundwater at the Northeast Site is estimated to move about 3 to 4 ft/year. This velocity is less than the historical estimates of 17 to 22 ft/year but consistent with the velocities observed since March 2006. Similar flow patterns were observed in the deep surficial aquifer (Plates 2 and 4).

At the WWNA, there was a radial flow in all directions, which came from a small groundwater mound in the surficial aquifer. This flow pattern is consistent with that observed the previous 2 years.

At Building 100, the surficial aquifer is no longer influenced by groundwater withdrawals from recovery wells PIN12−RW01 and –RW02 which were shut off in August 2006. For the past 5 years, shallow groundwater beneath Building 100 has been observed to flow to the southeast under a very slight gradient. This flow pattern was observed again in June and September 2007. The hydraulic gradient at the Building 100 Area was about 0.001 ft/ft. Using the approximations mentioned above, groundwater flow velocity in this area is estimated to be less than 2 ft/year.

Water-level elevations in the three wells screened in the upper part of the Floridan aquifer are presented in Table 2. The water levels in these wells indicate that the potentiometric surface of the Floridan aquifer at the site was at least 0.5 ft lower in June 2007 than in September 2007.

Surface-water elevations were recorded from the East, South, Southwest, and West Ponds, Pond 5, the pond immediately north of the 4.5 Acre Site, and the pond just east of Belcher Road, and they are presented in Table 3. All the ponds are hydraulically connected to the shallow surficial aquifer system (Plates 1 and 3).

3.0 Groundwater Sampling and Analytical Results

3.1 Work Performed

During annual sampling in March 2007, groundwater samples were collected from 119 monitoring and former recovery wells. VOCs analyses were performed on 77 samples using EPA method SW-846 8260B. Arsenic was analyzed in 13 samples, and aluminum, iron, and manganese were analyzed in 54 samples using EPA method SW-846 6010B. Laboratory reports are provided in Appendix A.

Four samples were also collected for dissolved gases and microbial analyses (Table 4). The dissolved gases are ethene, ethane, and methane. The microbiological analysis is for *Dehalococcoides ethenogenes.*

All samples were collected in accordance with the Stoller *Sampling Procedures for the Young - Rainey STAR Center and 4.5 Acre Site* (DOE 2006a), using FDEP procedures. All samples were submitted to TestAmerica, Tampa, Florida, for analysis. TestAmerica, Tampa, Florida, is accredited by the Florida Department of Health in accordance with the National Environmental Laboratory Accreditation Conference (certification number E84282). All monitoring wells were micropurged using a dedicated bladder pump, and sampling was performed when the field measurements stabilized. Table 5 lists field measurements of pH, specific conductance, dissolved oxygen, oxidation-reduction potential, turbidity, and temperature recorded at the time the samples were collected. Measurements were made with a flow cell and a multiparameter instrument.

3.2 Analytical Results

3.2.1 Northeast Site (PIN15)

Concentrations of contaminants of potential concern (COPCs) in samples collected from wells at the Northeast Site (PIN15) are presented in Table 6, which, for comparison purposes, also shows the previous year of data. Figure 11 shows the total COPCs (TCOPCs) concentrations. The highest TCOPCs concentration− 11,900 micrograms per liter (µg/L)—was measured in well PIN15−0587. Table 7 shows the results of arsenic sampling at four Northeast Site wells. Arsenic concentrations ranged from 0.018 to 0.075 mg/L, with the highest value detected in well PIN15−M03S.

As described in the Annual Monitoring Plan (DOE 2006b), special sampling was conducted at the Northeast Site during this sampling event to determine the aluminum, iron, and manganese concentrations remaining following NAPL remediation. All Northeast Site monitoring wells were sampled and analyzed for aluminum, iron, and manganese using EPA Method 6010B. The results demonstrated that iron and aluminum concentrations exceeded Cleanup Target Levels (CTL) at several locations and manganese concentrations did not exceed the CTL (Table 8).

3.2.2 Building 100 Area (PIN06, PIN09, PIN10, PIN12, and PIN21)

TCOPCs concentrations in samples collected from wells at the Building 100 Area are included in Table 9, which, for comparison purposes, also shows the previous year of data. Figure 12 shows

the TCOPCs concentrations, the highest of which was measured in well S35B at 34,190 µg/L. Table 7 shows the results of arsenic sampling in the Building 100 Area. The highest arsenic concentration, 0.060 mg/L, was measured in well S68B.

3.3 Quality Assurance/Quality Control

The results from the analytical laboratory, Severn-Trent Laboratories, were checked for quality assurance/quality control (QA/QC) through duplicate samples and trip blanks. Detected analytes for each duplicate sample collected from the STAR Center are listed in Table 10. The duplicate sample results were compared and the relative percent differences (RPDs) between the results were calculated. Sample PIN12−0524 had an RPD value of 57 percent for 1,1-dichloroethene (DCE) and sample PIN15−0568 had an RPD value of 63 percent for aluminum. All other data passed QA/QC criteria at a Class A level, indicating that the data may be used for quantitative and qualitative purposes.

As specified in the *Sampling Procedures for the Young - Rainey STAR Center and 4.5 Acre Site* (DOE 2006a), duplicate samples should be collected at a frequency of one duplicate for every 20 or fewer samples. For the STAR Center and the 4.5 Acre Site, there were 160 groundwater samples collected, with 8 duplicate samples collected. The duplicate requirements for this sampling event were nearly met. There were 10 trip blanks collected during this event.

A data validation software module for identifying and tracking anomalous groundwater data points within the SEEPro database was used to generate a report of analytical results that fall outside of historical minimum or maximum values. The manganese result for location PIN15−M03S was identified as a potential outlier. There is no evidence of laboratory errors and the data for this report identification number are acceptable as qualified. No other anomalous data were identified for this sampling event.

4.0 Data Interpretation

The purpose of this data-interpretation section is to aid in the evaluation of plume stability. Time-versus-concentration plots were generated to aid in the interpretation.

While most of the previous documents for the Pinellas site have compared groundwater contaminant concentrations to drinking water standards (i.e., MCLs), those standards are not the applicable default CTLs for the purpose of evaluating site remediation under RBCA. Based on a comprehensive review of background data for the site (DOE 2003a), it has been determined that aluminum and iron levels in the shallow groundwater in the site vicinity are naturally elevated and far exceed State of Florida Secondary Drinking Water Standards (Chapter 62-550, Florida Administrative Code [F.A.C.]). Specifically, the average background concentration of 1.1 mg/L for aluminum exceeds the 0.2 mg/L secondary standard, and the average background concentration for iron (9.3 mg/L) exceeds the 0.3 mg/L secondary standard. The ambient shallow groundwater in the area is therefore designated as “poor quality” as defined in 62-780.200 (35), F.A.C. Thus, the applicable groundwater CTLs are those for groundwater of “low yield/poor quality” provided in Table 1 of Chapter 62-777, F.A.C. In essence, these CTL values are a factor of 10 higher than the MCL values.

4.1 Contaminant Concentration Trends

Monitoring well PIN15–0569 was chosen to evaluate plume stability at the Northeast Site. Well PIN15−0569 is located near the leading edge of the contaminant plume at the Northeast Site (Figure 11). The VC concentration in this well shows an overall decreasing concentration trend (Figure 13), indicating a stable or shrinking contaminant plume in the vicinity of this well.

Monitoring wells PIN21–0512 and PIN12–S73C were chosen to evaluate plume stability at the Building 100 Area because they are the monitoring wells nearest the property boundaries. Well 0512 lies along the southern boundary of the STAR Center and well S73C lies along the eastern boundary (Figure 12). Figure 14 illustrates the VC concentration over time in well 0512, and Figure 15 shows the VC concentration in well S73C. Well 0512 shows a relatively consistent VC concentration trend (considering the inherent sampling and analytical variability of low concentrations), with concentrations ranging between 0.3 and 14 µg/L since November 1998. Well S73C shows a decreasing VC concentration trend from 2002 to late 2003, followed by a stable trend since that time. These stable and decreasing concentration trends indicate a stable or shrinking contaminant plume near the property boundaries.

In October 2007, 14 new monitoring wells were installed along the south and east property boundaries in the Building 100 Area. The purpose of these wells was to further define the extent of the contaminant plume at the property boundary in preparation for road construction work by Pinellas County. VC was the only contaminant found above the CTL in these wells, and the revised VC plume is shown in Figure 16.

Figure 17 shows the TCE, cis-1,2-DCE, trans-1,2-DCE, and VC concentrations in well PIN12−0524, located near the southeast corner of Building 100. The concentration trends in this well suggest that a localized slug of TCE, DCE, and VC is moving through the aquifer. The concentration trends in well 0524, particularly the significant TCE decrease, indicate that the slug is nearly past the well.

4.2 Geochemical Parameters

Geochemical parameters measured in the field in all wells at the STAR Center during September 2007 are summarized in Table 5. Generally, conditions across the STAR Center are reducing as evidenced by the low values of dissolved oxygen and oxygen reduction potential.

5.0 Tasks to be Performed Semiannually

The following tasks are expected to be conducted during the next semiannual period (December 2007 through May 2008):

- The collection of soil samples from 11 soil borings along the southern edge of the STAR Center adjacent to Bryan Dairy Road.
- The installation of 18 small-diameter monitoring wells at six locations (triplets with screens from 10−20 ft, 20−30 ft, and 30−40 ft bgs off the STAR Center property. Three

locations each will be located on the opposite side from the STAR Center along Bryan Dairy and Belcher roads, respectively.

- The collection of soil samples from up to 45 soil borings around three hot-spot areas at the Northeast Site.
- The semiannual sampling and analysis of groundwater in March 2008.
- The collection of water level measurements in March 2008.
- The continuing utilization of dedicated bladder pumps for semiannual sampling using the micropurging technique.

6.0 References

DOE (U.S. Department of Energy), 1986. *Old Drum Storage Pad Closure Certification*, U.S. Department of Energy, Pinellas Plant, Largo, Florida.

DOE (U.S. Department of Energy), 1987a. *Draft Environmental Survey Sampling and Analysis Plan for the Pinellas Plant, Largo, Florida*, U.S. Department of Energy, Office of Environmental Audit, July 24.

DOE (U.S. Department of Energy), 1987b. *Phase 1. Installation Assessment Pinellas Plant*, Draft, Comprehensive Environmental Assessment and Response Program, U.S. Department of Energy, Albuquerque Field Office, Albuquerque, New Mexico, June.

DOE (U.S. Department of Energy), 1991. *Environmental Restoration Program, RCRA Facility Investigation Report, Pinellas Plant* [DRAFT]. U.S. Department of Energy, Albuquerque Operations Office, Albuquerque, New Mexico. September.

DOE (U.S. Department of Energy), 1994a. *Corrective Measures Study Report, Industrial Drain Leaks – Building 100 Area and Old Drum Storage Site*, Draft, Revision 0, Pinellas Plant, Largo, Florida, Environmental Restoration Program, Albuquerque Field Office, Albuquerque, New Mexico.

DOE (U.S. Department of Energy), 1994b. *Statement of Basis for Twelve Solid Waste Management Units Recommended for No Further Action*, U.S. Department of Energy, Pinellas Plant, Largo, Florida, January.

DOE (U.S. Department of Energy), 1995. *Environmental Assessment of Corrective Action at the Northeast Site* [DRAFT]. U.S. Department of Energy, Albuquerque Operations Office, Albuquerque, New Mexico, February.

DOE (U.S. Department of Energy), 1996a. *Building 100 Area Corrective Measures Implementation Plan*, Draft, Pinellas Plant, Largo, Florida, Environmental Restoration Program, January.

DOE (U.S. Department of Energy), 1996b. *Northeast Site Interim Measures Quarterly Progress Report*, U.S. Department of Energy, January.

DOE (U.S. Department of Energy), 1997. *Pinellas Plant Environmental Baseline Report*, prepared by Lockheed Martin Specialty Components, Inc. for U.S. Department of Energy, Pinellas Area Office, June.

DOE (U.S. Department of Energy), 1998. *Building 100 Area Corrective Measures Implementation Plan Addendum*, Pinellas STAR Center, Largo, Florida, February.

DOE (U.S. Department of Energy), 2000a. *Statement of Basis Wastewater Neutralization Area/Building 200 Area*, MAC−PIN 12.3.1, prepared by MACTEC−ERS, Grand Junction, Colorado, for U.S. Department of Energy, September.

DOE (U.S. Department of Energy), 2000b. *Wastewater Neutralization Area/Building 200 Area Corrective Measures Implementation Plan Addendum*, prepared by MACTEC−ERS, Grand Junction, Colorado for U.S. Department of Energy, January.

DOE (U.S. Department of Energy), 2001. *Building 100 Area Remediation Technology Screening Report*, GJO−2001−248−TAR, U.S. Department of Energy Grand Junction Office, Grand Junction, Colorado, August.

DOE (U.S. Department of Energy), 2003a. *Historical Review and Evaluation of Contaminants of Potential Concern*, GJO-2002-359-TAC, February.

DOE (U.S. Department of Energy), 2003b. *Northeast Site Area A NAPL Remediation Final Report*, GJO−2003−482−TAC, prepared by U.S. Department of Energy Grand Junction Office, Grand Junction, Colorado, September.

DOE (U.S. Department of Energy), 2006a. *Pinellas Environmental Restoration Project Sampling Procedures for the Young - Rainey STAR Center and 4.5 Acre Site,* DOE-LM/GJ1159-2006, prepared by U.S. Department of Energy Office of Legacy Management, Grand Junction, Colorado, April.

DOE (U.S. Department of Energy) 2006b. *Young - Rainey STAR Center and 4.5 Acre Site Annual Monitoring Plan for Fiscal Year 2007*, DOE−LM/1310−2006, September.

EMC, 1989. *Conceptual Design Report to Upgrade the Existing Drain System, U.S. Department of Energy, Pinellas Plant*, prepared by EMC Engineers, Inc., for General Electric Company, Neutron Devices Department, Pinellas Plant, Pinellas County, Largo, Florida, June.

EPA (U.S. Environmental Protection Agency), 1988. *RCRA Facility Assessment Department of Energy - Fl6 890 090 008*, June.

EPA (U.S. Environmental Protection Agency), 1992. Letter to DOE, Gerald W. Johnson, Approval of Pinellas Site Remedial Facility Investigation Report. April.

Glass, R.E., 1995. Letter from R.E. Glass, U.S. Department of Energy, Pinellas Area Office, Largo, Florida, to B. Twining, U.S. Department of Energy, Albuquerque Operations Office, Albuquerque, New Mexico, May 19, 1995.

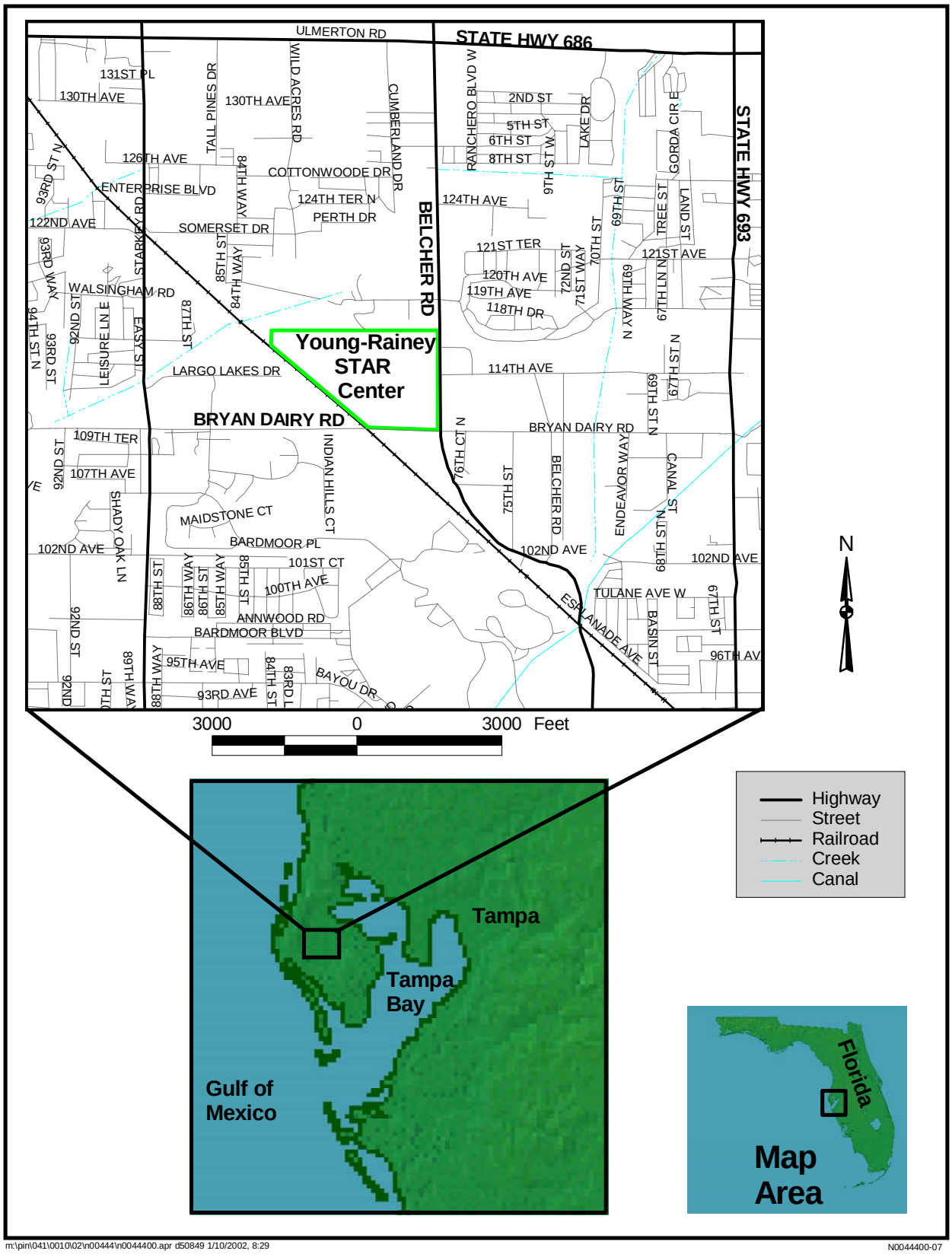


Figure 1. Young - Rainey STAR Center Location

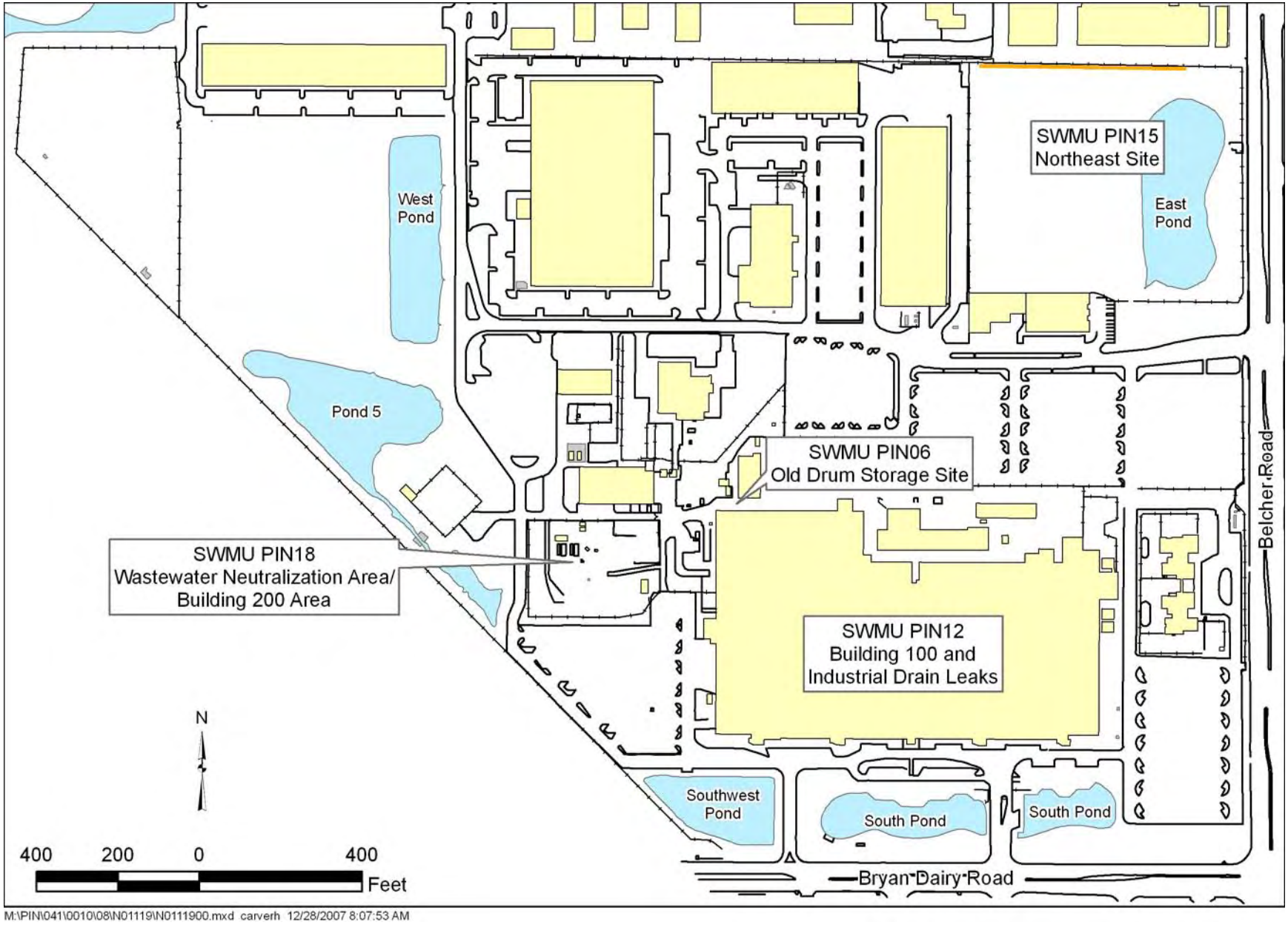


Figure 2. Location of STAR Center Solid Waste Management Units (SWMUs)

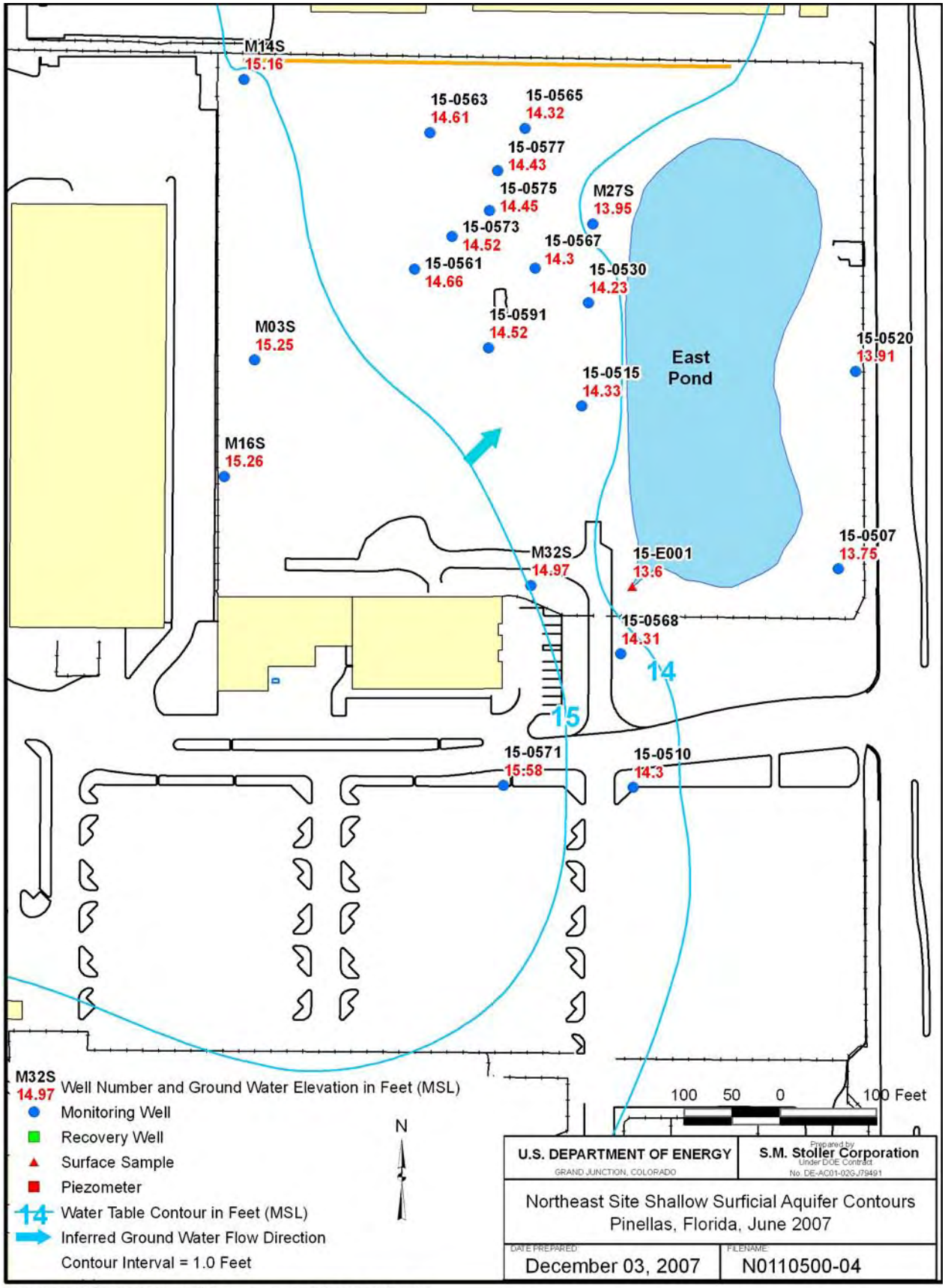


Figure 3. Groundwater Elevations and Shallow Surficial Aquifer Flow, Northeast Site, June 2007

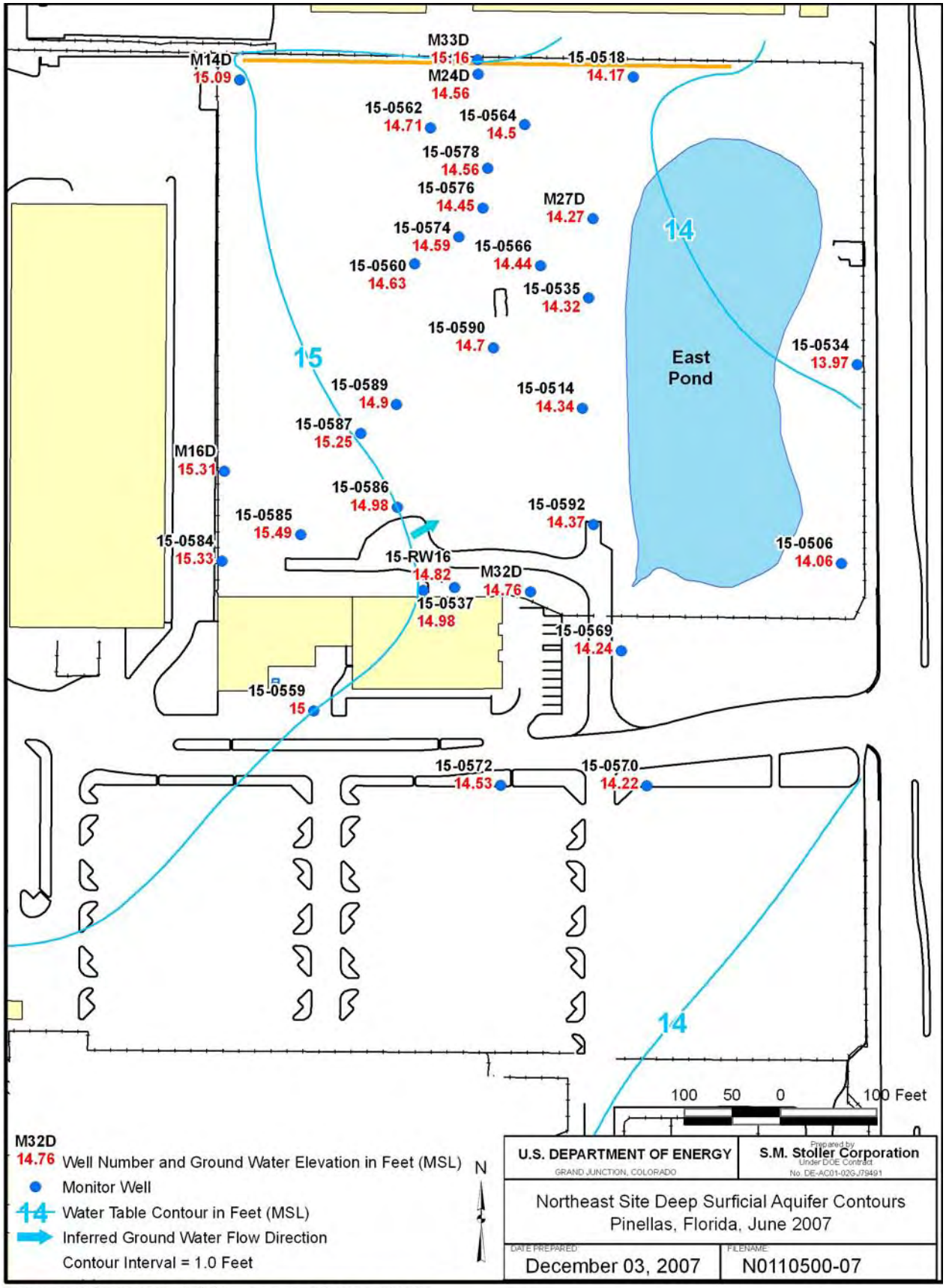


Figure 4. Groundwater Elevations and Deep Surficial Aquifer Flow, Northeast Site, June 2007

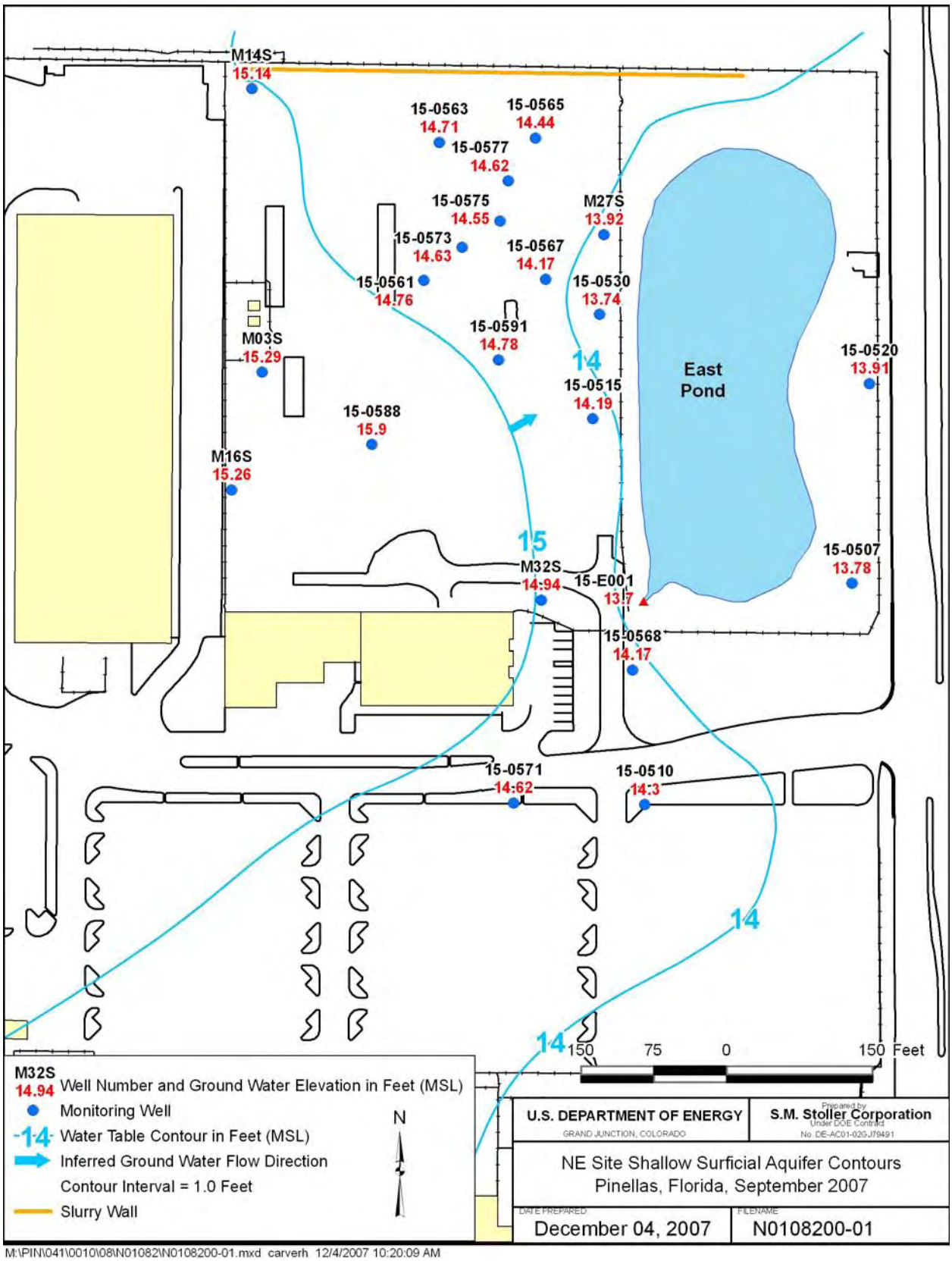


Figure 5. Groundwater Elevations and Shallow Surficial Aquifer Flow, Northeast Site, September 2007

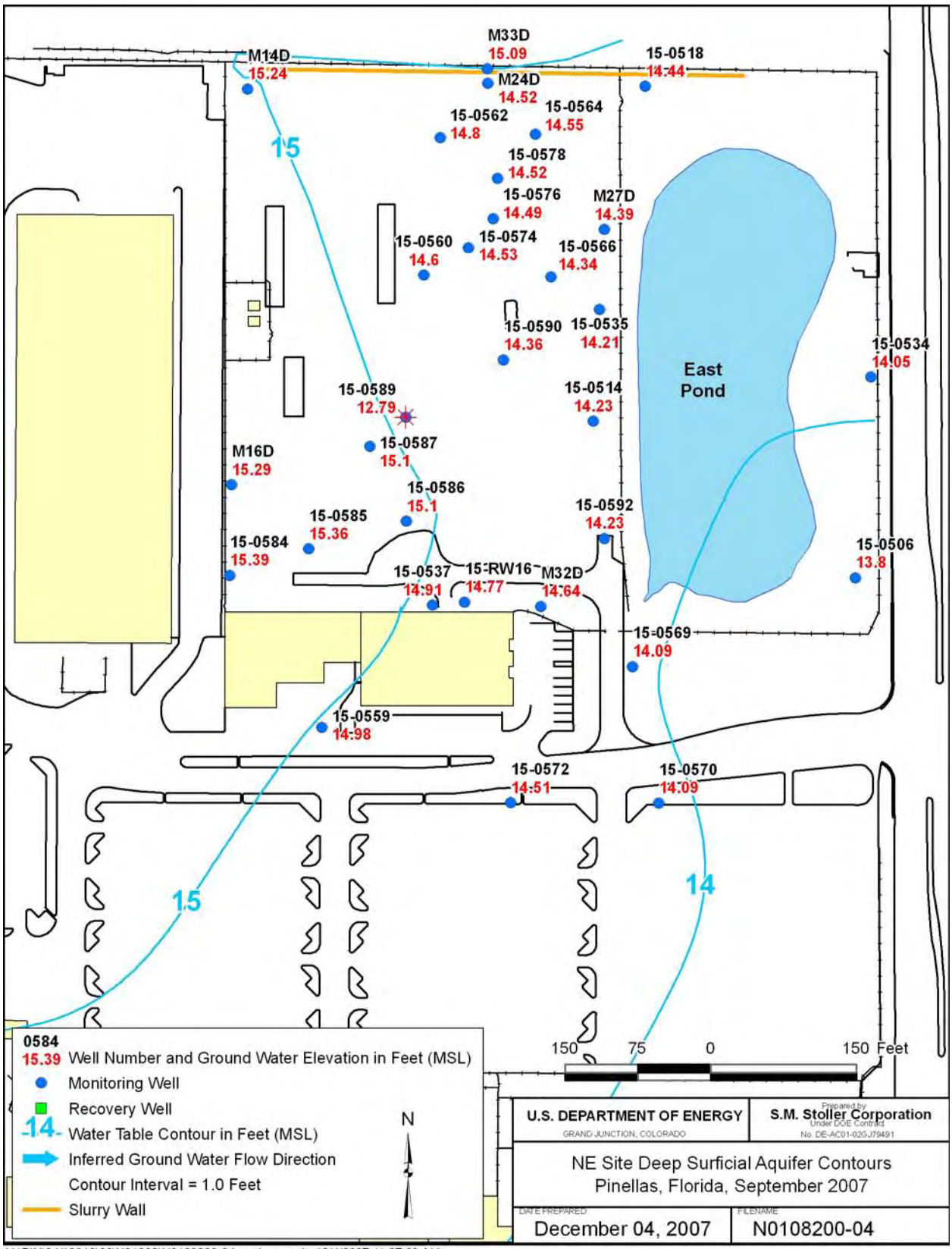


Figure 6. Groundwater Elevations and Deep Surficial Aquifer Flow, Northeast Site, September 2007

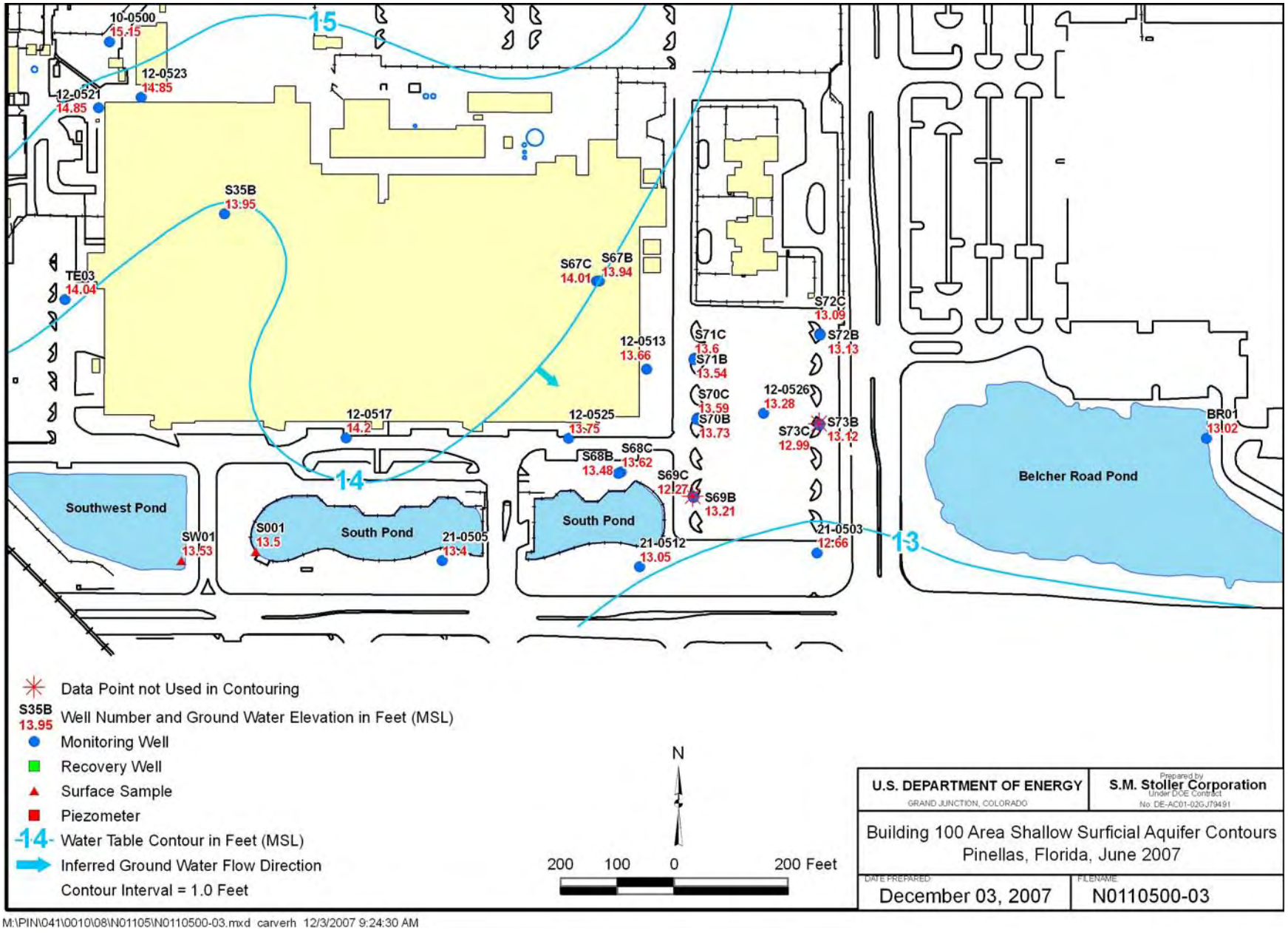


Figure 7. Groundwater Elevations and Shallow Surficial Aquifer Flow, Building 100 Area, June 2007

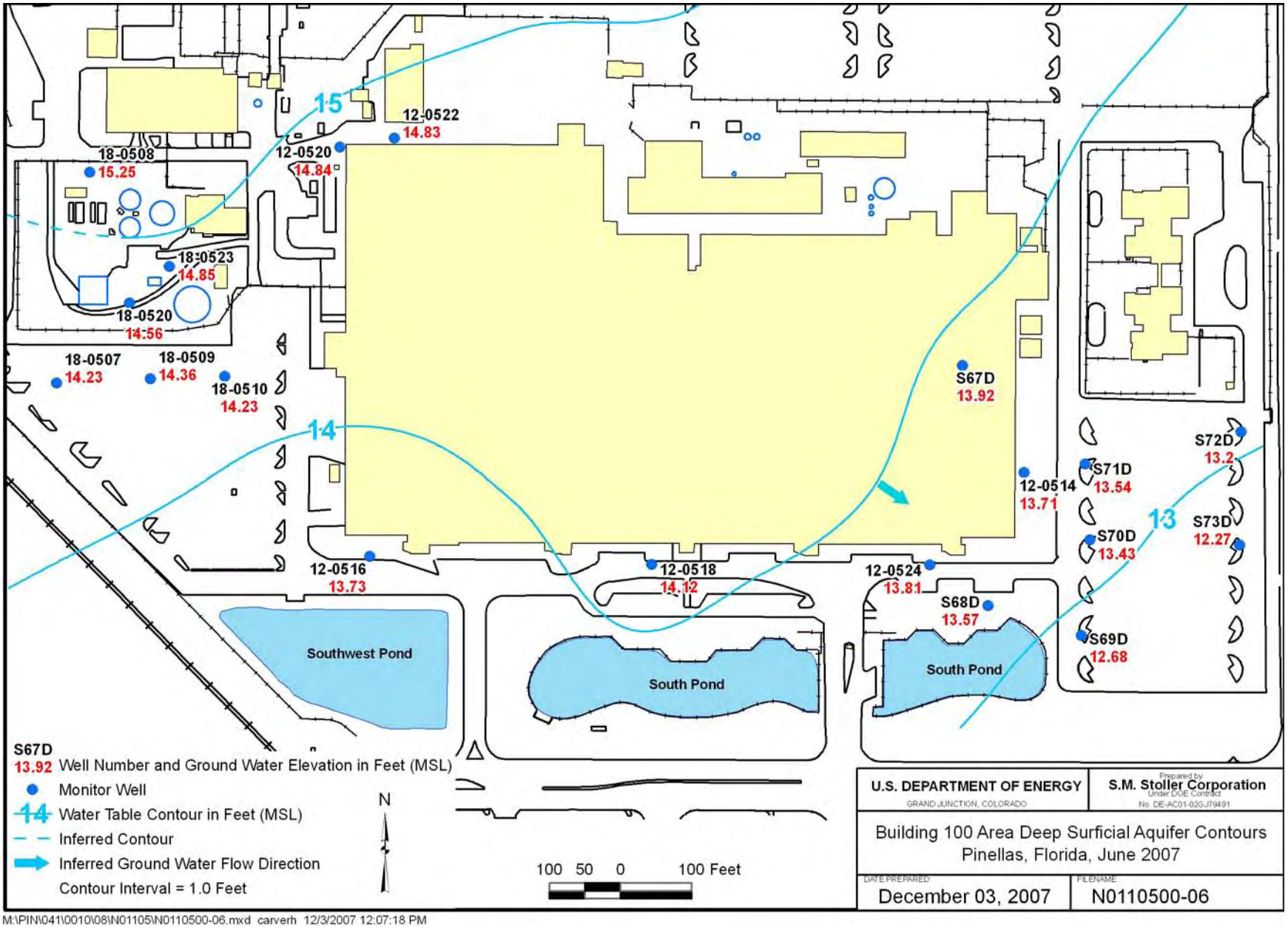


Figure 8. Groundwater Elevations and Deep Surficial Aquifer Flow, Building 100 Area, June 2007

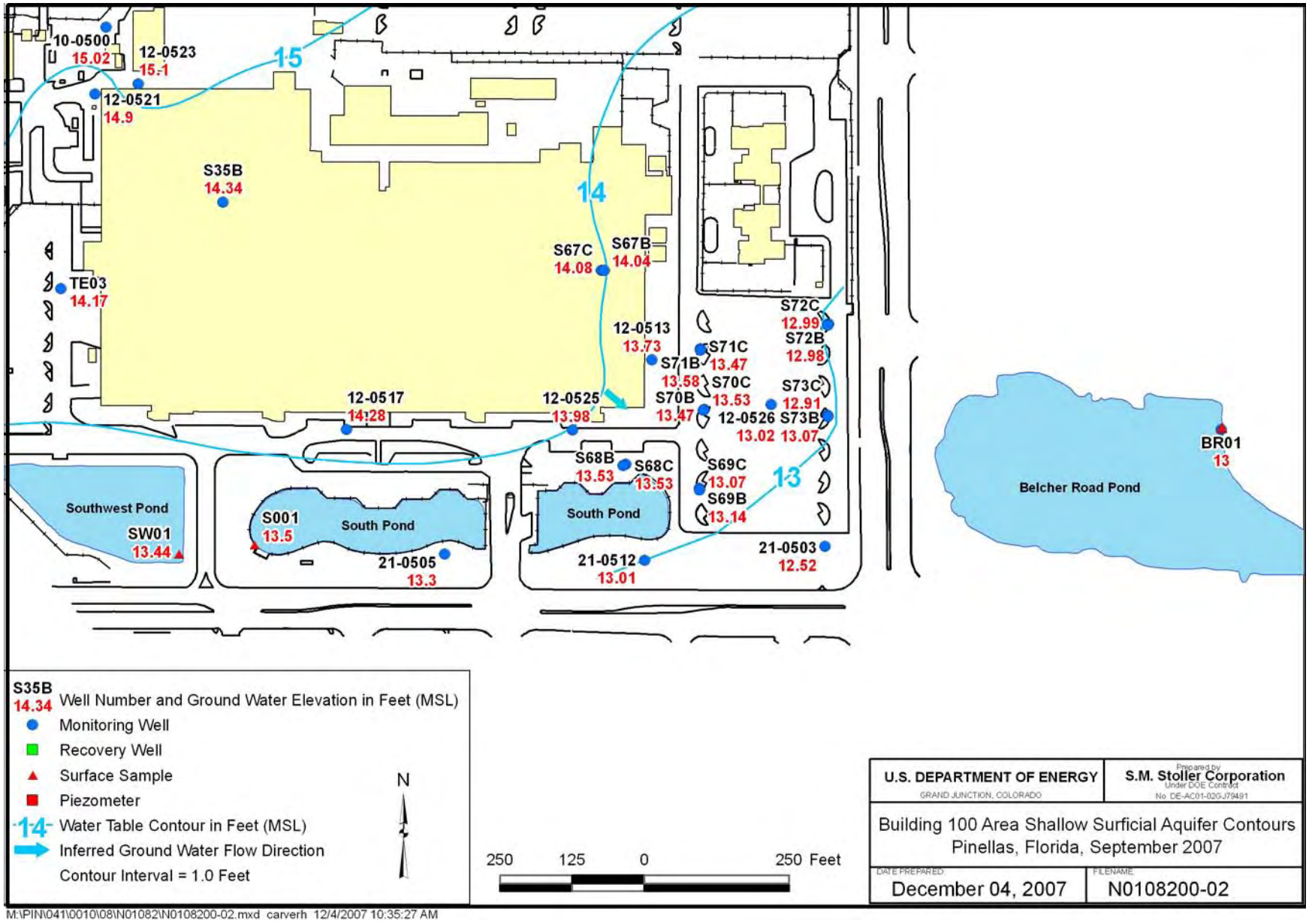


Figure 9. Groundwater Elevations and Shallow Surficial Aquifer Flow, Building 100 Area, September 2007

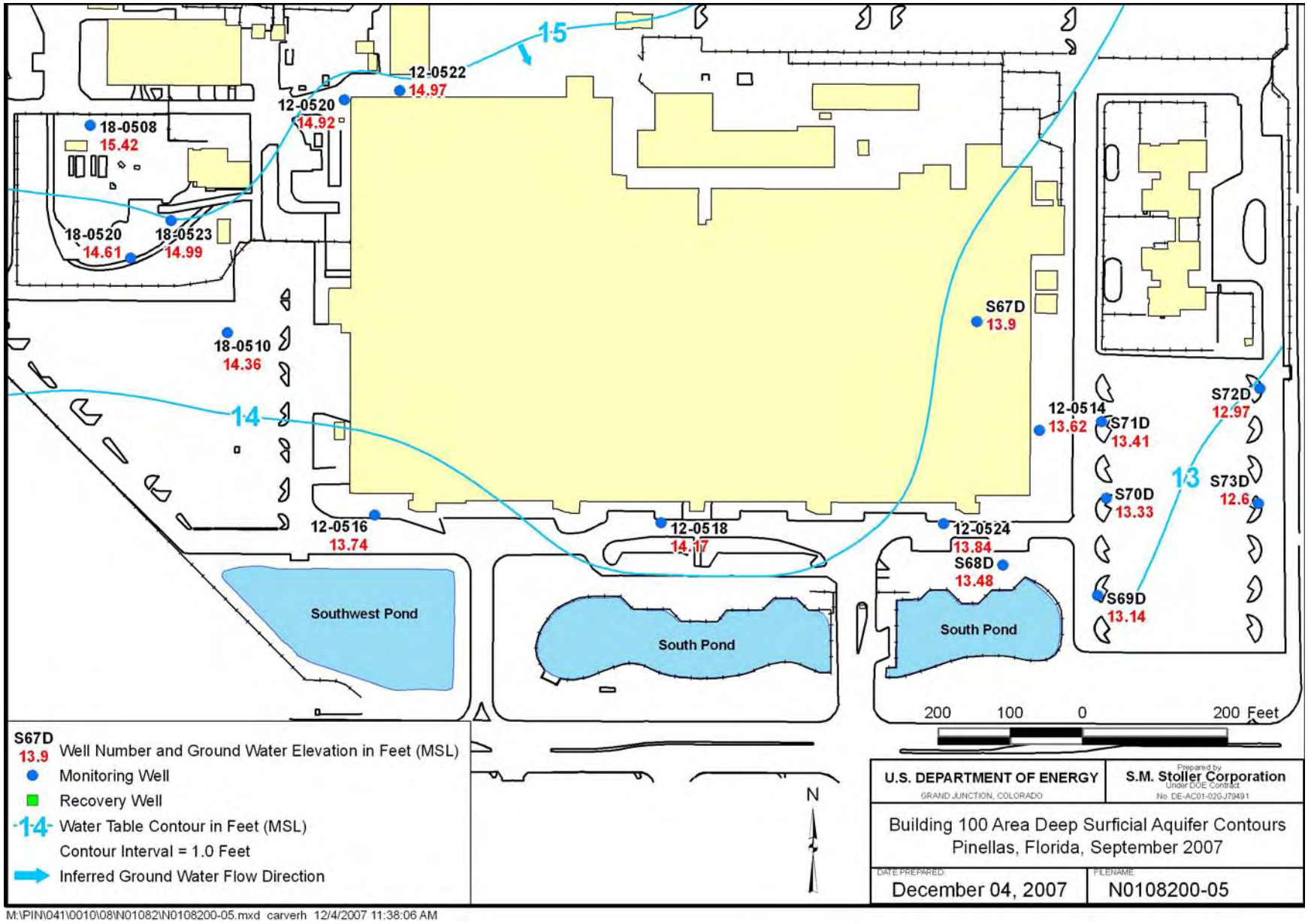


Figure 10. Groundwater Elevations and Deep Surficial Aquifer Flow, Building 100 Area, September 2007

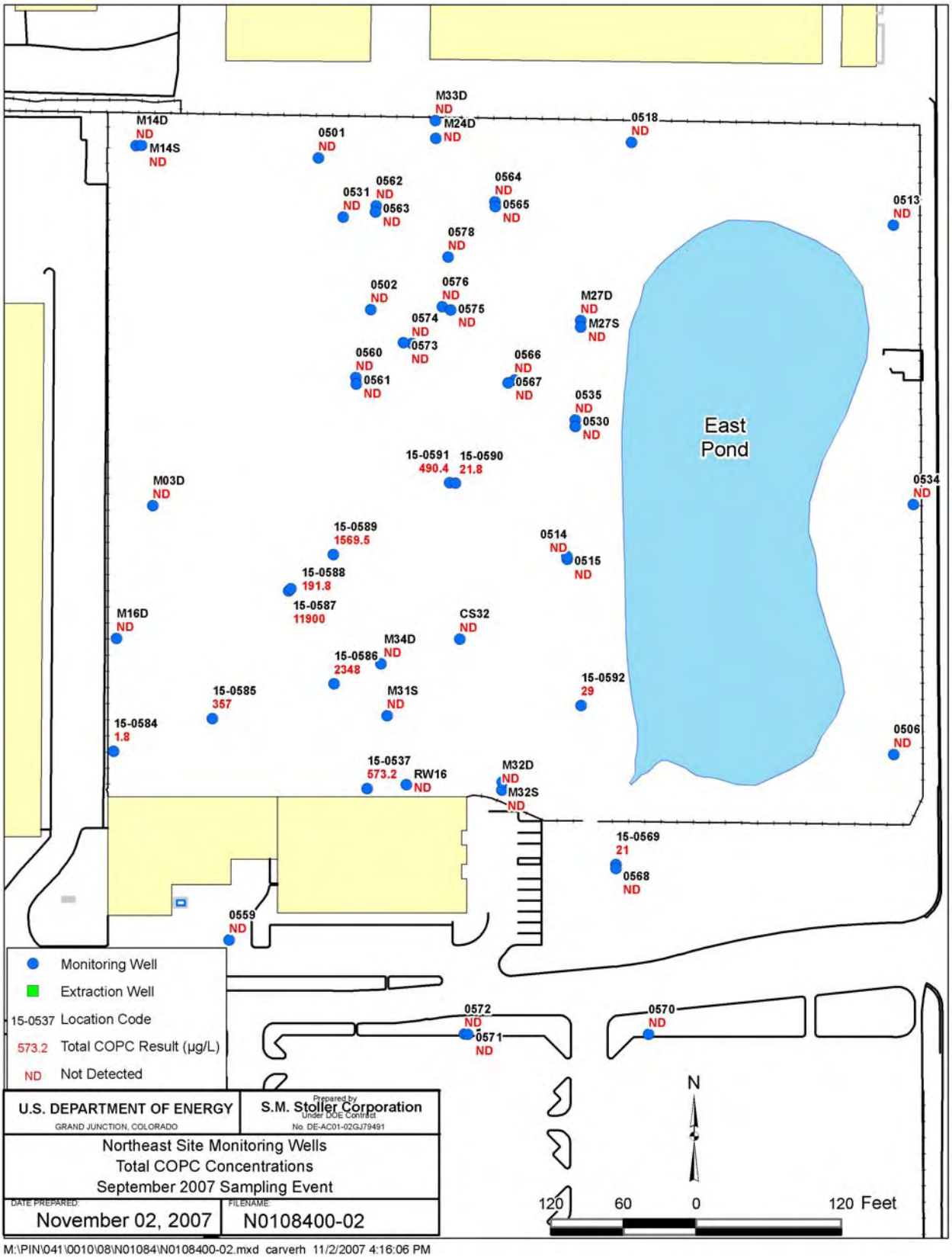


Figure 11. Northeast Site Total COPC Concentrations September 2007 Sampling Event

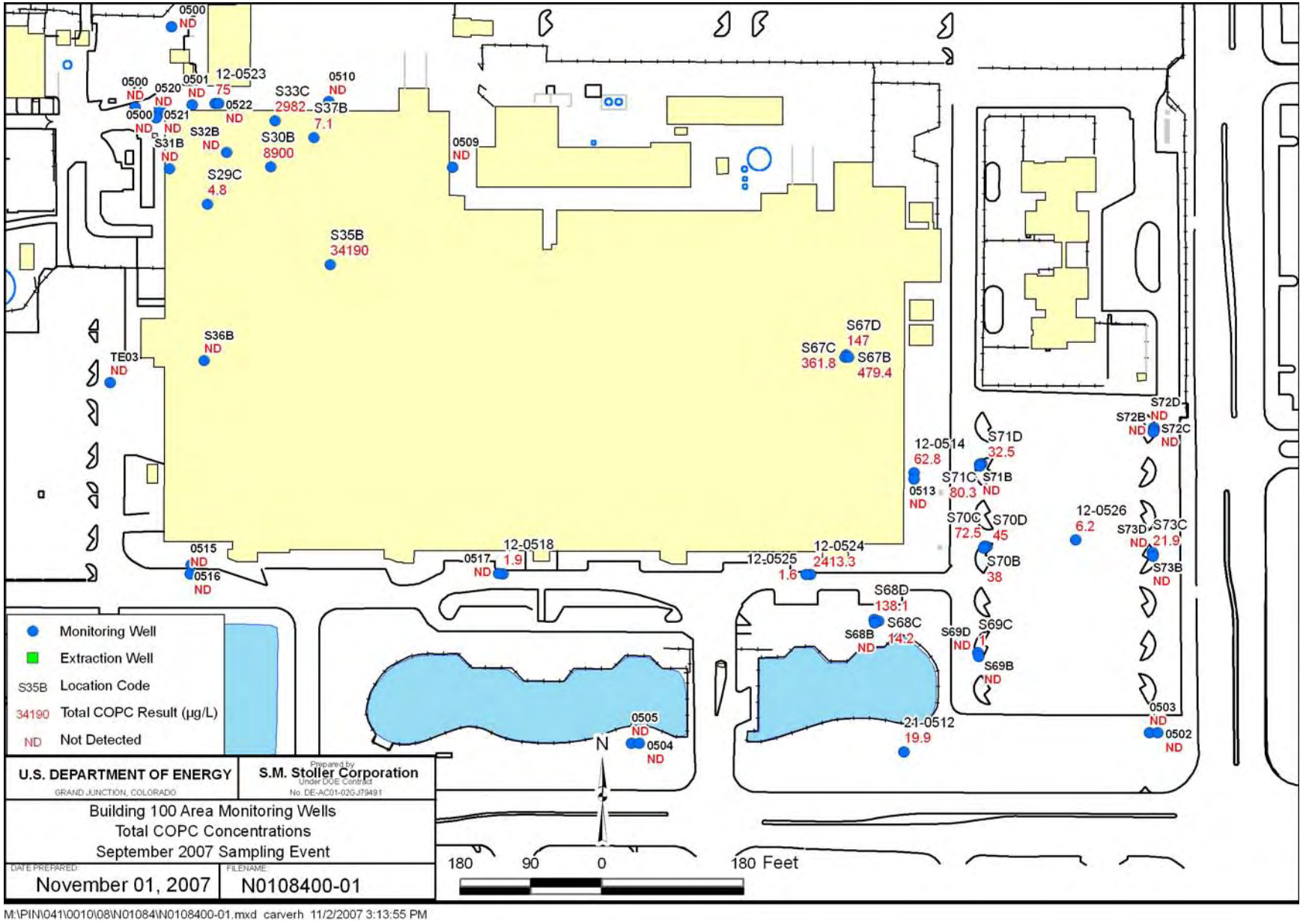


Figure 12. Building 100 Area Total COPC Concentrations September 2007 Sampling Event

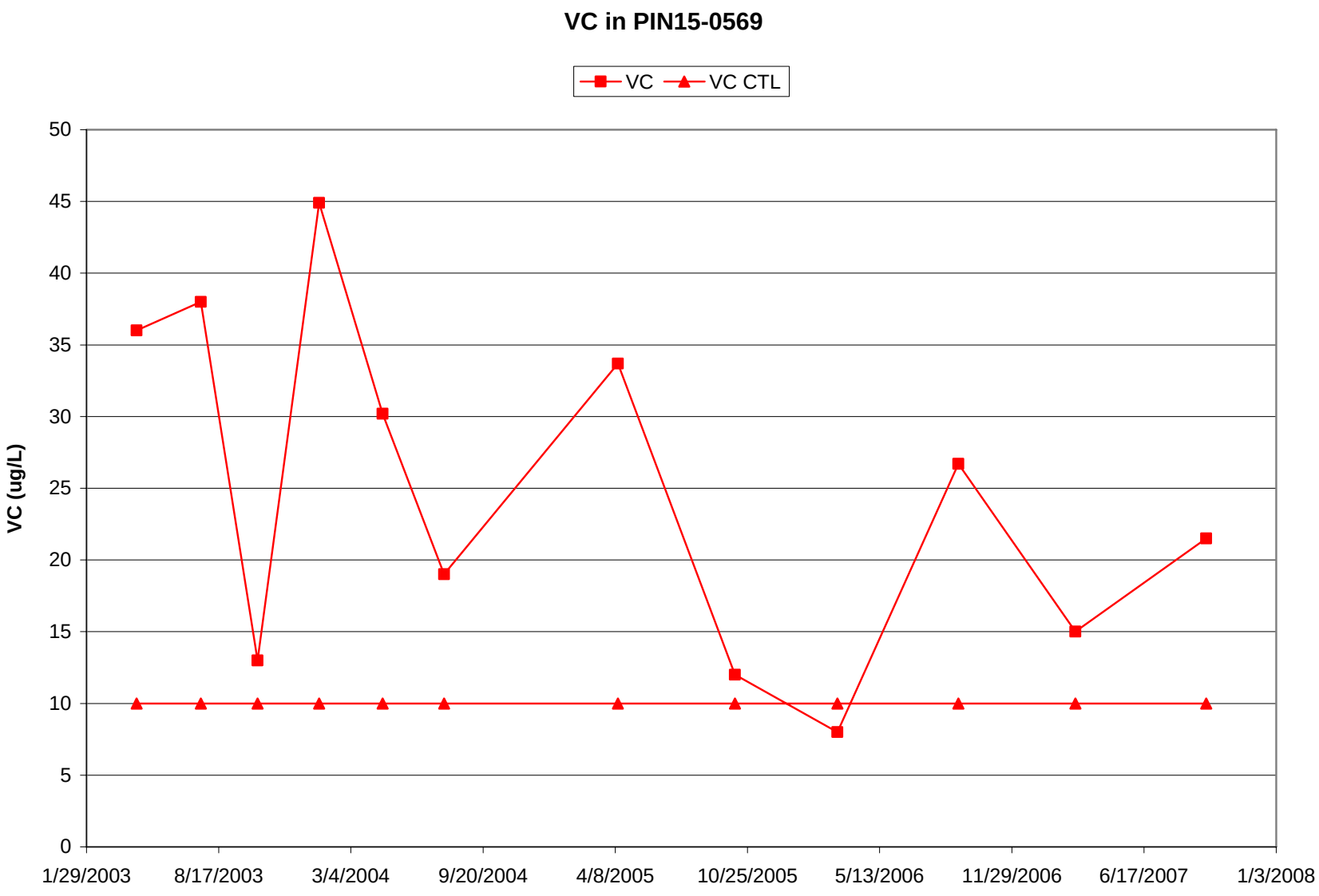


Figure 13. VC in PIN15−0569, Northeast Site

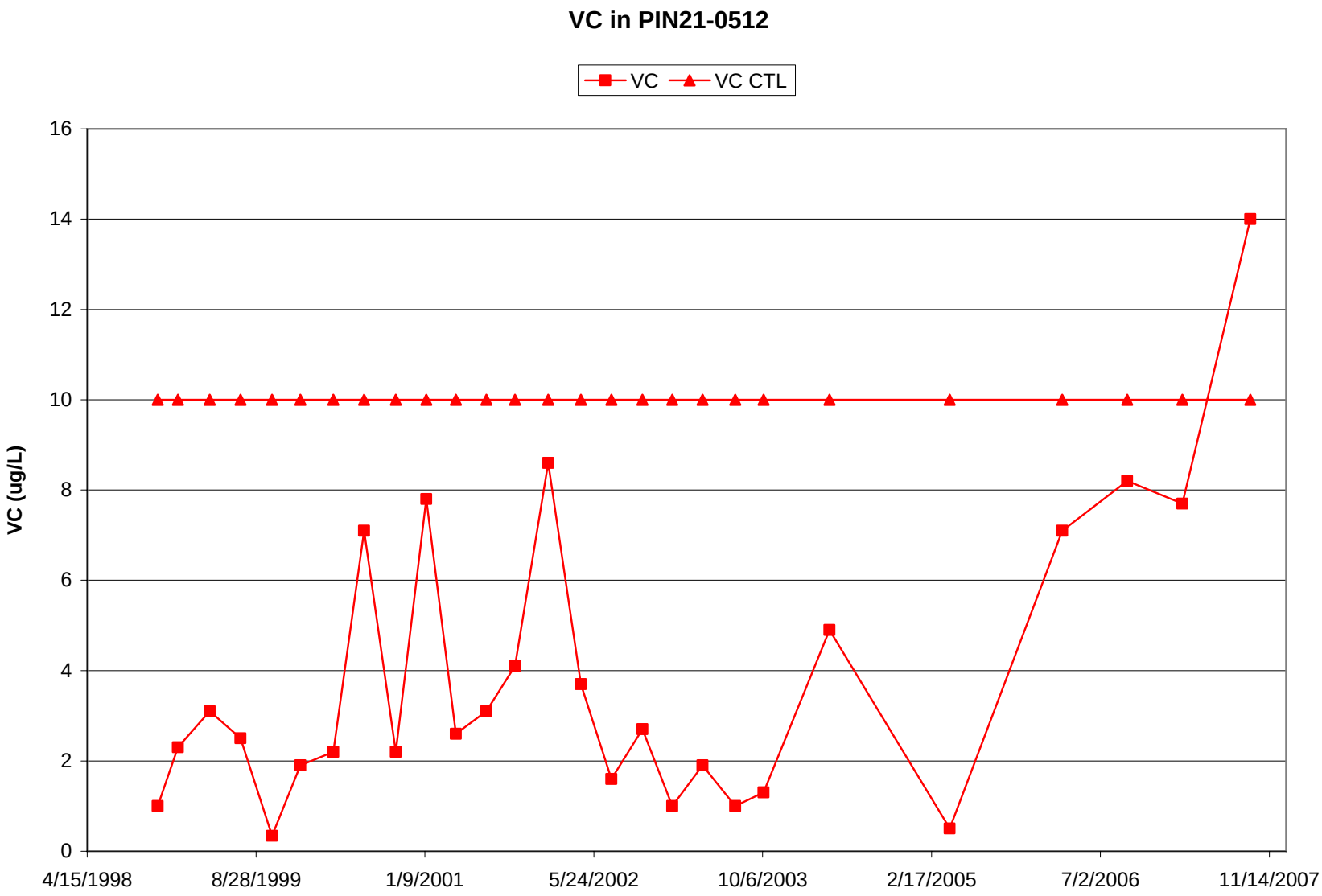


Figure 14. VC in PIN21−0512, Perimeter Well

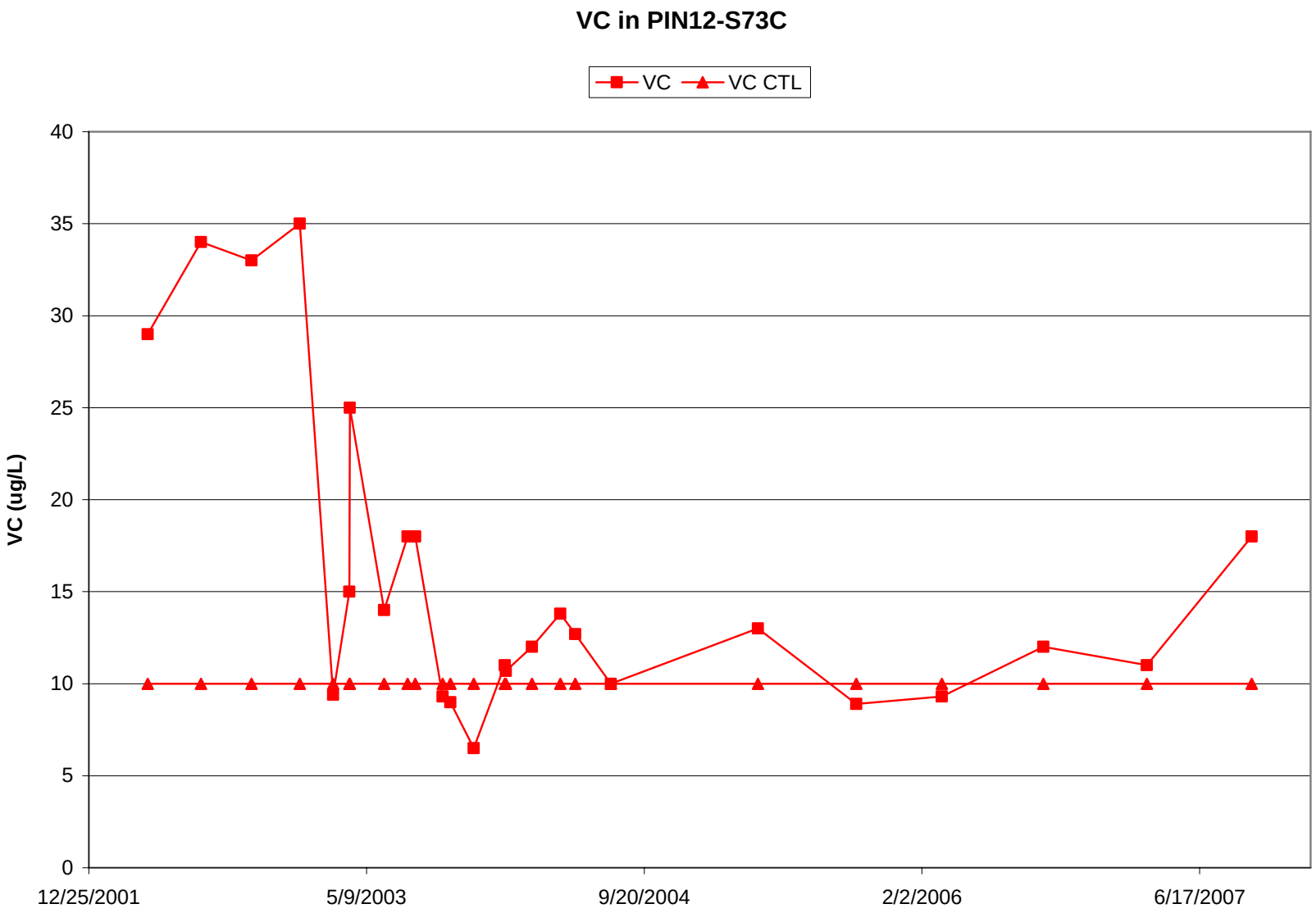


Figure 15. VC in PIN12−S73C, Building 100 Area

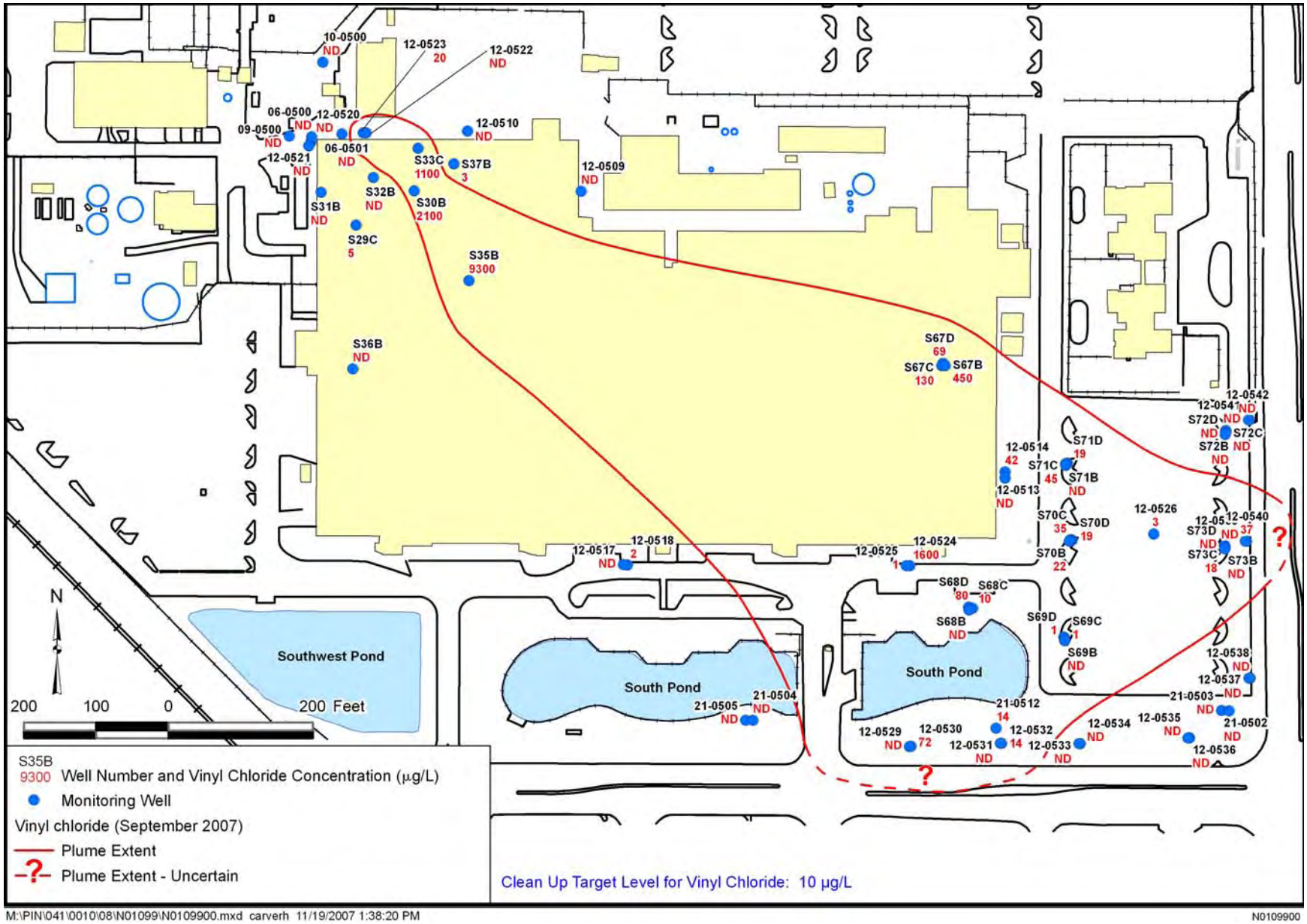


Figure 16. VC Plume, Building 100 Area

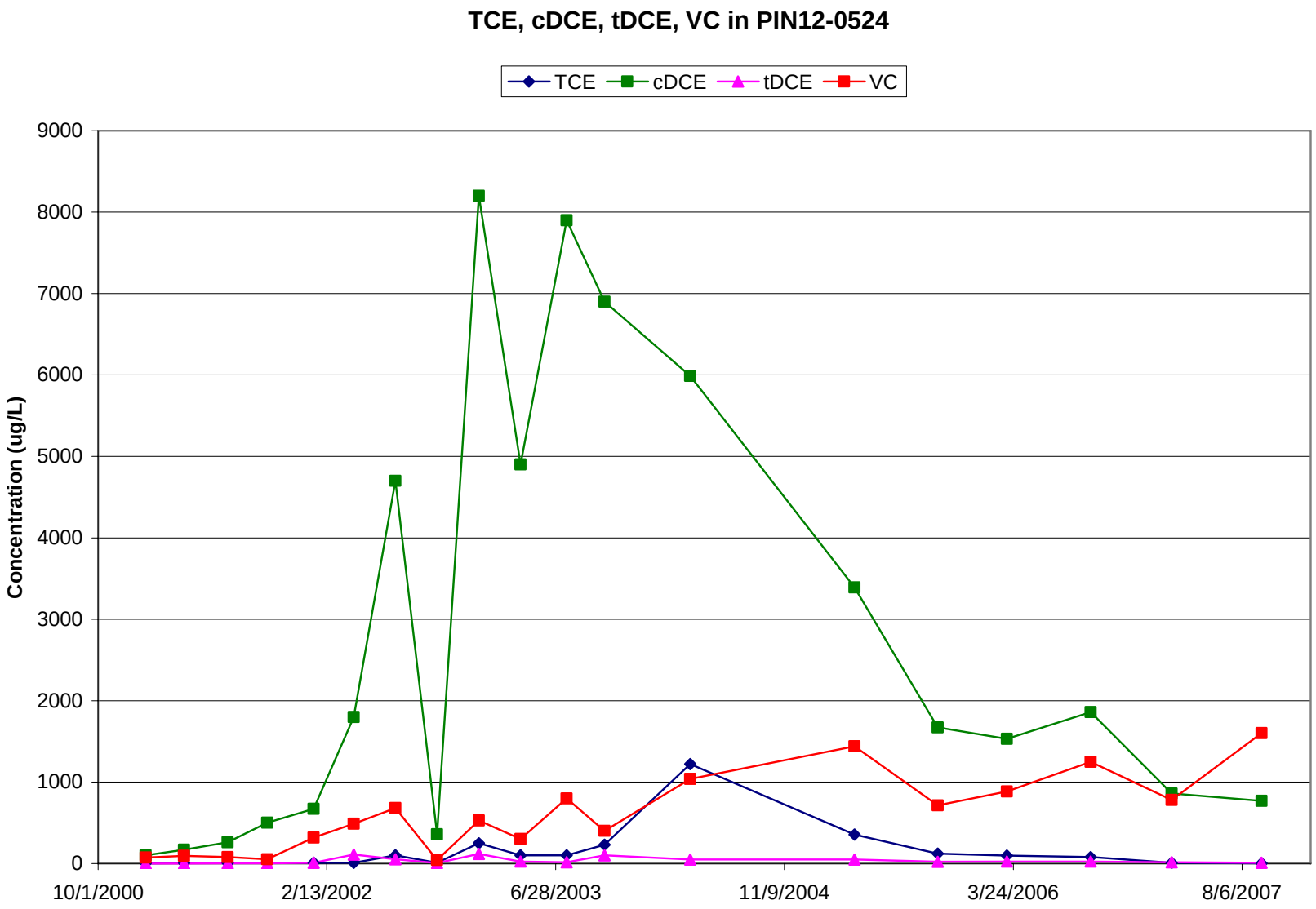


Figure 17. TCE, cDCE, tDCE, VC in PIN12−0524, Building 100 Area

Table 1. Water-Level Data at the STAR Center

Location	Measurement		Water Depth From Land Surface (ft)	Groundwater Elevation (ft NGVD)
	Date	Time		
PIN02	**Sitewide Piezometers**			
PZ01	06/08/07	09:30	2.61	15.39
	09/11/07	10:58	2.35	15.65
PZ02	06/08/07	09:25	2.24	16.06
	09/11/07	11:08	2.46	15.84
PZ03	06/08/07	10:02	3.09	16.61
	09/11/07	13:50	4.41	15.29
PZ04	06/08/07	10:10	2.67	15.53
	09/11/07	13:55	2.79	15.41
PZ05	06/08/07	10:14	2.92	15.18
	09/11/07	14:00	3.06	15.04
PZ07	06/08/07	09:35	2.86	15.04
	09/11/07	11:01	2.51	15.39
PZ08	06/08/07	13:14	1.98	16.42
	09/11/07	14:13	3.96	14.44
PZ09	06/08/07	13:35	3.76	14.24
	09/11/07	14:07	3.75	14.25
PIN06	**Industrial Drain Leaks Bldg 100 / Old Drum Storage Site**			
0500	6/8/2007	11:13	3.13	14.87
	9/11/2007	14:16	3.05	14.95
0501	6/8/2007	11:24	3.41	14.89
	9/11/2007	14:20	3.28	15.02
PIN09				
0500	6/8/2007	11:05	3.11	14.86
	9/11/2007	14:14	3.00	14.97
PIN10				
0500	6/8/2007	11:03	2.75	15.15
	9/11/2007	14:12	2.88	15.02
PIN12				
0509	6/8/2007	15:57	3.62	14.42
	9/11/2007	14:26	3.27	14.77
0510	6/8/2007	12:54	3.54	14.52
	9/11/2007	14:24	3.28	14.78
0513	6/8/2007	14:55	4.84	13.66
	9/11/2007	10:35	4.77	13.73
0514	6/8/2007	14:57	4.79	13.71
	9/11/2007	10:36	4.88	13.62
0515	6/8/2007	13:42	3.98	13.92
	9/11/2007	14:00	4.06	13.84
0516	6/8/2007	13:44	4.27	13.73
	9/11/2007	14:01	4.26	13.74
0517	6/8/2007	14:10	3.70	14.20
	9/11/2007	13:52	3.62	14.28
0518	6/8/2007	14:11	3.82	14.12
	9/11/2007	13:53	3.77	14.17

Table 1 (continued). Water-Level Data at the STAR Center

Location	Measurement		Water Depth From Land Surface (ft)	Groundwater Elevation (ft NGVD)
	Date	Time		
0520	6/8/2007	11:19	3.17	14.84
	9/11/2007	14:18	3.09	14.92
0521	6/8/2007	11:08	3.20	14.85
	9/11/2007	14:18	3.15	14.90
0522	6/8/2007	12:52	3.37	14.83
	9/11/2007	14:21	3.23	14.97
0523	6/8/2007	12:53	3.31	14.85
	9/11/2007	14:22	3.06	15.10
0524	6/8/2007	14:39	3.60	13.81
	9/11/2007	10:45	3.57	13.84
0525	6/8/2007	14:38	3.67	13.75
	9/11/2007	10:46	3.44	13.98
0526	6/8/2007	15:19	3.54	13.28
	9/11/2007	10:20	3.80	13.02
0527	6/8/2007	10:21	12.50	5.57
	9/11/2007	14:05	11.72	6.35
0528	6/8/2007	13:38	12.23	5.37
	9/11/2007	14:04	11.72	5.88
S29C	6/8/2007	08:22	4.16	14.35
	9/11/2007	10:00	3.91	14.60
S30B	6/8/2007	08:41	4.13	14.38
	9/11/2007	10:24	3.83	14.68
S31B	6/8/2007	08:25	3.96	14.55
	9/11/2007	10:05	3.81	14.70
S32B	6/8/2007	08:28	3.98	14.53
	9/11/2007	10:09	3.75	14.76
S33C	6/8/2007	08:32	3.91	14.60
	9/11/2007	10:15	3.64	14.87
S35B	6/8/2007	08:49	4.56	13.95
	9/11/2007	10:32	4.17	14.34
S36B	6/8/2007	08:16	4.66	13.85
	9/11/2007	09:54	4.34	14.17
S37B	6/8/2007	08:36	4.02	14.49
	6/8/2007	10:19	4.53	13.94
	9/11/2007	10:51	4.43	14.04
S67C	6/8/2007	10:21	4.46	14.01
	9/11/2007	10:55	4.39	14.08
S67D	6/8/2007	10:23	4.56	13.92
	9/11/2007	10:53	4.58	13.90
S68B	6/8/2007	14:29	4.42	13.48
	9/11/2007	11:20	4.37	13.53
S68C	6/8/2007	14:34	4.28	13.62
	9/11/2007	11:21	4.37	13.53
S68D	6/8/2007	14:23	4.33	13.57
	9/11/2007	11:22	4.42	13.48
S69B	6/8/2007	15:30	2.79	13.21
	9/11/2007	11:22	2.86	13.14

Table 1 (continued). Water-Level Data at the STAR Center

Location	Measurement		Water Depth From Land Surface (ft)	Groundwater Elevation (ft NGVD)
	Date	Time		
S69C	6/8/2007	15:29	3.73	12.27
	9/11/2007	11:23	2.93	13.07
S69D	6/8/2007	15:23	3.32	12.68
	9/11/2007	11:24	2.86	13.14
S70B	6/8/2007	15:15	2.97	13.73
	9/11/2007	10:40	3.23	13.47
S70C	6/8/2007	15:13	3.11	13.59
	9/11/2007	10:41	3.17	13.53
S70D	6/8/2007	15:01	3.27	13.43
	9/11/2007	10:42	3.37	13.33
S71B	6/8/2007	15:08	4.86	13.54
	9/11/2007	10:31	4.82	13.58
S71C	6/8/2007	15:04	4.80	13.60
	9/11/2007	10:32	4.93	13.47
S71D	6/8/2007	15:00	4.86	13.54
	9/11/2007	10:33	4.99	13.41
S72B	6/8/2007	15:42	5.07	13.13
	9/11/2007	10:39	5.22	12.98
S72C	6/8/2007	15:44	5.11	13.09
	9/11/2007	10:41	5.21	12.99
S72D	6/8/2007	15:43	5.00	13.20
	9/11/2007	10:43	5.23	12.97
S73B	6/8/2007	15:39	3.88	13.12
	9/11/2007	10:23	3.93	13.07
S73C	6/8/2007	15:36	4.01	12.99
	9/11/2007	10:25	4.09	12.91
S73D	6/8/2007	15:41	4.73	12.27
	9/11/2007	10:27	4.40	12.60
TE03	6/8/2007	13:29	2.96	14.04
	9/11/2007	14:19	2.83	14.17
PIN15	**Northeast Site**			
0506	6/8/2007	11:15	2.94	14.06
	9/11/2007	09:32	3.20	13.80
0507	6/8/2007	11:17	3.25	13.75
	9/11/2007	09:30	3.22	13.78
0510	6/8/2007	10:40	3.22	14.30
	9/11/2007	10:13	3.22	14.30
0513	6/8/2007	11:05	12.07	5.53
	9/11/2007	09:17	11.45	6.15
0514	6/8/2007	12:49	3.16	14.34
	9/11/2007	09:02	3.27	14.23
0515	6/8/2007	12:50	3.17	14.33
	9/11/2007	09:03	3.31	14.19
0516	6/8/2007	12:51	3.21	14.19
	9/11/2007	09:04	3.59	13.81
0518	6/8/2007	11:03	3.63	14.17
	9/11/2007	09:14	3.36	14.44

Table 1 (continued). Water-Level Data at the STAR Center

Location	Measurement		Water Depth From Land Surface (ft)	Groundwater Elevation (ft NGVD)
	Date	Time		
0520	6/8/2007	11:11	3.29	13.91
	9/11/2007	09:27	3.29	13.91
0530	6/8/2007	16:52	3.17	14.23
	9/11/2007	09:03	3.66	13.74
0534	6/8/2007	11:09	3.33	13.97
	9/11/2007	09:28	3.25	14.05
0535	6/8/2007	12:54	3.28	14.32
	9/11/2007	09:04	3.39	14.21
0537	6/8/2007	15:09	3.62	14.98
	9/11/2007	09:06	3.69	14.91
0559	6/8/2007	10:24	3.79	15.00
	9/11/2007	10:13	3.81	14.98
0560	6/8/2007	13:57	3.37	14.63
	9/11/2007	09:19	3.40	14.60
0561	6/8/2007	13:58	3.34	14.66
	9/11/2007	09:19	3.24	14.76
0562	6/8/2007	13:12	3.09	14.71
	9/11/2007	09:13	3.00	14.80
0563	6/8/2007	13:10	3.19	14.61
	9/11/2007	09:14	3.09	14.71
0564	6/8/2007	13:02	2.70	14.50
	9/11/2007	09:09	2.65	14.55
0565	6/8/2007	13:04	2.88	14.32
	9/11/2007	09:10	2.76	14.44
0566	6/8/2007	12:57	3.06	14.44
	9/11/2007	09:23	3.16	14.34
0567	6/8/2007	12:55	3.20	14.30
	9/11/2007	09:23	3.33	14.17
0568	6/8/2007	10:43	4.19	14.31
	9/11/2007	10:05	4.33	14.17
0569	6/8/2007	10:45	4.14	14.24
	9/11/2007	10:05	4.29	14.09
0570	6/8/2007	10:36	3.76	14.22
	9/11/2007	10:10	3.89	14.09
0571	6/8/2007	10:29	1.89	15.58
	9/11/2007	10:15	2.85	14.62
0572	6/8/2007	10:32	2.98	14.53
	9/11/2007	10:18	3.00	14.51
0573	6/8/2007	13:54	3.86	14.52
	9/11/2007	10:20	3.75	14.63
0574	6/8/2007	13:52	3.83	14.59
	9/11/2007	10:21	3.89	14.53
0575	6/8/2007	13:51	3.39	14.45
	9/11/2007	10:24	3.29	14.55
0576	6/8/2007	13:49	3.03	14.45
	9/11/2007	10:26	2.99	14.49

Table 1 (continued). Water-Level Data at the STAR Center

Location	Measurement		Water Depth From Land Surface (ft)	Groundwater Elevation (ft NGVD)
	Date	Time		
0577	6/8/2007	13:21	3.21	14.43
	9/11/2007	09:15	3.02	14.62
0578	6/8/2007	13:19	2.96	14.56
	9/11/2007	09:18	3.00	14.52
0584	6/8/2007	15:02	3.37	15.33
	9/11/2007	08:51	3.31	15.39
0585	6/8/2007	15:04	2.81	15.49
	9/11/2007	08:52	2.94	15.36
0586	6/8/2007	14:04	3.22	14.98
	9/11/2007	09:43	3.10	15.10
0587	6/8/2007	14:48	3.45	15.25
	9/11/2007	09:40	3.60	15.10
0588	6/8/2007	14:50	3.28	15.42
	9/11/2007	09:38	2.80	15.90
0589	6/8/2007	14:55	3.60	14.90
	9/11/2007	09:35	5.71	12.79
0590	6/8/2007	14:10	3.00	14.70
	9/11/2007	09:32	3.34	14.36
0591	6/8/2007	14:12	3.38	14.52
	9/11/2007	09:30	3.12	14.78
0592	6/8/2007	12:43	3.33	14.37
	9/11/2007	09:48	3.47	14.23
M03D	6/8/2007	14:20	2.88	15.22
	9/11/2007	08:45	2.68	15.42
M03S	6/8/2007	14:18	2.85	15.25
	9/11/2007	08:44	2.81	15.29
M14D	6/8/2007	13:15	2.91	15.09
	9/11/2007	08:40	2.76	15.24
M14S	6/8/2007	13:14	2.84	15.16
	9/11/2007	08:39	2.86	15.14
M16D	6/8/2007	14:58	2.89	15.31
	9/11/2007	08:47	2.91	15.29
M16S	6/8/2007	15:00	2.94	15.26
	9/11/2007	08:47	2.94	15.26
M24D	6/8/2007	13:07	3.24	14.56
	9/11/2007	09:10	3.28	14.52
M27D	6/8/2007	13:01	3.33	14.27
	9/11/2007	08:50	3.21	14.39
M27S	6/8/2007	12:59	3.65	13.95
	9/11/2007	09:07	3.68	13.92
M32D	6/8/2007	15:13	3.04	14.76
	9/11/2007	09:00	3.16	14.64
M32S	6/8/2007	15:12	2.83	14.97
	9/11/2007	09:02	2.86	14.94
M33D	6/8/2007	13:09	2.44	15.16
	9/11/2007	09:07	2.51	15.09

Table 1 (continued). Water-Level Data at the STAR Center

Location	Measurement		Water Depth From Land Surface (ft)	Groundwater Elevation (ft NGVD)
	Date	Time		
RW16	6/8/2007	15:10	3.18	14.82
	9/11/2007	09:08	3.23	14.77
PIN18	**Wastewater Neutralization Area**			
0500	6/8/2007	10:39	4.92	15.18
	9/11/2007	14:02	4.95	15.15
0502	6/8/2007	10:36	4.91	15.09
	9/11/2007	13:58	4.97	15.03
0503	9/11/2007	14:22	3.07	14.61
0504	6/8/2007	09:54	4.11	15.49
	9/11/2007	14:22	4.28	15.32
0508	6/8/2007	09:53	4.25	15.25
	9/11/2007	14:25	4.08	15.42
0509	6/8/2007	13:25	3.47	14.36
0510	6/8/2007	13:27	3.53	14.23
	9/11/2007	14:20	3.40	14.36
0519	6/8/2007	13:31	4.30	13.98
0520	6/8/2007	10:44	3.44	14.56
	9/11/2007	14:05	3.39	14.61
0521	6/8/2007	10:45	3.35	14.75
	9/11/2007	14:04	3.25	14.85
0522	6/8/2007	10:43	3.31	14.79
	9/11/2007	14:05	3.25	14.85
0523	6/8/2007	10:56	4.55	14.85
	9/11/2007	14:07	4.41	14.99
0524	6/8/2007	10:54	4.08	14.92
	9/11/2007	14:07	4.02	14.98
0525	6/8/2007	10:53	3.99	14.91
	9/11/2007	14:06	3.80	15.10
0526	6/8/2007	13:19	4.18	14.42
	9/11/2007	14:33	4.39	14.21
RW02	6/8/2007	10:39	5.00	15.10
	9/11/2007	14:01	5.06	15.04
RW03	6/8/2007	10:42	3.54	14.76
	9/11/2007	14:03	3.46	14.84
RW0501	6/8/2007	10:37	4.97	15.03
	9/11/2007	14:00	5.01	14.99
PIN21	**Perimeter Monitoring Wells**			
0502	6/8/2007	15:34	2.49	12.71
	9/11/2007	10:57	2.65	12.55
0503	6/8/2007	15:33	2.54	12.66
	9/11/2007	10:52	2.68	12.52
0504	6/8/2007	14:17	4.19	13.41
	9/11/2007	11:00	4.41	13.19
0505	6/8/2007	14:18	4.00	13.40
	9/11/2007	11:21	4.10	13.30
0512	6/8/2007	15:30	4.25	13.05
	9/11/2007	11:13	4.29	13.01

Table 2. Floridan Aquifer Monitoring Well Water Elevations

Well Identification	June 2007 Water Level Elevation (ft, MSL)	September 2007 Water Level Elevation (ft, MSL)
PIN12−0527	5.57	6.35
PIN12−0528	5.37	5.88
PIN15−0513	5.53	6.15

Table 3. Surface Water Elevations

Location	Measurement		Water Depth From Land Surface (ft)	Groundwater Elevation (ft NGVD)
	Date	Time		
PIN01	**Pond 5**			
P501	6/8/2007			13.50
	9/11/2007	14:11		13.46
P502	6/8/2007	13:11		13.74
	9/11/2007	14:12		13.78
PIN02	**West Pond**			
W005	6/8/2007	09:56		13.71
	9/11/2007	14:18		13.79
PIN12	**Belcher Road Pond**			
BR01	6/8/2007	10:11		13.20
	9/11/2007	13:15		13.00
PIN15	**East Pond**			
E001	6/8/2007	11:19	2.42	13.60
	9/11/2007	09:42	2.32	13.70
PIN20	**North of 4.5 Acre Site**			
BP01	6/8/2007	10:01		14.16
	9/11/2007	10:47		15.44
PIN23	**Southwest Pond**			
SW01	6/8/2007			13.53
	9/11/2007	13:50		13.44
PIN37	**South Pond**			
S001	6/8/2007			13.50
	9/11/2007	13:52		13.50

Table 4. Dehalococcoides ethenogenes

Location		Date Sampled	Dehalococcoides ethenogenes (copy numbers/L)
Northeast Site			
PIN15	0537	9/12/07	20,000
PIN15	0585	9/13/07	700J
PIN15	0587	9/14/07	<4,000
PIN15	0588	9/13/07	<20,000

Notes:
"<"=not detected above the associated value
J = Estimated value, result is between the reporting limit and the method detection limit.

Table 5. Field Measurements of Samples Collected at the STAR Center

Location	Screen Depth (ft bls)	Temperature (°C)	Specific Conductance (µmhos/cm)[a]	Turbidity (NTU)	pH	Oxidation Reduction Potential (mV)	Dissolved Oxygen (mg/L)
PIN06	**Industrial Drain Leaks Bldg 100 / Old Drum Storage Site**						
0500	3–13	29.9	637	6.4	6.54	-75.3	0.62
0501	3–13	29.2	745	8.2	6.58	62.2	0.66
PIN09							
0500	3–13	30.7	670	0.7	6.95	-132	0.23
PIN10							
0500	3–13	27.2	598	3	6.94	-171.6	0.29
PIN12							
0509	3–13	28.2	613	6.2	6.73	-25.5	0.68
0510	3–13	31	1,502	25.3	6.03	4.2	1.69
0513	15–25	24.76	805	6	6.56	-99.6	0.39
0514	30–40	25.08	1,493	339	6.36	-288.3	0.19
0517	15–25	29.52	531	19	6.91	-121.7	0.39
0518	30–40	29.17	682	11	6.68	-78.7	0.36
0520	36–46	27.72	1,104	9.6	6.62	-79.6	0.78
0521	19.5–29.5	27.1	558	7.7	7	-153.7	0.21
0522	32–42	27.3	845	10.7	6.57	-65.7	1.08
0523	18–28	27	686	8.6	6.6	-94.8	0.81
0524	27–37	29.04	1,519	4.53	6.48	-75.5	0.52
0525	12–22	29.71	789	6.86	6.64	-110.2	0.44
0526	19.5–29.5	31.84	1,905	9.66	6.37	-280.7	0.12
S29C	14–24	23.1	1,126	5.8	6.4	-77.7	0.32
S30B	5–15	23	1,296	8.3	6.46	-58.2	0.33
S31B	5–15	24.9	586	11	6.47	22.7	0.41
S32B	5.5–15.5	23.1	1,313	5.2	6.48	-1.5	0.32
S33C	11–21	24.1	1,087	70	6.44	-90.6	0.27
S35B	5–15	23.2	1,829	16	6.19	-43.8	0.4
S36B	5–15	23.1	728	13	6.17	-62.3	0.36
S37B	5–15	22.1	889	60	6.45	-94.1	0.36
S67B	10–19.83	23.6	1,266	35	6.54	-71.6	0.71
S67C	20–29.83	23.1	999	20	6.62	-75.5	0.56
S67D	30–39.83	23.3	1,135	106.7	6.61	-74.1	0.68
S68B	10–20	27.89	827	11.92	6.5	-102.4	0.25
S68C	18–28	27.23	970	16	6.54	-158.5	0.28
S68D	30–40	27.55	1,323	7.18	6.52	-112.9	0.24
S69B	10–20	30	630	14.4	6.72	-138.1	0.13
S69C	20–30	29.24	877	21.4	6.55	-138.2	0.11
S69D	30–40	29.41	1,456	12.5	6.57	-119.8	0.12
S70B	10–20	29.06	1,266	76.3	6.53	24.9	0.57
S70C	20–30	28.67	1,455	145	6.38	10.7	0.34
S70D	30–40	28.69	1,509	69.8	6.38	8.7	0.32
S71B	10–20	31.41	1,444	55.7	6.42	-70.7	0.37
S71C	20–30	30.73	1,539	264	6.36	-60.4	0.3
S71D	30–40	29.71	1,428	88.9	6.32	-54.5	0.35
S72B	10–20	31.23	1,832	12.1	5.95	-206.1	0.3

Table 5 (continued). Field Measurements of Samples Collected at the STAR Center

Location	Screen Depth (ft bls)	Temperature (°C)	Specific Conductance (µmhos/cm)[a]	Turbidity (NTU)	pH	Oxidation Reduction Potential (mV)	Dissolved Oxygen (mg/L)
S72C	20–30	30.53	808	6.8	6.46	-206.3	0.22
S72D	30–40	30.24	1,421	60	6.51	-162.3	0.18
S73B	10–20	31.28	880	55	6.16	-104.7	0.46
S73C	20–30	30.46	1,773	95	6.15	-52.5	0.48
S73D	30–40	30.73	2,371	450	6.1	-62.4	0.52
PIN15	**Northeast Site**						
0506	12–21.5	26.52	1,319	29.6	6.44	-33.9	0.96
0507	5–14.5	27.39	1,039	23.6	6.53	-34.2	0.79
0510	4–13.5	29.58	368	7.7	6.85	-96.8	0.44
0514	15.5–25.5	26.15	1,597	14	6.51	-194.6	0.25
0515	7.6–17.6	26.48	562	4.62	6.6	-157.3	0.37
0516	0.3–10.3	28.23	705	8.21	6.91	-106.9	0.3
0518	23–28	26.05	1,906	8.62	6.38	-26.4	0.57
0520	5–14.5	28.21	857	2.25	6.48	-39	0.76
0530	5–14.5	27.23	668	33.1	6.64	-145.9	0.55
0534	19.5–29	26.62	1,781	23.8	6.33	-16.3	0.6
0535	20.5–30	26.28	1,713	71.8	6.54	-201.1	0.31
0537	17.5–30	25.91	1,055	2.48	6.28	-101.1	0.47
0559	22–31.5	29.62	1,296	12.3	6.5	-60	0.59
0560	19–28.5	28.14	937	3.5	6.2	-68.8	0.59
0561	5–14.5	28.54	1,293	4.14	6.32	-88.9	0.38
0562	20–29.5	27.39	1,069	13.1	5.95	-40.6	0.56
0563	5–14.5	28.69	2,030	7.37	6.22	-81.7	0.43
0564	20–29.5	28.4	1,527	5.69	6.58	-66.3	0.85
0565	5–14.5	28.4	880	34	6.49	-22.4	0.73
0566	19–28.5	28.55	1,394	468	6.32	-177.6	0.29
0567	5–14.5	29.96	1,226	43.5	6.56	-51	0.35
0568	10–20	28.23	991	61.6	6.5	-12.9	0.4
0569	20–30	27.27	1,472	77.5	6.31	-34.7	0.32
0570	20–30	29.38	2,026	53.7	6.42	-55.5	0.29
0571	10–20	29.1	861	47.3	6.57	-31.1	0.37
0572	20–30	28.47	1,062	67.7	6.49	-54.8	0.35
0573	5–15	31.87	1,826	10	6.76	-148.7	0.16
0574	18–28	30.3	1,064	3.73	6.63	-150.4	0.29
0575	5–15	30.4	2,417	37.4	6.91	-131.4	0.22
0576	20–30	30.57	556	49.3	6.99	-260.7	0.17
0577	5–15	29.56	1,473	16.5	6.77	-133.6	0.26
0578	20–30	29.11	1,182	18.4	6.32	-283.8	0.16
0584	20–30	30.42	928	>1,000	6.64	-215.9	0.26
0585	20–30	41.76	1,012	274	7.32	-353	
0586	20–30	40.82	1,575	>1,000	6.9	-236.6	0.2
0587	20–30	41.15	2,018	132	6.64	-240.2	0.21
0588	5–15	38.03	3,113	78.1	7.02	-298.7	0.15
0589	20–30	37.53	1,955	418	6.45	-234.3	0.19
0590	20–30	40.15	1,485	140	6.97	-222.4	0.3

Table 5 (continued). Field Measurements of Samples Collected at the STAR Center

Location	Screen Depth (ft bls)	Temperature (°C)	Specific Conductance (µmhos/cm)[a]	Turbidity (NTU)	pH	Oxidation Reduction Potential (mV)	Dissolved Oxygen (mg/L)
0591	5–15	37.67	1,581	264	6.93	-217.3	0.15
0592	20–30	26.09	1,743	>1,000	6.29	-149.2	0.41
M03D	15–25	26.57	1,087	114	6.13	-119.7	0.41
M03S	2.5–12	28.44	740	38.5	6.49	-84	0.67
M14D	18.5–28.5	29.07	862	46.7	6.35	-56.6	0.36
M14S	4–14	28.51	687	103	6.45	-15.1	0.93
M16D	18.5–28.5	28.37	936	4.78	6.63	-184.3	0.37
M16S	5–14.5	29.24	940	38.5	6.63	-22.7	0.35
M24D	20–30	26.87	1,571	108	6.49	-116.1	0.73
M27D	21–31	27.35	1,754	8.75	6.56	-184.2	0.27
M27S	6–16	27.95	791	1	6.58	-107.3	0.3
M32D	14–24	27.65	795	6.11	6.83	-78	0.64
M32S	3–13	28.49	683	9.86	6.88	-124.8	0.34
M33D	20–30	27.18	665	63.9	6.55	-44	0.97
RW16	20–30	25.94	1,171	0.78	6.43	-126.9	0.42
PIN21							
0502	7–17	27.55	959	5.7	6.62	-161.6	0.24
0503	20–28	26.46	843	22.9	6.59	-131.3	0.16
0504	7–17	26.93	690	9.16	6.76	-132.4	0.31
0505	20–28	25.21	984	20.3	6.63	-100.9	0.24
0512	20–29.5	25.48	966	24.1	6.61	-131.9	0.17

[a]Temperature corrected to 25°C.

Table 6. COPC Concentrations at the Northeast Site
(reported in micrograms per liter)[a]

Location	Screen Depth (ft)	Date Sampled	TCE	cis-1,2-DCE	Total 1,2-DCE[b]	Vinyl chloride	Methylene chloride	Benzene	Toluene	Total COPC[c]
FDEP MCL			**3**	**70**	**63**	**1**	**5**	**1**	**1,000**	
PIN15	**Northeast Site**									
0506	12–21.5	3/7/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0507	5–14.5	3/8/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0510	4–13.5	3/6/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0513	135–149.6	3/5/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0514	15.5–25.5	3/8/07	<0.5	<0.65	2.3	<0.5	<4	0.76J	<0.51	2.3
0515	7.6–17.6	3/8/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0516	0.3–10.3	3/8/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0518	23–28	3/5/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0520	5–14.5	3/7/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0530	5–14.5	3/28/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0534	19.5–29	3/7/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0535	20.5–30	3/5/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0537	17.5–30	3/2/07	<0.5	0.93J	0.93J	31	<4	2.8	<0.51	33.8
		9/12/07	<0.5	120	120	450	<4	3.2	<0.51	573.2
0559	22–31.5	3/6/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0560	19–28.5	9/15/06	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
		3/12/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0561	5–14.5	9/15/06	25.9	14.2	14.2	11.4	<1	0.61J	<0.5	51.5
		3/12/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0562	20–29.5	9/15/06	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
		3/8/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0563	5–14.5	9/15/06	<0.5	1.5	1.5	<0.5	<1	<0.5	<0.5	1.5
		3/8/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0564	20–29.5	9/14/06	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
		3/5/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0565	5–14.5	9/14/06	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
		3/5/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0566	19–28.5	9/18/06	<0.5	2.7	2.7	7.4	<1	0.86J	<0.5	10.1
		3/12/07	1.5	7.6	7.6	4.9	<4	0.93J	<0.51	14
0567	5–14.5	9/7/06	<0.5	5.2	6.8	1.1	<1	<0.5	<0.5	7.9
		3/12/07	1.8	26	33.8	11	<4	0.96J	<0.51	46.6
0568	10–20	3/5/07	50	1.8	1.8	<0.5	<4	<0.5	50	101.8
		9/19/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0569	20–30	9/9/06	<0.5	<0.5	ND	26.7	<1	<0.5	<0.5	26.7
		3/5/07	<0.5	<0.65	ND	15	<4	<0.5	<0.51	15
		9/19/07	<0.5	<0.65	ND	21	<4	<0.5	<0.51	21
0570	20–30	3/6/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0571	10–20	3/6/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0572	20–30	3/6/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0573	5–15	9/18/06	<0.5	<0.5	ND	28	<1	<0.5	<0.5	28
		3/12/07	<0.5	<0.65	0.69J	38	<4	0.75J	<0.51	38

Table 6 (continued). COPC Concentrations at the Northeast Site (reported in micrograms per liter)[a]

Location	Screen Depth (ft)	Date Sampled	TCE	cis-1,2-DCE	Total 1,2-DCE[b]	Vinyl chloride	Methylene chloride	Benzene	Toluene	Total COPC[c]
FDEP MCL			**3**	**70**	**63**	**1**	**5**	**1**	**1,000**	
0574	18–28	9/7/06	<0.5	<0.5	0.52J	32.5J	<1	0.66JJ	<0.5	32.5
		3/13/07	<0.5	52	52	140	<4	0.61J	<0.51	192
0575	5–15	9/18/06	<0.5	1.2	2.2	1.1	<1	0.83J	<0.5	3.3
		3/13/07	<0.5	<0.65	0.77J	0.62J	<4	0.66J	<0.51	ND
0576	20–30	9/7/06	<0.5	1.6J	1.6	0.86JJ	<1	<0.5	<0.5	1.6
		3/13/07	<0.5	3	3	1.8	<4	<0.5	<0.51	4.8
0577	5–15	9/7/06	<0.5	<0.5	3	2.3J	<1	3.2J	0.85JJ	8.5
		3/8/07	<0.5	<0.65	2	<0.5	<4	3.1	<0.51	5.1
0578	20–30	9/15/06	<0.5	0.76J	0.76J	0.58J	<1	<0.5	<0.5	ND
		3/8/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0579	5–15	9/11/06	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
		9/25/06	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
0580	20–30	9/11/06	<0.5	1.1	1.1	2.8	<1	<0.5	<0.5	3.9
		9/25/06	<0.5	<0.5	ND	1.2	<1	<0.5	<0.5	1.2
0581	5–15	9/11/06	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
		9/26/06	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
0582	20–30	9/11/06	<0.5	<0.5	ND	<0.5	<1	1.2	<0.5	1.2
		9/26/06	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
0583	5–15	9/12/06	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
		9/25/06	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
0584	20–30	3/7/07	<0.5	<0.65	ND	1.1	<4	<0.5	5.2	6.3
		9/12/07	<0.5	<0.65	ND	1.8	<4	<0.5	<0.51	1.8
0585	20–30	3/3/07	21	35	35	2.5	<4	1.3	18	77.8
		9/13/07	180	140	140	28	<4	0.86J	9	357
0586	20–30	3/7/07	430	2,400	2,406.3	1,200	<4	7.2	140	4,183.5
		9/13/07	430	1,400	1,400	490	<20	3J	28	2,348
0587	20–30	3/3/07	16,000	390	390	29J	<250	<50	17,000	33,390
		3/28/07	23,000	1,100	1,100	60	<200	<25	22,000	46,160
0587	20–30	9/14/07	1,700	8,200	8,200	300	<200	<25	1,700	11,900
0588	5–15	3/3/07	15	360	364.2	28	<4	1.9	52	461.1
		9/13/07	1.1	170	171.1	8.8	<4	1.8	9	191.8
0589	20–30	3/7/07	65	1,500	1,500	710	<4	37	1,200	3,512
		9/14/07	18	630	632.5	440	<4	49	430	1,569.5
0590	20–30	3/8/07	14	180	180	12	<4	0.91J	0.79J	206
		9/17/07	2.6	17	17	<0.5	<4	2.2	<0.51	21.8
0591	5–15	9/17/07	40	410	418.2	28	<8	1.3J	4.2	490.4
0592	20–30	3/8/07	<0.5	<0.65	ND	<0.5	<4	28	1.6	29.6
		9/13/07	<0.5	<0.65	ND	<0.5	<4	29	0.94J	29
CS17	13–13	9/26/06	<0.5	<0.5	ND	<0.5	<1	<0.5	0.76J	ND
CS18	11–11	9/26/06	<0.5	4.7	4.7	<0.5	<1	<0.5	1.8	6.5
CS19	17.8–17.8	9/26/06	133	67.5	67.5	0.5J	<1	<0.5	2.7	203.2
CS20	13.8–13.8	9/26/06	<0.5	26.1	26.1	<0.5	<1	<0.5	1.9	28
CS21	19.3–19.3	9/26/06	<0.5	<0.5	ND	1.1	<1	<0.5	<0.5	1.1
CS22	21.5–21.5	9/25/06	8.7	9.7	9.7	0.8J	<1	<0.5	10.1	28.5
CS23	17.8–17.8	9/25/06	1.2	1.1	1.1	<0.5	<1	<0.5	<0.5	2.3

Table 6 (continued). COPC Concentrations at the Northeast Site (reported in micrograms per liter)[a]

Location	Screen Depth (ft)	Date Sampled	TCE	cis-1,2-DCE	Total 1,2-DCE[b]	Vinyl chloride	Methylene chloride	Benzene	Toluene	Total COPC[c]
FDEP MCL			**3**	**70**	**63**	**1**	**5**	**1**	**1,000**	
CS24	5–5	9/26/06	15.8	69.9	72.6	5.2	<2	<1	84.7	178.3
CS25	19.8–19.8	9/27/06	308	96	96	47.4	<5	<2.5	70.2	521.6
CS26	29.8–29.8	9/25/06	2.9	181	181	3.5	<1	1	2.2	190.6
CS27	24.8–24.8	9/25/06	69	21.7	21.7	12.1	<1	<0.5	1.2	104
CS28	28.8–28.8	9/25/06	486	178	178	<10	<20	<10	584	1,248
CS29	18.3–18.3	9/7/06	1.9J	159	159	37.2	<4.4JB	1.5J	86.8	283
		9/27/06	1.6J	168	168	31.5	<2	1.2J	94	293.5
CS30	22.8–22.8	9/7/06	<1	14.1	14.1	5.1	<4.4JB	2.3	80	101.5
		9/27/06	<1	30	30	13.2	<2	3.6	257	303.8
CS31	30.3–30.3	9/7/06	<0.5	3.6	3.6	<0.5	<1	5.3	18.9	27.8
		9/27/06	<0.5	3.5	3.5	<0.5	<1	3.9	14.8	22.2
CS32	12.8–12.8	9/7/06	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
		9/27/06	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
CS33	10–10	9/25/06	5.5	58.8	58.8	2.8	<1	<0.5	1.2	68.3
CS34	23.3–23.3	9/25/06	3,860	807	807	234	<100	<50	4,670	9,571
CS35	9.5–9.5	9/25/06	6.4	38.1	38.1	3.6J	<5	<2.5	26	70.5
CS36	28.5–28.5	9/10/06	<0.5	4	4	8.8	<2.3JB	2.2	40.4	55.4
		9/25/06	1.3	21.8	21.8	47.5	<1	14.6	206	291.2
CS37	13.5–13.5	9/7/06	2.7	11.1	11.1	1.5	<1	1.9	3.2	20.4
		9/27/06	<1	6.2	6.2	<1	<2	2	3.3	11.5
CS38	20.5–20.5	9/8/06	<0.5	2.4	2.4	1.9	<1	1.9	6.5	12.7
		9/27/06	<0.5	2.3	2.3	1.8	<1	2	5.7	11.8
CS39	7.5–7.5	9/25/06	2.3	3.6	3.6	67	<1	<0.5	1.4	74.3
CS40	23.8–23.8	9/25/06	263	2,530	2,550.6	575	<5	23.5	250	3,662.1
CS41	21.8–21.8	9/10/06	15.2	30.6	30.6	24.3	<1	0.94J	7.1	77.2
		9/25/06	3.2	17.5	17.5	9.8	<1	0.67J	4.8	35.3
CS42	11.3–11.3	9/10/06	2.9	18.7	18.7	3	<1	1.2	4.4	30.2
		9/26/06	2.8	18.3	18.3	2.8	<1	1.3	4.9	30.1
CS43	22–22	9/10/06	2.3	30.2	30.2	16.4	<1	2.8	1.8	53.5
		9/26/06	2.6	31.7	31.7	12.6	<1	2.8	1.5	51.2
CS44	17.5–17.5	9/10/06	2.1	15.6	16.6	31.7	<1	0.97J	<0.5	50.4
		9/26/06	1.7	12.2	12.2	24.9	<1	0.92J	<0.5	38.8
CS45	10.5–10.5	9/9/06	5.4	56.9	56.9	5.3	<1	1.6	4.5	73.7
		9/26/06	4.7	49.7	49.7	3.3	<1	1.2	5.5	64.4
CS46	8.8–8.8	9/9/06	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
		9/27/06	<0.5	0.64J	0.64J	<0.5	<1	<0.5	<0.5	ND
CS47	13–13	9/9/06	<5	338	338	81.1	23.6JB	<5	<5	419.1
		9/27/06	<5	222	222	51.2	<12.5J	<5	<5	273.2
CS48	21–21	9/9/06	<0.5	<0.5	ND	2.8	<1	<0.5	<0.5	2.8
		9/27/06	<0.5	<0.5	ND	3.1	<1	<0.5	<0.5	3.1
M03D	15–25	3/6/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
M03S	2.5–12	3/6/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
M14D	18.5–28.5	3/7/07	<0.5	<0.65	ND	13	<4	<0.5	<0.51	13
M14S	4–14	3/7/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
M16D	18.5–28.5	3/6/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND

Table 6 (continued). COPC Concentrations at the Northeast Site (reported in micrograms per liter)[a]

Location	Screen Depth (ft)	Date Sampled	TCE	cis-1,2-DCE	Total 1,2-DCE[b]	Vinyl chloride	Methylene chloride	Benzene	Toluene	Total COPC[c]
FDEP MCL			**3**	**70**	**63**	**1**	**5**	**1**	**1,000**	
M16S	5–14.5	3/6/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
M24D	20–30	3/5/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
M27D	21–31	3/5/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
M27S	6–16	3/5/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
M32D	14–24	3/7/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
M32S	3–13	3/7/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
M33D	20–30	3/5/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
RW16	20–30	3/7/07	<0.5	<0.65	ND	3.3	<4	<0.5	<0.51	3.3

[a]Before December 18, 2003 "<" values are reporting limits. On or after December 18, 2003 "<" values are method detection limits.
[b]Total 1,2–DCE is the sum of cis–1,2–DCE and trans–1,2–DCE
[c]Total COPC is the sum of the individual COPC concentrations. The cis–1,2–DCE value is not part of the total COPC value because this value is included in the total 1,2–DCE value. "J" values are not included in the total COPC value.
ND = Not detected.
J = Estimated value, result is between the reporting limit and the method detection limit.
Arsenic, while a COPC, is not included in this table, nor in the total COPC value.

Table 7. Sitewide Arsenic Measurements

Location	Sample Date	Concentration (mg/L)
PIN06	**Industrial Drain Leaks Bldg 100 / Old Drum Storage Site**	
0501	9/18/07	0.02
PIN09		
0500	9/12/07	0.0077B
PIN10		
0500	9/12/07	<0.0048
PIN12		
0525	9/18/07	0.026
S31B	9/13/07	0.018
S32B	9/13/07	0.011
S33C	9/13/07	0.0048B
S35B	9/13/07	0.017
S68B	9/19/07	0.06
PIN15	**Northeast Site**	
0567	9/14/07	0.051
M03S	9/12/07	0.075
M14S	9/18/07	0.074
M32S	9/12/07	0.018

B = Inorganic result is between the IDL and CRDL
"<" values are method detection limits.

Table 8. Aluminum, Iron, and Manganese Concentrations Measured at the Northeast Site (reported in µg/L)

Well	Aluminum	Iron	Manganese
Cleanup Target Level:	**2,000**	**3,000**	**500**
0506	3,800	2,000	10
0507	1,700	1,100	17
0510	320	4,600	32
0514	2,300	1,700	9.7 B
0515	81 B	1,000	10
0516	140 B	6,700	29
0518	980	1,000	11
0520	150 B	760	18
0530	1,100	2,300	34
0534	1,900	650	19
0535	5,000	1,800	9.9 B
0537	<70	3,200	11
0559	1,800	440	7.1 B
0560	200 B	5,700	4.5 B
0561	280	1,200	14
0562	1,200 NJ	4,900	9.6 B
0563	350	8,600	72
0564	480	730	17
0565	1,100	9,700	200
0566	31,000	11,000	18
0567	390	15,000	87
0568	940	1,200	5.8 B
0569	1,500	3,200	18
0570	9,400	1,600	24
0571	1,100	3,400	10
0572	2,300	960	10
0573	120 B	1,100	140
0574	120 B	2,400	14
0575	230	8,100	170
0576	1,200	1,300	23
0577	190 B	9,400	210
0578	510 NJ	790	140
0584	67,000	38,000	46
0585	10,000	6,600	16
0586	18,000	16,000	49
0587	2,700	36,000	15
0588	840	3,300	250
0589	9,900	17,000	64
0590	2,500	1,900	7.9 B
0591	6,400	9,200	60
0592	27,000	17,000	36
M03D	4,200	6,500	4.9 B
M03S	5,100	41,000	54
M14D	6,100	5,800	7.9 B
M14S	310	13,000	13
M16D	470	3,000	4.2 B

Table 8 (continued). Aluminum, Iron, and Manganese Concentrations Measured at the Northeast Site (reported in µg/L)

Well	Aluminum	Iron	Manganese
Cleanup Target Level:	**2,000**	**3,000**	**500**
M16S	1,400	3,500	34
M24D	8,600	1,100	14
M27D	690	900	9.8 B
M27S	<70	1,900	110
M32D	230	5,300	9.6 B
M32S	600	3,600	82
M33D	6,900	2,000	14
RW16	<70	3,900	17

< = not detected
B= estimated value metals
J=estimated
N=spike sample recovery not within control limits inorganics.

Table 9. COPC Concentrations at the Building 100 Area (reported in micrograms per liter)[a]

Location	Screen Depth (ft)	Date Sampled	TCE	cis-1,2-DCE	trans-1,2-DCE	Total 1,2-DCE[b]	1,1-DCE	Vinyl chloride	Total COPC[c]
FDEP MCL			**3**	**70**	**100**	**63**	**7**	**1**	
Industrial Drain Leaks Bldg 100 / Old Drum Storage Site									
PIN06									
0500	3–13	9/29/06	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
		3/6/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/18/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0501	3–13	9/20/06	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
		3/6/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/18/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
PIN09									
0500	3–13	9/29/06	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
		3/2/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/12/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
PIN10									
0500	3–13	9/20/06	0.84J	1.3	<0.5	1.3	<0.5	<0.5	1.3
		3/2/07	0.63J	1.1	<0.44	1.1	<0.45	<0.5	1.1
		9/12/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
PIN12									
0509	3–13	9/20/06	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
		3/6/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/18/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0510	3–13	9/20/06	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
		3/7/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/18/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0513	15–25	9/21/06	<0.5	<0.5	0.94J	0.94J	<0.5	<0.5	ND
		3/14/07	<0.5	<0.65	0.64J	0.64J	<0.45	<0.5	ND
		9/19/07	<0.5	<0.65	0.59J	0.59J	<0.45	<0.5	ND
0514	30–40	9/9/06	<0.5	9.9	24.6	34.5	<0.5	41.3	75.8
		3/14/07	<0.5	8.1	26	34.1	<0.45	32	66.1
		9/19/07	<0.5	5.8	15	20.8	<0.45	42	62.8
0515	15–25	3/3/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0516	30–40	3/3/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0517	15–25	9/20/06	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
		3/3/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/18/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0518	30–40	9/20/06	<0.5	<0.5	<0.5	ND	<0.5	1.1	1.1
		3/3/07	<0.5	<0.65	<0.44	ND	<0.45	1.3	1.3
		9/18/07	<0.5	<0.65	<0.44	ND	<0.45	1.9	1.9
0520	36–46	9/29/06	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
		3/2/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/18/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0521	19.5–29.5	9/29/06	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
		3/2/07	<0.5	0.75J	<0.44	0.75J	<0.45	2.3	2.3
		9/12/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND

Table 9 (continued). COPC Concentrations at the Building 100 Area (reported in micrograms per liter)[a]

Location	Screen Depth (ft)	Date Sampled	TCE	cis-1,2-DCE	trans-1,2-DCE	Total 1,2-DCE[b]	1,1-DCE	Vinyl chloride	Total COPC[c]
FDEP MCL			**3**	**70**	**100**	**63**	**7**	**1**	
0522	32–42	9/20/06	<0.5	<0.5	<0.5	ND	<0.5	1.7	1.7
		3/7/07	<0.5	<0.65	<0.44	ND	<0.45	0.59J	ND
		9/18/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0523	18–28	9/20/06	<0.5	10.3	6.1	16.4	<0.5	9	25.4
		3/6/07	0.67J	5.5	3.1	8.6	<0.45	<0.5	8.6
		9/18/07	1	32	22	54	<0.45	20	75
0524	27–37	9/9/06	78.9	1,860	<25	1,860	83.5	1,250	3,272.4
		3/5/07	9.1	860	15	875	53	780	1,717.1
		9/18/07	4.3	770	10	780	29	1,600	2,413.3
0525	12–22	9/20/06	<0.5	2.5	<0.5	2.5	<0.5	<0.5	2.5
		3/3/07	<0.5	1.7	<0.44	1.7	<0.45	<0.5	1.7
		9/18/07	<0.5	1.6	<0.44	1.6	<0.45	0.66J	1.6
0526	19.5–29.5	9/9/06	<0.5	3.5	1.3	4.8	<0.5	2.2	7
		3/3/07	<0.5	2.1	0.97J	2.1	<0.45	1.1	3.2
		9/19/07	<0.5	1.9	1.3	3.2	<0.45	3	6.2
0527	118–137.9	9/18/06	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
		3/6/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0528	127–146.9	9/19/06	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
		3/3/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
S29C	14–24	9/12/06	<0.5	<0.5	1.2	1.2	<0.5	5.2	6.4
		3/5/07	<0.5	0.72J	2.8	2.8	<0.45	9.4	12.2
		9/13/07	<0.5	<0.65	<0.44	ND	<0.45	4.8	4.8
S30B	5–15	9/12/06	5,560	13,700	901	14,601	176J	802	20,963
		3/5/07	1,400	8,700	510	9,210	140	1,100	11,850
		9/13/07	350	6,000	330	6,330	120	2,100	8,900
S31B	5–15	9/13/06	<0.5	1.3	<0.5	1.3	<0.5	0.93J	1.3
		3/5/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/13/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
S32B	5.5–15.5	9/13/06	<0.5	2.3	<0.5	2.3	<0.5	<0.5	2.3
		3/5/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/13/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
S33C	11–21	9/13/06	6.7J	69	10.9	79.9	<5	193	272.9
		3/5/07	9.6	210	21	231	17	210	467.6
		9/13/07	43	1,700	29	1,729	110	1,100	2,982
S35B	5–15	9/12/06	19,400	71,700	10,900	82,600	<500	18,700	120,700
		3/5/07	13,000	26,000	5,900	31,900	150	7,800	52,850
		9/13/07	7,500	14,000	3,300	17,300	90	9,300	34,190
S36B	5–15	9/13/06	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
		3/5/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/13/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
S37B	5–15	9/12/06	<0.5	25.2	<0.5	25.2	<0.5	30.2	55.4
		3/5/07	<0.5	5.4	<0.44	5.4	<0.45	9.7	15.1
		9/13/07	<0.5	3.7	<0.44	3.7	<0.45	3.4	7.1

Table 9 (continued). COPC Concentrations at the Building 100 Area (reported in micrograms per liter)[a]

Location	Screen Depth (ft)	Date Sampled	TCE	cis-1,2-DCE	trans-1,2-DCE	Total 1,2-DCE[b]	1,1-DCE	Vinyl chloride	Total COPC[c]
FDEP MCL			**3**	**70**	**100**	**63**	**7**	**1**	
S67B	10–19.83	9/13/06	<5	19.8	<5	19.8	<5	288	307.8
		3/6/07	<0.5	34J	7.5J	41.5	<0.45	510	551.5
		9/17/07	<0.5	24	5.4	29.4	<0.45	450	479.4
S67C	20–29.83	9/13/06	<1	193	36.3	229.3	2.7	95.2	327.2
		3/6/07	<0.5	290J	72J	362	5.9J	120	487.9
		9/17/07	<0.5	190	39	229	2.8	130	361.8
S67D	30–39.83	9/13/06	<0.5	95.4	15.4	110.8	1.4	69.2	181.4
		3/6/07	<0.5	100	19	119	3.5	83	205.5
		9/17/07	<0.5	65	12	77	1	69	147
S68B	10–20	9/21/06	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
		3/16/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/19/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
S68C	18–28	9/21/06	<0.5	2.1	<0.5	2.1	<0.5	4.5	6.6
		3/16/07	<0.5	3.7	<0.44	3.7	<0.45	8.8	12.5
		9/19/07	<0.5	4.2	<0.44	4.2	<0.45	10	14.2
S68D	30–40	9/21/06	<0.5	56.5	0.98J	56.5	<0.5	58	114.5
		3/2/07	<0.5	51	1.2	52.2	<0.45	44	96.2
		9/19/07	<0.5	56	1.1	57.1	1	80	138.1
S69B	10–20	9/19/06	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
		3/15/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/20/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
S69C	20–30	9/21/06	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
		3/15/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/20/07	<0.5	<0.65	<0.44	ND	<0.45	1	1
S69D	30–40	9/21/06	<0.5	1.1	<0.5	1.1	<0.5	<0.5	1.1
		3/15/07	<0.5	0.92J	<0.44	0.92J	<0.45	<0.5	ND
		9/20/07	<0.5	<0.65	<0.44	ND	<0.45	0.54J	ND
S70B	10–20	9/21/06	<0.5	19.8	0.9J	19.8	<0.5	17.3	37.1
		3/15/07	<0.5	18	0.72J	18	<0.45	20	38
		9/20/07	<0.5	16	0.61J	16	<0.45	22	38
S70C	20–30	9/21/06	<0.5	25.8	9.5	35.3	0.94J	19.6	54.9
		3/15/07	<0.5	25	10	35	0.98J	21	56
		9/20/07	<0.5	25	11	36	1.5	35	72.5
S70D	30–40	9/21/06	<0.5	14.4	5.4	19.8	<0.5	8.3	28.1
		3/15/07	<0.5	16	7.3	23.3	0.71J	12	35.3
		9/20/07	<0.5	17	7.4	24.4	1.6	19	45
S71B	10–20	9/21/06	<0.5	0.65J	<0.5	0.65J	<0.5	<0.5	ND
		3/16/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/19/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
S71C	20–30	9/21/06	<0.5	37.2	19.5	56.7	0.69J	46	102.7
		3/5/07	<0.5	15	10	25	<0.45	20	45
		3/16/07	<0.5	14	8.9	22.9	<0.45	19	41.9
		9/19/07	<0.5	20	14	34	1.3	45	80.3
S71D	30–40	9/21/06	<0.5	7	3.1	10.1	<0.5	8	18.1
		9/19/07	<0.5	7.7	4.8	12.5	1	19	32.5

Table 9 (continued). COPC Concentrations at the Building 100 Area (reported in micrograms per liter)[a]

Location	Screen Depth (ft)	Date Sampled	TCE	cis-1,2-DCE	trans-1,2-DCE	Total 1,2-DCE[b]	1,1-DCE	Vinyl chloride	Total COPC[c]
FDEP MCL			**3**	**70**	**100**	**63**	**7**	**1**	
S72B	10–20	9/18/06	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
		3/13/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/19/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
S72C	20–30	9/18/06	<0.5	1.2	<0.5	1.2	0.62J	0.75J	1.2
		3/13/07	<0.5	2.3	<0.44	2.3	1.6	0.86J	3.9
		9/19/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
S72D	30–40	9/18/06	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
		3/13/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/19/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
S73B	10–20	9/18/06	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
		3/14/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/19/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
S73C	20–30	9/9/06	<0.5	2.5	3.5	6	<0.5	12	18
		3/14/07	<0.5	0.85J	3.5	3.5	<0.45	11	14.5
		9/19/07	<0.5	<0.65	3.9	3.9	<0.45	18	21.9
S73D	30–40	9/18/06	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
		3/13/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/19/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
TE03	–	3/3/07	<0.5	<0.65	<0.44	ND	<0.45	5	5
PIN21		**Perimeter Monitoring Wells**							
0502	7–17	9/19/06	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
		3/14/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/19/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0503	20–28	9/19/06	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
		3/14/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/19/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0504	7–17	9/19/06	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
		3/14/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/18/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0505	20–28	9/19/06	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
		3/14/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/18/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0512	20–29.5	9/19/06	<0.5	4.9	<0.5	4.9	<0.5	8.2	13.1
		3/2/07	<0.5	6.1	<0.44	6.1	<0.45	7.7	13.8
		9/19/07	<0.5	5.9	<0.44	5.9	<0.45	14	19.9

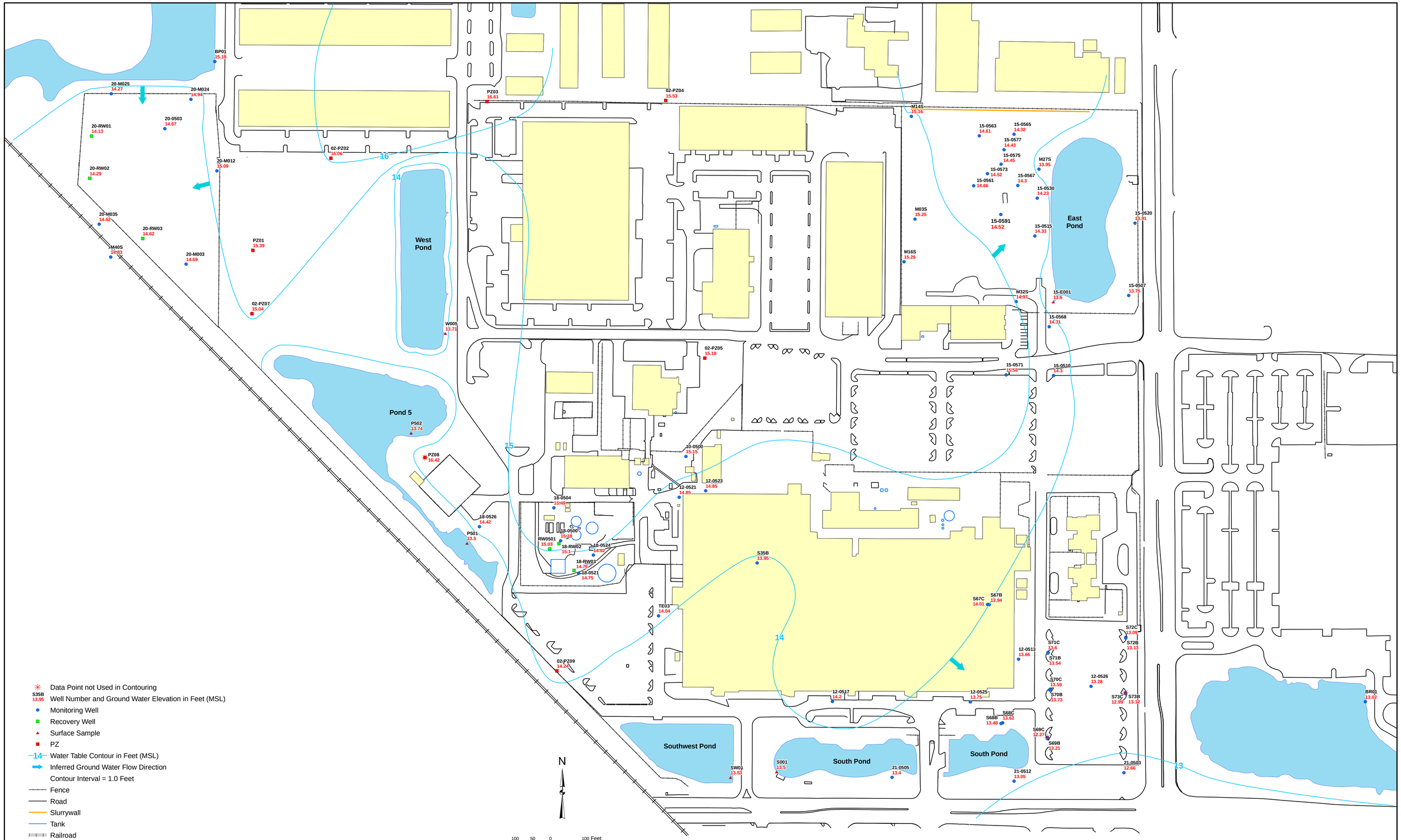
[a]"<" values are reporting limits.
[b]Total 1,2-DCE is the sum of cis-1,2-DCE and trans-1,2-DCE.
[c]Total COPC is the sum of the individual COPC concentrations. The cis-1,2-DCE and trans-1,2-DCE values are not part of the total COPC value because these values are included in the total 1,2-DCE value. "J" values are not included in the total COPC value.

ND = Not detected.
J = Estimated value, result is between the reporting limit and the method detection limit.
Arsenic, while a COPC, is not included in this table, nor in the Total COPC value.

Table 10. Relative Percent Difference (RPD) for Duplicate Samples

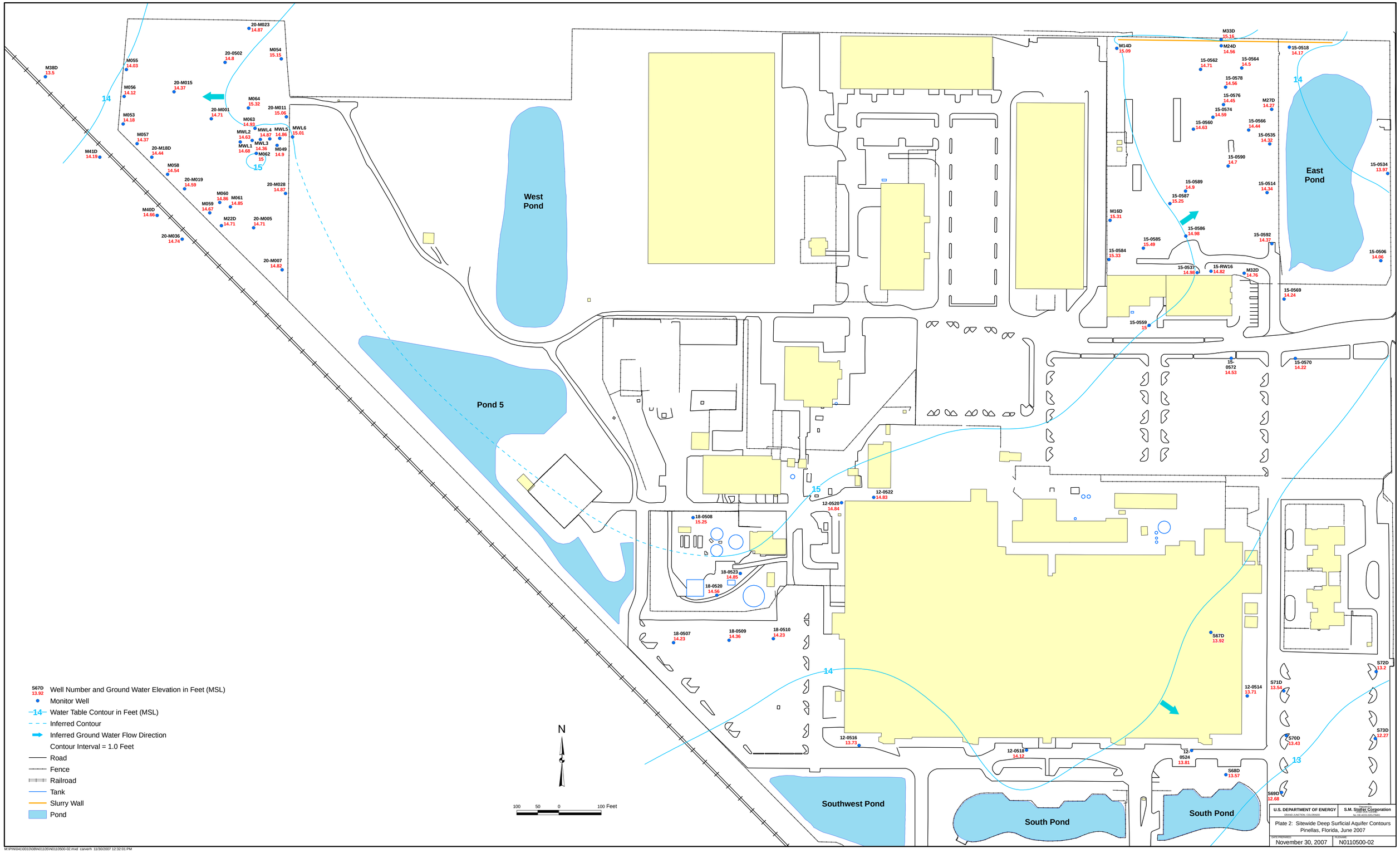
Sample ID	Analyte	S	D	RPD	MDL	5xMDL	Fail?
PIN12–0524	1,1-Dichlorethylene	29	52	57	9	45	Yes
PIN12–0524	cis-1,2-Dichloroethylene	770	770	0	13	65	
PIN12–0524	Vinyl chloride	1,600	1,700	6	10	50	
PIN12–S68D	1,1-Dichloroethane	5.3	6	12	0.52	2.6	
PIN12–S68D	cis-1,2-Dichloroethylene	56	64	13	0.65	3.25	
PIN12–S68D	Vinyl chloride	80	91	13	0.5	2.5	
PIN15–0568	Aluminum	0.94	1.8	63	0.07	0.35	Yes
PIN15–0568	Iron	1.2	1.2	0	0.022	0.11	
PIN15–0569	Aluminum	1.5	1.4	7	0.07	0.35	
PIN15–0569	Iron	3.2	3.2	0	0.022	0.11	
PIN15–0569	Manganese	0.018	0.018	0	0.0014	0.007	
PIN15–0569	Vinyl chloride	21	22	5	0.5	2.5	
PIN15–0586	Aluminum	18	21	15	0.07	0.35	
PIN15–0586	cis-1,2-Dichloroethylene	1,400	1,300	7	13	65	
PIN15–0586	Iron	16	18	12	0.022	0.11	
PIN15–0586	Manganese	0.049	0.052	6	0.0014	0.007	
PIN15–0586	Toluene	28	31	10	2.6	13	
PIN15–0586	Trichloroethylene	430	450	5	2.5	12.5	
PIN15–0586	Vinyl chloride	490	500	2	2.5	12.5	

S = Original sample (N001), VOC concentrations in μg/L and metals in mg/L.
D = Duplicate sample (N002), VOC concentrations in μg/L and metals in mg/L.
RL = Reporting limit.
Fail = Volatiles "fail" when the RPD is greater than ± 30% and the concentration is more than 5 times the reporting limit. Metals "fail" when the samples are more than 5 times the reporting limit and the RPD is greater than 20%. For metals samples that are less than 5 times the reporting limit the difference must be less than ± the reporting limit (this includes the case when only one of the duplicate/sample values is less than 5 times the reporting limit).

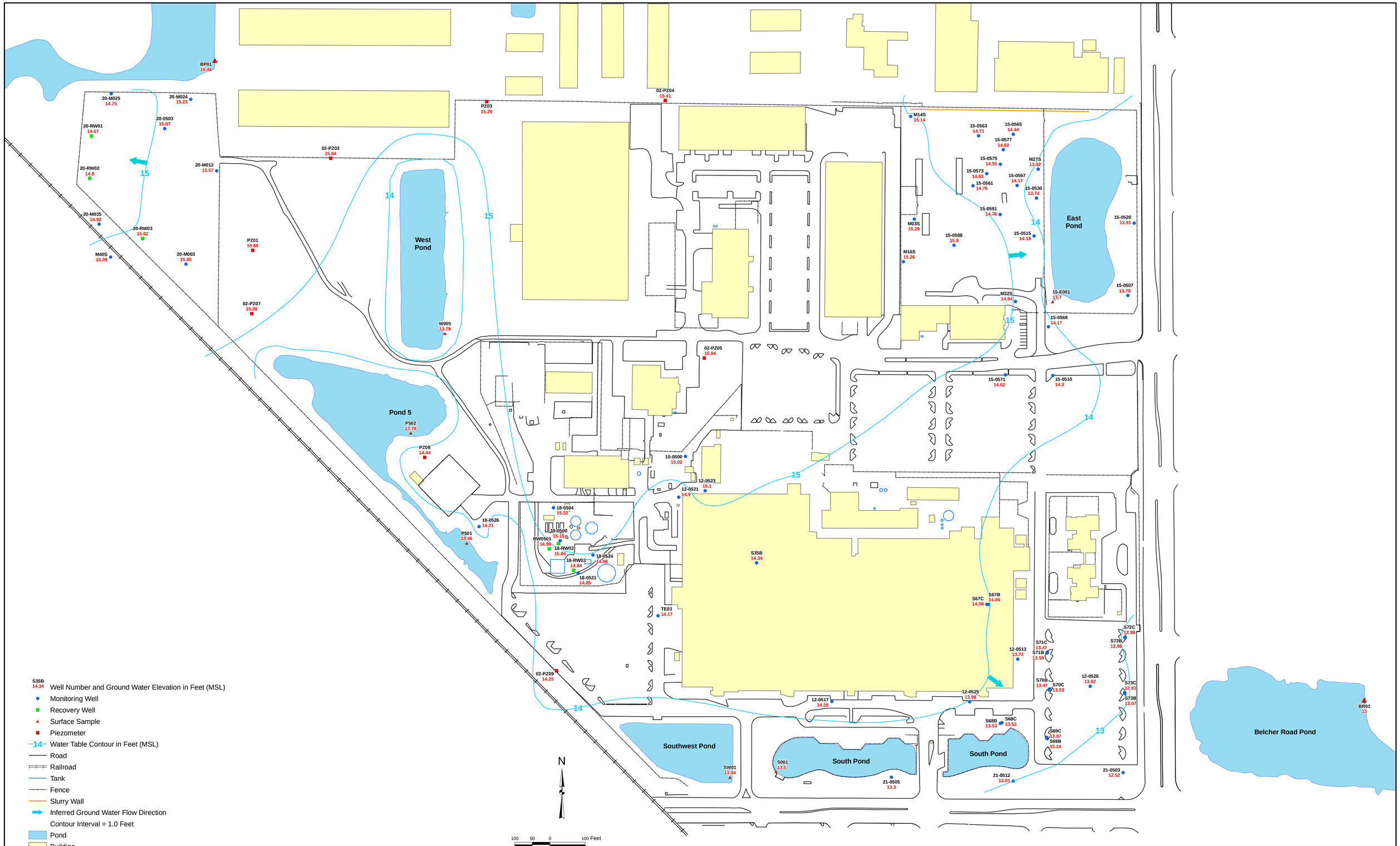


U.S. DEPARTMENT OF ENERGY	PREPARED BY S.M. Stoller Corporation (A LLNS LLC Company)
GRAND JUNCTION, COLORADO	No. DE-AC01-02CL27081
Plate 1: Sitewide Shallow Surficial Aquifer Contours Pinellas, Florida, June 2007	
DATE PREPARED: December 03, 2007	FILE NUMBER: N0110500-01

M:\PIN\041\0010\08\N01105\N0110500-01.mxd carverh 12/3/2007 12:36:04 PM

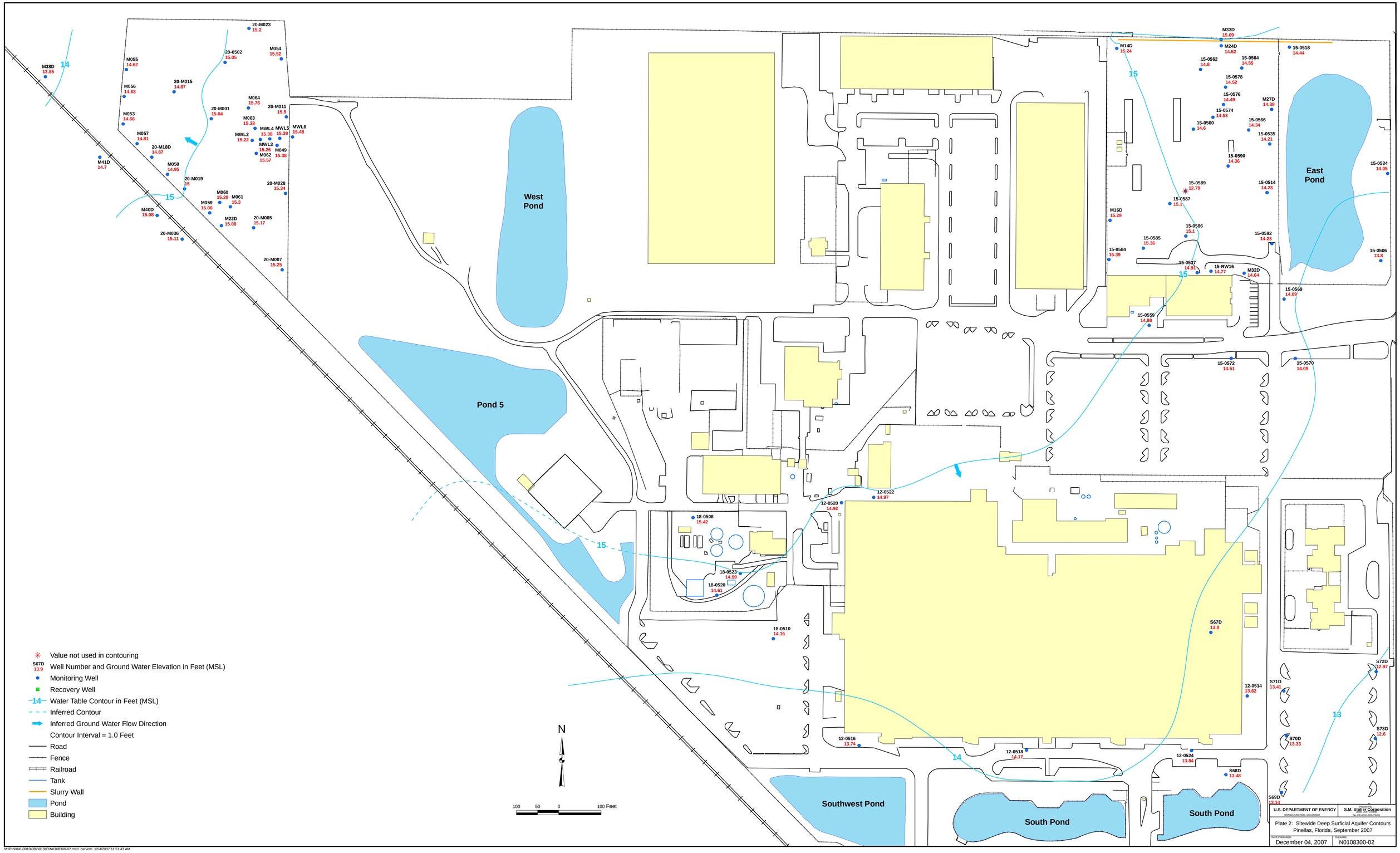


M:\PIN\041\00100\08N01105\N0110500-02.mxd carverh 11/30/2007 12:32:01 PM



U.S. DEPARTMENT OF ENERGY GRAND JUNCTION, COLORADO	S.M. Stoller Corporation CONTRACTOR No. DE-AC01-03G1/5800
Plate 1: Sitewide Shallow Surficial Aquifer Contours Pinellas, Florida, September 2007	
DATE PREPARED December 04, 2007	FILE/JOB N0108300-01

M:\PIN\04\10010\08\N010839\N0108300-01.mxd carverh 12/4/2007 10:10:47 AM


West Pond
Pond 5
East Pond
Southwest Pond
South Pond
South Pond
M38D 13.85
M55 14.62
M56 14.63
M53 14.66
M57 14.61
20-M18D 14.87
M41D 14.7
M58 14.95
20-M019 15
M40D 15.08
20-M036 15.11
20-M015 14.87
20-0502 15.05
20-M023 15.2
M054 15.52
20-M001 15.04
M064 15.76
M063 15.33
20-M011 15.5
MWL2 15.22
MWL4 15.38
MWL5 15.39
MWL6 15.48
MWL3 15.26
M062 15.57
M049 15.38
20-M028 15.34
M060 15.29
M061 15.3
M059 15.06
M22D 15.08
20-M005 15.17
20-M007 15.25
M33D 15.09
M14D 15.24
M24D 14.52
15-0518 14.44
15-0562 14.8
15-0564 14.55
15-0578 14.52
15-0576 14.49
M27D 14.39
15-0574 14.53
15-0560 14.6
15-0566 14.34
15-0535 14.21
15-0590 14.36
15-0534 14.05
15-0589 12.79
15-0514 14.23
15-0587 15.1
M16D 15.29
15-0586 15.1
15-0585 15.36
15-0592 14.23
15-0506 13.6
15-0584 15.39
15-0537 14.91
15-RW16 14.77
M32D 14.64
15-0569 14.09
15-0559 14.98
15-0572 14.51
15-0570 14.09
12-0522 14.97
12-0520 14.92
18-0508 15.42
18-0523 14.99
18-0520 14.61
18-0510 14.36
S67D 13.9
12-0514 13.62
S71D 13.41
S72D 12.97
S70D 13.33
S73D 12.6
12-0516 13.74
12-0518 14.17
12-0524 13.84
S68D 13.48
S69D 13.14
14
15
13
N
100 50 0 100 Feet
Value not used in contouring
S67D 13.9 Well Number and Ground Water Elevation in Feet (MSL)
Monitoring Well
Recovery Well
14 Water Table Contour in Feet (MSL)
Inferred Contour
Inferred Ground Water Flow Direction
Contour Interval = 1.0 Feet
Road
Fence
Railroad
Tank
Slurry Wall
Pond
Building
U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION, COLORADO
Prepared by
S.M. Stoller Corporation
Inc. DE-AC02-05GJ1569
Plate 2: Sitewide Deep Surficial Aquifer Contours
Pinellas, Florida, September 2007
DATE PREPARED
December 04, 2007
FILENAME
N0108300-02
M:\PIN\041\00100\08N\0108\N0108300-02.mxd carverh 12/4/2007 11:51:43 AM