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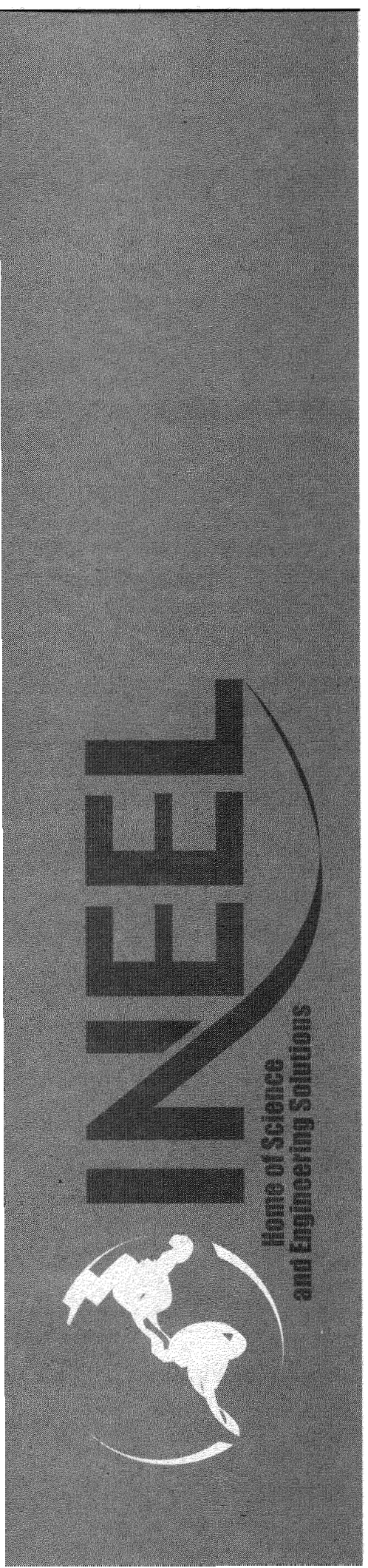

New Pump and Treat Facility Annual Operations Report October 2001 through September 2002, Test Area North Final Groundwater Remedy, Operable Unit 1-07B

August 2003

Idaho National Engineering and Environmental Laboratory
Bechtel BWXT Idaho, LLC

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August 2003

Idaho National Engineering and Environmental Laboratory
Idaho Completion Project
Idaho Falls, Idaho 83415

Prepared for the
U.S. Department of Energy
Assistant Secretary for Environmental Management
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ABSTRACT

The New Pump and Treat Facility is a component of the groundwater remediation remedy for a portion of a dissolved plume of volatile organic compounds in the Snake River Plain Aquifer beneath Test Area North, which is a facility located at the Idaho National Engineering and Environmental Laboratory. This report documents New Pump and Treat Facility operations during Fiscal Year 2002 (October 1,2001, through September 30,2002). The New Pump and Treat Facility began routine operations on October 1, 2001, and continued operating throughout Fiscal Year 2002. The New Pump and Treat Facility consists of three extraction wells, one injection well, two air strippers, and ancillary equipment such as piping and monitoring equipment. Contaminated groundwater is pumped from the aquifer using one or more extraction wells, processed by air stripping to remove volatile organic compounds, and then is injected back into the aquifer. During Fiscal Year 2002, the New Pump and Treat Facility met all operational goals. It was operational more than 98% of the time, the extraction flow rate was within prescribed limits during all operation periods, effluent concentration limits were met, and air discharge limits were not exceeded. Groundwater monitoring data show that contaminant concentrations in the area affected by the New Pump and Treat Facility are declining.

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TABLES

ACRONYMS

ASTU	air stripper treatment unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	contaminant of concern
DCE	dichloroethene
FY	fiscal year
INEEL	Idaho National Engineering and Environmental Laboratory
MCL	maximum contaminant level
MDL	method detection limit
NPTF	New Pump and Treat Facility
O&M	operations and maintenance
ORP	oxygen reduction potential
PCE	tetrachloroethene
SP	sampling point
TAN	Test Area North
TCE	trichloroethene
TPR	technical procedure
VC	vinyl chloride
VOC	volatile organic compound

New Pump and Treat Facility Annual Operations Report October 2001 through September 2002, Test Area North Final Groundwater Remedy, Operable Unit 1-07B

1. INTRODUCTION

This report documents the first year of operations of the New Pump and Treat Facility (NPTF), which is operated as part of the Test Area North (TAN) Operable Unit 1-07B groundwater remedy at the Idaho National Engineering and Environmental Laboratory (INEEL), as described in the *Record of Decision for the Technical Support Facility Injection Well (TSF-05) and Surrounding Groundwater Contamination (TSF-23) and Miscellaneous No Action Sites Final Remedial Action* (DOE-ID 1995). Although this Record of Decision (DOE-ID 1995) was amended in September 2001, the pump-and-treat portion of the remedy was not affected by the modification. The NPTF is operated in accordance with the *New Pump and Treat Facility Remedial Action Work Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B* (DOE-ID 1999) and *New Pump and Treat Facility Operations and Maintenance Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B* (DOE-ID 2002a). Associated sampling of groundwater-monitoring wells in the vicinity is described in the *Sampling and Analysis Plan for the New Pump and Treat Facility Performance Monitoring Test Area North, Operable Unit 1-07B* (INEEL 2001). This annual report provides information on the first year of operation, compliance, and performance of the NPTF required by these documents.

The specific meanings of three terms used in this document are listed below:

- Operations — refers to the routine activities associated with maintaining and running the NPTF
- Compliance — refers to the NPTF being operated within operational uptime and extraction flow-rate requirements and meeting air- and water-effluent discharge standards
- Performance — refers to the function of the NPTF relative to requirements to capture the contaminated groundwater plume that emanates from the contaminant hot spot near the former Injection Well TSF-05.

1.1 New Pump and Treat Facility History

From about 1953 to 1972, liquid types of waste generated at TAN (e.g., organic, inorganic, and low-level radioactive wastewaters) were disposed of by injection into Injection Well TSF-05. This injected waste spread within the Snake River Plain Aquifer underlying the INEEL Site. Over time, this created a contaminated groundwater plume originating from TSF-05. The plume was first detected in 1987 as low levels of two volatile organic compounds (VOCs) (i.e., trichloroethene [TCE] and tetrachloroethene [PCE]). Investigating the extent of contamination began in 1987 as a Resource Conservation and Recovery Act (42 USC § 6901 et seq.) corrective action. The INEEL was listed on the National Priorities List in 1989 (54 FR 29820), and subsequent investigation and remediation of contaminated groundwater at TAN was executed as a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC § 9601 et seq.) action. The CERCLA record of decision (discussed in Section 1) that addresses contaminated groundwater was signed in August 1995 (DOE-ID 1995) and amended in September 2001 (DOE-ID 2001).

The NPTF is the remedy identified for the medial-zone portion of the contaminated groundwater plume in which TCE concentrations were measured between 1,000 and 20,000 µg/L (INEEL 1997). The NPTF was completed and operational tests were conducted in Fiscal Year (FY) 2001. It began continuous operations at the beginning of FY 2002.

1.2 Overview of the New Pump and Treat Facility

The NPTF is a pump and treat system that is operated to capture the width of the medial-zone portion of the TAN TCE plume (see Figure 1-1). Major components of the pump and treat system include a network of extraction wells (i.e., TAN-38, -39, and -40), an aboveground treatment system that uses two air strippers to reduce concentrations of VOCs to less-than-maximum contaminant levels (MCLs), and an injection well (i.e., TAN-53A) used for injecting treated water back into the aquifer. Locations of the NPTF and surrounding wells are shown in Figure 1-1. The schematic diagram of the NPTF included in Figure 1-2 shows the location of sampling points (SPs) (e.g., SP-1 and -2) used for collecting samples to assess NPTF performance in relation to major components of the NPTF.

1.3 Document Organization

This annual report is organized as follows:

- Section 1 contains a brief introduction
- Section 2 contains a summary of facility operations
- Sections 3 contains a description of compliance monitoring
- Section 4 contains a description of performance monitoring
- Section 5 presents conclusions and recommendations
- Appendixes A through I present operational data.

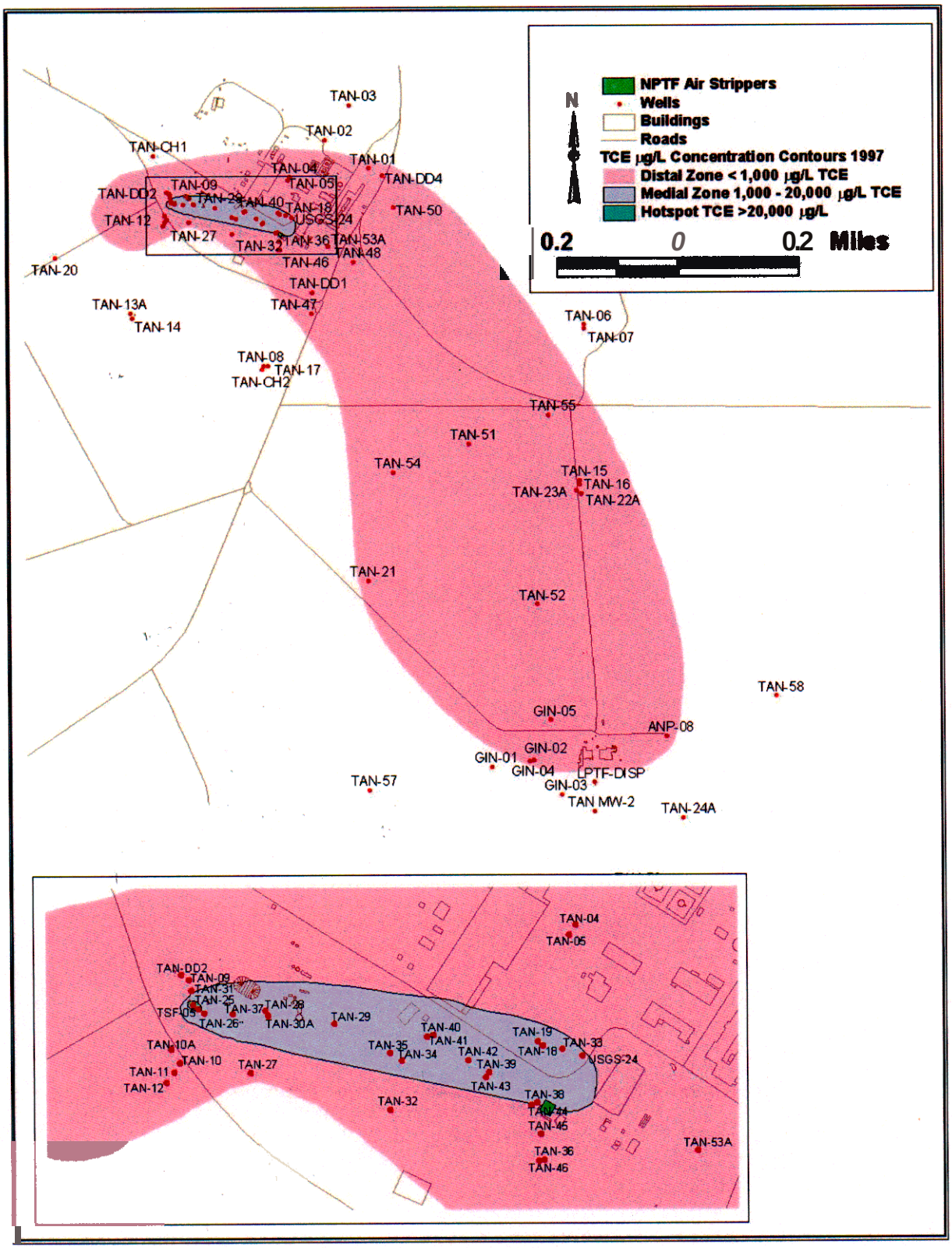

Figure 1-1. Medial zone of the trichloroethene plume at Test Area North.

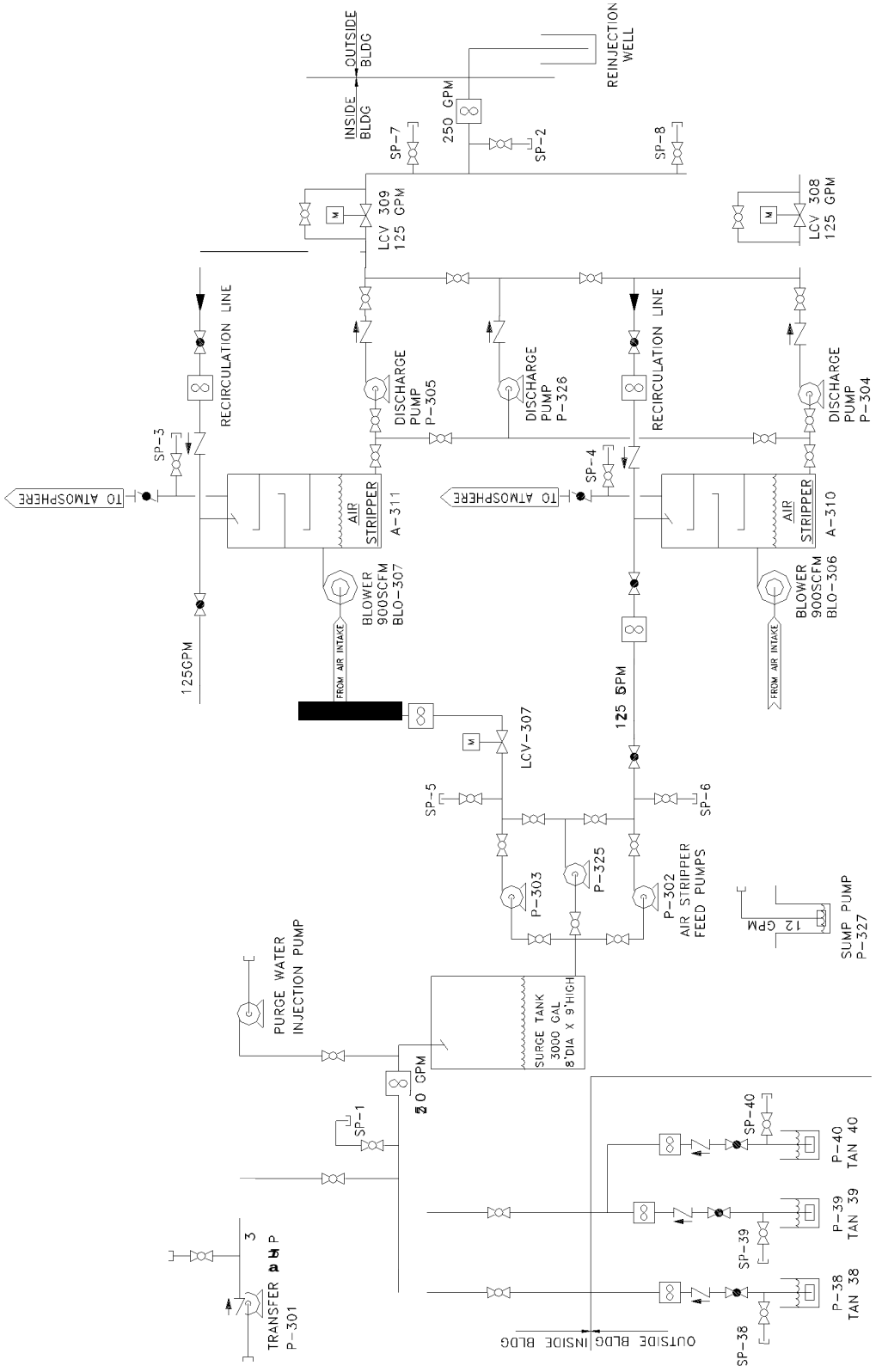

Figure 1-2. Schematic of the New Pump and Treat Facility at Test Area North.

2. SUMMARY OF OPERATIONS

The NPTF began routine operations on October 1, 2001. The system experienced 21 short-term shutdowns during the first 7 months of operation. Repair and replacement of system components to correct outages improved system reliability, and there were no unplanned outages during the last 5 months of the FY 2002.

The NPTF operated within required limits during FY 2002. These limits include effluent concentration limits, atmospheric discharge mass flow-rate limits, minimum and maximum groundwater extraction flow rates, and minimum operational uptime requirements.

In addition to processing contaminated groundwater produced from extraction wells, the NPTF also processed purge water generated from groundwater sampling activities. Purge water was managed in accordance with the applicable procedure.

This section addresses groundwater processed (see Section 2.1), purge water processed (see Section 2.2), inspections, operational issues, and corrective measures (see Section 2.3), and sampling and analysis (see Section 2.4).

2.1 Groundwater Processed

Throughout FY 2002, the NPTF operated between 120 and 250 gpm, except during planned shutdowns or inadvertent alarm situations. These events or conditions are described in detail in Section 2.3.

2.2 Purge Water Processed

Purge water was generated during routine groundwater sampling activities and was treated in the NPTF to remove VOCs and subsequently injected into TAN-53A. Purge water was managed in accordance with Technical Procedure (TPR) -6641, "New Pump and Treat Facility Purge Water Injection." The requirements of TPR-6641 were met throughout FY 2002; however, purge-water volumes were not recorded in the logbook on August 5, 6, 7, and 21,2002. Discussions with NPTF field personnel indicate that the purge-water-processingratios specified in TPR-6641 were met on those dates. Excerpts from logbooks that provide more detail on purge-water management are contained in Appendix A.

2.3 Inspections, Operational Issues, and Corrective Maintenance

2.3.1 Requirements

The inspection requirements are described in Section 3.3 of the NPTF Operations and Maintenance (O&M) Plan (DOE-ID 2002a). Detailed inspection procedures are described in TPR-6639, "New Pump and Treat Facility Process System Monitoring Procedure."

2.3.2 Performance

Inspections were performed on a daily basis throughout FY 2002 in accordance with TPR-6639.

The NPTF ran in continuous operation throughout the reporting period except for instances of planned or unplanned shutdowns. Unplanned shutdowns were caused by power outages and by spurious alarms caused by faulty high- and low-level sensors on the air strippers and a faulty circuit board. Planned

shutdowns were performed to test or repair system components. Additional details are provided in Appendix B, which contains excerpts from NPTF logbooks that document planned shutdowns, unplanned shutdowns, indications of equipment malfunctions that contributed to unplanned shutdowns, and corrective measures.

Operational uptime and downtime are discussed in greater detail in Section 3.1.

2.4 Compliance and Performance Monitoring

Compliance monitoring requirements identified in the NPTF O&M Plan are summarized in Table 2-1, as well as the performance relative to these requirements. Table 2-2 contains monitoring parameters established by the project to evaluate overall plume parameters in and around the medial zone. Results of these activities are presented in subsequent sections.

2.4.1 Requirements

Sampling and analysis were performed in accordance with the NPTF O&M Plan to document trends in NPTF influent concentrations, to document compliance with air and water discharge limits, and to demonstrate that the minimum capture-zone-width requirement had been met. Sampling and analysis was performed in accordance with the NPTF Sampling and Analysis Plan (INEEL 2001) ". . .to establish a baseline for trichloroethene. . .concentrations near the NPTF. . .These data will be used along with historical data and data from other sampling activities...to develop a long-term performance evaluation strategy."

2.4.2 Performance

Sampling and measurement requirements established by these documents were met for this reporting period, except as follows.

- Compliance monitoring – water influent and water effluent — The samples collected in October 2001 from SP-1 and -8 were analyzed for total 1,2-dichloroethene (DCE) instead of the specified cis-1,2 DCE and *trans*-1,2 DCE. The sample from SP-7 was analyzed for *cis*- and *trans*-isomers.

- Performance monitoring – plume capture — Determining width of the capture zone was required to be performed quarterly (DOE-ID 2002a) by measuring water levels (1) before extraction-well shutdown, (2) during recovery, and (3) after subsequent startup and calculating drawdown caused by extraction-well pumping. This was done during the first three quarters of FY 2002, but not in the fourth quarter.

Table 2-1. Compliance monitoring reauirements.

Monitoring Location	Parameters Measured	Frequency and Duration	Deviations	Source Document	Section in this Document
Water influent (SP-1)	PCE, TCE, cis-1,2 DCE, *trans*-1,2 DCE, and VC gross alpha, gross beta, Sr-90, and tritium	Monthly No duration specified	Total DCE was analyzed but cis- and *trans*-1,2 DCE were not speciated.	DOE-ID 2002," p. 4-2	3.3
Water effluent (SP-7 and -8)	PCE, TCE, cis-1,2 DCE, *trans*-1,2 DCE, and VC gross alpha and gross beta	Monthly No duration specified	Total DCE was analyzed but cis- and *trans*-1,2 DCE were not speciated.	DOE-ID 2002,[a] p. 4-2	3.4
Air effluent (SP-3 and -4)	PCE, TCE, cis-1,2 DCE, *trans*-1,2 DCE, and VC	Monthly No duration specified	None	DOE-ID 2002,[a] p. 4-2	3.5
TAN-19, -34, -36, -38, -39, -40, -41, TAN-42, -43, -45, -48, and USGS-24	Water levels during extraction well shutdown, recovery, and startup, for calculation of drawdown due to operation of extraction wells	Quarterly for four quarters following NPTF startup, semiannually thereafter.	Drawdown analysis performed for the first three quarters of FY 2002. No planned or unplanned shutdowns occurred during the fourth quarter that would have generated data needed for assessing drawdown.	DOE-ID 2002,[a] p. 4-5	4.1

a. DOE-ID, 2002a, *New Pump and Treat Facility Operations and Maintenance Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B*, DOE/ID-10684, Revision 2, U.S. Department of Energy Idaho Operations Office, May 2002.

DCE = dichloroethene
FY = fiscal year
NPTF = New Pump and Treat Facility
PCE = tetrachloroethene
SP = sampling point
TCE = trichloroethene
USGS = U.S. Geological Survey
VC = vinyl chloride

Table 2-2. Medial zone plume evaluation monitoring.

Monitoring Location (Well)	Parameters Measured	Frequency and Duration	Deviations	Source Document	Section in this Document
		Baseline Facility Performance			
TAN-29, -33, -36, -43, and -44	PCE, TCE, cis-DCE, trans-DCE, and VC Tritium, gross alpha, gross beta, and Sr-90 Temp, pH, ORP, DO, and conductivity	Quarterly for eight quarters, semiannually for 2 subsequent years.	Temperature, pH, OW, DO, and conductivity not measured at TAN-44 during March 2001 because of inoperative field equipment. Nevertheless, the 90% completeness goal was met.	INEEL 2001,"pp. 1,3,6,7, Appendix A	4.3

a. INEEL, 2001, *Sampling and Analysis Plan for the New Pump and Treat Facility Performance Monitoring Test Area North, Operable Unit 1-07B,* INEEL/EXT-01-01468, Revision 0, Idaho National Engineering and Environmental Laboratory, December 2001.

DCE = dichloroethene
DO = dissolved oxygen
ISB = in situ bioremediation
OW = oxygen reduction potential
PCE = tetrachloroethene
TCE = trichloroethene
VC = vinyl chloride
VOC = volatile organic compound

3. COMPLIANCE MONITORING EVALUATION

Compliance monitoring consists of documenting operational uptime and extraction flow rate and monitoring concentrations of contaminants of concern (COCs) to document trends in NPTF influent and to demonstrate that both water and air discharged from the NPTF meet discharge limits.

Operational uptime and extraction flow rate requirements were met. Influent criteria have not been defined. Contaminant-of-concernconcentrations in the NPTF influent declined throughout the fiscal year. Contaminant concentrations in water effluent were below discharge limits throughout FY 2002. Contaminant atmospheric mass discharge rates were also below the discharge limits throughout FY 2002.

Operational uptime and extraction flow rate are discussed in Sections 3.1 and 3.2, respectively. Influent concentrations are discussed in Section 3.3. Water and air emissions are discussed in Sections 3.4 and 3.5.

3.1 Operational Uptime

3.1.1 Performance Requirement

The NPTF operational uptime goal is greater than 90% (DOE-ID 2002a).

3.1.2 Actual Performance

The NPTF operated 98.4% of the time during FY 2002 and, therefore, met the operational uptime requirement.

Appendix C contains excerpts from NPTF logbooks that document periods during which the NPTF was not operating as well as flow rates from the extraction wells. Lines in italic font in Table C-1 (see Appendix C) were not excerpted from logbooks, but were added to facilitate calculation of operating periods. The extraction well flow-rate plot shown in Figure 3-1 provides a graphical representation of the NPTF operational periods in addition to flow rate.

3.2 Extraction Flow Rate

3.2.1 Performance Requirement

Influent flow rate to the NPTF (see Figure 3-1), which is the combined discharge rate from Extraction Wells TAN-38, -39, and -40, is required to be 120 to 250 gpm (DOE-ID 2002b).

3.2.2 Actual Performance

The flow rate from Extraction Wells TAN-38, -39, and -40 during FY 2002 is shown as a stacked area chart in Figure 3-1. Tabular data are presented in Appendix C. The height of the area for each well corresponds to the extraction rate for that well, and the total height of the areas corresponds to the total flow rate. Operating limits are shown as heavy dashed lines. Except for brief shutdown periods (see Section 4.4), the total extraction flow rate remained between the limits shown in Figure 3-1. Therefore, the requirement that the total extraction flow rate be between 120 and 250 gpm was met.

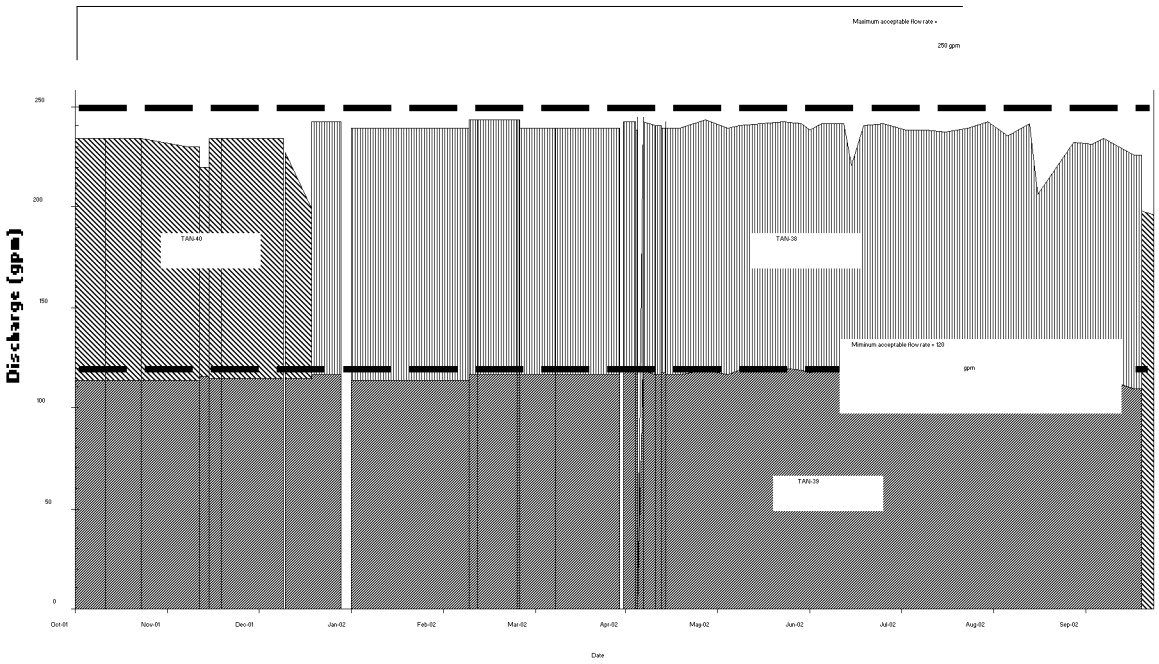

Figure 3-1. Flow rate from the New Pump and Treat Facility extraction wells

3.3 Influent Concentrations

3.3.1 Performance Requirements

Performance requirements for NPTF influent sampling, described in Table 4-1 of the NPTF O&M Plan are shown in Table 3-1. Section A.1.2.5 of the NPTF O&M Plan discusses completeness requirements for NPTF samples and specifies the completeness goal as 100%.

Influent concentrations are being monitored primarily to document input to the NPTF and to provide data for calculating air emissions of VOCs and radionuclides. New Pump and Treat Facility influent concentrations are limited only by the facility's ability to meet effluent criteria.

Table 3-1. New Pump and Treat Facility water influent sampling requirements."

Objective	Data Use	Measurement	Sample Freauencv
Determine contaminant concentrations at SP-1 (water influent)	Support mass balance evaluation for air emissions	v o c s (PCE, TCE, *cis*-1,2-DCE, trans-1.2 DCE, and VC) Radionuclides (gross α/β, Sr-90, and H-3)	Monthly

a. DOE-ID, 2002a, *New Pump and Treat Facility Operations and Maintenance Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B*, DOE/ID-10684, Revision 2, U.S. Department of Energy Idaho Operations Office, May 2002.

DCE = dichloroethene
PCE = tetrachloroethene
SP = sampling point
TCE = trichloroethene
VC = vinyl chloride
VOC = volatile organic compound

3.3.2 Actual Performance

Volatile organic compound and radionuclide concentrations measured in samples collected from the NPTF influent sampling point (i.e., SP-1) are shown in Figure 3-2. These data are tabulated in Appendix D.

Concentrations of VOCs and tritium in NPTF influent samples (SP-1) generally showed an overall trend of declining concentrations, with a large amount of scatter about this general trend. In contrast, strontium concentrations did not have an obvious trend but were variable. Gross alpha and gross beta measured in the NPTF influent remained relatively constant. Throughout the fiscal year, Sr-90 was at or below detection limits and there was no discernible trend. These data are tabulated in Appendix D but were not plotted.

Samples were collected monthly and submitted for analysis of the required suite of analytes. However, the analytical laboratory reported total 1,2 DCE instead of the cis- and *trans*- isomers in the October 2001 sample. Concentrations of cis- and *trans*-1,2 DCE were estimated based on the ratio of cis:total or trans:total in samples collected through the remainder of the year. The actual completeness for NPTF influent samples (106 actual results/108 planned results = 98.1%) is less than the 100% completeness goal.

3.4 Water Effluent Emissions

3.4.1 Performance Requirement

Volatile organic compound and radionuclide concentrations in water discharged from the NPTF must be below MCLs."Furthermore, the cumulative carcinogenic risk due to VOCs must be less than 1×10^{-5}.[b]

Effluent sampling requirements are shown in Table 3-2

Table 3-2. New Pump and Treat Facility water effluent sampling requirements."

Objective	Data Use	Measurement	Sample Frequency
Determine contaminant concentrations at SP-7 and -8 (water effluent)	Assess compliance to effluent discharge requirements	VOCs (PCE, TCE, cis-1,2 DCE, trans-1.2 DCE, and VC) Radionuclides (gross α/β)	Monthly

a. DOE-ID, 2002a, *New Pump and Treat Facility Operations and Maintenance Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B*, DOE/ID-10684, Revision 2, U.S. Department of Energy Idaho Operations Office, May 2002.

DCE = dichloroethene
PCE = tetrachloroethene
SP = sampling point
TCE = trichloroethene
VC = vinyl chloride
VOC = volatile organic compound

a. Karl J. Dreher, Idaho Department of Water Resources, Letter to C. Stephen Allred, Idaho Department of Environmental Quality, April 3,2001, "Injection of Amendments and Treated Ground Water into the Eastern Snake Plain Aquifer ("ESPA") in Support of Remedial Actions at Test Area North ("TAN") OU 1-07B, INEEL."

b. Brian R. Monson, Idaho Department of Environmental Quality, Letter to Dave Wessman, U.S. Department of Energy Idaho Operations Office, February 5,2001, "August 8,2001, and January 12,2001, Request of a 'No Longer Contained-In' Determination for Operable Unit 1-07B Remediated Water at the INEEL, EPA ID No. ID4890008952."

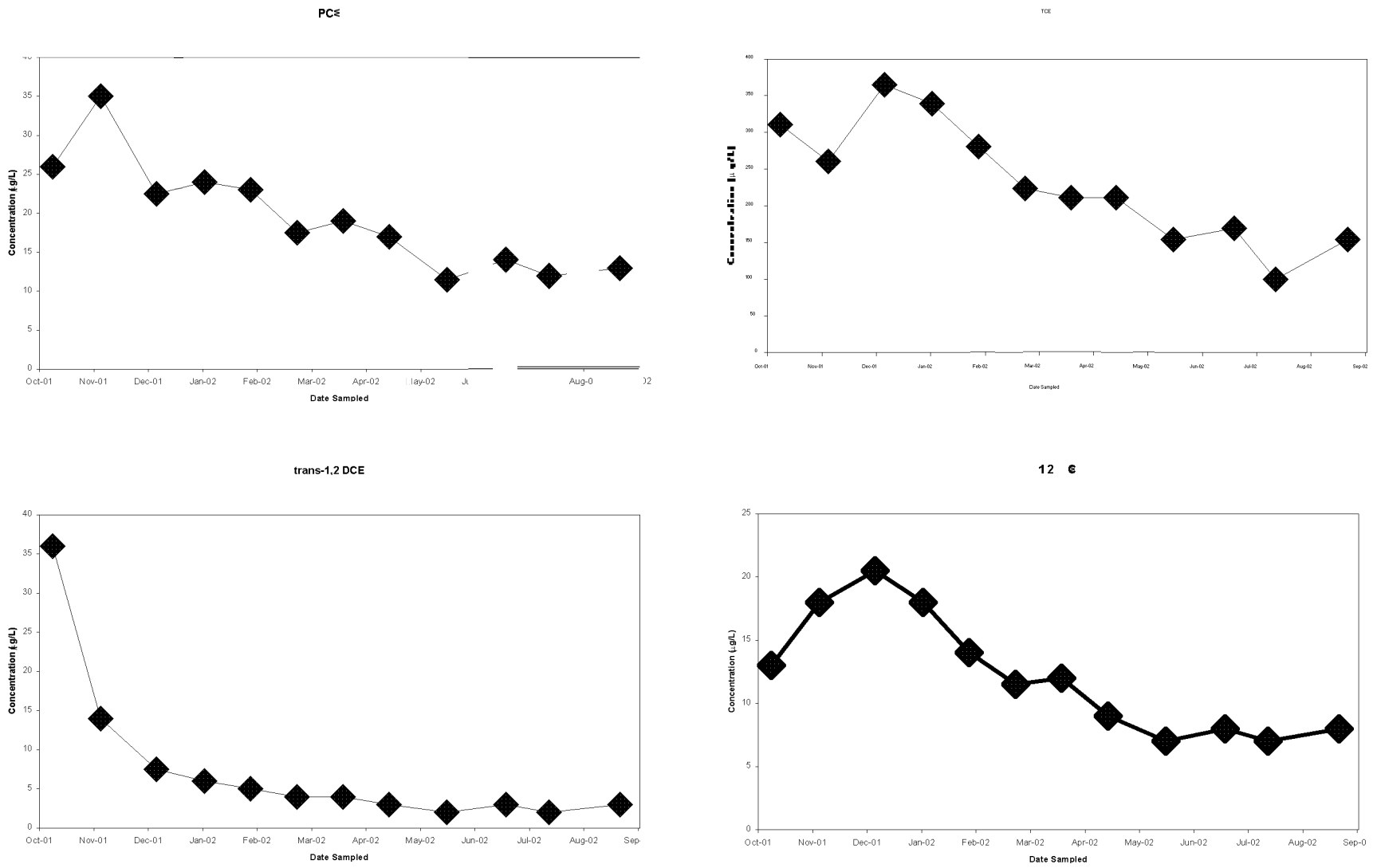

Figure 3-2. Contaminant-of-concern concentrations in New Pump and Treat Facility influent.

3.4.2 Actual Performance

The NPTF effluent met discharge limits throughout FY 2002. Volatile organic compound and radionuclide COCs in NPTF effluent were below MCLs. The cumulative carcinogenic risk due to VOC COCs was less than the 1×10^{-5} limit.

New Pump and Treat Facility effluent data are tabulated in Appendix D. Trichloroethene is plotted in Figure 3-3. Trichloroethene concentrations were approximately 1 µg/L throughout FY 2002 and were consistently below the 5-µg/L MCL-discharge limit. Values above the method detection limit (MDL) for TCE are plotted as solid symbols, while open symbols are used for values below the MDL. All other VOC COCs were below MDLs throughout FY 2002 and, therefore, were not plotted.

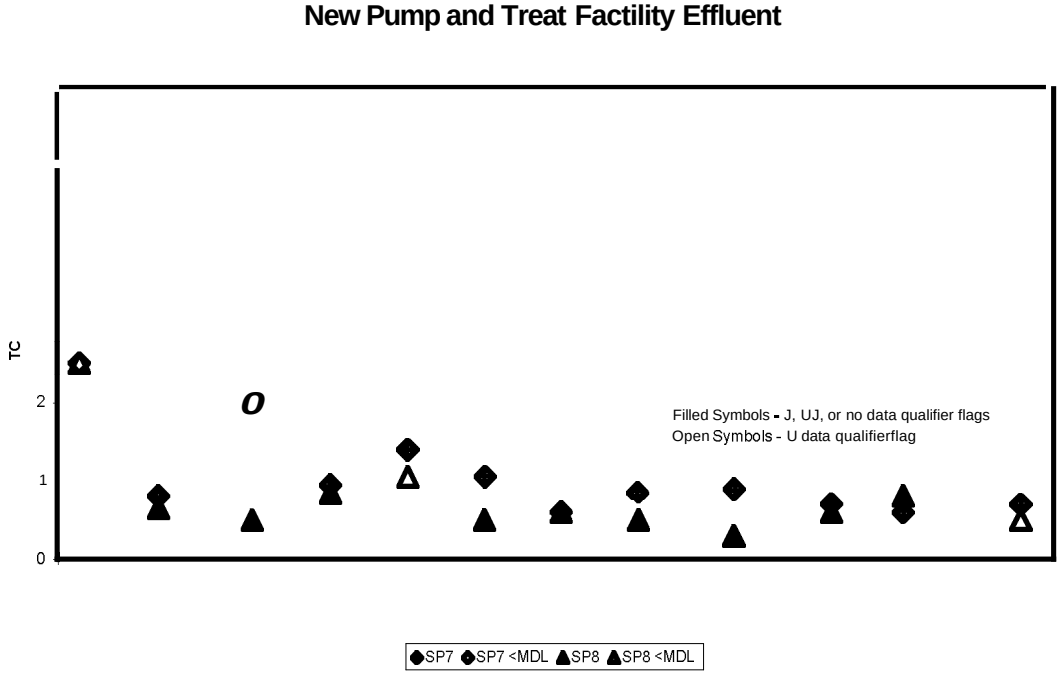

Figure 3-3. Contaminant-of-concern concentrations in New Pump and Treat Facility water effluent.

The calculation of carcinogenic risk due to VOCs that are COCs at Operable Unit 1-07B was performed in accordance with the procedure described in Appendix C of the NPTF O&M Plan (DOE-ID 2002a). The Agencies (i.e., DOE-ID, U.S. Environmental Protection Agency, and the Idaho Department of Environmental Quality) did not reach an agreement on the method for evaluating cumulative risk until after the start of the FY 2002 sampling program. Trichloroethene is the only COC included in the carcinogenic risk calculation detected above its MDL and, therefore, is the only contaminant used in the carcinogenic risk calculation.

Most of the VOCs identified in the risk calculation procedure were not analyzed during FY 2002 because the controlling documents in force at the beginning of the fiscal year did not require that they be analyzed. Changes to these documents (that will become effective in 2003) will require that they be analyzed in the future.

Data used for calculating cumulative carcinogenic risk are provided in Appendix E. Duplicate samples were sometimes collected from one sample point (SP-7 or -8), and both sample points were

routinely sampled. Measured concentrations for a given sample collection date were averaged and the average value was used for risk calculation. Values less than the MDL (data qualifier flag U) were not included in the averaging process. Results of the cumulative risk calculation based on NPTF water effluent data show that the calculated cumulative risk was well below the 1×10^{-5} limit throughout FY 2002 (see Figure 3-4).

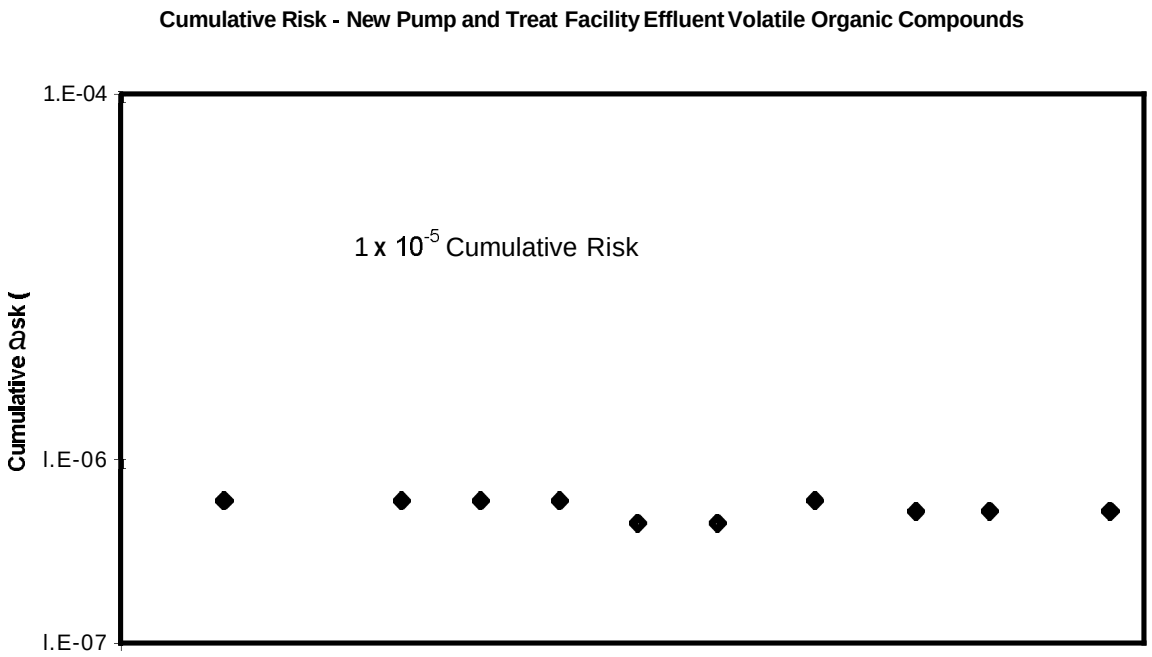

Figure 3-4. Cumulative carcinogenic risk due to volatile organic compounds in New Pump and Treat Facility water effluent.

Values for cis-1,2 DCE and *trans*-1,2 DCE were not reported for the October 2001 sample from SP-8, although they were reported for SP-7. Instead, total 1,2 DCE was reported. This laboratory error caused the actual completeness (166 actual analytical results/168 planned analytical results = 98.8%) to be less than the 100% completeness goal.

3.5 Air Emissions

3.5.1 Performance Requirement

Limits for VOCs discharged from the NPTF to the atmosphere are described in the New Pump and Treatment Facility Remedial Action Report, Test Area North Final Groundwater Remediation (DOE-ID 2002b) as: "Air emissions from the NPTF must be maintained below 0.18 lb/hr for TCE, 4.9 lb/hr for PCE, 564.3 lb/hr for cis-DCE, and 0.33 lb/hr for VC."

Sample collection analysis and validation requirements for monitoring air effluent are described in Table 4-1 of the NPTF O&M Plan (DOE-ID 2002a), and are repeated here as Table 3-3.

Table 3-3. New Pump and Treat Facility air effluent sampling requirements (DOE-ID 2002a).

Objective	Data Use	Measurement	Sample Frequency
Determine contaminant concentrations at SP-3 and -4 (air effluent)	Assess compliance to air emission requirements at air stripper	VOCs (PCE, TCE, *cis*-1,2 DCE, *trans*-1,2 DCE, and VC)	Monthly

DCE = dichloroethene
PCE = tetrachloroethene
SP = sampling point
TCE = trichloroethene
VC = vinyl chloride
VOC = volatile organic compound

3.5.2 Actual Performance

Concentrations of VOC COCs in NPTF air effluent declined throughout FY 2002 (see Figure 3-5). Mass flow rates of VOCs discharged from the NPTF air strippers to the atmosphere were below the respective air discharge limits throughout FY 2002 (see Figure 3-6).

Volatile organic compound emissions from NPTF air strippers to the atmosphere were calculated two ways. The first approach was to calculate the VOC mass flow rate using VOC concentrations measured in air stripper off-gas samples (the air effluent approach). The second approach was to assume that all VOCs dissolved in NPTF influent were discharged to the atmosphere and to calculate the VOC mass influx to the NPTF (the water influent approach). Comparison of results from two independent calculation methods provides a check on the calculations.

3.5.2.1 Air Effluent Approach. The mass of VOCs discharged to the atmosphere from the air strippers was calculated as the product of measured VOC concentrations in samples collected from air stripper off-gas sample points (SP-3 and -4) and the volumetric flow rate of air discharged from the air strippers. These calculations are documented in Appendix F. The mass flow rates of PCE, TCE, cis-1,2-DCE, and vinyl chloride (VC) were below their respective discharge limits (see Figure 3-6). Open symbols are used for plotting values calculated with this approach. All VC concentrations were below the MDL, and the VC mass flow rate was calculated using the MDL as the concentration.

3.5.2.2 Water Influent Approach. If the air strippers in the NPTF were 100% efficient at transferring VOCs from water to air, then the mass flow rate of VOCs discharged to the atmosphere would equal the mass flow rate of VOCs dissolved in water entering the NPTF. Because the actual air stripper removal efficiency is somewhat less than 100%, the actual mass flow rate discharged to the atmosphere is less than the influent mass flow rate. Therefore, the influent VOC mass flow rate is an upper bound on the VOC mass flow rate discharged to the atmosphere.

Volatile-organic-compound emissions from the NPTF to the atmosphere were calculated as the product of VOC concentrations measured at the influent sample point (i.e., SP-1) and the average monthly combined flow rate from Extraction Wells TAN-38, -39, and -40. These calculations are documented in Appendix F.

The influent VOC mass flow rates to the NPTF, and by inference the VOC mass flow rates discharged, were well below the NPTF air-emission limits for the entire fiscal year (see Figure 3-6). Solid symbols were used for plotting values calculated with this approach.

3.5.2.3 *Comparison of Air Effluent and Water Influent Approaches.* Mass discharge values for PCE, TCE, and cis-1,2 DCE, calculated using both approaches, show close agreement (see Figure 3-6). This close agreement between results calculated using independent data sets and different approaches provides confidence in these results.

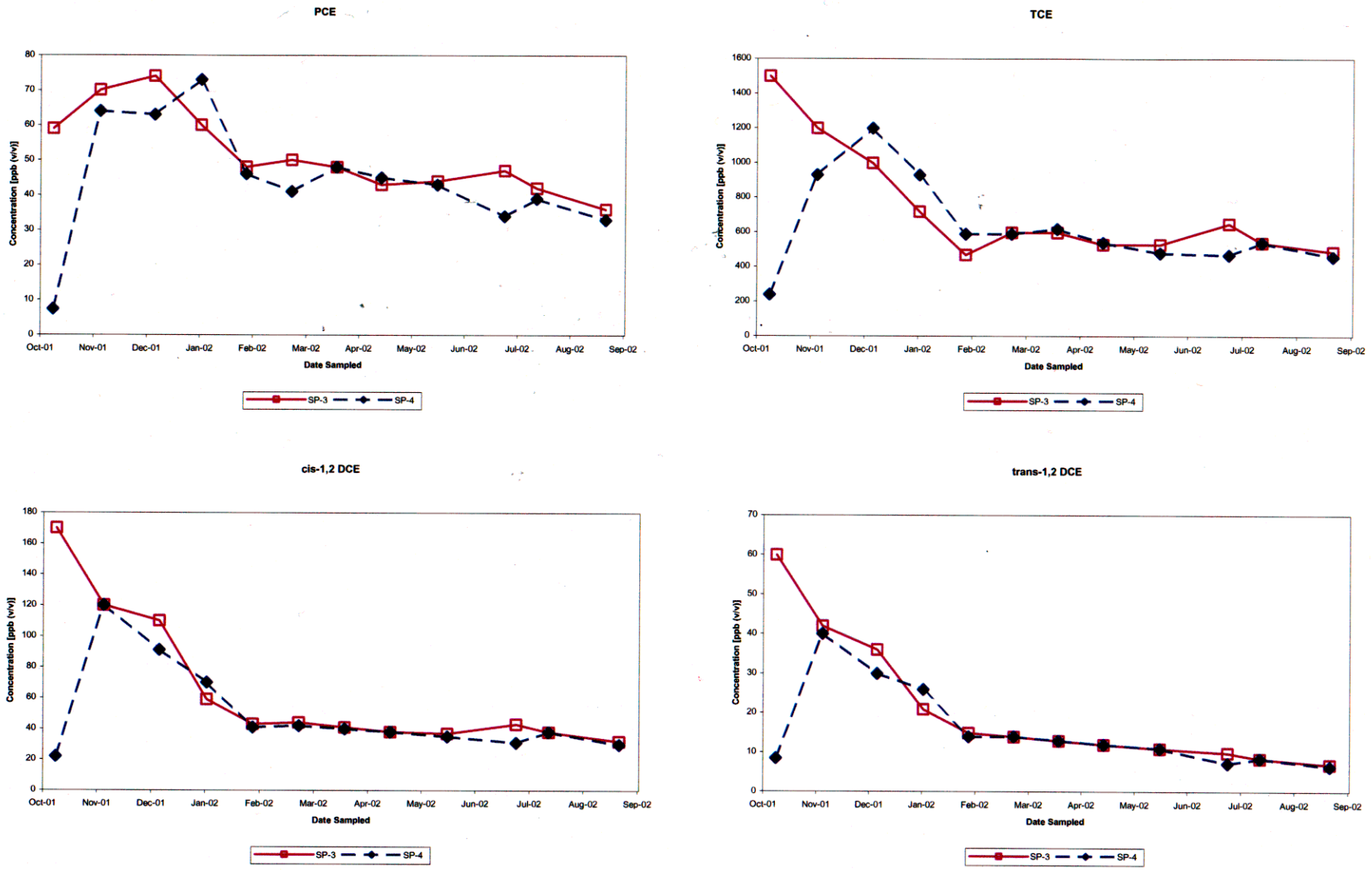

Figure 3-5. Contaminant-of-concern concentrations in New Pump and Treat Facility air effluent sampling points SP-3 and -4.

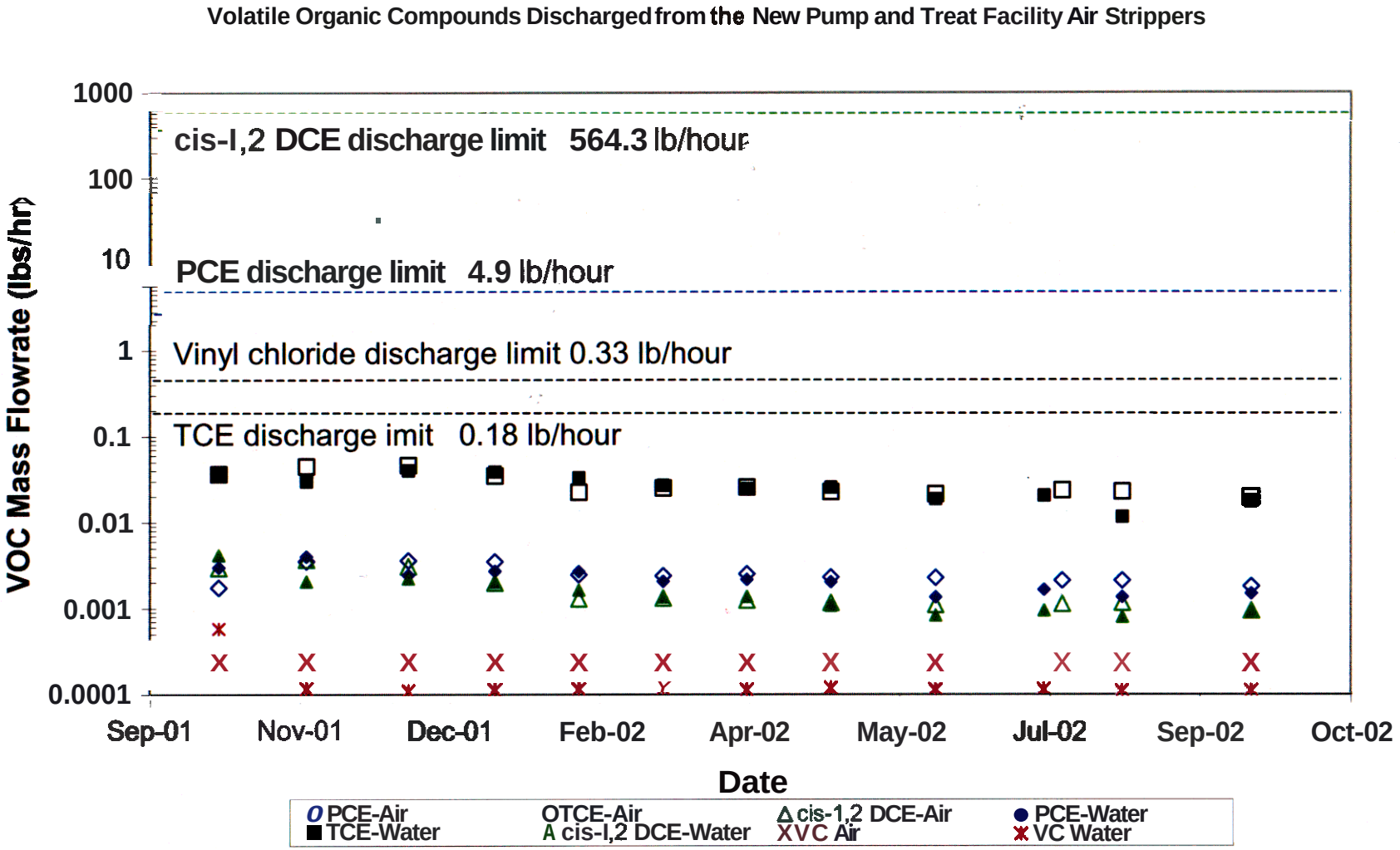

Figure 3-6. Mass flow rate of volatile organic compounds discharged to the atmosphere by the New Pump and Treat Facility.

4. PERFORMANCE MONITORING EVALUATION

This section addresses the effectiveness of extraction wells at generating a capture zone that encompasses the medial zone (see Section 4.1), temporal trends in COC concentrations at the upgradient end of the medial zone (see Section 4.2), and baseline facility effectiveness (see Section 4.3). Baseline facility effectiveness includes the effect of groundwater remedies on COC concentrations throughout the medial zone (see Section 4.3.1) and the hydraulic performance of extraction and injection wells (see Section 4.3.2).

4.1 Plume Capture

This section evaluates the width of the capture zone generated by operating Extraction Wells TAN-38, -39, and -40. Performance requirements, both for generating the capture zone and for conducting tests to document the width of the capture zone, are described in Section 4.1.1. Analysis of water level data to determine whether the minimum required capture-zone width has been achieved is described in Section 4.1.2.

Water level data collected during unplanned or planned shutdowns and subsequent startups were used to calculate the amount of drawdown at selected monitoring wells due to operating extraction wells. This analysis showed that the capture-zone width met the requirement during the first three quarters of FY 2002. Data needed for this analysis were not generated during the fourth quarter.

4.1.1 Performance Requirement

The plume capture performance monitoring requirements, as described in Sections 4.2 and 4.2.1 of the NPTF O&M Plan (DOE-ID 2002a) are as follows.

> The first objective for treatment facility long-term performance monitoring is to determine that the original design specifications for hydraulic capture or containment are being maintained.…The design criterion established for the NPTF to ensure capture of groundwater having TCE concentrations greater than 1,000 µg/L was that the flow rate be sufficient to produce a closed hydraulic head contour at least equal to the width of the 1,000-µg/L TCE isopleth.. . .Long-term monitoring of NPTF performance, with respect to this criterion, will consist of the periodic determination of the steady-state drawdown induced by groundwater extraction associated with the facility.. . .The drawdown induced by the facility will be determined periodically by shutting down the extraction pumps long enough to allow the water table to recover to ambient conditions, then restarting the facility while measuring drawdown for several hours. The aquifer response to this test should be consistent if it is performed on a regular frequency during the life of the NPTF. If the width of the capture zone is consistent with that observed during system operations testing, the facility performance is adequate.

Wells from which water-level measurements were required are shown in Table 2-3 of the NPTF O&M Plan. Hydraulic test data for selected wells are found in Appendix G.

4.1.2 Actual Performance

Capture-zone width was evaluated during the first three quarters of FY 2002 by examination of the hydraulic response of selected monitoring wells during FY 2002. Wells used in this analysis (TAN-19, -32, -33, and -36) are located near the edge of the minimum required capture zone (see Figure 4-1). The

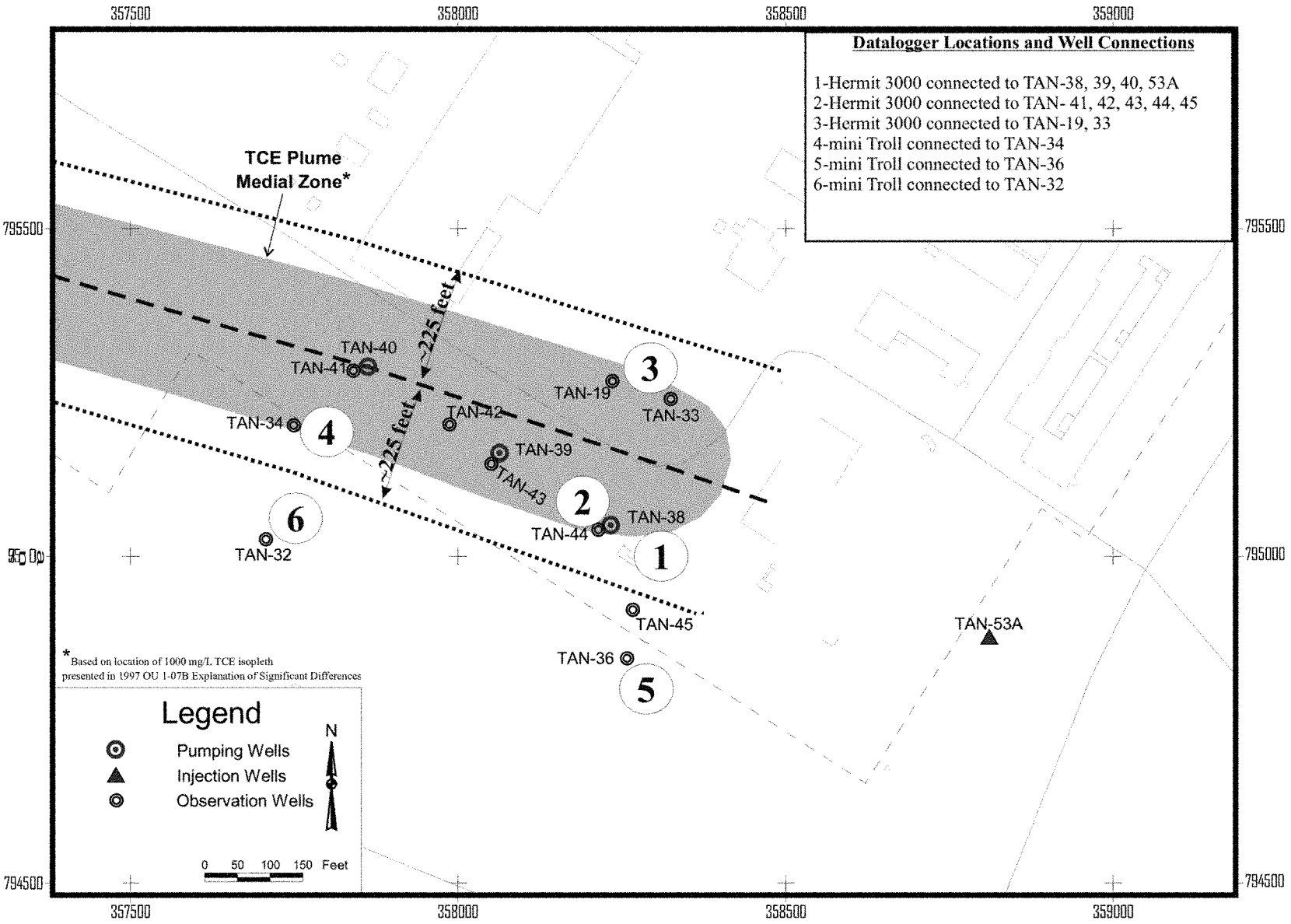

Figure 4-1. Medial zone capture zone.

hydraulic response of these wells to changes in extraction flow rate due to planned shutdowns and unplanned outages (and the subsequent restarts) was interpreted to determine whether drawdown caused by operating the extraction wells occurred at these monitoring wells. Flow modeling conducted previously indicates that measurable drawdown in these wells would indicate that the capture zone was at least as wide as required (INEEL 2002b). The following sections present these water-level data and evaluate the capture-zone effectiveness of NPTF extraction wells.

Hydrographs showing barometric-pressure and water-level data collected from selected wells at TAN during NPTF extraction-well shutdowns during FY 2002 are presented in Appendix G. Both water levels and barometric pressure are shown on the hydrographs because water levels in these wells respond to changes in barometric pressure. An increase in barometric pressure causes a decline in water level and, thus, the barometric-pressure and water-level records roughly mirror each other. The change in water level caused by stopping or starting extraction-well pumping appears as a deflection in the water-level record immediately after the change in pumping rate, which does not have a corresponding change in the barometric-pressure record.

The hydrographs are annotated with vertical lines, which show times when extraction-well pumps were stopped and started, and with horizontal dotted lines, which show the water level before and after pumping was stopped or started. The number between the dotted lines is the change in water level (i.e., the drawdown caused by pumping).

Results of drawdown testing are summarized in Table 4-1. Water levels responded from 0.04 to 0.15 ft when extraction-well pumps were turned off or on. The response of water levels in these four wells to extraction well shutdown indicates that extraction wells cause drawdown at these monitoring wells and, thus, that the capture zone extends at least as far as these wells. Therefore, it can be concluded that the extraction wells generate a capture zone that meets the requirement that it extend at least 225 ft from the medial zone centerline.

Table 4-1. Drawdown measured at selected wells

Test Date	Preshutdown and Poststartup Extraction Rate (gpm)			Shutdown	Startup	Drawdown Determined from Shutdown (upper value) and Startup (lower value) (ft)			
	TAN-38	TAN-39	TAN-40	Time and Date		TAN-19	TAN-32	TAN-33	TAN-36
First quarter	0	114	120	2210	0708	0.05	0.10	0.04	0.04
12/10-11/2001	0	114	113	12/10/01	12/11/01	0.06	0.15	0.10	0.05
Second quarter	126	117	0	1000	1650	0.10	0.06	0.11	—
2/27/2002	126	117	0			0.06	0.05	0.07	0.06
Third quarter	121	118	0	0705	1306	0.07	0.06	0.08	0.08
4/18/2002	122	120	0			0.07	0.06	0.08	0.07

4.2 Upgradient Source Control

No requirement is included in current controlling documents for monitoring concentrations of COCs in groundwater upgradient of the NPTF, specifically as part of NPTF performance monitoring. A revision to the NPTF Remedial Action Work Plan (DOE-ID 1999), that will be effective in Calendar Year 2003, will add this requirement. Upgradient-source control refers to monitoring the concentration of COCs upgradient of the extraction well network. The purpose is primarily to provide sufficient warning that operational changes can be made if groundwater with higher-than-anticipated contaminant concentrations is moving toward the extraction wells. Contaminant concentrations monitored at Well TAN-29 during FY 2002 showed expected trends, and no operational changes are warranted based on these trends.

4.2.1 Proposed Performance Requirements

Although it was not required for FY 2002, upgradient-source-control monitoring for the NPTF (i.e., monitoring of contaminant concentrations in Well TAN-29 approximately 350 ft upgradient of Extraction Well TAN-40) was performed as a good operational practice.

4.2.2 Actual Performance

Volatile-organic-compound and radionuclide data for Well TAN-29 are shown in Figure 4-2 and are tabulated in Appendix H. With the exception of PCE and TCE, contaminant concentrations declined between the first and fourth quarters of FY 2002. The increase in PCE (fourth quarter concentration was 2.1 times the first quarter concentration) and TCE (fourth quarter concentration was 1.1 times the first quarter concentration) may be an artifact of operating the air stripper treatment unit (ASTU) before beginning NPTF operations. Air stripper treatment unit operations would have produced a volume of low VOC water in the vicinity of Well TAN-49, which is adjacent to Well TAN-29. As this body of water moved past Well TAN-29 toward the extraction wells, VOC concentrations at TAN-29 would have rebounded as groundwater that had not been treated by the ASTU moved into the area.

Based on the trends illustrated in Figure 4-2, there is no evidence that a body of water that has substantially higher contaminant concentrations than has been previously treated is moving toward the NPTF extraction wells. Hence, it is not expected that NPTF effluent limits will be exceeded. No changes in NPTF operations are needed.

4.3 Baseline Facility Performance

Baseline facility performance refers to the effect of operating the NPTF on groundwater quality in selected wells near the NPTF and on the hydraulic performance of extraction and injection wells. Agency-approved controlling documents currently do not require water quality to be monitored in wells near the NPTF for assessing NPTF performance. Nevertheless, this was done as a good operational practice. Monitoring was performed in accordance with the NPTF Sampling and Analysis Plan (INEEL 2001). Wells to be sampled were TAN-29, -33, -36, -43, and -44. Quarterly sampling is specified. Analytes specified were chloroethenes (i.e., PCE, TCE, cis-DCE, trans-DCE, and VC), and tritium, Sr-90, gross alpha, and gross beta. Field analyses specified were temperature, pH, oxygen reduction potential (OW), dissolved oxygen, and conductivity. A completeness goal of 90% is specified in the Sampling and Analysis Plan (INEEL 2001).

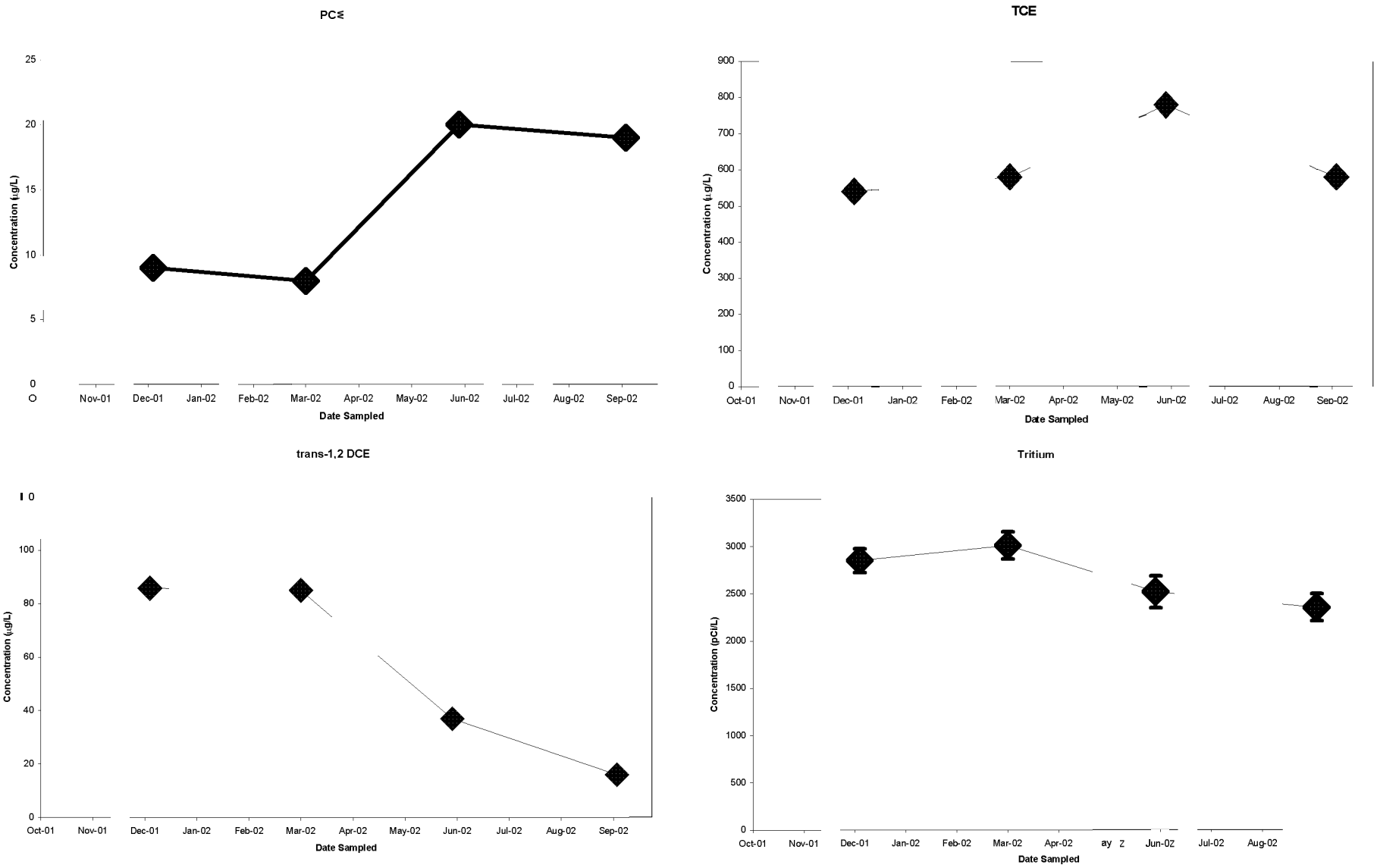

Figure 4-2. Contaminant-of-concern concentrations at Well TAN-29.

The wells and parameters indicated above were sampled at the required frequency during this reporting period. The 90% completeness goal (INEEL 2001) was met for all analytes. Water quality monitoring data are tabulated in Appendix H. Data from these wells will be used in a 5- to 10-year timeframe for assessing whether to terminate NPTF operations.

Hydraulic performance of extraction and injection wells is being monitored to detect system changes that may affect the ability of the NPTF to capture the medial zone and cut off flux from the hot spot, as designed. Water levels were measured at each pumping well at an interval of once per day over a 6-month period to evaluate water level trends. The injection well, TAN-53A, also was monitored to ensure that water levels inside the borehole did not rise to a level near the land surface.

Water levels were measured in the extraction and injection wells using pressure transducer data-logger systems. Water levels were typically measured every 15 minutes throughout the fiscal year, except for brief periods when equipment was removed from wells for maintenance.

Plots showing water level and flow rate for the extraction wells (i.e., TAN-38, -39, and -40) and the injection well (i.e., TAN-53A) are shown in Appendix I.

5. SUMMARY

This section summarizes the findings of previous sections of this report.

5.1 Operations

Operations at the NPTF during FY 2002 are summarized below:

- The NPTF operated within required limits throughout FY 2002. These limits include operational uptime, extraction well flow rate, and both water and air discharge limits.
- Purge water processed by the NPTF during FY 2002 was handled in accordance with procedures.
- Routine inspections were performed as required.
- Twenty-one planned and unplanned outages occurred between October 2001 and April 2002. Corrective maintenance in response to these outages increased plant reliability. The NPTF did not experience unplanned outages after April 18, 2002.
- The 90% completeness goal for performance-sample collection and analysis was met. The 100% completeness goal for compliance-sample collection was met. Laboratory error caused the actual completeness for compliance sample analysis to be only 99%. Instead of analyzing for ***cis***- and *trans*-1,2 DCE separately, the laboratory measured the total DCE concentration.

5.2 Operational Uptime

The NPTF operational uptime was greater than 98%, which met the uptime goal of at least 90%.

5.3 Extraction Flow Rate

The combined extraction flow rate was maintained between the 120 to 250 gpm flow rate limits throughout the fiscal year, except during planned or unplanned shutdown periods.

5.4 Influent Concentration Monitoring

Contaminant of concern concentrations in NPTF influent declined throughout FY 2002.

5.5 Water Effluent Emissions

Effluent concentrations of COCs, including both VOCs and radionuclides, were below MCLs throughout FY 2002.

Cumulative carcinogenic risk caused by VOCs that are COCs was less than the 1×10^{-5} requirement throughout the fiscal year.

5.6 Air Emissions

Mass flow rates of each VOC discharged from the NPTF air strippers to the atmosphere were less than the maximum amount allowed.

Results of two independent calculations of VOC mass discharge to the atmosphere agree.

5.7 Plume Capture

Plume capture activities at the NPTF during FY 2002 are summarized below:

- The hydraulic response of four wells near the edge of the capture zone was monitored during planned and unplanned shutdowns and restarts during the first three quarters of FY 2002. No extraction well shutdowns occurred during the fourth quarter; therefore, drawdown caused by pumping fi-om the extraction wells was not assessed during the fourth quarter.
- Water levels in these wells responded to extraction-well shutdown and start up (i.e., pumping from extraction wells caused drawdown at these monitoring wells). Drawdown in these wells indicates that the minimum required capture-zone width has been achieved.
- Shutdown and restart tests used for measuring.the hydraulic response of wells, which in turn are used to infer capture-zone width, should be planned and executed on a routine basis instead of relying on unplanned shutdowns or shutdowns for other purposes to generate data sets for evaluating drawdown.

5.8 Upgradient Source Control

Upgradient source control activities at the NPTF during FY 2002 are summarized below:

- Concentrations of COCs in TAN-29 were used as an indicator of temporal trends in water approaching the extraction wells
- Concentrations of COCs other than PCE and TCE were either steady or declined
- Concentrations of PCE and TCE at TAN-29 increased slightly during FY 2002. The PCE and TCE trends may be an artifact of previous operation of the ASTU. This increase is not expected to affect NPTF operations, and no changes to the operating strategy are needed.

5.9 Baseline Facility Performance

Baseline facility performance activities at the NPTF during FY 2002 are summarized below:

- Concentrations of COCs were monitored quarterly in wells TAN-29, -33, -36, -43, and -44.
- Concentrations of PCE and TCE increased at TAN-29 during FY 2002 but decreased elsewhere. The increase at TAN-29 may be an artifact of prior ASTU operation.
- Remaining COCs showed an overall trend of declining concentrations in all wells monitored.
- Concentrations of COCs other than tritium decreased downgradient fi-om TAN-29. Tritium concentrations were approximately the same in all wells monitored.
- Collection of water quality data from this suite of wells should be continued.
- After data have been collected for 5 years, they should be analyzed to assess the effect of NPTF operations on COC concentrations.

5.10 Hydraulic Performance of Injection and Extraction Wells

Hydraulic performance of injection and extraction wells at the NPTF during FY 2002 are summarized below:

- Extraction wells did not show any signs of declining transmissivity during FY 2002
- The injection well did not show any signs of declining transmissivity during FY 2002.

6. REFERENCES

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Appendix A

Purge Water Management at the New Pump and Treat Facility, FY 2002

Appendix A

Purge Water Management at the New Pump and Treat Facility, FY 2002

This appendix contains excerpts from New Pump and Treat Facility logbooks that provide additional detail on purge-water management.

Table A-1. Purge water management.

Sampling Event Date	Wells Sampled (well identifier)	Minimum Ratio	Total Volume of Purge Water (gal)	Was Minimum Ratio Met? (Y or N)
1012001	TAN-D2, -10A, -26, -27, -28, -29, -30A	100:1	432.4	Y
	TSF-05A & B; TAN-25, -31, -37A, -37B, -37C	500:1	479.3	Y
1112001	TAN-D2, -10A, -26, -27, -28, -29, -30A	100:1	386.4	Y
	TSF-05A & B; TAN-25, -31, -37A, -37B, -37C	500:1	432.3	Y
1212001	TAN-D2, -10A, -26, -27, -28, -29, -30A	100:1	370	Y
	TSF-05A & B; TAN-25, -31, -37A, -37B, -37C	500:1	372	Y
	TAN-33, TAN-36, TAN-43, TAN-44	N/A[a]	299	Y
	TAN-51	N/A[b]	73.6	Y
	TAN-51	N/A[b]	75	Y
0112002	TAN-D2, -10A, -26, -27, -28, -29, -30A	100:1	300	Y
	TSF-05A & B; TAN-25, -31, -37A, -37B, -37C	500:1	368.8	Y
	TAN-51	N/A[b]	300	Y
0212002	TAN-D2, -10A, -26, -27, -28, -29, -30A	100:1	494	Y
	TSF-05A & B; TAN-25, -31, -37A, -37B, -37C	500:1	408	Y

Table A-1. (continued).

Sampling Event Date	Wells Sampled (well identifier)	Minimum Ratio	Total Volume of Purge Water (gal)	Was Minimum Ratio Met? (Y or N)
03/2002	TAN-D2, -10A, -26, -27, -28, -29, -30A	100:1	540‘	Y
	TAN-33, -36, -43, -44	N/A[a]		Y
	TSF-05A & B; TAN-25, -31, -37A, -37B, -37C	500:1	301.2	Y
04/2002	TAN-D2, -10A, -26, -27, -28, -29, -30A	100:1	200	Y
	TSF-05A & B; TAN-25, -31, -37A, -37B, -37C	500:1	453.2	Y
05/2002	TAN-D2, -10A, -26, -27, -28, -29, -30A	100:1	350	Y
	TSF-05A & B; TAN-25, -31, -37A, -37B, -37C	500:1	424	Y
06/2002	TAN-D2, -10A, -26, -27, -28, -29, -30A	100:1	470‘	Y
	TAN-33, -36, -43, -44	N/A[a]		Y
	TSF-05A & B; TAN-25, -31, -37A, -37B, -37C	500:1	504	Y
	TAN-4, -5, -18, -19	N/A[a]	124	Y
	TAN-48	N/A[b]	99	Y
	TAN-55, USGS-24, TAN-32, -34	N/A[a] and N/A[b]	112	Y
07/2002	TAN-D2, -10A, -26, -27, -28, -29, -30A	100:1	340	Y
	TSF-05A & B; TAN-25, -31, -37A, -37B, -37C	500:1	1816	Y
	TAN-21, -32	N/A[a] and N/A[b]	234	Y
	TAN-11, -15, -50	N/A[a] and N/A[b]	150	Y
	TAN-22A, -32	N/A[a] and N/A[b]	125	Y
	TAN-47	N/A[b]	56	Y
	TAN-16, -23A, -D1	N/A[b]	168	Y

Table A-1. (continued).

Sampling Event Date	Wells Sampled (well identifier)	Minimum Ratio	Total Volume of Purge Water (gal)	Was Minimum Ratio Met? (Y or N)
08/2002	TAN-D2, -10A, -26, -27, -28, -29, -30A	100:1	1897	Y
	TSF-05A & B; TAN-25, -31, -37A, -37B, -37C	500:1	2021.8	Y
	TAN-51	N/A[b]	253	Y
	TAN-54	N/A[b]	280	Y
	TAN-48, -52	N/A[b]	350	Y
09/2002	TAN-D2, -10A, -26, -27, -28, -29, -30A	100:1	360	Y
	TSF-05A & B; TAN-25, -31, -37A, -37B, -37C	500:1	62	Y
	TAN-7, -33, -36, -43, -44	N/A[a] and N/A[b]	200	Y
	TAN-52, -55, -16	N/A[b]	350	Y

a. Purge water from wells TAN-04, -05, -9, -11, -12, -18, -19, -32, -33, -34, -35, -36, -38, -40, -41, -42, -43, -44, -45, and -46 may be processed through the New Pump and Treat Facility with no flowrate restriction.
b. Unrestricted ratio for Flexible Liner Underground Technology (FLUTe) liner sampling; wells TAN-7, -15, -16, -21, -22A, -23, -47, -48, -50, -51, -52, -54, -55, -D1, and USGS-24, although not identified in TPR-6641.
c. Combined purge water from the wells. Not all the wells needed to be blended. All water processed at 100:1 ratio.

Appendix B

Excerpts from New Pump and Treat Facility Logbooks, FY 2002

Appendix B

Excerpts from New Pump and Treat Facility Logbooks, FY 2002

The New Pump and Treat Facility ran in continuous operation throughout the reporting period except for instances of planned or unplanned shutdowns. Unplanned shutdowns were caused by power outages and by spurious alarms caused by faulty high- and low-level sensors on the air strippers and a faulty circuit board. Planned shutdowns were performed to test or repair system components. Table B- contains excerpts from New Pump and Treat Facility logbooks that document planned shutdowns, unplanned shutdowns, indications of equipment malfunctions that contributed to unplanned shutdowns, and corrective measures.

Table B-1. Select New Pump and Treat Facility operational logbook excerpts.

Date	Issue	Resolution
10/11/01	At 0759, NPTF shutdown for unknown reason. Alarm panel showed ESD had been actuated.	At 0809, started pumps back up. NPTF back on-line, processing.
10/23/01	Estimated at 0015 NPTF was shutdown due to a site loss of power.	At 0640, no corrective action was required and the system was restarted.
11/12/01	Between 0715 and 0730, an unintended shutdown occurred due to LSHH-322 high activation, LSHH-321 high activation, LSL-309 low activation, and LSL-308 low activation. It was assumed that the water dripping from the above tray caused this shutdown.	At 1100, no corrective action was required and the system was restarted.
11/15/01	At 1450, a normal shutdown was performed to test system. ESD was pressed to verify proper operation and system worked correctly.	At 1520, began system startup and at 1543, system at steady state operation.
11/19/01	At 1508, TAN-38 was tested by pulling up its transducer out of the water in order to determine if the pump would shut down. Shutdown did occur. Tested TAN-40 by pulling up its transducer. TAN-40 pump shutoff. At 1524, tested shutdown using LSH-38 in well house TAN-38: did not strobe light or page using the auto dialer.	AT 1529, TAN-40 and –39 were started and at 1530, the NPTF was in auto operations.

Table B-1. (continued).

Date	Issue	Resolution
11/28/01	At 1130, performed testing of PLC with computer. Determined that the acknowledge alarm button was green, indicating that the alarms are acknowledged prior to even being set off. At 1150 NPTF shutdown by initiating TAN-38 high level. Beacon blinking and paging system worked. At 1158 TAN-40 back online. At 1159 TAN-39 back online. 1214 NPTF shutdown by initiating TAN-38 high level. At 1231 TAN-40 online. At 1232 TAN-39 online and NPTF in operation.	1200, Start NPTF operations. PLC card was changed and re-programmed. The button cannot acknowledge prior to an alarm being detected.
12/10/01	At 2208, NPTF shutdown due to LSHH-322 activation. This is believed to be caused by water dripping from the above tray. At 2210, NPTF started paging operators.	At 2210, project manager contacted and directed operators to respond in a.m. and continue processing.
12/11/01	Continuation from 12/10/01 shutdown.	At 0708, no corrective action was required, and the NPTF was restarted.
12/31/01	NPTF secured due to locked LSL-39 signal.	Control panel power was cycled to clear this alarm and preparations were made to replace instrument card F2-08AD-1.
01/01/02	NPTF remained shut down	—
01/02/02	At 1603, NPTF startup.	—
01/03/02	At 1531 NPTF secured for PLC instrument card F2-08AD-1 replacement.	The PLC instrument card F2-08AD-1 was replaced. At 1546, NPTF operation was restored.
01/24/02	At 1610, FIT-318 on the touch screen was displaying inaccurate readings. Checked the local indicator in the process room and it was reading properly.	Contacted Project Manager who instructed personnel to continue processing.
01/25/02	Same as 01/24/02.	Continued operations.
01/26/02	Control panel FIT-318 reading now indicating properly within range.	Continued operations.
02/10/02	FIT-318 was not providing a reading at the locally in the pump room. FIT-318 at the touch screen was reading 586.	FIT-318 was failing but NPTF continued operations until 02/11/02.
02/11/02	1225 NPTF secured for replacement of PLC card F2-08AD-1 due to this failing FIT-318.	1322 card F2 F2-08AD-1was replaced and NPTF started.

Table B-1. (continued).

Date	Issue	Resolution
02/12/02	0800 NPTF in continuous operation but touch screen display showing FT-318 analog failure.	Continued operations. See 02/14/02 for correction.
02/14/02	1000 NPTF secured for FIT-318 gage replacement and instrument calibration.	1000 Gage FIT-318.replaced and instruments were calibrated and tested per TPR-6490. At 1616 NPTF started.
02/27/02	1000 NPTF shutdown to perform video logging of TAN-53A.	1650 NPTF started.
02/28/02	1146 NPTF shutdown for Pump P-40 replacement.	1923 NPTF started.
03/12/02	0845 NPTF shutdown for planned power outage on CKT-53.	1257 NPTF started.
04/04/02	0120 not in continuous operation. Alarm screen indicated "Stripper High/LSHH-321, Stripper High/LSHH-322, Stripper Low/LSL-309, and Stripper Low/LSL-308."	At 0125 NPTF restarted per Project Manager.
04/08/02	0339 NPTF shutdown. Alarm screen indicated "Stripper High/LSHH-321, Stripper High/LSHH-322, Stripper Low/LSL-309, and Stripper Low/LSL-308."	At 0856 NPTF restarted per Project Manager.
04/09/02	2221 NPTF Shutdown	Recorded on 04/10/02.
04/10/02	0645 recorded NPTF shutdown from 04/09/02. Alarm screen indicated "Stripper High/LSHH-321, Stripper High/LSHH-322, Stripper Low/LSL-309, and Stripper Low/LSL-308."	At 0650 NPTF restarted.
04/11/02	1130 began securing NPTF to perform minor maintenance on LSHH-321/322.	Minor maintenance postponed due to electricians being called off to perform another job. NPTF restarted at 1358.
04/15/02	1644 NPTF shutdown due to spurious LSHH-321 signal alarm. Alarm screen indicated "Stripper High/LSHH-321, Stripper High/LSHH-322, Stripper Low/LSL-309, and Stripper Low/LSL-308."	1654 NPTF restarted per Project Manager.
04/17/02	0311 NPTF shutdown due to LSHH-321. Alarm screen indicated "Stripper High/LSHH-321, Stripper High/LSHH-322, Stripper Low/LSL-309, and Stripper Low/LSL-308."	0742 NTPF started.
04/18/02	0705 NTPF secured for minor maintenance of LSHH-321/322.	LSHH-321/322 sensors were replaced and tested satisfactorily. At 1306 NPTF restarted.

No further issues were recorded after April 18, 2002.

Appendix C

New Pump and Treat Facility Operational Uptime and Extraction Flow Rate

Appendix C

New Pump and Treat Facility Operational Uptime and Extraction Flow Rate

Appendix C contains excerpts from New Pump and Treat Facility (NPTF) logbooks that document periods during which the NPTF was not operating as well as flow rates from the extraction wells. Lines in italic font in Table C-1 were not excerpted from logbooks, but were added to facilitate calculation of operating periods.

Table C-1. New Pump and Treat Facility influent flowrate

Date / Time	TAN-38 Flowrate (gpm)	TAN-39 Flowrate (gpm)	TAN-40 Flowrate (gpm)	Total Flowrate (gpm)	Comment	Serial Date	UpTime (days)	Down Time (days)	Down Time (hours)	Volume of water Processed (gal)	Average Quantity (gpm)
10/1/01 0:00	*0*	*113*	*121*	*234*	BEGINNING OF FISCAL YEAR	37165.00	—	—	—	—	—
10/1/01 13:01	0	113	121	234		37165.54	—	—	—	—	—
10/11/01 7:58	0	113	121	234		37175.33	10.3	—	—	3.5E+06	—
10/11/01 7:59	0	0	0	0	Unexplained shutdown	37175.33	—	—	—	—	—
10/11/01 8:08	*0*	0	0	0		37175.34	—	*0.0*	*0.1*	—	—
10/11/01 8:09	0	113	121	234		37175.34	—	—	—	—	—
10/23/01 0:29	0	113	121	234		37187.02	11.7	—	—	3.9E+06	—
10/23/01 0:30	0	0	0	0	Bird into transformer	37187.02	—	—	—	—	—
10/23/01 6:39	0	0	0	0		37187.28	—	*0.3*	*6.1*	—	—
10/23/01 6:40	0	113	121	234		37187.28	—	—	—	—	—
10/31/01 23:59	*0*	*113*	*121*	*234*		*37196.00*	*8.7*	—	—	2.9E+06	—
Monthly Totals							30.7	0.3	—	1.0E+07	232
11/1/01 0:00	*0*	*113*	*121*	*234*		*37196.00*	—	—	—	—	—
11/8/01 7:00	0	113	117	230		37203.29	—	—	—	2.4E+06	—
11/12/01 7:14	0	113	117	230		37207.30	11.3	—	—	1.3E+06	—
11/12/01 7:15	0	0	0	0	Shutdown	37207.30	—	—	—	—	—
11/12/01 10:59	0	0	0	0		37207.46	—	*0.2*	*3.7*	—	—
11/12/01 14:30	0	115	105	220		37207.60	—	—	—	—	—
11/15/01 14:49	0	115	105	220		37210.62	3.2	—	—	1.0E+06	—
11/15/01 14:50	0	0	0	0	Normal shutdown	37210.62	—	—	—	—	—
11/15/01 15:19	0	0	0	0		37210.64	—	*0.0*	*0.5*	—	—
11/15/01 15:20	0	0	120	120		37210.64	—	—	—	—	—
11/15/01 15:30	0	114	120	234		37210.65	—	—	—	1.8E+03	—
11/19/01 15:07	0	114	120	234		37214.63	4.0	—	—	1.3E+06	—
11/19/01 15:08	0	0	0	0	Pull up transducers (test)	37214.63	—	—	—	—	—

Table C-1. (continued)

Date / Time	TAN-38 Flowrate (gpm)	TAN-39 Flowrate (gpm)	TAN-40 Flowrate (gpm)	Total Flowrate (gpm)	Comment	Serial Date	UpTime (days)	Down Time (days)	Down Time (hours)	Volume of water Processed (gal)	Average Quantity (gpm)
11/19/01 15:29	0	0	0	0		37214.65	—	0.0	*0.3*	—	—
11/19/01 15:29	0	114	120	234		37214.65	—	—	—	—	—
11/30/01 23:59	*0*	*114*	*120*	*234*		*37226.00*	*11.4*	—	—	3.8E+06	—
Monthly Totals							29.8	0.2	—	9.9E+06	230
									—		
12/1/01 0:00	*0*	*114*	*120*	*234*		*37226.00*	—	—	—	—	—
12/10/01 22:09	0	114	120	234		37235.92	9.9	—	—	3.3E+06	—
12/10/01 22:10	0	*0*	*0*	*0*	System shutdown, paged operator	37235.92	—	—	—	—	—
12/11/01 7:07	0	*0*	*0*	*0*		37236.30	—	*0.4*	*9.0*	—	—
12/11/01 7:08	0	114	113	227		37236.30	—	—	—	—	—
12/20/01 13:09	0	114	85	199		37245.55	—	—	—	2.8E+06	—
12/20/01 13:10	126	114	0	240	P-40 secured, degraded flow	37245.55	—	—	—	2.2E+02	—
12/20/01 15:10	126	116	0	242		37245.63	—	—	—	2.9E+04	—
12/30/01 18:09	126	116	0	242		37255.76	19.5	—	—	3.5E+06	—
12/30/01 18:10	0	0	0	0	System shutdown	37255.76	—	—	—	—	—
12/31/01 23:59	*0*	0	*0*	0	*System shutdown*	*37257.00*	—	*1.2*	—	—	—
Monthly Totals							29.4	1.6	—	9.7E+06	218
1/1/02 0:00	*0*	*0*	0	0		*37257.00*	—	—	—	—	—
1/2/02 16:02	0	0	0	0		37258.67	—	*1.7*	*40.0*	—	—
1/2/02 16:03	126	113	0	239		37258.67	—	—	—	—	—
1/31/02 23:59	*126*	*113*	*0*	*239*		*37288.00*	*29.3*	—	—	*1.0E+07*	—
Monthly Totals							29.3	1.7	—	1.0E+07	226
2/1/02 0:00	126	113	0	239		37288.00	—	—	—	—	—
2/11/02 12:24	126	113	0	239		37298.52	10.5	—	—	3.6E+06	—

Table C-1 (continued)

Date / Time	TAN-38 Flowrate (gpm)	TAN-39 Flowrate (gpm)	TAN-40 Flowrate (gpm)	Total Flowrate (gpm)	Comment	Serial Date	Up Time (days)	Down Time (days)	Down Time (hours)	Volume of Water Processed (gal)	Average Quantity (gpm)
2/11/02 12:25	0	0	0	0	Shutdown to replace card in panel	37298.52	—	—	—	—	—
2/11/02 13:21	0	0	0	0		37298.56	—	*0.0*	*0.9*	—	—
2/11/02 13:22	126	117	0	243		37298.56	—	—	—	—	—
2/14/02 9:59	126	117	0	243		37301.42	2.9	—	—	1.0E+06	—
2/14/02 10:00	0	0	0	0	Shutdown, perform gauge calibrations	37301.42	—	—	—	—	—
2/14/02 14:39	0	0	0	0		37301.61	—	*0.2*	*4.7*	—	—
2/14/02 14:40	126	117	0	243		37301.61	—	—	—	—	—
2/14/02 16:16	126	117	0	243		37301.68	—	—	—	—	—
2/27/02 9:59	126	117	0	243		37314.42	12.8	—	—	4.5E+06	—
2/27/02 10:00	0	0	0	0	Shutdown to video TAN-53A	37314.42	—	—	—	—	—
2/27/02 16:49	0	0	0	0		37314.70	—	*0.3*	*6.8*	—	—
2/27/02 16:50	126	117	0	243		37314.70	—	—	—	—	—
2/28/02 11:45	126	117	0	243		37315.49	0.8	—	—	2.8E+05	—
2/28/02 11:46	0	0	0	0	Shutdown to replace pump in TAN-40	37315.49	—	—	—	—	—
2/28/02 17:02	0	0	0	0		37315.71	—	*0.2*	*5.3*	—	—
2/28/02 17:03	0	0	200	200		37315.71	—	—	—	—	—
2/28/02 17:04	*0*	*0*	*200*	*200*		37315.71	0.0	—	—	2.0E+02	—
2/28/02 17:05	*0*	*0*	*0*	*0*		37315.71	—	—	—	—	—
2/28/02 17:08	0	0	0	0	Flow indicator problem	37315.71	—	—	—	—	—
2/28/02 17:11	0	0	0	0		37315.72	—	*0.0*	*0.1*	—	—
2/28/02 17:12	0	0	200	200		37315.72	—	—	—	—	—
2/28/02 19:14	0	0	200	200		37315.80	0.1	—	—	1.5E+04	—
2/28/02 19:15	*0*	*0*	*0*	*0*		37315.80	—	—	—	—	—
2/28/02 19:17	0	0	0	0		37315.80	—	—	—	—	—
2/28/02 19:21	0	0	0	0		37315.81	—	*0.0*	*0.1*	—	—

Table C-1. (continued)

Date / Time	TAN-38 Flowrate (gpm)	TAN-39 Flowrate (gpm)	TAN-40 Flowrate (gpm)	Total Flowrate (gpm)	Comment	Serial Date	UpTime (days)	Down Time (days)	Down Time (hours)	Volume of water Processed (gal)	Average Quantity (gpm)
2/28/02 19:22	122	117	0	239		37315.81	—	—	—	—	—
2/28/02 23:59	122	117	0	239		37316.00	0.2	—	—	6.6E+04	—
Monthly Totals							27.2	0.7	—	9.5E+06	235
3/1/02 0:00	*122*	*117*	*0*	*239*		*37316.00*	—	—	—	—	—
3/12/02 8:39	122	117	0	239		37327.36	11.4	—	—	3.9E+06	—
3/12/02 8:40	0	*0*	0	0	Performed normal shutdown	37327.36	—	—	—	—	—
3/12/02 12:57	0	*0*	0	0		37327.54	—	*0.2*	*4.3*	—	—
3/12/02 12:58	122	117	0	239		37327.54	—	—	—	—	—
3/31/02 23:59	*122*	*117*	*0*	*239*		*37347.00*	19.5	—	—	6.7E+06	—
Monthly Totals							30.8	0.2	—	1.1E+07	238
4/1/02 0:00	122	117	0	239		37347.00	—	—	—	—	—
4/3/02 23:14	122	117	0	239		37349.97	3.0	—	—	1.0E+06	—
4/3/02 23:15	0	0	0	0	Alarm shut down	37349.97	—	—	—	—	—
4/4/02 1:24	0	0	0	0		37350.06	—	*0.1*	*2.2*	—	—
4/4/02 1:25	122	120	0	242		37350.06	—	—	—	—	—
4/8/02 3:38	122	120	0	242		37354.15	4.1	—	—	1.4E+06	—
4/8/02 3:39	0	0	0	0	Shutdown	37354.15	—	—	—	—	—
4/8/02 8:55	0	0	0	0		37354.37	—	*0.2*	*5.3*	—	—
4/8/02 8:56	122	116	0	238		37354.37	—	—	—	—	—
4/9/02 0:00	122	116	0	238		37355.00	—	—	—	—	—
4/9/02 22:20	122	116	0	238		37355.93	1.6	—	—	5.3E+05	—
4/9/02 22:21	0	0	0	0	NPTF shutdown	37355.93	—	—	—	—	—
4/10/02 6:49	0	0	0	0		37356.28	—	*0.4*	*8.5*	—	—
4/10/02 6:50	123	121	0	244		37356.28	—	—	—	—	—

Table C-1. (continued)

Date / Time	TAN-38 Flowrate (gpm)	TAN-39 Flowrate (gpm)	TAN-40 Flowrate (gpm)	Total Flowrate (gpm)	Comment	Serial Date	UpTime (days)	Down Time (days)	Down Time (hours)	Volume of water Processed (gal)	Average Quantity (gpm)
4/11/02 11:29	123	121	0	244		37357.48	1.2	—	—	4.2E+05	—
4/11/02 11:30	0	0	0	0		37357.48	—	—	—	—	—
4/11/02 13:57	0	0	0	0	Conduct potable water flush	37357.58	—	*0.1*	*2.5*	—	—
4/11/02 13:58	123	119	0	242		37357.58	—	—	—	—	—
4/15/02 8:30	123	117	0	240		37361.35	—	—	—	—	—
4/15/02 16:43	123	117	0	240		37361.70	4.1	—	—	1.4E+06	—
4/15/02 16:44	0	0	0	0	NPTF shutdown signal alarm	37361.70	—	—	—	—	—
4/15/02 16:53	0	0	0	0		37361.70	—	0.0	*0.1*	—	—
4/15/02 16:54	123	117	0	240		37361.70	—	—	—	—	—
4/17/02 3:10	123	117	0	240		37363.13	1.4	—	—	4.9E+05	—
4/17/02 3:11	0	0	0	0	System shutdown due to LSHH	37363.13	—	—	—	—	—
4/17/02 7:41	0	0	0	0		37363.32	—	*0.2*	*4.5*	—	—
4/17/02 7:42	121	118	0	239		37363.32	—	—	—	—	—
4/18/02 7:04	121	118	0	239		37364.29	1.0	—	—	3.4E+05	—
4/18/02 7:05	0	0	0	0	System secured, replace sensors	37364.30	—	—	—	—	—
4/18/02 13:05	0	0	0	0		37364.55	—	*0.3*	6.0	—	—
4/18/02 13:06	122	120	0	242		37364.55	—	—	—	—	—
4/18/02 13:28	123	116	0	239		37364.56	—	—	—	—	—
4/23/02 10:00	123	116	0	239		37369.42	—	—	—	—	—
4/30/02 23:59	123	116	0	239		37377.00	12.5	—	—	4.3E+06	—
Monthly Totals							28.8	1.2	—	1.0E+07	230
5/1/02 0:00	*124*	*119*	*0*	*243*		*37377.00*	—	—	—	—	—
5/2/02 8:52	124	119	0	243		37378.37	—	—	—	—	—
5/9/02 9:30	122	117	0	239		37385.40	—	—	—	—	—
5/13/02 9:50	121	119	0	240		37389.41	—	—	—	—	—

Table C-1. (continued)

Date / Time	TAN-38 Flowrate (gpm)	TAN-39 Flowrate (gpm)	TAN-40 Flowrate (gpm)	Total Flowrate (gpm)	Comment	Serial Date	UpTime (days)	Down Time (days)	Down Time (hours)	Volume of water Processed (gal)	Average Quantity (gpm)
5/28/02 7:00	122	120	0	242		37404.29	—	—	—	—	—
5/31/02 23:59	*122*	*120*	*0*	*242*		*37408.00*	*31.0*	—	—	*1.1E+07*	—
Monthly Totals							31.0	0.0	—	1.1E+07	241
6/1/02 0:00	122	119	*0*	*241*		*37408.00*	—	—	—	—	—
6/3/02 7:00	122	119	*0*	241		37410.29	—	—	—	—	—
6/6/02 7:00	120	118	0	238		37413.29	—	—	—	—	—
6/10/02 7:00	122	119	0	241		37417.29	—	—	—	—	—
6/17/02 7:00	121	120	0	241		37424.29	—	—	—	—	—
6/20/02 14:39	121	100	0	221		37427.61	—	—	—	—	—
6/24/02 7:00	121	119	0	240		37431.29	—	—	—	—	—
6/30/02 23:59	*121*	*119*	0	*240*		*37438.00*	*30.0*	—	—	*1.0E+07*	—
Monthly Totals							30.0	0.0	—	1.0E+07	238
7/1/02 0:00	*120*	*121*	*0*	*241*		*37438.00*	—	—	—	—	—
7/8/02 0:00	118	120	0	238		37445.00	—	—	—	—	—
7/15/02 0:00	121	117	0	238		37452.00	—	—	—	—	—
7/22/02 0:00	120	117	0	237		37459.00	—	—	—	—	—
7/29/02 0:00	119	120	0	239		37466.00	—	—	—	—	—
7/31/02 23:59	*119*	*120*	*0*	*239*		*37469.00*	*31.0*	—	—	*1.1E+07*	—
Monthly Totals							31.0	0.0	—	1.1E+07	239
8/1/02 0:00	*119*	*120*	*0*	*239*		*37469.00*	—	—	—	—	—
8/5/02 0:00	121	121	0	242		37473.00	—	—	—	—	—
8/12/02 0:00	118	117	0	235		37480.00	—	—	—	—	—
8/19/02 0:00	123	118	0	241		37487.00	—	—	—	—	—

Table C-1. (continued)

Date / Time	TAN-38 Flowrate (gpm)	TAN-39 Flowrate (gpm)	TAN-40 Flowrate (gpm)	Total Flowrate (gpm)	Comment	Serial Date	UpTime (days)	Down Time (days)	Down Time (hours)	Volume of water Processed (gal)	Average Quantity (gpm)
8/21/02 0:00	96	117	0	213		37489.00	—	—	—	—	—
8/22/02 0:00	91	115	0	206		37490.00	—	—	—	—	—
8/31/02 23:59	*119*	*113*	*0*	*232*		*37500.00*	*31.0*	—	—	*1.0E+07*	—
Monthly Totals							31.0	0.0	—	1.0E+07	230
9/1/02 0:00	119	113	0	232		37500.00	—	—	—	—	—
9/3/02 0:00	119	113	0	232		37502.00	—	—	—	—	—
9/9/02 0:00	121	110	0	231		37508.00	—	—	—	—	—
9/13/02 0:00	120	114	0	234		37512.00	—	—	—	—	—
9/23/02 7:00	117	109	0	226		37522.29	—	—	—	—	—
9/26/02 9:07	117	109	0	226		37525.38	25.4	—	—	8.4E+06	—
9/26/02 9:08	0	0	0	0		37525.38	—	—	—	—	—
9/26/02 9:12	*0*	*0*	*0*	0		37525.38	—	*0.0*	*0.1*	—	—
9/26/02 9:12	0	0	198	198		37525.38	—	—	—	—	—
9/30/02 0:00	0	0	196	196		37529.00	—	—	—	—	—
9/30/02 23:59	*0*	*0*	*196*	*196*	END OF FISCAL YEAR	37530.00	4.6	—	—	1.3E+06	—
Monthly Totals							30.0	0.0	—	9.7E+06	—
ANNUAL TOTALS					TOTALS	365.00	359.1	5.9	111.1	1.2E+08	232
								365.0			
						Percent	98.4	1.6			

LSHH = level switch high-high
NPTF = New Pump and Treat Facility

Appendix D

Water Quality Data for New Pump and Treat Facility Influent and Effluent, FY 2002

Appendix D

Water Quality Data for New Pump and Treat Facility Influent and Effluent, FY 2002

Volatile organic compound and radionuclide concentrations measured in samples collected from the New Pump and Treat Facility influent sampling point, SP-1, are tabulated in Tables D-1 through D-10.

Table D-1. New Pump and Treat Facilitv volatile organic compound influent data.

SP-1 New Pump and Treat Facility, Influent	New Pump and Treat Facility Volatile Organic Compound Data from Southwest Research Institute											
Sample Identifier	Date	Time	PCE (µg/L)	Flag	TCE (µg/L)	Flag	*trans*-DCE (µg/L)	Flag	cis-DCE (µg/L)	Flag	VC (µg/L)	Flag
NPTF7201VA	10/09/01	955	26	—	310	D	13[b]	—	36[b]	—	5	U
NPFT7901VA	11/07/01	1230	35	J	260	D	14	J	18	D, J	1	U
NPTF8601VA[a]	12/11/01	1330	22	—	380	D	7	—	20	—	1	U
NPTF8602VA[a]	12/11/01	1330	23	—	350	D	8	—	21	—	1	U
NPTF9301VE	01/09/02	1400	24	J	340	D, J	6	J	18	J	1	U, J
NPTGOOO1VE	02/06/02	1030	23	—	280	D	5	—	14	—	1	U
NPTG0701VA[a]	03/06/02	1100	17	—	220	D	4	—	11	—	1	U
NPTG0702VA[a]	03/06/02	1100	18	—	230	D	4	—	12	—	1	U
NPTG1401VE	04/03/02	1400	19	—	210	—	4	—	12	—	1	U
NPTG2101VA	05/01/02	1320	17	—	210	—	3	—	9	—	1	U
NPTG2801VA[a]	06/05/02	1100	11	—	150	D	2	—	7	—	1	U
NPTG2802VA[a]	06/05/02	1100	12	—	160	D	2	—	7	—	1	U
NPTG3501VA	07/11/02	1130	14	—	170	D	3	—	8	—	1	U
NPTG4201VA	08/06/02	1400	12	—	100	D	2	—	7	—	1	U
NPTG4901VA[a]	09/18/02	845	13	—	160	D	3	—	8	—	1	U
NPTG4902VA[a]	09/18/02	845	13	—	150	D	3	—	8	—	1	U

a. Duplicates were averaged for more clear representation of the results
b. Total 1,2 DCE analyzed, Concentration = 49 µg/L. Tablulated concentrations are estimated. Individual isomers were not analyzed in this sample.

DCE = dichloroethene
PCE = tetrachloroethene
TCE = trichloroethene
VC = vinvl chloride

D = diluted sample
U = nondetect (half the detection limit is graphed)
J = estimated value

Table D-2. New Pump and Treat Facilitv tritium influent data

SP-1, Influent	New Pump and Treat Facility Tritium Sample Data from General Engineering Laboratories				
Sample Identifier	Date	Time	H-3 (pCi/L)	+/-	Minimum Detectable Activity
NPTF7201R8	10/10/01	955	3,540	147	327
NPTF7901R8	11/07/01	1230	3,300	132	283
NPTF8601R8[a]	12/11/01	1330	3,290	128	266
NPTF8602R8[a]	12/11/01	1330	3,470	130	263
NPTF9301R8	01/09/02	1400	3,700	129	252
NPTGOOO1R8	02/06/02	1030	3,280	95	136
NPTG0701R8[a]	03/06/02	1100	3,190	193	321
NPTG0702R8[a]	03/06/02	1100	3,060	192	327
NPTG 1401R8	04/03/02	1400	3,110	187	278
NPTG2101R8	05/01/02	1320	2,990	188	303
NPTG2801R8[a]	06/05/02	1100	2,470	169	281
NPTG2802R8[a]	06/05/02	1100	2,910	179	278
NPTG3501R8	07/11/02	1130	2,920	121	261
NPTG4201R8	08/06/02	1400	2,770	182	329
NPTG4901R8[a]	09/18/02	845	2,740	133	314
NPTG4902R8[a]	09/18/02	845	2,130	105	248

a. Duplicates were averaged for more clear representation of the results.

Table D-3. New Pump and Treat Facilitv strontium-90 influent data

SP-1, Influent		New Pump and Treat Facility Sr-90 Sample Data from General Engineering Laboratories				
Sample Identifier	Date	Time	Sr-9 (pCi/L)	Flag	+/-	Minimum Detectable Activity
NPTF7201RB	10/10/01	955	0.231	—	0.138	0.563
NPTF7901RB	11/07/01	1230	0.418	U, J	0.176	0.54
NPTF8601RB[a]	12/11/01	1330	0.172	—	0.063	0.223
NPTF8602RB[a]	12/11/01	1330	-0.351	U	0.374	1.44
NPTF9301RB	01/09/02	1400	0.193	U	0.106	0.412
NPTG0001RB	02/06/02	1030	0.106	U	0.132	0.598
NPTG0701RB[a]	03/06/02	1100	-0.0112	—	0.666	0.334
NPTG0702RB[a]	03/06/02	1100	-0.0302	U	0.055	0.284
NPTG1401RB	04/03/02	1400	0.13	U	0.751	0.276
NPTG2101RB	05/01/02	1320	0.0762		0.0837	0.376
NPTG2801RB[a]	06/05/02	1100	0.0598	U	0.096	0.443
NPTG2802RB[a]	06/05/02	1100	-0.0415	U	0.137	0.887
NPTG3501RB	07/11/02	1130	0.205	—	0.139	0.602
NPTG4201RB	08/06/02	1400	0.675	—	0.22	0.821
NPTG4901RB[a]	09/18/02	845	0.0287	—	0.065	0.281
NPTG4902RB[a]	09/18/02	845	-0.0697	—	0.128	0.571

a. Duplicates were averaged for more clear representation of the results.

D = diluted sample
U = nondetect (half the detection limit is graphed)
J = estimated value

Table D-4. New Pump and Treat Facilitv gross alpha influent data.

Sample Identifier	Sample Collection Date	Sample Collection Time	Sample Location	Alpha Count Date	Total BKG Counts	BKG (cpm)	Total Source Counts	Source (cpm)	EEF (cpddpm)	Total Sample Counts	Sample (cpm)	Net Sample Activity or Net Count Rate (cpm)	Gross Alpha (pCi/L)	Sample Activity (pCi)	Average of Gross Alpha Duplicates (pCi/L)
NPTF7201AB	10/09/01	955	SP-1-NPTF	10/10/01	14	0.28	265.334	5.306.68	0.30887078	31	0.62	0.34 ± 0.26833	16.51176 ± 13.03109	0.016512	16.51176 ± 13.03109
NPTF7901AB	11/07/01	1230	SP-1-NPTF	11/08/01	4	0.08	268,287	5,365.74	0.31232014	29	0.58	0.50 ± 0.22978	24.01382 ± 11.03591	0.024014	24.01382 ± 11.03591
NPTF8601AB	12/11/01	1330	SP-1-NPTF	01/09/02	32	0.64	264,032	5,280.64	0.30733411	24	0.48	-0.16 ± 0.29933	-7.809091 ± 14.60947	-0.007809	-3.251043 ± 13.06186
NPTF8602AB	12/11/01	1330	SP-1-NPTF	01/09/02	32	0.64	264.032	5.280.64	0.30733411	16	0.32	-0.32 ± 0.27713	-15.61818 ± 13.52574	-0.015618	
NPTF8701AB	12/11/01	1462	SP-1-NPTF	01/10/02	9	0.18	263,850	5,277	0.30714901	23	0.46	0.28 ± 0.22627	13.67414 ± 11.05038	0.013674	
NPTG0001AB	02/06/02	1030	SP-1-NPTF	02/11/02	51	1.02	261.961	5.239.22	0.30490105	17	0.34	-0.68 ± 0.32985	-33.45348 ± 16.22732	-0.033453	-33.45348 ± 16.22732
NPTG0701AB	03/06/02	1100	SP-1-NPTF	03/12/02	31	0.62	264,690	5,293.8	0.30810128	10	0.2	-0.42 ± 0.25612	-20.44782 ± 12.46952	-0.020448	-9.737058 ± 13.96331
NPTG0702AB	03/06/02	1100	SP-1-NPTF	03/12/02	31	0.62	264,690	5,293.8	0.30810128	32	0.64	0.02 ± 0.31749	0.973706 ± 15.4571	0.000974	
NPTG1401AB	04/03/02	1400	SP-1-NPTF	04/18/02	5	0.1	260.045	5.200.9	0.3027241	6	0.12	0.02 ± 0.13266	0.991001 ± 6.57356	0.000991	0.991001 ± 6.57356
NPTG2101AB	05/01/02	1320	SP-1-NPTF	05/02/02	5	0.1	260,982	5,219.64	0.3038149	16	0.32	0.22 ± 0.18330	10.86188 ± 9.050068	0.010862	10.86188 ± 9.050068
NPTG2801AB	06/05/02	1100	SP-1-NPTF	08/07/02	5	0.1	254,400	5,088	0.2961525	13	0.26	0.16 ± 0.16971	8.103933 ± 8.595519	0.008104	3.545471 ± 7.336734
NPTG2802AB	06/05/02	1100	SP-1-NPTF	08/07/02	5	0.1	254.400	5.088	0.2961525	4	0.08	-0.02 ± 0.12000	-1.012992 ± 6.07795	-0.001013	
NPTG3501AB	07/11/02	1130	SP-1-NPTF	08/05/02	3	0.06	2,578,259	51,565.18	3.00146217	33	0.66	0.6 ± 0.24000	2.998539 ± 1.199415	0.002999	2.998539 ± 1.199415
NPTG4201AB	08/06/02	1400	SP-1-NPTF	08/08/02	6	0.12	254,907	5,098.14	0.29674156	5	0.1	-0.02 ± 0.13266	-1.010981 ± 6.706088	-0.001011	-1.010981 ± 6.706088
NPTG4901AB	09/18/02	845	SP-1-NPTF	10/09/02	7	0.14	257,565	5,151.3	0.29983469	6	0.12	-0.02 ± 0.144222	-1.000551 ± 7.215078	-0.001001	-4.022665 ± 7.75702
NPTG4902AB	09/18/02	845	SP-1-NPTF	11/05/02	12	0.24	256,074	5,121.48	0.29809313	5	0.1	-0.14 ± 0.164924	-7.044778 ± 8.298961	-0.007045	

BKG =background
EEF = efficiency source check

Table D-5. New Pump and Treat Facilitv gross beta influent data.

SP-1 Influent				Sample Data from General Engineering Laboratories											
Sample Identifier	Sample Collection Date	Sample Collection Time	Sample Location	Beta Count Date	Total BKG Counts	BKG (cpm)	Total Source Counts	Source (cpm)	EEF (cpddpm)	Total Sample Counts	Sample (cpm)	Net Sample Activity or Net Count Rate (cpm)	Gross Beta (pCi/L)	Sample Activity (pCi)	Average of Gross Beta Duplicates (pCi/L)
NPTF7201AB	10/09/01	955	SP-1-NPTF	10/10/01	1.504	30.08	112.470	2249.4	0.20325305	1.612	32.24	2.16 ± 2.232846	159.4072 ± 164.7832	0.159407	159.4072 ± 164.7832
NPTF7901AB	11/07/01	1230	SP-1-NPTF	11/08/01	1,492	29.84	113,520	2270.4	0.20519828	1,545	30.9	1.06 ± 2.204359	77.48603 ± 161.1387	0.077486	77.48603 ± 161.1387
NPTF8601AB	12/11/01	1330	SP-1-NPTF	01/09/02	1,505	30.1	113,414	2268.28	0.20498031	1,546	30.92	0.82 ± 2.209434	60.00576 ± 161.6815	0.060006	-10.1728 ± 159.5362
NPTF8602AB	12/11/01	1330	SP-1-NPTF	01/09/02	1.505	30.1	113.414	2268.28	0.20498031	1.549	30.98	0.88 ± 2.21052	64.39643 ± 161.7609	0.064396	
NPTF8701AB	12/11/01	1462	SP-1-NPTF	01/10/02	1,435	28.7	112,443	2248.86	0.20332998	1,330	26.6	-2.1 ± 2.103331	-154.9206 ± 155.1663	-0.154921	
NPTG0001AB	02/06/02	1030	SP-1-NPTF	02/11/02	1.533	30.66	111.425	2228.5	0.20128583	1.527	30.54	-0.12 ± 2.212691	-8.942507 ± 164.8917	-0.008943	-8.942507 ± 164.8917
NPTG0701AB	03/06/02	1100	SP-1-NPTF	03/12/02	1,594	31.88	112,130	2242.6	0.20246543	1,497	29.94	-1.94 ± 2.22387	-143.7282 ± 164.7593	-0.143728	-34.07989 ± 166.7084
NPTG0702AB	03/06/02	1100	SP-1-NPTF	03/12/02	1,594	31.88	112,130	2242.6	0.20246543	1,645	32.9	1.02 ± 2.276489	75.56846 ± 168.6576	0.075568	
NPTG1401AB	04/03/02	1400	SP-1-NPTF	04/18/02	1.632	32.64	112.123	2242.46	0.202383	1.474	29.48	-3.16f2.22926	-234.2094 ± 165.2258	-0.234209	-234.2094 ± 165.2258
NPTG2101AB	05/01/02	1320	SP-1-NPTF	05/02/02	1,520	30.4	110,465	2209.3	0.19955124	1,616	32.32	1.92 ± 2.24	144.3238 ± 168.3778	0.144324	144.3238 ± 168.3778
NPTG2801AB	06/05/02	1100	SP-1-NPTF	08/07/02	1,570	31.4	109,643	2192.86	0.19795403	1,617	32.34	0.94 ± 2.258141	71.22866 ± 171.111	0.071229	24.24805 ± 170.2747
NPTG2802AB	06/05/02	1100	SP-1-NPTF	08/07/02	1.570	31.4	109.643	2192.86	0.19795403	1.555	31.1	-0.3 ± 2.236068	-22.73255 ± 169.4384	-0.022733	
NPTG3501AB	07/11/02	1130	SP-1-NPTF	08/05/02	1,450	29	110,691	2213.82	0.20009342	1,536	30.72	1.72 ± 2.185772	128.9398 ± 163.8564	0.12894	128.9398 ± 163.8564
NPTG4201AB	08/06/02	1400	SP-1-NPTF	08/08/02	1.611	32.22	112.806	2256.12	0.2036725	1.572	31.44	-0.78 ± 2.256723	-57.44516 ± 166.2024	-0.057445	-57.44516 ± 166.2024
NPTG4901AB	09/18/02	845	SP-1-NPTF	10/09/02	1,600	32	110,043	2200.86	0.19863174	1,553	31.06	-0.94 ± 2.246063	-70.98563 ± 169.6151	-0.070986	-41.46084 ± 168.6259
NPTG4902AB	09/18/02	845	SP-1-NPTF	11/05/02	1,582	31.64	111,357	2227.14	0.20107153	1,574	31.48	-0.16 ± 2.247132	-11,93605 ± 167.6367	-0.011936	

BKG =background
EEF = efficiency source check

Table D-6. New Pump and Treat Facilitv volatile organic compound air effluent data.

SP-3-A-311	New Pump and Treat Facility Volatile Organic Compound (Model TO-14) Air Sample Data from Southwest Research Institute											
Sample Identifier	Date	Time	PCE [ppb (v/v)]	Flag	TCE [ppb (v/v)]	Flag	cis-DCE [ppb (v/v)]	Flag	*trans*-DCE [ppb (v/v)]	Flag	**VC** [ppb (v/v)]	Flag
NPTF7501VT	10/09/01	1012	59	—	1,500	D	170	—	60	—	7.5	U
NPTF8201VT	11/07/01	1230	70	—	1,200	D	120	—	42	—	7.7	U
NPTF8901VT	12/11/01	1330	74	—	1,000	D	110	—	36	—	7.5	U
NPTF9601VT	01/09/02	1400	60	—	720	D	59	—	21	—	6.7	U
NPTG0301VT	02/06/02	1030	48	—	470	D	43	—	15	—	7.6	U
NPTG1001VT	03/06/02	1100	50	—	600	D	44	—	14	—	7.8	U
NPTG1701VT	04/03/02	1400	48	—	600	D	41	—	13	—	7.8	U
NPTG2401VT	05/01/02	1320	43	—	530	D	38	—	12	—	8	U
NPTG3101VT	06/05/02	1100	44	—	530	D	37	—	11	—	8.3	U
NPTG3801VT	07/17/02	1305	47	—	650	—	43	—	10	—	8	U
NPTG4501VT	08/06/02	1400	42	—	540	—	38	—	8.5	—	7.9	U
NPTG5201VT	09/18/02	845	36	—	490	—	32	—	7	J	7.6	U
SP-4-A-310	New Pump and Treat Facility Volatile Organic Compound (Model TO-14) Air Sample Data from Southwest Research Institute											
Sample Identifier	Date	Time	PCE [ppb (v/v)]	Flag	TCE [ppb (v/v)]	Flag	cis-DCE [ppb (v/v)]	Flag	*trans*-DCE [ppb (v/v)]	Flag	**VC** [ppb (v/v)]	Flag
NPTF7601VT	10/09/01	1012	7.4	—	240	—	22	—	8.5	—	7.5	U
NPTF8301VT	11/07/01	1230	64	—	930	D	120	—	40	—	7.7	U
NPTF9001VT	12/11/01	1330	63	—	1,200	D	91	—	30	—	7.6	U
NPTF9701VT	01/09/02	1400	73	—	930	D	70	—	26	—	7.7	U
NPTG0401	02/06/02	1030	46	—	590	D	41	—	14	—	7.6	U
NPTG1101	03/06/02	1100	41	—	590	D	42	—	14	—	7.6	U
NPTG1801	04/03/02	1400	48	—	620	D	40	—	13	—	7.9	U
NPTG2501	05/01/02	1320	45	—	540	D	38	—	12	—	8	—
NPTG3201	06/05/02	1100	43	—	480	D	35	—	11	—	8	U
NPTG3901	07/17/02	1305	34	—	470	—	31	—	7.3	J	8	U
NPTG4601	08/06/02	1400	39	—	540	—	38	—	8.5	—	8	U
NPTG5301VT	09/18/02	845	33	—	460	—	30	—	6.5	J	7.6	U

DCE = dichloroethene
PCE = tetrachloroethene
TCE = trichloroethene
VC = vinvl chloride

D = diluted sample
U = nondetect (half the detection limit is graphed)
J = estimated value

Table D-7. New Pump and Treat Facility volatile organic compound water effluent data.

SP-7-A-311 Effluent		New Pump and Treat Facility Volatile Organic Compound Groundwater Sample Data from Southwest Research Institute										
Sample Identifier	Date	Time	PCE (µg/L)	Flag	TCE (µg/L)	Flag	*trans*-DCE (µg/L)	Flag	cis-DCE (µg/L)	Flag	VC (µg/L)	Flag
NPTF7301VA[a]	10/09/01	955	5	U	5	U	5	U	5	U	5	U
NPTF7302VA[a]	10/09/01	955	5	U	5	U	5	U	5	U	—	—
NPTF8001VE	11/07/01	1230	2	U	0.9	J	2	U	2	U	1	U
NPTF8701VA	12/11/01	1330	2	U	2	U	2	U	2	U	1	U
NPTF9401VA	01/09/02	1400	2	U, J	0.9	J	2	U, J	2	U, J	1	U, J
NPTG0101VA“	02/06/02	1030	2	U	2	U	2	U	2	U	1	U
NPTG0102VA[a]	02/06/02	1030	1	J	0.8	J	2	U	2	U	1	U
NPTG0801VE	03/06/02	1100	1	U	1	—	1	U	1	U	1	U
NPTG1501VA”	04/03/02	1400	1	U	0.6	J	1	U	1	U	1	U
NPTG1502VA[a]	04/03/02	1400	1	U	0.6	J	1	U	1	U	1	U
NPTG2201VA“	05/01/02	1320	1	U	1	U	1	U	1	U	1	U
NPTG2202VA[a]	05/01/02	1320	1	U	0.7	J	1	U	1	U	1	U
NPTG2901VA	06/05/02	1100	1	U	0.9	J	1	U	1	U	1	U
NPTG3601VA”	07/11/02	1100	1	U	0.7	J	1	U	1	U	1	U
NPTG3602VA[a]	07/11/02	1100	1	U	0.7	J	1	U	1	U	1	U
NPTG4301VE	08/06/02	1400	1	U	0.6	J	1	U	1	U	1	U
NPTG5001VA	09/18/02	845	1	U	0.7	J	1	U	1	U	1	U

SP-8-A-310, Effluent		New Pump and Treat Facility Volatile Organic Compound Groundwater Sample Data from Southwest Research Institute										
Sample Identifier	Date	Time	PCE (µg/L)	Flag	TCE (µg/L)	Flag	*trans*-DCE (µg/L)	Flag	cis-DCE (µg/L)	Flag	VC (µg/L)	Flag
NPTF7401VE	10/09/01	955	5	U	5	U	5[b]	U	5[b]	U	5	U
NPTF8101VA[a]	11/07/01	1230	2	U	0.7	J	2	U	2	U	1	U
NPTF8102VA[a]	11/07/01	1230	2	U	0.8	J	2	U	2	U	1	U
NPTF8801VE	12/11/01	1330	2	U	0.6	J	2	U	2	U	1	U
NPTF9501VA“	01/09/02	1400	2	U	0.8	J	2	U	2	U	1	U
NPTF9502VA[a]	01/09/02	1400	2	U, J	0.8	J	2	U	2	U	1	U
NPTG0201VA	02/06/02	1030	2	U	2	U	2	U	2	U	1	U
NPTG0901VA	03/06/02	1100	1	U	0.5	J	1	U	1	U	1	U
NPTG1601VA	04/03/02	1400	1	U	0.6	J	1	U	1	U	1	U
NPTG2301VE	05/01/02	1320	1	U	0.5	J	1	U	1	U	1	U
NPTG3001VE	06/05/02	1100	1	U	0.6	J	1	U	1	U	1	U
NPTG3701VA	07/11/02	1130	1	U	0.6	J	1	U	1	U	1	U
NPTG4401VA”	08/06/02	1400	1	U	1	—	1	U	1	U	1	U
NPTG4402VA[a]	08/06/02	1400	1	U	0.6	J	1	U	1	U	1	U
NPTG5101VE	09/18/02	845	1	U	1	U	1	U	1	U	1	U

a Duplicates were averaged for more clear representation of the results

b Total 1,2 DCE analyzed, concentration = 5 µg/L, with a U data qualifier flag

DCE = dichloroethene
PCE = tetrachloroethene
TCE = trichloroethene
VC = Vinyl Chloride

D = diluted sample
U = nondetect (half the detection limit is graphed)
J = estimated value

Table **D-8.** New Pump and Treat Facilitv tritium effluent data

SP-7-A-311, Effluent		New Pump and Treat Facility Tritium Sample Data from General Engineering Laboratories			
Sample Identifier	Date	Time	H-3 (pCi/L)	+/-	Minimum Detectable Amount
NPTF7301R8[a]	10/10/01	955	3,550	147	328
NPTF7302R8[a]	10/10/01	955	3,500	145	322
NPTF8001R8	11/07/01	1230	3,580	138	289
NPTF8701R8	12/11/01	1330	2,350	113	258
NPTF9401R8	01/09/02	1400	3,290	130	273
NPTG0101R8[a]	02/06/02	1030	3,340	100	146
NPTGO102R8[a]	02/06/02	1030	3,360	100	146
NPTG0801R8	03/06/02	1100	3,050	187	315
NPTG1501R8[a]	04/03/02	1400	2,650	175	279
NPTG1502R8[a]	04/03/02	1400	2,800	179	278
NPTG2201R8[a]	05/01/02	1320	2,720	179	298
NPTG2202R8[a]	05/01/02	1320	2,890	182	293
NPTG2901R8	06/05/02	1100	2,490	166	274
NPTG3601R8[a]	07/11/02	1130	3,020	125	271
NPTG3602R8[a]	07/11/02	1130	2,870	122	266
NPTG4301R8	08/06/02	1400	2,740	180	325
NPTG5001R8	09/18/02	845	2,490	126	300
SP-8-A-310, Effluent		New Pump and Treat Facility Tritium Sample Data from General Engineering Laboratories			
Sample Identifier	Date	Time	H-3 (pCi/L)	+/-	Minimum Detectable Amount
NPTF7401R8	10/10/01	955	3,280	143	327
NPTF8101R8[a]	11/07/01	1230	3,400	136	289
NPTF8102R8[a]	11/07/01	1230	3,590	137	285
NPTF8801R8	12/11/01	1330	3,290	129	267
NPTF9501R8[a]	01/09/02	1400	3,410	137	289
NPTF9502R8[a]	01/09/02	1400	3,360	137	292
NPTG0201R8	02/06/02	1030	1,980	80	145
NPTG0801R8	03/06/02	1100	2,870	186	321
NPTG1601R8	04/03/02	1400	2,920	182	279
NPTG2301R8	05/01/02	1320	3,060	187	294
NPTG3001R8	06/05/02	1100	2,650	172	278
NPTG3701R8	07/11/02	1130	3,050	126	270
NPTG4401R8[a]	08/06/02	1400	2,680	180	332
NPTG4402R8[a]	08/06/02	1400	2,570	175	325
NPTG5101R8	09/18/02	845	2,610	139	338

a Duplicates were averaged for more clear representation of the results

Table D-9. New Pump and Treat Facility strontium-90 effluent data

SP-7-A-311, Effluent			New Pump and Treat Facility Sr-90 Sample Data from General Engineering Laboratories			
Sample Identifier	Date	Time	Sr-90 (pCi/L)	Flag	+/-	Minimum Detectable Limit
NPTF7302RB[a]	10/10/01	9[illegible]5	0.88	—	0.204	0.647
NPTF7301RB[a]	10/10/01	9[illegible]5	0.[illegible]E	U, J	0.145	0.[illegible]5
NPTF8001RB	11/07/01	1230	1.87	—	0.479	0.53
NPTF8701RB	12/11/01	1330	0.1[illegible]6	U, J	0.064	[illegible]E[illegible]O
NPTF9401RB	01/09/02	1400	-0.0711	U	0.145	0.628
NPTG0101RB[a]	02/06/02	1030	0.0674	U	0.112	0.[illegible]5
NPTG0102RB[a]	02/06/02	1030	0.577	U, J	0.257	0.[illegible]5
NPTG0801RB	03/06/02	1[illegible]00	-0.0435	U	0.0[illegible]5	0.299
NPTG1501RB[a]	04/03/02	1400	-0.0601	U	0.0539	0.228
NPTG1502RB[a]	04/03/02	1400	0.141	U, J	0.0[illegible]6	0.173
NPTG2201RB[a]	05/01/02	1[illegible]O	0.105	—	0.102	0.449
NPTG2201RB[a]	05/01/02	1[illegible]O	-0.0764	—	0.141	0.703
NPTG2901RB	06/05/02	1[illegible]00	-0.0633	U	0.838	0.451
NPTG3601RB[a]	07/11/02	1130	-0.0541	—	0.1[illegible]9	0.783
NPTG3602RB[a]	07/11/02	1130	0.267	—	0.192	0.719
NPTG4301RB	08/06/02	1400	0.357	U	0.245	1.05
NPTG5001RB	09/18/02	845	0.0074	—	0.128	0.[illegible]6

SP-8-A-3[illegible]0, Effluent			New Pump and Treat Facility Sr-90 Sample Data from General Engineering Laboratories			
Sample Identifier	Date	Time	Sr-90 (pCi/L)	Flag	+/-	Minimum Detectable Limit
NPTF7401RB	10/10/01	9[illegible]5	0.579	U, J	0.19[illegible]	0.702
NPTF8101RB[a]	11/07/01	1230	1.81	—	0.299	0.307
NPTF8102RB[a]	11/07/01	1230	1.6[illegible]	—	0.478	0.568
NPTF8801RB	12/11/01	1330	0.0831	U	0.071	0.269
NPTF9501RB[a]	01/09/02	1400	0.111	U	0.075	0.299
NPTF9502RB[a]	01/09/02	1400	[illegible]ZO[illegible]	U, J	0.092	0.347
NPTG0201RB	02/06/02	1030	-0.0307	U	0.113	0.576
NPTG0901RB	03/06/02	1[illegible]00	-0.0112	U	0.791	0.427
NPTG1601RB	04/03/02	1400	0.[illegible]06	U	0.067	0.249
NPTG2301RB	05/01/02	1[illegible]O	0.392	—	0.149	0.532
NPTG3001RB	06/05/02	1[illegible]00	0.0371	U	0.[illegible]9	0.428
NPTG3701RB	07/11/02	1130	0.267	—	0.192	0.719
NPTG4401RB[a]	08/06/02	1400	0.882	U	0.241	1.[illegible]7
NPTG4402RB[a]	08/06/02	1400	0.176	U	0.222	1.02
NPTG5101RB	09/18/02	845	0.0268	—	0.134	0.582

a. Duplicates were averaged for more clear representation of the results.
D = diluted sample
U = nondetect (half the detection limit is graphed)
J = estimated value

Table D-10. New Pump and Treat Facilitv gross alpha effluent data.

Sample Identifier	Sample Collection Date	Sample Collection Time	Sample Location	Alpha Count Date	Total BKG Counts	BKG (cpm)	Total Source Counts	Source (cpm)	EEF (cpddpm)	Total Sample Counts	Sample (cpm)	Net Sample Activity or Net Count Rate (cpm)	Gross Alpha (pCi/L)	Sample Activity (pCi)	Average of Gross Alpha Duplicates (pCi/L)
NPTF7301AB	10/09/01	955	SP-7-A-311	10/09/01	5	0.10	265,237	5,304.74	0.30876834	15	0.30	0.20 ± 0.17889	9.716022 ± 8.690274	0.009716	8.258619 ± 8.351156
NPTF7302AB	10/09/01	955	SP-7-A-311	10/09/01	5	0.10	265.237	5.304.74	0.30876834	12	0.24	0.14 ± 0.16492	6.801216 ± 8.012037	0.006801	
NPTF8001AB	11/07/01	1230	SP-7-A-311	11/19/01	10	0.20	266,639	5,332.78	0.31039464	17	0.34	0.14 ± 0.20785	6.765581 ± 10.04428	0.006766	6.765581 ± 10.04428
NPTF9301AB	01/09/02	1504	SP-7-A-311	01/10/02	9	0.18	263,850	5,277	0.30714901	13	0.26	0.08 ± 0.18762	3.906898 ± 9.162489	0.003907	-16.68641 ± 12.18039
NPTF9401AB	01/09/02	1400	SP-7-A-311	01/23/02	49	0.98	262.728	5.254.56	0.30579627	11	0.22	-0.76 ± 0.30984	-37.27972 ± 15.19829	-0.03728	
NPTGO101AB	02/06/02	1030	SP-7-A-311	02/11/02	51	1.02	261,961	5,239.22	0.30490105	49	0.98	-0.04 ± 0.40000	-1.967852 ± 19.67852	-0.001968	7.379443 ± 20.57262
NPTG0102AB	02/06/02	1030	SP-7-A-311	02/11/02	51	1.02	261,961	5,239.22	0.30490105	68	1.36	0.34 ± 0.43635	16.72674 ± 21.46673	0.016727	
NPTG0801AB	03/07/02	1101	SP-7-A-311	03/13/02	32	0.64	264,690	5,293.8	0.30810012	18	0.36	-0.28 ± 0.28284	-13.63193 ± 13.77033	-0.013632	-13.63193 ± 13.77033
NPTG1501AB	04/03/02	1400	SP-7-A-311	04/18/02	5	0.1	260,045	5,200.9	0.3027241	7	0.14	0.04 ± 0.13856	1.982003 ± 6.865859	0.001982	4.459506 ± 7.518933
PTG1502AB	04/03/02	1400	SP-7-A-311	04/18/02	5	0.1	260.045	5.200.9	0.3027241	12	0.24	0.14 ± 0.16492	6.93701 ± 8.172007	0.006937	
NPTG2201AB	05/01/02	1320	SP-7-A-311	05/02/02	5	0.1	260,982	5,219.64	0.3038149	13	0.26	0.16 ± 0.16971	7.899547 ± 8.378735	0.0079	11.3556 ± 9.126584
NPTG2202AB	05/01/02	1320	SP-7-A-311	05/02/02	5	0.1	260,982	5,219.64	0.3038149	20	0.4	0.3 ± 0.20000	14.81165 ± 9.874433	0.014812	
NPTG2901AB	06/05/02	1100	SP-7-A-311	08/02/02	3	0.06	254.244	5.084.88	0.29597322	4	0.08	0.02 ± 0.10583	1.013605 ± 5.363495	0.001014	1.013605 ± 5.363495
NPTG3601AB	07/11/02	1130	SP-7-A-311	08/05/02	3	0.06	257,259	5,145.18	0.29948312	13	0.26	0.2 ± 0.16000	10.01726 ± 8.013807	0.010017	6.511218 f7.012081
NPTG3602AB	07/11/02	1130	SP-7-A-311	08/05/02	3	0.06	257,259	5,145.18	0.29948312	6	0.12	0.06 ± 0.12000	3.005178 ± 6.010355	0.003005	
NPTG4301AB	08/06/02	1400	SP-7-A-311	08/08/02	6	0.12	254,907	5,098.14	0.29674156	12	0.24	0.12 ± 0.16971	6.065884 ± 8.578456	0.006066	6.065884 ± 8.578456
NPTG5001AB	09/18/02	845	SP-7-A-311	11/05/02	12	0.24	256.074	5.121.48	0.29809313	22	0.44	0.2 ± 0.233238	10.06397 ± 11.7365	0.010064	10.06397 ± 11.7365
NPTF7401AB	10/09/01	955	SP-8-A-310	10/10/01	14	0.28	265,334	5,306.68	0.30887078	23	0.46	0.18 ± 0.24331	8.74152 ± 11.81613	0.008742	8.74152 ± 11.81613
NPTF8101AB	11/07/01	1230	SP-8-A-310	11/19/01	10	0.20	266,639	5,332.78	0.31039464	21	0.42	0.22 ± 0.22271	10.63163 ± 10.76262	0.010632	13.00024 ± 10.08704
NPTF8102AB	11/07/01	1230	SP-8-A-310	11/08/01	4	0.08	268,287	5,365.74	0.31232014	20	0.40	0.32 f0.19596	15.36885 ± 9.411457	0.015369	
NPTF8801AB	12/11/01	1330	SP-8-A-310	01/10/02	9	0.18	263.850	5.277	0.30714901	20	0.4	0.22f0.21541	10.74397 ± 10.51965	0.010744	10.74397 ± 10.51965
NPTF9501AB	01/09/02	1400	SP-8-A-310	01/23/02	49	0.98	262,728	5,254.56	0.30579627	17	0.34	-0.64 ± 0.32496	-31.39345 ± 15.9401	-0.031393	-30.90293 ± 16.00025
NPTF9502AB	01/09/02	1400	SP-8-A-310	01/23/02	49	0.98	262,728	5,254.56	0.30579627	18	0.36	-0.62 ± 0.32741	-30.4124 ± 16.0604	-0.030412	
NPTG0201AB	02/06/02	1030	SP-8-A-310	02/11/02	51	1.02	261.961	5.239.22	0.30490105	30	0.6	-0.42 ± 0.36000	-20.66244 ± 17.71066	-0.020662	-20.66244 ± 17.71066
NPTG0901AB	03/06/02	1100	SP-8-A-310	03/12/02	31	0.62	264.690	5.293.8	0.30810128	16	0.32	-0.3 f0.27423	-14.60559 ± 13.35078	-0.014606	-14.60559 ± 13.35078
NPTG1604AB	04/03/02	1400	SP-8-A-310	04/18/02	5	0.1	260,045	5,200.9	0.3027241	7	0.14	0.04 ± 0.13856	1.982003 ± 6.865859	0.001982	1.982003 ± 6.865859
NPTG2301AB	05/01/02	1320	SP-8-A-310	05/02/02	5	0.1	260,982	5,219.64	0.3038149	12	0.24	0.14 ± 0.16492	6.912103 ± 8.142666	0.006912	6.912103 ± 8.142666
NPTG3001AB	06/05/02	1100	SP-8-A-310	08/02/02	3	0.06	254.244	5.084.88	0.29597322	11	0.22	0.16 ± 0.14967	8.108842 ± 7.585127	0.008109	8.108842 ± 7.585127
NPTG3701AB	07/11/02	1130	SP-8-A-310	08/05/02	3	0.06	257,259	5,145.18	0.29948312	5	0.1	0.04 ± 0.11314	2.003452 ± 5.666617	0.002003	2.003452 ± 5.666617
NPTG4401AB	08/06/02	1400	SP-8-A-310	08/08/02	6	0.12	254,907	5,098.14	0.29674156	14	0.28	0.16 ± 0.17889	8.087846 ± 9.042487	0.008088	5.560394 ± 8.436755
NPTG4402AB	08/06/02	1400	SP-8-A-310	08/08/02	6	0.12	254.907	5.098.14	0.29674156	9	0.18	0.06 ± 0.15492	3.032942 ± 7.831023	0.003033	
NPTF5101AB	09/18/02	845	SP-8-A-310	10/09/02	7	0.14	257.565	5.151.3	0.29983469	8	0.16	0.02f0.154919	1.000551f7.750237	0.001001	1.000551f7.750237

BKG =background
EEF = efficiencv source check

Table D-11. New Pump and Treat Facility gross beta effluent data.

SP-7 and SP-8 Effluent					Sample from General Engineering Laboratories										
Sample Identifier	Sample Collection Date	Sample Collection Time	Sample Location	Beta Count Date	Total BKG Counts	BKG (cpm)	Total Source Counts	Source (cpm)	EEF (cpddpm)	Total Sample Counts	Sample (cpm)	Net Sample Activity or Net Count Rate (cpm)	Gross Beta (pCi/L)	Sample Activity (pCi)	Average of Gross Beta Duplicates (pCi/L)
NPTF7301AB	10/09/01	955	SP-7-A-311	10/09/01	1,521	30.42	114,909	2,298.18	0.20768935	1,407	28.14	-2.28 ± 2.16444	-164.669 ± 156.3229	-0.164669	-106.1682 ± 157.3966
NPTF7302AB	10/09/01	955	SP-7-A-311	10/09/01	1,521	30.42	114,909	2,298.18	0.20768935	1,488	29.76	-0.66 ± 2.194174	-47.66735 ± 158.4704	-0.047667	
NPTF8001AB	11/07/01	1230	SP-7-A-311	11/19/01	1,517	30.34	113,602	2,272.04	0.20530268	1,534	30.68	0.34 ± 2.209434	24.84137 ± 161.4276	0.024841	24.84137 ± 161.4276
NPTF9301AB	01/09/02	1504	SP-7-A-311	01/10/02	1,435	28.7	112,443	2,248.86	0.20332998	1,400	28	-0.7 ± 2.129789	-51.6402 ± 157.1182	-0.05164	-22.89831 ± 159.7931
NPTF9401AB	01/09/02	1400	SP-7-A-311	01/23/02	1,544	30.88	113,657	2,273.14	0.20535397	1,548	30.96	0.08 ± 2.22423	5.843569 ± 162.468	0.005844	
NPTGO101AB	02/06/02	1030	SP-7-A-311	02/11/02	1,533	30.66	111,425	2,228.5	0.20128583	1,578	31.56	0.9 ± 2.231054	67.0688 ± 166.2601	0.067069	40.24128 ± 165.7777
NPTGO102AB	02/06/02	1030	SP-7-A-311	02/11/02	1,533	30.66	111,425	2,228.5	0.20128583	1,542	30.84	0.18 ± 2.218107	13.41376 ± 165.2953	0.013414	
NPTG0801AB	03/07/02	1101	SP-7-A-311	03/13/02	1,594	31.88	112,130	2,242.6	0.20246543	1,564	31.28	-0.6 ± 2.247843	-44.45203 ± 166.5354	-0.044452	-44.45203 ± 166.5354
NPTG1501AB	04/03/02	1400	SP-7-A-311	04/18/02	1,632	32.64	112,123	2,242.46	0.202383	1,483	29.66	-2.98 ± 2.232487	-220.8684 ± 165.465	-0.220868	-207.5273 ± 165.7037
NPTG1502AB	04/03/02	1400	SP-7-A-311	04/18/02	1,632	32.64	112,123	2,242.46	0.202383	1,501	30.02	-2.62 ± 2.238928	-194.1863 ± 165.9424	-0.194186	
NPTG2201AB	05/01/02	1320	SP-7-A-311	05/02/02	1,520	30.4	110,465	2,209.3	0.19955124	1,471	29.42	-0.98 ± 2.187601	-73.66529 ± 164.4391	-0.073665	6.013493 ± 165.8833
NPTG2202AB	05/01/02	1320	SP-7-A-311	05/02/02	1,520	30.4	110,465	2,209.3	0.19955124	1,577	31.54	1.14 ± 2.226028	85.69228 ± 167.3275	0.085692	
NPTG2901AB	06/05/02	1100	SP-7-A-311	08/02/02	1,515	30.3	112,899	2,257.98	0.20401868	1,454	29.08	-1.22 ± 2.179541	-89.69767 ± 160.2457	-0.089698	-89.69767 ± 160.2457
NPTG3601AB	07/11/02	1130	SP-7-A-311	08/05/02	1,450	29	110,691	2,213.82	0.20009342	1,607	32.14	3.14 f2.211606	235.3901 ± 165.793	0.23539	211.4013 ± 165.358
NPTG3602AB	07/11/02	1130	SP-7-A-311	08/05/02	1,450	29	110,691	2,213.82	0.20009342	1,575	31.5	2.5 ± 2.2	187.4125 ± 164.923	0.187412	
NPTG4301AB	08/06/02	1400	SP-7-A-311	08/08/02	1,611	32.22	112,806	2,256.12	0.2036725	1,493	29.86	-2.36 ± ,228542	-173.8084 ± 164.1269	-0.173808	-173.8084 ± 164.1269
NPTG5001AB	09/18/02	845	SP-7-A-311	11/05/02	1,582	31.64	111,357	2,227.14	0.20107153	1,617	32.34	0.7 ± 2.262388	52.22022 ± 168.7749	0.05222	52.22022 ± 168.7749
NPTF7401AB	10/09/01	955	SP-8-A-310	10/10/01	1,504	30.08	112,470	2,249.4	0.20325305	1,498	29.96	-0.12 ± 2.19162	-8.855956 ± 161.7408	-0.008856	-8.855956 ± 161.7408
NPTF8101AB	11/07/01	1230	SP-8-A-310	11/19/01	1,517	30.34	113,602	2,272.04	0.20530268	1,541	30.82	0.48 ± 2.211967	35.07017 ± 161.6127	0.03507	-0.739922 ± 160.3343
NPTF8102AB	11/07/01	1230	SP-8-A-310	11/08/01	1,492	29.84	113,520	2,270.4	0.20519828	1,467	29.34	-0.5 ± 2.175868	-36.55001 ± 159.056	-0.03655	
NPTF8801AB	12/11/01	1330	SP-8-A-310	01/10/02	1,435	28.7	112,443	2,248.86	0.20332998	1,418	28.36	-0.34 ± 2.136539	-25.08238 ± 157.6162	-0.025082	-25.08238 ± 157.6162
NPTF9501AB	01/09/02	1400	SP-8-A-310	01/23/02	1,544	30.88	113,657	2,273.14	0.20535397	1,529	30.58	-0.3 ± 2.217386	-21.91338 ± 161.9681	-0.021913	-5.843569 ± 162.2574
NPTF9502AB	01/09/02	1400	SP-8-A-310	01/23/02	1,544	30.88	113,657	2,273.14	0.20535397	1,551	31.02	0.14 ± 2.225309	10.22624 ± 162.5468	0.010226	
NPTG0201AB	02/06/02	1030	SP-8-A-310	02/11/02	1,533	30.66	111,425	2,228.5	0.20128583	1,572	31.44	0.78 ± 2.228901	58.1263 ± 166.0997	0.058126	58.1263 ± 166.0997
NPTG0901AB	03/06/02	1100	SP-8-A-310	03/12/02	1,594	31.88	112,130	2,242.6	0.20246543	1,558	31.16	-0.72 ± 2.245707	-53.34244 ± 166.3771	-0.053342	-53.34244 ± 166.3771
NPTG1604AB	04/03/02	1400	SP-8-A-310	04/18/02	1,632	32.64	112,123	2,242.46	0.202383	1,542	30.84	-1.8 ± 2.253531	-133.4104 ± 167.0247	-0.13341	-133.4104 ± 167.0247
NPTG2301AB	05/01/02	1320	SP-8-A-310	05/02/02	1,520	30.4	110,465	2,209.3	0.19955124	1,539	30.78	0.38 ± 2.212329	28.56409 ± 166.2978	0.028564	28.56409 ± 166.2978
NPTG3001AB	06/05/02	1100	SP-8-A-310	08/02/02	1,515	30.3	112,899	2,257.98	0.20401868	1,589	31.78	1.48 ± 2.228542	108.8136 ± 163.8484	0.108814	108.8136 ± 163.8484
NPTG3701AB	07/11/02	1130	SP-8-A-310	08/05/02	1,450	29	110,691	2,213.82	0.20009342	1,573	31.46	2.46 ± 2.199273	184.4139 ± 164.8684	0.184414	184.4139 ± 164.8684
NPTG4401AB	08/06/02	1400	SP-8-A-310	08/08/02	1,611	32.22	112,806	2,256.12	0.2036725	1,560	31.2	-1.02 ± 2.252465	-75.1206 ± 165.8888	-0.075121	-83.22184 ± 165.7448
NPTG4402AB	08/06/02	1400	SP-8-A-310	08/08/02	1,611	32.22	112,806	2,256.12	0.2036725	1,549	30.98	-1.24 ± 2.248555	-91.32308 ± 165.6008	-0.091323	
NPTG5101AB	09/18/02	845	SP-8-A-310	10/09/02	1,600	32	110,043	2,200.86	0.19863174	1,546	30.92	-1.08 ± 2.243569	-81.55796 ± 169.4267	-0.081558	-81.55796 ± 169.4267

BKG =background
EEF = efficiency source check

Appendix E

Carcinogenic Risk Calculations

Appendix E

Carcinogenic Risk Calculations

Table E-1 provides the data used for calculating cumulative carcinogenic risk.

Table E-1. Volatile organic compound data used in calculation of carcinogenic risk posed by volatile organic compound contaminants of concern in New Pump and Treat Facility effluent.

Sample Identifier	Date	Time	Sample Location	VC (µg/L)	Flag	TCE (µg/L)	Flag	Average TCE for Sample Date (µg/L)	PCE (µg/L)	Flag	*trans*-DCE (µg/L)	Flag	*cis*-DCE (µg/L)	Flag
NPTF7301VA[a]	10/09/01	955	SP-7-A-314	5	U	5	U	—	5	U	—	—	—	—
NPTF7302VA[a]	10/09/01	955	SP-7-A-314	—	—	5	U	U	5	U	—	—	—	—
NPTF7401VE	10/09/01	955	SP-8-A-312	5	U	5	U	—	5	U	—	—	—	—
NPTF8001VE	11/07/01	1230	SP-7-A-311	1	U	0.9	J	—	2	U	2	U	2	U
NPTF8101VA[a]	11/07/01	1230	SP-8-A-310	1	U	0.7	J	0.8	2	U	2	U	2	U
NPTF8102VA[a]	11/07/01	1230	SP-8-A-310	1	U	0.8	J	—	2	U	2	U	2	U
NPTF8701VA	12/11/01	1330	SP-7-A-311	1	U	2	U	U	2	U	2	U	2	U
NPTF8801VE	12/11/01	1330	SP-8-A-310	1	U	0.6	J	0.6	2	U	2	U	2	U
NPTF9401VA	01/09/02	1400	SP-7-A-311	1	UJ	0.9	J	—	2	UJ	2	UJ	2	UJ
NPTF9501VA[a]	01/09/02	1400	SP-8-A-310	1	U	0.8	J	0.8	2	U	2	U	2	U
NPTF9502VA[a]	01/09/02	1400	SP-8-A-310	1	U	0.8	J	—	2	UJ	2	U	2	U
NPTG0101VA[a]	02/06/02	1030	SP-7-A-311	1	U	2	U	U	2	U	2	U	2	U
NPTG0102VA[a]	02/06/02	1030	SP-7-A-311	1	U	0.8	J	0.8	1	J	2	U	2	U
NPTG0201VA	02/06/02	1030	SP-8-A-310	1	U	2	U	U	2	U	2	U	2	U
NPTG0801VE	03/06/02	1100	SP-7-A-311	1	U	1		0.8	1	U	1	U	1	U
NPTG0901VA	03/06/02	1100	SP-8-A-310	1	U	0.5	J	—	1	U	1	U	1	U
NPTG1501VA[a]	04/03/02	1400	SP-7-A-311	1	U	0.6	J	—	1	U	1	U	1	U
NPTG1502VA[a]	04/03/02	1400	SP-7-A-311	1	U	0.6	J	0.6	1	U	1	U	1	U
NPTG1601VA	04/03/02	1400	SP-8-A-310	1	U	0.6	J	—	1	U	1	U	1	U
NPTG2201VA[a]	05/01/02	1320	SP-7-A-311	1	U	1	U	U	1	U	1	U	1	U
NPTG2202VA[a]	05/01/02	1320	SP-7-A-311	1	U	0.7	J	0.6	1	U	1	U	1	U

Table E-1. (continued).

Sample Identifier	Date	Time	Sample Location	VC (µg/L)	Flag	TCE (µg/L)	Flag	Average TCE for Sample Date (µg/L)	PCE (µg/L)	Flag	*trans*-DCE (µg/L)	Flag	*cis*-DCE (µg/L)	Flag
NPTG2301VE	05/01/02	1320	SP-8-A-310	1	U	0.5	J	—	1	U	1	U	1	U
NPTG2901VA	06/05/02	1100	SP-7-A-311	1	U	0.9	J	0.8	1	U	1	U	1	U
NPTG3001VE	06/05/02	1100	SP-8-A-310	1	U	0.6	J	—	1	U	1	U	1	U
NPTG3601VA[a]	07/11/02	1100	SP-7-A-311	1	U	0.7	J	—	1	U	1	U	1	U
NPTG3602VA[a]	07/11/02	1100	SP-7-A-311	1	U	0.7	J	0.7	1	U	1	U	1	U
NPTG3701VA	07/11/02	1130	SP-8-A-310	1	U	0.6	J	—	1	U	1	U	1	U
NPTG4301VE	08/06/02	1400	SP-7-A-311	1	U	0.6	J	—	1	U	1	U	1	U
NPTG4401VA[a]	08/06/02	1400	SP-8-A-310	1	U	1	—	0.7	1	U	1	U	1	U
NPTG4402VA[a]	08/06/02	1400	SP-8-A-310	1	U	0.6	J	—	1	U	1	U	1	U
NPTG5001VA	09/18/02	845	SP-7-A-311	1	U	0.7	J	0.7	1	U	1	U	1	U
NPTG5101VE	09/18/02	845	SP-8-A-310	1	U	1	U	U	1	U	1	U	1	U

a. Duplicates were averaged for more clear representation of the results

DCE = dichloroethene
PCE – tetrachloroethene
TCE = trichloroethene
VC = vinyl chloride

J = estimated value
U = nondetect

Appendix F

Atmospheric Discharge of Volatile Organic Compounds from the New Pump and Treat Facility. FY 2002

Appendix F

Atmospheric Discharge of Volatile Organic Compounds from the New Pump and Treat Facility, FY 2002

Using the equation in Table F-1, the mass of volatile organic compounds (VOCs) discharged to the atmosphere from the air strippers was calculated as the product of measured VOC concentrations in samples collected from air stripper off-gas sample points (SP-3 and -4) and the volumetric flow rate of air discharged from the air strippers. These calculations are documented in Table F-2.

Using the equation in Table F-1, volatile-organic-compoundemissions from the New Pump and Treat Facility to the atmosphere were calculated as the product of VOC concentrations measured at the influent sample point (i.e., SP-1) and the average monthly combined flow rate from Extraction Wells TAN-38, -39, **and** -40. These calculations are documented in Table F-3.

$\dot{m}_{voc} = Q^{voc} \times Q^{air} \times \frac{P}{RT} \times MW$		Value
$\dot{m}_{voc}$	Mass flowrate of VOC (g/hour)	calculated
Q^{voc}	Volumetric concentration of VOC (ppb)	as measured
Q^{air}	Volumetric flowrate of air (L/hour)	3.91E+06
P	Absolute pressure (atm)	0.87
R	Universal gas constant (L atm/mol K)	0.082075
T	Temperature (K)	286
MW	Molecular weight (grams/mole)	—

Table F-2. New Pump and Treat Facility air emission calculations using air data

Date	PCE Q^{voc} (ppb v/v)	PCE m_{voc} (lb/hour)	TCE Q^{voc} (ppb v/v)	TCE m_{voc} (lb/hour)	*cis*-1,2 DCE Q^{voc} (ppb v/v)	*cis*-1,2 DCE m_{voc} (lb/hour)	*trans*-1,2 DCE Q^{voc} (ppb v/v)	*trans*-1,2 DCE m_{voc} (lb/hour)	VC Q^{voc} (ppb v/v)	VC m_{voc} (lb/hour)
Air Emission Limit	4.9		0.18		564.3		N/A		0.33	
10/09/01	33.2	0.001756	870	0.036465	96	0.002969	34.25	0.001059	7.5	0.000232
11/07/01	67	0.003544	1,065	0.044638	120	0.003711	41	0.001268	7.7	0.000238
12/11/01	68.5	0.003624	1,100	0.046105	100.5	0.003108	33	0.00102	7.55	0.000233
01/09/02	66.5	0.003518	825	0.034579	64.5	0.001995	23.5	0.000727	7.2	0.000223
02/06/02	47	0.002486	530	0.022214	42	0.001299	14.5	0.000448	7.6	0.000235
03/06/02	45.5	0.002407	595	0.024938	43	0.00133	14	0.000433	7.7	0.000238
04/03/02	48	0.002539	610	0.025567	40.5	0.001252	13	0.000402	7.85	0.000243
05/01/02	44	0.002328	535	0.022424	38	0.001175	12	0.000371	8	0.000247
06/05/02	43.5	0.002301	505	0.021166	36	0.001113	11	0.00034	8.15	0.000252
07/17/02	40.5	0.002142	560	0.023472	37	0.001144	8.65	0.000267	8	0.000247
08/06/02	40.5	0.002142	540	0.022633	38	0.001175	8.5	0.000263	7.95	0.000246
09/18/02	34.5	0.001825	475	0.019909	31	0.000959	6.75	0.000209	7.6	0.000235
10/09/01	33.2	0.001756	870	0.036465	96	0.002969	34.25	0.001059	7.5	0.000232
11/07/01	67	0.003544	1,065	0.044638	120	0.003711	41	0.001268	7.7	0.000238

DCE = dichloroethene
PCE – tetrachloroethene
TCE = trichloroethene
VC = vinyl chloride

Table F-3. New Pump and Treat Facility air emission calculations using water data.

Month	Average m_{voc} (gpm)	PCE (µg/L)	Flag	PCE Mass Flowrate (lb/hour)	TCE (µg/L)	Flag	TCE Mass Flowrate (lb/hour)	*cis*-DCE (µg/L)	Flag	cis-12 DCE Mass Flowrate (lb/hour)	trans-DCE (µg/L)	Flag	trans-1,2 DCE Mass Flowrate (lb/hour)	VC (µg/L)	Flag	**VC** Mass Flowrate (lb/hour)
NPTF Air Emission Limit (lb/hour)				4.9 4.9E+00			0.18 1.8E-01			564.3 5.6E+02			NA			0.33 3.3E-01
10/09/2001	232	26	—	3.0E-03	310	D	3.6E-02	36	—[a]	4.2E-03	13	—[a]	1.5E-03	5	U	5.8E-04
11/07/2001	230	35	J	4.0E-03	260	D	3.0E-02	18	DJ	2.1E-03	14	J	1.6E-03	1	U	1.2E-04
12/11/2001	218	22.5	—	2.5E-03	365	D	4.0E-02	20.5		2.2E-03	7.5	—	8.2E-04	1	U	1.1E-04
01/09/2002	226	24	J	2.7E-03	340	DJ	3.8E-02	18	J	2.0E-03	6	J	6.8E-04	1	UJ	1.1E-04
02/06/2002	235	23	—	2.7E-03	280	D	3.3E-02	14	—	1.6E-03	5	—	5.9E-04	1	U	1.2E-04
03/06/2002	238	17.5	—	2.1E-03	225	D	2.7E-02	11.5	—	1.4E-03	4	—	4.8E-04	1	U	1.2E-04
04/03/2002	230	19	—	2.2E-03	210	—	2.4E-02	12	—	1.4E-03	4	—	4.6E-04	1	U	1.2E-04
05/01/2002	241	17	—	2.1E-03	210	—	2.5E-02	9	—	1.1E-03	3	—	3.6E-04	1	U	1.2E-04
06/05/2002	238	11.5	—	1.4E-03	155	D	1.8E-02	7	—	8.3E-04	2	—	2.4E-04	1	U	1.2E-04
07/11/2002	239	14	—	1.7E-03	170	D	2.0E-02	**8**	—	9.6E-04	3	—	3.6E-04	1	U	1.2E-04
08/06/2002	230	12	—	1.4E-03	100	D	1.1E-02	7	—	8.0E-04	2	—	2.3E-04	1	U	1.1E-04
09/18/2002	232	13	—	1.5E-03	155		1.8E-02	**8**	—	9.3E-04	3	—	3.5E-04	1	U	1.2E-04

a. 49 µg/L Total 1,2 DCE reported. Concentrations of *cis*- and *trans*- isomers estimated

DCE = dichloroethene
PCE – tetrachloroethene
TCE = trichloroethene
VC = vinyl chloride

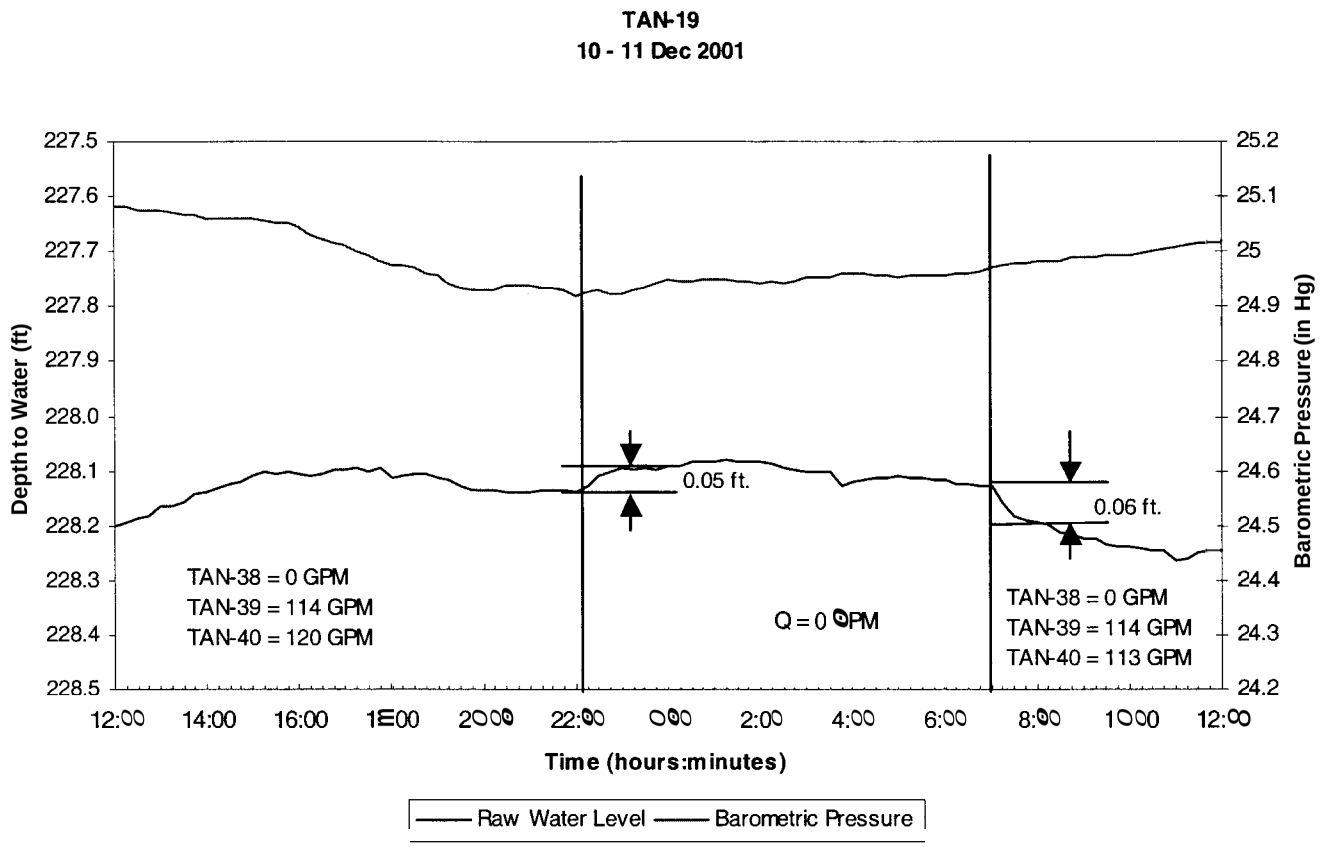
Appendix G

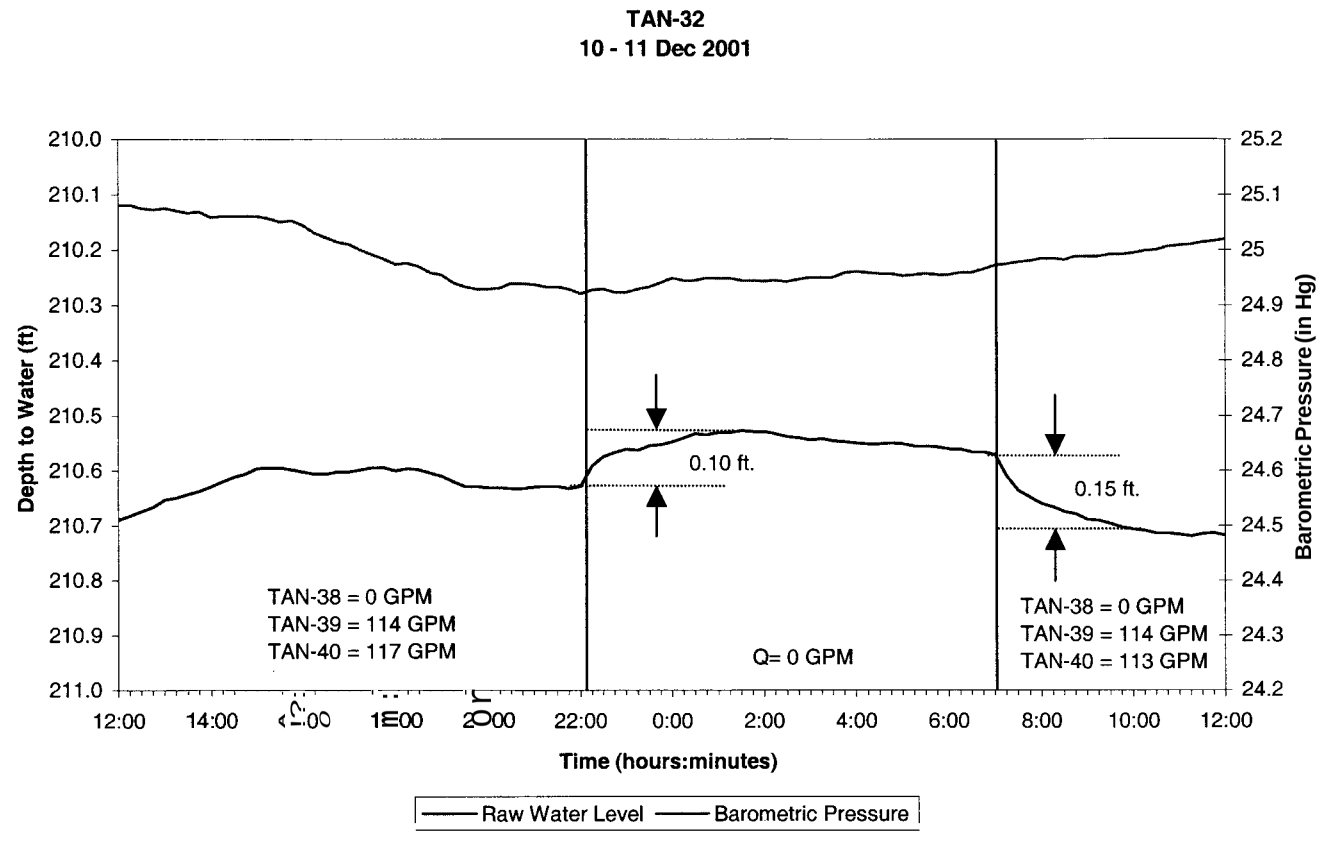
Drawdown Test Data for Selected Wells at Test Area North. FY 2002

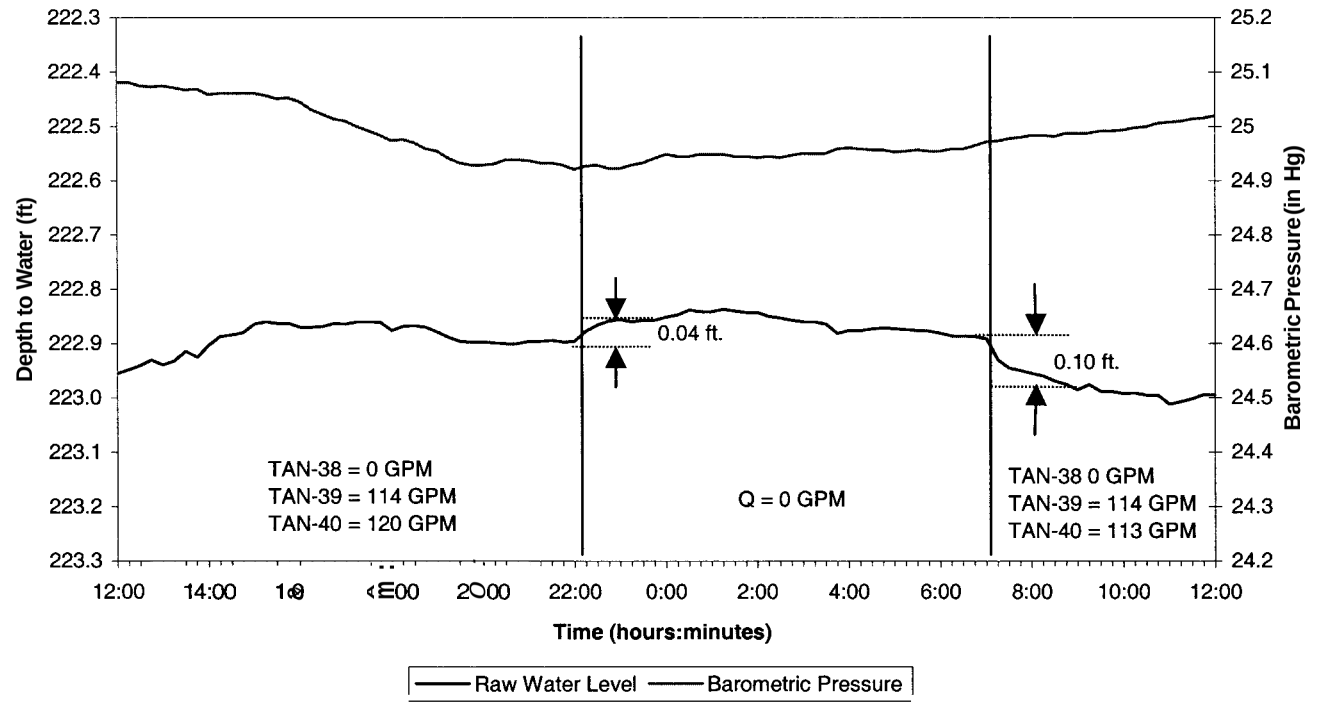
Appendix G

Drawdown Test Data for Selected Wells at Test Area North, FY 2002

Figures G-1 through G-3 show drawdown test data for selected wells at Test Area North for December 2001, and February and April 2002.







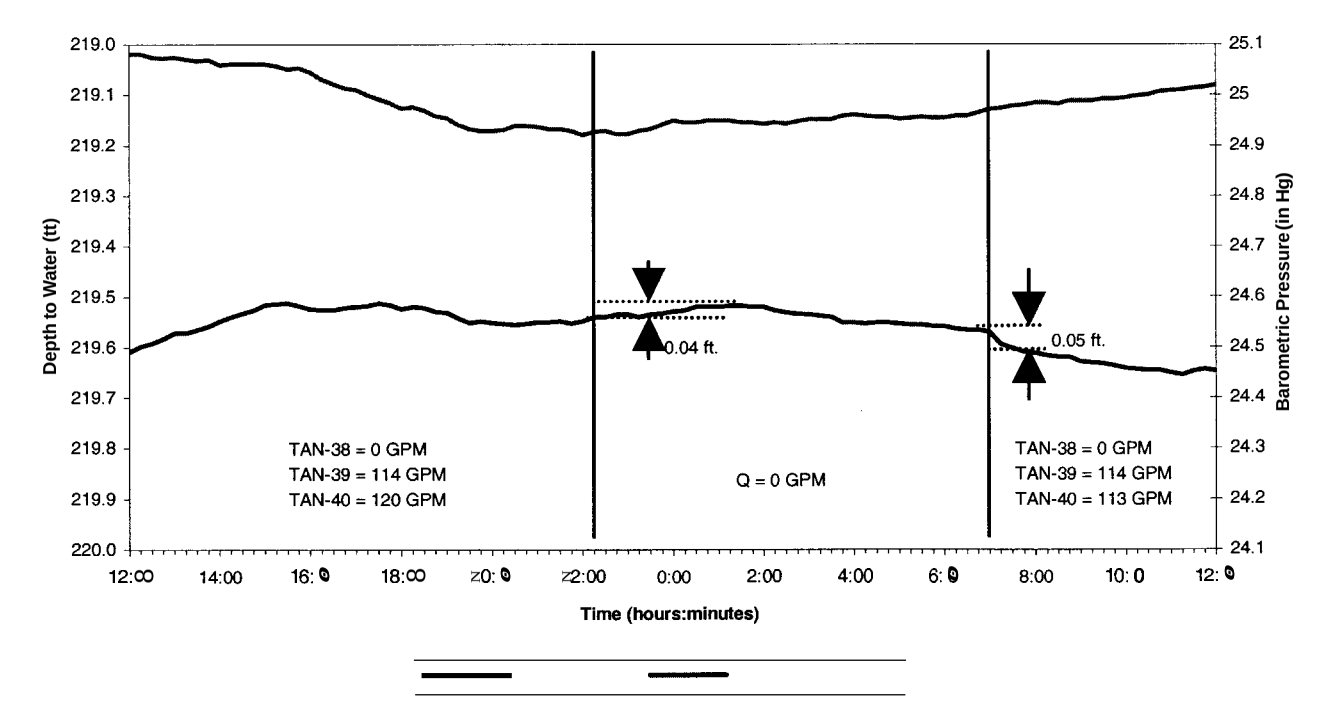
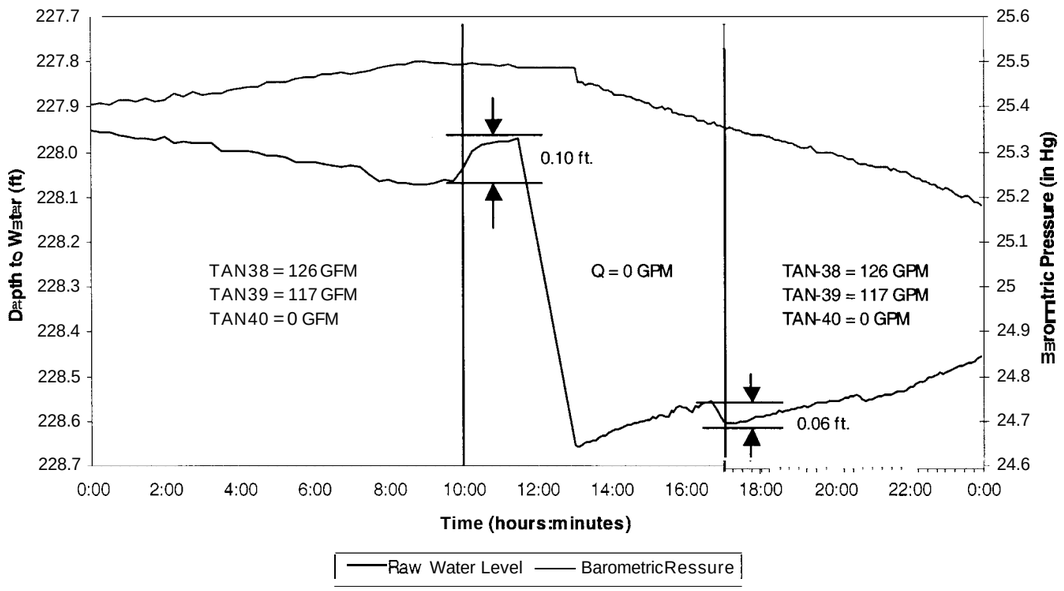
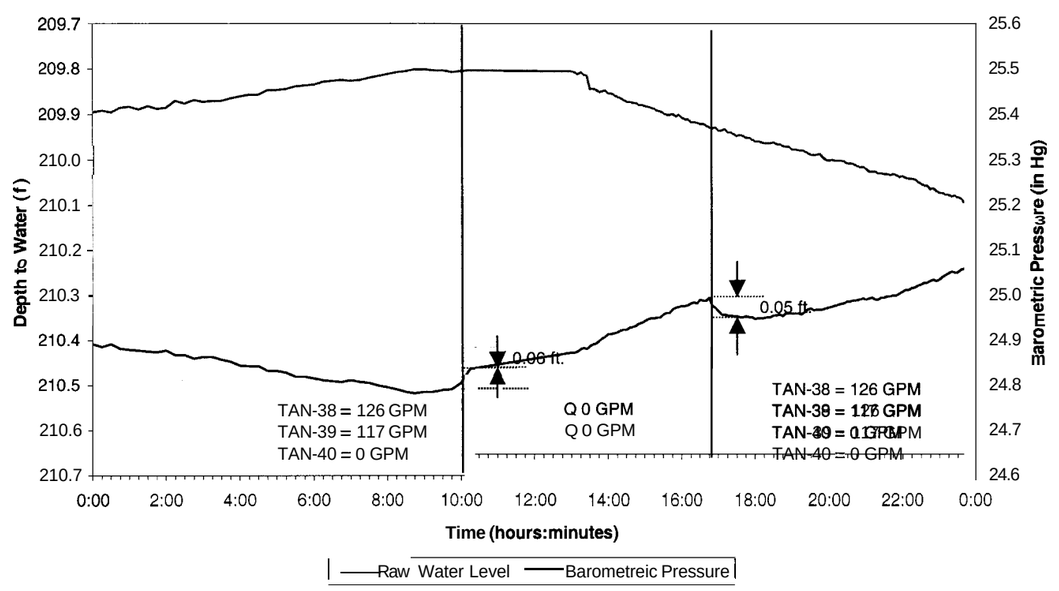
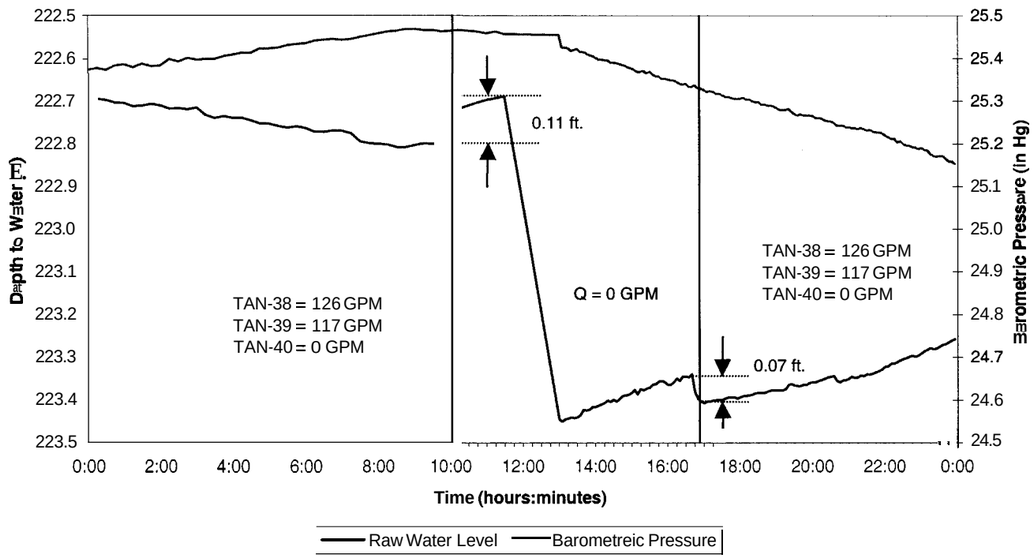


Figure G-1. Drawdown test data for selected wells at Test Area North for December 2001.







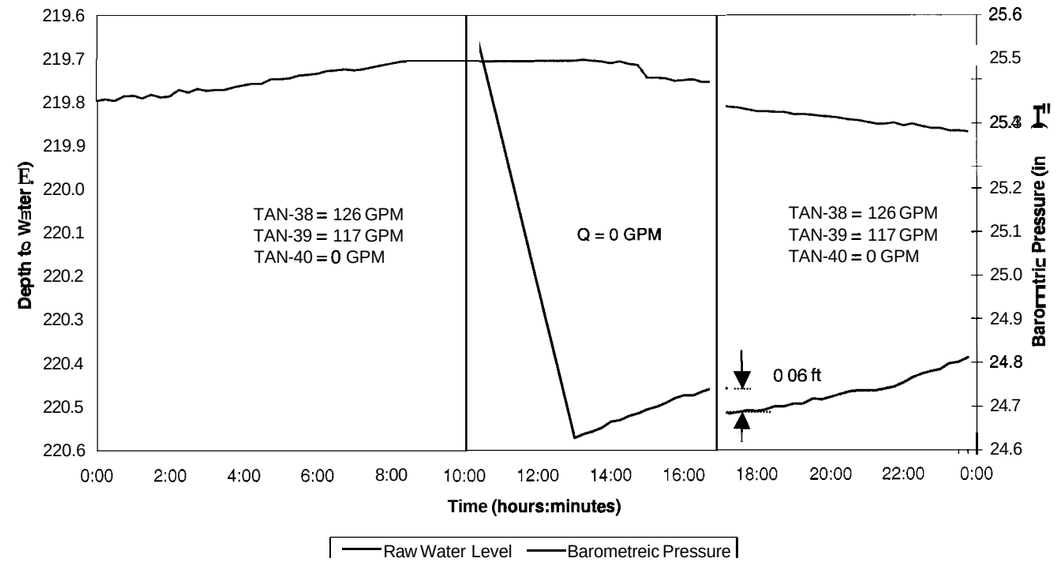
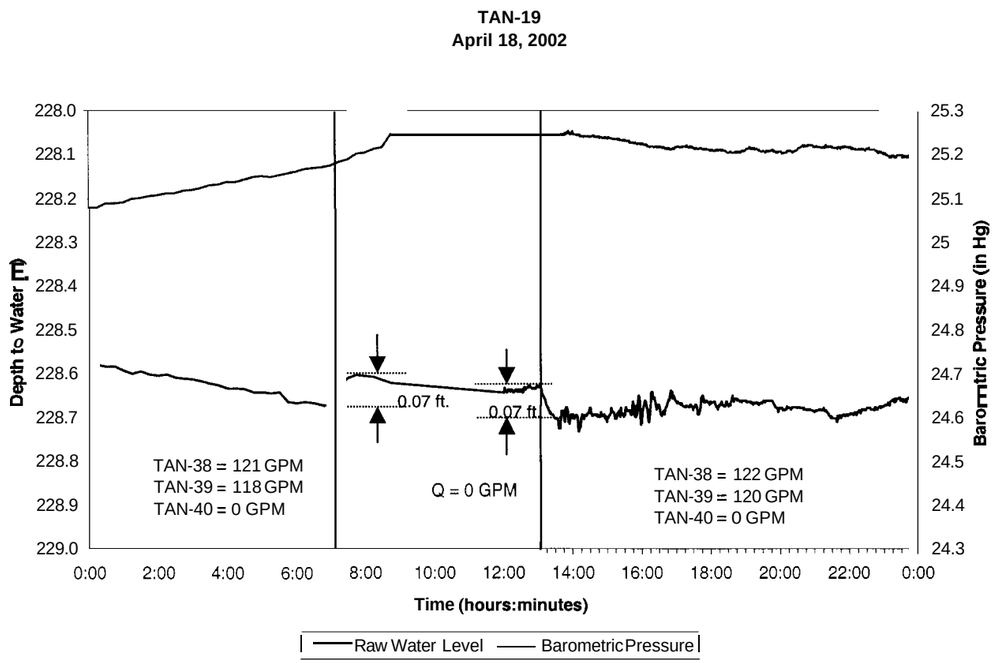
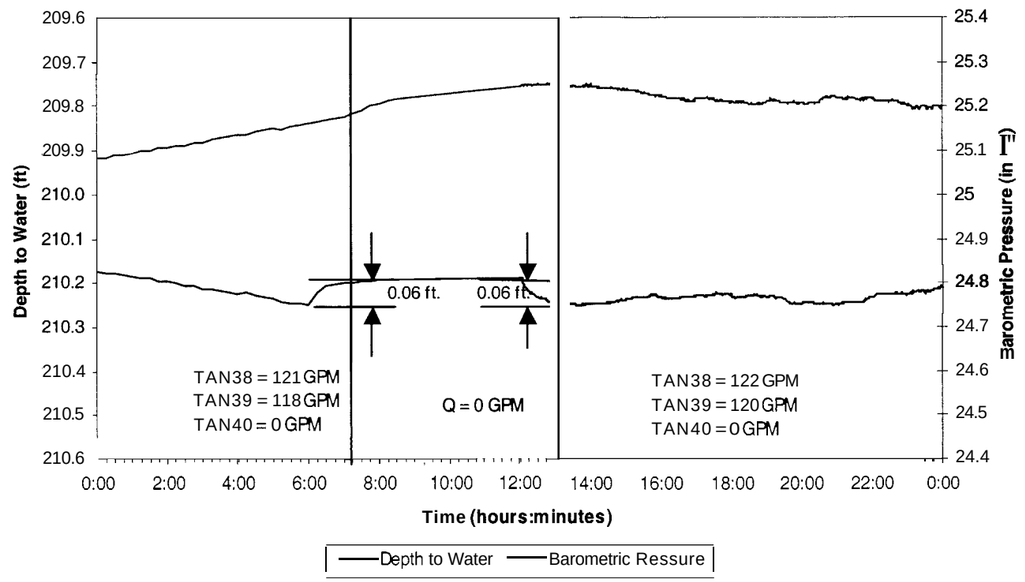
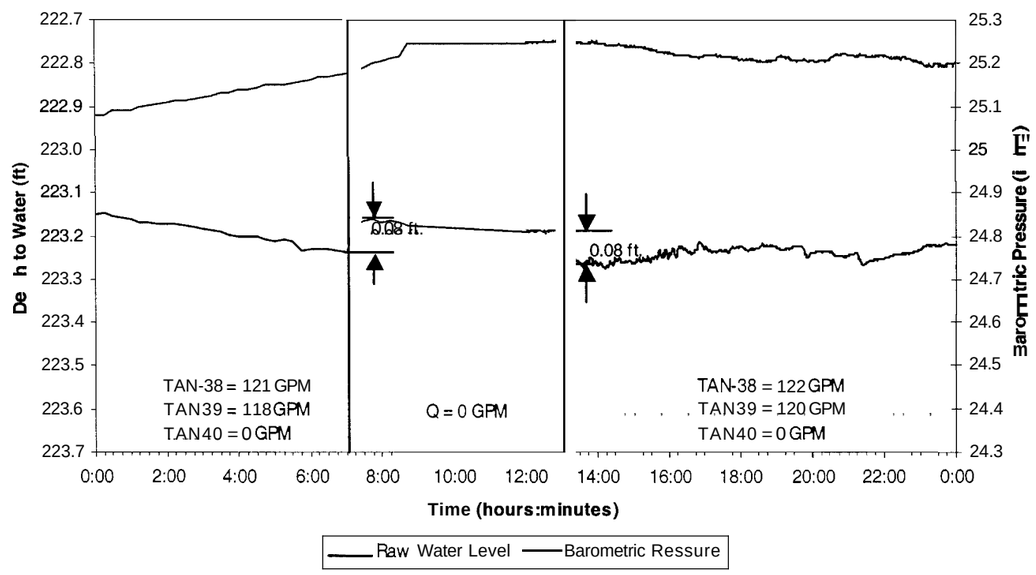


Figure G-2. Drawdown test data for selected wells at Test Area North for February 2002.







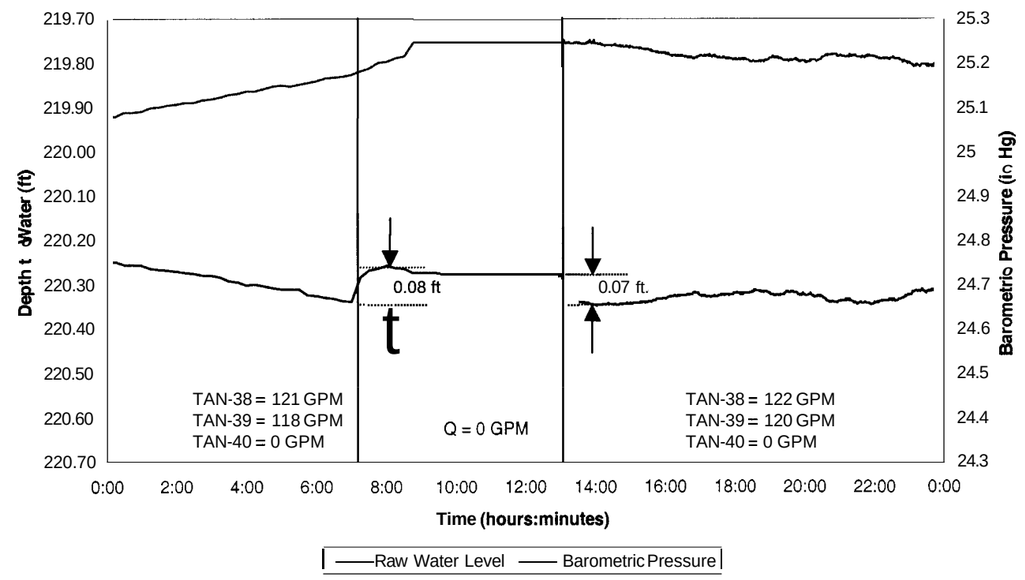


Figure G-3. Drawdown test data for selected wells at Test Area North for **April** 2002.

Appendix H

Water Quality Data for Wells TAN.29. -33, -36, -43, and –44

Appendix H

Water Quality Data for Wells TAN-29, -33, -36, -43, and –44

Water quality data for Wells TAN-29, -33, -36, -43, and –44 are shown in Tables H-1 through H-3 an Figure H-1.

Table H-1. Volatile organic compound data at Wells TAN-29, -33, -36, -43, and -44.

Well	Date	PCE (µg/L)	Flag	TCE (µg/L)	Flag	*cis*-1,2 DCE (µg/L)	Flag	*trans*-1,2 DCE (µg/L)	Flag	VC (µg/L)	Flag
TAN-29	12/5/01	9	—	540	—	110	—	86	—	5.8	J
	3/5/02	8	J	580	—	130	—	85	—	7.8	J
	6/3/02	20	J	780	—	130	—	37	—	< 5	U
	9/9/02	19	—	580	—	75	—	16	—	< 5	U
TAN-33	12/10/01	27	—	360	—	15	—	6.1	—	2.5	—
	3/6/02"	19.2	—	185.6	—	10.8	—	4.2	J	< 5	U
	3/6/02"	19.5	—	186.2	—	10.9	—	4.2	J	< 5	U
	6/5/02"	15	—	140	—	8	—	3.1	J	< 5	U
	6/5/02"	14	—	140	—	2.5	—	2.5	J	< 5	U
	9/11/02	13	—	120	—	4.8	J	1.7	J	< 5	U
TAN-36	12/5/01"	9.5	—	200	—	11	—	4.7	—	5	—
	12/5/01[a]	9.8	—	180	—	11	—	4.4	—	2.5	—
	3/4/02	5	—	75	—	5.6	—	< 5	U	< 5	U
	6/5/02"	4	J	61	—	4.1	J	1.6	J	< 5	U
	6/5/02"	4	J	61	—	4.2	J	1.7	J	< 5	U
	9/11/02"	4.4	—	59	—	3.3	—	1.2	—	< 5	U
	9/11/02"	4.6	—	60	—	3.4	—	1.2	—	< 5	U
TAN-43	12/10/01	14	—	230	—	15	—	6.3	—	< 5	U
	3/6/02	12	—	160	—	11	—	2.5	—	< 5	U
	6/5/02	10	—	130	—	8.9	—	3.2	J	< 5	U
	9/11/02	13	—	140	—	7.2	—	2.2	J	< 5	U
TAN-44	12/6/01	27	—	440	—	24	—	9.6	—	2.5	—
	3/7/02	8.5	—	120	—	9	—	1.25	—	< 5	U
	6/5/02"	6.6	—	92	—	6	—	2.4	J	< 5	U
	6/5/02"	6	—	89	—	< 5	U	< 5	U	< 5	U
	9/11/02	6.2	—	73	—	3.8	J	< 5	U	< 5	U

a. Duplicates taken on the presented dates with their corresponding well (average of the duplicates is shown on the figures presented in the text)

DCE = dichloroethene
PCE = tetrachloroethene
TCE = trichloroethene
VC = vinyl chloride

J = estimated value
U = non-detect

Table H-2. Radiological data at Wells TAN-29. -33. -36. -43. and -44

Well	Date	H-3 (pCi/L)	+/-	Sr-90 (pCi/L)	+/-	Minimum Detectable Activity for Sr-90	Gross Alpha (pCi/L)	+/-	Gross Beta (pCi/L)	+/-
TAN-29	12/5/01	2,850	125	55.1	6.26	N/A	41.35	16.21	129.69	164.32
	3/5/02	3,010	145	43	5.03	N/A	9.84	34.07	106	164.32
	6/3/02	2,520	169	12.85	1.66	N/A	12.06	10.64	19.18	165.4
	9/9/02	2,360	142	9.93	1.27	N/A	19.02	9.6	120.8	168.6
TAN-33	12/10/01	3,010	124	0.16	0.278	0.278	5.86	9.56	-41.312	157.312
	3/6/02"	2,480	134	-0.0337	0.0607	0.32	83.14	18.036	98.194	164.224
	3/6/02"	2,500	138	0.0442	0.078	0.361	33.26	11.407	329.575	166.306
	6/5/02"	2,720	177	-0.242	0.0686	0.448	16.96	10.7	58.8	162.11
	6/5/02"	2,270	160	-0.0525	0.0837	0.444	31.9	13.23	39.7	161.8
	9/11/02	2,270	125	-0.087	0.09	0.482	10	7.49	11.9	166.7
TAN-36	12/5/01"	3,620	139	0.201	0.0725	0.255	23.08	13.869	33.89	162.59
	12/5/01"	3,400	139	0.179	0.081	0.29	11.54	12.164	22.1	162.4
	3/4/02	3,200	154	-0.297	0.105	0.602	78.69	62.21	205.093	166.122
	6/5/02"	2,770	182	-0.0231	0.0839	0.43	-3.02	7.25	1.48	165.1
	6/5/02"	2,720	176	-0.29	0.144	0.847	6.03	9.43	-25.1	164.67
	9/11/02"	2,740	146	-0.149	0.085	0.48	13.01	10.4	125.36	173.1
	9/11/02"	2,490	144	0.17	0.094	0.37	7	6.64	82.1	168
TAN-43	12/10/01	3,500	130	0.344	0.354	N/A	71.45	19.5	-25.32	167.3
	3/6/02	3,230	154	-0.0527	0.0639	0.339	-4.869	14.703	-65.196	166.166
	6/5/02	2,990	181	-0.0039	0.0877	0.441	11.97	9.77	-7.35	160.9
	9/11/02	2,600	143	0.0225	0.078	N/A	9	9.6	21.14	171.2
TAN-44	12/6/01	3,700	145	0.0898	0.227	N/A	5.77	11.2	66.3	163.2
	3/7/02	4,120	194	-0.0705	0.0659	0.358	-12.66	13.632	93.349	165.663
	6/5/02"	3,530	198	0.0676	0.104	0.48	0	8.04	-14.75	164.8
	6/5/02"	3,180	191	0.121	0.0935	0.4	2.99	7.72	-827.92	145.13
	9/11/02	2,610	146	0.18	0.094	0.37	5	6	19.4	166.8

a. Duplicates taken on the presented dates with their corresponding well (average of the duplicates is shown on the figures presented in the text).

Table H-3. Water aualitv data at Wells TAN-29. -33. -36. -43. and -44

Well	Date	Temperature (°C)	pH	Digital Output (mg/L)	Oxygen Reduction Potential (mV)	Specific Conductance (mS/cm)
TAN-29	12/5/01	13.52	7.76	0	155	0.845
	3/5/02	13.56	7.51	0	118	0.852
	6/3/02	14.19	7.74	0	405	0.733
	9/9/02	15.39	7.82	0	186	0.731
TAN-33	12/10/01	10.34	7.7	5.76	412	0.607
	3/6/02"	11.66	7.78	0.32	206	0.591
	3/6/02"	11.66	7.78	0.32	206	0.591
	6/5/02"	12.3	8.2	0	420	0.596
	6/5/02"	12.3	8.2	0	420	0.596
	9/11/02	12.48	8.93	7.5	237	0.567
TAN-36	12/5/01[a]	12.32	7.79	7.13	0.669	257
	12/5/01[a]	12.32	7.79	7.13	0.669	257
	3/4/02	11.71	7.66	0	0.61	321
	6/5/02"	12.65	7.77	3.52	0.609	500
	6/5/02"	12.65	7.77	3.52	0.609	500
	9/11/02"	13.1	9.03	8.68	0.591	257
	9/11/02"	13.1	9.03	8.68	0.591	257
TAN-43	12/10/01	10.75	7.65	6.22	502	0.685
	3/6/02	12.45	7.67	0	210	0.495
	6/5/02	12.9	7.93	0	515	0.637
	9/11/02	13.28	9.01	5.97	227	0.618
TAN-44	12/6/01	11.99	7.72	5.31	298	0.679
	3/7/02	—	—	—	—	—
	6/5/02"	12.49	8.18	0	439	0.685
	6/5/02"	12.49	8.18	0	439	0.685
	9/11/02	12.82	9.08	8.43	220	0.599

a. Duplicates taken on the presented dates with their corresponding well (average of the duplicates is shown on the figures presented in the text)
— Parameters not measured that dav.

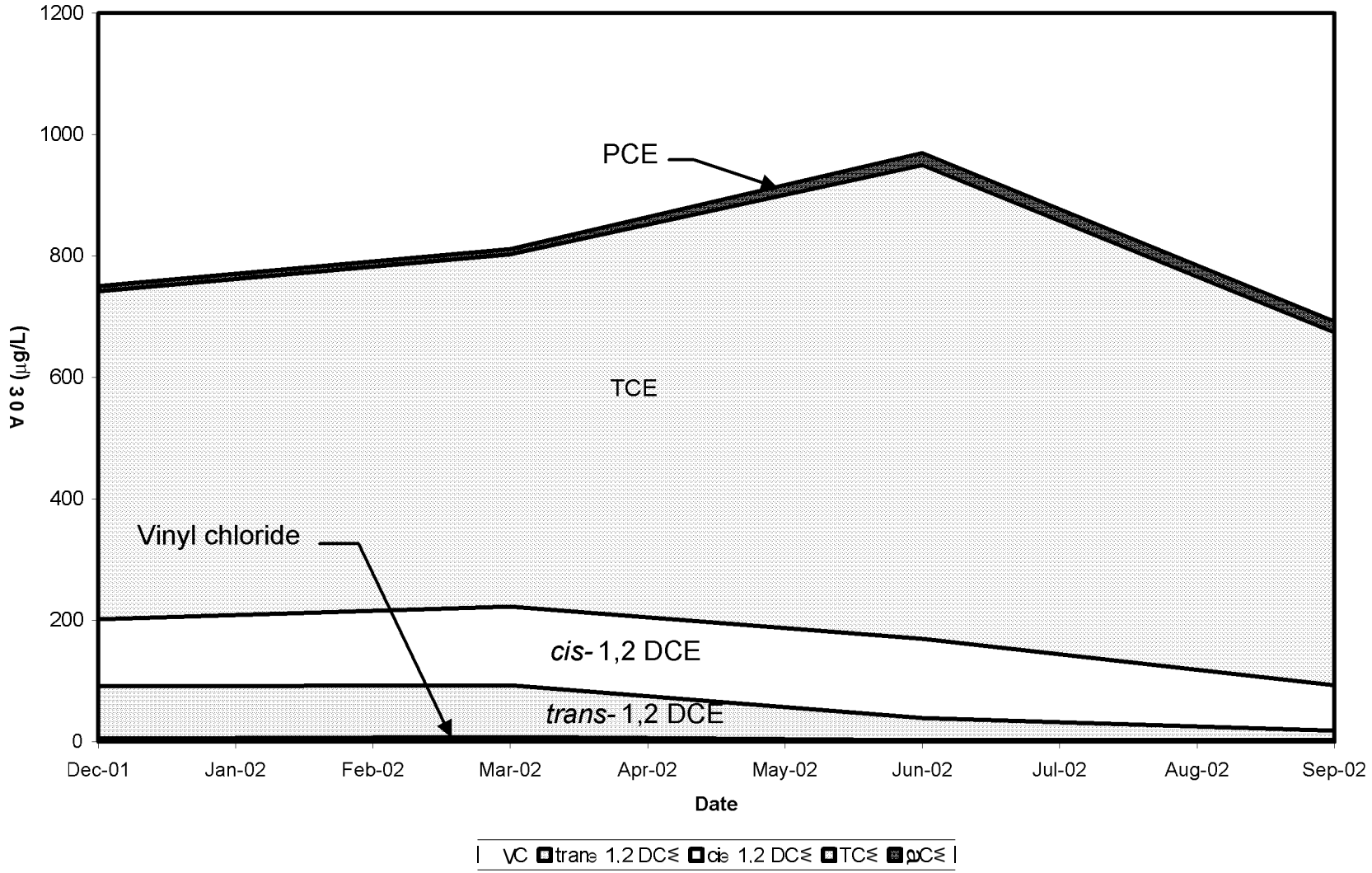


Figure H-1. Volatile organic compounds in TAN-29, Fiscal Year 2002.

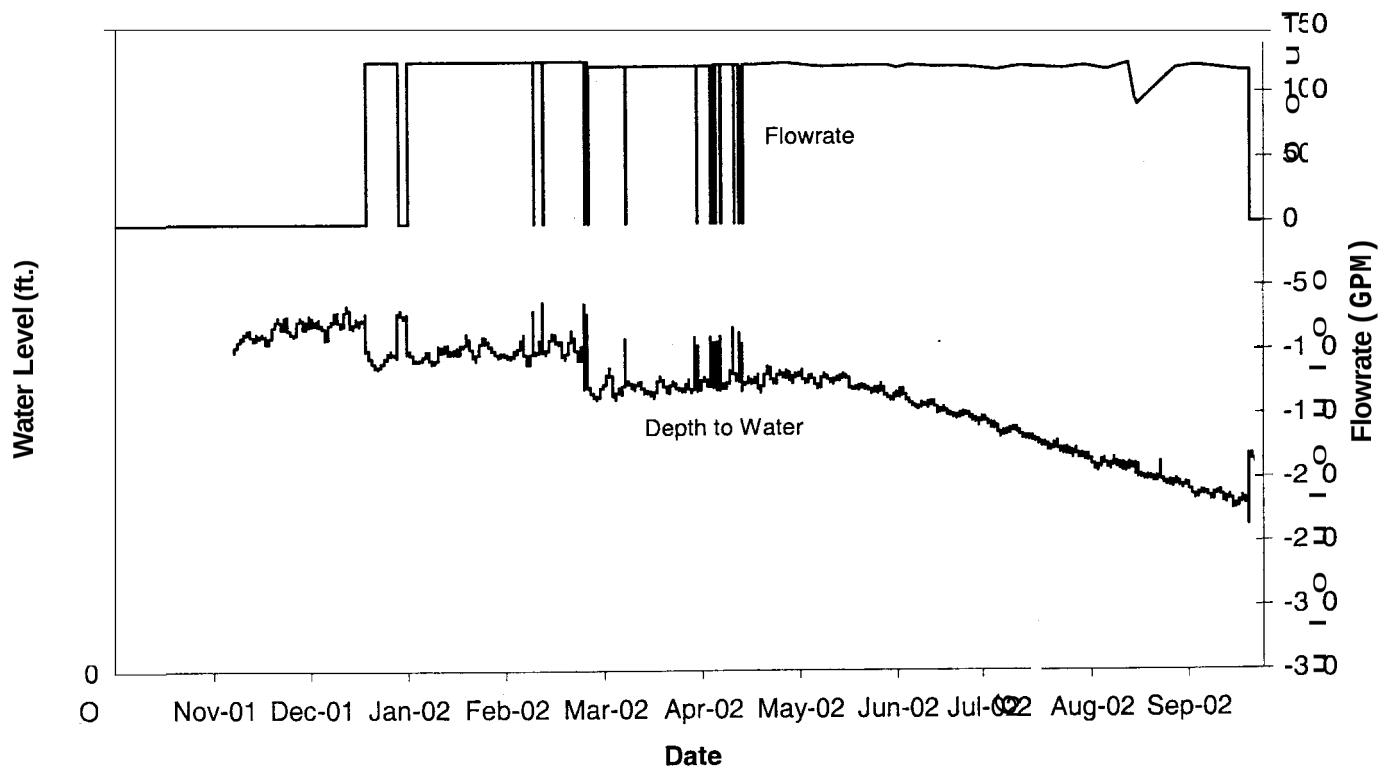
Appendix I

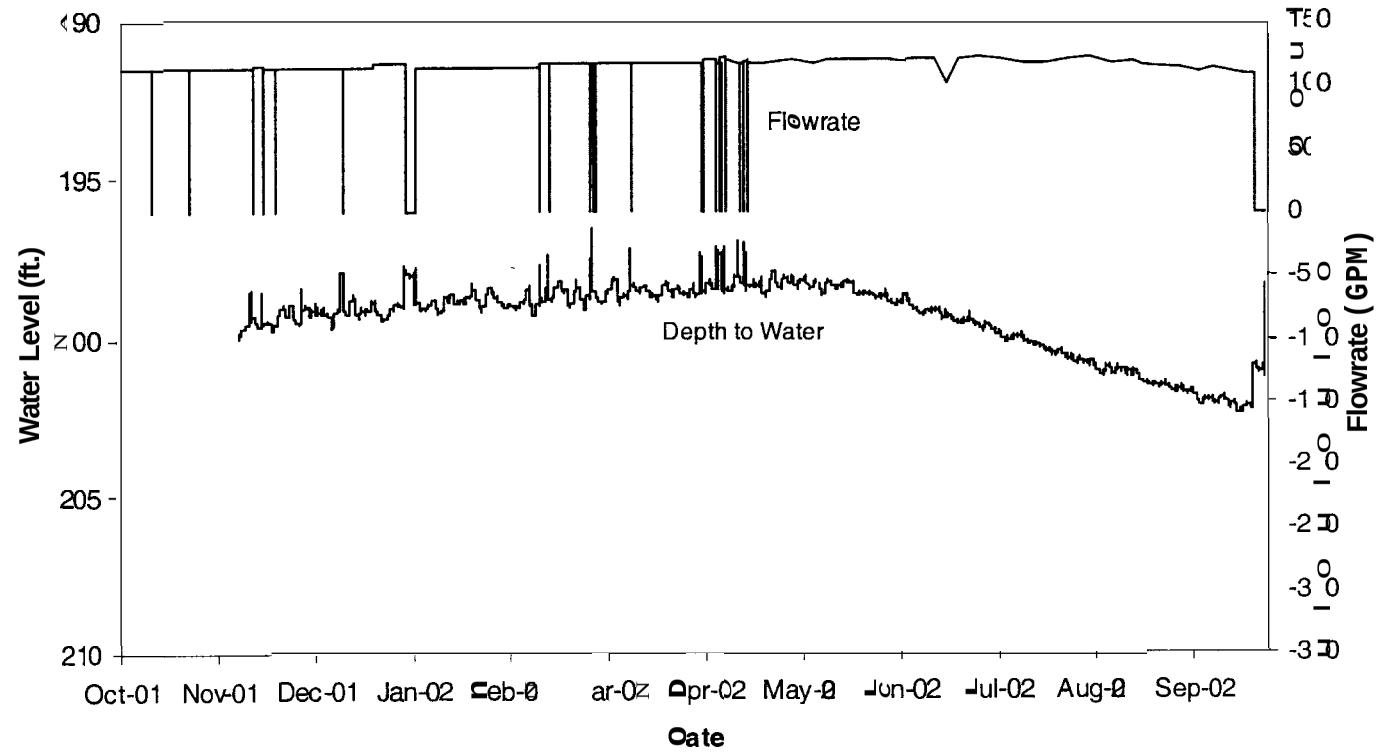
Hydrographs of New Pump and Treat Facility Extraction and Injection Wells

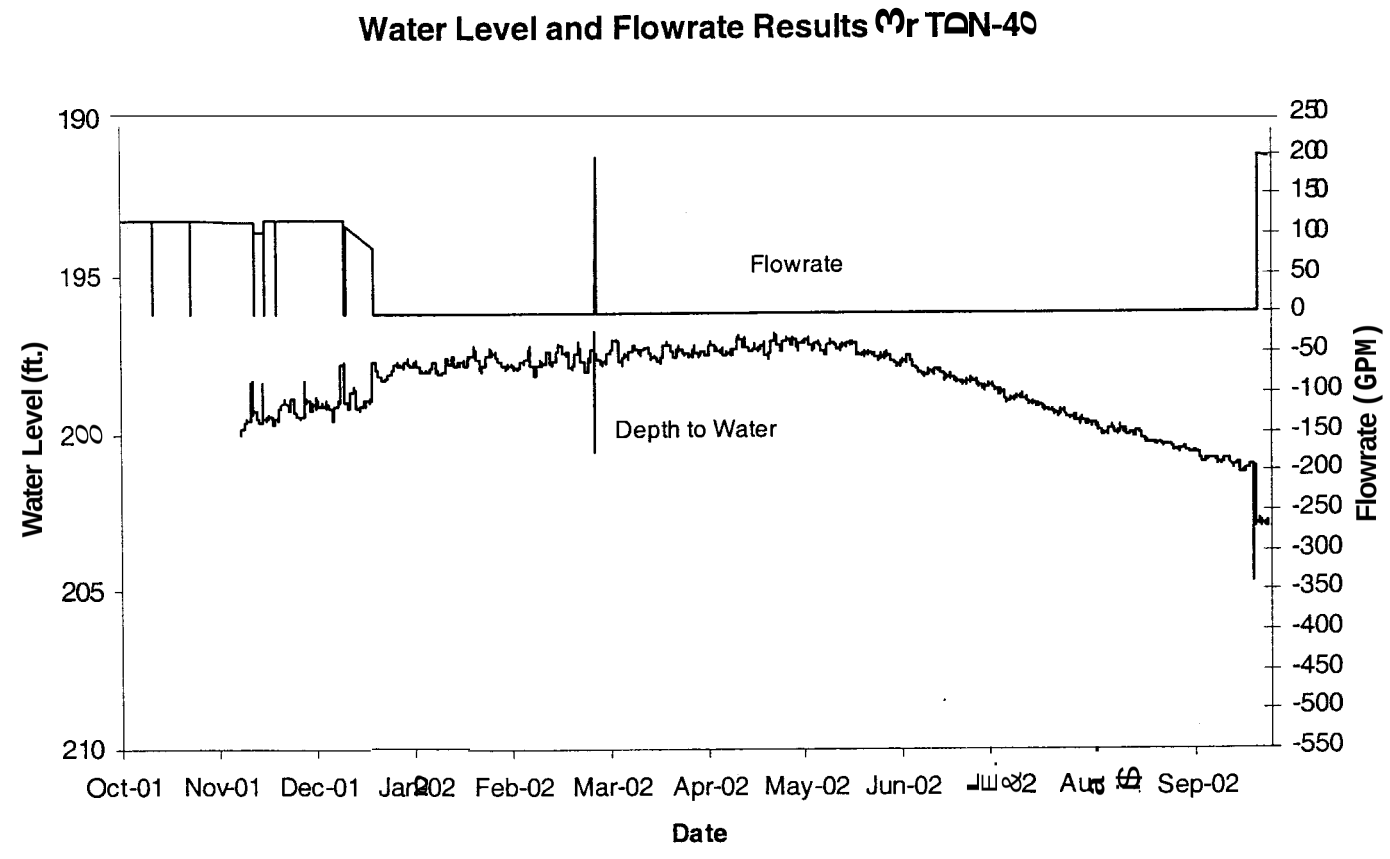
Appendix I

Hydrographs of New Pump and Treat Facility Extraction and Injection Wells

Plots showing water level and flow rate for the extraction wells (i.e., TAN-38, -39, and -40) and the injection well (i.e., TAN-53A) are shown in Figure I-1.







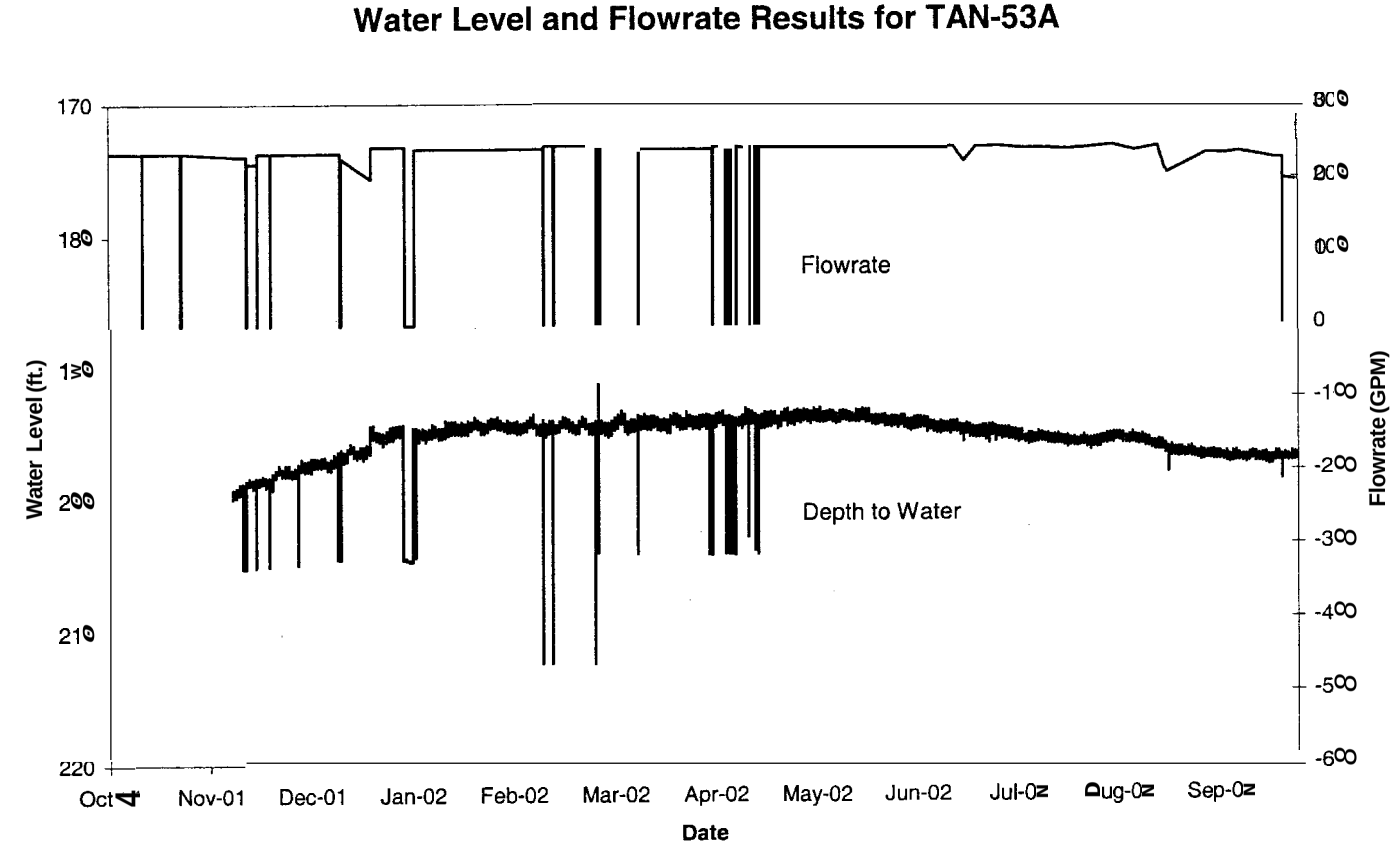


Figure I 1 Plots showing water level and flow rate for the extraction wells (i.e., TAN-38, -39, and -40) and the injection well (i.e., TAN-53A).